# City of Oxnard Bicycle & Pedestrian Facilities Master Plan Appendices

Approved by the City of Oxnard City Council
**February 2011**

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City of Oxnard

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# Appendix A: Design Guidelines

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# Appendix A: Design Guidelines

The design guidelines presented in this chapter are design solutions tailored to Oxnard's bicycle and pedestrian facility needs. To establish these standards Oxnard consulted the minimum standards outlined by the California Highway Design Manual's Chapter 1000 (Chapter 1000) and California Manual on Uniform Traffic Control Devices (CAMUTCD), recommended standards prescribed by the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities, the AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities, the national Manual on Uniform Traffic Control Devices (MUTCD), and the Institute of Transportation Engineers Manual of Traffic Signal Design. Standards in this document are all intended to meet, if not exceed, standards in Chapter 1000, CAMUTCD, AASHTO guidelines, MUTCD, and Institute of Transportation and Engineering Manual of Traffic Signal Design. If standards that are not covered in the Bicycle and Pedestrian Facilities Master Plan are covered by these other regulatory manuals, the City will at least meet the minimum standards of the regulatory manual.

These standards and guidelines provide basic information about the design of network infrastructure, such as bicycle lane dimensions, striping requirements, sidewalk zones, curb ramps, and recommended signage and pavement markings.

Guidelines addressing more complicated bicycle and pedestrian facility design issues provide solutions for safely accommodating non-motorized transportation through major arterial intersections, freeway interchanges, at transit stops, and in other situations to provide the foundation for a safe, functional, and inviting network.

The design guidelines provided here are intended to assist in the development of an inviting, walkable, and bike-able environment in the City of Oxnard, and to help to ensure compliance with the Americans with Disabilities Act. These are not engineering specifications and are not intended to replace existing applicable mandatory or advisory standards, nor the exercise of engineering judgment by licensed professionals.

## A.1 Overview of Bikeway Facility Classifications

According to Caltrans, the term "bikeway" encompasses all facilities provided primarily for bicycle travel. Caltrans has defined three types of bikeways in Chapter 1000 of the Highway Design Manual: Class I, Class II, and Class III. For each type of bikeway facility both "Design Requirements" and "Additional Design Recommendations" are provided. "Design Requirements" are minimum and preferred requirements. "Additional Design Recommendations" provide guidelines to assist with design and implementation of facilities and include alternate treatments. **Figure A-1** provides an illustration of these three types of bicycle facilities.

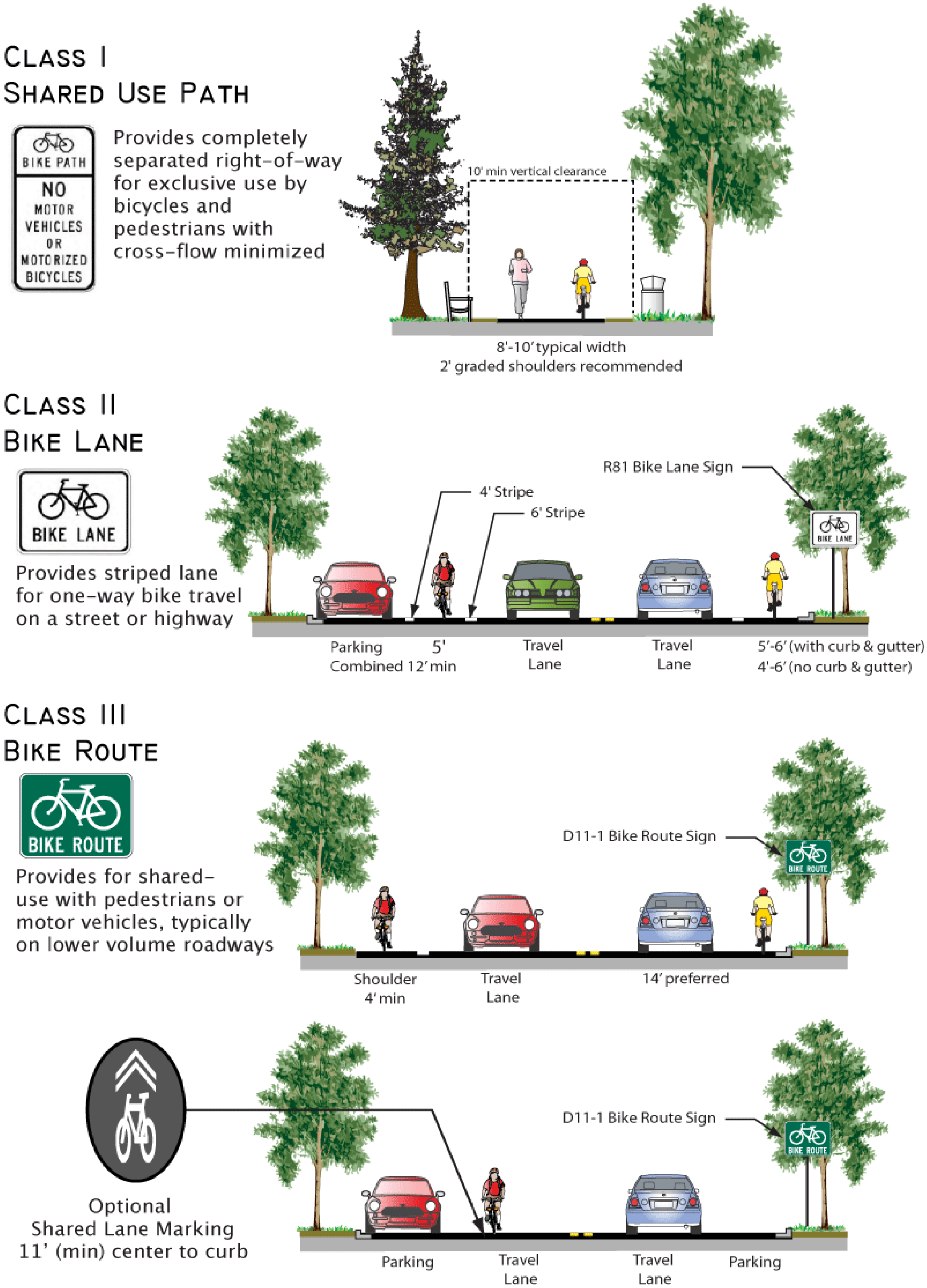



**Figure A-1: City of Oxnard Standard Bicycle Facility Types**

## A.2 Design of Multi-Use Paths (Class I)

A multi-use path (Caltrans designation Class I) allows for two-way, off-street bicycle use. Unless a parallel pedestrian path is provided, other non-motorized users such as pedestrians or rollerbladers are legally allowed to use the multi-use path. These facilities are frequently found in parks, along rivers and beaches, and in greenbelts or utility corridors where right-of-way exists and there are few conflicts with motorized vehicles. Class I facilities can also include amenities such as lighting, signage, and fencing.

### A.2.1. General Design Practices

Multi-use paths provide a desirable facility, particularly for novice riders, children, recreational trips, and long distance commuter bicyclists of all skill levels preferring separation from traffic. Multi-use paths should generally provide directional travel opportunities not provided by existing roadways. Some of the elements that enhance off-street path design include:

- Frequent access points from the local road network. If access points are spaced too far apart, users will have to travel out of direction to enter or exit the path, which can discourage use.
- Grade-separated crossings with streets or driveways.
- Placing wayfinding signs to direct users to and from the path and major roadway crossings.
- Construction at a standard that allows heavy maintenance equipment to use the path without causing it to deteriorate.
- Proper design of intersections where the multi-use path intersects with roadways to alert motorists to the presence of bicyclists and to alert bicyclists to the presence of motor vehicles.
- Identifying and addressing potential security problems.
- Provision of separate pedestrian ways to reduce conflicts.
- Landscape designs to accommodate bicycles and discourage loitering.

The City of Oxnard generally recommends against the development of multi-use paths directly adjacent to roadways. Known as “sidepaths”, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding when either entering or exiting the path. This can also result in an unsafe scenario where motorists entering or crossing the roadway at intersections and driveways do not notice bicyclists coming from their right, as drivers are not expecting traffic coming from that direction. In addition, stopped cross-street motor vehicle traffic or vehicles exiting side streets or driveways may frequently block paths or pull out unexpectedly. Bicyclists traveling from an unexpected direction also go unnoticed, especially when sight distances are poor.

Multi-use paths may be considered along roadways under the following conditions:

- The path will generally be separated from all motor vehicle traffic with few intersections with motor vehicles.
- Bicycle use is anticipated to be high or a need for facilities for novice-bicyclists is demonstrated.
- The path will provide continuity with an existing path through a roadway corridor.

- The path can be terminated at each end onto streets with good bicycle facilities, or onto another well-designed path.
- There is adequate access to local cross-streets and other facilities along the route.
- Grade separation structures do not add substantial out-of-direction travel.

California Vehicle Code 21208 requires bicyclists to ride in an on-road designated bicycle lane with exceptions but does not require bicyclists to ride on paths. Roadway design parallel to bicycle paths should still allow bicyclists' use of the road as provided by law, and appropriate bicycle design should be considered.

## A.2.2. Design Standards

The following design standards represent the City of Oxnard Standards. Caltrans Highway Design Manual (Chapter 1000) and the California MUTCD are referenced for minimum design standards where applicable.

### A.2.2.1. Width

The minimum paved width for a two-way multi-use path shall be 12 feet. A minimum 2-foot wide graded area shall be provided adjacent to the pavement on each side.

### A.2.2.2. Clearance to Obstructions

A 2-foot minimum graded shoulder on both sides of the path is required. An additional foot of lateral clearance (total of 3 feet) is required for the installation of signage or other furnishings. Grading is not required beyond the 2-foot shoulder.

The clear width on structures, where railings exist shall be not less than 8 feet.

The vertical clearance to obstructions across the clear width of the path shall be a minimum of 8 feet.

### A.2.2.3. Striping

The City of Oxnard recommends a 4-inch dashed yellow centerline stripe with 4-inch solid white edge lines.

### A.2.2.4. Separation from Roadway

Multi-use paths that are fewer than 5 feet from the edge of the shoulder shall include a physical barrier to prevent bicyclists from encroaching into the roadway. Multi-use paths within the clear recovery zone of highways and freeways shall include a physical barrier separation. Suitable barriers could include a fence.

### A.2.2.5. Surfacing

Material composition and construction methods can have a significant determination on the longevity of the pathway. Thicker asphalt sections (min. 4") and a well-prepared subgrade will reduce deformation over time and reduce long-term maintenance costs. If asphalt is to be used for surface material, redwood headers must be used to form the pathway. Using modern construction practices, asphalt provides a smooth ride with low maintenance costs and provides for easy repair of surface anomalies.

Concrete is also a common surface for multi-use paths. The surface must be cross-broomed and the crack-control joints should be saw-cut, not troweled to minimize noise and bumps to cyclists. Concrete paths cost more to build than asphalt paths, and can be highly durable, but concrete is subject to frequent cracking, and repairs to concrete path are more costly and time consuming than repairs to asphalt paths.

Multi-use paths should be designed with sufficient surfacing structural depth for the subgrade soil type to support maintenance and emergency vehicles. Wherever a path is constructed over a poor subgrade (i.e. wet and/or poor material), treatment of the subgrade with lime, cement or geotextile fabric should be considered.

#### A.2.2.6. Design Speed

The minimum design speed for multi-use paths is 25 miles per hour except on long downgrades as described in the table below, where a 30 mph design speed should be used.

**Table A-1: Design Speed for Multi-Use Paths**

| Type of Facility | Design Speed |
|---|---|
| Multi-use paths with Mopeds Prohibited | 25 mph |
| Multi-use paths on Long Downgrades (steeper than 4%, longer than 500 feet) | 30 mph |

*Source: Adapted from Caltrans Highway Design Manual (design speed converted to mph)*

Installation of "speed bumps" or other similar surface obstructions shall not be used to cause bicyclists to slow down in advance of intersections.

#### A.2.2.7. Horizontal Alignment and Superelevation

The minimum radius of curvature negotiable by a bicycle is a function of the superelevation rate of the multi-use path surface, the coefficient of friction between the bicycle tires, the multi-use path surface, and the speed of the bicycle.

For most multi-use path applications the superelevation rate will vary from a minimum of 2 percent to a maximum of approximately 5 percent. A straight 2 percent cross slope is recommended on tangent sections. The minimum superelevation rate of 2 percent will be adequate for most conditions, including drainage, and will simplify construction. Superelevation rates steeper than 5 percent should be avoided because they create maneuvering difficulties for slow moving bicyclists.

The minimum radius of curvature can be selected from the table below. Variance from the minimum radii may be needed because of right of way restrictions, topographical or other considerations. Standard curve warning signs and supplemental pavement markings should be installed when curve radii are designed smaller than those shown in the table below. The negative effects of nonstandard curves can also be partially offset by widening the pavement through the curves.

**Table A-2: Design Speed Minimum Radius**

| Design Speed (mph) | Minimum Radius (feet)<br>Minimum Radius<br>Superelevation<br>Minimum Radius | | | |
|---|---|---|---|---|
| | 2% Superelevation | 3% Superelevation | 4% Superelevation | 5% Superelevation |
| 25 | 154 | 147 | 141 | 137 |
| 30 | 282 | 269 | 259 | 249 |

*Source: Adapted from Caltrans Highway Design Manual (metric units converted to English)*

### A.2.2.8. Stopping Sight Distance

To provide bicyclists with an opportunity to see and react to the unexpected, a multi-use path should be designed with adequate stopping sight distances. The distance required to bring a bicycle to a full controlled stop is a function of the bicyclist's perception and brake reaction time, the initial speed of the bicycle, the coefficient of friction between the tires and the pavement, and the braking ability of the bicycle.

The table below indicates the minimum stopping sight distances for the common design speeds and grades on two-way paths. For two-way multi-use paths, the descending direction, that is, where grade is negative, will control the design. The higher design speed should be used on segments with five percent grade and higher.

**Table A-3: Design Speed Minimum Stopping Sight Distance**

| Design Speed (mph) | Stopping Distance (feet) | | | | |
|---|---|---|---|---|---|
| | 0% Grade | 5% Grade | 10% Grade | 15% Grade | 20% Grade |
| 25 | 176 | 197 | 232 | 300 | 507 |
| 30 | 246 | 279 | 332 | 440 | 763 |

*Source: Adapted from Caltrans Highway Design Manual (metric units converted to English)*

### A.2.2.9. Grades

Multi-use paths typically attract less skilled bicyclists, so it is important to avoid steep grades in their design. Bicyclists not physically conditioned will be unable to negotiate long, steep uphill grades. Since some novice bicyclists often ride poorly maintained bicycles, long downgrades can cause problems as well. For these reasons, multi-use paths with long, steep grades will generally receive very little use. The maximum grade rate recommended for multi-use paths is 5 percent. It is desirable to limit sustained grades to 2 percent to accommodate a wide range of riders. Steeper grades can be tolerated for short segments (e.g., up to about 500 feet). Where steeper grades are necessitated, the design speed should be increased and additional width provided.

### A.2.2.10. Lighting

Fixed-source lighting reduces conflicts along paths and at intersections. In addition, lighting allows the bicyclist to see the multi-use path direction, surface conditions, and obstacles. Lighting for multi-use paths is important and should be considered where riding at night is expected, such as on multi-use paths serving college students or commuters. Lighting should also be considered through underpasses or tunnels, at highway intersections, and when nighttime security could be a problem.

Depending on the location, average maintained horizontal illumination levels of 0.5 foot-candle to 2 foot-candle should be considered. Where special security problems exist, higher illumination levels may be considered. Light standards (poles) should meet the recommended horizontal and vertical clearances. Luminaries and standards should be at a scale appropriate for a pedestrian or multi-use path. Luminaires should be cutoff in design and utilize bulbs that provide optimum color quality. Uplighting along the paths should be avoided and shields or shrouds should be used where glare or light trespass may be an issue. The City of Oxnard Development Services Department should work with the City's Transportation Department to establish lighting standards for equipment and lighting levels.

#### A.2.2.11. Signage

See section A.9 for information on signage.

## A.2.3. Multi-use Paths in River & Utility Corridors

### Design Summary

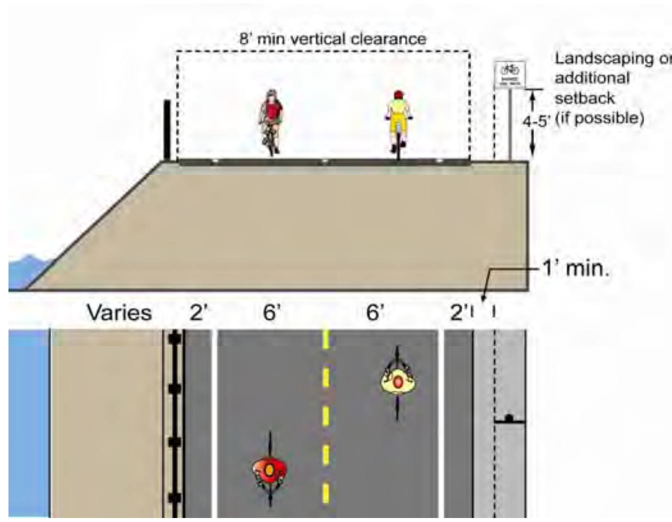
**Preferred Width:**

17′ (12′ paved area + 2′ shoulders on each side + 1′ clearance for signage), with 5′ for pedestrian path

**Minimum Design Standard:** 13′ minimum (8′ paved area + 2′ shoulders on each side + 1′ clearance for signage)

**Height:** 8′ min vertical clearance. If additional width allows, wider paths and bicycle path friendly landscaping are desirable.

### Preferred Design




### Discussion

Several utility and waterway corridors in Oxnard offer potential path development opportunities. These corridors offer excellent transportation and recreation opportunities for bicyclists of all ages and skills.

See following page for additional discussion.

### Guidance

Flood control channels are not discussed specifically, but general multi-use path guidance is available in the following documents:

- California MUTCD
- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO Guide for the Development of Bicycle Facilities

### Design Example

## Additional Discussion – Multi-use Paths in River & Utility Corridors

**Access Points:**

Any access point to a path should be well-defined with appropriate signage designating the pathway as a bicycle facility and prohibiting motor vehicles. Gates that can prevent all access to the facility should be present pursuant to the following conditions:

**Path Closure:**

Public access to the multi-use path in flood control channels may be prohibited during:

- Flood control channel utility maintenance or other activities
- Inclement weather or the prediction of storm conditions

**Fencing:**

Similar to railroads, public access to flood control channels or canals is undesirable by all parties. Hazardous materials, deep water or swift current, steep, slippery slopes, and debris all constitute risks for public access. Appropriate fencing may be required to keep path users within the designated travel way. The City should consult with the affected and or adjacent property owner to determine the height and design material of the fence.

Section 1.2.6 provides further guidance on fencing.

## A.2.4. Multi-use Paths in Existing Active Rail Corridors

### Design Summary

**Preferred Width:**
17' (12' paved area + 2' shoulders on each side + 1' clearance for signage), 5' for parallel pedestrian path
Preferred separation of 30' from centerline of rail tracks.

**Striping**

Dashed centerline and shoulder striping should be used.

**Fencing**

4' to 5' near at-grade crossings, 6' in other areas

### Discussion

Rails-with-Trails projects typically consist of paths adjacent to active railroads. Offering the same benefits as rail-to-trail projects, Oxnard features a prominent example of this type of project along Oxnard Boulevard. It should be noted that some constraints could impact the feasibility of rail-with-trail projects. In some cases, space may need to be preserved for future planned freight, transit or commuter rail service. In other cases, limited right-of-way width, inadequate setbacks, concerns about safety/trespassing, and numerous mid-block crossings may affect a project's feasibility.

See following page for additional discussion:

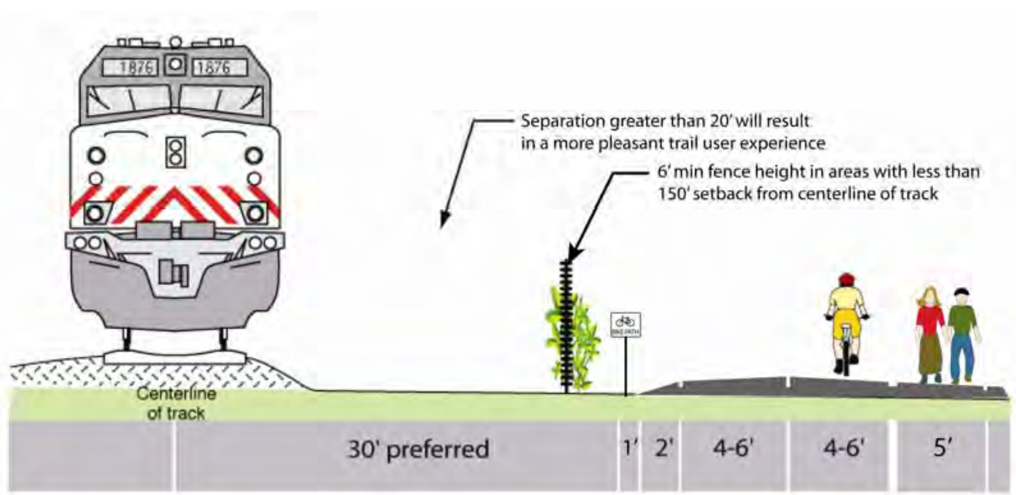
### Guidance

- Caltrans Highway Design Manual;
- California MUTCD
- AASHTO
- "Rails-with-Trails": Lessons Learned, FHWA, 2002
- SCRRA Rail-With-Trail Design Guidelines

### Design Example

Carlsbad, CA Rail-with-Trail

### Preferred Design



## *Additional Discussion – Multi-Use Paths in Existing Active Rail Corridors*

### Existing Guidance:

From "Rails-with-Trails"(RWT): Lessons Learned, FHWA, 2002"

"No national standards or guidelines dictate rail-with-trail facility design. Guidance must be pieced together from standards related to multi-use paths, pedestrian facilities, railroad facilities, and/or roadway crossings of railroad rights-of-way. Multi-use path designers should work closely with railroad operations and maintenance staff to achieve a suitable RWT design. Whenever possible, path development should reflect standards set by adjacent railroads for crossings and other design elements. Ultimately, RWTs must be designed to meet both the operational needs of railroads and the safety of multi-use path users. The challenge is to find ways of accommodating both types of uses without compromising safety or function."

### Design Considerations for Rails with Trails:

**Setback:**

The setback is the distance from the centerline of the railroad to the edge of the multi-use path facility. Each railroad generally has its own policies on multi-use paths adjacent to active rail lines. For example, the BNSF's policy on "Trails with Rails" states, *"Where train speeds are greater than 90 mph, trails are not acceptable. No trail will be constructed within 100 ft of any mainline track where train speeds are between 70 mph and 90 mph. Trails may be constructed between 50 ft and 100 ft where mainline train speed is 50 mph to 70 mph. Trails may be constructed 50 ft from centerline of track where train speeds are 25 mph to 50 mph, and 30 ft from any branchline track with speeds of 25 mph or less. No trails less than 30 ft from centerline of track for any reason."*

The Southern California Regional Rail Authority (SCRRA) has published guidelines for rail-with-trail projects and identifies its minimum recommended setback requirements:

- 45 feet for main line track where train speeds exceed 90 mph
- 40 feet for main line track where train speed is between 90 and 78 mph
- 35 feet where main line speed is between 78 and 60 mph
- 30 feet where main line speed is between 59 and 40 mph; and
- 25 feet where main line speed is below 40 mph.

Additionally, the SCRRA acknowledges that it may not be possible to provide recommended minimum setbacks at certain points. Additional barriers, vertical separation or other methods will be employed.

**Separation**

Separation is any physical barrier that keeps multi-use path users from accessing railroad operations. Separation can take the form of fencing, walls, vegetation, vertical grade, and ditches or swales. Fencing is the most common form of separation and can vary from chain link, wrought iron, vinyl, steel picket, galvanized pipe, and wooden rail. Fencing should be a minimum of 5 feet in height with higher fencing next to sensitive areas such as switching yards.

**Fencing**

Railroads typically require fencing with all rail-with-trail projects. Concerns with trespassing and safety can vary with the amount of train traffic on the adjacent rail line and the setting of the multi-use path, i.e. whether the section of track is in an urban or rural setting. The SCRRA typically requires tubular steel or welded wire mesh fencing. Exceptions may be granted that include 'best practices to ensure safe trail use and rail operations.' In rural or environmentally sensitive areas, fencing options may include a three rail split-rail fence in combination with landscaping. Fence height should be 4 to 5 feet within 150 feet of at-grade crossings and six feet in other areas. Section 1.2.6.2.6 provides further guidance on fencing.

**Full SCRRA guidelines can be found at**

http://www.metrolinktrains.com/documents/Public_Projects/Rail_with_Trail_Guidelines_021204.pdf

## A.2.5. Coastal Paths

### Design Summary

**Preferred Width:** 17′
Multi-use path: 12′ minimum; 17′ with parallel 5′ pedestrian path, with 1′ clearance for signage.

**Pavement Markings**

Facility should have graphic markings for non-English speakers.

**Striping**

Dashed centerline and shoulder striping should be used.

**Surfacing**

Paved surface adequate to support maintenance vehicles. Required thickness dependent upon paving material and subgrade.

### Discussion

Coastal Paths attract many types of pathway users and conveyances. Bicyclists, pedestrians, rollerbladers, strollers, and pedal cabs typically compete for space. To provide an adequate and pleasant facility, adequate widths and separation are needed to maintain a good pathway environment.

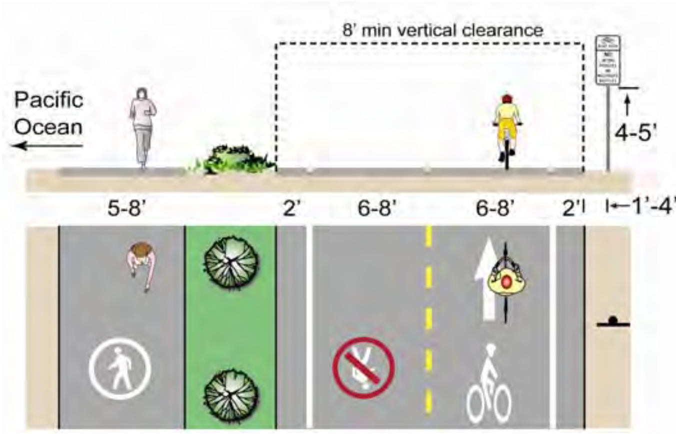
Offsetting of the pedestrian path should be provided if possible. Otherwise, physical separation should be provided in the form of striping or landscaping.

The multi-use path should be located on whichever side of the path will result in the fewest number of anticipated pedestrian crossings. For example, the multi-use path should not be placed adjacent to large numbers of destinations. Site analysis of each project is required to determine expected pedestrian behavior.

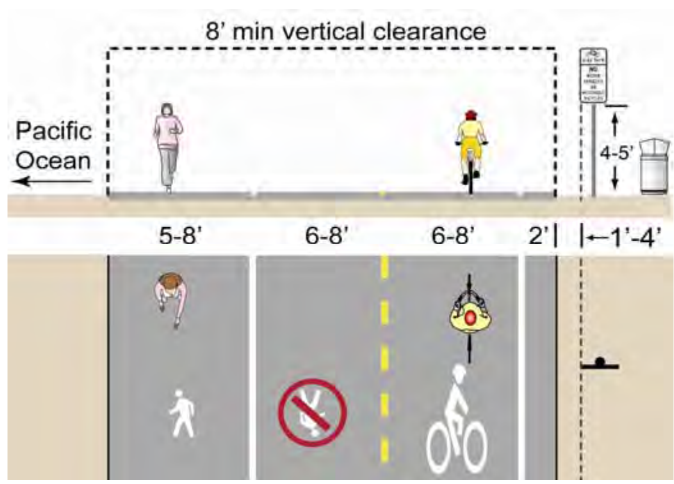
### Guidance

- California MUTCD
- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO Guide for the Development of Bicycle Facilities

### Preferred Design – with separation




### Preferred Design – no separation



## A.2.6. Grade Separated Undercrossing

### Design Summary

**Minimum Design Standard:**
14' to allow for access by maintenance vehicles if necessary

**Height:**
10' minimum

**Striping:**

Dashed centerline and shoulder striping should be used. The undercrossing should have a centerline stripe even if the rest of the path does not have one.

**Lighting:**

Vandal-resistant lighting should be installed with all undercrossings in culverts or tunnels.

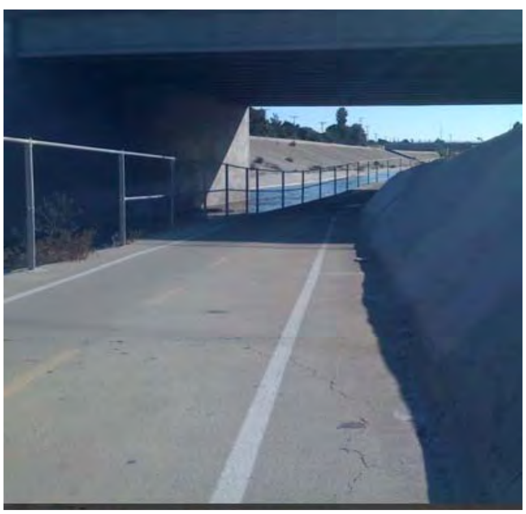
**Grade Requirements:**

As with other path sections, grade should not exceed 5%.

### Discussion

See following page for discussion.

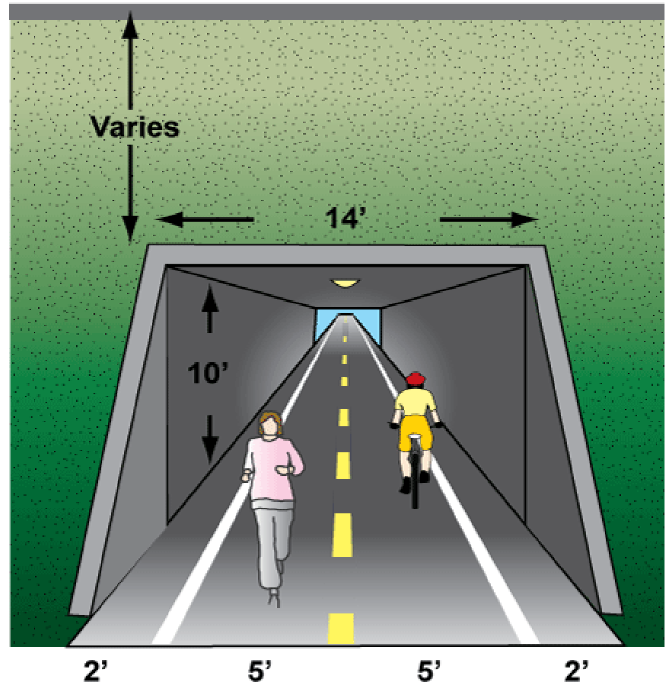
### Design Example



### Guidance

- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO Guide for the Development of Bicycle Facilities

### Minimum Design



# Additional Discussion – Grade Separated Undercrossing

## General Notes On Grade-Separated Crossings:

Bicycle/pedestrian overcrossings and undercrossings provide critical multi-use path links by separating the path from conflicts with motor vehicles. These structures are designed to provide safe crossings for bicyclists where they previously did not exist. For instance, an overcrossing or undercrossing may be appropriate where bicycle demand exists to cross a freeway in a specific location, or where a flood control channel separates a neighborhood from a nearby bicyclist destination. These facilities may also overcome barriers posed by railroads, and are appropriate in areas where frequent or high-speed trains would create at-grade crossing safety issues, and in areas where trains frequently stop and block a desired bicycle crossing point. They may also be required by the California Public Utilities Commission, which often prohibits new at-grade railroad crossings, or to replace existing at-grade crossings for efficiency, safety, and liability reasons.

Overcrossings and undercrossings also respond to bicyclist needs where existing at-grade crossing opportunities exist but are undesirable for any number of reasons. In some cases, high vehicle speeds and heavy traffic volumes might warrant a grade-separated crossing. Hazardous bicycle crossing conditions (e.g., few or no gaps in the traffic stream, conflicts between motorists and bicyclists at intersections, etc.) could also create the need for an overcrossing or undercrossing.

## Undercrossing Use:

Undercrossings should be considered when high volumes of bicyclists and pedestrians are expected along a corridor and:

- Vehicle volumes/speeds are high
- The roadway is wide
- An at-grade crossing is not feasible
- Crossing is needed under another grade-separated facility such as a freeway or rail line.

### Advantages of Grade Separated Undercrossing:

- Improves bicycle safety while reducing delay for all users.
- Eliminates barriers to bicyclists
- Undercrossings require 10 feet of overhead clearance from the path surface. Undercrossings often require less ramping and elevation change for the user versus an overcrossing, particularly for railroad crossings.

### Disadvantages / potential hazards:

- If the crossing is not convenient or does not serve a direct connection, it may not be well utilized.
- Potential issues with vandalism, maintenance.
- Security may be an issue if sight lines through undercrossing and approaches are inadequate. Undercrossing width greater than 14 feet, vandal resistant lighting and /or skylights may be desirable for longer crossings to enhance users' sense of security.
- High cost.

## A.2.7. Grade Separated Overcrossing

### Design Summary

**Preferred Width:** 14'

**Minimum Design Standard:**
12' minimum width. If overcrossing has any scenic vistas additional width or belvederes should be provided to allow for stopped path users. A separate 5' pedestrian area may be provided for facilities with high bicycle and pedestrian use.

**Height:**
10' vertical clearance.

**Striping:**
Dashed centerline and shoulder striping should be used.

**Grade:**
Ramps should not exceed 5% grade.

### Design Example

### Discussion

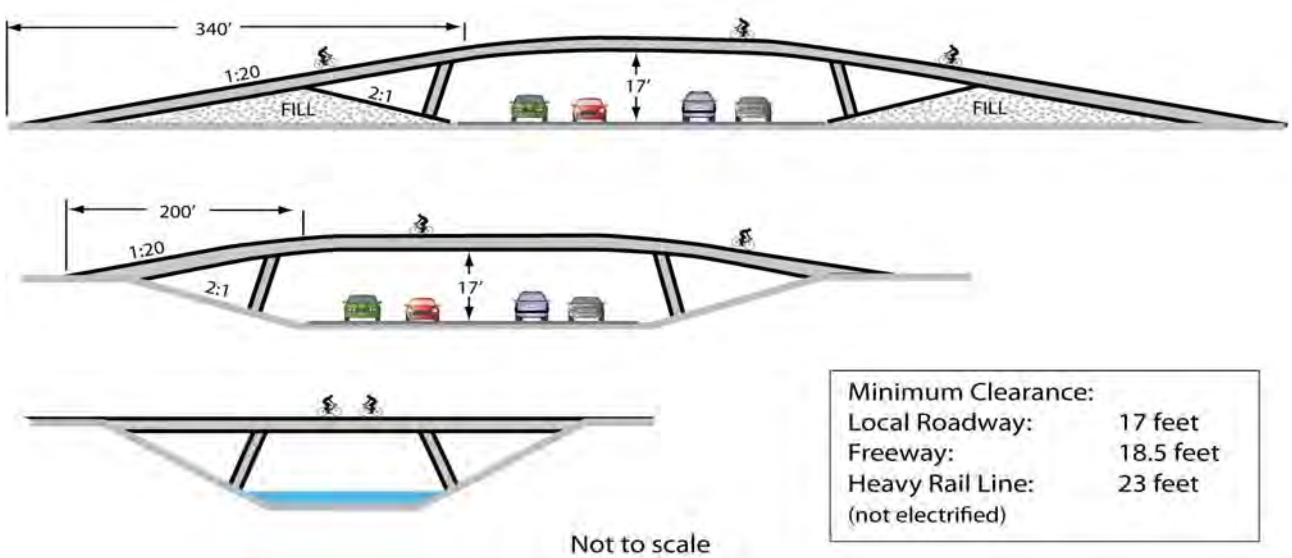
Overcrossings require a minimum of 17' of vertical clearance to the roadway below versus a minimum elevation differential of around 12' for an undercrossing. This results in potentially greater elevation differences and longer ramps.

See following page for additional discussion.

### Guidance

- Caltrans Highway Design Manual (Chapters 200 & 1000)
- Caltrans Bridge Design Specifications
- California MUTCD
- AASHTO Guide for the Development of Bicycle Facilities
- AASHTO Guide Specifications for Design of Pedestrian Bridges

### Preferred Design



## *Additional Discussion – Grade Separated Overcrossing*

### Ramp Considerations:

Overcrossings for bicycles typically fall under the Americans with Disabilities Act (ADA), and guidance is included in the Caltrans HDM which strictly limits ramp slopes to 5% (1:20) with landings at 400 foot intervals, or 8.33% (1:12) with landings every 30 feet.

### Overcrossing Use:

Overcrossings should be considered when high volumes of bicyclists are expected along a corridor and:

- Vehicle volumes/speeds are high
- The roadway is wide
- An at-grade crossing is not feasible
- Crossing is needed under another grade-separated facility such as a freeway or rail line

**Advantages of Grade Separated Overcrossing:**

- Improves bicycle safety while reducing delay for all users
- Eliminates barriers to bicyclists

**Disadvantages / potential hazards:**

- If the crossing is not convenient or does not serve a direct connection, it may not be well utilized.
- Overcrossings require at least 17 feet of clearance to the roadway below involving up to 400 feet or greater of approach ramps at each end. Long ramps must meet ADA requirements.
- Potential issues with vandalism, maintenance
- High cost

## A.2.8. Fencing

### Design Summary:

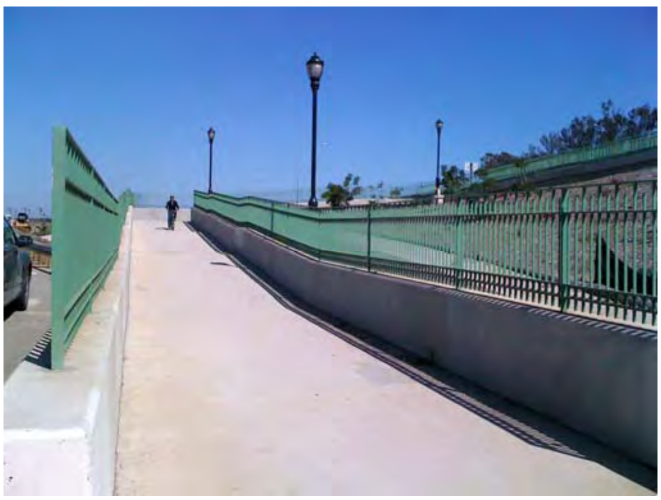
**Height:** 5′ minimum

### Discussion

Fencing can serve multiple purposes along multi-use path facilities, including access control, visual screening, channeling of path users, and safety.

See right column and following page for discussion.

### Design Example



### Guidance

- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO Guide for the Development of Bicycle Facilities

### General Notes on Fencing:

Some factors to consider when deciding on fencing necessity and styles include:

**Cost:** Fencing and other barriers can be costly,, depending on the type of materials used and the length, so options should be considered carefully.

**Security:** Fencing between the path and adjacent land uses can protect the privacy and security of the property owners. While crime or vandalism has not proven to be a common problem along most multi-use paths, fencing is still considered a prudent feature. The type, height, and responsibility of the fencing is dependent on local policies.

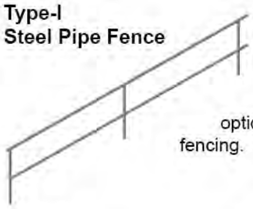
**Fencing height:** The height and design of a fence influences whether lateral movement will be inhibited. Few fences are successful at preventing people from continuing to cross at historic illegal crossing locations. Fencing that cannot be climbed will typically be cut or otherwise vandalized. Heavy-duty fencing such as wrought iron or Israeli-style fencing that are difficult to climb are often more expensive.

**Noise and dust:** Multi-use path corridors adjacent to freeways, busy roadways, or rail lines may be subject to noise, dust, vibration or vandalism, which may discourage use of the path. Methods of reducing this impact include the addition of vegetation or baffles to fencing barriers. This can increase the initial cost and maintenance cost.

The following page illustrates common types of fencing typically used with multi-use paths.

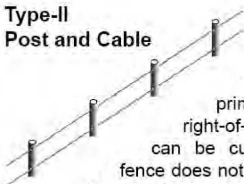
## *Additional Discussion – Fencing*

**Type-I**
**Steel Pipe Fence**



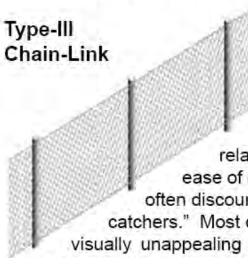
The City of Los Angeles standard steel pipe fence is a sturdy low maintenance option for bicycle path fencing.

**Type-II**
**Post and Cable**



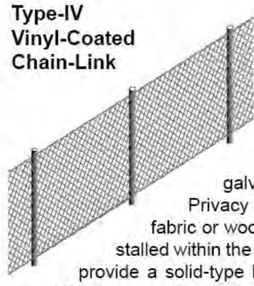
Post and cable fencing is an inexpensive option which serves primarily to demarcate right-of-way boundary but can be cut by vandals. The fence does not provide any screening or anti-trespassing features.

**Type-III**
**Chain-Link**



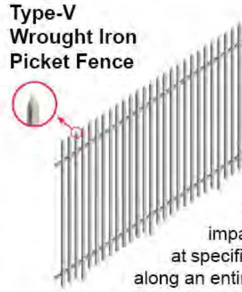
Chain-link fences are popular due to their effectiveness in keeping path users within the public right-of-way, relative low cost, and ease of maintenance but are often discouraged as "handle bar catchers." Most chain-link fences are visually unappealing and tend to project an image of an urban industrial environment. Chain-link is very easy to cut and vandalize and may not be useful in areas with a high history of trespassing. For these reasons, designers should be sensitive to the land-use context when considering the use of chain-link fencing. Privacy slats, plastic woven fabric or wood battens can be installed within the chin link material to provide a solid-type barrier to help catch debris, prevent handle bar grabbing and provide wind and visual

**Type-IV**
**Vinyl-Coated**
**Chain-Link**



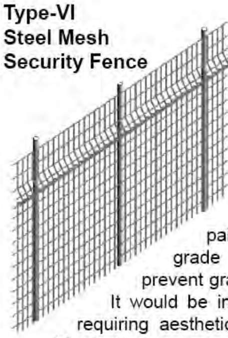
Vinyl coated chain link offers the same level of security, low cost and maintenance with a more passive and polished appearance than galvanized chain link. Privacy slats, plastic woven fabric or wood battens can be installed within the chain link material to provide a solid-type barrier to help catch debris, prevent handle bar grabbing and provide wind and visual buffering.

**Type-V**
**Wrought Iron**
**Picket Fence**



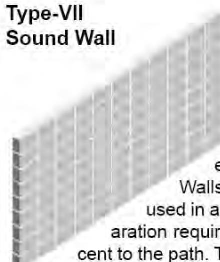
Often used as vandal-resistant fencing, and is used in locations that have a history of trespassing. It is difficult to cut and difficult to scale. Because of its cost and visual impact, it is typically used at specific locations rather than along an entire corridor.

**Type-VI**
**Steel Mesh**
**Security Fence**



Sometimes referred to as Israeli-style fencing for its use in Israel to protect kibbutzs, this product is more expensive than chain-link, difficult to vandalize, difficult to scale, and relatively easy to repair if it is cut. The fine grade of the mesh helps to prevent grabbing of handle bars. It would be inappropriate for areas requiring aesthetic treatment, and provides limited screening or buffering benefits.

**Type-VII**
**Sound Wall**



Sound walls have high costs and visual impacts. Solid concrete block walls are virtually indestructible and offer complete buffering and screening. Walls are most commonly used in areas where a grade separation requires a retaining wall adjacent to the path. These structures can become targets for graffiti artists and can create visually isolated stretches of bicycle path.

# A.3 Design of Bicycle Lanes (Class II)

Bicycle lanes or Class II bicycle facilities (Caltrans designation) are defined as a portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. Bicycle lanes are generally found on major arterial and collector roadways in Oxnard and are 5 to 8 feet wide. Bicycle lanes can be found in a large variety of configurations.

Bicycle lanes provide bicyclists with their own space on the roadway and enable them to ride at their preferred speed without interference from prevailing traffic conditions. Bicycle lanes facilitate predictable behavior and movements between bicyclists and motorists. Bicyclists may leave the bicycle lane to pass other bicyclists, make left turns, avoid obstacles or debris, merge with traffic at intersections, and to avoid conflicts with other roadway users.

New Construction shall meet the preferred design guidelines, unless otherwise recommended by the City Traffic Engineer. In no case shall the recommended design be less than the City's minimum standard or an adopted Federal or State standard.

## A.3.1. Required Design Guidelines

### A.3.1.1. Width

Varies depending on roadway configuration; the following pages contain specific design examples. The following is a quick summary:

- 3.3.1 Bicycle Lanes Next to On-Street Parallel Parking: 5' Min; 7' Preferred
- 3.3.2 Bicycle Lanes with No On-Street Parking: 5' Min; 8' Preferred
- 3.3.3 Bicycle Lanes at Channelized Intersection with Right Turn pocket: 4' Min, 5' Preferred

### A.3.1.2. Striping

Line separating vehicle lane from bicycle lane: 6 inches solid white

Line separating bicycle lane from parking lane: 4 inches solid white

Dashed white stripe when:

- Vehicle merging area approximately 50 feet to 200 feet. Solid 6" line may be considered at the discretion of the City Traffic Engineer.
- Delineating a conflict area within the intersection and only to the extent of the conflict area, unless otherwise directed by the City Traffic Engineer.

### A.3.1.3. Signing

Use R81 (CA) Bike Lane Sign at:

- Beginning of Bicycle Lane
- At far side of all arterial crossings
- At major changes in direction
- At intervals not to exceed ½ mile
- See Section 1.9.1 for additional information on bicycle signage.


R81 (CA) Sign

Bike Lane Sign

### A.3.1.4. Pavement Markings

Pavement markings for bicycle lanes shall be the 'BIKE LANE' stencil or graphic representation of a bicyclist with directional arrow (preferred) to be used at:

- Beginning of Bicycle Lane
- Far side of all multi-use path (Class I) crossings
- At far side of all arterial crossings
- At major changes in direction
- At intervals not to exceed ½ mile
- At beginning of bicycle lane pockets at approach to intersection.


Bike Lane Pavement Markings

## A.3.2. Bicycle Lanes Next to On-Street Parallel Parking

### Design Summary

**Preferred for New Development**: 7′ bicycle lane width

**Minimum Design Standard:** 5′ if parking stalls are marked. 12′ minimum (15′ preferred) for a shared bicycle/parking lane adjacent to a curb face, or 11′ minimum where parking is permitted but not marked on streets without curbs.

**Striping:** 6″ outside stripe, 4″ inside stripe, "T" markings

### Discussion

Bicycle lanes adjacent to on-street parallel parking are common in the United States. Crashes caused by a suddenly opened vehicle door are a hazard for bicyclists using this type of facility. Providing wider bicycle lanes is one way to mitigate potential bicyclist collisions with car doors. However, if the outer edge of the bicycle lane abuts the parking stall, bicyclists may still ride too close to parked cars. Bicycle lanes that are too wide may also encourage vehicles to use the bicycle lane as a loading zone in busy areas where on-street parking is typically full or motorists may try to drive in them. Encouraging bicyclists to ride farther away from parked vehicles will increase the safety of the facility.

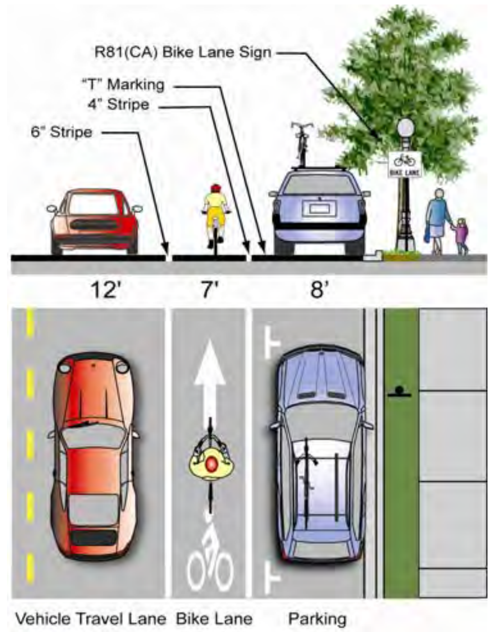
If sufficient space is available, the preferred design (upper right) provides a buffer zone between parked cars and the bicycle lane. This could be accomplished by using parking "T's" to increase separation. If parking volume is substantial or turnover is high, the preferred design is advised. Bicycle lanes shall not be placed between the parking area and the curb.

### Design Example

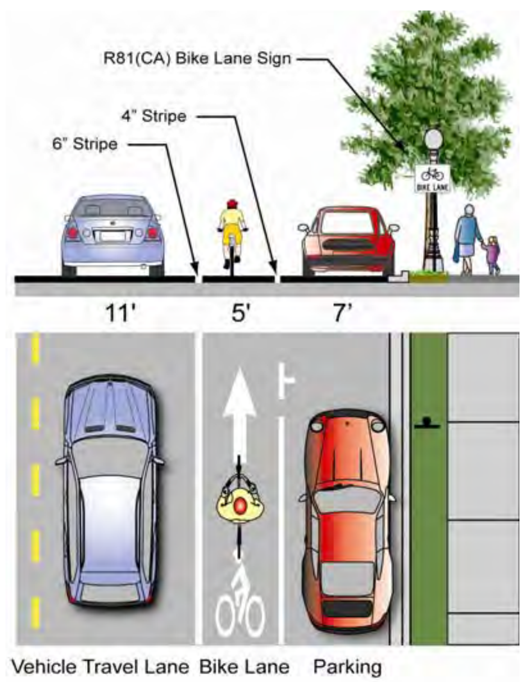
### Guidance (see following page)

- California MUTCD
- Caltrans *Highway Design Manual (Chapter 1000)*
- AASHTO *Guide for the Development of Bicycle Facilities*

### Preferred Design (if space is available)




### Minimum Design



## A.3.3. Bicycle Lanes with No On-Street Parking

### Design Summary

**Preferred for New Development:** 8'

**Minimum Design Standard:** 5' minimum measured from face of curb when adjacent to curb, with 2' maximum gutter width. 4' minimum on streets without a curb and speed limits of 35mph and below. 5' minimum on streets without a curb and speeds above 35mph.

**Striping:** 6"

### Discussion

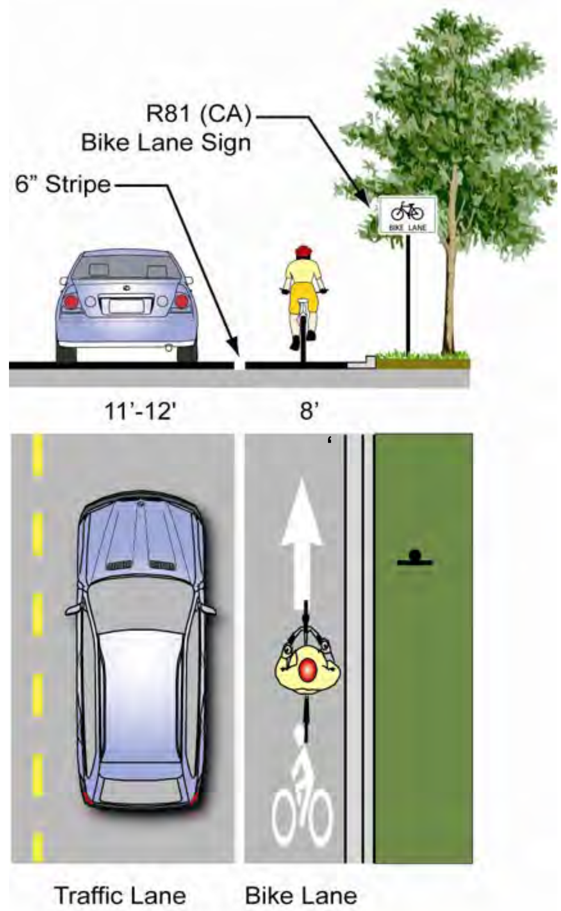
Wider bicycle lanes are desirable in certain circumstances such as on high speed arterials (35 mph+) where a wider bicycle lane can increase separation between passing vehicles, parked vehicles and bicyclists. Wide bicycle lanes are also appropriate in areas with high bicycle use. A bicycle lane width of 8 feet makes it possible for bicyclists to pass each other without leaving the bicycle lane, increasing the capacity of the bicycle lane. Frequent signage and pavement markings are important with wide bicycle lanes to ensure motorists do not mistake the lane for a vehicle lane or parking lane.

### Design Example

### Guidance

- California MUTCD
- Caltrans *Highway Design Manual (Chapter 1000)*
- AASHTO *Guide for the Development of Bicycle Facilities*

### Preferred Design



# A.3.4. Bicycle Lanes at Channelized Intersection with Right Turn Pocket

## Design Summary

**Preferred for New Development:** 5′ bicycle lane width next to right-turn pocket

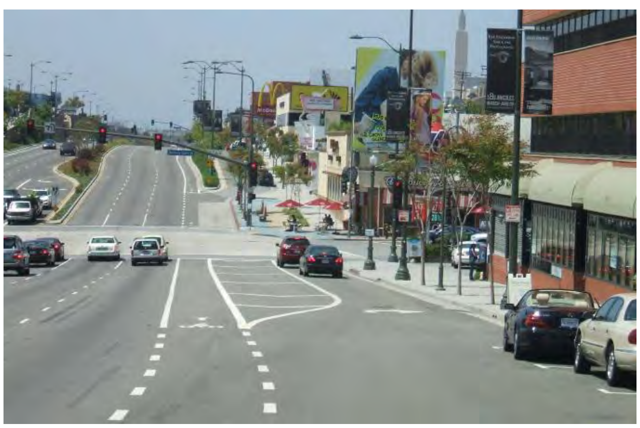
**Minimum Design Standard**: 4′ bicycle lane width next to a right turn pocket.

## Discussion

The appropriate treatment for right-turn only lanes is to place a bicycle lane pocket between the right-turn lane and the right-most through lane or, where right-of-way is insufficient, to drop the bicycle lane entirely approaching the right-turn lane. The design (right) illustrates a bicycle lane pocket, with signage indicating that motorists should yield to bicyclists through the merge area. The dashed lines in the merging area should be an integral part of any intersection with this treatment in Oxnard. The merge area (dashed lines) should begin no less than 50′ before the stop line on the near side of the intersection. Sign R4-4 is optional. Dropping the bicycle lane should only be done when a bicycle lane pocket cannot be accommodated.

- Travel lane reductions may be required to achieve this design.

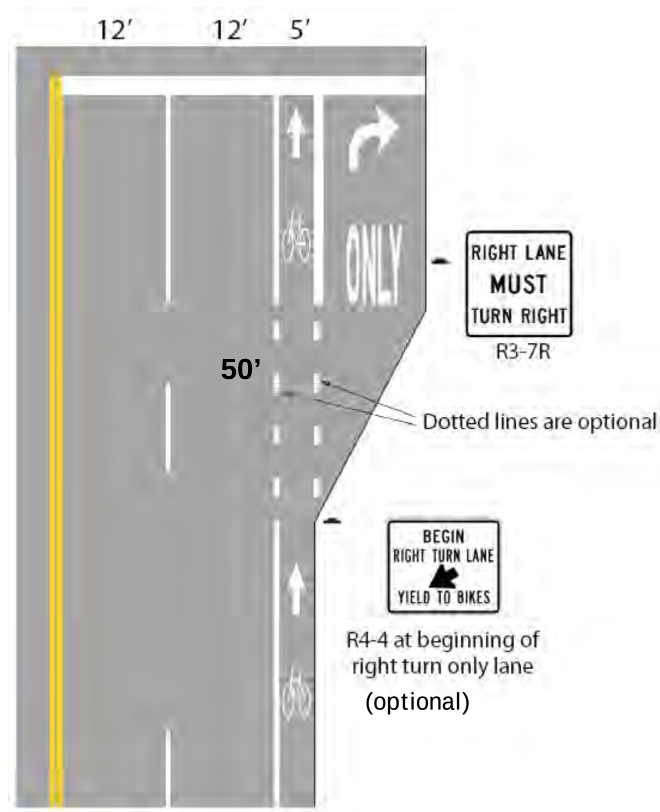
## Design Example



## Guidance

- California MUTCD
- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO Guide for the Development of Bicycle Facilities

## Preferred Design



# A.4 Design of Bicycle Routes (Class III)

Class III bicycle facilities – (Caltrans designation) are defined as facilities shared with motor vehicles. They are typically used on roads with low speeds and traffic volumes, however can be used on higher volume roads with wide outside lanes or with shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided. Bicycle routes are intended to provide continuity to the bikeway system and are established by placing Bicycle route signs along roadways.

Bicycle routes can employ a large variety of treatments from simple signage to complex treatments including various types of traffic calming and/or pavement stenciling. The level of treatment to be provided for a specific location or corridor depends on several factors.

## A.4.1. General Design Guidance

### A.4.1.1. Width

Varies depending on roadway configuration; see following pages for design examples.

### A.4.1.2. Striping

If shoulder is present, a 4-inch edge line separating vehicle lane from shoulder for bicycle use should be used.

### A.4.1.3. Signing

Use D11-1 "Bicycle Route" Sign at:

- Beginning or end of Bicycle Route (with applicable M4 series sign below)
- Entrance to multi-use path (Class I) - optional
- At major changes in direction or at intersections with other bicycle routes (with applicable M7 series sign below)
- At intervals along bicycle routes not to exceed ½ mile
- For additional information on signage see Section A.9.1.


D11-1 Sign

### A.4.1.4. Pavement Markings

Shared Lane Markings may be applied to Bicycle routes per the California MUTCD.

## A.4.2. Bicycle Routes with Wide Outside Lane

### Design Summary

**Bicycle Lane Width:**

Fourteen feet (14') minimum shared travel lane is preferred. Fifteen feet (15') should be considered if heavy truck or bus traffic is present. Bicycle lanes should be considered on roadways with outside lanes wider than 15 feet. This treatment is found on all residential streets, collectors, and minor arterials.

**Sign Height:**

The clearance from the bottom edge of the sign to the path surface directly under the sign shall be a minimum of 8 ft. The clearance for overhead signs on shared-use paths should be adjusted when appropriate to accommodate typical maintenance vehicles.

### Discussion

The wide outside lane provides adequate on-street space for the vehicle and bicycle to share the lane without requiring the vehicle to leave its lane to pass the bicyclist. This facility is frequently found with and without on-street parking.

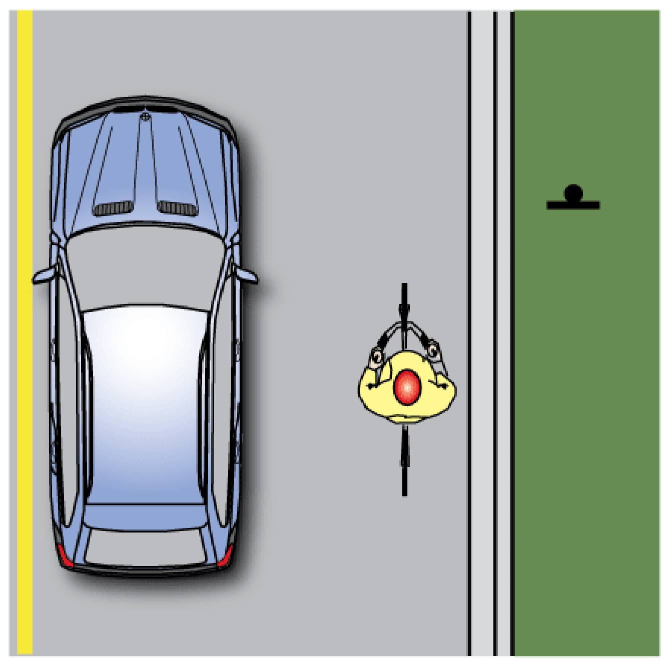
### Design Example

### Guidance

- California MUTCD
- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO Guide for the Development of Bicycle Facilities

### Preferred Design


14' preferred minimum



## A.4.3. Bicycle Routes on Collector/Residential Streets

### Design Summary

**Sign Placement:**

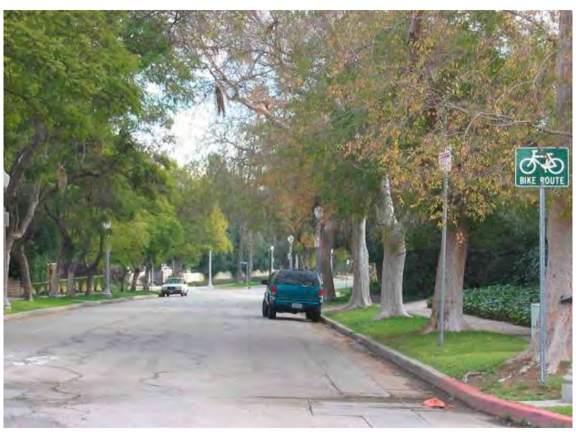
Bicycle route signage should be applied at intervals frequent enough to keep bicyclists informed of changes in route direction and to remind motorists of the presence of bicyclists. The clearance from the bottom edge of the sign to the path surface directly under the sign shall be a minimum of 8 ft. The clearance for overhead signs on shared-use paths should be adjusted when appropriate to accommodate typical maintenance vehicles.

### Discussion

Bicycle routes on local streets should have vehicle traffic volumes under 1,000 vehicles per day. Traffic calming may be appropriate on streets that exceed this limit.

Bicycle routes may be equipped with directional signage, traffic diverters, chicanes, chokers, and /or other traffic calming devices to reduce vehicle speeds or volumes. Such treatments often are associated with Bicycle Boulevards (see Section **A**.4.5 for discussion of Bicycle Boulevards).

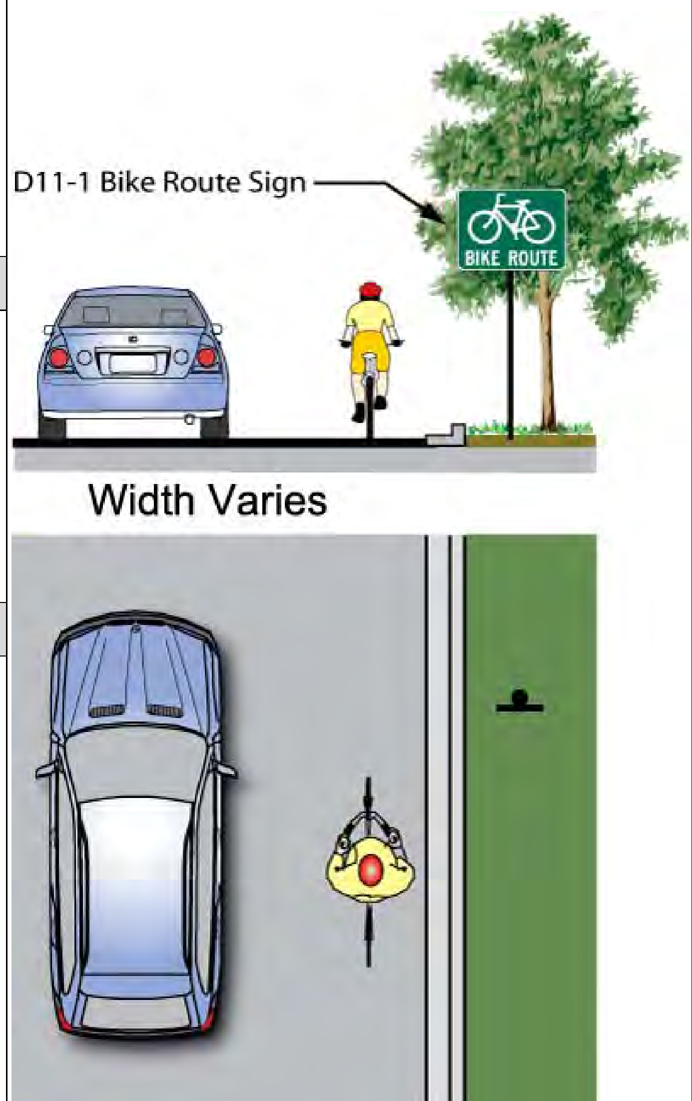
### Design Example




### Guidance

- California MUTCD
- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO Guide for the Development of Bicycle Facilities

### Preferred Design



## A.4.4. Shared Roadway Bicycle Markings (SRBM)

### Design Summary

**Door Zone Width:**

The width of the door zone is generally assumed to be 2.5 feet from the edge of the parking lane.

**Recommended SRBM placement:**

For 7’ parking lanes a minimum of 11’ from edge of curb where on-street parking is present but may be placed more than 11 feet as conditions support. Shared lane markings adjacent to an 8’ parking stall may be installed at a minimum of 12’ from centerline to curb.

### Discussion

Shared Roadway Bicycle Marking stencils (also called “Sharrows”) have been introduced for use in California as an additional treatment for Class III facilities and are only currently allowed in conjunction with on-street parking.

The stencil can serve a number of purposes, such as reminding bicyclists to ride further from parked cars to prevent “dooring” collisions, making motorists aware of bicycles potentially in their lane, and showing bicyclists the correct direction of travel.

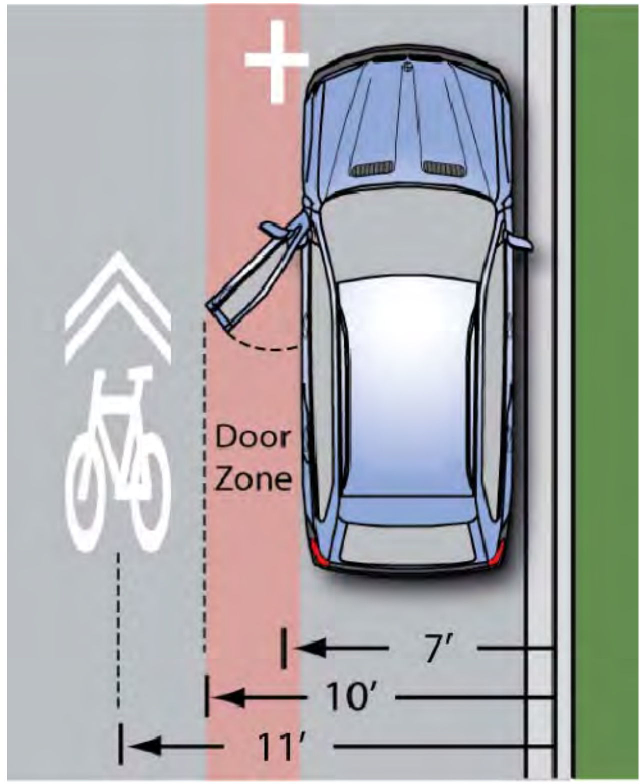
Placing the SRBM between vehicle tire tracks may also be considered as it will increase the life of the markings and reduce the long-term cost of maintenance to the treatment.

### Design Example

### Guidance

- California MUTCD

### Minimum Design



## A.4.5. Bicycle Boulevards

### Design Summary

Bicycle Boulevards are roadways that prioritize bicycle travel through various traffic calming measures. They are generally installed on minor or local roadways. No design standard exists. See following pages for additional guidance.

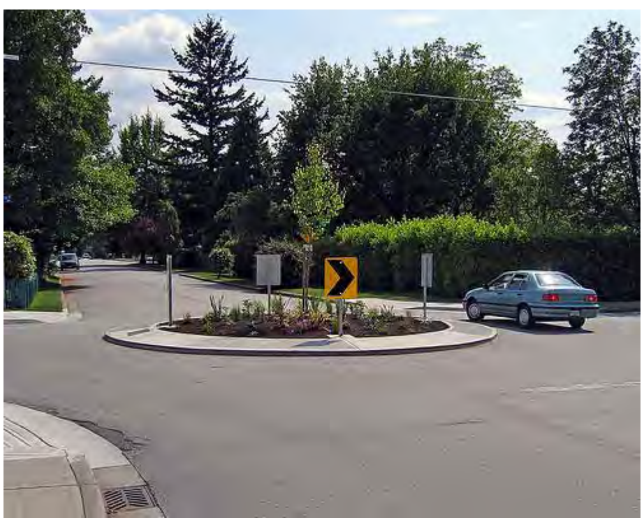
### Discussion

The benefit of Bicycle Boulevards, or bicycle routes with bicycle friendly treatment, is reduced travel time, lower motor vehicle traffic volumes and/or reduced motor vehicle speeds. Ideally, the bicyclist should not be making frequent stops.

The Bicycle Boulevard or bicycle route should be observed closely following treatment to see if there is an increase in vehicle trips along the bicycle route as many motorists may take advantage of fewer stops thereby reducing the effectiveness of the facility for bicycles. If motor vehicle ADT increases, treatments may be considered such as diagonal diverters, one-way closures, chicanes, chokers and other applicable treatments to preserve bicycle permeability and limit through vehicle access.

See following pages for additional discussion.

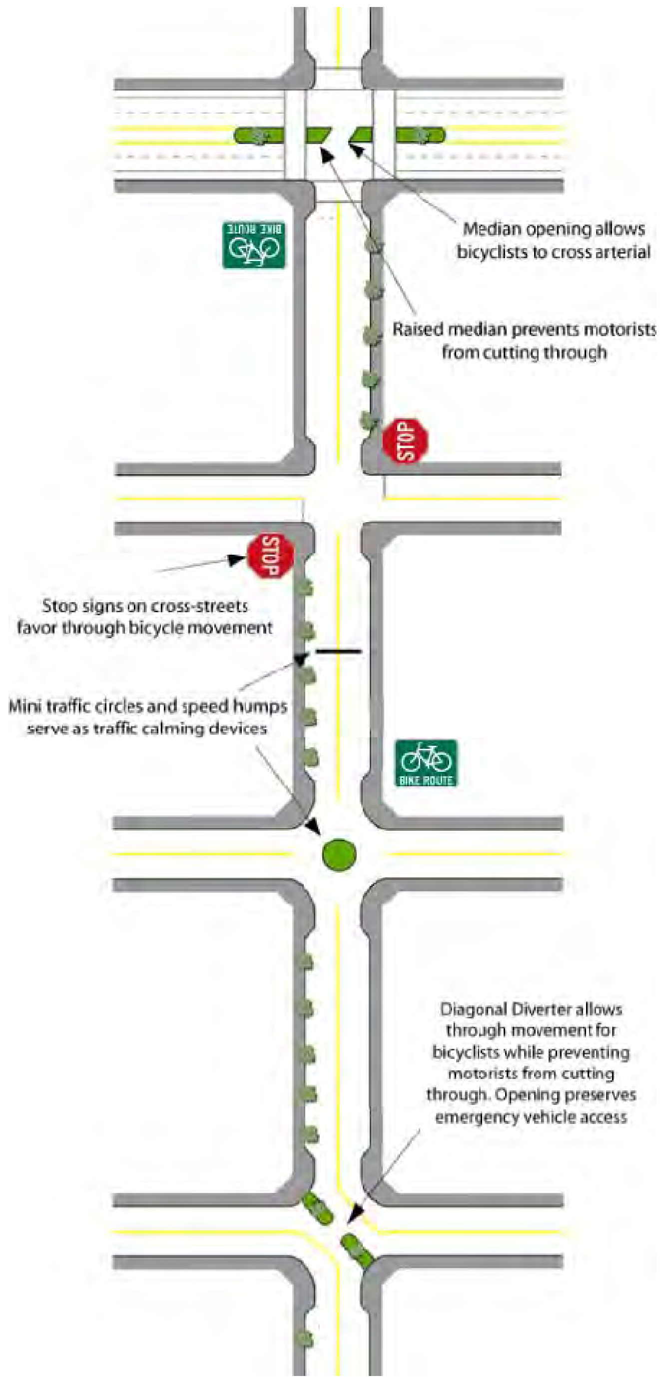
### Design Example



### Guidance

- No explicit guidance in State or Federal manuals

### Design Elements of a Bicycle Friendly Street



## *Additional Discussion – Bicycle Boulevards*

This section describes various treatments commonly used for developing Bicycle Boulevards. The treatments fall within four main "application levels" based on their level of physical intensity, with Level 1 representing the least physically-intensive treatments that could be implemented at relatively low impact on roadways that already function well for bicyclists. Identifying appropriate application levels for individual Bicycle Friendly Street corridors provides a starting point for selecting appropriate site-specific improvements. Four Bicycle Friendly Street application levels are as follows:

- Level 1: Signage
- Level 2: Pavement markings — See Sections **3.4.3. and 3.4.6-3.4.8**
- Level 3: Intersection treatments — See Sections **5-3.4.8**
- Level 4: Traffic calming — See Section **5 and 3.4.7**

It should be noted that corridors targeted for higher-level applications would also receive relevant lower-level treatments (as illustrated below). For instance, a street targeted for Level 3 applications should also include Level 1 and 2 applications as necessary. It should also be noted that some applications may be appropriate on some streets and inappropriate on others. In other words, it may not be appropriate or necessary to implement all "Level 2" applications on a Level 2 street. Furthermore, several treatments could fall within multiple categories as they achieve multiple goals. To identify and develop specific treatments for each Bicycle Friendly Street, the City could involve the bicycling community and neighborhood groups. Further analysis and engineering work may also be necessary to determine the feasibility of some applications.

## A.4.6. Bicycle Routes/Bicycle Boulevards at Local Intersections – Mini Roundabout

### Design Summary

Design varies; see below and following pages for additional discussion.

### Discussion

Roundabouts may be implemented where the Bicycle Friendly Street intersects a local street or even a collector if the ADT is less than 2,000. Signage and striping treatments should be implemented based on traffic volumes and may be appropriate for local/local intersections with very low ADT, while increased signage and splitter striping may be appropriate for larger ADTs and intersections with collector streets. Mini roundabouts can be landscaped with drought tolerant plants that do not impact sight lines for added visual impact and traffic calming effect. Treatment should be designed with the input of Oxnard Police and Fire Departments, City Traffic Engineer, Gold Coast Transit, and the affected school district(s).

**Advantages:**

- Reduces through bicycle and cross vehicle conflicts
- Calms traffic overall in all directions
- Eliminates unwarranted stop signs

**Disadvantages:**

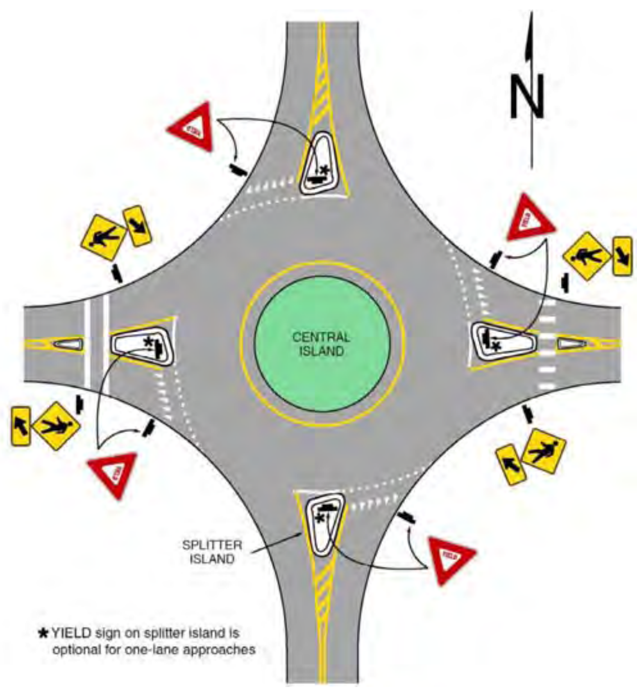
- Moderate cost (approx $20,000 per intersection)
- Required approval of neighborhood for installation
- Required neighborhood support and adoption for maintenance of landscaping if installed

### Guidance

- California MUTCD
- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO Guide for the Development of Bicycle Facilities Berkeley Bicycle Boulevard Design Tools and Guidelines
- FHWA *Roundabouts: An Informational Guide*

### Design Example

**Mini Roundabout**



## A.4.7. Bicycle Routes/Bicycle Boulevards at Local Intersections – Stop Signs on Cross-Streets

### Design Summary

Design varies; see below and following pages for additional discussion.

### Discussion

The installation of a stop sign on streets that cross a Bicycle Friendly Street or bicycle route maximizes through bicycle connectivity and speed and forces motorists crossing the facility to stop and proceed when safe. This treatment will typically be unwarranted and should be considered a traffic calming tool rather than a traffic control device.

**Advantages:**

- Inexpensive
- Effective at reducing through bicycle and cross vehicle conflicts

**Disadvantages:**

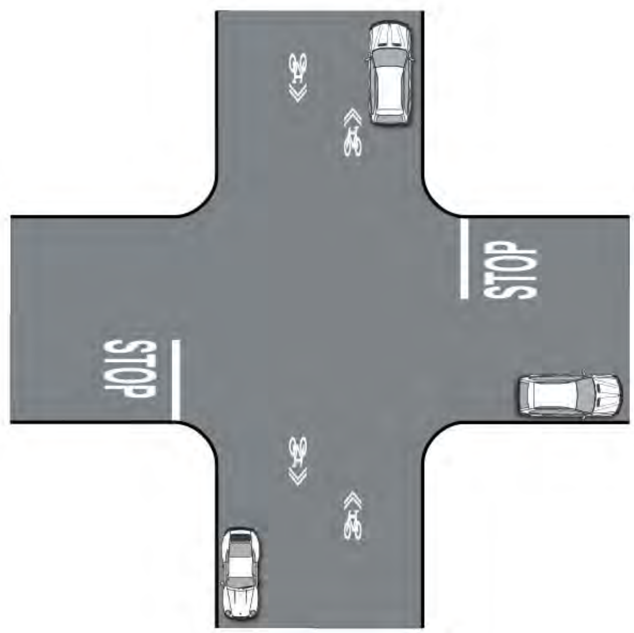
- May be unwarranted as traffic control device

### Guidance

- California MUTCD
- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO Guide for the Development of Bicycle Facilities Berkeley Bicycle Boulevard Design Tools and Guidelines

### Design Example

**Stop Signs on Cross Streets**



## A.4.8. Bicycle Routes/Bicycle Boulevards at Local Intersections – Curb Bulb-outs and High-Visibility Crosswalks

### Design Summary

Design varies; see below and following pages for additional discussion.

### Discussion

This treatment is appropriate for Bicycle Boulevards or bicycle routes near activity centers that may generate large amounts of pedestrian activity such as schools or commercial areas. The bulb-outs should only extend across the parking lane and should not obstruct bicyclists' path of travel or the travel lane. This treatment may be combined with a stop sign on the cross street if necessary.

**Advantages:**

- Traffic calming device

**Disadvantages:**

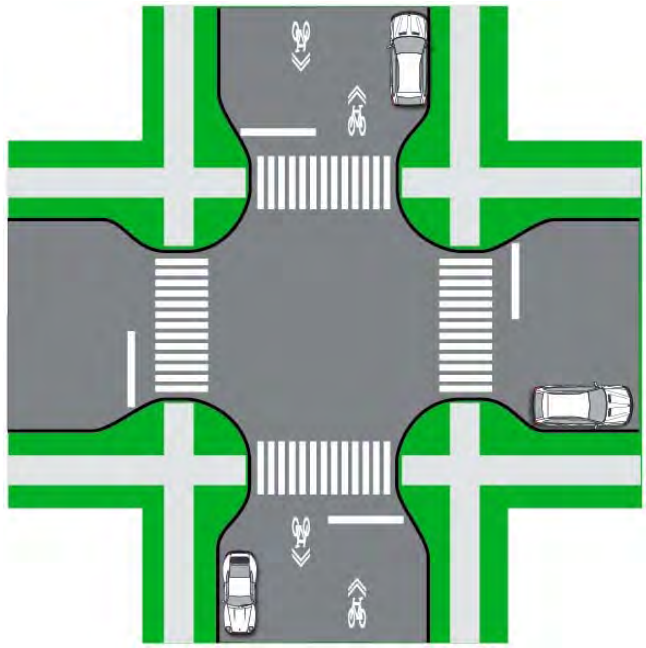
- May impact on-street parking
- Moderate cost (approx. $5,000-$15,000 per intersection)
- May impact bus/truck turning movements
- May impact emergency vehicles

### Guidance

- AASHTO Guide for the Development of Pedestrian Facilities
- Berkeley Bicycle Boulevard Design Tools and Guidelines

### Design Example

**Curb Bulb-outs and High-Visibility Crosswalks**



## A.4.9. Bicycle Routes/Bicycle Boulevards at Local/Major Unsignalized Intersections – Crossing Islands

### Design Summary

**Crossing Island Width**: 8′
Striping and intersection treatments vary. See following page for additional discussion.

### Discussion

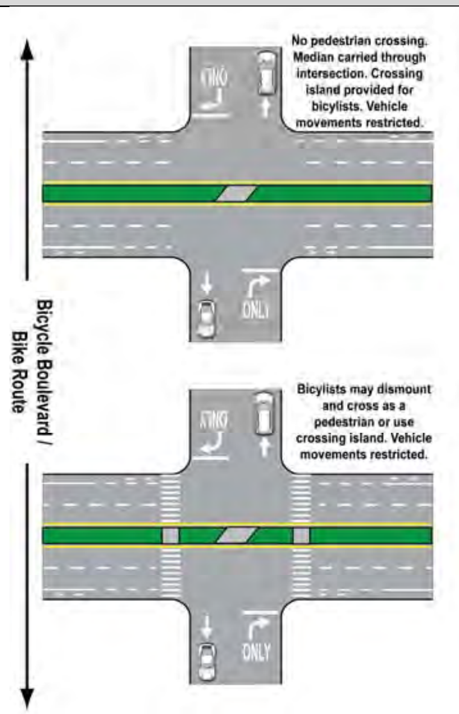
Bicycle crossing islands enable crossing for bicyclists where traffic signals or other designs may not be feasible.

### Guidance

- Caltrans Highway Design Manual (Chapter 1000)
- California MUTCD
- AASHTO Guide for the Development of Bicycle Facilities

### Design Example

### Recommended Design (not to scale)



## *Additional Discussion - Bicycle Route/Bicycle Boulevards at Local/Major Unsignalized Intersections – Crossing Islands*

### Special Considerations for Bicyclists at Local/Major Unsignalized Intersections

At intersections of Bicycle Boulevards/bicycle routes and major unsignalized intersections, a bicycle crossing island should be provided to allow bicyclists to cross one direction of traffic at a time when gaps in traffic allow. The bicycle crossing island should be at least 8 feet wide (measured perpendicular to the centerline of the major road) to be used as a bicycle refuge. Narrower medians can accommodate bikes if the holding area is at an acute angle to the major roadway, which allows stopped bicyclists to face oncoming motorists. Crossing islands should be in the middle of the intersection, thus prohibiting left and through vehicle movements or at the sides in conjunction with a high-visibility crosswalk (left turn prohibition is recommended).

**Advantages of bicycle crossing islands**

Provides safe refuge in the median of the major street so that bicyclists only have to cross one direction of traffic at a time – works well with signal controlled traffic platoons coming from opposite directions.

Provides traffic calming and safety benefits by preventing left turns and/or through traffic from using the intersection.

**Disadvantages / potential hazards**

- Potential impacts to major roadway, including lane narrowing, loss of some on-street parking and restricted turning movements.
- Crossing island may collect debris and may be difficult to maintain.

# A.5 Signalization

With the needs and characteristics of bicycles and motor vehicles varying so greatly, adequately accommodating bicyclists at traffic signals can be challenging for traffic engineers. This chapter contains guidance on the detection of bicycles at signals, bicycle pavement markings at signals, and bicycle signals.

## A.5.1. Bicycle Considerations at Traffic Signals

Bicycles typically travel much slower than motor vehicles and can find themselves without an adequate time to clear an intersection. The duration of the amber phase of signals is typically sufficient to allow motor vehicles to clear an intersection at the prevailing speed; however, bicyclists typically average only 10 mph through intersections. Methods for accommodating bicyclists include:

- Lengthening the 'all red' phase of the intersection: This allows any vehicles or bicyclists still in the intersection to clear it before a green phase is given to opposing traffic. The maximum length of the 'all red' phase should not generally be greater than 3 seconds. Under no circumstances should this time be extended beyond 6 seconds.
- Coordinating signals to allow for the 10-15 mph progression speed of bicyclists: Sometimes it is possible to alter signal timing to provide 'green bands' for bicyclists without significantly impeding motor vehicle flow.
- Increasing the minimum green phase: Bicyclists have slower speeds and accelerations than motor vehicles and even if they are at the stop line when a green light is given, the bicyclist may still lack sufficient time to clear the intersection before a conflicting green phase.
- Using signal detection to detect moving bicyclists: Video detection technology may be programmed to detect the presence of bicyclists. This allows for the adjustment of the minimum green phase, or the clearance interval based on the presence of bicyclists.

## A.5.2. Detectors

### A.5.2.1. Video Detectors

Video detection cameras can be used to determine if a cyclist is waiting for a signal. These systems use digital image processing to detect a change in the image at the location. Video detection cameras should be installed on the signal pole mast arms or luminaire mast arms and placed at an angle, determined by the manufacturer, to see oncoming bicyclists within the established detection zone. At night, video detection systems currently in place have at times had difficulty accurately detecting cyclists, however current strides in detection technology may eliminate this problem. Video camera system costs range from $20,000 to $25,000 per intersection. Detection cameras are currently used for cyclists in the City of San Luis Obispo, California, where the system has proven to detect pedestrians as well.

# A.6 Bicycle Parking

Bicycle parking is a support facility that allows bicyclists to store their bicycles when they reach a destination. These facilities enhance the bicycle and pedestrian environment and are important aspects of a complete network. Bicycle parking can be separated into two categories: short term and long term.

- Short-term bicycle parking serves users who will park for less than two hours, typically for shopping and recreation. This type of parking should be convenient. Short-term parking is typically provided with bicycle racks (see table below).
- Long-term bicycle parking should serve users who park their bicycles for a period longer than two hours. This type of parking should provide a high level of security. Long-term parking is typically provided with bicycle lockers and bicycle cages (see table below).

**Table A-4: Bicycle Parking Location and Capacity**

| Land Use or Location | Physical Location | Short-Term Bicycle Parking Capacity | Long-Term Bicycle Parking Capacity |
|---|---|---|---|
| Multi-Family Residential (with private garage for each unit) | Near building entrance with good visibility | 0.05 spaces for each bedroom (2 spaces minimum) | 0 |
| Multi-Family Residential (without private garage for each unit) | Near building entrance with good visibility | 0.05 spaces for each bedroom (2 spaces minimum) | 0.15 spaces for each bedroom (2 spaces minimum) |
| Park | Adjacent to restrooms, picnic areas, fields and other attractions | 8 spaces | 0 |
| Schools | Near office entrance with good visibility | 8 spaces | 2 locker spaces per 2 classrooms |
| Public Facilities (city hall, libraries, community centers) | Near main entrance with good visibility | 8 spaces | 0 |
| Commercial, retail and industrial developments over 10,000 gross square feet | Near main entrance with good visibility | 8 spaces per 10,000 square feet | 2 locker spaces per 10,000 square feet |
| Shopping Centers over 10,000 gross square feet | Near main entrance with good visibility | 8 spaces per 10,000 square feet | 2 locker spaces per 10,000 square feet |
| Commercial Districts | Near main entrance with good visibility | 4 spaces every 200 feet | 0 |
| Transit Stations | Near platform or security guard | 8 spaces | 2 locker spaces for every 30 parking spaces |

Recommendations in this chapter are based on national best practices, Association of Bicycle and Pedestrian Professionals Draft Bike Parking Guide (2009).

## A.6.1. General Design Guidance

### A.6.1.1. Accessibility and Location

Make bicycle parking visible to bicyclists, building security, foot traffic, and anyone approaching the building. Making bicycle parking visible to foot traffic reduces the incidents of theft and vandalism. Bicycle parking should be placed within 50' of the primary entrance of the building(s)/establishment(s). Avoid placement around the corner or in an out-of-the-way place or placing screening or landscaping around the parking. Hiding bicycle parking increases theft and vandalism.

Provide lighting for bicycle parking areas. This may be included in the overall site lighting plan and must comply with City Standards for lighting levels. Bicyclists, just like motorists, prefer to park in a well-lit place.

If possible, provide a rack situated in an area that can cover the bicycle from the elements. Bicyclists don't want to sit on a wet seat or leave their bicycle out in the rain.

### A.6.1.2. Design of the Bicycle Rack

Recommended bicycle rack is shaped like an inverted U and bolted securely into the ground. Bicycles should park parallel to the rack which supports the frame of the bicycle at two points.

### A.6.1.3. Location of the Rack in Relation to the Public Right of Way

*Distance from a Curb* - The bicycle rack should be situated 24 to 30 inches from the curb. The rack should align with existing street furniture. The rack should be placed parallel to the street with bicycles parking parallel to the rack.

*Distance from other Street Furniture* - The rack should maintain 8 feet of clearance from other street furniture. Other street furniture includes but is not limited to: parking meters, trees, tree wells, newspaper racks, light poles, sign poles, telephone poles, utility meters, benches, mailboxes, fire hydrants, trash cans, other street furniture, and other sidewalk obstructions.

*Distance from other Bicycle Racks* - The rack should allow a minimum of 30" of clearance when placed parallel to other bicycle racks from center of base plate to center of base plate. The rack should allow sufficient space for any bicycle. A typical bicycle requires a clearance of 6 feet in length and at least two feet in width. See the diagram in ***Additional Discussion – Rack Installation*** for detailed guidance.

*Distance from Building* - The rack should be a maximum of 50 feet from the front entrance of establishment. The rack should allow enough room between the rack and the entrance to the establishment. Bicycle racks should not impede access to a building. Bicycle racks should allow at least 5 feet of clearance on the sidewalk for pedestrian traffic.

*Other Distances* – Installing bicycle racks in bus stop zones requires special consideration. See ***Bicycle Parking at Bus Stops*** for detailed guidance. A bicycle rack should be placed at a minimum of 5 feet from a pedestrian crossing, driveways, alley entrances, and street corners/intersections. Bicycle racks should not be placed on top of gutters/storm drains.

*Signage* - Where bicycle parking areas are not clearly visible to approaching bicyclists, signs—such as the California MUTCD Bicycle Parking Area (D4-3) sign—may be posted to direct cyclists to bicycle parking facilities.

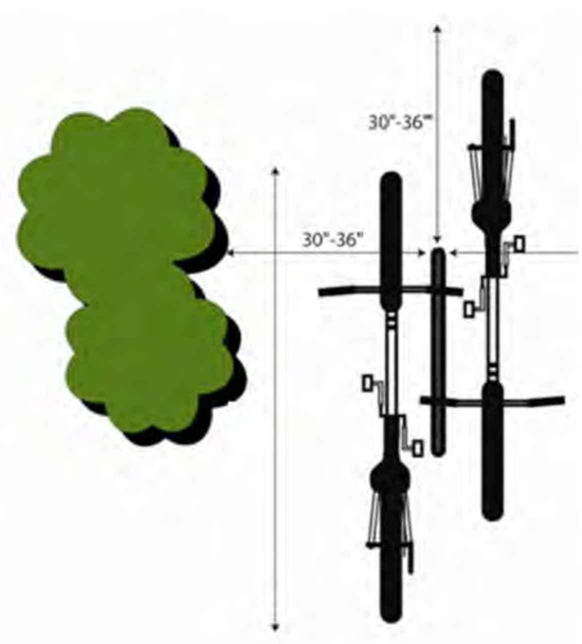
## A.6.2. Bicycle Rack Design

### Design Summary

- Bicycle racks should be a design that is intuitive and easy to use.
- Bicycle racks should be securely anchored to a surface or structure.
- The rack element (part of the rack that supports the bicycle) should keep the bicycle upright by supporting the frame in two places without the bicycle frame touching the rack. The rack should allow one or both wheels to be secured.
- A standard inverted-U style rack is a simple and functional design that takes up minimal space on the sidewalk and is easily understood by users. Avoid use of multiple-capacity "wave" style racks. Users commonly misunderstand how to correctly park at wave racks, placing their bikes parallel to the rack and limiting capacity to 1 or 2 bikes.
- Position racks so there is enough room between parked bicycles. Racks should be situated on 36" minimum centers.
- A five-foot aisle for bicycle maneuvering should be provided and maintained beside or between each row of bicycle racks.
- Empty racks should not pose a tripping hazard for visually impaired pedestrians. Position racks out of the walkway's clear zone.
- For sidewalks with heavy pedestrian traffic, at least seven feet of unobstructed right-of-way is required.
- Racks should be located close to a main building entrance, in a lighted, high-visibility area protected from the elements.

### Recommended Design

**Inverted-U Bicycle Rack**

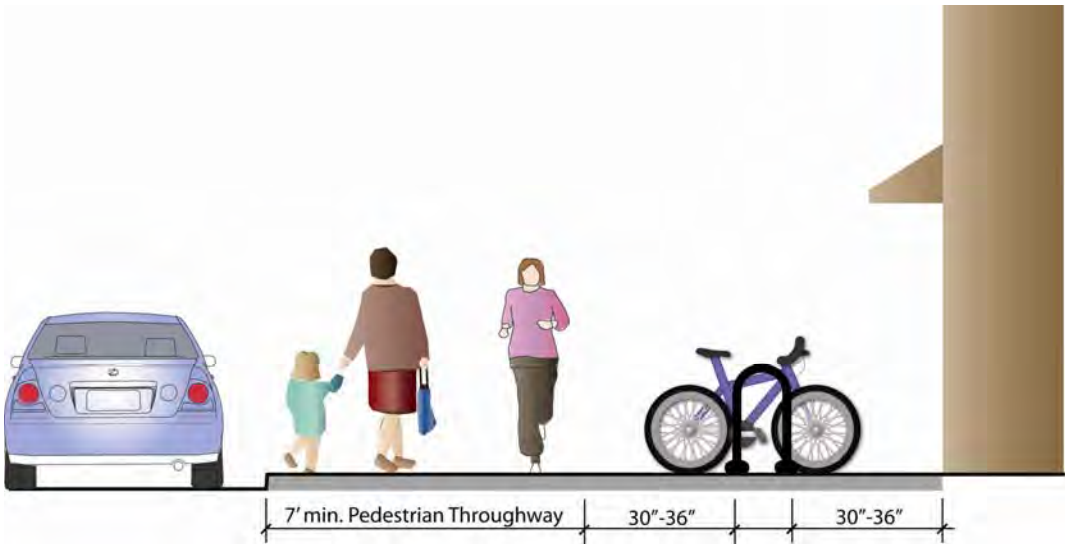



### Discussion

Bicycle Parking Manufactures:

- Palmer: www.bikeparking.com
- Dero: www.dero.com
- Creative Pipe: www.creativepipe.com
- Cycle Safe: www.cyclesafe.com

**Recommended Design (continued)**




**Design Example**

Short-term bicycle parking showing recommended clearances (non-local)

## Additional Discussion – Rack Installation

Racks will be affixed to City sidewalks or other concrete pad location by the utilization of vandal-resistant hardware provided by the installer and approved by the city.

Racks will be installed in locations as designated by the city. In most cases racks will be sited for installation in clusters for a significant length of busy business districts.

Racks will be installed or removed in/from locations as designated by the city.

All bicycle racks shall be installed at locations approved by city staff. All installations shall conform to Americans with Disabilities Act (ADA) requirements.

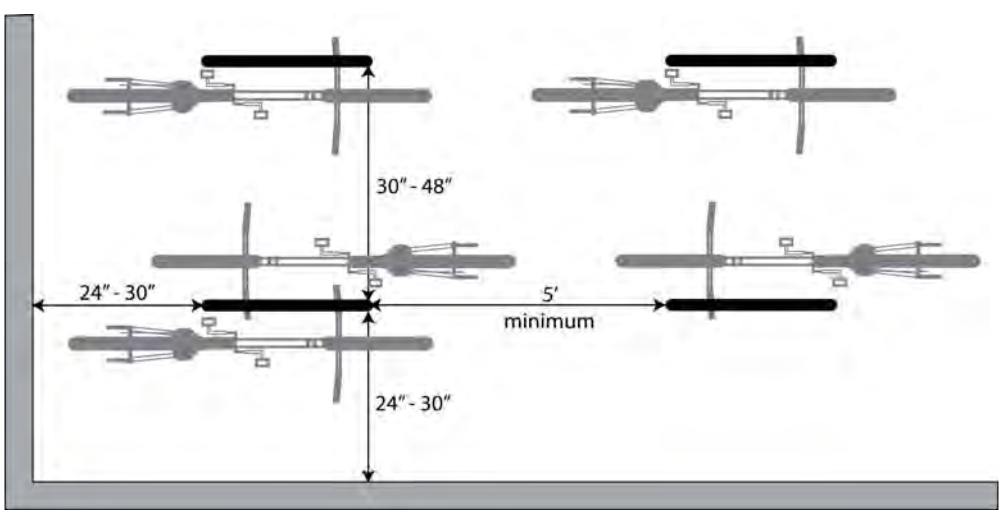
All bolt holes shall be clean of dust or any debris. The anchoring bolts should be driven vertically through the support plate into the bolt holes until the bolt head is firmly seated against the support plate.

For pavement surfaces that are not level use washers to level the rack and support plate. Fill with non-shrinking grout after the bicycle rack is mounted to the concrete.

Do not place bicycle rack over any pavement expansion or control joint. Bicycle rack shall be placed at least 3 inches away from any expansion and or control joints in the cement.

**Requirements for Multiple Bicycle Parking Installation**

- Bicycle racks can be placed perpendicular or parallel to a building.
- Bicycle racks should be placed at least 24 to 30 inches from a wall or structure.
- When racks are placed side by side each rack should be spaced at least 30 to 48 inches from one another. Measured from the center of the rack.
- There should be sufficient room for a rider and a bicycle to fit in the aisle, and the total width between bicycle racks should be at least 5 feet wide.



## A.6.3. Bicycle Parking at Bus Stops

### Discussion

Siting bike parking near a bus shelter is dependent upon the existing city right-of-way and sidewalk width. Bike parking options include installing racks near the shelter or incorporating covered bike parking within the shelter structure.

The most important element to consider is maintaining a clear pathway from the shelter to the bus for universal access. It is also important to avoid blocking areas where riders queue to board the bus. Although standard site furnishing suppliers do not readily stock shelters incorporating covered bike parking, a few simple modifications to the standard design could be accommodated by most manufacturers.

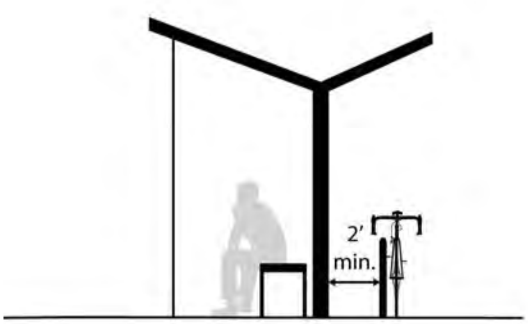
### Guidance

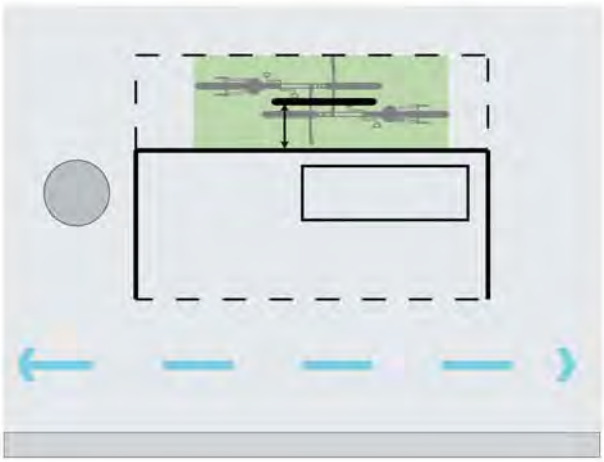
- APBP Bicycle Parking Guidelines

**Existing Bus Shelter on C Street**

### Covered Bicycle Parking Behind Bus Shelter

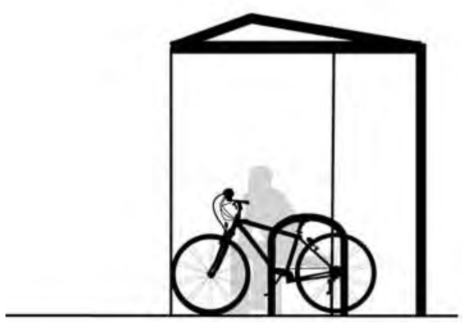
- A bicycle rack installed behind the shelter would be applicable to areas with a wide right-of-way or sidewalk width. A standard bus shelter could be modified to include a cantilevered roof over the bike parking. If this configuration is used, the design and layout of the bus shelter and surrounding street furniture should allow for a clear view of parked bicycles from all sides.

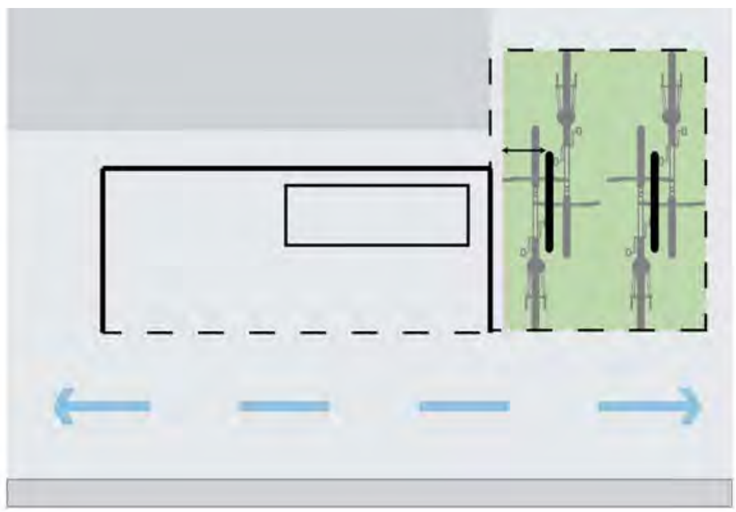


| Covered Bicycle Parking Parallel to Bus Shelter |
|---|
| A bicycle rack installed next to the shelter with a parallel orientation will minimize conflicts with pedestrians on the sidewalk. This would be a good configuration where the sidewalk is narrow. A standard bus shelter could be modified to include a cantilevered roof over the bike parking. |

| Covered Bicycle Parking Perpendicular to Bus Shelter |
|---|
| A bicycle rack installed next to the shelter with a perpendicular orientation will need to be set back to prevent bikes from encroaching into the pedestrian zone of the sidewalk. This configuration would accommodate multiple racks for bus stops that serve a large number of boardings. A roof over the bike parking would provide protection for the bikes. |





## A.6.4. Alternative Non-Standard Racks (Art Racks, etc.)

### Design Summary

Alternate parking devices may be approved by the City, but must meet the following criteria:

- Support the bicycle frame at two points not only by the wheel
- Accept a variety of bicycle sizes and styles including various types and sizes of frames, wheel sizes, and tire widths.
- Allow for the use of a cable as well as a U-shaped lock
- Allow for the frame and at least one wheel of the bicycle to be locked to the rack
- Must be tall enough to be "seen" by pedestrians and the visually impaired yet not be monumental in comparison with the bicycles that will be parked at the device
- Must be maintenance free or fabricated from materials which wear in an aesthetically pleasing manner
- Must have simple rather than complex designs which allow the user to easily understand and utilize the rack. Moving parts are not acceptable or must be kept at a minimum
- Must not require the user to lift the bicycle onto the parking device

### Discussion

While the Inverted-U design is the accepted standard for bicycle parking in the public right-of-way, other rack designs may be accepted for use at the discretion of the city.

### Guidance

- APBP Bicycle Parking Guidelines

### Design Examples

## A.6.5. Bicycle Locker Design

### Design Summary

- Bicycle lockers should be designed in a way that is intuitive and easy to use.
- Bicycle lockers should be securely anchored to a surface or structure.
- Bicycle lockers should be constructed to provide protection from theft, vandalism and weather.
- A five-foot aisle for bicycle maneuvering should be provided and maintained beside or between each row of bicycle lockers.
- Lockers should be located close to a main building entrance, in a lighted, high-visibility area protected from the elements. Long-term parking should always be protected from the weather.

### Discussion

Bicycle Parking Manufactures:

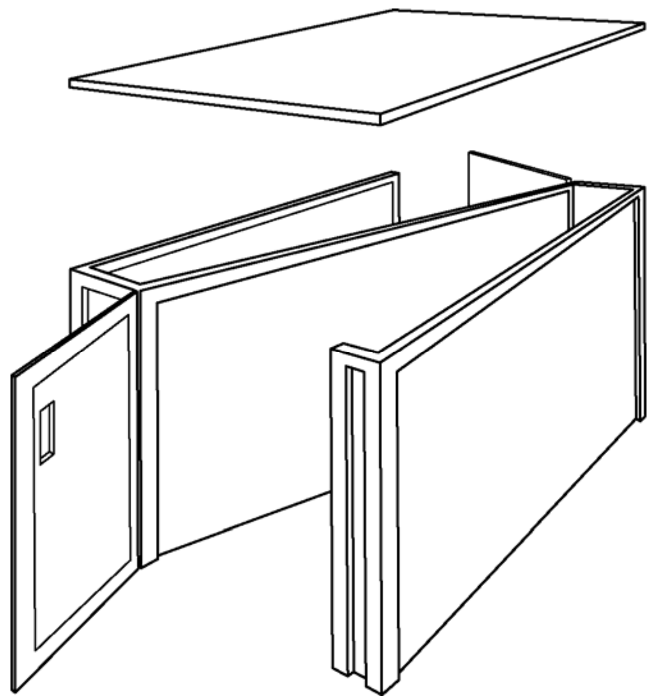
- Palmer: www.bikeparking.com
- Dero: www.dero.com
- Creative Pipe: www.creativepipe.com
- Cycle Safe: www.cyclesafe.com

### Design Example

### Guidance

- Association of Bicycle and Pedestrian Professionals Draft Bicycle Parking Guidelines
- City of Oakland, CA Bicycle Parking Standards

### Recommended Design



## A.7 Non-Standard Treatments

Standard bicycle facility treatments do not always provide enough options when developing bikeways to retrofit the existing built environment. Narrow rights-of-way, off angled intersection, limited opportunities, and unique roadway geometry may warrant the use of context sensitive, non-standard treatments. This chapter discusses unique treatments and signage that are gaining acceptance across the nation.

None of the treatments discussed in this chapter are contained within the standards set forth by the California MUTCD or Caltrans HDM. Any application of these treatments should follow the processes outlined by the California Traffic Control Devices Committee (CTCDC) and the Federal Highway Administration (FHWA).

## A.7.1. Bicycle Only Left Turn Pocket

### Design Summary

**Bicycle Lane Width:**

Bicycle Lane pocket should be 4' minimum in width, with 5' preferred.

**Recommended Use:** Can be installed on Class II and Class III bikeways, or on streets with no designated bicycle facility.

### Discussion

A left-turn pocket allows only bicycles left turn access to a bicycle boulevard or designated bikeway. If the intersection is controlled, the left-turn pocket may have a left arrow signal, depending on bicycle and vehicle volumes. Signs and raised median design restrictions should be provided that prohibit motorists from turning, while allowing access to bicyclists. Bicycle signal heads may also be used at busy or complex intersections. Ideally, the left turn pocket should be protected by a raised curb, but the pocket may also be defined by striping only if necessary. This treatment is typically only applied on lower volume arterials and collectors.

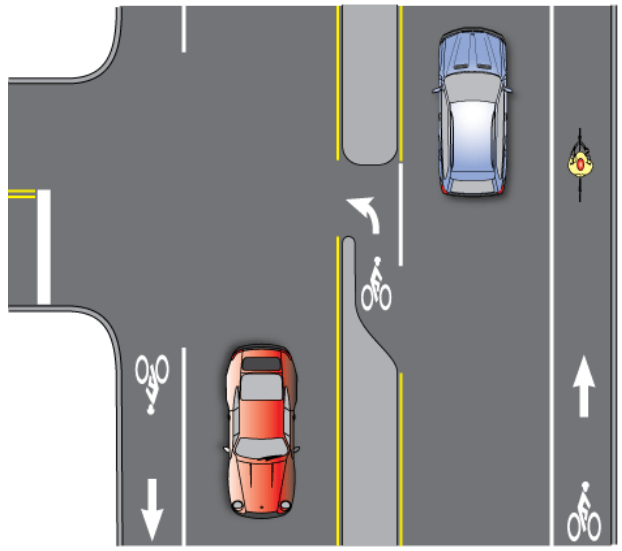
### Design Example

Portland, Oregon

### Guidance

- There is no currently adopted Federal or State guidance for this treatment.
- This treatment is currently used in Portland, Oregon.

### Recommended Design



## A.7.2. Bicycle Lanes at Double Right Turn Intersections

### Design Summary

**Width:**
Bicycle Lane pocket should have a minimum width of 4' with 5' preferred.

### Discussion

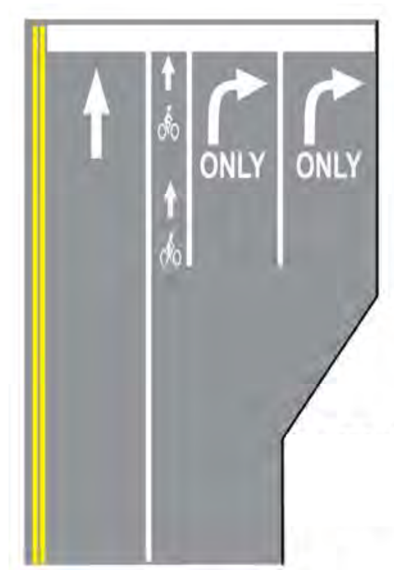
Merging across two lanes exceeds the comfort zone of most bicyclists. Double right turn lanes or an inside through/right combination lane should be avoided on routes with heavy bicycle use. To prevent vehicles in the outside right turn lane from turning into a bicyclist it is important to encourage proper lane positioning for the bicyclist. This can be accomplished by providing either a bicycle lane to the left of the outside turn lane with a bicycle lane.

This design positions bicyclists using a bicycle lane to the outside of a double right-turn lane. This treatment should only be considered at locations where the right most turn lane is a pocket at the intersection. In this instance, the bicyclist would only have to merge across one lane of traffic to reach the bicycle lane. Colored bicycle lanes can also help distinguish the bicycle lane in the merging area. Under no circumstances should the bicyclist be expected to merge across two lanes of traffic to continue straight though an intersection. See following page for additional discussion.

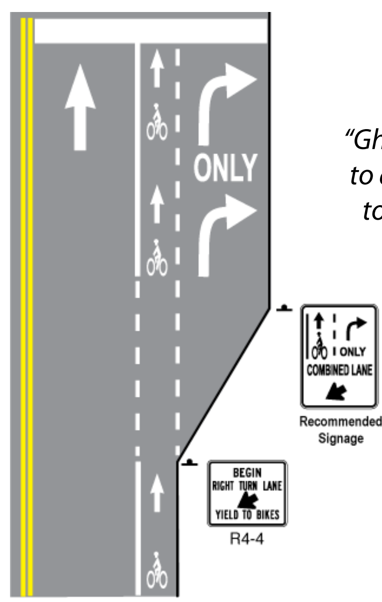
### Design Example

### Guidance

- California MUTCD




*Bike Lane at Double Right Turn Intersection*




*"Ghost" Bike Lane to alert bicyclists to merge early*

## *Additional Discussion - Bicycle Lanes at Double Right Turn Intersections*

The use of double-turn lanes should be discouraged because of the difficulties they present for pedestrians and bicyclists. Existing double-turn lanes should be studied and converted to single-turn lanes, unless found to be absolutely necessary for traffic operations. In situations where the double-turn lane cannot be avoided, the options on the previous page can be used to better accommodate bicyclists.

**From California MUTCD:**

"A dashed line across the right-turn-only lane should not be used on extremely long lanes, or where there are double right-turn-only lanes. For these types of intersections, all striping should be dropped to permit judgment by the bicyclists to prevail."

**Advantages of Bicycle Treatments at Double Right Turn Lanes**

- Aids in correct positioning of bicyclists at intersections with a double right turn lanes. Bicyclists should be able to travel straight through an intersection without vehicles turning through their path.
- Encourages motorists to yield to bicyclists when using the outside right turn lane.
- Reduces motor vehicle speed within the right turn lanes.

**Disadvantages / potential hazards**

- Many bicyclists may be uncomfortable with double right turn lanes regardless of the treatment.
- Not suitable for intersections with high bicycle volumes – the second right turn lane should be eliminated in such cases.

## A.7.3. Colored Bicycle Lanes in Conflict Areas

### Design Summary

**Bicycle Lane Width:**
The bicycle lane width through the interchange should be the same width as the approaching bicycle lane (minimum 5', preferred 8'). Additionally, bicycle lane should follow guidance in sections 3.3.1-3.3.3.

### Discussion

Some cities in the United States are using colored bicycle lanes to guide bicyclists through major vehicle/bicycle conflict points.

**Color Considerations:**

There are three colors commonly used in bicycle lanes: blue, green, and red. All help the bicycle lane stand out in merging areas. The City of Portland began using blue lanes and changed to green in April 2008. Green is the color being recommended for use.

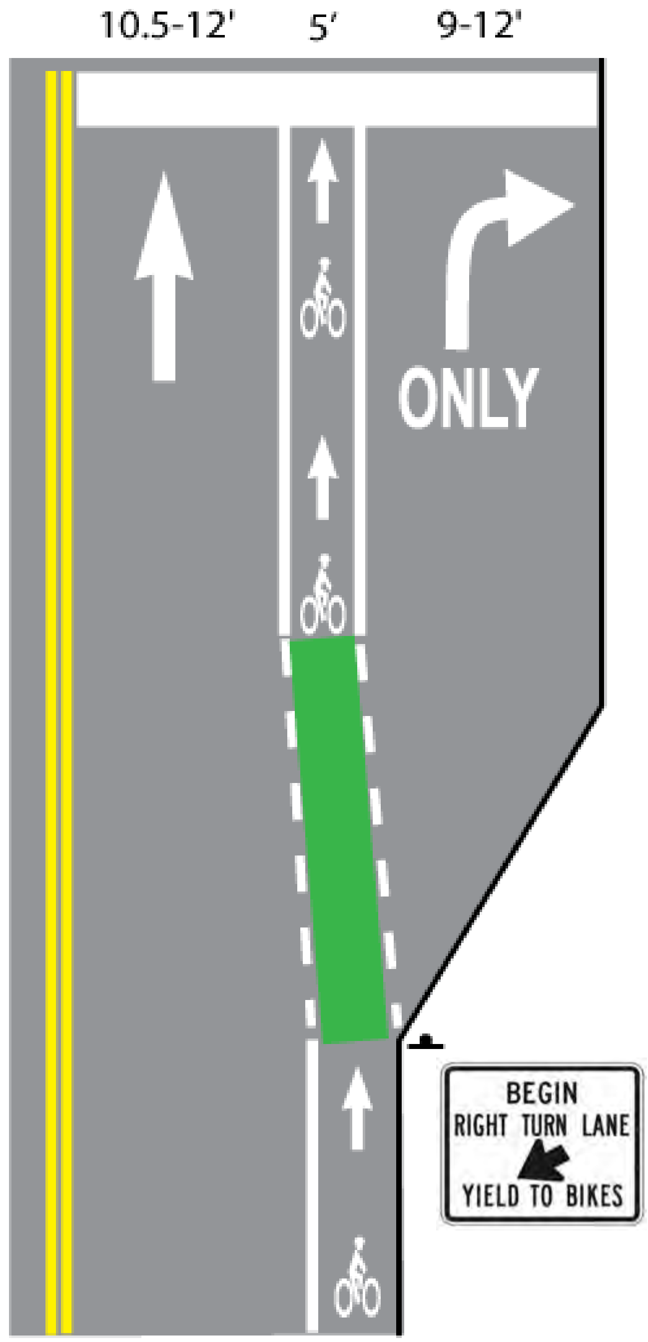
See following page for additional discussion:

### Design Example

### Guidance

- This treatment is not currently present in any State or Federal design standards
- Portland's Blue Bicycle Lanes
- City of Chicago - Green Pavement Markings for Bicycle Lanes (Ongoing) - FHWA Experiment No. 9-77(E)

Recommended Design



## Additional Discussion - Colored Bicycle Lanes in Conflict Areas

### Guidance

Colored bicycle lanes can be used in conflict areas or locations where motorists and bicyclists must cross each other's path (e.g., at intersections or merge areas). Bicyclists are especially vulnerable at locations where the volume of conflicting vehicle traffic is high, and where the vehicle/bicycle conflict area is long. Colored bicycle lanes typically extend through the entire bicycle/vehicle conflict zone (e.g., through the entire intersection, or through the transition zone) where motorists cross a bicycle lane to enter a dedicated right-turn lane.

Although colored bicycle lanes are not an official standard in California at this time, they continue to be successfully used around the country. Portland, Oregon, Chicago, Philadelphia, Pennsylvania, Cambridge, Massachusetts, Mammoth Lakes, California, and Tempe, Arizona use colored bicycle lanes in select locations. This treatment typically includes accompanying signage alerting motorists of vehicle/bicycle conflict points. Portland's 'Blue Bicycle Lane' report found that significantly more motorists yielded to bicyclists and slowed or stopped before entering the conflict area after the application of the colored pavement.

In areas of high vehicle traffic, thermoplastic application (as opposed to paint) is recommended. At high volume intersections, the thermoplastic treatment has shown to significantly prolong the life of the marking, thus off-setting the additional cost for the treatment by lowering the frequency of required maintenance.

**Advantages of colored bicycle lanes at conflict points:**

- Draws attention to conflict areas
- Results in more consistent yielding behavior by motorists
- Emphasizes expectation of bikes in the road

**Disadvantages / potential hazards:**

- Non-standard treatment
- Maintenance
- Slipping hazard

## A.7.4. Bicycle Lanes at Interchanges

### Design Summary

**Bicycle Lane Width:**

The bicycle lane width through the interchange should be the same width as the approaching bicycle lane (minimum five feet). Additionally, bicycle lane should follow guidance in sections A.3.2 through 1.3.3.

### Discussion

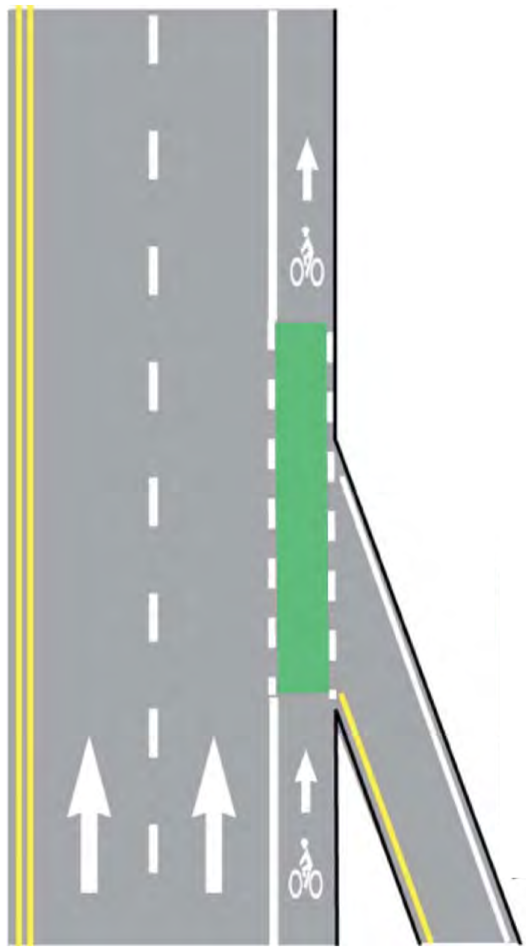
On high traffic bicycle corridors non-standard treatments may be desirable over current practices outlined in Figure 9C-104 in the California MUTCD. Dashed bicycle lane lines with or without colored bicycle lanes may be applied to provide increased visibility for bicycles in the merging area.

### Design Example

### Guidance

- This treatment is not currently present in any State or Federal design standards
- City of Chicago - Green Pavement Markings for Bicycle Lanes (Ongoing) - FHWA Experiment No. 9-77(E)
- Portland's Blue Bicycle Lanes http://www.portlandonline.com/shared/cfm/image.cfm?id=58842

### Recommended Design



## A.7.5. Cycle Tracks

### Design Summary

**Cycle Track Width:**

7 feet minimum to allow passing and obstacle avoidance

12 feet minimum for two-way facility

### Discussion

A cycle track is a hybrid type bicycle facility that combines the experience of a separated path with the on-street infrastructure of a conventional bicycle lane. Cycle tracks have different forms, but all share common elements. Cycle tracks provide space that is intended to be exclusively or primarily for bicycles, and is separated from vehicle travel lanes, parking lanes and sidewalks. Cycle tracks can be either one-way or two-way, on one or both sides of a street, and are separated from vehicles and pedestrians by bollards, curbs/medians, mountable curbs or a combination of these elements; pavement marking or coloring are at times used for further differentiation.

See following page for additional discussion.

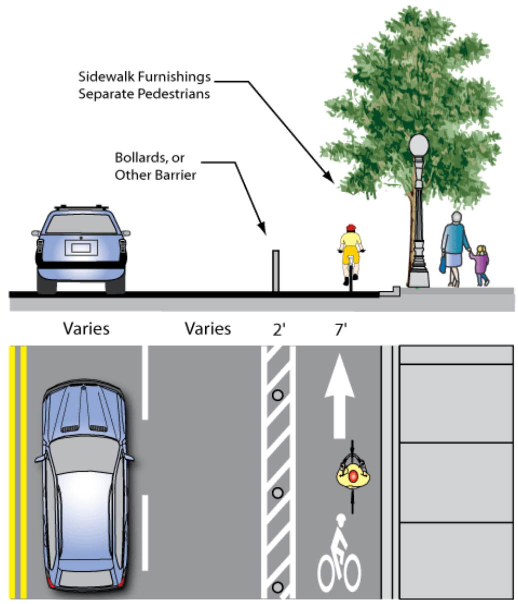
### Design Example

9th Avenue – New York City

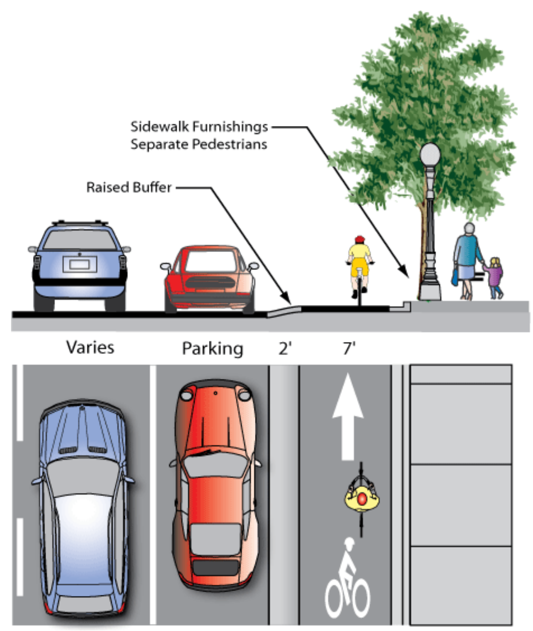
### Guidance

- This treatment is not currently present in any U.S. State or Federal design manuals
- Crow Design Manual for Bicycle Traffic - Chapter 5

### Recommended Design – No Parking




### Recommended Design – On-Street Parking



## Additional Discussion – Cycle Tracks

### Separation

Cycle tracks can be separated by a barrier or by on-street parking. Cycle tracks using barrier separation are typically at-grade, but when a mountable curb is used as a barrier from the street, the facility becomes raised, providing an element of physical separation from faster moving vehicle traffic. For drivers, the mountable curb provides a visual and tactile reminder of where the bicycle lane is. For bicyclists the mountable curb makes it possible to leave the bicycle lane if necessary. Raised cycle tracks with mountable curbs cost more than traditional bicycle lanes and typically require a separate paving operation. Maintenance costs are lower as the bicycle lane receives no vehicle wear and resists debris accumulation. They also work well adjacent to higher speed roadways with few driveways.

Regardless of the type of barrier or curb utilized, openings are needed at driveways or other access points. The barrier should be dropped at intersections to allow vehicle crossing (raised cycle tracks should return to level grade at intersections).

When on-street parking is present, it should separate the cycle track from the roadway, the cycle track should be placed with a 2-foot (min.) buffer between parking and the cycle track to minimize the hazard of opening car doors into passing bicyclists.

### Placement

Cycle tracks should be placed along slower speed urban/suburban streets with long blocks and few driveways or midblock access points for vehicles. Cycle tracks located on one-way streets will have fewer potential conflicts than those on two-way streets. A two-way cycle track is desirable when there are more destinations on one side of a street or if the cycle track will be connecting to a multi-use path or other bicycle facility on one side of the street.

Cycle tracks should only be constructed along corridors with adequate right-of-way. Sidewalks or other pedestrian facilities should not be narrowed to accommodate the cycle track, as pedestrians will likely walk on the cycle track if sidewalk capacity is reduced. Visual and physical cues should be present that make it easy to understand where bicyclists and pedestrians should be moving.

### Intersections

Cycle tracks separate bicyclists and motor vehicles to a greater degree than bicycle lanes. This produces added comfort for low speed bicyclists on the cycle track, but it creates additional considerations at intersections that must be addressed. Most commonly, right and left turning motorists conflict with cycle track users. Both roadway users have to expand their visual scanning to see potential conflicts. To mitigate this issue, several treatments can be applied at intersections:

- **Protected Phases at Signals**. This treatment MUST have separate signal phases for bicyclists and will potentially increase delay. With this treatment, left and right turning movements are prevented from conflicting with through movements. The use of a bicycle signal head is required in this treatment to ensure all users know which signals to follow. Demand only bicycle signals can be implemented to reduce vehicle delay to prevent an empty signal phase from regularly occurring. With this scenario, a push button or imbedded loop within the cycle track should be available to actuate the signal. If frequent bicyclist left turns are expected, incorporate a bicycle box. Bicyclists' movements should be given their own signal phase and signal activation.
- **Advanced Signal Phases**. Signalization utilizing a bicycle signal head can also be set to provide cycle track users a green phase in advance of vehicle phases. The amount of time will depend on the width of the intersection.
- **Unsignalized Treatments**. At non-signalized intersections the same conflicts exist. Warning signs, special markings and the removal of on-street parking (if present) in advance of the intersection can all raise visibility and awareness for bicyclists.
- **Access Management**. The reduction in the number of potential conflict points can also benefit a cycle track corridor. Medians, driveway consolidations, or restricted movements reduce the potential for conflict.

## Additional Discussion – Cycle Tracks

**Advantages:**

- Well designed facilities have been proven to increase bicycle ridership where implemented (e.g. Portland, OR, Minneapolis, MN).
- Cycle tracks provide increased comfort for bicyclists and greater clarity about expected behavior on the part of both bicyclists and motorists.
- Properly designed cycle tracks eliminate conflicts between bicyclists and parking motorists by placing the cycle track on the inside of the parking lane.
- Barriers used along cycle tracks to separate parking and travel lanes from bicyclists provide adequate space to mitigate or remove the danger of car "dooring."

**Disadvantages:**

- Can create unusual situations at intersections for vehicles.
- Can be expensive to correctly implement.
- Can require closures/restrict vehicle access from driveways, alleys, and parking lots through access management planning.
- Left turns can be complicated for bicyclists.
- May be difficult for existing street maintenance equipment to maintain cycle track (sweepers etc.)

# A.8 Pedestrian Guidelines

## A.8.1. Sidewalk Design

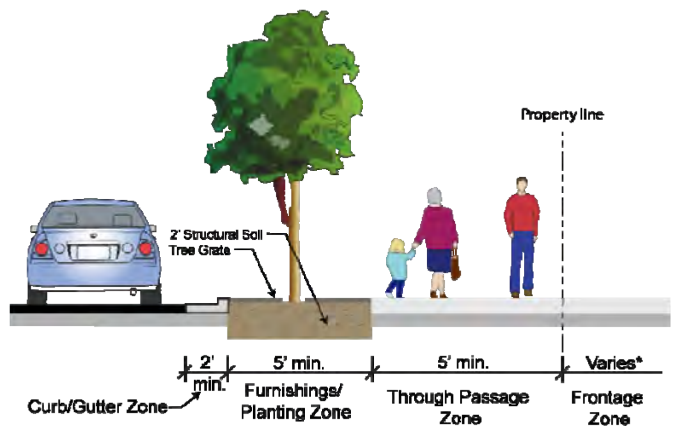
### Design Summary

While the width of the curb, furnishings and frontage zones may be adjusted to reflect the needs of the site, the through zone should always be at least 5' wide in all locations. Wider sidewalks are appropriate in areas with high levels of pedestrian traffic.

### Discussion

Sidewalks are comprised of four zones: curb, furnishings, through pedestrian and frontage. The curb zone abuts the street and provides a buffer between the sidewalk and the street. The furnishings zone lies between the through zone and the curb zone and provides a location for street furniture and other public amenities such as trash receptacles, bicycle racks, lighting, news racks, and water fountains. The through pedestrian zone is the sidewalk space for walking and is located between the furnishings zone and the frontage zone. The through pedestrian zone is the widest zone and should be clear of obstructions at all times. Finally, the frontage zone provides a transition between the building or property line and the through zone. The frontage zone may feature furniture and act as an outdoor extension of restaurants or cafés.

### Preferred Design




### Guidance

Sidewalks should be

- located on both sides of the street;
- constructed of durable, slip-resistant materials, like Portland cement;
- clearly delineated from zone to zone—furniture should not be placed in the through zone, etc.;
- kept clear of obstructions at all times in the through passage zone.

General maintenance should be conducted regularly to repair cracks and gaps and remove debris, which can present safety hazards to pedestrians.

Tree Planting in Planting Zone

Trees surrounded in paving require special attention in order to reduce future paving destruction and increase longevity of the trees. Canopy trees (as shown in this graphic) require an additional treatment in order to provide long term sustainability. The entire length and width of the "Planting Zone" should receive a 2' depth of Structural 'CU-SOIL' as the planting medium for the trees. The CU-SOIL mix should extend from the curb back to the property line in continuously paved areas. Automatic irrigation and a 5' X 5' tree grate are to be included as well in this design layout.

The exception to the use of Structural 'CU-SOIL' would be where palm trees are used. Palm trees do not require Structural Soil. 5' X 5' tree grates are required in areas surrounded by paving. An automatic irrigation system is also required.

## A.8.2. Sidewalk Zones - Residential

### Design Summary

If the area between the back of curb and the property line is less than 9 feet wide and no additional right-of-way is available, the planter strip should be eliminated in the interest of preserving a through pedestrian zone of at least 5 feet, with the remaining space functioning as a buffer between pedestrians and the street.

In new residential developments (not on a primary arterial):

5' minimum & preferred sidewalk

5' minimum planter strip

7' ½" to 8' preferred planter strip

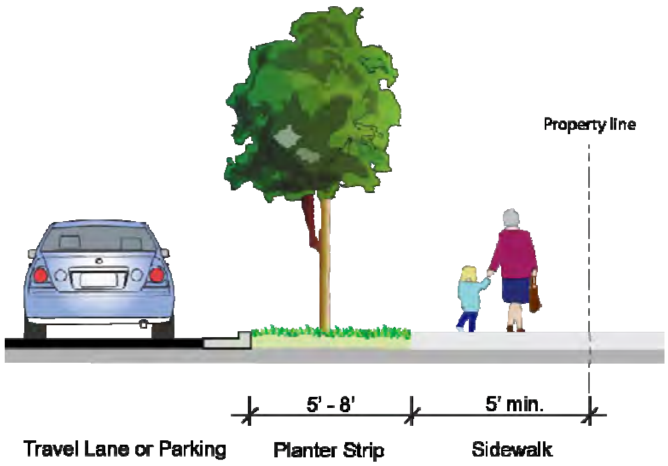
### Discussion

Residential sidewalks are generally narrower than commercial zone sidewalks, and priority should be given to the through pedestrian zone's width in residential sidewalk design. Residential sidewalks do include the other sidewalk zones, such as for placement of utility boxes in the furnishings zone, yet these zones are less prominent than in commercial or mixed use areas where furnishings and frontage zones may feature ample seating and amenities like newsstands.

### Guidance

- In residential areas minimum sidewalk width should be 5 feet clear of any obstructions.

### Preferred Design



## A.8.3. Sidewalk Zones – High Density

### Design Summary

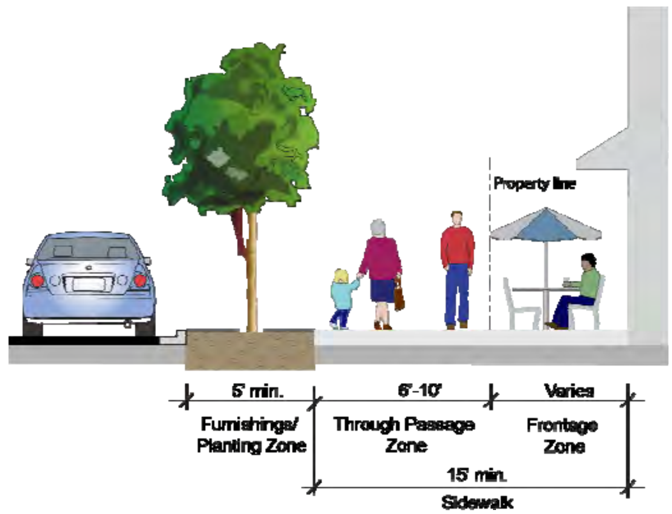
Sidewalks in high density commercial zones shall provide a sidewalk width of approximately 15 feet

The minimum "through passage zone" shall be a min. of 6' to 10' depending on the pedestrian density expected.

### Discussion

Medium to high-density pedestrian zones located in areas with commercial or retail activity provide excellent opportunities to develop an inviting pedestrian environment. The frontage zone in retail and commercial areas may feature seating for cafés and restaurants, or extensions of other retail establishments, like florists' shops. The furnishings zone may feature seating, as well as newspaper racks, water fountains, utility boxes, lampposts, street trees and other landscaping. The medium to high-density pedestrian zone should provide an interesting and inviting environment for walking as well as window shopping.

### Preferred Design



## A.8.4. Sidewalk Zones – Industrial Zones

### Design Summary

The furnishings zone, in combination with the curb zone, should provide a minimum 5 foot buffer between the pedestrian through zone and heavy traffic on industrial or arterial roadways.

5′ minimum & preferred sidewalk

5′ minimum planter strip

7 ½′ to 8′ preferred planter strip

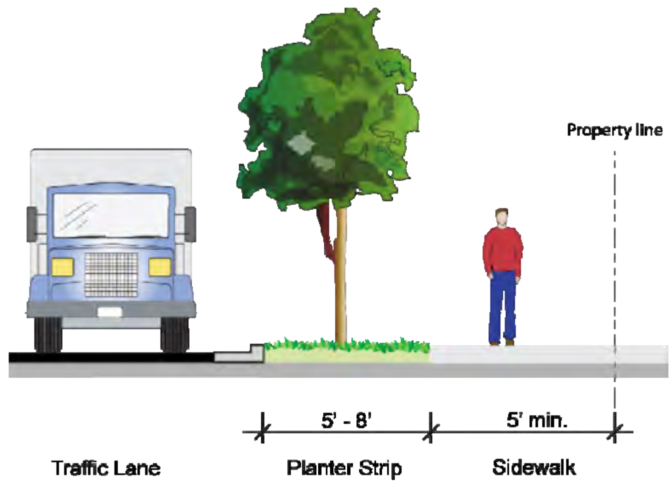
### Discussion

Sidewalks through industrial zones are essential components of the pedestrian network. Industrial zones and arterial roadways often experience heavy truck traffic which is both unpleasant and dangerous for pedestrians. Providing a broad furnishings zone will help separate pedestrians from heavy vehicle traffic. A limited frontage zone is appropriate for industrial zones and arterial roadways because there is a reduced need for seating or street-side vending in these locations.

### Guidance

- Industrial areas or zones.
- Along arterial roadways or other routes with heavy truck traffic.

### Preferred Design



## A.8.5. Sidewalk and Pathway Materials

### Design Summary

See Section A.8.1-A.8.4 above for additional sidewalk design details.

### Discussion

Sidewalks are generally constructed of Portland cement concrete. Sidewalk surfaces should be firm, stable and slip-resistant when dry. Some sidewalks are designed using decorative materials, such as brick or cobblestone. Although these surfaces may improve the aesthetic quality of the sidewalk, they may make mobility difficult for wheelchair users and create vibration. Brick and cobblestone also have a tendency to buckle, creating a tripping hazard and requiring increased maintenance. For these reasons, brick and cobblestone sidewalks are not recommended. Creative alternatives to brick sidewalks include concrete sidewalks with brick trim, which preserves the decorative quality of brick but is an easier surface to negotiate; or colored asphalt or concrete stamped to look like brick.

Newer materials, such as rubber sidewalk pavers, provide a softer walking surface, and may prevent cracked or uplifted sidewalks where tree roots are present. Several cities in the U.S., including locally the city of Santa Monica, have installed segments of rubber sidewalk and are reporting good results in terms of reduced uplifting. Pedestrian walkways and multi-use pathways may be constructed out of asphalt; however, asphalt is not suitable for sidewalk construction due to its shorter lifespan (ten years as opposed to 20 or more) and higher maintenance costs.

### Preferred Design

Workers installing rubber sidewalk pavers.

## A.8.6. Sidewalk Design - Furniture

### Design Summary

- Sidewalk amenities should be located within the Furnishings or Frontage Zones as described in Section 1.8.1.
- Seating should be provided adjacent to major destination points, such as department stores and restaurants, where it is often necessary and where it will be used frequently.
- Seating and other amenities should be made of durable, high-quality materials which visually reinforce community identity and the design of nearby buildings.
- Sidewalk bulb-outs can be used to accommodate additional street furniture in high-use areas.
- Street furnishing design and location should consider car overhangs and door movement when placed near the curb and be located at the ends of the on-street stalls rather than the center.
- No sidewalk amenity should reduce the clear width of a sidewalk or walkway to less than 4 feet.
- To aid the visually disabled, use colors that contrast with the sidewalks color and surroundings.

Design and location of streetscape amenities should comply with ADA requirements.

### Discussion

Street furniture is an integral part of good pedestrian design and walkable neighborhoods. The design and placement of street furniture should take into consideration the security, comfort and convenience of the user. Street furnishings should always be accessible to the disabled, and should be sited in a manner that preserves the width of the through zone.

### Guidance

Ideal locations for placement of sidewalk furniture include all sidewalks with a ten foot minimum width and sidewalks with significant pedestrian volumes.

### Preferred Design

Sidewalk furniture in Downtown Oxnard

## A.8.7. Overview ADA Sidewalks and Path – Grade and Cross Slope

### Design Summary

- Cross slope should not exceed 2 percent.
- Longer, steeper grades should have landings every 400 feet where people can rest.

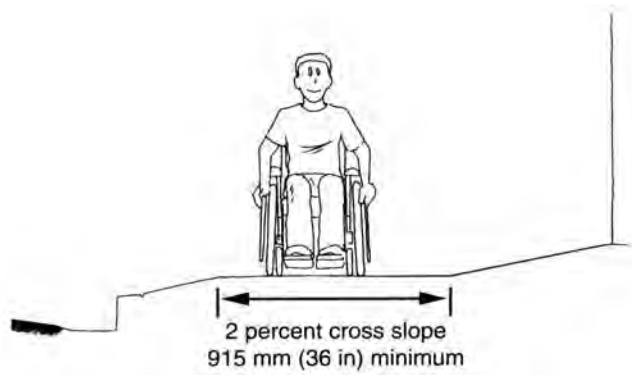
### Discussion

Making sidewalks and paths ADA compliant involves ensuring that the grade and the cross slope of the sidewalk or path is safe for disabled users. Gentle grades are preferred to steep grades due to issues of control, stability and endurance. The cross slope is significant for issues of control, not only for wheelchair users, but for those with difficulty walking.

### Guidance

These treatments should be applied to all sidewalks and paths, especially those on uneven or steep terrain.

### Preferred Design




## A.8.8. ADA Curb Ramps - Components and Slope

### Design Summary

- Curb ramps should be designed to accommodate the level of use anticipated at specific locations, e.g. sufficient width for the expected level of peak hour pedestrian volumes and other potential users.
- Adequate drainage should be provided to prevent flooding of curb ramps.

Tactile strips must be used to assist sight-impaired pedestrians in locating the curb ramp.

### Discussion

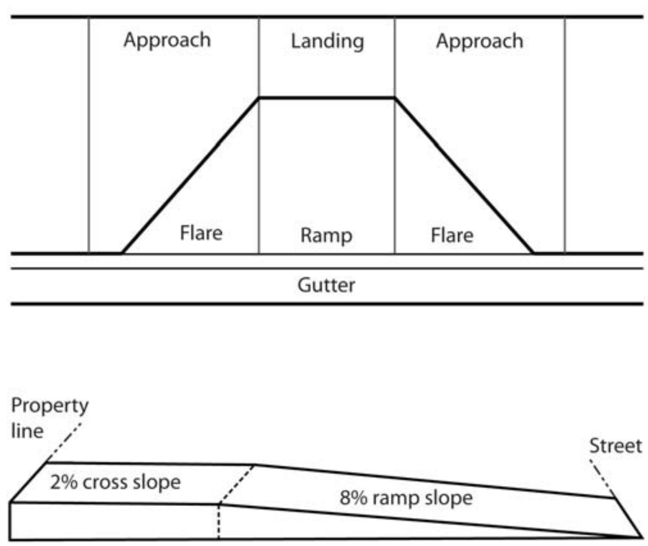
The main components of curb ramps are the landing, approach, flare, ramp and gutter. These are necessary to provide a gentle transition between the curb and sidewalk. Various ramp designs may be used to regulate the slope of the ramp.

### Guidance

Ramps are appropriate at the following locations:

- All intersections,
- Midblock crossings,
- Multi-use path and roadway intersections.

### Preferred Design



# A.8.9. ADA Curb Ramps - Detectable Warnings

## Design Summary

To meet ADA guidelines, detectable warnings shall consist of raised truncated domes and meet the following requirements:

- Diameter of 0.9 in (23 mm)
- Height of 0.2 in (5 mm)
- Center-to-center spacing of 2.35 in (60 mm)
- Contrast visually with adjoining surfaces, either light-on-dark, or dark-on-light

## Discussion

ADA guidelines require all curb ramps include detectable warnings which consist of truncated domes in a contrasting color to the sidewalk and street. The detectable warning area alerts pedestrians with little or no vision they have reached the end of the sidewalk. The warning strip can be felt with a walking cane or with a pedestrians' foot.

## Guidance

- All existing and new curb ramps

## Preferred Design

## A.8.10. ADA Curb Ramps - Design and Location

### Design Summary

- Perpendicular curb ramps should be used at large intersections.
- Curb ramps should be aligned with crosswalks, unless they are installed in a retrofitting effort and are located in an area with low vehicular traffic.
- The minimum width of a curb ramp should be 48 inches, in accordance with ADA Guidelines.

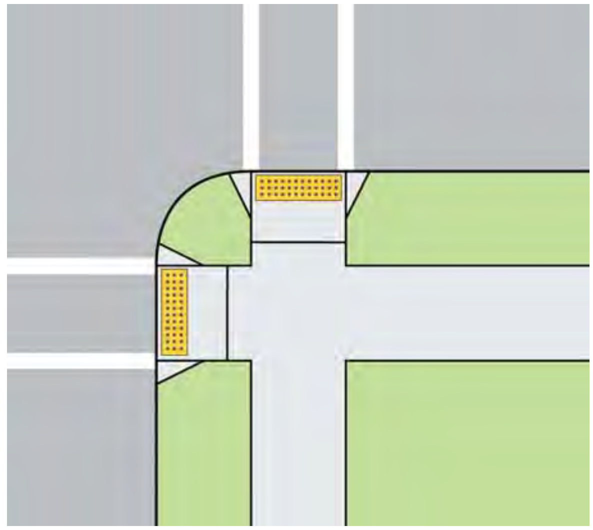
### Discussion

Curb ramps are necessary for people who use wheelchairs to access sidewalks and crosswalks. ADA requires the installation of curb ramps in new sidewalks, as well as retrofitting existing sidewalks.

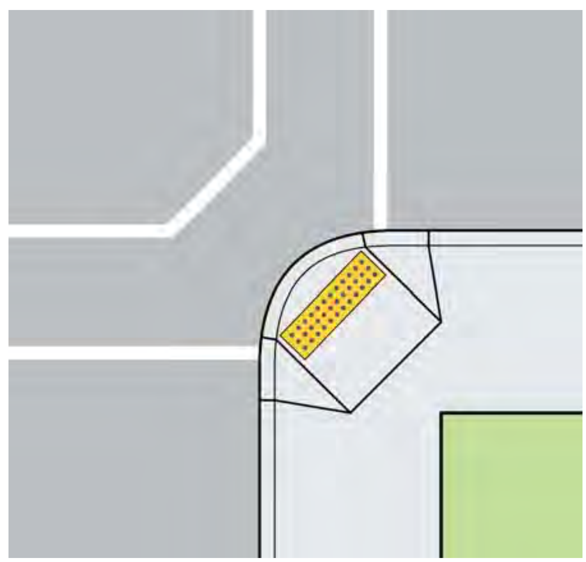
Curb ramps may be placed at each end of the crosswalk (perpendicular curb ramps), or between crosswalks (diagonal curb ramps).

The ramp may be formed by drawing the sidewalk down to meet the street level, or alternately building up a ramp to meet the sidewalk.

### Preferred Design



Perpendicular Curb Ramp



Diagonal Curb Ramp

## A.8.11. Crosswalks

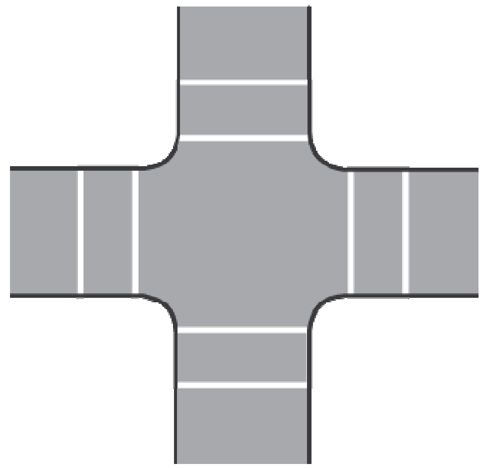
### Design Summary

The City of Oxnard's standard crosswalk design is transverse lines, also referred to as horizontal bars

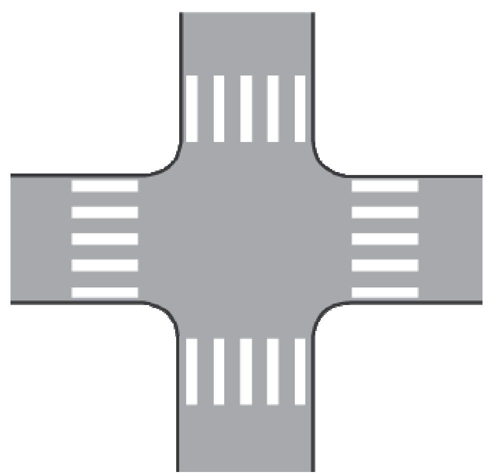
The piano key design, also referred to as the zebra design should be used in high pedestrian traffic areas or as determined necessary by the City Traffic Engineer.

- The width of crosswalks should be a minimum of 10 feet. Unless small-scale intersection conditions dictate otherwise, widths should be increased where there is a greater amount of pedestrian activity.
- Crosswalks should be adequately lit.
- Marked crosswalks should be considered for uncontrolled crossing locations if there are no controlled crossings (by a traffic signal or stop sign) within 600 feet of the proposed crossing location (provided that the other guidelines presented here are met).
- The stripes in parallel pavement marking crosswalks should be placed 10 feet apart. In situations where the crosswalk must be narrower, the minimum distance for parallel striping is 6 feet apart.
- Ladder pavement markings should feature 2 foot wide by 10 foot long bars.

**Preferred Design**



Transverse Lines



Piano Key

### Discussion

One of the most effective means of turning an important corridor into a community "spine" or "seam," rather than a "divider," is providing for safe street crossings. Communities frequently elect to install crosswalks at limited locations, such as only on certain legs of an intersection, or infrequently across a multi-lane arterial in order to promote vehicular circulation. These decisions do not eliminate pedestrian use of these roadways and intersections, but they make travel more difficult for existing pedestrians. Roadway geometry, traffic volumes and speeds, and signal configuration and timing must be carefully considered as a part of all new crosswalk installations and retrofits. The diagram below shows general guidelines for crosswalk placement on multiple roadway types.

Crosswalks at intersections should be striped in a manner that alerts motorists to the presence of pedestrians. The striping pattern should reflect the level of pedestrian traffic and location of the crosswalk. Piano key crosswalks should be used in high-traffic pedestrian areas, while crosswalks with parallel line striping should be used at low-traffic residential intersections. Parallel line striping should be adequate for most signalized or stop controlled intersections, although Piano key striping may be used if necessary (for example, if the site has a history of pedestrian collisions).

## *Additional Discussion – Crosswalk Placement and Texturing*

### Placement

Unless circumstances dictate otherwise, marked crosswalks should be provided at all signalized intersections where pedestrian crossing equipment is provided.

- In locations with significant pedestrian activity, crosswalks should be placed no further than 195-295 feet apart, and no closer than 145 feet apart.
- In other urban locations with limited pedestrian activity crosswalk frequency may be varied but should not exceed 395 feet without a crosswalk.

Marked crosswalks, without other substantial traffic calming or crossing improvements presented in these guidelines, are insufficient under the following conditions:

- Where the speed limit exceeds 40 mph;
- On a roadway with four or more lanes without a raised median or crossing island that has (or will soon have) an ADT of 12,000 vehicles per day or greater;
- On a roadway with four or more lanes with a raised median or crossing island that has (or will soon have) an ADT of 15,000 vehicles per day or greater.

Special crosswalk markings should be used in order to increase the visibility of the crosswalk and on uncontrolled approaches to un-signalized intersections. These special markings are generally more appropriate on roads where the adjacent land use may divert drivers' attentions.

### Texture

Raised or striped textures can be used to heighten motorists' awareness of pedestrian crossings. Visual differentiation through pavement type and appearance alerts motorists to the presence of pedestrians. Raised or textured crosswalks also provide an audible signal to motorists as they pass over the change in pavement texture, acting in a manner similar to speed bumps to slow vehicular traffic. Raised or textured crosswalks can slow traffic and may provide visual accents to pedestrian environments, but should not do so at the cost of accessibility. Textures or materials that are barriers to disabled access should be avoided. Textured crosswalks should not be used in areas where noise is a concern for nearby residents.

Adequate through pedestrian width should be integrated into the design of raised or textured crosswalks. Maintenance and traffic impacts must also be carefully considered. Some raised or textured applications work only in slow speed environments, such as neighborhood streets or parking circulation lanes. Further considerations include the following.

- Design of raised or textured crosswalk must be ADA compliant.
- Materials used must be durable and safe for pedestrians, (e.g. concrete should be used instead of brick).
- Design of raised or textured crosswalk should be aesthetically consistent with the surrounding environment.
- Textured application materials should be tested to ensure durability when subjected to turning vehicles, transit vehicles, emergency services vehicles, and local traffic as each category applies.

## A.8.12. Pedestrian Signals – Timing and Activation

### Design Summary

Pedestrian signals have two major components: timing and activation.

**Timing**

Traffic signals should provide all pedestrians, including seniors, the disabled, and children, with adequate time to cross the street or at least reach a pedestrian refuge in the middle of the street. An average walking speed which has been used historically to determine signal duration is 4 feet/second. However, a reduced speed such as 3.0 or 3.25 feet/second should be applied to account for the elderly and disabled.

Signal timing should be balanced with signal frequency. Ideally, pedestrian signals should be at a cycle frequency of 60 to 90 seconds in order to dissuade jaywalking.

Countdown pedestrian signals provide information on the amount of time remaining in the pedestrian change interval, which can assist pedestrians in making safe crossing judgments. Guidance on the use of these devices is now included in the California MUTCD. The City of Oxnard has incorporated the pedestrian countdown timer into its standards.

**Actuation**

Fully-actuated signals are responsive to local traffic variations because they detect vehicles and pedestrians arriving at the intersection. On fully-actuated signals, pedestrians are required to push the button to actuate the WALK phase in any direction.

### Discussion

Pedestrian signals ensure that pedestrians are given adequate time to cross the roadway and are not stranded in the crosswalk by signal lights with insufficient crossing time.

Special pedestrian phases can also be used to provide more crossing time for pedestrians at certain intersections. These include:

- Extended phase – pedestrians who push the pedestrian crossing button get more time to cross the street than the normal signal phase.
- Leading Pedestrian Interval (LPI) – At intersections where there are conflicts between turning vehicles and pedestrians, pedestrians are given a "walk" designation a few seconds before the associated green phase for the intersection begins.

### Preferred Design

Pedestrian Countdown Signal

Pedestrian Pushbutton


Vibrotactile Pushbutton

## *Additional Discussion – Pedestrian Signal Detectors*

### Placement

Place pedestrian push-buttons in locations that are easy to reach and ADA compliant. The control face should be aligned with the direction of travel.

- Pushbuttons detectors should be located at the level top of the curb ramp, adjacent to a level landing, at approximately 40-42 inches off the ground.
- Proper location is essential to ensure a sight impaired pedestrians can easily find the pushbutton.
- Pushbuttons can be mounted to an existing sign/lamp post or a new single use post.

### Accessible Pedestrian Signals

The California MUTCD defines an Accessible Pedestrian Signal (APS) as "a device that communicates information about pedestrian timing in non visual format such as audible tones, verbal messages, and/or vibrating surfaces." (California Manual on Uniform Traffic Control Devices 2003, Section 4A.01). A vibrotactile pedestrian device communicates information about pedestrian timing through a vibrating surface by touch. Vibrotactile pedestrian signals should be provided wherever sight-impaired pedestrians are expected.

## A.8.13. Pedestrian Refuge Islands

### Design Summary

- Pedestrian refuge islands should be installed at intersections where a pedestrian has to cross streets with four or more lanes, with traffic volumes higher 7,500 vehicles per day (VPD), and speeds greater than 35 mph.
- At street crossing locations with vehicle speeds higher than 35 mph and traffic volumes more than 15,000 VPD, "corral-style" pedestrian refuge islands should be offset so that pedestrians must face opposing traffic before crossing the second half of the street.
- Refuge islands should be a minimum of four feet wide by eight feet long. This is an absolute minimum and should not be used at multi-use trail crossings or other locations where bicycle traffic may be anticipated.
- Pedestrian refuge islands should be well illuminated.
- A vertical element should be provided on the island including trees, landscape features, bollards, or sign posts.
- Pedestrian refuge islands must be ADA compliant; where it is not possible to include ramps and waiting pads, waiting areas should be at-grade with the roadway.

### Discussion

Pedestrian refuges in wide or busy streets improve safety for pedestrians and vehicles. They are defined as areas within an intersection or between lanes of traffic where pedestrians may safely wait until vehicular traffic clears, allowing them to cross a street. These islands are particularly helpful for seniors, the disabled, and children who may be unable to cross the street during the available signal time. Another benefit to pedestrians is that it can significantly reduce delay in crossing un-signalized intersections since the pedestrian need only search for vehicles in one direction at a time.

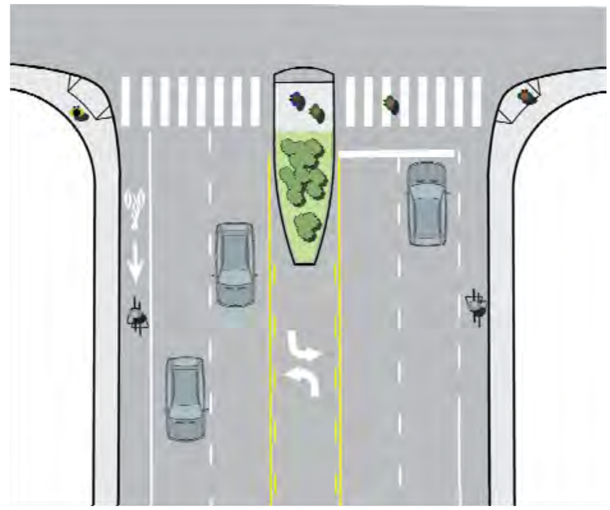
### Guidance

Intersections with high vehicular traffic volumes and pedestrian traffic.

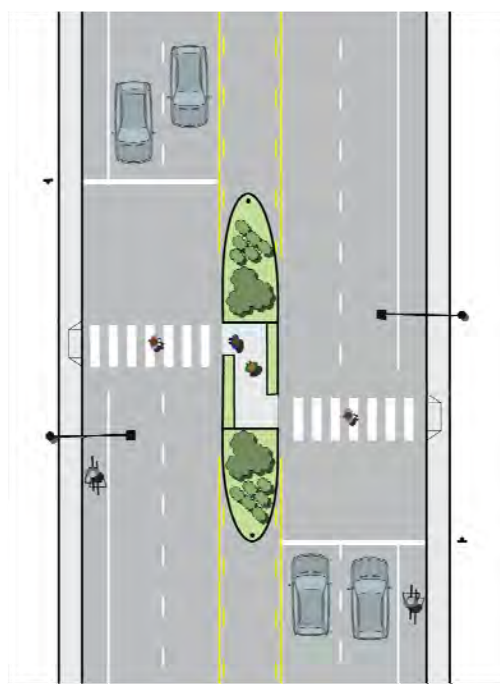
Wide roadways where a two legged crossing will increase ability of pedestrians to cross roadways taking advantage of traffic gaps, without modifications to adjacent intersection signal timing.

Multi-use trail crossings of multi-lane roadways.

### Preferred Design



Pedestrian refuge island at an intersection



Mid-block "corral-style" pedestrian refuge island

## A.8.14. Intersection Design – Free Right Turns

### Design Summary

Free right turns and large turning radii should generally be avoided wherever possible. Where free right turns are necessary, high visibility crosswalks, appropriate curb ramp configuration and motorist warning signage should be used in accordance with design guidelines presented herein.

### Discussion

A right turn slip lane, often delineated by paint or a concrete island, separates the right turn movement from through and left-turning vehicles.

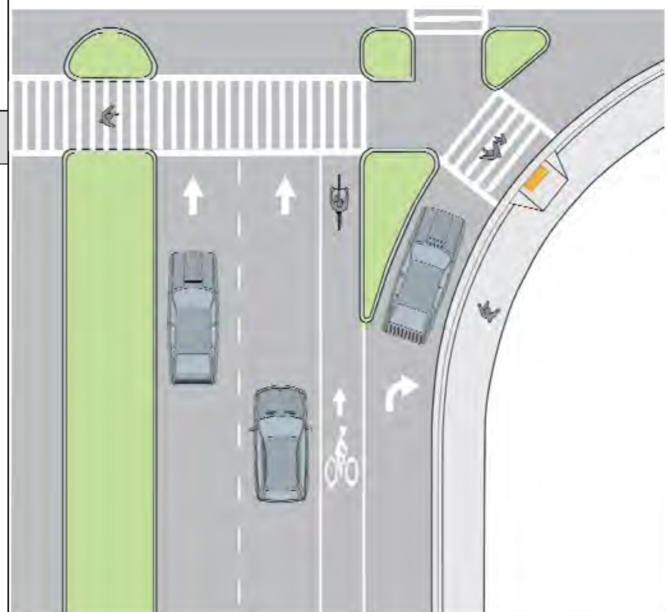
Slip turn lanes can present difficulties to pedestrians because drivers tend to look left and concentrate on merging with oncoming traffic and may not see pedestrians entering the crosswalk. In high-traffic areas, inadequate gaps in right-turning traffic may exist, making crossing a slip turn lane difficult for pedestrians. The non-standard corner geometry introduced by slip lanes is extremely difficult for the blind to negotiate.

The closing of a slip turn lane solves the problems discussed above and also serves to shorten the pedestrian crossing distance. Further, the area can be made an attractive corner for pedestrians through the use of street furniture, benches, and small-scale plantings.

Where slip turns cannot be removed due to traffic capacity considerations, several options exist for enhancing pedestrian safety.

- Signalizing the right turn movement to create gaps in traffic for pedestrians.
- Passive crossing treatments, such as warning signage or a raised crosswalk connecting the sidewalk with a refuge island.
- Decreasing the corner turn radius slows the speed of the turning car, provides a larger pedestrian zone at the corner, and may allow for larger or multiple curb ramps.

### Preferred Design



Right turn slip lane

## A.8.15. Mid-Block Crossings of Major Streets

### Design Summary

A Toucan crossing (derived from "two can cross") is used in higher traffic areas where pedestrians and bicyclists are crossing together. A Hawk (High-Intensity Activated Crosswalk) signal is a combination of a beacon flasher and traffic control signaling technique for marked crossings. RRFB (Rectangular Rapid Flash Beacon) crossings are flashing beacons at midblock crossings that can be activated by a pash button or by a pedestrian detection system.

A traffic engineering analysis should precede the installation of either treatment.

- Toucan crossings are generally used only when significant volumes of bicyclists and pedestrians are anticipated, and the crossings are generally at least 14 feet wide.
- Hawk crossings are typically used in both bike/ped and pedestrian-only situations. Accompanying signage can be adapted as needed.
- RRFB crossings are used for pedestrians only.

### Discussion

All enhancements are discussed in the ITE – Alternative Treatments for At-Grade Pedestrian Crossings. These treatments may be applicable in situations where both bicyclists and pedestrians need to cross a major street, especially when connecting multi-use paths.

### Guidance

Typically, Toucan crossings have bicycle and pedestrian signal heads on both sides of the crossing, and they are button or sensor actuated (bicycle loop detectors are often implemented with Toucan crossings). Refuge islands, curb extensions or other crossing treatments can be used in conjunction with a Toucan crossing. Crossings can be at intersections, or occur mid-block. If the crossing occurs mid-block vehicle stop lines should be provided 20' minimum in advance of the crossing.

If a refuge island is used with a Toucan crossing, it should be 8 feet wide at a minimum and 10 feet is desired. If a signal is provided, signal loop detectors may be placed in the pavement to detect bicycles if they can provide advance detection, and a pedestrian-actuated button provided (placed such that cyclists can press it without dismounting.)

On Hawk crossings, the beacon signal consists of a traffic signal head with a red-yellow-red lens. The unit is normally off until activated by a pedestrian or bicyclist. Bicyclists and pedestrians who wish to cross the street press a button and the signal flashes yellow indication to warn approaching motorists. A solid yellow, advising motorists to prepare to stop, is followed by a flashing yellow, then a solid red, at which time the user is shown a WALK indicator. The beacon converts to a flashing red, allowing drivers to proceed after stopping at the crosswalk while the bicyclist/pedestrian is shown the flashing DON'T WALK signal. The HAWK signal has been accepted by the Federal Highway Administration, and is en route to inclusion in the California MUTCD.

### Preferred Design

Example #1: Toucan Crossing (non-local)

Example #2: HAWK Crossing (non-local)

Example #3: RRFB Crossing (non-local)

# A.9 Signage

## A.9.1. Bicycle Signage

All bikeway signage on public roadways should conform to the signage identified in the Caltrans Manual and/or California Manual of Uniform Traffic Control Devices (California MUTCD). These manuals provide specifications, standards, and guidance on types, locations, and consideration of singing for bicycle networks. Commonly consulted signage will include Regulatory, Guide, Warning and Temporary Traffic Control (TTC) signage.

The California MUTCD provides the following standard and guidance for the application and placement of signs:

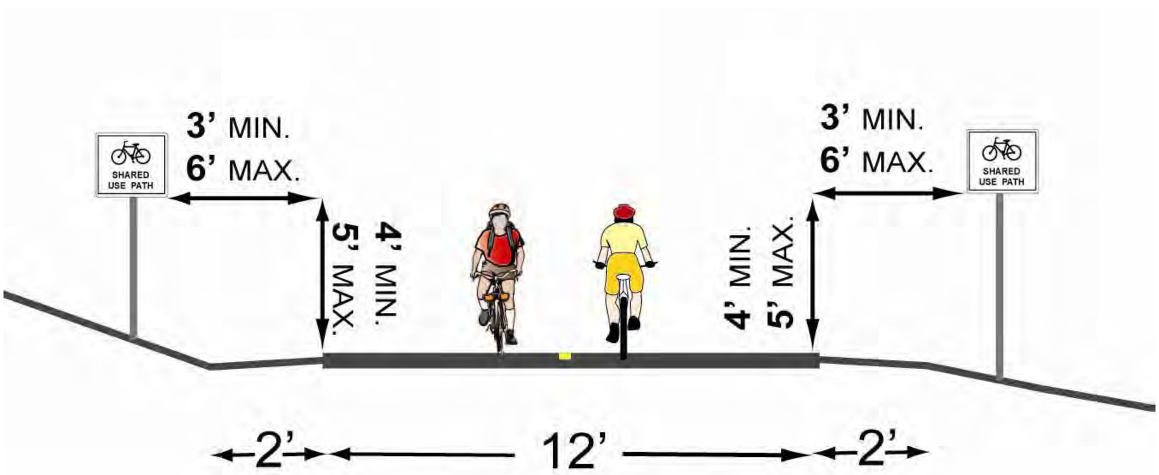
### A.9.1.1. Standard

Bicycle signs shall be standard in shape, legend, and color.

All signs shall be retroreflectorized for use on bikeways, including multi-use paths and bicycle lane facilities.

On multi-use paths, lateral sign clearance shall be a minimum of 3 ft and a maximum of 6 ft from the near edge of the sign to the near edge of the path.

Mounting height for ground-mounted signs on multi-use paths shall be a minimum of 4 ft and a maximum of 5 ft, measured from the bottom edge of the sign to the near edge of the path surface, as shown in the figure below.




### A.9.1.2. Guidance

Signs for the exclusive use of bicyclists should be located so that other road users are not confused by them.

When overhead signs are used on multi-use paths, the clearance from the bottom edge of the sign to the path surface directly under the sign shall be a minimum of 8 ft. The clearance for overhead signs on multi-use paths should be adjusted when appropriate to accommodate typical maintenance vehicles.

# A.9.2. Bicycle Route/Boulevard Signage & Pavement Markings

## Design Summary

Design varies; see following page for additional discussion.

## Discussion

Bikeway signage is a cost-effective yet highly-visible treatment that can improve the riding environment on a Bicycle Friendly Street network. Described in this section, signage can serve both wayfinding and safety purposes.

See following page for additional discussion:

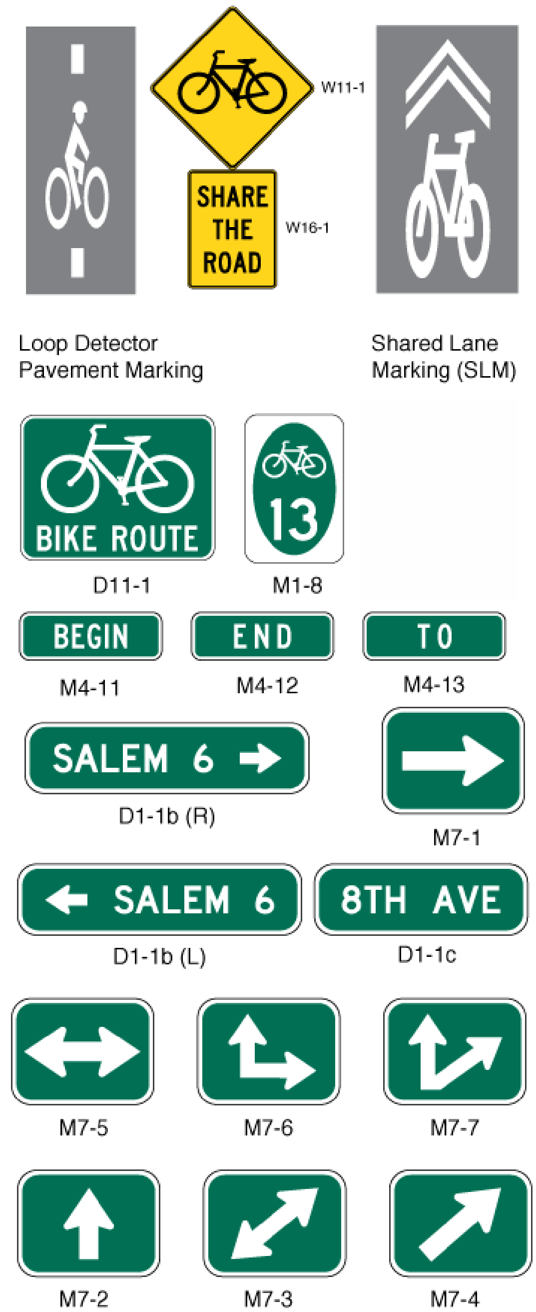
## Design Example


## Guidance

- California MUTCD
- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO Guide for the Development of Bicycle Facilities Chicago's Bikeways Signage System -

## Potential Signage/Wayfinding Options

(not comprehensive)



# *Bicycle Route/Bicycle Boulevard Signage & Pavement Markings*

## Signage

**Wayfinding Signs:**

Shown on previous page, wayfinding signs are typically placed at key locations leading to and along bicycle routes and boulevards, including where multiple routes intersect and at key bicyclist "decision points." Wayfinding signs displaying destinations, distances and "riding time" can dispel common misperceptions about time and distance while increasing users' comfort and accessibility to the Priority Street network. Wayfinding signs also visually cue motorists that they are driving along a bicycle route and should correspondingly use caution. Note that too many road signs tend to clutter the right-of-way.

**Warning signs:**

Warning signs advising motorists to "share the road" may also improve bicycling conditions on a bicycle route and boulevard network. These signs are especially useful near major bicycle trip generators such as schools, parks and other activity centers. Warning signs should also be placed on major streets approaching bicycle routes and boulevards to alert motorists of bicycle crossings.

**Pavement Markings:**

Pavement marking techniques may also improve bicycling conditions along bicycle routes and boulevards. Shared lane markings (SLMs – See Section A.4.4) are often used on streets where dedicated bicycle lanes are desirable but not possible due to physical or other constraints. They may also be used as bicycle route or boulevard markings where on-street parking is present.

**On-Street Parking Delineation :**

Delineating on-street parking spaces with parking Ts or Ls clearly indicates where a vehicle should be parked, and can discourage motorists from parking their vehicles too far into the adjacent travel lane. This helps bicyclists by maintaining a wide enough space to safely share a travel lane with moving vehicles while minimizing the need to swerve farther into the travel lane to maneuver around parked cars and opening doors. In addition to benefiting bicyclists, delineated parking spaces also promote the efficient use of on-street parking by maximizing the number of spaces in high-demand areas.

## *Non-Standard Signage:*

| Description | Facility Type | MUTCD CODE | Graphic |
|---|---|---|---|
| This sign instructs motorists to yield to bicyclists in a bicycle lane. The colored lane alerts motorists to the potential conflict area where motorists may merge across a bicycle lane. | Bicycle Lane Class II | N/A |   |
| Mileage wayfinding signage specifically targeting bicyclists can be extremely helpful, helping people anticipate both distance to and direction of their next destination. | Wayfinding Mileage Sign | N/A |   Photo source: Grant Davis |

## A.9.3. Pedestrian Warning Signage

### Design Summary

The California MUTCD provides guidance on the installation of warning signage and pavement stencils at and in advance of uncontrolled crosswalks. These signs are only for use at uncontrolled locations, because at STOP, YIELD, or signalized locations the presence of the traffic control serves to regulate the crosswalk at those intersections. Signage and stencils to supplement crosswalks are not required, and in fact the California MUTCD notes that such signs should be installed in locations where crossing activity is unexpected or not readily apparent.

In advance of the crosswalk, the Pedestrian Crossing sign plate is installed (W11-2). At the crosswalk location itself, the Pedestrian Crossing sign plate plus a downward arrow is installed to show the exact location of the crosswalk. White "PED XING" pavement markings may be placed in each approach lane to a marked crosswalk, except at intersections controlled by traffic signals or STOP or YIELD signs.

School crosswalk signage is mandatory. At each yellow school crosswalk, the School Crosswalk Warning Assembly B shall be installed, consisting of a School Warning plate (S1-1) plus downward arrow. School area pedestrian guidelines are further discussed in Sections 3.9.3 and 3.9.4.

Pedestrian crossing signs (W-54) should be used adjacent to all unexpected pedestrian crossing areas. One driver-side sign is appropriate on two-lane lower speed roads. Two signs facing each direction should be installed on roads with more than two lanes, higher speed roads, or roadways with medians (with one sign on the median where medians exist, otherwise on the opposite side of the street).

Warning signage should be placed on existing signposts if possible to reduce visual clutter.

### Discussion

One way of increasing the visibility of pedestrian-related signage is through the use of a Fluorescent Yellow-Green (FYG) background. Use of this FYG signage is approved by the California MUTCD for use on pedestrian, bicycle and school signs.

### Preferred Design

W11-2

S1-1

W-167P

## A.9.4. School Zone Striping and Signage

### Design Summary

To alert drivers to the presence of a school, crosswalks within the designated school zone must be striped yellow rather than white.

A school zone can be designated up to 500' in advance of the school boundary.

Special signage should also be located near school crossings in accordance with the guidelines provided in Chapter 7 of the California MUTCD.

### Discussion

Special considerations should be made for pedestrian facilities in school zones. School area signage and striping alerts motorists to be watchful for students, who because of their size are often less visible than adults. All school area crosswalks should be differentiated from normal crosswalks with the use of yellow coloring.

### Guidance

All school zones.

### Design Example


### Preferred Design

W-63
W16-7P


W-63
W-65


W-65
R-2
R-72


W-63
W16-9P

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# Appendix B: Trip and Emissions Reduction Estimates

**Prepared for:**

City of Oxnard

**Prepared by:**

Alta Planning + Design

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Table B-1: Estimated Existing and Projected Bicycling Activity ............................................................B-3

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# Appendix B: Trip and Emissions Reduction Estimates

This appendix provides detailed breakdowns of estimates that are required to make Oxnard eligible for funding from the State Bicycle Transportation Account. **Table B-1** and **Table B-2** present data, calculations and sources in four groups.

Existing Commuting Statistics provide calculations for assessing total daily bicycling and walking trips. All trips counted in these estimates are utilitarian—related to commutes or errands— nondiscretionary trips that a person has to make. There may be discretionary bicycling and walking trips, for exercise or recreation, but these estimates cannot capture them without more detailed data. One assumption in this group addresses the number of bicycle trips a person working from home might make. These existing statistics are also informed by National Safe Routes to School surveys, which cite a national average of 2% bike-to-school commute share and 11% walk-to-school commute share.

The Future Commuting Statistics use projected population growth, factoring in trends based on 1990 and 2000 census data, to predict the number of people who may bike in 2020. Some assumptions are made, relating to the impact from this plan; for example, this group of statistics relies on a future bike-to-work mode share doubling from 1.1% to 2.2% while the walk-to-work mode share increases by 25% of the present value at 1.7%. Other assumptions include the number of students who bike and walk to school, the number of college students biking and walking and the number of biking and walking trips made by a person working at home.

The Future Vehicle Trips and Mileage Reduction estimates convert results from future commuting projections into the number of actual trips, along with number of vehicle miles replaced by biking and walking. Those values are further converted, to assess Future Air Quality Benefits— lbs/weekday and tons/year values to assess the complete impact that this plan may induce if successfully implemented.

**Table B-1: Estimated Existing and Projected Bicycling Activity**

| Category | Calculation | source |
|---|---|---|
| **Existing Bicycling Commuter Statistics** | | |
| Existing study area population | 170,595 | 2000 Census, STF3, P1. |
| Existing employed population | 70,395 | 2000 Census, STF3, P30. |
| Existing bike-to-work mode share | 1.1% | 2000 Census, STF3, P30. |
| Existing number of bike-to-work commuters | 753 | Employed persons multiplied by bike-to-work mode share |
| Existing work-at-home mode share | 1.9% | 2000 Census, STF3, P30. |
| Existing number of work-at-home bike commuters | 332 | Assuming 25% of population working at home makes at least one daily bicycle trip |
| Existing school children, ages 6-14 | 27,816 | 2000 Census, STF3, P8. |
| Existing school children bicycling mode share | 2.0% | National Safe Routes to School surveys, 2003. |
| Existing school children bike commuters | 556 | School children population multiplied by school children bike mode share |
| Existing number of college students in study area | 9,822 | Full-time undergraduate and graduate student population in study area |

| Category | Calculation | source |
|---|---|---|
| Existing estimated college bicycling mode share | 10.0% | Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995). |
| Existing college bike commuters | 982 | College student population multiplied by college student bicycling mode share |
| Existing total number of bike commuters | 2,623 | Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation. |
| Total daily bicycling trips | 5,247 | Total bicycle commuters x 2 (for round trips) |
| **Future Commuting Statistics 2020** | | |
| Future study area population | 245,472 | Estimate based on historic population growth |
| Future employed population | 77,891 | Estimate based on historic employment growth |
| Future bike-to-work mode share | 2.2% | Doubling the bike-to-work mode share by 2020 |
| Future number of bike-to-work commuters | 1,714 | Employed persons multiplied by bike-to-work mode share |
| Future work-at-home mode share | 2.6% | Estimate based on historic work-at-home population growth |
| Future number of work-at-home bike trips | 1,024 | Assuming 50% of population working at home makes at least one daily bicycle trip. |
| Future school children ages 6-14 | 44,864 | Estimate based on historic population growth |
| Future school children bicycling mode share | 4.0% | Assuming the bike-to-school mode share doubles by 2020 |
| Future school bike commuters | 1,795 | School children population multiplied by school children bicycling mode share |
| Future number of college students in study area | 20,430 | Estimate based on historic college student population growth |
| Future estimated college bicycling mode share | 12.5% | Assuming that the college bike commute mode share increases by 25% |
| Future college bike commuters | 2,554 | College student population multiplied by college student bicycling mode share |
| Future total number of bicycle commuters | 7,086 | Total bike-to-work, school, college and utilitarian walking trips. Does not include recreation. |
| Future total daily bicycling trips | 14,172 | Total bike commuters x 2 (for round trips) |
| **Future Vehicle Trips and Mileage Reduction** | | |
| Reduced Vehicle Trips per Weekday | 4,814 | Assuming 73% of bicycling trips replace vehicle trips for adults/college students and 53% for school children |
| Reduced Vehicle Trips per Year | 1,232,379 | Reduced number of weekday vehicle trips multiplied by 256 (weekdays in a year) |
| Reduced Vehicle Miles per Weekday | 31,854 | Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren |

| Category | Calculation | source |
|---|---|---|
| Reduced Vehicle Miles per Year | 8,154,614 | Reduced number of weekday vehicle miles multiplied by 256) weekdays in a year) |
| **Air Quality Benefits** | | |
| Reduced HC (lbs/weekday) | 197 | Daily mileage reduction multiplied by 0.00617 lbs per reduced mile |
| Reduced CO (lbs/weekday) | 1,468 | Daily mileage reduction multiplied by 0.04607 lbs per reduced mile |
| Reduced NOX (lbs/weekday) | 98 | Daily mileage reduction multiplied by 0.00306 lbs per reduced mile |
| Reduced CO2 (lbs/weekday) | 29,179 | Daily mileage reduction multiplied by 0.91602 lbs per reduced mile |
| Reduced HC (tons/year) | 25 | Reduced HC lbs/weekday multiplied by 256 (weekdays in a year) |
| Reduced CO (tons/year) | 188 | Reduced CO lbs/weekday multiplied by 256 (weekdays in a year) |
| Reduced NOX (tons/year) | 12 | Reduced NOX lbs/weekday multiplied by 256 (weekdays in a year) |
| Reduced CO2 (tons/year) | 3,735 | Reduced CO2 lbs/weekday multiplied by 256 (weekdays in a year) |
| *Emissions rates from EPA report 420-F-00-013 "Emission Facts: Average Annual Emissions and Fuel Consumption for Passenger Cars and Light Trucks." 2000.* | | |

**Table B-2: Estimated Existing and Projected Walking Activity**

| Category | Calculation | source |
|---|---|---|
| **Existing Walking Commuter Statistics** | | |
| Existing study area population | 170,595 | 2000 Census, STF3, P1. |
| Existing employed population | 70,395 | 2000 Census, STF3, P30. |
| Existing walk-to-work mode share | 1.7% | 2000 Census, STF3, P30. |
| Existing number of walk-to-work commuters | 1,179 | Employed persons multiplied by walk-to-work mode share |
| Existing work-at-home mode share | 1.9% | 2000 Census, STF3, P30. |
| Existing number of work-at-home walk trips | 332 | Assumes 25% of population working at home makes at least one daily walking trip |
| Existing transit-to-work mode share | 1.3% | 2000 Census, STF3, P30. |
| Existing transit pedestrian commuters | 702 | Assumes 75% of transit riders access transit by foot |
| Existing school children, ages 6-14 | 27,816 | 2000 Census, STF3, P8. |
| Existing school children walking mode share | 11.0% | National Safe Routes to School surveys, 2003. |
| Existing school children walk commuters | 3,060 | School children population multiplied by school children walking mode share |
| Existing number of college students in study area | 982 | Full-time undergraduate and graduate student population in study area |

| Category | Calculation | source |
|---|---|---|
| Existing estimated college walking mode share | 60.0% | Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995) |
| Existing college walking commuters | 589 | College student population multiplied by college student walking mode share |
| Existing total number of walk commuters | 5,863 | Total bike-to-work, school, college and utilitarian walking trips. Does not include recreation |
| Total daily walking trips | 11,727 | Total walk commuters x 2 (for round trips) |
| **Future Commuting Statistics** | | |
| Future study area population | 245,472 | Estimate based on historic population growth |
| Future employed population | 77,891 | Estimate based on historic employment growth |
| Future walk-to-work mode share | 2.1% | Assuming the walk-to-work mode share increases by 25% of its present value |
| Future number of walk-to-work commuters | 1,631 | Employed persons multiplied by walk-to-work mode share |
| Future work-at-home mode share | 2.6% | Estimate based on historic work-at-home population growth |
| Future number of work-at-home walk commuters | 1,024 | Assuming 25% of population working at home makes at least one daily walking trip. |
| Future transit-to-work mode share | 1.6% | Assuming the transit-to-work mode share increases by a quarter of its present value. |
| Future transit pedestrian commuters | 935 | Assuming 75% of transit riders access transit by foot. |
| Future school children, ages 6-14 | 44,864 | Estimate based on historic population growth |
| Future school children walking mode share | 16.5% | Assuming the existing walk-to-work mode share increases by 50% of its present value |
| Future school children walk commuters | 7,403 | School children population multiplied by school children walking mode share |
| Future number of college students in study area | 20,430 | Estimate based on historic college student population growth |
| Future estimated college walking mode share | 60.0% | Assuming there is no change in the college walking mode share |
| Future college walking commuters | 12,258 | College student population multiplied by college student walking mode share |
| Future total number of walk commuters | 23,251 | Total walk-to-work, school, college and utilitarian walking trips. Does not include recreation |
| Future total daily walking trips | 46,501 | Total walk commuters x 2 (for round trips) |
| **Future Vehicle Trips and Miles Reduction** | | |
| Reduced Vehicle Trips per Weekday | 15,493 | Assumes 73% of walking trips replace vehicle trips for adults/college students and 53% for school children |

| Category | Calculation | source |
|---|---|---|
| Reduced Vehicle Trips per Year | 3,966,085 | Reduced number of weekday vehicle trips multiplied by 256 (weekdays in a year) |
| Reduced Vehicle Miles per Weekday | 15,845 | Assumes average round trip travel length of 1.2 miles for adults/college students and 0.5 mile for schoolchildren |
| Reduced Vehicle Miles per Year | 4,056,229 | Reduced number of weekday vehicle miles multiplied by 256 (weekdays in a year) |
| **Air Quality Benefits** | | |
| Reduced HC (lbs/weekday) | 98 | Daily mileage reduction multiplied by 0.00617 lbs per reduced mile |
| Reduced CO (lbs/weekday) | 730 | Daily mileage reduction multiplied by 0.04607 lbs per reduced mile |
| Reduced NOX (lbs/weekday) | 49 | Daily mileage reduction multiplied by 0.00306 lbs per reduced mile |
| Reduced CO2 (lbs/weekday) | 14,514 | Daily mileage reduction multiplied by 0.91602 lbs per reduced mile |
| Reduced HC (tons/year) | 13 | Reduced HC lbs/weekday multiplied by 256 (weekdays in a year) |
| Reduced CO (tons/year) | 93 | Reduced CO lbs/weekday multiplied by 256 (weekdays in a year) |
| Reduced NOX (tons/year) | 6 | Reduced NOX lbs/weekday multiplied by 256 (weekdays in a year) |
| Reduced CO2 (tons/year) | 1,858 | Reduced CO2 lbs/weekday multiplied by 256 (weekdays in a year) |
| *Emissions rates from EPA report 420-F-00-013 "Emission Facts: Average Annual Emissions and Fuel Consumption for Passenger Cars and Light Trucks." 2000.* | | |

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# Appendix C: Safety Review

**Prepared for:**

City of Oxnard

**Prepared by:**

Alta Planning + Design in collaboration with MNS Engineers, Inc.

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**Appendix C: Safety Review .......... C-1**

Table C-1: Class II - Bicycle Lane Safety Review .......... C-3

## Table C-1: Class II - Bicycle Lane Safety Review

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| **Auto Center Drive** | **Ventura Boulevard** | **Santa Clara Avenue** | | | | | | | |
| Auto Center Drive | Ventura Boulevard | Via Estrada | EB | No On-Street Parking | 8 | 2348 | Preferred | | |
| Auto Center Drive | Via Estrada | Paseo Mercardo | EB | No On-Street Parking | 8 | 1025 | Preferred | | |
| Auto Center Drive | Paseo Mercardo | Los Olivos | EB | No On-Street Parking | 8 | 823 | Preferred | | |
| Auto Center Drive | Los Olivos | Santa Clara Avenue | EB | No On-Street Parking | 7 | 2679 | Minimum | | |
| **Auto Center Drive** | **Santa Clara Avenue** | **Ventura Boulevard** | | | | | | | |
| Auto Center Drive | Santa Clara Avenue | Los Olivos | WB | Curbs and No Parking | 8 | 1857 | Preferred | | |
| Auto Center Drive | Los Olivos | Paseo Mercardo | WB | No On-Street Parking | 8 | 518 | Preferred | | |
| Auto Center Drive | Paseo Mercardo | Via Estrada | WB | No On-Street Parking | 8 | 1329 | Preferred | | |
| Auto Center Drive | Via Estrada | Ventura Boulevard | WB | No On-Street Parking | 8 | 1323 | Preferred | | |
| **Bard Road** | **Ventura Road** | **Pleasant Valley Road** | | | | | | | |
| Bard Road | S Ventura Road | 5th Pl | EB | On-Street Parallel Parking | 12 | 331 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,400 |
| Bard Road | 5th Pl | N 6th Place | EB | On-Street Parallel Parking | 12 | 510 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,400 |
| Bard Road | N 6th Place | N 7th Place | EB | On-Street Parallel Parking | 12 | 620 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $13,000 |
| Bard Road | N 7th Place | Park Avenue | EB | On-Street Parallel Parking | 12 | 419 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,900 |
| Bard Road | Park Avenue | J Street | EB | On-Street Parallel Parking | 12 | 874 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $14,350 |
| Bard Road | J Street | F Street | EB | On-Street Parallel Parking | 12 | 520 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,450 |
| Bard Road | F Street | C Street | EB | On-Street Parallel Parking | 12 | 1075 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $15,450 |
| Bard Road | C Street | A Street | EB | On-Street Parallel Parking | 12 | 536 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,350 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Bard Road | A Street | Saviers Road | EB | No On-Street Parking | - | 323 | | Bicycle lane drops off through this segment. Reconfiguration of the north and south side of Bard Road required to meet minimum design for A.3.3. Removal of on-street parking on north side of street as well. | |
| Bard Road | Saviers Road | Davis Court | EB | No On-Street Parking | 8 | 780 | Preferred | | |
| Bard Road | Davis Court | Justin Way | EB | No On-Street Parking | 8 | 632 | Preferred | | |
| Bard Road | Justin Way | San Juan Avenue | EB | No On-Street Parking | 8 | 980 | Preferred | | |
| Bard Road | San Juan Avenue | Terrace Avenue | EB | No On-Street Parking | 8 | 1386 | Preferred | | |
| Bard Road | Terrace Avenue | Anchorage St | EB | No On-Street Parking | 8 | 784 | Preferred | | |
| Bard Road | Anchorage St | S Rose Avenue | EB | No On-Street Parking | 8 | 1050 | Preferred | | |
| Bard Road | S Rose Avenue | Holmes Drive | EB | No On-Street Parking | 8 | 1112 | Preferred | | |
| Bard Road | Holmes Drive | Pleasant Valley Road | EB | No On-Street Parking | 8 | 1165 | Preferred | | |
| **Bard Road** | **Pleasant Valley Road** | **Ventura Road** | | | | | | | |
| Bard Road | Pleasant Valley Road | Simpson Drive | WB | No On-Street Parking | 5 | 1165 | Minimum | | |
| Bard Road | Simpson Drive | Rose Avenue | WB | No On-Street Parking | 5 | 1112 | Minimum | | |
| Bard Road | Rose Avenue | Anchorage Street | WB | No On-Street Parking | 8 | 1050 | Preferred | | |
| Bard Road | Anchorage Street | San Simeon Avenue | WB | No On-Street Parking | 8 | 1173 | Preferred | | |
| Bard Road | San Simeon Avenue | San Juan Avenue | WB | No On-Street Parking | 8 | 997 | Preferred | | |
| Bard Road | San Juan Avenue | Justin Way | WB | No On-Street Parking | 8 | 980 | Preferred | | |
| Bard Road | Justin Way | Saviers Road | WB | No On-Street Parking | 6 | 1412 | Minimum | Construct Bicycle Lane per A.3.4 at Saviers Road. | |
| Bard Road | Saviers Road | A Street | WB | On-Street Parallel Parking | 12 | 464 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,150 |
| Bard Road | A Street | C Street | WB | On-Street Parallel Parking | 12 | 395 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,750 |
| Bard Road | C Street | Francisco Place | WB | On-Street Parallel Parking | 12 | 804 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $13,950 |
| Bard Road | Francisco Place | G Street | WB | On-Street Parallel Parking | 12 | 527 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,500 |
| Bard Road | G Street | J Street | WB | On-Street Parallel Parking | 12 | 265 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,050 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Bard Road | J Street | 8th Place | WB | On-Street Parallel Parking | 12 | 272 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,100 |
| Bard Road | 8th Place | Park Avenue | WB | On-Street Parallel Parking | 12 | 602 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,900 |
| Bard Road | Park Avenue | 6th Place | WB | On-Street Parallel Parking | 12 | 839 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $14,150 |
| Bard Road | 6th Place | 5th Place | WB | On-Street Parallel Parking | 12 | 710 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $13,450 |
| Bard Road | 5th Place | Ventura Road | WB | On-Street Parallel Parking | 12 | 331 | Minimum | Additional right-of-way required to meet preferred design for right turn pocket per A.3.4. Removal of on-street parking on south side of street could accommodate A.3.4. | |
| **C Street** | **Channel Islands Boulevard** | **Kamala Street** | | | | | | | |
| C Street | Channel Islands Boulevard | Linden Drive | NB | No On-Street Parking | 7 | 1356 | Minimum | | |
| C Street | Linden Drive | Maywood Way | NB | No On-Street Parking | 5 | 492 | Minimum | | |
| C Street | Maywood Way | Laurel Street | NB | On-Street Parallel Parking | 12 | 514 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. Additional right-of-way required to meet preferred design for right turn pocket per A.3.4. | $12,400 |
| C Street | Laurel Street | Kamala Street | NB | No On-Street Parking | 5 | 478 | Minimum | | |
| **C Street** | **Kamala Street** | **Channel Islands Boulevard** | | | | | | | |
| C Street | Kamala Street | Laurel Street | SB | No On-Street Parking | 6 | 478 | Minimum | | |
| C Street | Laurel Street | Maywood Way | SB | On-Street Parallel Parking | 12 | 514 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,400 |
| C Street | Maywood Way | Linden Drive | SB | No On-Street Parking | 12 to 8 | 492 | | Bicycle lane tapers to 8 ft after bus stop. | |
| C Street | Linden Drive | Channel Islands Boulevard | SB | No On-Street Parking | 8 | 350 | Preferred | | |
| **Camino Del Sol** | **Entrada Drive/Garfield Avenue** | **Del Norte Boulevard** | | | | | | | |
| Camino Del Sol | Garfield Avenue | Mckinley Avenue | EB | No On-Street Parking | 8 | 693 | Preferred | | |
| Camino Del Sol | McKinley Avenue | Juanita Avenue | EB | No On-Street Parking | 8 | 939 | Preferred | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Camino Del Sol | Juanita Avenue | Higuera Drive | EB | On-Street Parallel Parking | 18 | 481 | | Reconstruction Bicycle Lane per A.3.2 preferred design. | $12,250 |
| Camino Del Sol | Higuera Drive | Gotita Way | EB | On-Street Parallel Parking | 18 | 866 | | Reconstruction Bicycle Lane per A.3.2 preferred design. | $14,300 |
| Camino Del Sol | Gotita Way | Colonia Road | EB | On-Street Parallel Parking | 18 | 256 | | Reconstruction Bicycle Lane per A.3.2 preferred design. | $11,000 |
| Camino Del Sol | Colonia Road | Rose Avenue | EB | On-Street Parallel Parking | 16 | 1233 | | Reconstruction Bicycle Lane per A.3.2 preferred design. | $16,300 |
| Camino Del Sol | Rose Avenue | Gibraltar Street | EB | On-Street Parallel Parking | 5 to 12 | 1671 | Minimum | Reconstruction Bicycle Lane per A.3.2 minimum design. | $18,650 |
| Camino Del Sol | Gibraltar Street | Kohala Street | EB | On-Street Parallel Parking | 12 | 879 | Minimum | Reconstruction Bicycle Lane per A.3.2 minimum design. | $14,400 |
| Camino Del Sol | Kohala Street | Lombard Street | EB | No On-Street Parking | 6 | 732 | Minimum | | |
| Camino Del Sol | Lombard Street | Graves Avenue | EB | No On-Street Parking | - | 689 | | Construct Bicycle Lane per A.3.3 preferred design. | $12,100 |
| Camino Del Sol | Graves Avenue | Rice Avenue | EB | No On-Street Parking | - | 1324 | | Construct Bicycle Lane per A.3.3 preferred design. | $14,400 |
| Camino Del Sol | Rice Avenue | Elevar Street | EB | No On-Street Parking | 5 | 1346 | Minimum | | |
| Camino Del Sol | Elevar Street | Kinetic Drive | EB | No On-Street Parking | 5 | 1535 | Minimum | | |
| Camino Del Sol | Kinetic Drive | Del Norte Boulevard | EB | No On-Street Parking | 5 | 1828 | Minimum | | |
| **Camino Del Sol** | **Del Norte Boulevard** | **Entrada Drive/Garfield Avenue** | | | | | | | |
| Camino Del Sol | Del Norte Boulevard | Kinetic Drive | WB | No On-Street Parking | 5 | 1828 | Minimum | | |
| Camino Del Sol | Kinetic Drive | Elevar Street | WB | No On-Street Parking | 5 | 1535 | Minimum | | |
| Camino Del Sol | Elevar Street | Rice Avenue | WB | No On-Street Parking | 5 | 1346 | Minimum | | |
| Camino Del Sol | Rice Avenue | Maulhardt Avenue | WB | No On-Street Parking | - | 698 | | Construct Bicycle Lane per A.3.3 minimum design. | $12,150 |
| Camino Del Sol | Maulhardt Avenue | Graves Avenue | WB | No On-Street Parking | - | 626 | | Construct Bicycle Lane per A.3.3 minimum design. | $11,900 |
| Camino Del Sol | Graves Avenue | Kohala Street | WB | No On-Street Parking | 10 | 1420 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $22,400 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Camino Del Sol | Kohala Street | Rose Avenue | WB | No On-Street Parking | 10 | 2551 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $32,600 |
| Camino Del Sol | Rose Avenue | Sara Drive | WB | No On-Street Parking | 12 | 1233 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $20,750 |
| Camino Del Sol | Sara Drive | Juanita Avenue | WB | No On-Street Parking | 12 | 1602 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $24,050 |
| Camino Del Sol | Juanita Avenue | Entrada Drive/Garfield Avenue | WB | No On-Street Parking | 8 | 1569 | Preferred | | |
| **Channel Islands Boulevard** | **Harbor Boulevard** | **Victoria Avenue** | | | | | | | |
| Channel Islands Boulevard | Harbor Boulevard | Penninsula Road | EB | No On-Street Parking | 9 | 1556 | | Additional right-of-way required to meet preferred design for right turn pocket per A.3.4. | |
| Channel Islands Boulevard | Penninsula Road | South Victoria Avenue | EB | No On-Street Parking | 8 to 4 | 1139 | | Reconstruct Bicycle Lane per A.3.3 minimum design. | $13,750 |
| **Channel Islands Boulevard** | **Victoria Avenue** | **Harbor Boulevard** | | | | | | | |
| Channel Islands Boulevard | Victoria Avenue | Penninsula Road | WB | No On-Street Parking | 6 | 1139 | Minimum | Median shift and reduction required to meet preferred design for right turn pocket per A.3.4 at Peninsula Road. | |
| Channel Islands Boulevard | Penninsula Road | Channel Islands Boulevard | WB | No On-Street Parking | 8 to 5 | 1556 | Minimum | | |
| **Channel Islands Boulevard** | **Paula Street** | **Pacific Coast Highway** | | | | | | | |
| Channel Islands Boulevard | Paula Street | Albany Drive | EB | No On-Street Parking | 8 | 384 | Preferred | | |
| Channel Islands Boulevard | Albany Drive | Concord Drive | EB | No On-Street Parking | 8 | 793 | Preferred | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Channel Islands Boulevard | Concord Drive | Dallas Drive | EB | No On-Street Parking | - | 341 | | Median or sidewalk reduction required to meet preferred design for right turn pocket at Dallas Drive per A.3.4. | |
| Channel Islands Boulevard | Dallas Drive | Cota Circle | EB | No On-Street Parking | 8 | 708 | Preferred | | |
| Channel Islands Boulevard | Cota Circle | Rose Avenue | EB | No On-Street Parking | 8 | 426 | Preferred | Median shift or sidewalk reduction required to meet preferred design for right turn pocket at Rose Avenue per A.3.4. | |
| Channel Islands Boulevard | Rose Avenue | Pacific Coast Highway | EB | No On-Street Parking | 8 | 397 | Preferred | | |
| **Channel Islands Boulevard** | **Pacific Coast Highway** | **Paula Street** | | | | | | | |
| Channel Islands Boulevard | Pacific Coast Highway | Rose Avenue | WB | No On-Street Parking | - | 397 | - | Median shift or sidewalk reduction required to meet preferred design for right turn pocket at Rose Avenue per A.3.4. | |
| Channel Islands Boulevard | Rose Avenue | Upton Sinclair Drive | WB | No On-Street Parking | 8 | 539 | Preferred | | |
| Channel Islands Boulevard | Upton Sinclair Drive | Statham Boulevard | WB | No On-Street Parking | 8 | 1152 | Preferred | | |
| Channel Islands Boulevard | Statham Boulevard | Albany Drive | WB | No On-Street Parking | 8 | 576 | Preferred | | |
| Channel Islands Boulevard | Albany Drive | Paula Street | WB | No On-Street Parking | 8 | 384 | Preferred | | |
| **Del Norte Boulevard** | **Fifth Street** | **Camino Avenue** | | | | | | | |
| Del Norte Boulevard | Fifth Street | Sturgis Road | NB | No On-Street Parking | | 1846 | | Construct Bicycle Lane per A.3.3. | $16,300 |
| Del Norte Boulevard | Sturgis Road | Camino Del Sol | NB | No On-Street Parking | 8 | 1195 | Preferred | | |
| Del Norte Boulevard | Camino Del Sol | Galaxy Place | NB | No On-Street Parking | 8 | 605 | Preferred | | |
| Del Norte Boulevard | Galaxy Place | Jupiter Court | NB | No On-Street Parking | 8 | 684 | Preferred | Reconstruct Bicycle Lane per A.3.4 at Jupiter Court. | $12,850 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Del Norte Boulevard | Jupiter Court | Lunar Court | NB | Curbs and No Parking | 13 | 742 | Minimum | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Reconstruct Bicycle Lane per A.3.4 at Lunar Court. | $21,300 |
| Del Norte Boulevard | Lunar Court | Camino Avenue | NB | Curbs and No Parking | 13 to 6 | 3772 | Minimum | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $43,600 |
| **Del Norte Boulevard** | **Camino Avenue** | **Fifth Street** | | | | | | | |
| Del Norte Boulevard | Camino Avenue | Camino Del Sol | SB | No On-Street Parking | 12 | 5803 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $61,850 |
| Del Norte Boulevard | Camino Del Sol | Sturgis Road | SB | No On-Street Parking | 8 | 1195 | Preferred | | |
| Del Norte Boulevard | Sturgis Road | East Fifth Street | SB | No On-Street Parking | 8 | 1846 | Preferred | | |
| **Doris Avenue** | **Ventura Road** | **H Street** | | | | | | | |
| Doris Avenue | Ventura Road | North N Street | EB | On-Street Parallel Parking | 13 | 424 | Minimum | | |
| Doris Avenue | North N Street | North M Street | EB | On-Street Parallel Parking | 14 | 317 | Minimum | | |
| Doris Avenue | North M Street | North H Street | EB | On-Street Parallel Parking | 14 | 1285 | Minimum | | |
| **Doris Avenue** | **H Street** | **Ventura Road** | | | | | | | |
| Doris Avenue | North H Street | North M Street | WB | On-Street Parallel Parking | 13 | 1285 | Minimum | | |
| Doris Avenue | North M Street | Ventura Road | WB | On-Street Parallel Parking | 13 | 741 | Minimum | | |
| **Eastman Avenue** | **Rose Avenue** | **Rice Avenue** | | | | | | | |
| Eastman Avenue | Rose Avenue | Rice Avenue | EB | No On-Street Parking | 8 | 5344 | Preferred | | |
| **Eastman Avenue** | **Rice Avenue** | **Rose Avenue** | | | | | | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Eastman Avenue | Rice Avenue | Candelaria Road | WB | No On-Street Parking | 7 | 646 | Minimum | | |
| Eastman Avenue | Candelaria Road | Lombard Street | WB | No On-Street Parking | 7 | 1415 | Minimum | | |
| Eastman Avenue | Lombard Street | Irving Drive | WB | No On-Street Parking | 7 | 993 | Minimum | | |
| Eastman Avenue | Irving Drive | Hearst Drive | WB | No On-Street Parking | 7 | 470 | Minimum | | |
| Eastman Avenue | Hearst Drive | Rose Avenue | WB | No On-Street Parking | 7 | 1820 | Minimum | Median or sidewalk reduction required to meet preferred design for right turn pocket at Rose Avenue per A.3.4. | |
| **Emerson Avenue** | **Pacific Avenue** | **Rose Avenue** | | | | | | | |
| Emerson Avenue | Pacific Avenue | Statham Boulevard | EB | No On-Street Parking | 5 | 525 | Minimum | | |
| Emerson Avenue | Statham Boulevard | Rose Avenue | EB | No On-Street Parking | 5 | 1025 | Minimum | | |
| **Emerson Avenue** | **Rose Avenue** | **Pacific Avenue** | | | | | | | |
| Emerson Avenue | Rose Avenue | Universe Circle | WB | No On-Street Parking | 5 | 338 | Minimum | | |
| Emerson Avenue | Universe Circle | Pacific Avenue | WB | No On-Street Parking | 5 | 1213 | Minimum | | |
| **Esplanade Drive** | **Wagon Wheel Road** | **Vineyard Avenue** | | | | | | | |
| Esplanade Drive | Wagon Wheel Road | Vineyard Avenue | WB | No On-Street Parking | 6 | 1350 | Minimum | | |
| **Esplanade Drive** | **Wagon Wheel Road** | **Vineyard Avenue** | | | | | | | |
| Esplanade Drive | Wagon Wheel Road | Vineyard Avenue | EB | No On-Street Parking | 6 | 1324 | Minimum | | |
| **Fifth Street** | **K Street** | **Victoria Avenue** | | | | | | | |
| Fifth Street | K Street | Ventura Rd | WB | No On-Street Parking | 5 | 934 | Minimum | Reconstruct Bicycle Lane per A.3.3 preferred design. | $13,000 |
| Fifth Street | Ventura Road | Patterson Road | WB | No On-Street Parking | 5 to 7 | 3990 | Minimum | | |
| Fifth Street | Patterson Road | Victoria Avenue | WB | No On-Street Parking | 7 | 4002 | Minimum | | |
| **Fifth Street** | **Victoria Avenue** | **K Street** | | | | | | | |
| Fifth Street | Victoria Avenue | Portofino Place | EB | No On-Street Parking | 5 to 11 | 1961 | | Construct Bicycle Lane Symbol at Victoria Avenue. | $9,200 |
| Fifth Street | Portofino Place | Patterson Road | EB | No On-Street Parking | 12 | 2041 | Preferred | Median or sidewalk reduction required to meet preferred design for right turn pocket at Patterson Road per A.3.4. | |
| Fifth Street | Patterson Road | Mira Loma Circle | EB | On-Street Parallel Parking | 12 to 7 | 2996 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $25,800 |
| Fifth Street | Mira Loma Circle | Ventura Rd | EB | No On-Street Parking | 7 | 995 | Minimum | Construct Bicycle Lane Symbol at | $9,200 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Mira Loma Circle. | |
| Fifth Street | Ventura Road | K Street | EB | No On-Street Parking | 7 | 934 | Minimum | | |
| **Forest Park Boulevard** | **Ventura Road** | **Vineyard Avenue** | | | | | | | |
| Forest Park Boulevard | Ventura Road | Oxnard Boulevard | SE | On-Street Parallel Parking | 11 | 947 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $14,750 |
| Forest Park Boulevard | Oxnard Boulevard | Moonlight Park Avenue | SE | On-Street Parallel Parking | 11 | 982 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $17,950 |
| Forest Park Boulevard | Moonlight Park Avenue | Riverpark Boulevard | SE | On-Street Parallel Parking | 11 | 837 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $14,150 |
| Forest Park Boulevard | Riverpark Boulevard | Vineyard Avenue | SE | No On-Street Parking | 10 | 1724 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Reconstruct Bicycle Lane per A.3.4 at Vineyard Avenue. | $29,850 |
| **Forest Park Boulevard** | **Vineyard Avenue** | **Ventura Road** | | | | | | | |
| Forest Park Boulevard | Vineyard Avenue | Thames River Drive | NW | No On-Street Parking | 12 | 1149 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $19,950 |
| Forest Park Boulevard | Thames River Drive | Garonne Street | NW | On-Street Parallel Parking | 12 | 575 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,750 |
| Forest Park Boulevard | Garonne Street | Moolight Park Avenue | NW | On-Street Parallel Parking | 12 | 837 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $14,150 |
| Forest Park Boulevard | Moolight Park Avenue | Oxnard Boulevard | NW | On-Street Parallel Parking | 12 | 982 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $14,950 |
| Forest Park Boulevard | Oxnard Boulevard | Ventura Road | NW | On-Street Parallel Parking | 12 | 1552 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $18,000 |
| **Garonne Street** | **Forest Park Boulevard** | **Ventura Road** | | | | | | | |
| Garonne Street | Forest Park Boulevard | Orleans Lane | NW | On-Street Parallel Parking | 8 | 657 | Preferred | | |
| Garonne Street | Orleans Lane | Nimes Lane | NW | On-Street Parallel Parking | 8 | 243 | Preferred | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Garonne Street | Nimes Lane | Moss Landing Boulevard | NW | On-Street Parallel Parking | 8 | 288 | Preferred | | |
| Garonne Street | Moss Landing Boulevard | London Lane | NW | On-Street Parallel Parking | 8 | 288 | Preferred | | |
| Garonne Street | London Lane | Oxnard Boulevard | NW | On-Street Parallel Parking | 8 | 281 | Preferred | | |
| Garonne Street | Oxnard Boulevard | Ventura Road | NW | No On-Street Parking | 12 | 770 | Minimum | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $16,550 |
| **Garonne Street** | **Ventura Road** | **Forest Park Boulevard** | | | | | | | |
| Garonne Street | Ventura Road | Oxnard Boulevard | SE | No On-Street Parking | 12 | 770 | Minimum | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $16,550 |
| Garonne Street | Oxnard Boulevard | Moss Landing Boulevard | SE | On-Street Parallel Parking | 8 | 771 | | Remove on-street parking to meet 3.3.2 preferred design. | $13,800 |
| Garonne Street | Moss Landing Boulevard | Green River Street | SE | On-Street Parallel Parking | 8 | 741 | | Remove on-street parking to meet 3.3.2 preferred design. | $13,650 |
| Garonne Street | Green River Street | Forest Park Boulevard | SE | On-Street Parallel Parking | 8 | 448 | | Remove on-street parking to meet 3.3.2 preferred design. | $12,050 |
| **Gonzales Road** | **Victoria Avenue** | **C Street** | | | | | | | |
| Gonzales Road | Victoria Avenue | Patterson Road | EB | No On-Street Parking | 8 | 4245 | Preferred | | |
| Gonzales Road | Patterson Road | Beryl Avenue | EB | No On-Street Parking | 8 | 707 | Preferred | Median or sidewalk reduction required to meet preferred design for right turn pocket at Beryl Avenue per A.3.4. | |
| Gonzales Road | Beryl Avenue | Gallatin Place | EB | No On-Street Parking | 8 | 827 | Preferred | | |
| Gonzales Road | Gallatin Place | Patricia Street | EB | No On-Street Parking | 8 | 1028 | Preferred | | |
| Gonzales Road | Patricia Street | Gina Drive | EB | No On-Street Parking | 8 | 799 | Preferred | | |
| Gonzales Road | Gina Drive | Ventura Road | EB | No On-Street Parking | 8 | 423 | Preferred | | |
| Gonzales Road | Ventura Road | Lantana Street | EB | No On-Street Parking | 8 | 1304 | Preferred | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Gonzales Road | Lantana Street | H Street | EB | No On-Street Parking | 8 | 1190 | Preferred | | |
| Gonzales Road | H Street | C Street | EB | No On-Street Parking | 8 | 1659 | Preferred | | |
| **Gonzales Road** | **C Street** | **Victoria Avenue** | | | | | | | |
| Gonzales Road | C Street | Ginger Street | WB | No On-Street Parking | 8 | 1024 | Preferred | | |
| Gonzales Road | Ginger Street | H Street | WB | No On-Street Parking | 8 | 635 | Preferred | Median or sidewalk reduction required to meet preferred design for right turn pocket at H Street per A.3.4. | |
| Gonzales Road | H Street | Lantana Street | WB | No On-Street Parking | 8 | 1190 | Preferred | | |
| Gonzales Road | Lantana Street | Lobelia Drive | WB | No On-Street Parking | 8 | 580 | Preferred | | |
| Gonzales Road | Lobelia Drive | Ventura Road | WB | No On-Street Parking | - | 724 | | Construct Bicycle Lane per A.3.3 preferred design. | $12,250 |
| Gonzales Road | Ventura Road | Patricia Street | WB | No On-Street Parking | 8 | 1222 | Preferred | | |
| Gonzales Road | Patricia Street | Gallatin Place | WB | No On-Street Parking | 8 | 1028 | Preferred | | |
| Gonzales Road | Gallatin Place | Patterson Road | WB | No On-Street Parking | 8 | 1534 | Preferred | Construct Bicycle Lane per A.3.4 at Patterson Road. | $13,500 |
| Gonzales Road | Patterson Road | Thurgood Marshall Drive | WB | No On-Street Parking | 8 | 851 | Preferred | | |
| Gonzales Road | Thurgood Marshall Drive | Merion Way | WB | No On-Street Parking | 8 | 1278 | Preferred | | |
| Gonzales Road | Merion Way | Belmont Lane | WB | No On-Street Parking | 8 | 912 | Preferred | | |
| Gonzales Road | Belmont Lane | Victoria Avenue | WB | No On-Street Parking | 8 | 1204 | Preferred | | |
| **Gonzales Road** | **Oxnard Boulevard** | **Rice Avenue** | | | | | | | |
| Gonzales Road | Oxnard Boulevard | Entrada Drive | EB | No On-Street Parking | 16 to 5 | 1470 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $22,850 |
| Gonzales Road | Entrada Drive | Snow Avenue | EB | No On-Street Parking | 5 | 2090 | Minimum | Reconstruct Bicycle Lane per A.3.3. | $17,150 |
| Gonzales Road | Snow Avenue | Sonata Drive | EB | No On-Street Parking | 7 | 984 | Minimum | | |
| Gonzales Road | Sonata Drive | Rose Avenue | EB | No On-Street Parking | 5 | 1144 | Minimum | | |
| Gonzales Road | Rose Avenue | Williams Drive | EB | No On-Street Parking | 8 | 1326 | Preferred | | |
| Gonzales Road | Williams Drive | Lombard Street | EB | No On-Street Parking | 8 | 1400 | Preferred | | |
| Gonzales Road | Lombard Street | Solar Drive | EB | No On-Street Parking | 8 | 1325 | Preferred | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Gonzales Road | Solar Drive | Rice Avenue | EB | No On-Street Parking | 8 | 867 | Preferred | | |
| **Gonzales Road** | **Rice Avenue** | **Oxnard Boulevard** | | | | | | | |
| Gonzales Road | Rice Avenue | Solar Drive | WB | No On-Street Parking | 6 | 867 | Minimum | | |
| Gonzales Road | Solar Drive | Outlet Center Drive | WB | No On-Street Parking | 6 | 1325 | Minimum | | |
| Gonzales Road | Outlet Center Drive | Williams Drive | WB | No On-Street Parking | 8 | 1400 | Preferred | | |
| Gonzales Road | Williams Drive | Rose Avenue | WB | No On-Street Parking | 8 | 1326 | Preferred | | |
| Gonzales Road | Rose Avenue | Almanor Street | WB | No On-Street Parking | 5 | 1400 | Minimum | | |
| Gonzales Road | Almanor Street | Snow Avenue | WB | No On-Street Parking | 5 | 728 | Minimum | Reconstruct Bicycle Lane per A.3.3. | $12,250 |
| Gonzales Road | Snow Avenue | Indiana Drive | WB | No On-Street Parking | 8 | 1504 | Preferred | | |
| Gonzales Road | Indiana Drive | Entrada Drive | WB | No On-Street Parking | 8 | 587 | Preferred | | |
| Gonzales Road | Entrada Drive | Bahia Drive | WB | No On-Street Parking | 8 | 846 | Preferred | | |
| Gonzales Road | Bahia Drive | Oxnard Boulevard | WB | No On-Street Parking | 14 | 624 | | Reconstruct Bicycle Lane per A.3.3. | $11,900 |
| **Graves Avenue** | **Camino Del Sol** | **Wankel Way** | | | | | | | |
| Graves Avenue | Camino Del Sol | Latigo Avenue | NB | No On-Street Parking | 7 | 1737 | Minimum | | |
| Graves Avenue | Latigo Avenue | Santiago Court | NB | No On-Street Parking | 7 | 1342 | Minimum | | |
| Graves Avenue | Santiago Court | Wankel Way | NB | No On-Street Parking | 7 | 776 | Minimum | | |
| **Graves Avenue** | **Camino Del Sol** | **Wankel Way** | | | | | | | |
| Graves Avenue | Wankel Way | Terazza Way | SB | No On-Street Parking | 7 | 354 | Minimum | | |
| Graves Avenue | Terazza Way | Pajaro Street | SB | No On-Street Parking | 7 | 915 | Minimum | | |
| Graves Avenue | Pajaro Street | Avenida Classica | SB | No On-Street Parking | 6 | 284 | Minimum | | |
| Graves Avenue | Avenida Classica | Latigo Avenue | SB | No On-Street Parking | 6 | 565 | Minimum | | |
| Graves Avenue | Latigo Avenue | Avenida Del Dia | SB | No On-Street Parking | 6 | 1410 | Minimum | | |
| Graves Avenue | Avenida Del Dia | Camino Del Sol | SB | No On-Street Parking | 6 | 327 | Minimum | | |
| **H Street** | **Fifth Street** | **Vineyard Avenue** | | | | | | | |
| H Street | Fifth Street | Fourth Street | NB | On-Street Parallel Parking | 10 to 12 | 479 | | Reconstruct Bicycle Lane per A.3.2. minimum design. | $12,200 |
| H Street | Fourth Street | Third Street | NB | On-Street Parallel Parking | 12 | 484 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $12,250 |
| H Street | Third Street | Second Street | NB | On-Street Parallel Parking | 12 | 478 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $12,200 |
| H Street | Second Street | Magnolia Avenue | NB | On-Street Parallel | 12 | 1036 | Minimum | Reconstruct Bicycle Lane per A.3.2. | $15,200 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Parking | | | | minimum design. | |
| H Street | Magnolia Avenue | Palm Drive | NB | On-Street Parallel Parking | 12 | 170 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $10,550 |
| H Street | Palm Drive | Doris Avenue | NB | On-Street Parallel Parking | 12 | 1081 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $15,450 |
| H Street | Doris Avenue | Roderick Avenue | NB | On-Street Parallel Parking | 12 | 677 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $13,300 |
| H Street | Roderick Avenue | Glenwood Drive | NB | On-Street Parallel Parking | 12 | 1700 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $18,800 |
| H Street | Glenwood Drive | Huntswood Way | NB | On-Street Parallel Parking | 12 | 276 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,100 |
| H Street | Huntswood Way | Ivywood Drive | NB | On-Street Parallel Parking | 12 | 273 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,100 |
| H Street | Ivywood Drive | Janetwood Drive | NB | On-Street Parallel Parking | 12 | 341 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,450 |
| H Street | Janetwood Drive | Kentwood Drive | NB | On-Street Parallel Parking | 12 | 381 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,700 |
| H Street | Kentwood Drive | Rosewood Drive | NB | On-Street Parallel Parking | 12 | 369 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,600 |
| H Street | Rosewood Drive | Gonzales Road | NB | No On-Street Parking | - | 212 | | Bicycle lane drops off through this segment. Construct Bicycle Lane per A.3.3. | $10,400 |
| H Street | Gonzales Road | Aster Street | NB | No On-Street Parking | 8 | 423 | Preferred | | |
| H Street | Aster Street | Bluebell Street | NB | On-Street Parallel Parking | 15 | 451 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. | $12,050 |
| H Street | Bluebell Street | Erica Place | NB | On-Street Parallel Parking | 15 | 780 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. | $13,850 |
| H Street | Erica Place | Holly Avenue | NB | On-Street Parallel Parking | 15 | 1047 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. | $15,300 |
| H Street | Holly Avenue | Vineyard Avenue | NB | On-Street Parallel Parking | 15 | 991 | Preferred | Construct Bicycle Lane per A.3.4. at Vineyard Avenue. Reduction of the west side bike lane required to meet 3.3.4. | $12,050 |
| **H Street** | **Vineyard Avenue** | **Fifth Street** | | | | | | | |
| H Street | Vineyard Avenue | Holly Avenue | SB | On-Street Parallel Parking | 15 | 991 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. | $15,300 |
| H Street | Holly Avenue | Erica Place | SB | On-Street Parallel Parking | 15 | 1047 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. | $13,850 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| H Street | Erica Place | Bluebell Street | SB | On-Street Parallel Parking | 15 | 780 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. | $12,050 |
| H Street | Bluebell Street | Gonzales Road | SB | On-Street Parallel Parking | 15 | 875 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. Construct Bicycle Lane per A.3.4. at Gonzales Road. | $19,950 |
| H Street | Gonzales Road | Rosewood Drive | SB | No On-Street Parking | 8 | 212 | Preferred | | |
| H Street | Rosewood Drive | Janetwood Drive | SB | On-Street Parallel Parking | 12 | 750 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $9,900 |
| H Street | Janetwood Drive | Ivywood Drive | SB | On-Street Parallel Parking | 12 | 341 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,450 |
| H Street | Ivywood Drive | Huntswood Way | SB | On-Street Parallel Parking | 12 | 273 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,100 |
| H Street | Huntswood Way | Glenwood Drive | SB | On-Street Parallel Parking | 12 | 276 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,100 |
| H Street | Glenwood Drive | Devonshire Drive | SB | On-Street Parallel Parking | 12 | 1101 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $15,600 |
| H Street | Devonshire Drive | Robert Avenue | SB | On-Street Parallel Parking | 12 | 289 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,200 |
| H Street | Robert Avenue | Roderick Avenue | SB | On-Street Parallel Parking | 12 | 310 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,300 |
| H Street | Roderick Avenue | Douglas Avenue | SB | On-Street Parallel Parking | 12 | 338 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,450 |
| H Street | Douglas Avenue | Doris Avenue | SB | On-Street Parallel Parking | 12 | 339 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,450 |
| H Street | Doris Avenue | Deodar Avenue | SB | On-Street Parallel Parking | 12 | 308 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,300 |
| H Street | Deodar Avenue | Beverly Drive | SB | On-Street Parallel Parking | 12 | 300 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $11,250 |
| H Street | Beverly Drive | Magnolia Avenue | SB | On-Street Parallel Parking | 12 | 643 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $13,100 |
| H Street | Magnolia Avenue | Second Street | SB | On-Street Parallel Parking | 12 | 1036 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. | $15,400 |
| H Street | Second Street | Fifth Street | SB | On-Street Parallel Parking | 12 | 1441 | Minimum | Reconstruct Bicycle Lane per A.3.2. minimum design. Sidewalk reduction required to meet preferred design for right turn pocket at Fifth Avenue per A.3.4. | $17,400 |
| **Harbor Blvd** | **Fifth Street** | **Channel Islands Boulevard** | | | | | | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Harbor Blvd | Fifth Street | Driftwood Street | SB | No On-Street Parking | 9 | 683 | | | |
| Harbor Blvd | Driftwood Street | Beachcomber Street | SB | No On-Street Parking | 10 | 768 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $16,550 |
| Harbor Blvd | Beachcomber Street | Whitecap Street | SB | No On-Street Parking | 12 | 819 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $17,000 |
| Harbor Blvd | Whitecap Street | Wooley Road | SB | No On-Street Parking | 11 | 644 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $15,450 |
| Harbor Blvd | Wooley Road | Nautilus Street | SB | No On-Street Parking | 11 | 945 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $18,150 |
| Harbor Blvd | Nautilus Street | Island View Street | SB | No On-Street Parking | 12 | 788 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $16,700 |
| Harbor Blvd | Island View Street | Oceanaire Street | SB | No On-Street Parking | 9 | 506 | | | |
| Harbor Blvd | Oceanaire Street | Eastbourne Bay | SB | No On-Street Parking | 12 to 5 | 689 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $15,850 |
| Harbor Blvd | Eastbourne Bay | Costa De Oro | SB | No On-Street Parking | 13 to 5 | 1249 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $20,850 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Harbor Blvd | Costa De Oro | Mandalay Beach Road | SB | No On-Street Parking | 13 | 995 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $18,600 |
| Harbor Blvd | Mandalay Beach Road | Channel Islands Boulevard | SB | No On-Street Parking | 13 to 5 | 639 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $15,400 |
| **Harbor Blvd** | **Channel Islands Boulevard** | **Fifth Street** | | | | | | | |
| Harbor Blvd | Channel Islands Bouelvard | Mandalay Beach Road | NB | No On-Street Parking | 10 to 5 | 639 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $15,400 |
| Harbor Blvd | Mandalay Beach Road | Costa De Oro | NB | No On-Street Parking | 15 to 5 | 995 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $18,600 |
| Harbor Blvd | Costa De Oro | Eastbourne Bay | NB | No On-Street Parking | 15 to 5 | 1249 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $20,850 |
| Harbor Blvd | Eastbourne Bay | Oceanaire Street | NB | No Curb and Gutter | 9 | 689 | | | |
| Harbor Blvd | Oceanaire Street | Island View Street | NB | No Curb and Gutter | 9 | 506 | | | |
| Harbor Blvd | Island View Street | Nautilus Street | NB | No Curb and Gutter | 8 | 788 | Preferred | | |
| Harbor Blvd | Nautilus Street | Wooley Road | NB | No Curb and Gutter | 8 | 945 | Preferred | | |
| Harbor Blvd | Wooley Road | Whitecap Street | NB | No Curb and Gutter | 7 | 644 | Minimum | | |
| Harbor Blvd | Whitecap Street | Beachcomber Street | NB | No On-Street Parking | 5 | 819 | Minimum | | |
| Harbor Blvd | Beachcomber Street | Fifth Street | NB | No Curb and Gutter | 8 to 5 | 1451 | Preferred | Construct Bicycle Lane per A.3.4. at Fifth Street. | $14,750 |
| **Hemlock Street** | **Patterson Road** | **Victoria Avenue** | | | | | | | |
| Hemlock Street | Patterson Road | Jetty Street | WB | On-Street Parallel | 14 | 796 | Minimum | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Parking | | | | | |
| Hemlock Street | Jetty Street | Masthead Drive | WB | On-Street Parallel Parking | 14 | 710 | Minimum | | |
| Hemlock Street | Masthead Drive | Capstan Drive | WB | On-Street Parallel Parking | 14 | 799 | Minimum | | |
| Hemlock Street | Capstan Drive | Fisher Drive | WB | On-Street Parallel Parking | 14 | 781 | Minimum | | |
| Hemlock Street | Fisher Drive | Victoria Avenue | WB | No On-Street Parking | 6 | 859 | Minimum | | |
| **Hemlock Street** | **Victoria Avenue** | **Patterson Road** | | | | | | | |
| Hemlock Street | Victoria Avenue | Anchor Avenue | EB | No On-Street Parking | 6 | 388 | Minimum | | |
| Hemlock Street | Anchor Avenue | Tiller Avenue | EB | On-Street Parallel Parking | 14 | 842 | Minimum | | |
| Hemlock Street | Tiller Avenue | Seaside Drive | EB | On-Street Parallel Parking | 13 | 410 | Minimum | | |
| Hemlock Street | Seaside Drive | Jetty Street | EB | On-Street Parallel Parking | 13 | 1120 | Minimum | | |
| Hemlock Street | Jetty Street | Patterson Road | EB | On-Street Parallel Parking | 14 | 796 | Minimum | | |
| **Hobson Way** | **Ninth Street** | **Fifth Street** | | | | | | | |
| Hobson Way | Ninth Street | Seventh Street | NB | On-Street Parallel Parking | 12 | 1003 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $15,050 |
| Hobson Way | Seventh Street | Fifth Street | NB | On-Street Parallel Parking | 12 | 1009 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $15,100 |
| **Hobson Way** | **Fifth Street** | **Ninth Street** | | | | | | | |
| Hobson Way | Fifth Street | Seventh Street | SB | On-Street Parallel Parking | 12 | 1009 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $15,100 |
| Hobson Way | Seventh Street | Ninth Street | SB | On-Street Parallel Parking | 12 | 1003 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $15,050 |
| **Hueneme Road** | **Arcturus Avenue** | **Edison Drive** | | | | | | | |
| Hueneme Road | Arcturus Avenue | Edison Drive | EB | No On-Street Parking | 8 | 1704 | Preferred | | |
| **Hueneme Road** | **Edison Drive** | **Arcturus Avenue** | | | | | | | |
| Hueneme Road | Edison Drive | Arcturus Avenue | WB | No On-Street Parking | 8 | 1704 | Preferred | Construct Bicycle Lane per A.3.4 at Arcturus Avenue. | $13,500 |
| **J Street** | **Hueneme Road** | **Ninth Street** | | | | | | | |
| J Street | Hueneme Road | Cuesta Del Mar Drive | NB | On-Street Parallel Parking | 5 | 485 | Minimum | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| J Street | Cuesta Del Mar Drive | Clara Street | NB | On-Street Parallel Parking | 5 | 828 | Minimum | | |
| J Street | Clara Street | Maxine Street | NB | On-Street Parallel Parking | 5 | 1054 | Minimum | | |
| J Street | Maxine Street | Pleasant Valley Road | NB | On-Street Parallel Parking | 5 | 267 | Minimum | | |
| J Street | Pleasant Valley Road | Sonoma Way | NB | On-Street Parallel Parking | 5 | 272 | Minimum | | |
| J Street | Sonoma Way | Van Ness Avenue | NB | On-Street Parallel Parking | 5 | 609 | Minimum | | |
| J Street | Van Ness Avenue | Brucker Road | NB | On-Street Parallel Parking | 5 | 1155 | Minimum | | |
| J Street | Brucker Road | Bard Road | NB | On-Street Parallel Parking | 5 | 262 | Minimum | | |
| J Street | Bard Road | Glacier Avenue | NB | On-Street Parallel Parking | 5 | 1532 | Minimum | | |
| J Street | Glacier Avenue | Yucca Street | NB | On-Street Parallel Parking | 5 | 263 | Minimum | | |
| J Street | Yucca Street | Bryce Canyon Avenue | NB | On-Street Parallel Parking | 5 | 1392 | Minimum | | |
| J Street | Bryce Canyon Avenue | Teakwood Street | NB | On-Street Parallel Parking | 5 | 275 | Minimum | | |
| J Street | Teakwood Street | Spruce Street | NB | On-Street Parallel Parking | 5 | 772 | Minimum | | |
| J Street | Spruce Street | Redwood Street | NB | On-Street Parallel Parking | 5 | 288 | Minimum | | |
| J Street | Redwood Street | Oleander Drive | NB | On-Street Parallel Parking | 5 | 491 | Minimum | | |
| J Street | Oleander Drive | Channel Islands Boulevard | NB | On-Street Parallel Parking | - | 487 | | Sidewalk reduction required to meet preferred design for Right Turn Pocket at Channel Islands Boulevard per A.3.4. | |
| J Street | Channel Islands Boulevard | Linden Drive | NB | On-Street Parallel Parking | - | 159 | | Construct Bicycle Lane per A.3.2 minimum design. | $10,500 |
| J Street | Linden Drive | Laurel Street | NB | On-Street Parallel Parking | 12 | 141 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $10,400 |
| J Street | Laurel Street | Kamala Street | NB | On-Street Parallel Parking | 12 | 674 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $13,250 |
| J Street | Kamala Street | Juniper Street | NB | On-Street Parallel | 12 | 309 | Minimum | Reconstruct Bicycle Lane per A.3.2 | $11,300 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Parking | | | | minimum design. | |
| J Street | Juniper Street | G Street | NB | On-Street Parallel Parking | 12 | 820 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $14,050 |
| J Street | G Street | Guava Court | NB | On-Street Parallel Parking | 12 | 286 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,150 |
| J Street | Guava Court | Hill Street | NB | On-Street Parallel Parking | 12 | 1674 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $18,650 |
| J Street | Hill Street | Wooley Road | NB | On-Street Parallel Parking | 12 | 1409 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $17,250 |
| J Street | Wooley Road | Ninth Street | NB | On-Street Parallel Parking | 12 | 819 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $14,050 |
| **J Street** | **Ninth Street** | **Hueneme Road** | | | | | | | |
| J Street | Ninth Street | Rigging Place | SB | On-Street Parallel Parking | 12 | 447 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,050 |
| J Street | Rigging Place | Wooley Road | SB | On-Street Parallel Parking | 12 | 453 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,100 |
| J Street | Wooley Road | Hill Street | SB | On-Street Parallel Parking | 12 | 1328 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $16,800 |
| J Street | Hill Street | Birch Street | SB | On-Street Parallel Parking | 12 | 306 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,300 |
| J Street | Birch Street | Cedar Street | SB | On-Street Parallel Parking | 12 | 288 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,200 |
| J Street | Cedar Street | Fir Avenue | SB | On-Street Parallel Parking | 12 | 749 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $13,700 |
| J Street | Fir Avenue | Guava Street | SB | On-Street Parallel Parking | 12 | 330 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,400 |
| J Street | Guava Street | Hemlock Street | SB | On-Street Parallel Parking | 12 | 286 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,150 |
| J Street | Hemlock Street | Iris Street | SB | On-Street Parallel Parking | 12 | 561 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,650 |
| J Street | Iris Street | Juniper Street | SB | On-Street Parallel Parking | 12 | 259 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,050 |
| J Street | Juniper Street | Kamala Street | SB | On-Street Parallel Parking | 12 | 276 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,100 |
| J Street | Kamala Street | Channel Islands Boulevard | SB | On-Street Parallel Parking | 12 | 1191 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $16,050 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| J Street | Channel Islands Boulevard | Redwood Street | SB | On-Street Parallel Parking | 7 to 12 | 795 | | Does not meet Bicycle Lane 3.3.1 requirements. Need to remove on-street parking or reduce sidewalk width to meet design guidelines where existing bicycle lane width is 7 ft. | |
| J Street | Redwood Street | Spruce Street | SB | On-Street Parallel Parking | 12 | 288 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,200 |
| J Street | Spruce Street | Teakwood Street | SB | On-Street Parallel Parking | 12 | 772 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $13,800 |
| J Street | Teakwood Street | Bryce Canyon Avenue | SB | On-Street Parallel Parking | 12 | 275 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,100 |
| J Street | Bryce Canyon Avenue | Polaris Way | SB | On-Street Parallel Parking | 12 | 754 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $13,700 |
| J Street | Polaris Way | Yucca Street | SB | On-Street Parallel Parking | 12 | 638 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $13,100 |
| J Street | Yucca Street | Glacier Avenue | SB | On-Street Parallel Parking | 12 | 292 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,200 |
| J Street | Glacier Avenue | Bard Road | SB | On-Street Parallel Parking | 12 | 1503 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $17,750 |
| J Street | Bard Road | Evergreen Lane | SB | On-Street Parallel Parking | 12 | 689 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $13,350 |
| J Street | Evergreen Lane | Sycamore Drive | SB | On-Street Parallel Parking | 12 | 438 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,000 |
| J Street | Sycamore Drive | Pleasant Valley Road | SB | On-Street Parallel Parking | 12 | 1170 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $15,950 |
| J Street | Pleasant Valley Road | Clara Street | SB | On-Street Parallel Parking | 12 | 1169 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $15,950 |
| J Street | Clara Street | Myran-Joyce Drive | SB | On-Street Parallel Parking | 12 | 406 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,800 |
| J Street | Myran-Joyce Drive | Jane Court | SB | On-Street Parallel Parking | 12 | 376 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,650 |
| J Street | Jane Court | Courtyard Drive | SB | On-Street Parallel Parking | 12 | 461 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,100 |
| J Street | Courtyard Drive | Hueneme Road | SB | On-Street Parallel Parking | 5 | 220 | Minimum | | |
| **Kiawah River Drive** | **Thames River Drive** | **Oxnard Boulevard** | | | | | | | |
| Kiawah River Drive | Thames River Drive | Roia Lane | NW | On-Street Parallel Parking | 12 | 439 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,000 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Kiawah River Drive | Roia Lane | Orleans Lane | NW | On-Street Parallel Parking | 12 | 466 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,150 |
| Kiawah River Drive | Orleans Lane | Moss Landing Boulevard | NW | On-Street Parallel Parking | 12 | 564 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,700 |
| Kiawah River Drive | Moss Landing Boulevard | London Lane | NW | On-Street Parallel Parking | 12 | 290 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,200 |
| Kiawah River Drive | London Lane | Oxnard Boulevard | NW | On-Street Parallel Parking | 12 | 278 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,150 |
| **Kiawah River Drive** | **Oxnard Boulevard** | **Thames River Drive** | | | | | | | |
| Kiawah River Drive | Oxnard Boulevard | London Lane | SE | On-Street Parallel Parking | 12 | 278 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,150 |
| Kiawah River Drive | London Lane | Moss Landing Boulevard | SE | On-Street Parallel Parking | 12 | 290 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,200 |
| Kiawah River Drive | Moss Landing Boulevard | Nimes Lane | SE | On-Street Parallel Parking | 12 | 288 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,200 |
| Kiawah River Drive | Nimes Lane | Orleans Lane | SE | On-Street Parallel Parking | 12 | 276 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,150 |
| Kiawah River Drive | Orleans Lane | Roia Lane | SE | On-Street Parallel Parking | 12 | 568 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,700 |
| Kiawah River Drive | Roia Lane | Thames River Drive | SE | On-Street Parallel Parking | 12 | 337 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,450 |
| **Lombard Street** | **Eastman Avenue** | **Camino Del Sol** | | | | | | | |
| Lombard Street | Eastman Avenue | Sturgis Road | NB | No On-Street Parking | 5 | 945 | Minimum | | |
| Lombard Street | Sturgis Road | Celsius Avenue | NB | No On-Street Parking | 5 | 645 | Minimum | | |
| Lombard Street | Celsius Avenue | Camino Del Sol | NB | No On-Street Parking | 5 | 1035 | Minimum | | |
| **Lombard Street** | **Camino Del Sol** | **Eastman Avenue** | | | | | | | |
| Lombard Street | Camino Del Sol | Bernoulli Circle | SB | No On-Street Parking | 5 | 402 | Minimum | | |
| Lombard Street | Bernoulli Circle | Bernoulli Circle | SB | No On-Street Parking | 5 | 1000 | Minimum | | |
| Lombard Street | Bernoulli Circle | Eastman Avenue | SB | No On-Street Parking | 5 | 1223 | Minimum | | |
| **Moss Landing Boulevard** | **Kiawah River Drive** | **Lakeview Court** | | | | | | | |
| Moss Landing Boulevard | Kiawah River Drive | Lakeview Court | NE | On-Street Parallel Parking | - | 284 | | Remove on-street parking to meet 3.3.2. preferred design. | $10,650 |
| **Moss Landing Boulevard** | **Lakeview Court** | **Kiawah River Drive** | | | | | | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Moss Landing Boulevard | Lakeview Court | Kiawah River Drive | SW | On-Street Parallel Parking | - | 284 | | Remove on-street parking to meet 3.3.2. preferred design. | $10,650 |
| **Ninth Street** | **Ventura Road** | **J Street** | | | | | | | |
| Ninth Street | Ventura Road | L Street | EB | On-Street Parallel Parking | 15 | 464 | Preferred | Reconstruct Bicycle Lane per A.3.2 preferred design. | $12,150 |
| Ninth Street | L Street | K Street | EB | On-Street Parallel Parking | 15 | 259 | Preferred | Reconstruct Bicycle Lane per A.3.2 preferred design. | $11,050 |
| Ninth Street | K Street | Jurymast Drive | EB | On-Street Parallel Parking | 15 | 258 | Preferred | Reconstruct Bicycle Lane per A.3.2 preferred design. | $11,050 |
| Ninth Street | Jurymast Drive | Inlet Drive | EB | On-Street Parallel Parking | 12 | 261 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,050 |
| Ninth Street | Inlet Drive | J Street | EB | On-Street Parallel Parking | 12 | 474 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,200 |
| **Ninth Street** | **Hobson Way** | **Ventura Road** | | | | | | | |
| Ninth Street | Hobson Way | Lighthouse Lane | WB | On-Street Parallel Parking | 15 | 994 | Preferred | Reconstruct Bicycle Lane per A.3.2 preferred design. | $15,000 |
| Ninth Street | Lighthouse Lane | Ventura Road | WB | On-Street Parallel Parking | 15 to 5 | 723 | Preferred | Reconstruct Bicycle Lane per A.3.2 preferred design. | $13,550 |
| **Oxnard Boulevard** | **Town Center Drive** | **Garonne Street** | | | | | | | |
| Oxnard Boulevard | Town Center Drive | Forest Park Boulevard | NE | On-Street Parallel Parking | 5 to 12 | 1433 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $17,350 |
| Oxnard Boulevard | Forest Park Boulevard | Flathead River Street | NE | On-Street Parallel Parking | 12 | 283 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $8,850 |
| Oxnard Boulevard | Flathead River Street | Green River Street | NE | On-Street Parallel Parking | 12 | 232 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $10,900 |
| Oxnard Boulevard | Green River Street | Garonne Street | NE | No On-Street Parking | 12 | 121 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $10,300 |
| **Oxnard Boulevard** | **Garonne Street** | **Town Center Drive** | | | | | | | |
| Oxnard Boulevard | Garonne Street | Green River Street | SW | No On-Street Parking | 12 | 121 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $10,300 |
| Oxnard Boulevard | Green River Street | Flathead River Street | SW | On-Street Parallel Parking | 12 | 232 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $10,900 |
| Oxnard Boulevard | Flathead River Street | Forest Park Boulevard | SW | On-Street Parallel Parking | 12 | 283 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $8,850 |
| Oxnard Boulevard | Forest Park Boulevard | Clyde River Place | SW | On-Street Parallel Parking | 12 | 812 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $14,000 |
| Oxnard Boulevard | Clyde River Place | Town Center Drive | SW | On-Street Parallel | 12 to 5 | 621 | Minimum | Reconstruct Bicycle Lane per A.3.2 | $13,000 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Parking | | | | minimum design. | |
| **Pacific Avenue** | **Statham Boulevard** | **Wooley Road** | | | | | | | |
| Pacific Avenue | Statham Boulevard | Emerson Avenue | NB | No On-Street Parking | 8 to 12 | 796 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $16,800 |
| Pacific Avenue | Emerson Avenue | Beacon Place | NB | No On-Street Parking | 12 | 614 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Construct Bicycle Lane per A.3.4. at Beacon Place. Will require two-way left turn lane reduction or removal. | $22,200 |
| Pacific Avenue | Beacon Place | Westar Drive | NB | No On-Street Parking | 12 | 709 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Construct Bicycle Lane per A.3.4. at Westar Drive. Will require two-way left turn lane reduction or removal. | $22,200 |
| Pacific Avenue | Westar Drive | Titan Place | NB | No On-Street Parking | 12 | 958 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Construct Bicycle Lane per A.3.4. at Titan Place. Will require two-way left turn lane reduction or removal. | $25,250 |
| Pacific Avenue | Titan Place | Wooley Road | NB | No On-Street Parking | 12 | 377 | | Median or sidewalk reduction required to meet A.3.4. at Wooley Road. | |
| **Pacific Avenue** | **Wooley Road** | **Statham Boulevard** | | | | | | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Pacific Avenue | Wooley Road | Voyager Place | SB | No On-Street Parking | 12 | 1008 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Construct Bicycle Lane per A.3.4. at Voyager Place. Will require two-way left turn lane reduction or removal. | $25,000 |
| Pacific Avenue | Voyager Place | Yarnell Place | SB | No On-Street Parking | 12 | 625 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Construct Bicycle Lane per A.3.4. at Yarnell Place. Will require two-way left turn lane reduction or removal. | $22,250 |
| Pacific Avenue | Yarnell Place | Statham Boulevard | SB | No On-Street Parking | 12 | 1822 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Construct Bicycle Lane per A.3.4. at Statham Boulevard Place. | $33,050 |
| **Patterson Road** | **Doris Avenue** | **Gonzales Road** | | | | | | | |
| Patterson Road | Doris Avenue | Lions Gate Drive | NB | No On-Street Parking | 8 | 693 | Preferred | | |
| Patterson Road | Lions Gate Drive | Nebula Street | NB | No On-Street Parking | 8 | 1024 | Preferred | | |
| Patterson Road | Nebula Street | Talus Street | NB | No On-Street Parking | 8 | 1243 | Preferred | | |
| Patterson Road | Talus Street | Gonzales Road | NB | No On-Street Parking | 8 | 1031 | Preferred | | |
| **Patterson Road** | **Gonzales Road** | **Doris Avenue** | | | | | | | |
| Patterson Road | Gonzales Road | Doris Avenue | SB | No On-Street Parking | 8 | 3990 | Preferred | | |
| **Patterson Road** | **Dunkirk Drive** | **Hemlock Street** | | | | | | | |
| Patterson Road | Dunkirk Drive | Oarfish Lane | SB | No On-Street Parking | 5 | 956 | Minimum | Reconstruct Bicycle Lane per A.3.3 preferred design. | $13,050 |
| Patterson Road | Oarfish Lane | Kelp Lane | SB | No On-Street Parking | 7 | 570 | Minimum | | |
| Patterson Road | Kelp Lane | West Wooley Road | SB | No On-Street Parking | 8 | 608 | Preferred | | |
| Patterson Road | West Wooley Road | Windward Way | SB | No On-Street Parking | 5 | 494 | Minimum | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Patterson Road | Windward Way | Lee Place | SB | No On-Street Parking | 5 | 1040 | Minimum | | |
| Patterson Road | Lee Place | Jacktar Avenue | SB | No On-Street Parking | 7 | 1072 | Minimum | Construct Bicycle Lane Symbol and provide signage. | $9,650 |
| Patterson Road | Jacktar Avenue | Hemlock Street | SB | No On-Street Parking | 8 | 707 | Preferred | | |
| **Patterson Road** | **Hemlock Street** | **Dunkirk Drive** | | | | | | | |
| Patterson Road | Hemlock Street | Jacktar Avenue | NB | No On-Street Parking | 7 | 707 | Minimum | Construct Bicycle Lane Symbol and provide signage. | $9,650 |
| Patterson Road | Jacktar Avenue | Lee Place | NB | No On-Street Parking | 7 | 1072 | Minimum | | |
| Patterson Road | Lee Place | Dominica Drive | NB | No On-Street Parking | 7 | 271 | Minimum | | |
| Patterson Road | Dominica Drive | Watch Way | NB | No On-Street Parking | 6 | 438 | Minimum | Construct Bicycle Lane Symbol and provide signage. | $9,650 |
| Patterson Road | Watch Way | Windward Way | NB | No On-Street Parking | 6 to 16 | 331 | | Construct Bicycle Lane Symbol and provide signage. | $9,650 |
| Patterson Road | Windward Way | Wooley Road | NB | No On-Street Parking | 4 to 5 | 494 | | Additional right-of-way required to meet minimum design for A.3.3. | |
| Patterson Road | Wooley Road | Oarfish Lane | NB | No On-Street Parking | 6 | 1179 | Minimum | | |
| Patterson Road | Oarfish Lane | Dunkirk Drive | NB | No On-Street Parking | 5 | 956 | Minimum | | |
| **Pleasant Valley Road** | **Squires Drive** | **Pacific Coast Highway** | | | | | | | |
| Pleasant Valley Road | Squires Drive | Jefferson Square | EB | No On-Street Parking | 8 | 478 | Preferred | | |
| Pleasant Valley Road | Jefferson Square | Longfellow Way | EB | No On-Street Parking | 8 | 307 | Preferred | | |
| Pleasant Valley Road | Longfellow Way | Pali Drive | NE | No On-Street Parking | 12 | 1679 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $24,750 |
| Pleasant Valley Road | Pali Drive | Rose Avenue | NE | No On-Street Parking | 12 | 1159 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Sidewalk reduction required to meet preferred design for right turn pocket at Rose Avenue per A.3.4. | $20,500 |
| Pleasant Valley Road | Rose Avenue | Syracuse Drive | NE | No On-Street Parking | 8 | 1165 | Preferred | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Pleasant Valley Road | Syracuse Drive | Beaumont Avenue | NE | No On-Street Parking | 8 | 1135 | Preferred | | |
| Pleasant Valley Road | Beaumont Avenue | Etting Road | NE | No On-Street Parking | 5 | 494 | Minimum | | |
| Pleasant Valley Road | Etting Road | Packard Street | NE | No On-Street Parking | 5 | 1914 | Minimum | | |
| Pleasant Valley Road | Packard Street | Pacific Coast Highway | NE | No On-Street Parking | 5 | 683 | Minimum | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Sidewalk reduction required to meet preferred design for right turn pocket at Pacific Coast Highway per A.3.4. | $15,800 |
| **Pleasant Valley Road** | **Oxnard Boulevard** | **Squires Drive** | | | | | | | |
| Pleasant Valley Road | Oxnard Boulevard | Butler Road | SW | No On-Street Parking | 5 | 350 | Minimum | | |
| Pleasant Valley Road | Butler Road | Shakspeare Drive | SW | No On-Street Parking | 5 | 617 | Minimum | | |
| Pleasant Valley Road | Shakspeare Drive | Orange Grove Avenue | SW | No On-Street Parking | 5 | 353 | Minimum | | |
| Pleasant Valley Road | Orange Grove Avenue | Oriole Lane | SW | No On-Street Parking | 5 | 467 | Minimum | | |
| Pleasant Valley Road | Oriole Lane | Olds Road | SW | No On-Street Parking | 5 | 810 | Minimum | Sidewalk reduction required to meet preferred design for Right Turn Pocket at Olds Road per A.3.4. | |
| Pleasant Valley Road | Olds Road | Bard Road | SW | No On-Street Parking | 5 | 224 | Minimum | | |
| Pleasant Valley Road | Bard Road | Rose Avenue | SW | No On-Street Parking | 5 | 2570 | Minimum | Sidewalk reduction required to meet preferred design for Right Turn Pocket at Rose Avenue per A.3.4. | |
| Pleasant Valley Road | Rose Avenue | Terrace Avenue | SW | No On-Street Parking | 12 to 5 | 2034 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design | $27,950 |
| Pleasant Valley Road | Terrace Avenue | Squires Drive | WB | No On-Street Parking | 12 to 5 | 1589 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $23,950 |
| **Rice Avenue** | **Fifth Street** | **Gonzales Road** | | | | | | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Rice Avenue | Fifth Street | Sturgis Road | NB | No Curb and Gutter | 5 | 1869 | Minimum | Additional paving/right-of-way along shoulder required to meet preferred design. | |
| Rice Avenue | Sturgis Road | Camino Del Sol | NB | No On-Street Parking | 8 | 1527 | Preferred | | |
| Rice Avenue | Camino Del Sol | Latigo Road | NB | No On-Street Parking | 8 | 1740 | Preferred | Construct Bicycle Lane per A.3.4 at Latigo Road. | $16,400 |
| Rice Avenue | Latigo Road | Gonzales Road | NB | No On-Street Parking | 8 to 5 | 2841 | Preferred | Additional paving/right-of-way along shoulder required to meet preferred design. | |
| **Rice Avenue** | **Gonzales Road** | **Fifth Street** | | | | | | | |
| Rice Avenue | Gonzales Road | Latigo Road | SB | No On-Street Parking | 8 | 2841 | Preferred | | |
| Rice Avenue | Latigo Road | Camino Del Sol | SB | No On-Street Parking | 8 | 1740 | Preferred | | |
| Rice Avenue | Camino Del Sol | Celsius Avenue | SB | No On-Street Parking | 8 | 760 | Preferred | | |
| Rice Avenue | Celsius Avenue | Sturgis Road | SB | No On-Street Parking | 8 | 767 | Preferred | | |
| Rice Avenue | Sturgis Road | Eastman Avenue | SB | No On-Street Parking | 8 | 1095 | Preferred | | |
| Rice Avenue | Eastman Avenue | Fifth Street | SB | No On-Street Parking | 8 | 774 | Preferred | | |
| **Rose Avenue** | **Camino Del Sol** | **Gonzales Road** | | | | | | | |
| Rose Avenue | Camino Del Sol | Cesar Chavez Drive | NB | No On-Street Parking | 11 to 5 | 2463 | | Construct Bicycle Lane per A.3.3. Additional paving/right-of-way along shoulder required to meet preferred design for bicycle lane and right turn pocket per A.3.4 at Cesar Chavez Drive. | $18,500 |
| Rose Avenue | Cesar Chavez Drive | Socorro Way | NB | No On-Street Parking | 5 | 507 | Minimum | | |
| Rose Avenue | Socorro Way | Gonzales Road | NB | No On-Street Parking | 8 | 1661 | Preferred | | |
| **Rose Avenue** | **Gonzales Road** | **Camino Del Sol** | | | | | | | |
| Rose Avenue | Gonzales Road | Tiesa Lane | SB | No On-Street Parking | 8 | 1195 | Preferred | | |
| Rose Avenue | Tiesa Lane | Cesar Chavez Drive | SB | No On-Street Parking | 8 | 973 | Preferred | Sidewalk reduction required to meet preferred design for Right Turn Pocket at Cesar Chavez Drive per A.3.4. | |
| Rose Avenue | Cesar Chavez Drive | Camino De La Luna | SB | No On-Street Parking | 5 | 1134 | Minimum | Sidewalk reduction required to meet preferred design per A.3.3. | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Rose Avenue | Camino De La Luna | Camino Del Sol | SB | No On-Street Parking | 5 | 1329 | Minimum | Sidewalk reduction required to meet preferred design per A.3.3. Construct Bicycle Lane per A.3.4 at Camino Del Sol. Crossing Island reduction required to meet A.3.4. | $17,100 |
| **Rose Avenue** | **Gonzales Road** | **Auto Center Drive** | | | | | | | |
| Rose Avenue | Gonzales Road | Lockwood Street | NB | No On-Street Parking | 5 | 1179 | Minimum | | |
| Rose Avenue | Lockwood Street | Highway 101 | NB | No On-Street Parking | 8 to 5 | 1566 | Preferred | | |
| Rose Avenue | Highway 101 | Auto Center Drive | NB | No On-Street Parking | 5 | 629 | Minimum | | |
| **Rose Avenue** | **Ventura Boulevard** | **Lockwood Street** | | | | | | | |
| Rose Avenue | Ventura Boulevard | Highway 101 | SB | No On-Street Parking | 5 | 1523 | Preferred | | |
| Rose Avenue | Highway 101 | Lockwood Street | SB | No On-Street Parking | 5 | 672 | Preferred | | |
| Rose Avenue | Lockwood Street | Gonzales Road | SB | No On-Street Parking | - | 1179 | | Construct Bicycle Lane per A.3.3 preferred design and Right Turn Pocket per A.3.4. | $20,850 |
| **Rose Avenue** | **Fifth Street** | **Pleasant Valley Road** | | | | | | | |
| Rose Avenue | Fifth Street | Mountain View Avenue | SB | No On-Street Parking | 8 to 5 | 1303 | Minimum | | |
| Rose Avenue | Mountain View Avenue | Patton Court | SB | No On-Street Parking | 5 | 662 | Minimum | | |
| Rose Avenue | Patton Court | Wooley Road | SB | No On-Street Parking | 5 | 642 | Minimum | Additional right-of-way required to meet preferred design for right turn pocket per A.3.4. | |
| Rose Avenue | Wooley Road | Westar Drive | SB | No On-Street Parking | 11 | 1337 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $21,650 |
| Rose Avenue | Wester Drive | Emerson Avenue | SB | No On-Street Parking | 9 to 11 | 1318 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Additional right-of-way required to meet preferred design for right turn pocket per A.3.4. | $21,500 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Rose Avenue | Emerson Avenue | Fiske Place | SB | No On-Street Parking | 11 to 5 | 633 | Minimum | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $15,350 |
| Rose Avenue | Fiske Place | Ives Avenue | SB | No On-Street Parking | 7 | 523 | Minimum | | |
| Rose Avenue | Ives Avenue | Jones Way | SB | No On-Street Parking | 7 | 648 | Minimum | | |
| Rose Avenue | Jones Way | Pacific Coast Highway | SB | No On-Street Parking | 8 | 883 | Preferred | | |
| Rose Avenue | Pacific Coast Highway | Channel Islands Boulevard | SB | No On-Street Parking | 5 | 691 | Minimum | | |
| Rose Avenue | Channel Islands Boulevard | Raider Way | SB | No On-Street Parking | 5 | 599 | Minimum | Additional right-of-way required to meet preferred design for right turn pocket per A.3.4. | |
| Rose Avenue | Raider Way | Gary Drive | SB | No On-Street Parking | 12 to 16 | 1377 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $22,000 |
| Rose Avenue | Gary Drive | Lindsay Place | SB | No On-Street Parking | 15 | 1282 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $21,200 |
| Rose Avenue | Lindsay Place | Bard Road | SB | No On-Street Parking | 15 | 804 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $16,850 |
| Rose Avenue | Bard Road | Billings Street | SB | No On-Street Parking | 15 | 731 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $16,200 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Rose Avenue | Billings Street | Pleasant Valley Road | SB | No On-Street Parking | 15 | 836 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $17,150 |
| **Rose Avenue** | **Pleasant Valley Road** | **Fifth Street** | | | | | | | |
| Rose Avenue | Pleasant Valley Road | Billings Street | NB | No On-Street Parking | 14 | 836 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $17,150 |
| Rose Avenue | Billings Street | Bard Road | NB | No On-Street Parking | 14 to 5 | 731 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $16,200 |
| Rose Avenue | Bard Road | S Campus Road | NB | On-Street Parallel Parking | 16 | 340 | | Reconstruct Bicycle Lane per A.3.2. preferred design. | $11,450 |
| Rose Avenue | S Campus Road | N Campus Road | NB | On-Street Parallel Parking | 16 | 1301 | | Reconstruct Bicycle Lane per A.3.2. preferred design. | $16,650 |
| Rose Avenue | N Campus Road | Channel Islands Boulevard | NB | No On-Street Parking | 14 | 2420 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $17,300 |
| Rose Avenue | Channel Islands Boulevard | Pacific Coast Highway | NB | No On-Street Parking | 5 | 788 | Minimum | Construct Bicycle Lane per A.3.4. at Pacific Coast Highway. | $13,300 |
| Rose Avenue | Pacific Coast Highway | Ives Avenue | NB | No On-Street Parking | 5 | 1434 | Minimum | | |
| Rose Avenue | Ives Avenue | Emerson Avenue | NB | No On-Street Parking | 5 | 1156 | Minimum | | |
| Rose Avenue | Emerson Avenue | Wooley Road | NB | No On-Street Parking | 5 | 2654 | Minimum | | |
| Rose Avenue | Wooley Road | Fifth Street | NB | No On-Street Parking | 5 | 2607 | Minimum | | |
| **Seventh Street** | **Ventura Road** | **C Street** | | | | | | | |
| Seventh Street | Ventura Road | Lighthouse Lane | EB | On-Street Parallel Parking | 15 | 930 | Preferred | Reconstruct Bicycle Lane per A.3.2. | $14,650 |
| Seventh Street | Lighthouse Lane | Hobson Way | EB | On-Street Parallel Parking | 15 to 5 | 954 | Preferred | Reconstruct Bicycle Lane per A.3.2. | $14,800 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Seventh Street | Hobson Way | G Street | EB | On-Street Parallel Parking | 12 | 725 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $13,550 |
| Seventh Street | G Street | F Street | EB | On-Street Parallel Parking | 12 | 377 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,650 |
| Seventh Street | F Street | E Street | EB | On-Street Parallel Parking | 12 | 382 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,700 |
| Seventh Street | E Street | D Street | EB | On-Street Parallel Parking | 12 | 379 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,700 |
| Seventh Street | D Street | C Street | EB | On-Street Parallel Parking | - | 380 | | Sidewalk reduction required to meet minimum design. | |
| **Seventh Street** | **C Street** | **Ventura Road** | | | | | | | |
| Seventh Street | C Street | D Street | WB | On-Street Parallel Parking | - | 380 | | Sidewalk reduction required to meet minimum design. | |
| Seventh Street | D Street | E Street | WB | On-Street Parallel Parking | 12 | 379 | Minimum | Reconstruct Bicycle Lane per A.3.3 | $11,700 |
| Seventh Street | E Street | F Street | WB | On-Street Parallel Parking | 12 | 382 | Minimum | Reconstruct Bicycle Lane per A.3.3 | $11,700 |
| Seventh Street | F Street | G Street | WB | On-Street Parallel Parking | 12 | 377 | Minimum | Reconstruct Bicycle Lane per A.3.3 | $11,650 |
| Seventh Street | G Street | Hobson Way | WB | On-Street Parallel Parking | 12 to 5 | 725 | Minimum | Reconstruct Bicycle Lane per A.3.3 | $13,550 |
| Seventh Street | Hobson Way | I Street | WB | On-Street Parallel Parking | 12 | 457 | Minimum | Reconstruct Bicycle Lane per A.3.3 | $12,100 |
| Seventh Street | I Street | K Street | WB | On-Street Parallel Parking | 12 | 496 | Minimum | Reconstruct Bicycle Lane per A.3.3 | $12,300 |
| Seventh Street | K Street | M Street | WB | On-Street Parallel Parking | 12 | 492 | Minimum | Reconstruct Bicycle Lane per A.3.3 | $12,300 |
| Seventh Street | M Street | Ventura Road | WB | On-Street Parallel Parking | 12 | 438 | Minimum | Reconstruct Bicycle Lane per A.3.3 | $12,000 |
| **Solar Drive** | **Wankel Way** | **Lockwood Street** | | | | | | | |
| Solar Drive | Wankel Way | Gonzales Road | NB | No On-Street Parking | 8 | 653 | Preferred | Construct 300 ft of Bicycle Lane per A.3.3 and right turn pocket per A.3.4. | $16,300 |
| Solar Drive | Gonzales Road | Lockwood Street | NB | No On-Street Parking | 5 | 1017 | Minimum | | |
| **Solar Drive** | **Lockwood Street** | **Wankel Way** | | | | | | | |
| Solar Drive | Lockwood Street | Gonzales Road | SB | No On-Street Parking | 5 | 1017 | Minimum | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Solar Drive | Gonzales Road | Wankel Way | SB | No On-Street Parking | 8 | 653 | Preferred | Construct 700 ft of Bicycle Lane per A.3.3 preferred design. | $12,150 |
| **Statham Boulevard** | **Ives Avenue** | **Emerson Avenue** | | | | | | | |
| Statham Boulevard | Ives Avenue | Fiske Place | NB | No On-Street Parking | 5 | 256 | Minimum | | |
| Statham Boulevard | Fiske Place | Emerson Avenue | NB | No On-Street Parking | 5 | 540 | Minimum | | |
| **Statham Boulevard** | **Emerson Avenue** | **Ives Avenue** | | | | | | | |
| Statham Boulevard | Emerson Avenue | Ives Avenue | SB | No On-Street Parking | 5 | 796 | Minimum | Construct Bicycle Lane per A.3.4 at Ives Avenue. | $13,700 |
| **Sturgis Road** | **Lombard Street** | **Del Norte Boulevard** | | | | | | | |
| Sturgis Road | Lombard Street | Candelaria Road | EB | No On-Street Parking | 5 | 678 | Minimum | Construct 800 ft of Bicycle Lane per A.3.3 minimum design. | $12,500 |
| Sturgis Road | Candelaria Road | Rice Avenue | EB | No On-Street Parking | 5 | 670 | Minimum | | |
| Sturgis Road | Rice Avenue | Discovery Drive | EB | No On-Street Parking | 5 | 663 | Minimum | | |
| Sturgis Road | Discovery Drive | Elevar Street | EB | No On-Street Parking | 5 | 555 | Minimum | | |
| Sturgis Road | Elevar Street | Del Norte Boulevard | EB | No On-Street Parking | 5 | 3289 | Minimum | | |
| **Sturgis Road** | **Del Norte Boulevard** | **Lombard Street** | | | | | | | |
| Sturgis Road | Del Norte Boulevard | Kinetic Drive | WB | No On-Street Parking | 7 | 1764 | Minimum | | |
| Sturgis Road | Kinetic Drive | Elevar Street | WB | No On-Street Parking | 7 | 1525 | Minimum | | |
| Sturgis Road | Elevar Street | Rice Avenue | WB | No On-Street Parking | - | 1218 | | Construct Bicycle Lane per A.3.3 minimum design. | $14,000 |
| Sturgis Road | Rice Avenue | Lombard Street | WB | No On-Street Parking | 7 | 1348 | Minimum | Construct 500 ft of Bicycle Lane per A.3.3 minimum design. | $11,450 |
| **Thames River Drive** | **Kiawah River Drive** | **Vineyard Avenue** | | | | | | | |
| Thames River Drive | Kiawah River Drive | Vineyard Avenue | EB | No On-Street Parking | 8 | 1500 | Preferred | | |
| **Thames River Drive** | **Vineyard Avenue** | **Kiawah River Drive** | | | | | | | |
| Thames River Drive | Vineyard Avenue | Turnout Park Circle | WB | No On-Street Parking | 8 | 358 | Preferred | | |
| Thames River Drive | Turnout Park Circle | Kiawah River Drive | WB | No On-Street Parking | 8 | 1142 | Preferred | | |
| **Ventura Road** | **Fifth Street** | **Teal Club Road** | | | | | | | |
| Ventura Road | Seventh Street | Fifth Street | NB | No On-Street Parking | 5 | 462 | Minimum | Construct 600 ft of Bicycle Lane per A.3.3. minimum design. | $11,800 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Ventura Road | Fifth Street | Teal Club Road | NB | No On-Street Parking | 8 | 1881 | Preferred | Construct Bicycle Lane per A.3.4. at Teal Club Road. | $14,950 |
| **Ventura Road** | **Teal Club Road** | **Fifth Street** | | | | | | | |
| Ventura Road | Teal Club Road | Little Farms Road | SB | No On-Street Parking | - | 493 | | Construct Bicycle Lane per A.3.3. preferred design and right turn pocket per A.3.4. at Little Farms Road. Maintain chevron striping where lane width exceeds 8 ft. | $20,350 |
| Ventura Road | Little Farms Road | Fifth Street | SB | No On-Street Parking | - | 1389 | | Construct Bicycle Lane per A.3.3. preferred design. Maintain striping where lane width exceeds 8 ft. Sidewalk reduction required to meet preferred design for Right Turn Pocket at Fifth Street per A.3.4. | $22,150 |
| Ventura Road | Fifth Street | Seventh Street | SB | No On-Street Parking | - | 462 | | Construct Bicycle Lane per A.3.3. minimum design. | $11,300 |
| **Ventura Road** | **Gonzales Road** | **Vineyard Avenue** | | | | | | | |
| Ventura Road | Gonzales Road | Azalea Street | NB | No On-Street Parking | 12 | 631 | | Reconstruct Bicycle Lane per A.3.3. preferred design. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $15,300 |
| Ventura Road | Azalea Street | Fuchsia Street | NB | On-Street Parallel Parking | 12 | 1267 | Minimum | Reconstruct Bicycle Lane per A.3.3 minimum design. | $14,200 |
| Ventura Road | Fuchsia Street | Holly Avenue | NB | On-Street Parallel Parking | 12 | 779 | Minimum | Reconstruct Bicycle Lane per A.3.3 minimum design. | $12,450 |
| Ventura Road | Holly Avenue | Vineyard Avenue | NB | No On-Street Parking | 12 | 998 | | Reconstruct Bicycle Lane per A.3.3 preferred design. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. Sidewalk reduction required to meet A.3.4 at Vineyard Avenue. | $18,600 |
| **Ventura Road** | **Vineyard Avenue** | **Gonzales Road** | | | | | | | |
| Ventura Road | Vineyard Avenue | Holly Avenue | SB | No On-Street Parking | 8 | 998 | Preferred | | |
| Ventura Road | Holly Avenue | Carmen Way | SB | No On-Street Parking | 8 | 286 | Preferred | | |
| Ventura Road | Carmen Way | Bevra Avenue | SB | On-Street Parallel | 12 | 873 | Minimum | Reconstruct Bicycle Lane per A.3.2 | $14,350 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Parking | | | | minimum design. | |
| Ventura Road | Bevra Avenue | Azalea Street | SB | On-Street Parallel Parking | 12 | 888 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $14,450 |
| Ventura Road | Azalea Street | Gonzales Road | SB | On-Street Parallel Parking | 12 | 631 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $13,050 |
| **Ventura Road** | **Town Center Drive** | **Forest Park Boulevard** | | | | | | | |
| Ventura Road | Town Center Drive | Clyde River Place | NB | No On-Street Parking | 5 | 763 | Minimum | | |
| Ventura Road | Clyde River Place | Forest Park Boulevard | NB | No On-Street Parking | 5 | 1179 | Minimum | | |
| Ventura Road | Forest Park Boulevard | Flathead River Street | NB | No On-Street Parking | 8 | 822 | Preferred | | |
| Ventura Road | Flathead River Street | Green River Street | NB | No On-Street Parking | 8 | 241 | Preferred | | |
| Ventura Road | Green River Street | Garonne Street | NB | No On-Street Parking | 8 | 162 | Preferred | | |
| **Ventura Road** | **Forest Park Boulevard** | **Town Center Drive** | | | | | | | |
| Ventura Road | Garonne Street | Forest Park Boulevard | SB | No On-Street Parking | 8 | 2831 | Preferred | | |
| Ventura Road | Forest Park Boulevard | Town Center Drive | SB | No On-Street Parking | 5 | 1972 | Minimum | | |
| **Victoria Avenue** | **Gonzales Road** | **Monarch Lane** | | | | | | | |
| Victoria Avenue | Gonzales Road | Gum Tree Street | NB | No On-Street Parking | - | 2005 | | Construct Bicycle Lane per A.3.3 minimum design. | $16,850 |
| Victoria Avenue | Gum Tree Street | Monarch Lane | NB | No On-Street Parking | - | 3456 | | Construct Bicycle Lane per A.3.3 minimum design. | $22,050 |
| **Victoria Avenue** | **Monarch Lane** | **Gonzales Road** | | | | | | | |
| Victoria Avenue | Monarch Lane | Gonzales Road | SB | No On-Street Parking | - | 5460 | | Construct Bicycle Lane per A.3.3 minimum design. Additional paving required to meet preferred design for Right Turn Pocket at Gonzales Road. | $29,300 |
| **Victoria Avenue** | **Teal Club Road** | **Melrose Drive** | | | | | | | |
| Victoria Avenue | Teal Club Rd | Fifth Street | SB | No Curb and Gutter | 6 | 1995 | Minimum | | |
| Victoria Avenue | Fifth Street | Nantucket Parkway | SB | No Curb and Gutter | 5 | 1169 | Minimum | | |
| Victoria Avenue | Nantucket Parkway | Pier Walk | SB | No Curb and Gutter | 5 | 1015 | Minimum | | |
| Victoria Avenue | Pier Walk | Wooley Road | SB | No Curb and Gutter | 5 | 449 | Minimum | | |
| Victoria Avenue | Wooley Road | Via Pacifica Walk | SB | No On-Street Parking | 6 | 495 | Minimum | | |
| Victoria Avenue | Via Pacifica Walk | Via Marina Avenue | SB | No On-Street Parking | 6 | 327 | Minimum | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Victoria Avenue | Via Marina Avenue | Alee Lane | SB | No On-Street Parking | 6 | 246 | Minimum | | |
| Victoria Avenue | Alee Lane | Leeward Way | SB | No On-Street Parking | 6 | 686 | Minimum | | |
| Victoria Avenue | Leeward Way | Ketch Avenue | SB | No On-Street Parking | 4 | 565 | | Median or sidewalk reduction required to meet minimum design for A.3.3. Sidewalk reduction required to meet preferred design for right turn pocket at Ketch Avenue per A.3.4. | |
| Victoria Avenue | Ketch Avenue | Hemlock Street | SB | No On-Street Parking | 6 | 674 | Minimum | | |
| Victoria Avenue | Hemlock Street | Marina Village Street | SB | No On-Street Parking | 7 | 687 | Minimum | | |
| Victoria Avenue | Marina Village Street | Monaco Drive | SB | No On-Street Parking | 7 | 689 | Minimum | | |
| Victoria Avenue | Monaco Drive | Channel Islands Boulevard | SB | No On-Street Parking | 7 | 604 | Minimum | Construct Bicycle Lane per A.3.4 at West Channel Islands Boulevard. This option would require 10 ft traffic lanes. | $16,200 |
| Victoria Avenue | Channel Islands Boulevard | Curlew Way | SB | No On-Street Parking | 5 to 11 | 1871 | | Reconstruct Bicycle Lane per A.3.3. It is recommended that channelizing lines with chevron or diagonal striping be installed where bicycle lane exceeds preferred design. | $26,450 |
| Victoria Avenue | Curlew Way | Murre Way | SB | No Curb and Gutter | 5 | 2583 | Minimum | | |
| Victoria Avenue | Murre Way | Pelican Way | SB | No Curb and Gutter | 6 | 473 | Minimum | | |
| Victoria Avenue | Pelican Way | Lakeshore Drive | SB | No On-Street Parking | 6 to 5 | 450 | Minimum | | |
| Victoria Avenue | Lakeshore Drive | Melrose Drive | SB | On-Street Parallel Parking | 13 | 563 | Minimum | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,650 |
| **Victoria Avenue** | **Melrose Drive** | **Teal Club Road** | | | | | | | |
| Victoria Avenue | Melrose Drive | Lakeshore Drive | NB | On-Street Parallel Parking | 12 | 563 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $12,650 |
| Victoria Avenue | Lakeshore Drive | Pelican Way | NB | No Curb and Gutter | 5 | 450 | Minimum | | |
| Victoria Avenue | Pelican Way | Murre Way | NB | No Curb and Gutter | 6 | 473 | Minimum | | |
| Victoria Avenue | Murre Way | Curlew Way | NB | No Curb and Gutter | 6 | 2583 | Minimum | | |
| Victoria Avenue | Curlew Way | West Channel Islands Boulevard | NB | Curbs and No Parking | 6 | 1871 | Minimum | | |
| Victoria Avenue | West Channel Islands Boulevard | Monaco Drive | NB | No On-Street Parking | 8 | 604 | Preferred | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Victoria Avenue | Monaco Drive | Marina Village Street | NB | No On-Street Parking | 8 | 689 | Preferred | | |
| Victoria Avenue | Marina Village Street | W Hemlock Street | NB | No On-Street Parking | 8 | 687 | Preferred | | |
| Victoria Avenue | West Hemlock Street | Ketch Avenue | NB | No On-Street Parking | 5 | 974 | Minimum | | |
| Victoria Avenue | Ketch Avenue | Leeward Way | NB | No On-Street Parking | 5 | 565 | Minimum | | |
| Victoria Avenue | Leeward Way | Alee Lane | NB | No On-Street Parking | 5 | 686 | Minimum | | |
| Victoria Avenue | Alee Lane | Via Marina Avenue | NB | No On-Street Parking | 5 | 246 | Minimum | | |
| Victoria Avenue | Via Marina Avenue | Via Pacifica Walk | NB | No On-Street Parking | 5 | 327 | Minimum | | |
| Victoria Avenue | Via Pacifica Walk | Wooley Road | NB | No On-Street Parking | 5 | 495 | Minimum | | |
| Victoria Avenue | Wooley Road | Pier Walk | NB | No On-Street Parking | 5 | 449 | Minimum | | |
| Victoria Avenue | Pier Walk | Nantucket Parkway | NB | No On-Street Parking | 7 | 1015 | Minimum | | |
| Victoria Avenue | Nantucket Parkway | Fifth Street | NB | No On-Street Parking | 7 to 5 | 1169 | Minimum | | |
| Victoria Avenue | Fifth Street | Teal Club Road | NB | No On-Street Parking | 7 | 1995 | Minimum | | |
| **Vineyard Avenue** | **Patterson Road** | **Oxnard Boulevard** | | | | | | | |
| Vineyard Avenue | Patterson Road | Pebble Beach Terrace | EB | No On-Street Parking | 7 | 1719 | Minimum | | |
| Vineyard Avenue | Pebble Beach Terrace | Willow Creek Court | EB | No On-Street Parking | 7 | 907 | Minimum | | |
| Vineyard Avenue | Willow Creek Court | River Ridge Road | EB | No On-Street Parking | 8 | 1160 | Preferred | | |
| Vineyard Avenue | River Ridge Road | Pinehurst Drive | EB | No On-Street Parking | 8 | 679 | Preferred | | |
| Vineyard Avenue | Pinehurst Drive | Ventura Road | EB | No On-Street Parking | 8 | 666 | Preferred | | |
| Vineyard Avenue | Ventura Road | Lobelia Drive | EB | No On-Street Parking | 8 | 832 | Preferred | | |
| Vineyard Avenue | Lobelia Drive | Kentia Street | EB | No On-Street Parking | 8 | 740 | Preferred | | |
| Vineyard Avenue | Kentia Street | H Street | EB | No On-Street Parking | 8 | 933 | Preferred | Construct Bicycle Lane per A.3.4. at H Street. | $16,000 |
| Vineyard Avenue | H Street | Heather Street | EB | On-Street Parallel Parking | 15 | 912 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. | $14,550 |
| Vineyard Avenue | Heather Street | Edel Weiss Street | EB | On-Street Parallel Parking | 15 | 1020 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. | $15,150 |
| Vineyard Avenue | Edel Weiss Street | Oxnard Boulevard | EB | On-Street Parallel Parking | 15 | 1144 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. | $10,800 |
| **Vineyard Avenue** | **Oxnard Boulevard** | **Patterson Road** | | | | | | | |
| Vineyard Avenue | Oxnard Boulevard | Nandina Place | WB | On-Street Parallel Parking | 8 to 15 | 2445 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. | $22,850 |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Vineyard Avenue | Nandina Place | H Street | WB | On-Street Parallel Parking | 15 | 632 | Preferred | Reconstruct Bicycle Lane per A.3.2. preferred design. Construct Bicycle Lane per A.3.4. at H Street. | $19,350 |
| Vineyard Avenue | H Street | Kentia Street | WB | No On-Street Parking | 8 | 933 | Preferred | | |
| Vineyard Avenue | Kentia Street | Lobelia Drive | WB | No On-Street Parking | 8 | 740 | Preferred | | |
| Vineyard Avenue | Lobelia Drive | Ventura Road | WB | No On-Street Parking | 5 | 832 | Minimum | Reconstruct Bicycle Lane per A.3.3. preferred design. Construct Bicycle Lane per A.3.4. at Ventura Road. | $23,800 |
| Vineyard Avenue | Ventura Road | Pebble Beach Terrace | WB | On-Street Parallel Parking | 5 to 12 | 3412 | Minimum | Reconstruct Bicycle Lane per A.3.2. and 3.3.2. preferred design. | |
| Vineyard Avenue | Pebble Beach Terrace | Diamond Head Way | WB | No On-Street Parking | 12 to 8 | 865 | Minimum | Reconstruct Bicycle Lane per A.3.2. preferred design. | $14,300 |
| Vineyard Avenue | Diamond Head Way | Crown Point Court | WB | No On-Street Parking | 8 | 558 | Preferred | | |
| Vineyard Avenue | Crown Point Court | Patterson Road | WB | No On-Street Parking | 8 | 296 | Preferred | | |
| **Wooley Road** | **C Street** | **Chesapeake Drive** | | | | | | | |
| Wooley Road | C Street | E Street | WB | No On-Street Parking | - | 753 | | Construct Bicycle Lane pre 3.3.2 minimum design. | $12,350 |
| Wooley Road | E Street | F Street | WB | On-Street Parallel Parking | 9 | 393 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,750 |
| Wooley Road | F Street | King Street | WB | On-Street Parallel Parking | 10 | 370 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,650 |
| Wooley Road | King Street | G Street | WB | On-Street Parallel Parking | 10 | 253 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,000 |
| Wooley Road | G Steet | H Street | WB | On-Street Parallel Parking | 10 | 334 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,450 |
| Wooley Road | H Street | Ilena Street | WB | On-Street Parallel Parking | 10 | 336 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,450 |
| Wooley Road | Ilena Street | Hobson Way | WB | No On-Street Parking | 6 | 330 | Minimum | | |
| Wooley Road | Hobson Way | Ventura Road | | No On-Street Parking | 6 | 1530 | Minimum | Additional right-of-way required to meet preferred design for right turn pocket per A.3.4. | |
| Wooley Road | Ventura Road | Ontario | WB | No On-Street Parking | 6 | 400 | Minimum | | |
| Wooley Road | Ontario | Peidmont | WB | No On-Street Parking | 7 | 280 | Minimum | | |
| Wooley Road | Peidmont | Rialto | WB | No On-Street Parking | 7 | 276 | Minimum | | |
| Wooley Road | Rialto | Saratoga | WB | No On-Street Parking | 7 | 270 | Minimum | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Wooley Road | Saratoga | Escalon Drive | WB | No On-Street Parking | 7 | 277 | Minimum | | |
| Wooley Road | Escalon Drive | Novato Drive | WB | No On-Street Parking | 7 | 1123 | Minimum | | |
| Wooley Road | Novato Drive | Cutter Drive | WB | No On-Street Parking | 7 | 763 | Minimum | | |
| Wooley Road | Cutter Drive | Patterson Road | WB | No On-Street Parking | 7 | 597 | Minimum | Construct Bicycle Lane per A.3.4 at Patterson Road. | $18,350 |
| Wooley Road | Patterson Road | Kelp Lane | WB | No On-Street Parking | 7 | 970 | Minimum | | |
| Wooley Road | Kelp Lane | Offshore Street | WB | No On-Street Parking | 7 | 493 | Minimum | | |
| Wooley Road | Offshore Street | Deckside Drive | WB | No On-Street Parking | 7 | 476 | Minimum | | |
| Wooley Road | Deckside Drive | Victoria Avenue | WB | No On-Street Parking | 7 to 5 | 1176 | Minimum | | |
| Wooley Road | Victoria Avenue | Chesapeake Drive | WB | No On-Street Parking | 5 | 3056 | Minimum | Reconstruct Bicycle Lane per A.3.3 preferred design. | $20,650 |
| **Wooley Road** | **Chesapeake Drive** | **C Street** | | | | | | | |
| Wooley Road | Chesapeake Drive | Tradewinds Drive | EB | No On-Street Parking | 7 | 1317 | Minimum | Construct Bicycle Lane per A.3.3 minimum design and taper to existing 7 ft bicycle lane. Existing single lane (16') transitions into 2-lane roadway. | $14,350 |
| Wooley Road | Tradewinds Drive | Seabridge Lane | EB | No On-Street Parking | 7 | 1033 | Minimum | | |
| Wooley Road | Seabridge Lane | Victoria Avenue | EB | No On-Street Parking | 7 | 1063 | Minimum | | |
| Wooley Road | Victoria Avenue | Via Pacifica Walk | EB | No On-Street Parking | 7 | 845 | Minimum | | |
| Wooley Road | Via Pacifica Walk | Deckside Drive | EB | No On-Street Parking | 7 | 332 | Minimum | | |
| Wooley Road | Deckside Drive | Offshore Street | EB | No On-Street Parking | 7 | 859 | Minimum | | |
| Wooley Road | Offshore Street | Kelp Street | EB | No On-Street Parking | 7 | 997 | Minimum | | |
| Wooley Road | Kelp Street | Windward Way | EB | No On-Street Parking | 7 | 476 | Minimum | | |
| Wooley Road | Windward Way | Patterson Road | EB | No On-Street Parking | 8 | 493 | Preferred | Construct Bicycle Lane per A.3.4 at Patterson Road. | $14,950 |
| Wooley Road | Patterson Road | Cutter Drive | EB | No Curb and Gutter | 6 | 597 | Minimum | | |
| Wooley Road | Cutter Drive | Novato Drive | EB | No On-Street Parking | 6 | 763 | Minimum | | |
| Wooley Road | Novato Drive | Escalon Drive | EB | No On-Street Parking | 7 | 1123 | Minimum | | |
| Wooley Road | Escalon Drive | Pisco Lane | EB | No On-Street Parking | 7 | 828 | Minimum | | |

| Route | Between | | Direction | Bicycle Lane With/On | Existing Bike Lane Width (ft) | Existing Bike Lane Length (ft) | Meets Standard (Preferred or Min. Design) | Comments/ Recommendations | Estimate Cost |
|---|---|---|---|---|---|---|---|---|---|
| Wooley Road | Pisco Lane | Ventura Road | EB | No On-Street Parking | 7 | 672 | Minimum | Median or sidewalk reduction required to meet preferred design for right turn pocket at Ventura Road per A.3.4. | |
| Wooley Road | Ventura Road | N Street | EB | On-Street Parallel Parking | 10 | 346 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,500 |
| Wooley Road | N Street | M Street | EB | On-Street Parallel Parking | 11 | 314 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,350 |
| Wooley Road | M Street | L Street | EB | On-Street Parallel Parking | 11 | 310 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,300 |
| Wooley Road | L Street | K Street | EB | On-Street Parallel Parking | 11 | 316 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,350 |
| Wooley Road | K Street | J Street | EB | On-Street Parallel Parking | 11 | 329 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,400 |
| Wooley Road | J Street | I Street | EB | On-Street Parallel Parking | 11 | 330 | | Reconstruct Bicycle Lane per A.3.2 minimum design. | $11,400 |
| Wooley Road | I Street | H Street | EB | On-Street Parallel Parking | - | 336 | | On-street diagonal parking. Construct Bicycle Lane per A.3.2. minimum design. | $11,450 |
| Wooley Road | H Street | G Street | EB | On-Street Parallel Parking | - | 334 | | On-street diagonal parking. Construct Bicycle Lane per A.3.2. minimum design. | $11,450 |
| Wooley Road | G Steet | E Street | EB | No On-Street Parking | - | 763 | | Construct Bicycle Lane per A.3.3 minimum design. | $12,400 |
| Wooley Road | E Steet | C Street | EB | On-Street Parallel Parking | - | 753 | | Construct Bicycle Lane per A.3.3 minimum design. | $12,350 |
| **Total** | | | | | | **559,813** | **feet** | | **$4,194,900** |
| | | | | | | **106** | **miles** | | |

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# Appendix D: Bicycle Transportation Account Checklist

The Bicycle Transportation Account (BTA) is an annual program that provides state funds for City projects that improve safety and convenience for bicycle commuters. The City must prepare and adopt a Bicycle Transportation Plan (BTP) that complies with Streets and Highways Code Section 891.2 to be eligible for BTA funds. The table below presents these eleven criteria and identifies the section of the Plan that contains each element.

| Bicycle Transportation Plan Requirements Checklist | | |
|---|---|---|
| **Approved** | **Requirement** | **Plan Section and Page Number** |
| | (a) Existing and future bicycle commuters | Section 4.1- page 29<br>Appendix B- page B-3 |
| | (b) Existing and proposed land use patterns description and maps | 3.1.1.2- pages 7-8<br>Figure 3-2 – page 10 |
| | (c) Existing bikeways<br>Proposed bikeways | Section 3.2-pages 18-22 and Map 3-1 – page 23<br>Section 5.1 – pages 49-57 and Map 5-1 page 51 |
| | (d) Existing bicycle parking facilities<br>Proposed bicycle parking facilities | Section 3.2.2-page 25, Table 3-1 pages-12-13<br>Section 5.1.5 – page 57 |
| | (e) Existing and proposed multi-modal connections | Section 3.2.2-page 25<br>Section 5.4.2.5-page 67<br>Section 8.2.5 – page 119 |
| | (f) Existing and proposed facilities for changing and storage | Section 3.2.2-page 25<br>Section 5.1.5 – page 57 |
| | (g) Bicycle safety and education programs Safety collision analysis | Section 5.4-pages 63-71<br>Section 4.3.1 -page 41 |
| | (h) Citizen and community involvement | Section 4.4.1-page 46 |
| | (i) Consistency with transportation, air quality, and energy plans | Section 3.1 – pages 5-18<br>Appendix B– pages B-3 through B-7 |
| | (j) Project descriptions/priority listings | Section 6.2 – pages 76-82- Map 6-1 page 83<br>Section 6.5 - pages 92-97 |
| | (k) Past expenditures<br>Future financial needs | Section 6.4– page 91<br>Section 6.3 - pages 88-89 |

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