

Bob Jones City-to-Sea Trail

2.6 Trail Design Standards

2.6 TRAIL DESIGN STANDARDS

Typical Bike Trail Construction

The Bob Jones City-to-Sea Trail has been designed to be attractive to both the novice and experienced bicyclist. The proposed trail will be constructed with a paved surface wide enough to accommodate multiple uses. The following list describes the typical trail construction materials and design standards.

Class I Bike Trail:

- A. Outside the creek setback: 3.7 meters (12-foot) wide, 0.12 meter (4-inch) thick, asphalt path over 0.15 meters (6-inch) aggregate base.
- B. Inside the creek setback: 2.4 meters (8-foot) wide, with the same thickness and base as the trail outside the setback area.
- C. 0.6 meter (2-foot) wide, 0.15 meter (6-inch) thick, aggregate base shoulders on each side of the paved trail.
- D. Caltrans minimum turn radii.
- E. Appropriately designed “knuckles” may be used to attain desired alignment.
- F. Trail access to roads aligned to create a right angle with the road.
- G. Removable bollards at all trail and road intersections to bar unauthorized vehicle entry.
- H. Fencing as necessary to direct or limit trail access.
- I. 0.12 meter (4-inch) wide painted yellow centerline to create two lanes of travel.
- J. 0.12 meter (4-inch) wide painted white edge lines delineating edge of pathway.
- K. Low landscaping at intersections and roadway entrances to maintain proper site distances.



Figure 22. Typical Class I Bike Trail

Enhanced Class II Bike Lane on Prado Road:

- A. 1.5 meters (5-foot) wide bike lane.
- B. Paved section color to contrast with asphalt motor vehicle travel lanes.
- C. 0.20 meter (8-inch) wide painted white edge line to delineate the bike lane from motor vehicle lane.

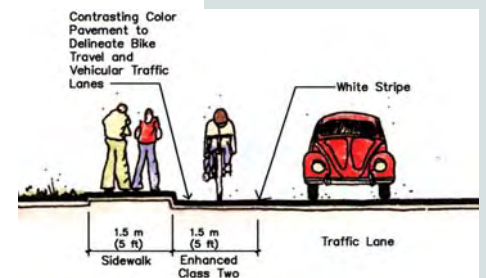


Figure 23. Enhanced Class II Bike Lane

Signing and Marking

Uniform sign design with the Bob Jones City-to-Sea Trail logo is provided along the trail. Signing and marking will unify the trail design and provide functional information. Elements such as bollards to prevent unauthorized trail access, traffic control signs, directional signs, and trail entrance information at bus stops and other strategic locations within the City will help guide and control use along the trail. Informational kiosks located at the major staging areas and parks will provide updated trail and event information to trail users.

Signs along the trail should be designed to meet all of the required and recommended signing and marking standards developed by Caltrans in Chapter 1000 of the *Highway Design Manual*. In addition, all signs and markings should conform to the standards developed in the *Manual of Uniform Traffic Control Devices (MUTCD)*. In general, all signs should be located at least 0.9 meter (3-foot) from the edge of the paved surface. The signs should have a minimum vertical clearance of 2.6 meters (8.5-foot) when located above the trail, and be a minimum of 1.2 meters (4-foot) above the trail surface when located on the side of the trail. All signs should be oriented so as not to confuse motorists. The design (though not the size) of signs and markings should be the same as used for motor vehicles.



Figure 24. Directional Signage Example

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Directional signing will be useful for trail users and motorists alike. For motorists, a sign reading “Bob Jones City-to-Sea Trail Crossing” along with a trail logo helps to both warn and promote use of the trail itself. For trail users, directional signs and street names at crossings help direct people to their destinations.

Whenever possible, existing crosswalks and traffic signals were used to allow trail users to travel over motor vehicle travel lanes, and additional or enhanced crossing controls were included at modified crossings.

A 0.12 meter (4-inch) wide yellow centerline stripe will be used to separate opposite directions of travel. This stripe will be broken where adequate passing site distance occurs, and solid in other areas where bicycle passing is discouraged. White trail edging will also be installed to clearly define the trail’s boundary.



Figure 25. Madonna Road Staging Area

Other barrier types between the trail and private property may be used such as ditches, berms and/or vegetation. Recommended vegetation types should survive on low water and maintenance. Ditch and berm gradients should not exceed 2:1 slopes or be greater than 3.0 meters (10-feet) in depth or height.

Staging and Rest Areas

Staging areas and trail side rest areas will offer expanded recreational opportunities along the trail. Refer to trail alignment maps for staging and rest area locations.

Madonna Road and Dalidio Property Staging

Where high volumes of trail use and major entry points to the bikeway are anticipated, staging/ access areas should be developed. In addition to the amenities on the rest area list, the staging areas contain:

- A. Bike racks and lockers
- B. Public restrooms
- C. Picnic tables
- D. Informational kiosk
- E. Drinking fountain
- F. Telephones
- G. Evening lighting
- H. Turf areas
- I. Automobile parking areas

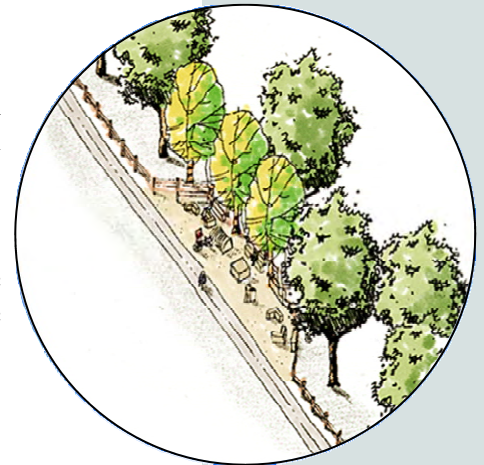


Figure 26. Typical Trail Side Rest Area



Figure 27. Dalidio Property Staging Area

Trail Side Rest Areas:

- A. Benches
- B. Trash receptacles
- C. Interpretive signs
- D. Landscape fencing
- E. Native Plantings

Trail Fencing

Fencing placement along the trail will vary depending on the proximity to the riparian habitat, private property, and adjacent land use. Fencing is primarily designed to discourage access into sensitive riparian habitat and bar access into City facilities.

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Riparian Corridor Fencing:

Where the trail is located along the creek, a fence should be placed on the edge of the trailside shoulder to discourage trail users from entering the creek channel.

Fencing should consist of the following:

- A. 1.2 meters (4-foot) tall wood posts
- B. Posts 2.4 meters (8-foot) on center
- C. 4 wire strands

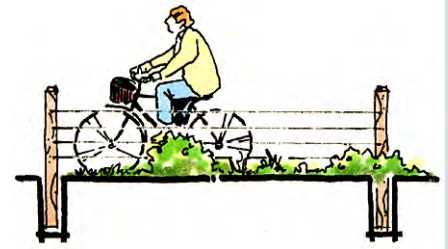


Figure 28. Typical Riparian Corridor Fencing

Wastewater Treatment Facility Fencing:

Where the trail is located along the Wastewater Treatment Plant's industrial areas, security fencing should be constructed to prohibit unauthorized access and consist of the following components:

- A. 1.8 meters (6-foot) high metal posts support mesh panels
- B. Posts 2.4 meters (8-foot) on center
- C. Flowering vines to screen views into the facility
- D. Removable panels where noted on plans

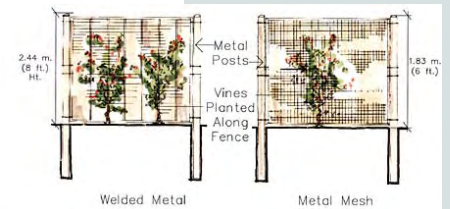


Figure 29. Wastewater Treatment Facility Fencing

Rest and Staging Area Fencing:

Perimeter fencing in these areas should consist of the following:

- A. 1.2 meters (4-foot) high wood posts
- B. Posts 1.8 meters (6-foot) on center
- C. Split rails

Trail Access Fence:

In locations where the Bob Jones City-to-Sea Trail intersects vehicle travel lanes, unauthorized vehicular access must be controlled. Fencing along the trail and connecting to the street right-of-way, in conjunction with removable bollards placed in the trail at these intersections would serve to limit access. Fencing for this condition should consist of the following design:

- A. Large diameter 1.2 meters (4-foot) high wood posts
- B. Posts 1.8 meters (6-foot) on center
- C. Split rails

Trail Bridges

All bridges should include structural design that is able to support pedestrian live loading and maintenance and emergency vehicles.

Creek Crossings:

To minimize or avoid potential impacts to the creeks, pre-engineered clear span bridges should be used to cross all creeks and drainage ways. Bridges over the creeks should incorporate the following components:

- A. Low maintenance weathering steel finish
- B. Asphalt deck
- C. 1.4 meters (54-inch) high bicycle railing
- D. Horizontal toe plates
- E. Mesh screen of sufficient weight to prevent fishing or littering from bridge



Figure 30. Typical Clear Span Bridge Over Creek

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Road Crossings:

Grade-separated crossings over Madonna Road should be a pre-engineered portal bridge that includes the following design components:

- A. Low maintenance weathering steel finish
- B. Asphalt deck
- C. 1.4 meters (54-inch) high bicycle railing
- D. Horizontal toe plates
- E. Fully enclosed portal
- F. Attached security fence
- G. ADA accessible ramp system

San Luis Obispo Creek at Prado Road Crossing:

The City is proposing to widen Prado Road and the existing vehicular bridge over San Luis Obispo Creek as part of the Route 101/ Prado Road Interchange Plan between Highway 101 and South Higuera Street. With a new bridge design anticipated to expand the southern edge, an opportunity exists for the City's engineers to incorporate a cantilevered Class I bike bridge into the bridge expansion plans. The cantilevered bridge should incorporate the following:

- A. Asphalt deck
- B. Horizontal toe plates
- C. 1.4 meters (54-inch) high physical separation, such as a fence or bicycle railing, to be provided to protect cyclists from motor vehicles

Trail Lighting

The Bob Jones City-to-Sea Trail is not proposed to have continuous lighting. Where the trail crosses public roads at grade, supplemental lighting should be incorporated into existing street lighting. Limited lighting may be incorporated into the proposed staging areas.

Historic and Educational Themes

The trail offers a unique opportunity to develop historic and educational themes. Interpretive exhibits should be placed at strategic locations along the trail offering a variety of information. For example, information regarding bird species visitors are likely to observe along the trail can be developed. Additional interpretive topics along the creek corridors include:

- A. Creek habitats
- B. Local wildlife
- C. Relation of the creek to the larger watershed
- D. Bike use and images of trails in other cities and countries
- E. Air quality improvements through bicycle commuting
- F. Wastewater and water reclamation processes
- G. Bicycle development through history
- H. Local history of San Luis Obispo



Figure 31. Typical Staging Area Informational/ Interpretive Exhibit



Figure 32. Typical Trailside Interpretive Exhibit

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Riparian Enhancement

The preferred alignment for the Bob Jones trail has been designed to run outside of the creek setback to the greatest extent possible. Where no practicable alternative exists, however, the trail will be located within the setback for limited distances and to cross San Luis Obispo, Prefumo, and Meadow Creeks. Trail sections within the creek setback are indicated on the Preliminary Alignment Plans contained in Section 2.5.

San Luis Obispo Creek Corridor

Where the construction of the trail or bridges occurs within the creek setback, trail design that minimizes or eliminates any significant adverse impacts to the surrounding habitat should be utilized. Low impact trail design standards include:

- A. Riparian corridor fencing along the entire length of the trail between the trail's edge and creek corridor to discourage creek access.
- B. Installation of locally occurring native plant species between the trail and existing riparian vegetation. Plantings should consist of low water using native species to increase the diversity and width of the riparian corridor, and may include species that discourage human access into the riparian area.
- C. Installation of plant species observed to support local bird and wildlife habitat.
- D. Mesh screen, or other restrictive covering material, included in bridge design to prevent fishing or littering from the bridge and discourage human encroachment into the creek area.
- E. Bridge flooring consisting of a solid material, such as concrete or steel, to minimize noise generation from bicyclists and pedestrians.
- F. Signs indicating the sensitive nature of all creek habitats and restricting entrance into the areas posted along the corridor fencing and on bridges.

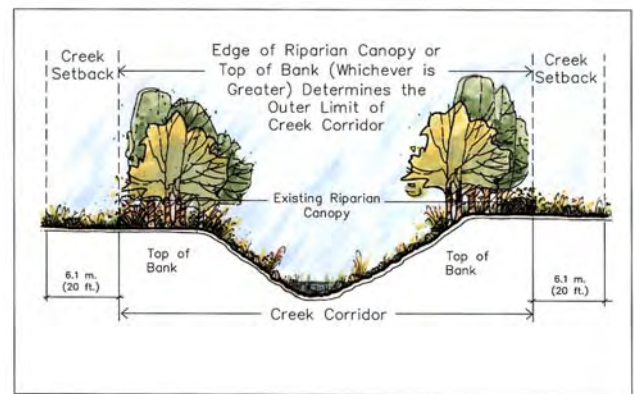


Figure 33. San Luis Obispo Creek Corridor and Creek Setback Area Definition

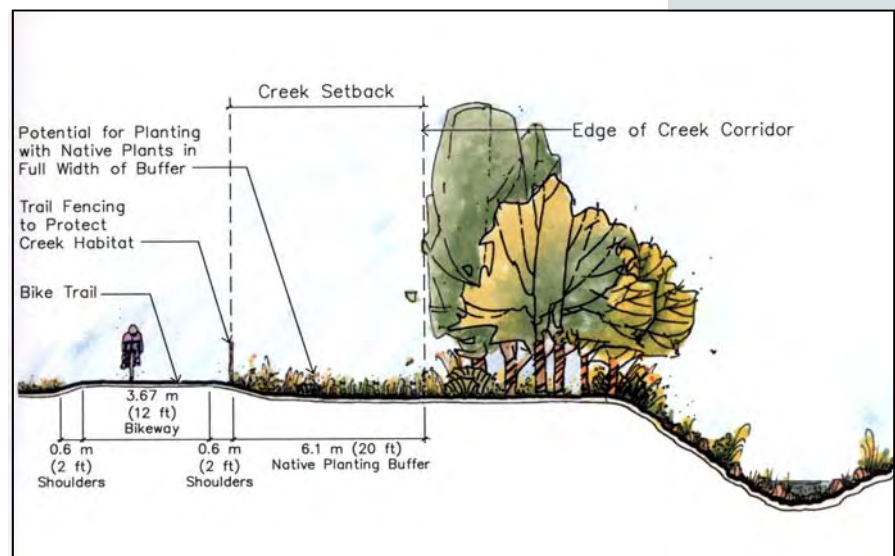


Figure 34. Typical Trail Alignment Along San Luis Obispo Creek

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Prefumo Creek Corridor

Where the construction of the trail or bridges occurs within the creek setback, trail design that minimizes or eliminates any significant adverse impacts to the surrounding habitat should be utilized. Low impact trail design standards include:

- A. Riparian corridor fencing placed no closer than 7.6 meters (25 feet) along the entire length of the trail between the trail's edge and creek corridor to discourage creek access. (See note below)
- B. Installation of locally occurring native plant species between the trail and existing riparian vegetation. Plantings should consist of low water using native species to increase the diversity and width of the riparian corridor and may include species that discourage human access into the riparian area.
- C. Installation of plant species observed to support local bird and wildlife habitat.
- D. Mesh screen, or other restrictive covering material, included in bridge design to prevent fishing or littering from the bridge and discourage human encroachment into the creek area.
- E. Bridge flooring consisting of a solid material, such as concrete or steel, to minimize noise generation from bicyclists and pedestrians.
- F. Signs indicating the sensitive nature of all creek habitats and restricting entrance into the areas posted along the corridor fencing and on bridges.

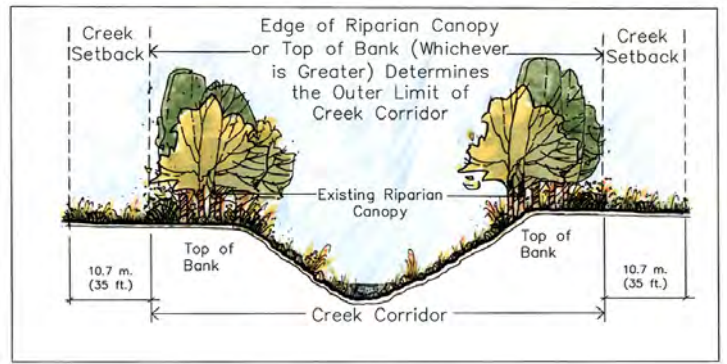


Figure 35. Prefumo Creek Corridor and Creek Setback Area Defined

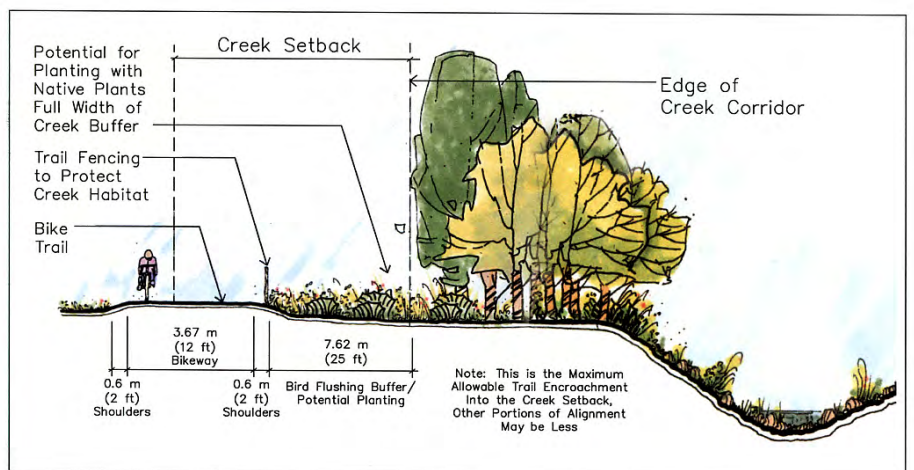


Figure 36. Trail Alignment Within Shared Portion of Creek Setback Along Eastern Reach of Prefumo Creek

Note:

Along the Prefumo Creek corridor, the riparian corridor is relatively wide, ranging from 50 to 100 feet or more. Creek Setbacks are measured from the outside edge of this corridor, providing an additional 35 feet of buffer area along the creek. Locating the bike path outside of this 35-foot setback would require an additional 16-foot wide strip along the creek which equates to a 51-foot wide development setback strip along Prefumo Creek.

Some limited encroachment of the bike trail into the 35-foot setback is acceptable due to the width of the riparian corridor in this reach. The trail would maintain a minimum buffer distance of 25 feet between the trail fence and outside edge of the riparian canopy. According to the City Biologist, 25 feet or less is the distance at which bird species are likely to be flushed from their habitat, therefore, any impacts from temporary human presence at distances greater than 25 feet are likely to be insignificant. The 25 foot buffer would more than adequately provide an opportunity to plant native species and would act as a biological transition area or “ecotone”, where animal species can habituate to occasional, temporary human presence.

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2.7 Implementation

2.7 IMPLEMENTATION

The City intends to implement the Bob Jones City-to-Sea Trail over time through the construction of individual segments. The City further recognizes that most, if not all, areas identified for the preferred trail alignment in Segments 1, 2, and 4 are held as private property or non-City public lands (Caltrans). Segment 3, Prado Road to Los Osos Valley Road, is predominantly located on City-owned land with the exception of the Kuden property adjacent to Prado Road. Due to City ownership of Segment 3, Prado Road to Los Osos Valley Road, it is likely that the City will begin trail construction in this area first. The City however intends to secure easements or real property in all segments where the trail is proposed to cross privately held property.

Given the alignment and ownership issues, the following principles should guide the City in securing land for the trail and construction of the trail itself.

Land Acquisition

- A. In segments 1, 2 and 4 the City should work with property owners when new development or redevelopment is proposed to secure easements or real property for the trail as described in this plan.
- B. If the City should desire to acquire easements or real property in advance of adjacent new development or redevelopment, then negotiations with individual property owners on a case-by-case basis should be enacted.

Trail Construction

- A. Construction of the Bob Jones City-to-Sea Trail should be coordinated with any flood control improvements such that the trail could be integrated and installed as part of the flood control improvements.
- B. Priorities for trail construction should be based on the ability to create a logical and usable section of the trail supporting efficient use of public funds.
- C. Trail construction should be considered as a part of any major new development or redevelopment project i.e. Caltrans properties, Elks Club vacant lands, drive-in-theater site, etc.

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2.7 Implementation

Cost Analysis

The following Preferred Alignment Estimated Cost Summary is based on the elements identified in the Preliminary Alignment Plan. The cost opinion parallels the four Bob Jones City-to-Sea Trail segments discussed in the Project Study Area (Section 2.1). The estimate isolated the core Class I trail costs from other proposed trail amenities. The cost opinion is a key tool in estimating the project's overall budget and provides the information necessary to develop trail phasing and funding allocation. The Bob Jones City-to-Sea Trail construction costs are presented in the following summary.

BOB JONES CITY-TO-SEA TRAIL PREFERRED ALIGNMENT ESTIMATED COST SUMMARY	
Class I Bike Facility (Ultimate Alignment)	
	Subtotal
Segment 1	\$ 1,155,708
Segment 2	\$ 831,289
Segment 3	\$ 1,972,587
Segment 4	\$ 1,848,836
Class 1 Bike Facility Grand Total = \$ 5,808,420	
Trail Amenities (Rest and Staging Areas)	
	Subtotal
Segment 1	\$ 595,079
Segment 2	\$ 14,289
Segment 3	\$ 112,592
Segment 4	\$ 834,189
Trail Amenities Grand Total = \$ 1,556,149	
BOB JONES CITY-TO-SEA TRAIL PROJECT TOTAL = \$ 7,364,569	

Figure 37. Bob Jones City-to-Sea Trail Preferred Alignment Estimated Cost Summary