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Background and Relationship to the 1995 Santa Clara Countywide Trails Master Plan Update

INTRODUCTION

The *1995 Countywide Trails Master Plan Update* is an element of the Santa Clara County General Plan. One strategy of the Trails Master Plan recognizes the need for interjurisdictional coordination between the County, its fifteen Cities, and the other various special districts and agencies that provide trails within the County (Strategy #6 of the Trails Master Plan). Because a number of the proposed trails in the Trails Master Plan pass through multiple jurisdictions, many of the General Plan policies call for interjurisdictional cooperation. One set of policies in particular calls for an interjurisdictional committee to coordinate and establish trail guidelines that provide consistency for the benefit of both the trail user and affected properties on or adjacent to the countywide trails¹.

The Santa Clara County Interjurisdictional Trails Committee participants are listed in Appendix A.

Purpose

These guidelines provide a common frame of reference for the various jurisdictions and private developers who design and manage trails in the urban areas of Santa Clara County. These guidelines complement, rather than replace, the design, use, and management guidelines contained in the *1995 Santa Clara Countywide Trails Master Plan Update* that are generally directed to rural areas in the County. Because some of the Cities within the County do retain relatively rural land use patterns, both sets of guidelines might be referenced when designing certain trails.

¹ **County Policy PR-TS 6.1:** Trail planning, acquisition, development, and management of trail routes shown on the Countywide Trails Master Plan Map should be coordinated among the various local, regional, state and federal agencies which provide trails or funding for trails.

County Policy PR-TS (I) 6A: Establish a Countywide Trails Technical Staff Group overseen by the County Parks and Recreation Department, with representation from participating county, city, special districts, and other agencies, for the purpose of coordinating the implementation of the County's trails plan and policies in a manner that is compatible with each participating jurisdiction's needs and desires and is reflective of the guidelines for implementing the countywide trail system. (see Design and Management Guidelines). Among other duties, the Staff Group should be charged with the following: 1) establishment of consistent trail designs that benefit the user and affected properties; 2) coordination of specific trail routes' siting and design; 3) recommendations to appropriate agencies for creation of joint powers agreements for the acquisition, development and maintenance of specific trail routes; 4) development of implementation and management plans for inter-jurisdictional trail routes; and 5) prioritization of trail routes for funding purposes.

The guidelines in this document generally identify:

- how a specific trail route should be sited and designed based on a series of common trail conditions and landscape circumstances found in Santa Clara County; and
- once constructed, how a specific trail within the jurisdiction of Santa Clara County should be managed to provide appropriate levels of maintenance and user safety, as well as offer security and privacy to properties either adjacent to the trail or through which the trail crosses.

It is not the intent that these guidelines be applied retroactively to existing trails within the countywide trail system. However, when warranted, upgrading of existing trail features, such as signs, trail width, and the like should be considered, either as independent projects or as part of larger projects.

Application These guidelines are to be used when preparing detailed design and management plans for new trail routes indicated on the *Santa Clara County General Plan - Countywide Trails Policies and Map* as adopted by the Santa Clara County Board of Supervisors on November 14, 1995.

These guidelines are not to be construed as “standards” nor to dictate any specific trail design or management practices. Each new trail route should be evaluated on a case-by-case basis, taking into account actual field conditions and trail route / land use relationships.

WHO USES THESE GUIDELINES

These guidelines are intended to be a model and point-of-reference for each of the fifteen Cities within the County, as well as other special districts, and State and Federal Agencies who develop and manage trails within Santa Clara County. These jurisdictions are encouraged to reference and/or adopt these guidelines, where appropriate, as part of their own general plans.

RELATIONSHIP TO ENVIRONMENTAL REVIEW AND PERMITTING CONSIDERATIONS

The design, use, or management guidelines outlined below were not developed specifically to mitigate potential environmental impacts.

These guidelines do not substitute or replace any existing codes, rules or regulations of land managing and permitting agencies that may govern trail development, but are in addition to them. For example, the California Department of Fish and Game has jurisdiction over the bed and banks of creeks, streams, rivers and seasonal drainages that have a defined channel. The U.S. Army Corps of Engineers has jurisdiction over creek channels and wetlands. Permits required from these and other agencies must be obtained when trail alignments result in impacts to their jurisdictional areas.



What is an Urban Trail?

TRAIL EXPERIENCE LEVELS

One way of designing and managing trails is to define them in terms of the user's experience. For both the trail manager and the user, trail opportunities may be expressed in terms of three principal components: the activities, the setting, and the experience. Table 1 presents an overview of design and management characteristics for three different trail experiences.

The *1995 Santa Clara Countywide Trails Master Plan Update* routes, in their entirety, provide for the full spectrum of the trail experiences identified in Table 1. The Uniform Interjurisdictional Trail Design, Use, and Management Guidelines are directed towards the “**High Volume /Urban Experience**” column of the table. Conversely, the trail design, use and management guidelines provided in the *1995 Santa Clara Countywide Trails Master Plan Update* generally apply to the “Low Volume/Isolated Experience” and the “Moderate Volume /Natural Experience” columns of the table.

TABLE 1: TRAIL EXPERIENCE LEVELS

	LEVEL 1	LEVEL 2	LEVEL 3
Design and Management Characteristic	Low Volume / Remote Experience	Moderate Volume / Rural Area or Natural Experience	High Volume / Incorporated Urban Experience

General Setting

Manipulation of surrounding environment	Few, if any, structures and cultural improvements evident; surrounding drainages natural in character	Some structures and cultural improvements evident	Structures and other cultural improvements (parks, plazas, streets) nearby and readily evident; surrounding drainages typically channeled with levees
Street crossings	Few, if any	Occasional	Occasional to Frequent

Physical Parameters

Tread width and design	Optimum width varies	Optimum width varies; 8' (2.4 m.) minimum for paved trails	12' to 14' (3.7m. to 4.7m.) optimum width; designed with turning radii to accommodate multiple use as fire lane.
Tread surface and materials	Natural Surface	Natural, reinforced, or paved surface	Paved surface with some use of natural surfaces in special circumstances
Shoulder width, surface and materials	None	2' (0.6 m.) free area minimum on either side of trail	2' (0.6m.) free area minimum on either side of trail; 5' (1.5 m.) optimum width to accommodate varied uses
Shoulder materials	None	Natural materials	Natural materials, turf, compacted decomposed granite
Striping	None	On paved trails, centerline striping around blind curves and marking for all posts and bollards located in trails; otherwise none	Centerline striping around blind curves and along trail if use warrants; marking for all posts and bollards located in trails
Signing	Limited to trail name, regulation and safety; wood signs and standards	Trail identity regulations and safety signs; wood signs and metal standards	Full sign program; metal signs and standards
Access barriers	Gates and bollards as needed; wood standards	Gates and bollards; wood and metal standards	Gates and bollards; metal or composite plastic standards
Trail grades (ADA requirements)	12.5% maximum	10% maximum	8.33 % maximum
Curbs / mow strips	None	None	Separating turf areas from trail tread
Walls and fences	As needed	As needed	As needed

TABLE 1: TRAIL EXPERIENCE LEVELS

	LEVEL 1	LEVEL 2	LEVEL 3
Design and Management Characteristic	Low Volume/ Remote Experience	Moderate Volume / Natural Experience	High Volume / Urban Experience

Physical Parameters (continued)

Benches	None	Near staging areas	At regular intervals where feasible
Emergency call boxes	Along trails that pass through more remote areas or private lands	Along trails that pass through remote / isolated areas or private lands	Along trails that pass through isolated areas
Lights	None	At trail undercrossings and access points	At trail undercrossings, access points, and areas with related nighttime activity
Trash receptacles	Near staging areas	Near staging areas	At staging areas and along the trail as needed and practical to maintain
Drainage / erosion control	Minimum improvements	May include some drainage and slope improvements, water bars, and culverts	Drainage and slope improvements, catch basins, culverts typical
Drainage crossings	Open crossing except for blue-line streams that require bridges for safety / environmental protection	Combination of open crossings, backfilled culverts, and bridges	Backfilled culverts, and bridges typical
Planting	Typically no planting except for environmental mitigation requirements	Some planting for shade, screening, and other amenity values at specific areas along trail; environmental mitigation requirements	May involve significant plantings for shade, screening and other amenity values along long trail segments; environmental mitigation requirements and habitat enhancement
Irrigation	None except to establish environmental mitigation plantings	None except to establish environmental mitigation plantings	Permanent irrigation typical
Potable Water	Limited to staging areas and park camping areas	Limited to staging areas and park camping/ picnic areas	Readily available at regular intervals
Non-potable Water	Limited to staging areas and park camping areas for irrigation and pets	Limited to staging areas and park camping/ picnic areas for irrigation and pets	Limited to water for irrigation areas
Sanitary Facilities	Limited to staging areas and park camping areas	Limited to staging areas and park camping/ picnic areas	At staging areas and areas with high activity (e.g. adjacent recreation areas, commercial areas, or entertainment zones)

TABLE 1: TRAIL EXPERIENCE LEVELS

	LEVEL 1	LEVEL 2	LEVEL 3
Design and Management Characteristic	Low Volume/ Remote Experience	Moderate Volume / Natural Experience	High Volume / Urban Experience

Management Parameters

Speeds Limits	15 MPH with lower speeds on narrow trails	15 MPH	15 MPH with lower limits in congested areas
Maintenance	Emphasis on seasonal maintenance activities; maintained for low volume of use and intermediate to expert user	Monthly maintenance activities typical; maintained for moderate use volumes and intermediate users	Regularly maintained for high use levels including families, seniors and individuals with special needs
Trail Route Inspection	Annual inspection and repair of unsafe conditions; specific repairs as necessary based on user reports of unsafe conditions	Seasonal inspection and repair; trail tread and sides maintained for public safety and user convenience; specific repairs as necessary based on user reports of unsafe conditions	Regular inspection; tread re-paved and patched as needed; specific repairs as necessary based on presence of unsafe conditions
Mowing / clearing	Annual brushing	Seasonal mowing /brushing of shoulders and other areas	Regular mowing / brushing of shoulders and other areas



Organization

GUIDELINES

The guidelines that follow are divided into three general sections that are the same as found in the *1995 Santa Clara Countywide Trails Master Plan Update*. These are:

- **Urban Trail Design Guidelines:** summarizing physical parameters for siting, designing, and constructing a new trail and the immediate trail setting. Urban design guideline reference numbers begin with the letters “UD”.
- **Urban Trail Management Guidelines:** summarizing the managerial parameters for siting and constructing a new trail including parameters for:
 - managing general use along the trail;
 - recommended use ordinances;
 - frequency of maintenance, inspections, and repairs;
 - frequency of patrols; and
 - generalized costs to be considered in inter-agency management agreements.

Urban management guideline reference numbers begin with the letters “UM”.

- **Urban Trail Plans and Sections:** illustrating the physical characteristics of trails and dimensional relationships of a trail to its setting. Plan and section reference numbers begin with the letter “T” for trail guidelines and “S” for sign guidelines.

Cross-referencing with the 1995 Santa Clara Countywide Trails Master Plan Update

For most urban trail scenarios, these guidelines are self-standing, and can be used independently from the trail guidelines contained in the *1995 Santa Clara Countywide Trails Master Plan Update*. For ease of cross-referencing, the numbering system is essentially same between the two sets of guidelines. For example, an urban trail design guideline provided below keyed as UD-1.2 generally complements the guideline found in the *1995 Santa Clara Countywide Trails Master Plan Update* keyed as D-1.2. Because there is not a new complementary urban trail guideline for every guideline in the 1995 Countywide

Trails Master Plan, some gaps may appear in the guideline numbers provided below.

Where there are differences between the two sets of guidelines, they are indicated as such using a reference system of symbols as follows:

- **No symbol:** a guideline derived from the *1995 Santa Clara Countywide Trails Master Plan Update* and directly applicable to urban trails
- **One cross (†):** a guideline that is substantially the same in the *1995 Santa Clara Countywide Trails Master Plan Update*, but modified or amended for urban trail conditions
- **Two crosses (††):** a new guideline not contained in the *1995 Santa Clara Countywide Trails Master Plan Update*.

Relationship to Environmental Review Considerations

Many of the trail design and management action policies found in the *1995 Countywide Trails Master Plan Update* were developed specifically to mitigate a potential environmental impact. Where this is the case, the design or management guideline coding is followed by an asterisk such as "3.5.2* Cut and Fill". Where there is no title involved, an asterisk is used after the coding such as "3.5.2*". Also in instances where a guideline has been developed specifically to mitigate a potentially significant environmental impact, use of the words "shall" or "will" is made.

Metric Conversions

The California State Department of Transportation guidelines for trails now use the International System (metric). However, for convenience, measurements indicated in these guidelines are provided using the U.S. Customary System of feet and inches with metric equivalents shown in parentheses. Where State guidelines for trails, such as the case for the minimum paved width of a two-way bike path, might be indicated as 2.4 meters (m), these guidelines show a converted width of 8 feet, which technically is 2.43 meters, or slightly greater than the metric equivalent. In no case is the converted distance indicated in these guidelines less than the metric equivalent. Therefore, if the measurement indicated in feet and inches is used, the designer will satisfy the State's guidelines.

Optimum Distances and Frequency of Management

In referencing distance, widths, and the frequency at which certain management activities should take place, these guidelines make frequent use of the word “optimum”. In these cases, “optimum” means the best or most favorable condition for a particular trail situation from the perspective of responsible management.

General Sign Philosophy

There are literally thousands of messages that can be presented to the trail user through signs. A common goal within a trail environment is to limit signs to only those necessary to:

- provide for the safety of the trail user;
- protect the surrounding environment; and
- enhance the trail and open space experience.

The sign guidelines provided represent the more common signs that should be considered for placement along a trail.



DESIGN GUIDELINES

UD - 1.0 OPTIMUM LOCATION

Should a situation be encountered where the optimum measurements indicated cannot be achieved, mitigation measures should be used to provide for trail user safety. Such measures could include, but are not limited to: vegetation removal; trail pull-outs at regular intervals; signage; or dismounting requirements.

UD - 1.1 Trails and Land Use Compatibility

UD-1.1.1 (†)* Locate trails along property lines where feasible and appropriate in conjunction with the use of the land, to avoid unnecessarily crossing private properties. Exceptions may include commercial centers and transit stations where the trail alignment would avoid adversely impacting the feasibility of development .(See also: Figures T-4, T-5A, T-5B, T-6, and T-18).

UD - 1.1.2 (††)* Trails shall generally be sited as far away from occupied dwellings as practical. Where trails are developed in conjunction with high-density residential areas, it may be appropriate to incorporate the trail or access to the trail into the overall circulation of the housing complex. In these situations, the trail alignment should be developed to avoid the creation of alleys and should take into consideration the privacy of residents using setbacks as indicated in Table UD-1. (See also: Figure T-4).

Table UD-1: Trail Setbacks

Land Use Category⁽¹⁾	Trail Setback⁽²⁾
Residential	25 feet (7.6 m)
Commercial	10 feet (3.0 m)
Research / Light Industrial	10 feet (3.0 m)
Industrial	Distance Varies

- (1) Generalized; may vary between jurisdictions; Open space buffers adjacent to all land uses should be maximized to the extent feasible.
- (2) Optimum distance as measured from the edge of the trail tread

UD - 1.1.3* In areas where trails would pass adjacent land uses such as mining, railroads, and defense research and testing facilities, trail structures such as fences, barriers and signing shall be used to deter trail users from leaving the trail and

The following symbols relate these guidelines to the *1995 Santa Clara Countywide Trails Master Plan Update* as follows:

- No Additional Symbol: Guideline the same
- (†) Guideline is substantially the same but modified or amended for urban trail conditions
- (††) New guideline not in the *1995 Santa Clara Countywide Trails Master Plan Update*
- * Guideline serves as a mitigation measure to reduce an environmental impact.

encountering unsafe conditions. When requested by the adjacent property owner, temporary trail closures shall be employed during intermittent operations that would jeopardize the safety of an otherwise safe trail. Appropriate safety and trail closure signs should be used in such circumstances with a temporary, alternative route identified and signed if possible. (See also: Figures S-9).

UD - 1.1.4 (†)* In areas where trail routes are adjacent to private property, visible fencing shall be employed, if requested by the adjacent property owner, to deter users from leaving the trail. Type of fencing should be determined in consultation with the property owner(s). Security fencing or walls should be no closer to the trail than 3’-6” (1 m) and no lower than 4’-8” (1.4 m). (See also: Guideline UD - 4.11.2, Figures T-4, T-5A, and T-5B).

UD - 1.1.5 Trail alignments should be selected that minimize intersections with motorized vehicles. Where feasible, trail grades should be separated from roadway grades at crossings. Where separated crossings are not possible, at-grade crossings must be designed to equally consider vehicular and trail user safety. (See also: Figures T-12A, T-12B, T-13A and T-13B).

UD - 1.1.6 Trail Crossings of Streets

UD - 1.1.6.1 (†) At the intersections of Shared-use Trails there should ideally be a 15’ turning radius or greater and 100’ sight clearance between the two trail routes. (See also: Figure T-8).

UD - 1.1.6.2 (††) At-grade trail crossings of streets should be developed with appropriate safety and regulatory signs for both trail users and motorists where either: a trail route crosses the street; or where a trail terminates at a street designated as an on-street bicycle route. (See also: Guideline UD - 4.17; Figures T-13A and T-13B).

UD - 1.1.7(†)* Safety is a major consideration whenever new trails are developed within a rail line corridor. In such circumstances, the trail alignment should be coordinated with local and regional transportation agencies and located

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- * Guideline serves as a mitigation measure to reduce an environmental impact.

so as not to preclude future multiple-use of the corridor for public mass-transit facilities if such facilities are included in City or County General Plans.

**UD - 1.2
Staging Areas and
Land Use
Compatibility**

UD - 1.2.1*(††) Staging areas for countywide trails should ideally be located within community-wide parks or provided as a cooperative joint-use project with land uses that require large parking areas (such as schools, shopping centers, corporate office complexes, and hotels). Landscape designs need to take into account security in urban areas. Space will be provided for berms and landscaping as necessary to reduce noise and screen views to the staging area from surrounding sensitive receptors such as residences.

D - 1.2.2 Regional Staging Areas shall be designed to adequately accommodate and manage anticipated use levels to prevent overflow parking onto local neighborhood streets. Ideally, Regional Staging Areas should be located on or near a public transit route.

**UD - 1.3
Trails and
Environmental
Protection**

UD - 1.3.1 General

UD - 1.3.1.1 (†)* Trail alignments and their associated facilities shall be sited and designed to be in harmony with surrounding natural and cultural settings and to retain natural appearances and values.

UD - 1.3.1.2* Existing native vegetation shall be retained by removing only as much vegetation as necessary to accommodate the trail clearing width. Maintenance roads should be used if possible to avoid effects on riparian corridors.

UD - 1.3.1.3* Trail design shall include barriers to control trail use and prevent environmental damage; barriers may include fences, vegetation, stiles, and/or fallen trees or branches as appropriate.

UD - 1.3.1.4 (†)* Biological resource assessments shall be conducted as specific trail routes along streams, creeks, or Bayside settings are implemented. These assessments will include mitigation recommendations as appropriate.

UD - 1.3.2 Special Status Species Habitats

The following symbols relate these guidelines to the *1995 Santa Clara Countywide Trails Master Plan Update* as follows:

- No Additional Symbol: Guideline the same
- (†) Guideline is substantially the same but modified or amended for urban trail conditions
- (††) New guideline not in the *1995 Santa Clara Countywide Trails Master Plan Update*
- * Guideline serves as a mitigation measure to reduce an environmental impact.

UD - 1.3.2.1 (†)* To the maximum extent feasible, trail alignments shall avoid impacts to known special status plant and animal habitats. Trail alignments shall be evaluated on a case-by-case basis by a professional biologist to identify impact avoidance measures or mitigation measures for biotic impacts. Consideration shall be given to: rerouting the trail; periodic closures; revegetation prescriptions including replacement vegetation based on habitat acreage or plant quantity; buffer plantings; and other appropriate measures. Removal of mature native vegetation shall be avoided as much as possible to protect the productivity of the landscape and the aesthetic quality of the trail. The appropriate resource agencies will be contacted for consultation regarding any trail alignments that are identified as having potential significant impacts to special status species or their habitat.

UD - 1.3.2.2* In special status species habitat areas, trail use levels shall be limited as appropriate to ensure protection of resources. Techniques for limiting use may include, but are not limited to:

- physical access controls
- seasonal or intermittent closures
- restricted use permits
- exclusion of domestic pets
- signs (See also: Figures S-5 and S-11).

UD - 1.3.2.3* Existing access routes and levees shall be used wherever possible to minimize impacts of new construction in special status species habitats and riparian zones. (See also: Figure T-15).

UD - 1.3.3 Washes, Freshwater Streams, Riparian Zones, and Wetlands

UD - 1.3.3.1 (†)* When parallel to a stream or riparian zone and not located on top of a levee, new trails shall be located behind the top of bank or at the back or outside edge of the riparian zone except where topographic, resource management, or other constraints or management objectives make this not feasible or undesirable. Examples of possible exceptions to this requirement include drainage

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- * Guideline serves as a mitigation measure to reduce an environmental impact.

crossings, passing under bridges, or where the trails are on an existing flood-control structure (e.g., levee or filled bank). Based upon advice of a professional biologist and concurrence of reviewing agencies, riparian setbacks may be required on a case-by-case basis. (See also: Figures T-17 and T-18).

UD - 1.3.3.2 (†)* Trails in areas of moderate or difficult terrain and adjacent to a riparian zone shall be composed of natural materials or shall be designed (e.g. a bridge or boardwalk) to minimize disturbance and need for drainage structures, and to protect water quality (See also: Table UD-3 and Figures T-17 and T-18).

UD - 1.3.3.3* Trail crossings of freshwater stream zones and drainages shall be designed to minimize disturbance, through the use of bridges or culverts, whichever is least environmentally damaging. Bridges and culverts shall be designed so that they visually and functionally blend with the environment. (See also: Figure T-17).

UD - 1.3.3.4(†) New native riparian vegetation should be planted in the setback zone, where practical, to complement existing riparian growth.

UD - 1.3.3.5* Trails will avoid wetlands, including seasonal wetlands, wherever possible. Use of existing levees and levee maintenance roads is to be emphasized. A wetlands biologist will conduct reconnaissance level surveys of all trail alignments in areas with potential wetlands. Trails adjacent to wetland areas will be constructed so that trail fills avoid wetland impacts. A formal wetland delineation will be required along trails that may impact wetlands.

UD - 1.3.3.6 (†)* Revegetation and/or enhancement will be undertaken where any sensitive habitat or special status species habitat will be disturbed or destroyed by trail construction. The design of an appropriate revegetation program shall fully compensate for the lost habitat, with no net loss of habitat functions and values. The revegetation program should be designed by a qualified biologist, submitted to the appropriate regulatory or trustee agency (usually the Department of Fish and Game and the Santa Clara Valley Water District) for approval, and

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implemented prior to or concurrently with the trail development. At a minimum, the revegetation program will include a description of project impacts, mitigation calculations, the mitigation site, revegetation techniques, maintenance measures, a long-term monitoring program, and contingency measures. Riparian and wetland habitat impacts will typically be mitigated at a 3:1 ratio for high quality habitat areas, and at lower ratios where lower habitat quality justifies a lower ratio. A lower ratio may also be justified if habitat mitigation is implemented prior to the occurrence of impacts. Mitigation will be based on in-kind replacement of impacted habitat with habitat of equal or better biotic value. Locally native plant materials will be utilized in all mitigation work.

UD - 1.3.4 Other Habitat Areas: In other areas no specific setbacks are required. However, at a minimum, all trail alignments should be reviewed in the field by a professional biologist prior to construction.

UD - 1.4*
Hillside Scenic /
Aesthetic
Resources

Trail alignments across the face of open hillsides and near the top of ridgelines shall be sited to avoid creating permanent, noticeably visible lines on the existing landscape when viewed from points looking up at or perpendicular to the trail. Criteria to be used in siting the trail include, but are not limited to: avoidance of excessive cuts in slopes that can not be effectively revegetated; presence of native soil to support revegetation; and placement of trail alignments on cross-slopes less than 45%.

UD - 1.5*
Areas of Geologic
Instability

Appropriate surveys shall be conducted as part of trail route site planning to identify the occurrence of any potentially hazardous geologic conditions. Such areas shall be avoided or necessary construction design measures will be incorporated into the design of the trail to assure that users will not be exposed to the identified hazard.

UD - 1.6*
Emergency Access

During trail implementation, planners should locate final trail alignments and access points to allow the trails to also serve as emergency access routes (for patrol or emergency medical transport).

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UD - 2.0
TRAIL DESIGN
UD - 2.1 (††)
Trail Setting

The public lands or easements that comprise the trail setting should not preclude the viability of adjacent uses. The trail setting should allow sufficient width for management activities and/or buffer space from adjacent uses.

Table UD-2 lists optimum widths for trail settings based on generic urban land use designations.

Table UD-2: Trail Settings

Land Use ⁽¹⁾	Optimum Trail Route Easement / Right-of-way ⁽²⁾
Low Density Residential	30 feet (9.1 m)
High Density Residential (apartment, condominium, townhouse)	30 feet (9.1 m)
Commercial	30 feet (9.1 m)
Light Industrial / Office Research	50 feet (15.2 m)
Transportation	30 feet (9.1 m)
Industrial	30 feet (9.1 m)
Parks / Open Space	50 feet (15.2 m)
Schools / Institutional	50 feet (15.2 m)

(1) Land use designations are generic and may vary based on local General Plan designations

(2)

UD - 2.2
Tread Width

UD - 2.2.1 (†) Trail tread width should be determined by amount and intensity of trail use and field conditions such as topography, vegetation and sensitivity of environmental resources. Where treads are narrower than 8 feet (2.4 m), such as on access routes to levee trails, they should be signed and wider turn-out / passing areas should be provided at regular intervals. In most cases these trails should not be narrower than 6 feet (1.8 m) in order to allow two wheelchairs to pass easily. Safety and regulatory signs should be used to notify the trail user of a transition of trail widths or of other conditions that may exist. (See also: Figures S-7, S-8 and S-9).

UD - 2.2.2 (†) Shared-use trails should be designed as paved two-way paths and should have an optimum width of 12 feet (3.7 m) with a center stripe (See also: Guideline UD - 4.11) and minimal 2-foot (0.6 m), flush graded shoulders or clear

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space on each side of the trail. A 2-foot (0.6 m) minimum vegetation clearance should be maintained on each side of the trail. All brush over 12" in height and 1/2" diameter that extends into the railway should be pruned. (See also: Figures T-1, T-3, T-4, T-5A, and T-5B).

**UD - 2.3(†)
Trail Grades**

Grades along trail treads should be held to a minimum. Longitudinal grades of 5% or less are desirable. Longitudinal grades should not exceed 8.33%. (See also: Guideline UD-3.5.4 and Figure T-1).

**UD - 2.4
Accessible Trails**

UD - 2.4.1 (†) Where feasible, the design of countywide trails should recognize the intent of the American With Disabilities Act (ADA) and should emphasize accessibility for everyone. (See also Guideline 4.2). To determine feasibility and the degree to which trails should be designed for whole-access, the overall terrain conditions of the area surrounding the trail route should be referenced. As an initial reference, three general accessibility zones are: Valley Floors; Foothills; and Mountains. Table UD-3 defines the general slope characteristics of each of these zones. The final definition of each zone as it pertains to a particular trail alignment should be made only after detailed site investigations have been conducted.

Table UD-3: Ranking Access Conditions by Topography

Criteria	Accessibility Zone		
	Easy Level of Access (e.g. Valley Floor)	Moderate Level of Access (e.g. Foothills)	Difficult Level of Access (e.g. Mountains)
Average slope conditions *	< 10%	11% - 20%	> 20%

* Average slope applies to entire landscape surrounding the trail and is not limited to the trail alignment. Landscapes with an average slope of less than 10% should be designed to accommodate ADA requirements.

UD - 2.4.2 (†) Table UD-4 summarizes trail design criteria to be used for the three general accessibility zones described in Table UD-3. All countywide trail routes within the Valley Floor zone should be designed to meet guidelines

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presented in Table UD-4. Trails within Foothills and Mountain zones should be evaluated on a case-by-case basis.

Table UD-4: Summary of Accessible Design Guidelines for Trails⁽¹⁾

Design Component	Accessibility Zone ⁽²⁾		
	Easy Level of Access (e.g. Valley Floor)	Moderate Level of Access (e.g. Foothills)	Difficult level of Access (e.g. Mountains)
Maximum running slope	8.33%	10%	12.5%
Maximum interval of 5' by 5' passing areas	200' (60.0 m.)	300' (99.0 m.)	400' (122.0 m.)
Optimum trail tread	12'-0" (3.7 m.)	6'-0" (1.8m.)	4'-0" (1.2 m.)
Rest area interval	600' (180.0 m.)	900' (275 m.)	optional
Maximum ramp gradient	8.33%	12.5%	15%
Maximum ramp rise to landing	2' (0.6m.)	5' (1.5m.)	6' (1.8m.)
Maximum ramp run to landing	40' (182.0 m.)	40' (182.0 m.)	40' (182.0 m.)
Maximum tread cross-slope	2%	5%	5%
Minimum vertical clearance ⁽³⁾	12' (3.7 m.)	12' (3.7 m.)	12' (3.7 m.)

(1) Based on guidelines developed in cooperation with Federal agencies by PLEA inc.

(2) An Accessibility Zone Map should be developed for each urban service area jurisdiction

(3) Also provides clearance for bicycles.

**UD - 2.5 (†)
Sight Distance**

Clearing widths and trail curvature design should be provided to assure an optimum 100-foot (30.4 m) average sight distance where possible. If sight distances on curves, around hills or through densely vegetated areas are less than 100 feet (30.4 m), safety signs and reduced speed limits should be considered. (See also: Figures S-7 and S-8).

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**UD - 2.6 (†)
Trail
Undercrossings**

Where a countywide trail must pass under a highway bridge, sufficient vertical clear-space and security lighting should be provided to accommodate trail use. Where practical, optimum horizontal dimensions as shown in Figure T-16 should be provided. Where the provision of such spaces is not possible, alternative pavement textures should be provided and safety signs placed on either side of the undercrossing involved to inform trail users of such conditions and the appropriate use conditions to follow, such as reducing speeds or dismounting.

**UD - 3.0
MATERIALS AND
CONSTRUCTION
PRACTICES**

**UD - 3.1
General**

UD - 3.1.1 (†) Machine construction of trails is the most cost-effective in the majority of cases. Hand construction of trails may be necessary where potential impacts to land or habitat resources, and subsequent mitigation costs, would be exacerbated by machine construction.

UD - 3.1.2 Trail development should require the minimum construction necessary to provide for public safety and protect natural and cultural resources.

**UD - 3.2
Construction
Limits
UD - 3.3 (†)
Clearing Width**

Visible evidence of trail construction should be confined to the trail clearing limit.

The minimum horizontal clearing width from physical obstructions varies based on the type of trail but should be no less than 3 feet-6 inches (1.0 m) from the outer limits of the trail tread. Minimum vertical distance from overhanging branches or bridge undercrossings should be 12 feet (3.7 m). (See also: Figure T-3 and T-16).

**UD - 3.4
Trail Surfaces**

UD - 3.4.1 (††)* Where feasible, trail treads should be of materials that are stable, firm, slip-resistant. Surface materials should be of concrete, asphalt, pavers set on concrete, or well-maintained crushed stone.

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**UD - 3.5
Grading
and Drainage**

UD - 3.4.2 (†)* Trail surface appropriate to intended use shall be selected so as to minimize runoff and erosion problems.

UD - 3.5.1* Extent of Grading: No significant grading as defined by local ordinances shall be used for trail construction unless in conjunction with a development project where large-scale grading has been found acceptable by the permitting agencies.

UD - 3.5.2 (†)* Cut and Fill: The degree of cut allowed on a slope depends on the soil type, hardness, and surrounding natural resources. Ultimate cuts shall be contoured to blend with the natural slopes. Berms of earth, rocks or wood on the outside of the trail may be necessary. Steep areas where shall be handled by limited terracing or building steps to avoid large-scale grading. Steps must be reinforced with stone or wood.

UD - 3.5.3 (†)* Soil Disturbance: In order to reduce erosion and maintenance problems during construction, disturbance of the soil surface shall be kept to a minimum.

UD - 3.5.4 (†)* Drainage: Surface water shall be diverted from trails by outsloping the trail tread between 2% and 3%. (See also: Figure T-1).

UD - 3.5.5 (†)* Erosion Control Plans: Where a potential for significant soil erosion exists along a new trail alignment, specific erosion control plans shall be developed by a Registered Civil or Soils Engineer as part of the trail construction documentation. Criteria to be used in determining the erosion potential include: slope; soil type; soil composition and permeability; and the relative stability of the underlying geologic unit as identified on local General Plans or other adopted planning documents.

UD - 3.5.6 (††)* Irrigation Systems: Irrigation systems should not be located within 2' (0.6 m) of the edge of the trail. Irrigation systems for turf areas around a trail should use only a pop-up variety of irrigation head and should be located

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and controlled so that only incidental spray might reach the trail surface and edge to avoid erosion and undercutting of the trail surface (See also: Figures T-4 and T-6).

**UD - 3.6*(†)
Planting of
Disturbed Areas**

Any cut or fill slopes adjacent to the trail shall be immediately reseeded or replanted. Vegetation palettes will vary by location and surrounding landscape context. Within or immediately adjacent to stream zones and Bay waters, criteria that would be used in selecting plant materials include, but are not limited to: indigenous species to the area; habitat value; rate of growth; ultimate size; fire resistance; strength of root system; resistance to pests and diseases; aesthetic characteristics; ability to provide shade; and ease of maintenance. Noxious plants (e.g. Yellow Star Thistle, Giant Reed, and the like) shall be controlled within the trail setting.

**UD - 3.7*
Cultural Resource
Protection**

Trail design shall minimize negative impacts on cultural resources by avoiding grading where such resources are known to exist. Prior to construction, a cultural resource survey by a qualified professional will be made of the trail alignment. Where it is deemed appropriate and use-related impacts can be avoided, trails may be designed to provide access to resources, such as historic sites.

**UD - 3.8 (†)*
Air Quality**

Parking surfaces and trail materials that reduce dust shall be used. Dust suppression techniques, including watering of disturbed lands, should be used to reduce dust during trail construction.

**UD - 4.0
RELATED TRAIL
FEATURES**

**UD - 4.1
Trail Structures**

UD - 4.1.1* Drainage Crossings: Trails crossing creeks and drainages may require a bridge or culvert. Structures over water courses shall be carefully placed to minimize disturbance. Erosion control measures shall be taken to prevent erosion at the outfalls of drainage structures. (See also: Figure T-17).

UD - 4.1.2(†) Trail Bridges: Bridges should be a minimum of 12 feet (3.7 m) wide and structurally capable of carrying maintenance vehicles. All bridges

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should have minimum 4'-8" (1.4 m) high railings when necessary. Fill over culverts, at a minimum, should equal the trail and shoulder widths combined. Bridge footings should be constructed outside of the stream's top of bank whenever possible. (See also: Figures T-17).

UD - 4.1.3 Hardware: All trail structures should be designed to be as vandal-proof as possible. Rounded framing members and recessed bolt heads and other hardware should be used for safety.

UD - 4.1.4 (††) Retaining Walls: Retaining walls parallel to trails are generally discouraged. Where necessary, they should be signed as a hazard. If the trail is located on top of the retaining wall, a railing and pavement safety striping should be provided. If the trail is located below the retaining wall, pavement safety striping should be provided (See also: Guideline UD - 4.11.2 and Figure T-19).

UD - 4.2
Access Controls
and Safety Barriers

UD - 4.2.1 (††)* Where it is demonstrated that it is necessary to prevent motor vehicles from entering the trail, bollards and/or metal gates shall be used at any trail crossing of a public road right-of-way or at any trail staging area. Otherwise, even if gates may be present, gates should remain open. The design of gates and barriers should recognize the intent of the American With Disabilities Act (ADA). If sight distance to barrier posts or gates is limited, warning signs should be provided an optimum of 100 feet (30.4 m) before the post or gate. (See also: Figures T-9, T-10, T-11 and S-9).

UD - 4.2.2 (†)* Safety barriers, grade separations, and/or barrier plantings shall be provided to separate trail routes located parallel to streets and roads. Provide an optimum of at least 8 feet (2.4 m) clearance between trails and motorized travel lanes. If a 5 feet (1.5 m) minimum clearance it is not possible then safety barriers should be installed between the motorized travel lands and the trail. (See also: Figures T-4, T-5A, T-5B and T-18).

UD - 4.2.3 (††) If used, gates installed for trail users should be a minimum of 5 feet (1.5 m) in width, 4 feet-6 inches (1.4m) high, and able to be easily closed or

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self-closing. Reflectors should be installed on gates. The design of should recognize the intent of the American With Disabilities Act (ADA).

UD - 4.2.4 (††) Where electronic controls are not used, combination locks should be used on gates.

UD - 4.3
Signs**

UD - 4.3.1 (††) Sign Types: Six types of signs should be considered in design and management plans for each countywide trail. These include:

- **UD - 4.3.1.1 (††)* Regional Trail Entrance Signs:** Signs that announce the trail and that are visible from nearby parking/staging areas. Regional Trail Entrance signs are placed at the beginning or entrance to the trail an optimum of 10 feet (3.0 m) away from the trail shoulder. Pedestrian access to the sign should be provided to accommodate all users. (See also: Figures S-1 and S-4).
Information presented on Regional Trail Entrance signs can include: applicable use and management regulations with references to appropriate governing ordinances; accessibility conditions and other ADA-related information; water availability along the trail, litter control; the presence of private property along the trail route and/or any special land use considerations; restrictions on smoking and/or use of matches or lighters during high fire season and other rules and regulations.
- **UD - 4.3.1.2 (††)* Trail Entrance Bollards and Use Control Signs:** Signs that portray the name of the trail and the types of trail use that are not appropriate for the trail. All countywide trails are intended to be shared-use trails, accommodating all types of trail users. Where a local jurisdiction determines that this is not the case, use signs should indicate the type of trail user that is not permitted on the trail. Use signs should generally be placed within 25 feet (7.6 m) of a trail intersection with another trail, intersections with roads and sidewalk access points, or near parking areas (See also: Figures S-1 and S-5). Other signs that could be included near to trail entrances include information about neighborhood

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programs that are working to discourage criminal behavior such as “Neighborhood Watch” and “Adopt-A-Trail” signs.

- **UD - 4.3.1.3(††) Trail Mile Marker and Directional Signs:** Signs that provide information to the trail user about trail names, distances along the trail, and distances to points of interest. Mile markers can be provided independently from information about points of interest. It may not be appropriate to use mile markers on all trails. If used, mile marker signs should be placed at regular intervals, such as every 1/2 mile (0.8 km), and be based on distinct beginning and ending points of the trail. (See also: Figures S-1 and S-6).
- **UD - 4.3.1.4(††) Trail Regulatory Signs:** Signs that provide information to trail users about rules and regulations that affect trail use such as: the need to stop; reduce speed; dismount and walk bicycles; trail endings; use restrictions during the fire season; and the hierarchy of yielding among trail users. If sight distances on curves, around hills or buildings or through densely vegetated areas are less than 100 feet (30.4 m), reduced speed limits should be considered. Where a trail must pass under a bridge and optimum horizontal dimensions of 12 feet (3.7 m) is not possible, safety / regulatory signs should be used to reduce speeds or dismount if necessary. (See also: Figures S-1 and S-8).
- **UD - 4.3.1.5(††) Trail Safety Signs:** Signs that display warnings of such items as upcoming obstacles, street intersections, blind curves, vertical clearances and special wildlife conditions. If sight distances on curves, around hills or buildings or through densely vegetated areas are less than 100 feet (30.4 m), safety signs should be considered. Where a trail must pass under a bridge and optimum horizontal dimensions (See also: Figure T-16) are not possible, safety signs should be placed on either side of the undercrossing involved to inform trail users of such conditions. (See also: Figures S-1 and S-9).

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- **UD - 4.3.1.6(††) Roadway Regulatory or Safety Signs:** Signs that serve as caution signs used to alert vehicles on the street system about an upcoming trail crossing or regulatory signs used at intersections where typical crosswalks or signal controls are not sufficient to safely manage traffic/trail conflicts (See also: Figure S-10). Roadway regulatory or safety signs generally are placed erect in the standard position on the right of road; 250 feet to 750 feet (76.2 m to 228.6 m), dependent upon traffic speeds, in advance of a trail crossing.
- **UD - 4.3.1.7(††) Private Property Signs:** Signs that are posted at regular intervals in conformance with legal requirements to remind the trail user not to trespass.
- **UD - 4.3.1.8 (††)* Interpretive and Protective Signs:** Signs indicating natural resource or historical points of interest or sensitive areas. Signs would be designed to identify specimen habitat types and to be educational by briefly describing resource characteristics and values.
- **UD - 4.3.1.9(†) Regional Signs:** Signs posted at strategic locations along the local freeway and street system to direct regional traffic to staging areas and away from neighborhoods which may have trail access points but do not have sufficient parking to accommodate regional use.

UD - 4.3.2(††) Sign Placement: Specific location of signs should be determined in the field and should, where applicable, reference the following standards:

- California State Department of Transportation. *Highway Design Manual (HDM); Chapter 1000 - Bikeway Planning and Design; Topic 1004 - Uniform Signs, Markings and Traffic Control Devices.*
- U.S. Department of Transportation, Federal Highway Administration, Office of Highway Safety. *Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways.*

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UD - 4.3.2(††) Sight Distance to Signs: Trail signs should be located such that they are in clear view for an optimum distance of 100 feet (30.4 m). If sight distances on curves, around hills or buildings, or through densely vegetated areas are less than 100 feet (30.4 m), safety signs and reduced speed signs should be considered.

**UD - 4.4*
Potable Water**

Potable water for trail users will be provided at regional staging areas (vs. neighborhood access points) and, ideally, at least every 5 miles (8.0 km) along Regional Trails. Trail routes where no potable water is available for a interval greater than 5 miles (8.0 km) will be posted with safety signs indicating such conditions.

**UD - 4.5
Non-Potable Water**

Water for domestic animals permitted on the trail should be provided at staging areas and, where possible, at an optimum of 5-mile (8.0 km) intervals.

**UD - 4.6*
Sanitary Facilities**

Sanitary facilities shall be located at all trail-specific staging areas. Where necessary, based on anticipated types and volumes of use, sanitary facilities shall be located along trails where they can be easily accessed and maintained.

**UD - 4.7(†)
Benches**

Benches for resting should be provided at regular intervals within 1/2 mile (0.8 km) of staging areas and intermittently along all trail routes at places with aesthetic qualities, viewpoints, and particularly at the end of any long uphill stretches.

**UD - 4.8(†)
Stream and
Shoreline Access
Points**

In the detail design of any trail alignment parallel to a freshwater stream zone or the Bay shoreline, access points should be identified for environmental education and interpretive programs. Such access points should be sited in coordination with the California Department of Fish and Game, the U.S. Army Corps of Engineers, SCVWD, and other jurisdictional agencies as appropriate.

**UD - 4.9 (†)*
Fire Suppression**

During preparation of design plans for specific trail alignments, the implementing agency should:

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- review, in conjunction with the local fire protection services, available water sources at staging areas and/or along the trail, and provide for "draft" systems to allow fire suppression equipment access to emergency water supplies; and
- to the maximum extent feasible, select plant materials and/or seed mixes utilized at staging areas or along trails for their low maintenance and drought and fire resistant characteristics to minimize additional fuel available.

UD - 4.10*
Emergency
Telephones / Call
Boxes

Along trails located outside of public parks and along trails that pass through relatively isolated areas or private lands, consider installing solar-powered emergency telephones at regular intervals that generally do not exceed one mile (1.6 km) in distance. Where practical, locations should coincide with emergency access points and/or helicopter landing sites.

UD - 4.11
Pavement
Markings

UD - 4.11.1(††) Centerline Striping: Painted, 4-inch-wide (100 mm) yellow centerline stripes should be used along paved trails. Solid centerline stripes should be used where there is heavy use, on curves greater than 100 feet long (30.4 m) with restricted sight distances, and where the path is unlighted and nighttime riding is expected. Dashed stripes should be used where there is heavy use and where sight distances are greater than 100 feet (30.4 m). Dashed stripes to be an optimum length of 3 feet (0.9 m) with 9-foot (2.7 m) spacing. (See also: Figure T-19).

UD - 4.11.2(††) Edge Striping: If a paved trail is contiguous with a continuous fixed object (e.g. retaining wall, fence, building facade), a 4-inch-wide (100 mm) white edge stripe, 1 foot (0.3 m) from the fixed object, shall be provided to minimize the likelihood of a bicyclist or skater hitting it. (See also: Figure T-19)

D - 4.11.3(††) Pavement Markings / Signing: Pavement signing is generally discouraged for maintenance reasons. Exceptions include:

- providing safety markings around bollards

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- identifying locations along the trail where users should stop

(See also: Figures T-10 and T-14)

D - 4.11.4 (††) Trail / Street Crossings: Where a countywide trail route crosses a road or street, trail crossing markings should be painted on the street. Trail crossings should be a minimum of 18 feet (5.5 m) wide and painted in two colors to clearly separate them from a typical pedestrian crosswalk.

**UD - 4.12(††)
Curb Cuts**

Where a countywide trail route enters a road or street, curb cuts should be provided that are at least as wide as the width of the trail. A vertical lip from the trail to the street gutter should be avoided. If a lip is deemed necessary, the height should be limited to 1/2 inch (15 mm).

**UD - 4.13(††)
Drainage Grates
and Utility Covers**

Drainage inlet grates, manhole covers, etc., on countywide trails should be designed and installed outside the trail tread wherever possible. Where this is not feasible, warning signs should be posted to warn skaters and wheelchair users of impending hazard. The grates should be maintained flush with the surface when resurfacing. Drainage inlet grates should have openings narrow enough and short enough to assure bicycle tires should not drop into the grates (e.g. reticuline type), regardless of the direction of bicycle travel. Where it is not immediately feasible to replace existing grates with standard grates designed for trail uses, 1 inch x 1/8 inch (25 mm x 6 mm) steel cross straps should be welded to the grates at a spacing of 6 inch x 8 inch (150 mm x 200 mm) on centers to reduce the size of the openings.

**UD - 4.14(††)
At-grade Railroad
Crossings**

Whenever it is necessary to cross railroad tracks, the crossing should be at least as wide as the trail. Wherever possible, the crossing should be straight and at right angles to the rails. Trail pavement at rail crossings should optimally be concrete or synthetic rubberized materials and should be maintained so ridge buildup does not occur next to the rails. All railroad crossings are regulated by the California Public Utilities Commission (CPUC). All new bike path railroad crossings must be approved by the CPUC. Necessary railroad protection should be determined

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- * Guideline serves as a mitigation measure to reduce an environmental impact.

based on a joint field review involving the applicant, the railroad company, and the CPUC.

**UD - 4.15(††)
Lighting**

Lighting along countywide trails is discouraged with the following exceptions:

- where required as part of commuter corridors (e.g. light trail during winter months from 5 AM to 7 AM and 4:30 PM to 8 PM);
- at trail undercrossings of streets; (See also: Figure T-16)
- where the trail use could be anticipated to be significant at night, such as passing through downtown commercial and entertainment areas;
- where the trail parallels lighted streets and roads; and
- at street intersections and street crossings.

**UD - 4.16(††)
Traffic Signals**

For safety, trail crossings of streets may be signalized. This would consist of either a normal traffic signal or a lighted, flashing caution sign that would be activated by the trail user using pedestrian push buttons, bicycle loop detectors, or other means as appropriate. Based on traffic flows, consideration should be given to sequencing traffic lights to stop all vehicular traffic for trail users, or to allow for movement by trail users prior to movement by vehicular traffic. (See also: Figures T-12A, T-12B, T-13A and T-14)

**UD - 4.17(††)
Traffic Calming**

For safety, where a trail crosses a street or street intersection, consideration should be given to street designs that incorporate traffic calming techniques including, but not limited to, right-turn slip lanes and curb bulb-outs as well as mid-street crossing refuge islands for trail users. (See also: Figures T-12A, T-12B, T-13A and T-14)

**UD - 4.18(††)
Trash Receptacles**

Trash receptacles should be provided at all staging areas beyond the beginning point of a trail where they are accessible to maintenance vehicles but not accessible to public vehicular access. Where determined as necessary from a management perspective, trash receptacles should be placed along a trail at regular intervals of 1/8 mile (0.2 km).

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USE AND MANAGEMENT GUIDELINES

UM - 1.0 GENERAL USE CONDITIONS

UM - 1.1 Day-use Management (††)

UM- 1.1.1 Countywide trails in urban areas are intended for day-use only except when within a public road right-of-way or located within lighted, urban commercial and entertainment areas.

UM - 1.1.2 (†)* Staging Areas shall be managed as day-use facilities. If necessary, access gates or removable bollards to Staging Areas shall be secured during nighttime hours by the managing agency. Where Staging Areas are outside of public parks, such as associated with Community Colleges or private lands, individual management agreements shall be developed for joint operations of facilities. Specific management plans shall be prepared for individual countywide trail staging areas and reviewed periodically.

UM - 1.2 Trails and Trail Users (†)

Shared use on trails is encouraged (See also: Figure T-1). Trail uses should be consolidated where safe within the same trailway, depending on the steepness, available right-of-way, user frequencies, and other conditions. Where it is appropriate and/or necessary to limit use on one trail bed, limited-use and single-use trails should be kept separate and clearly signed.

UM - 1.3 Trail Use Restrictions

UM - 1.3.1 User Types: Where a trail is restricted to a particular type of user(s), the trail should be clearly designated as such and shall be equipped with use signs and barriers, as appropriate, to discourage unauthorized use. (See also: Figure S-5).

UM - 1.3.2 Use Conditions: Where a trail, surrounding habitat, or adjacent land use condition warrants special notice limiting trail use, the trail should be clearly designated and should be equipped with use signs and appropriate barriers to

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discourage unauthorized use. Examples of limited use conditions include, but are not restricted to: seasonal, daily, or hourly use periods; and requirements for special-use permits. (See also: Figures S-9 and S-11)

**UM - 1.4
Trail Closure**

UM - 1.4.1 (†)* Reasons for trail closure include, but are not limited to: trail construction, major repair, or seasonal maintenance; seasonal periods critical to special status species; high fire season; hazardous conditions (e.g. landslide or washout); periods of flooding or extremely wet weather where such weather renders the trail dangerous or where use would damage the trail; where overuse threatens resource values; special events; or where adjacent land uses may present unsafe conditions that could affect the trail user. Trail closures may be for all uses or for specific types of trail use based on the circumstances present at the time, including failure to properly maintain the trail. (See also: Figures S-9 and S-11)

UM - 1.4.2 (†)* In incorporated urban areas, the local managing agency shall decide whether or not to close segments of countywide trails. If the affected trail or trail segment remains closed for longer than ninety days, the disposition of the trail will be reviewed with other participating agencies, Commissions, Councils and Boards.

UM - 1.4.3 (††)* Notice of trail closure shall be posted at all trail entrances and staging areas. Barriers shall be placed at strategic points where feasible. Trail closure notices should include the reason(s) for the closure. Where possible, alternate travel routes to the trail should be posted.

UM - 1.4.4 (†) If a trail is closed for an extended period of time (beyond two weeks) trail closure notices should include: the reason(s) for the closure; what steps should be taken to correct the problem; an estimate of how long the trail should be closed; and a telephone number to call for further information.

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UM - 1.4.5(††) Trail closures should be as short in duration as possible. Where there is construction along trails or a trail is being repaired, such activities should, where possible, be timed to permit use of the trail during normal commute hours, on holidays, and on weekends. Prior to opening a trail that is either closed or associated with construction/repair activities, the local managing agency should make a determination that there is no danger to public safety or potential long-term adverse effects on the trail setting before noticing the trail as reopened.

UM - 1.4.7(†)* The local managing agency shall collaborate with local fire departments on the specific criteria used for procedures to temporarily close trails during high fire conditions and with the Santa Clara Valley Water District during flooding periods.

UM - 2.0
PRIVATE ACCESS
TO PUBLIC
TRAILS

UM - 2.1* Except where trail routes cross driveways and front entry walks, no private access to countywide trails or gates within continuous fencing/walls along the property line or trail easement shall be permitted without prior written authorization from the appropriate jurisdiction. A bond may be required by the jurisdiction in the amount of the actual costs to reclaim the private access in the event the access is abandoned.

UM - 2.2* Criteria that shall be used to evaluate the appropriateness of private access to public trails includes: visibility of access points; self-closing and self-locking features of gates; route alignment between the entry point and the actual trail tread; and maintenance costs and responsibilities.

UM - 3.0 (††)
TRAIL
MONITORING AND
MAINTENANCE

A level-of-service approach should be used by the managing agency to operate and maintain trails. Table UM -1 provides a general management framework for normal trail-related stewardship activities.

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UM - 3.1*
Annual
Maintenance

A yearly inventory of all trail maintenance, including drainage, vegetation clearing, signing, surfacing, need for graffiti removal, and repair of structures, gates, fences, and barriers shall be done in early spring, prior to the heavy summer use period. Based on maintenance reports, trails shall be subject to closure or repair as warranted.

UM - 3.2 (†)*
Trail Closures

Short segments of trails may require permanent re-routing, due to landslides, washouts, or other problems. The managing agency should determine when such re-routing is necessary. Temporary closure, and appropriate safety signs should be posted. If a new permanent route is constructed, the original route should be closed to use and reclaimed.

UM - 3.3
Clearing the Trail

Vegetation growth should be cleared and obstacles should be removed where necessary on an as-needed basis. Good pruning practices along trails should be followed. (See also: Figures T-3; T-4; and S-4). Noxious plants (e.g. Yellow Star Thistle) should be controlled along the trail in a timely manner.

UM - 3.4*
Clearing
Inspections

Within the trail clearing limit, understory grasses and herbaceous annuals shall be inspected annually during the early summer months and prior to the fire season and, where appropriate, mowed. (See also: Figures T-1, T-4 and T-6).

UM - 3.5*
Corrective Erosion
Control

Corrective work for drainage or erosion problems shall be performed within a reasonable period of time. Where necessary, barriers to prevent further erosion shall be erected until problems are corrected. Missing or damaged signs shall be replaced as soon as possible. Damaged structures shall be repaired as soon as possible. Damaged gates, fences and barriers shall be replaced as soon as possible. Trails shall be closed if corrective work can not be accomplished within a reasonable time frame. If monitoring reveals that undesirable soil compaction is occurring in sensitive habitats adjacent to trails, erection of barriers or other appropriate measures will be employed as needed to discourage off-trail use.

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- UM - 3.6 (†)**
**Sweeping and
Regrading** Paved trails should be swept periodically to keep them free of loose gravel, debris, broken glass and other litter. Damaged pavement should be replaced as soon as possible. Unpaved shared-use trails should be graded as necessary to maintain smooth surfaces.
- UM - 3.7 (††)**
Casual Trails Casual trails and trail shortcuts that present ongoing unsafe conditions to the trail user or cause other management problems, such as affecting habitat areas, should be barricaded from access and, if appropriate, covered with natural materials to visually camouflage the path.
- UM - 3.8* (†)**
**Monitoring
Habitat Areas** Periodic monitoring of known sensitive habitats near trails will be conducted to determine if unacceptable soil compaction is occurring and remedial action should be initiated. Sensitive habitats include: Salt/Brackish Marsh; Riparian; Wetlands; Serpentine; and Oak Woodland.
- UM - 4.0 (†)***
**TRAIL
RECLAMATION** Should there be an event that necessitates the permanent closure of a countywide trail, a management program to rehabilitate the trailway will be developed. Along rivers and streams, a reclamation program shall include disking and replanting the former trail to a natural condition, and/or sufficiently blocking the trail with barriers to effectively prohibit use. Best management practices shall be used for all grading activities to keep silt from entering a stream channel.
- UM - 5.0**
**TRAIL PATROL
AND
INFORMATION**
- UM - 5.1(†)** The local managing agency has responsibility for revising existing sign information to show up-to-date trail information. If trail maps are developed about countywide trails within the jurisdiction they should include trail use rules, emergency information, trail accessibility, and other pertinent information.
- UM - 5.2(†)** The local managing agency has responsibility for patrolling portions of countywide trails within that agency's jurisdiction whether by staff, by contract with related agencies, or approved volunteer groups. On trails which

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extend through more than one jurisdiction, cooperative agreements with appropriate agencies should be formed for trail patrol and maintenance activities.

UM - 5.3(†)* Where shared-use trails pass through multiple jurisdictions, trail-specific bicycle patrols by the participating agencies or by contract with the other agencies are encouraged.

UM - 5.4(†)* Along heavily-used trails, traffic counters should be installed to determine needed changes in patrols based on usage. Information gained from traffic counters should be shared with local police departments, the County Sheriff's office and other participating agencies.

UM-5.8(††) Trail Supervision: A level-of-service approach should be used by the managing agency to patrol and supervise trails and provide security. Table UM -1 provides a general management framework defining typical levels of service for normal trail-related oversight activities.

UM - 5.8.1(†)* Minimum Presence: All countywide trails shall be patrolled to assure that they are safe and usable. A level-of-service approach shall be used by the managing agency, such that trails receive routine attention commensurate with that provided to that agency's public parks. Objectives of trail inspections shall be trail safety and security, adjacent private property security, code enforcement, visitor information and education, litter control, and minor maintenance. (See also: Table UM -1).

UM - 5.8.2(†)* Use of Volunteers: To the extent feasible, certain aspects of trail supervision, such as trail safety and security, litter control, and information and education should be accomplished by volunteers. In any event, local managing agency personnel shall inspect the trails as outlined above.

UM - 6.0*
STAFFING

Prior to developing and opening a countywide trail to public use, a trail management plan that identifies the level of personnel needed to operate and

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maintain the trail relative to the above guidelines shall be prepared by the lead agency(ies). Criteria to be included in the trail management plan include, but are not limited to:

- anticipated types and levels of use
- availability of police and fire protection
- trail patrols
- annual maintenance requirements
- emergency management allotments
- management agreements with other agencies
- anticipated use of volunteers or contract services

Prior to opening for public use, funding for a trail's maintenance in terms of staffing and equipment should be identified and obtained for the first fiscal year of a new trail's operations. (See also Table UM-1 and Generalized Cost Section: Table C-3)

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TABLE UM-1: GUIDELINE FOR ESTABLISHING LEVEL OF SERVICE FOR INSPECTIONS AND MAINTENANCE

TRAIL TYPE	OPTIMUM FREQUENCY OF INSPECTION ⁽¹⁾			
	Seasonally		Quarterly	Regularly ⁽²⁾
High Volume Use / Urban Experience (See Table 1)	Summer / Fall	Spring		

General

Inspection				•	
Empty trash; remove graffiti (within two days of discovery); collect litter; service restrooms; refill pet pooper-scooper dispensers				•	
Repair and clean lights; remove fallen trees, limbs, and debris on trail				•	as needed for hazard abatement
Repair trail furniture (benches, trail drinking fountains, telephones, etc.)			•		as needed for hazard abatement
Sweep trail		•		•	as needed for hazard abatement
Clean, repair culverts and drains	•			• ⁽³⁾	
Perform drainage and ditch work	•			• ⁽³⁾	
Perform major storm damage, washout, erosion repairs; and annual grading	•			• ⁽³⁾	as needed for hazard abatement
Clear / brush vegetation adjacent to trail to provide needed horizontal and vertical clearance and to improve sight lines		•			as needed for hazard abatement
Mow turf / vegetation adjacent to trail				•	
Weed control in trail tread		•			as needed for hazard abatement
Repair pavement (cracks and potholes)		•			as needed for hazard abatement

- (1) Indications are general guidelines regarding timing of inspection and maintenance activities; use of the word “optimum” means the best or most favorable condition for a particular trail situation from the perspective of responsible management; should any reports by trail users be made about unsafe conditions, these should be responded to immediately. Typical dates for inspections are:
- Seasonally - Summer / Fall: to be conducted during the dry season before October 15
 - Seasonally - Spring: to be conducted after seasonal rains have diminished
- (2) Regularly means on a routine basis as needed to provide a safe, clean environment similar to local public parks.
- (3) As needed during seasonal rain period

TABLE UM-1: GUIDELINE FOR ESTABLISHING LEVEL OF SERVICE FOR INSPECTIONS AND MAINTENANCE

TRAIL TYPE	OPTIMUM FREQUENCY OF INSPECTION ⁽¹⁾				
	Seasonally		Quarterly	Regularly ⁽²⁾	Special Condition
High Volume Use / Urban Experience (See Table 1)	Summer / Fall	Spring			
Repair /replace fences, gates, bollards			•		as needed for hazard abatement
Test / repair traffic signal controls; emergency call boxes			•	•	as needed for hazard abatement
Monitor habitat areas (riparian zones and Bay marshes) relative to user impacts / provide protective fencing if necessary	•	•			
Monitor unauthorized encroachments			•		

Signs / Pavement Markings:

Upkeep of centerline stripes / other pavement markings		•		•	
Repair / replace regulatory and safety signs				•	
Update information panels				•	
Post / Remove “Storm Damage Signs”		•		• ⁽³⁾	
Post / Remove “No Fireworks” Signs					mid June / mid July

- 1) Indications are general guidelines regarding timing of inspection and maintenance activities; use of the word “optimum” means the best or most favorable condition for a particular trail situation from the perspective of responsible management; should any reports by trail users be made about unsafe conditions, these should be responded to immediately. Typical dates for inspections are:
- Seasonally - Summer / Fall: to be conducted during the dry season before October 15
 - Seasonally - Spring: to be conducted after seasonal rains have diminished
- (2) Regularly means on an as needed basis
 (3) As needed during seasonal rain period



RECOMMENDED USE ORDINANCES

In order to provide the trail user with consistent expectations and a sense of trail rules continuity about countywide trails, the following ordinances are recommended for incorporation into local codes by all implementing agencies.

TRAIL USE

- Use of motorized vehicles on countywide trails shall be prohibited, except for wheelchairs, maintenance vehicles, and emergency vehicles.
- Use of countywide trails, except for maintenance and emergency vehicles, shall be limited to the prepared trails, bridges, boardwalks or other surfaces designated for such purposes.
- Restricting particular trail use from a countywide trail shall be accompanied with readily evident signs or other public information posted at all major trail entrances.

SPEED LIMITS

- Use of countywide trails, except in the case of emergency vehicles, shall be restricted to a maximum speed of 15 mph or less as otherwise clearly posted at all entrances and/or along an individual trail.

AVOIDANCE OF TRAIL USE CONFLICTS

- No person shall operate a bicycle or other wheeled apparatus on a countywide trail:
 1. In a negligent, unsafe or reckless manner or in any way that endangers any person or property;
 2. At a speed that is greater than is reasonable or prudent, having due regard for weather, visibility, the traffic volume, and the trail surface and width; or at a speed that endangers the safety of persons or property.
- No person shall operate a bicycle on a countywide trail in violation of any applicable provision of the California Vehicle Code.
- A person on skates, operating a bicycle or other wheeled apparatus on a countywide trail (except wheelchairs) shall yield to all equestrians and hikers who are crossing the trail. When approaching equestrians or hikers from the rear, the person on wheels shall audibly warn of his or her presence and, when passing, exercise due care.

PERSONAL SAFETY

All persons operating a bicycle or traveling on roller-skates or in-line skates on a countywide trail must wear an ANSI, Snell, or other State-approved helmet for head protection.

PETS Unless otherwise posted at entrances or along a countywide trail:

- Dogs or other pets allowed on countywide trails shall be controlled by a leash which is not more than six feet (9.7 m) in length. It is the pet owner's responsibility or the individual who has the custody or care of the dog or other animal to ensure that the animal does not interfere with, bother, or harass trail users, other animals, wildlife or trail resources; such conduct constitutes a public nuisance.
- Each pet shall be properly licensed and proof of such license shall be present on the animal or with the animal's attendee.
- A person shall, in the event that his or her dog or other animal defecates on the trail property, remove the defecation from the trail and place it in a proper receptacle.
- Designated employees of the _____ (insert jurisdiction) may require the owner or caretaker to remove the animal from the trail if the animal poses a threat to public safety and welfare or creates a public nuisance. If the owner or caretaker does not remove the animal, then the designated employee: (1) may issue a citation to the owner or caretaker; and (2) may remove or cause removal of the animal from the trail area.



GENERALIZED COSTS

BASIC TRAIL FEATURES

DEVELOPMENT COSTS

Costs of constructing trails in urban areas are widely disparate. Construction costs vary, in large part based on the level of design sophistication involved. A parallel should be drawn between the costs of constructing a paved trail and the costs of constructing a one-lane roadway. Table C-1 outlines features that should typically be included in a projection of development costs for constructing a trail. Also shown are additional items that may need to be included in cost projections based on the circumstances involved with a particular trail alignment.

Basic costs for urban, shared-use trails as outlined on Figure T-1 are outlined in Table C-2.

MANAGEMENT COSTS

Costs of trail operations and maintenance include a variety of functions in addition to the routine maintenance activities listed in Table UM -1. Table C-3 identifies a series of activities in addition to routine maintenance that should be taken into consideration when authorizing and funding a countywide trail or segment of countywide trail.

TABLE C-1: ITEMS TO BE INCLUDED IN DEVELOPMENT COST PROJECTIONS FOR URBAN TRAILS

BASIC URBAN TRAIL DEVELOPMENT ITEMS	RELATED ITEMS
<ul style="list-style-type: none"> • Planning fees • Environmental Analysis and Documentation fees • Engineer / Property line survey • Soils analysis • Design fees • Construction administration fees • Contractor start-up and clean-up costs • Trail <ul style="list-style-type: none"> • Grading and drainage • Paved trail tread • Shoulder materials • Striping • Signing <ul style="list-style-type: none"> • Entrance • Identity • Mile markers • Management / Safety • Gates / Access barriers • Benches • Trash receptacles • Drainage / Erosion control • Drainage crossings • Planting and irrigation • Specialty features ⁽¹⁾ 	<ul style="list-style-type: none"> • Fences and walls • Potable water and drinking fountains • Non-potable water • Emergency call boxes • Lights • Bridges • Undercrossings • Restrooms • Habitat Mitigation <ul style="list-style-type: none"> • Land acquisition • Design fees • Planting and irrigation • Monitoring / maintenance • Interpretive displays and specialty signing • Trail / street intersection modification • Staging / parking areas

(1) Specialty features would include such items as retaining walls, sound or barrier walls, fences, bridges, freeway overcrossings and undercrossings, street intersection modifications, or habitat mitigation

TABLE C-2: BASIC URBAN TRAIL CONSTRUCTION COSTS⁽¹⁾

TRAIL TYPE	COST PROJECTION 1-MILE SEGMENT ⁽²⁾	
	LOW	HIGH
Paved Trail w/o landscaping (see Figure T-1, Section A)	\$ 350,000 / mile	\$ 450,000 / mile
Paved Trail w/ turf or landscaping within surrounding corridor (see Figure T-1, Section B)	\$900,000 / mile	\$1,000,000 / mile
Combination Paved Trail and Unpaved Jogging Trail w/o landscaping (see Figure T-1, Section C)	\$ 450,000 / mile	\$ 550,000 / mile

- (1) See Table 1, Column 1: Basic Trail Development Items
 March, 1999 costs. This projection is preliminary and for planning purposes only and is subject to change. This projection uses normal trail construction costs based on industry standards and is not based on such considerations as might be discovered through detailed engineering/topographic surveys, soil analysis, title reports, or unusual habitat or sub-surface conditions. Costs may also vary based on regional fluctuations in the construction industry in terms of labor availability and labor rates
- (2) Costs shown do not include “Specialty Items” as shown in Table 1. Such items could significantly increase the cost of constructing an urban trail. For example, bridges over streams that could be used for maintenance vehicles could range from \$150,000 to \$350,000 depending on the length, width and structural requirements. Freeway overcrossings for a trail could cost from between \$1,000,000 to \$1,500,000 or more depending on the design employed. Modification of a signalized intersection to accommodate a trail crossing could be between \$40,000 and \$80,000 per intersection.

TABLE C-3: GUIDELINE FOR ESTABLISHING TRAIL OPERATIONS AND MAINTENANCE COSTS ⁽¹⁾

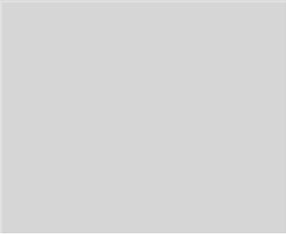
GENERALIZED JOB DESCRIPTION	Administrat or & Professional	Office Assistant	Ranger / Police	Maintenan ce Supervisor	Maint. Worker II	Maint. Worker 1	Groundskee per	Seasonal Temporary	Volunteer
TYPICAL SALARY RANGE (1)			\$65,000 to \$95,000	\$ 40,000 to \$ 60,000	\$ 35,000 to \$ 50,000	\$ 30,000 to \$ 50,000	\$ 30,000 to \$ 40,000	\$ 20,000 to \$ 25,000	

ACTIVITY

Routine Patrol And Surveillance (See Table UM-1)			•	•	•	•		•	•
General Maintenance (See Table UM-1)					•	•	•	•	•
General Administration	•	•							
Special Event Programming	•		•	•					•
Public Outreach	•	•							
Purchasing		•		•					
Budgeting / Account Management	•			•					
Volunteer Coordination	•	•							•
User Surveys	•	•	•						•
Monitoring Encroachments (Authorized And Unauthorized)	•		•	•					•
Interagency Meetings And Agreements	•	•							

TABLE 1: TRAIL EXPERIENCE LEVELS

- (1) Typical salary ranges shown represent average costs experienced in 1999 in Santa Clara County. Actual salaries will vary depending upon jurisdiction.



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PARTICIPANTS AND REPORT PREPARATION

These guidelines were prepared for the Santa Clara County Interjurisdictional Trails Committee that included participation from the following agencies:

Municipal Agencies

City of Campbell
City of Cupertino
City of Gilroy
City of Los Altos
Town of Los Altos Hills
Town of Los Gatos
City of Milpitas
City of Monte Sereno
City of Mountain View
City of Morgan Hill
City of Palo Alto
City of San Jose
City of Santa Clara
City of Saratoga
City of Sunnyvale

County and Regional Agencies

Midpeninsula Regional Open Space District
San Francisco Bay National Wildlife Refuge
Santa Clara Valley Water District
Santa Clara County, Parks and Recreation
Santa Clara County, Roads and Airports
Santa Clara Open Space Authority
State of California, Department of Fish and Game
State of California, Coe State Park
State of California, Department of Transportation
State of California, Portola Redwoods and Castle Rock State Parks
Valley Transportation Authority

Other Agencies and Organizations

Association of Bay Area Governments, The Bay Trail Project
Bay Area Ridge Trail Council
National Park Service, San Juan Bautista de Anza Trail
San Jose Water Co.

Committee coordination and report preparation was provided by the following:

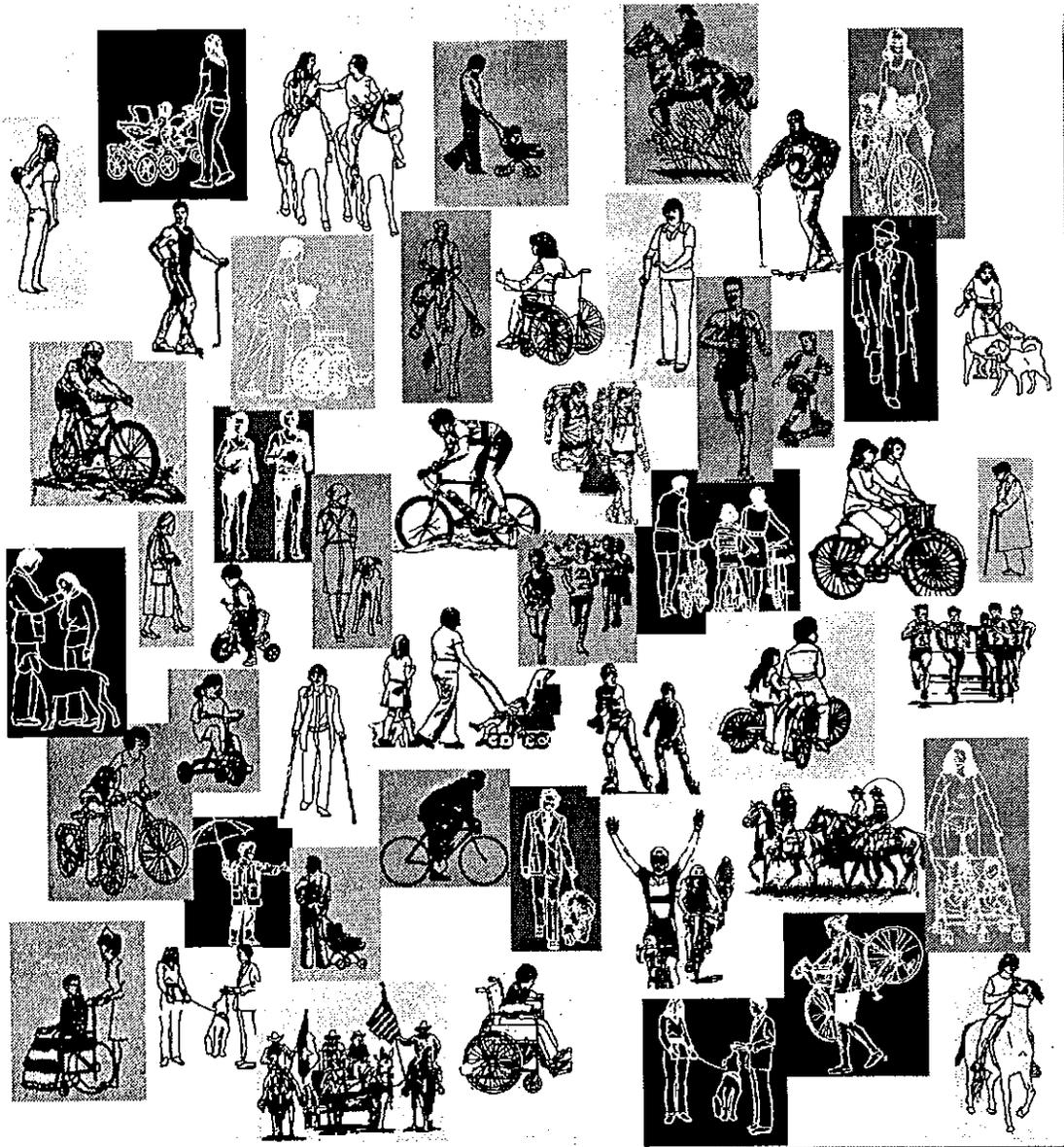
Julie Bondurant, Park Planner
Santa Clara County
Parks & Recreation Department
298 Garden Hill Drive
Los Gatos, California 95032

Patrick T. Miller, Partner
2M Associates, Landscape Architecture and Planning
Box 7036
Landscape Station
Berkeley, California 94707

Questions about these guidelines should be directed to the Santa Clara County
Parks & Recreation Department at (408) 358-3741.



Trail Design Guidelines



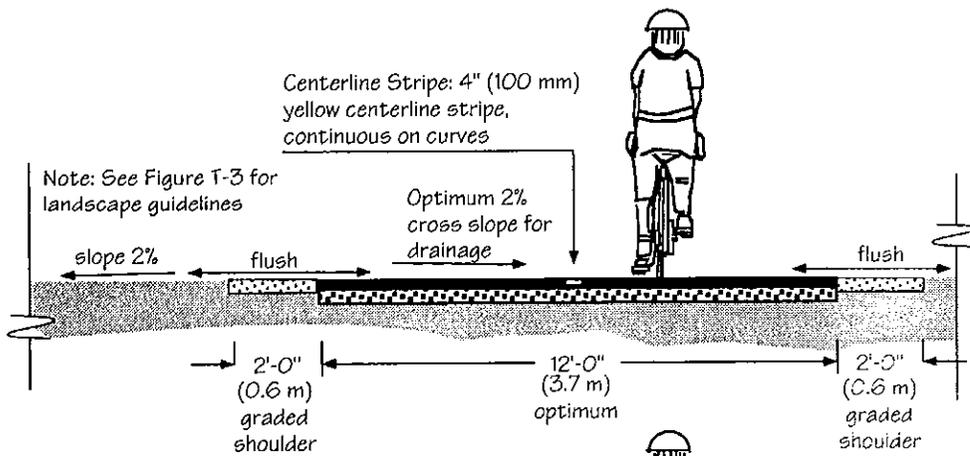
Uniform Interjurisdictional Trail Design, Use, and Management Guidelines

*Santa Clara County
Interjurisdictional Trails Committee*

A Program of the Santa Clara County Trails Master Plan

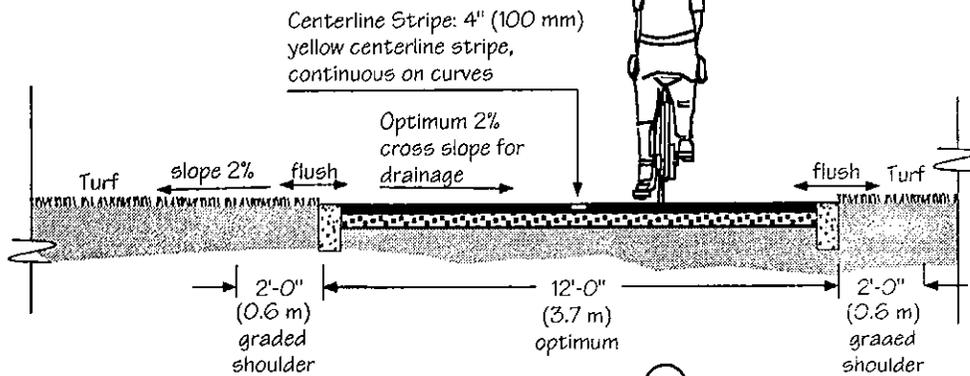
Urban Shared-Use Trail Sections T-1

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
Santa Clara County Interjurisdictional Trails Committee



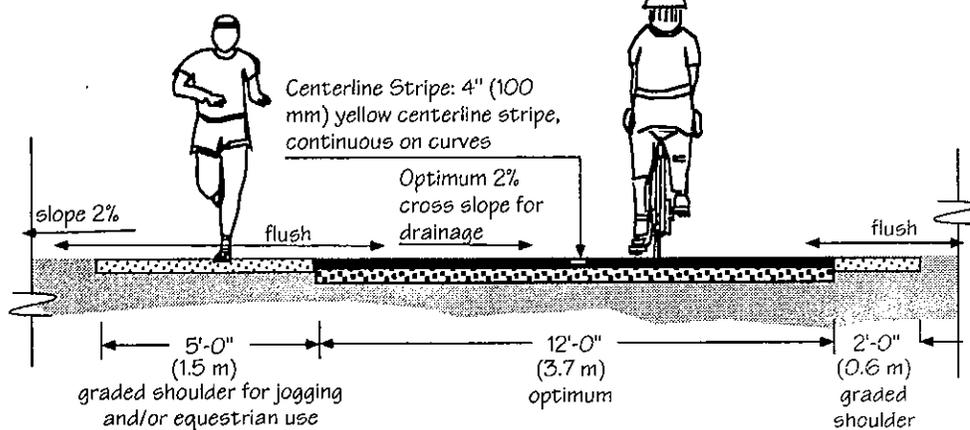
Paved Trail
(See Figure T-2, A and B)

Section
A



Paved Trail
in Turf Area
(See Figure T-2, C)

Section
B



Combination Paved Trail and
Unpaved Jogging Trail
(See Figure T-2, A and B)

Section
C

Related Policies: UD-2.2.2; UD-3.5.4; UD-4.11.1; UM-3.4

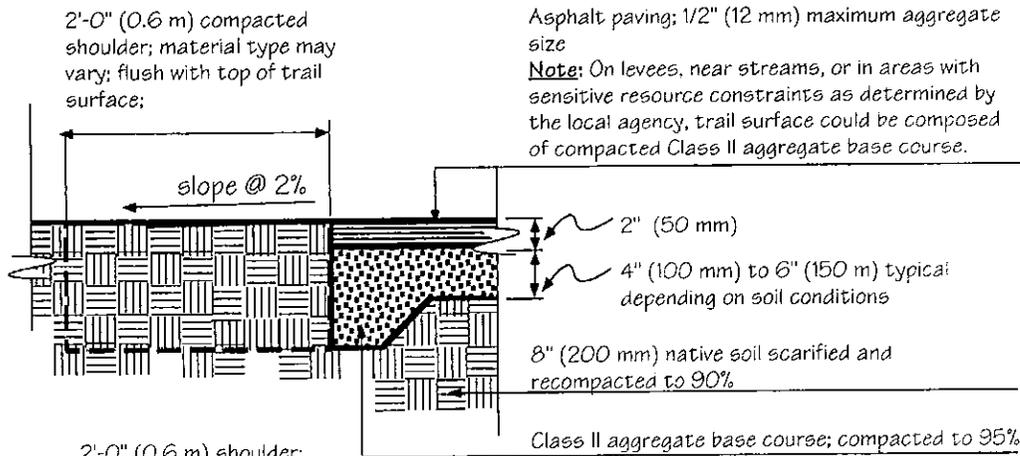
Notes:

- For natural-surfaced trail cross-sections and urban Shared-Use Trails that include an equestrian shoulder, refer to the 1995 Countywide Trails Master Plan, Figures G-2 and G-3.
- Trail shoulders: 2' (0.6 m) graded shoulder; 2' (0.6 m) minimum vegetation clearance; prune all brush over 12" (0.3 m) in height and 1/2" (12 mm) dia. that extends into trailway.
- Centerline stripes should be used along trails. Solid centerline stripes should be used where there is heavy use, on curves greater than 100 feet long (30.5 m) with restricted sight distances, and where the path is unlighted and nighttime riding is expected. Dashed stripes should be used where there is heavy use but only where sight distances permit.
- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

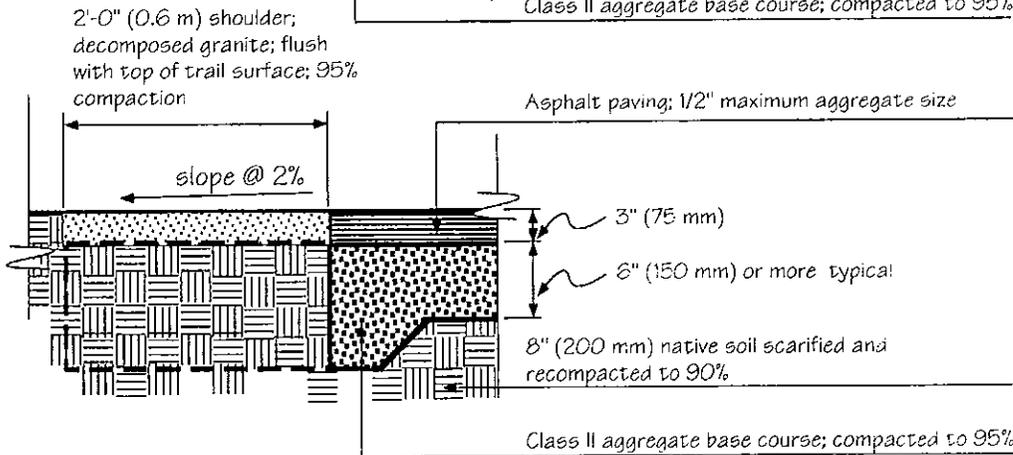
Final: April 15, 1999

T-2 Trail Edge Details

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

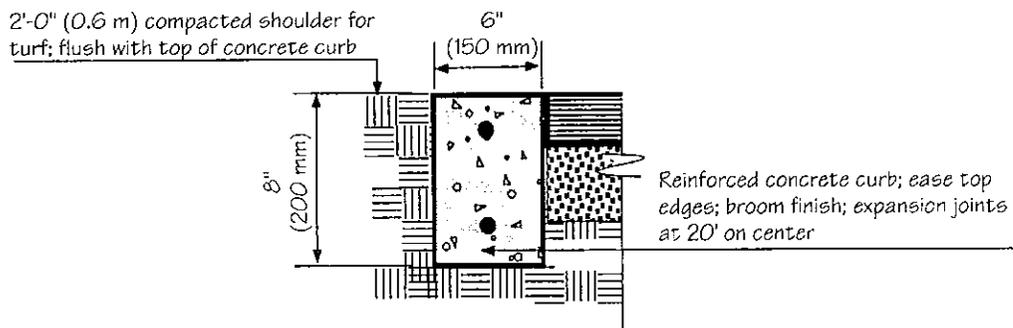


Co-use with
 Light Trucks
Section A



Co-use with
 Emergency and Fire
 Vehicles
Section B

Note: design should accommodate H-20 loading



Curb
 Adjacent to
 Irrigated Turf
Section C

Related Policies:

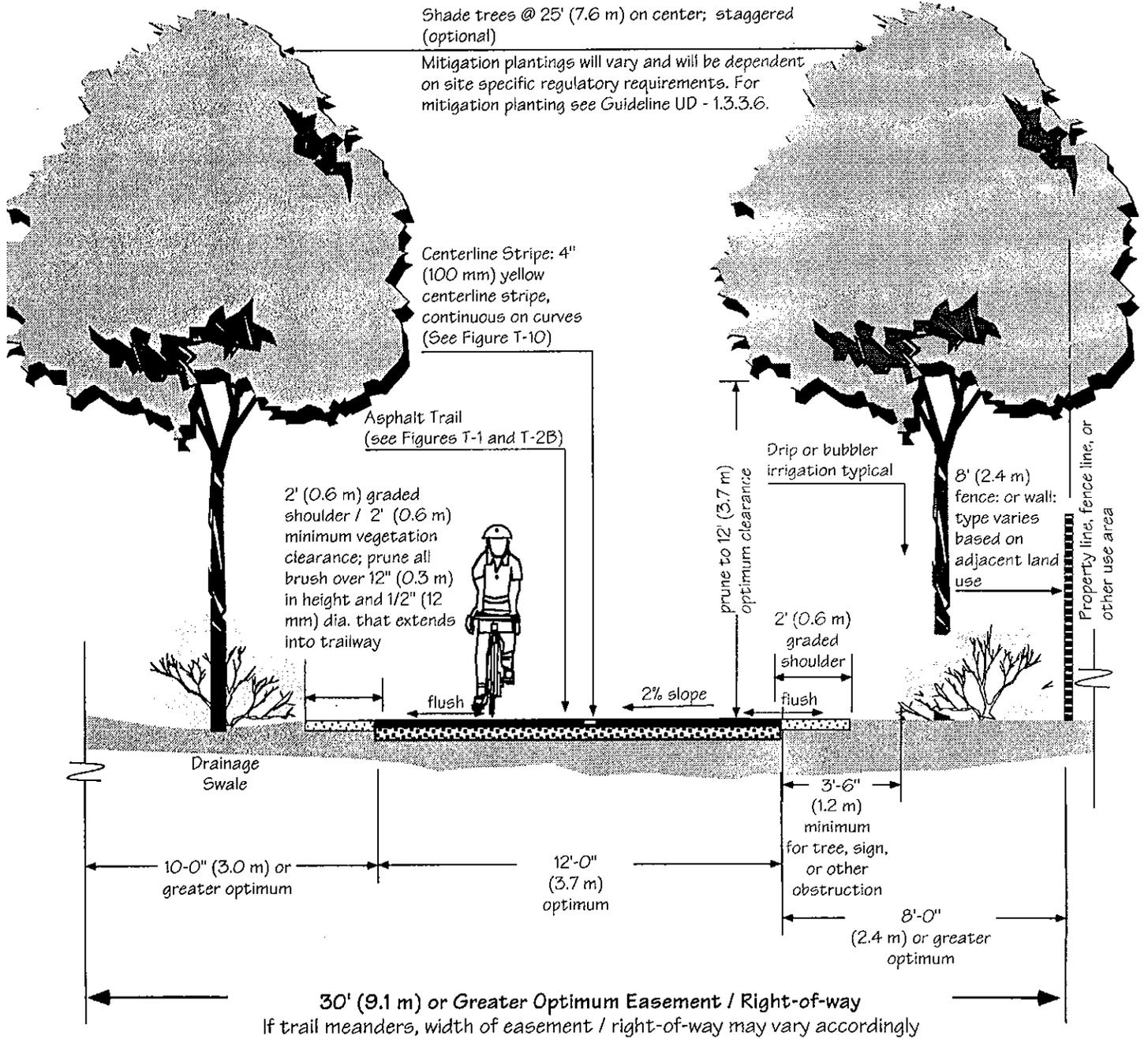
Notes:

- As soil conditions vary through Santa Clara County, soil tests should be made on a case-by-case basis prior to trail design.
- The cross-section design of any trail located on a flood-control levee should be developed to a standard to accommodate Santa Clara Valley Water District vehicle access requirements.

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management.
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

Urban Trail with Adjacent Landscaping T-3

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
Santa Clara County Interjurisdictional Trails Committee



Related Policies: UD-2.2.2; US-3.3; UD-1.1.4; UD-4.11.1; UM-3.3

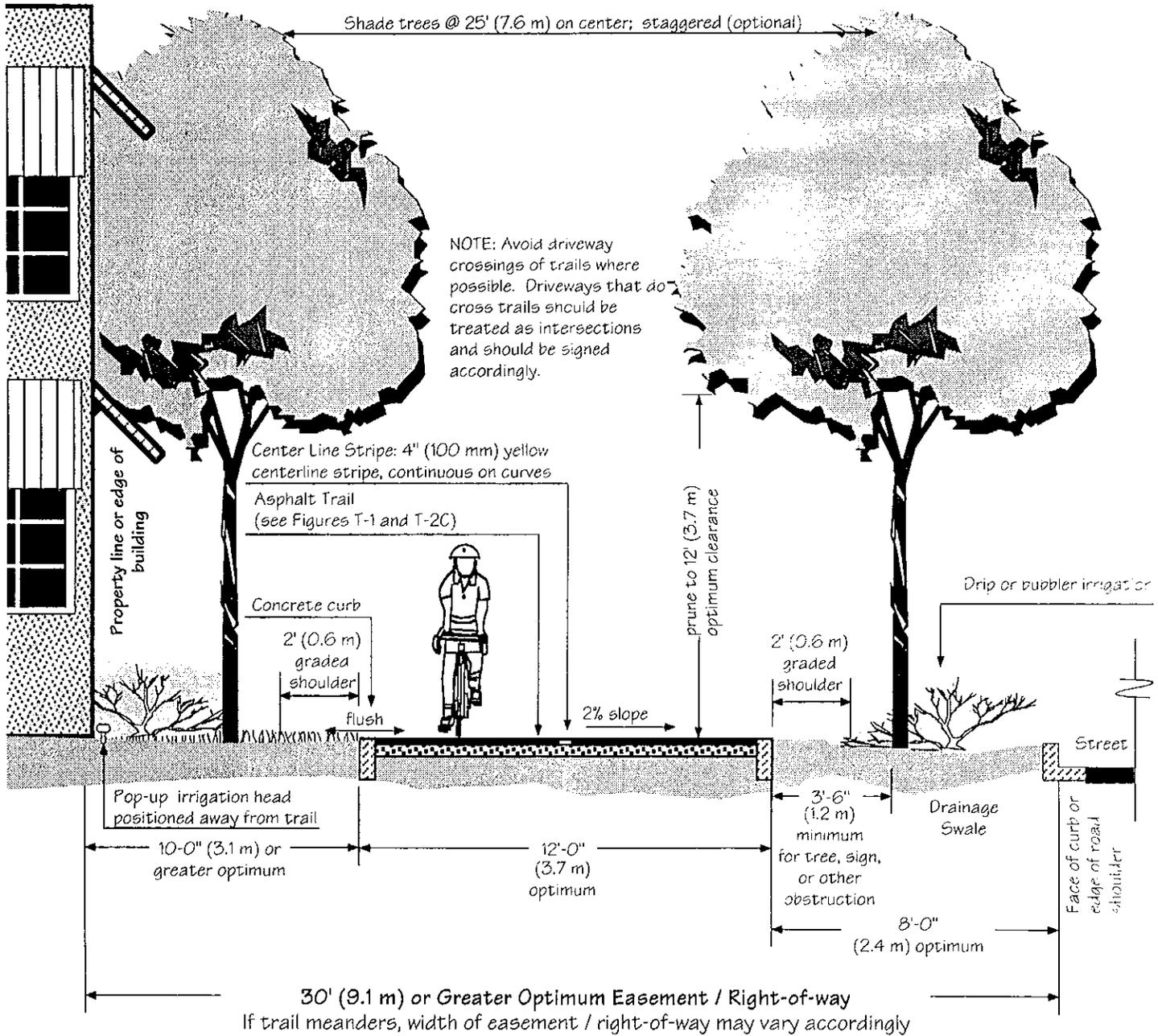
Notes:

- Maximum grade of 5% is optimum; 8.33% maximum for short sections.
- Centerline stripes should be used along trails. Solid centerline stripes should be used where there is heavy use, on curves greater than 100 feet long (30.5 m) with restricted sight distances, and where the path is unlighted and nighttime riding is expected. Dashed stripes should be used where there is heavy use but only where sight distances permit.

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

T-4 Trail Adjacent to Street with Landscaping

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee



Related Policies: UD-1.1.1; UD-1.1.2; UD-2.2.2; UD-3.5.6; UD-4.11.1; UM-3.3; UM-3.4

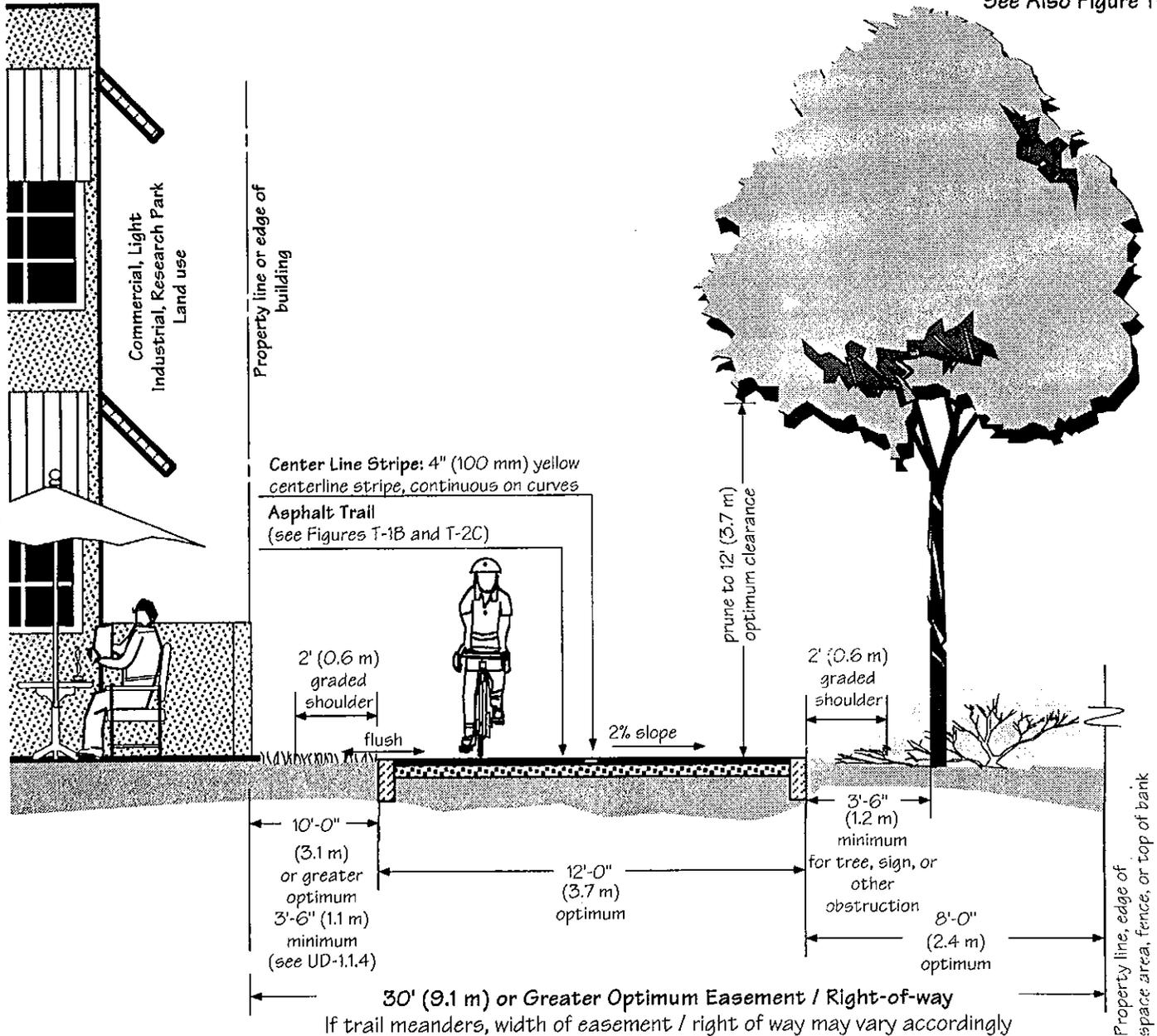
Notes:

- Maximum grade of 5% is optimum; 8.33% maximum for short sections
- Trail shoulders: 2' (0.6 m) graded shoulder / 2' (0.6 m) minimum vegetation clearance; prune all brush over 12" (0.3 m) in height and 1/2" (12 mm) dia. that extends into trailway.
- Centerline stripes should be used along trails. Solid centerline stripes should be used where there is heavy use, on curves greater than 100 feet long (30.5 m) with restricted sight distances, and where the path is unlighted and nighttime riding is expected. Dashed stripes should be used where there is heavy use but only where sight distances permit.
- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

Trail Adjacent to Creek, Park, or Open Space T-5A

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

See Also Figure T-5B



Related Policies: UD-1.1.1; UD-1.1.4; UD-2.2.2; UD-3.5.6; UD-4.11.1; UM-3.4

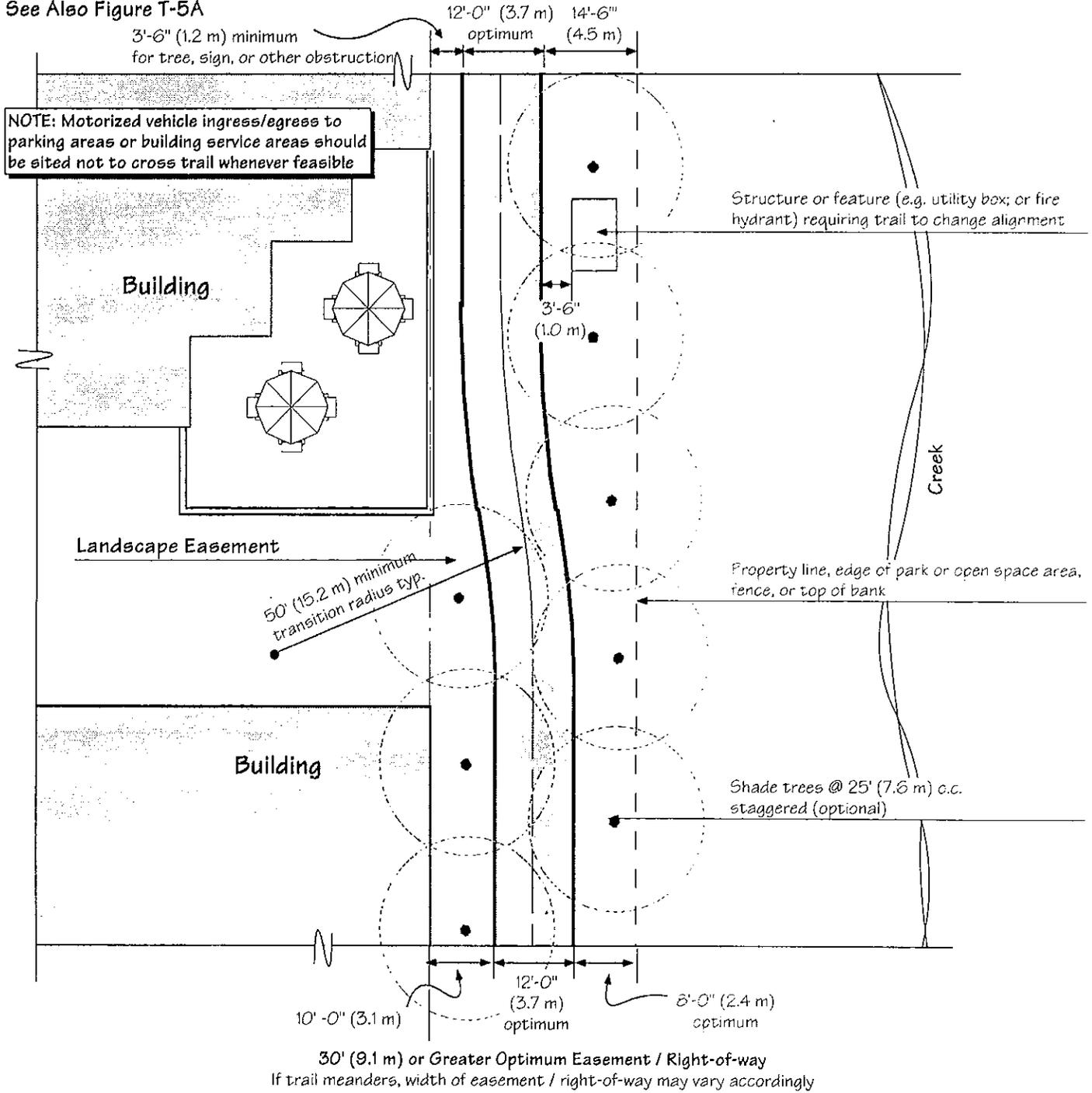
Notes:

- Maximum grade of 5% is optimum; 8.33% maximum for short sections.
- Trail shoulders: 2' (0.6 m) graded shoulder / 2' (0.6 m) minimum vegetation clearance; prune all brush over 12" (0.3 m) in height and 1/2" (12 mm) dia. that extends into trailway.
- Centerline stripes should be used along trails. Solid centerline stripes should be used where there is heavy use, on curves greater than 100 feet long (30.5 m) with restricted sight distances, and where the path is unlighted and nighttime riding is expected. Dashed stripes should be used where there is heavy use but only where sight distances permit.
- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: *Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs.* California State Department of Transportation.

T-5B Plan: Trail Adjacent to Creek, Park, or Open Space

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

See Also Figure T-5A

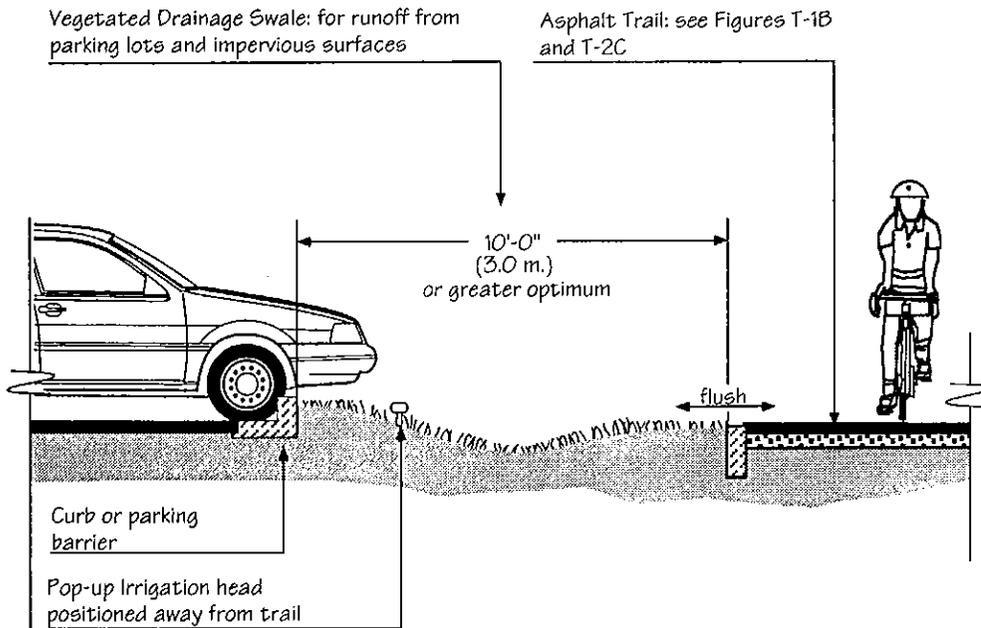


Related Policies: UD-1.1.1; UD-1.1.4; UD 2.2.2; UD-4.11.1

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

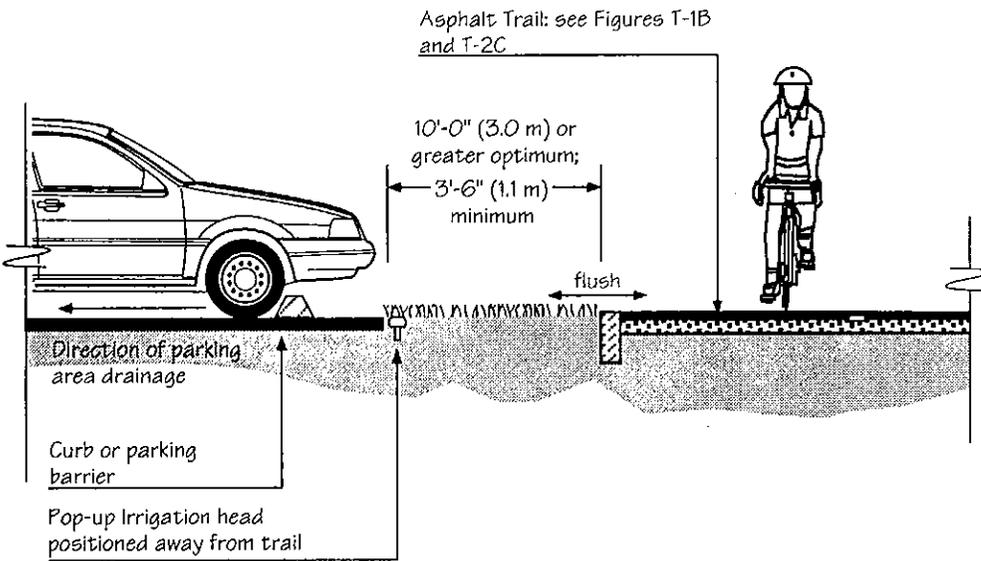
Trail and Adjacent Parking T-6

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee



Adjacent to Parking with Vegetated Swale

Section A



Adjacent to Parking without Vegetated Swale

Section B

• **Related Policies:** UD-1.1.1; UD-3.5.6; UD-4.11.1; UM-3.4

Notes:

- Maximum grade of 5% is optimum; 8.33% maximum for short sections
- Trail shoulders: 2' (0.6 m) graded shoulder / 2' (0.6 m) minimum vegetation clearance; prune all brush over 12" (0.3 m) in height and 1/2" (12 mm) dia. that extends into trailway

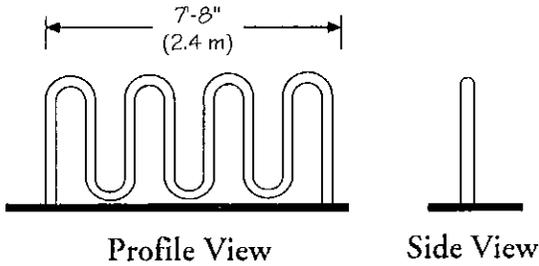
- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

T-7 Bicycle Parking Adjacent to Trail

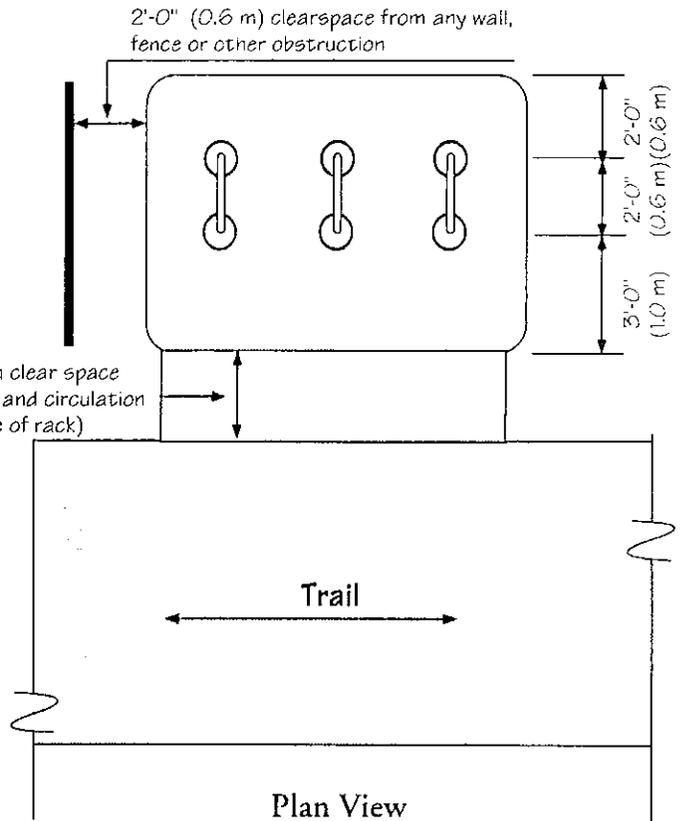
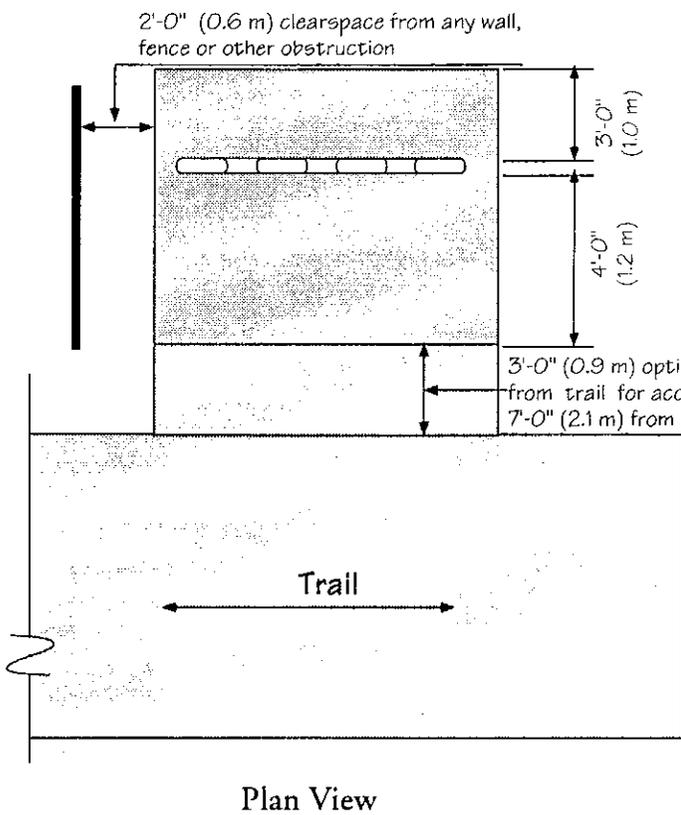
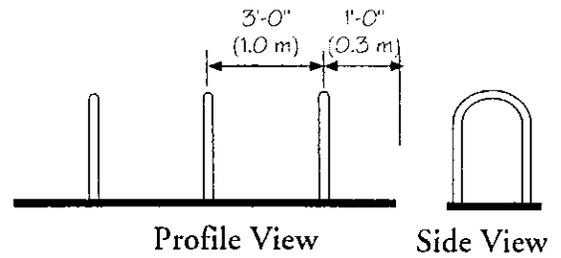
Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

note: Rack dimensions for reference only

"Wave" Style Bicycle Rack



"Inverted U" Style Bicycle Rack



Source: Wilbur Smith Associates

Related Policies:

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

Trail Intersections T-8

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

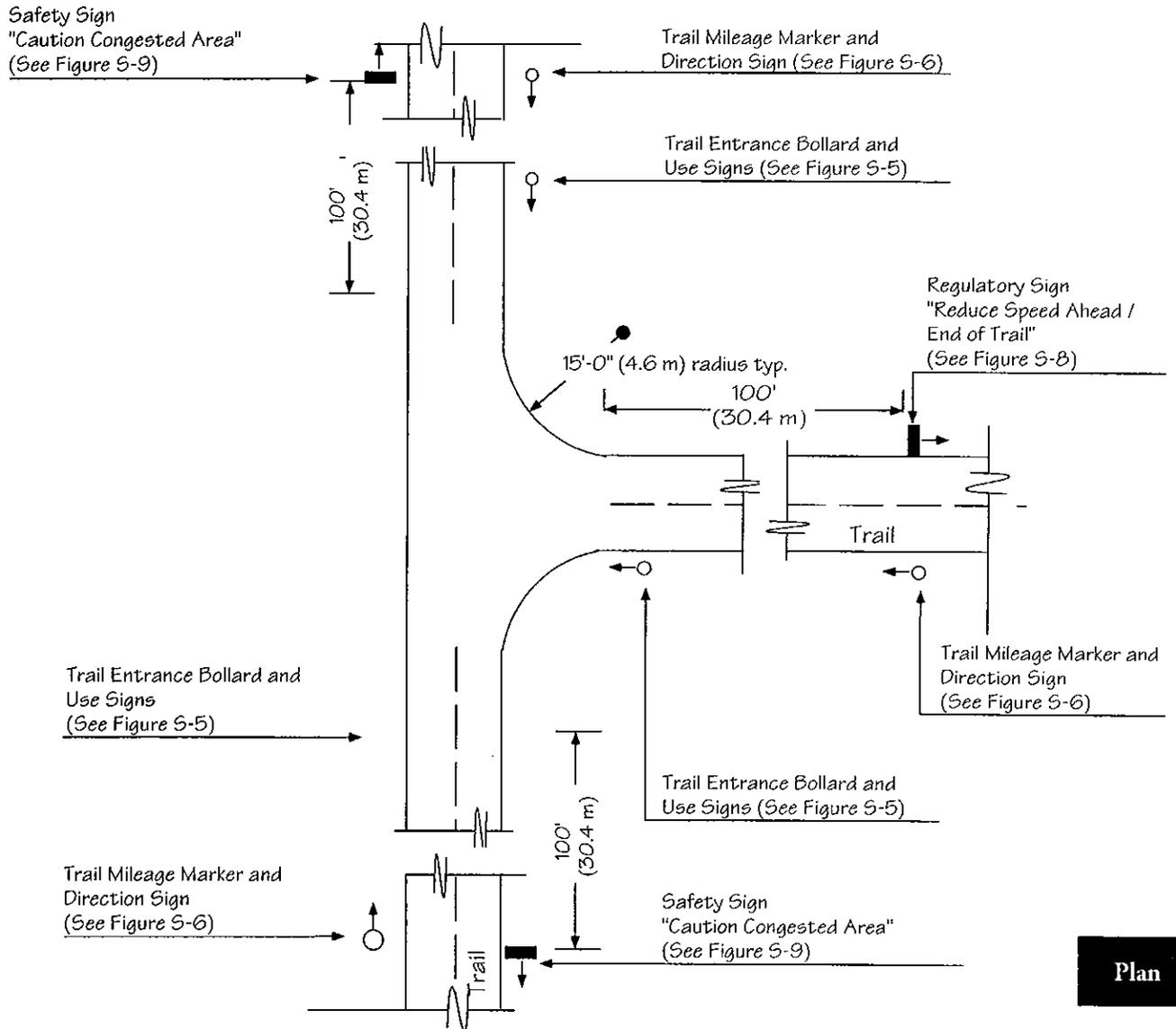
Legend



Sign
 Direction of Sign



Trail Post
 Direction of Markings



Plan

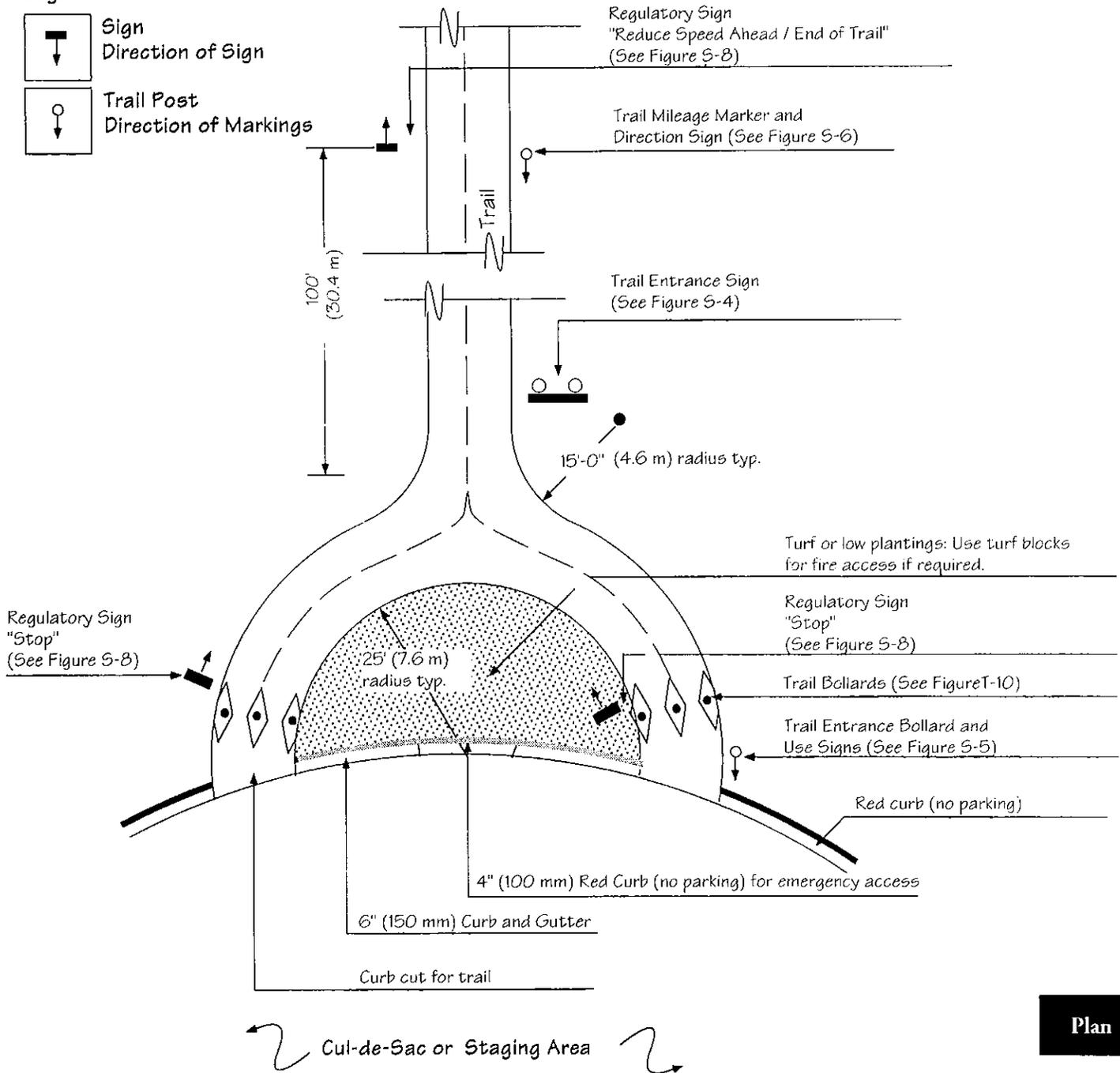
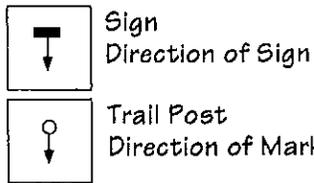
Related Policies: UD-1.1.6.1

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

T-9 Trail Ending At Parking Area or Cul-de-Sac

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

Legend



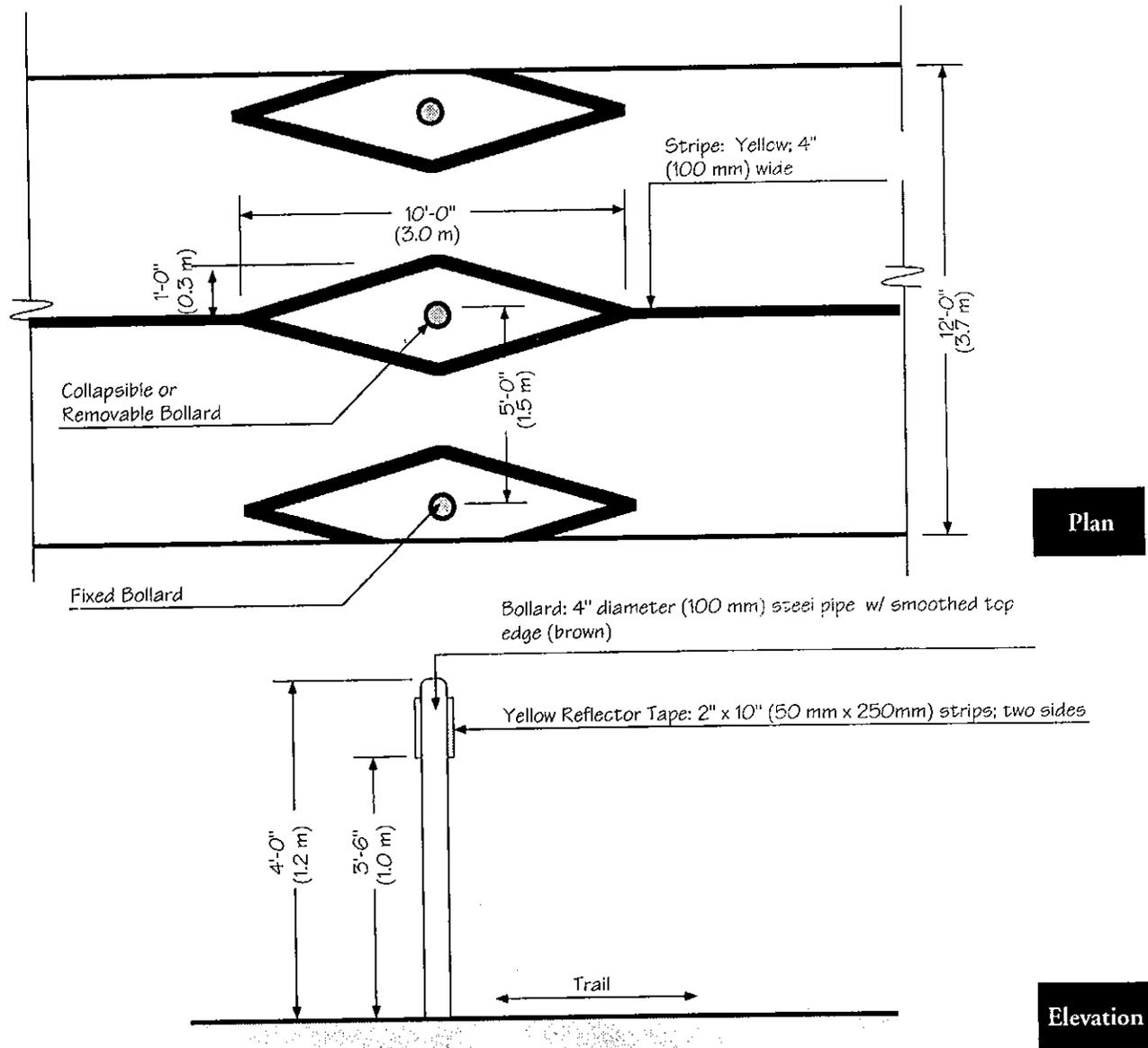
Plan

Related Policies: UD-4.2.1

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

Typical Trail Barrier Posts T-10

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee



Related Policies: UD-4.2.1; UD-4.11.1

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

Final: April 15, 1999

T-11 Trail Maintenance Gate

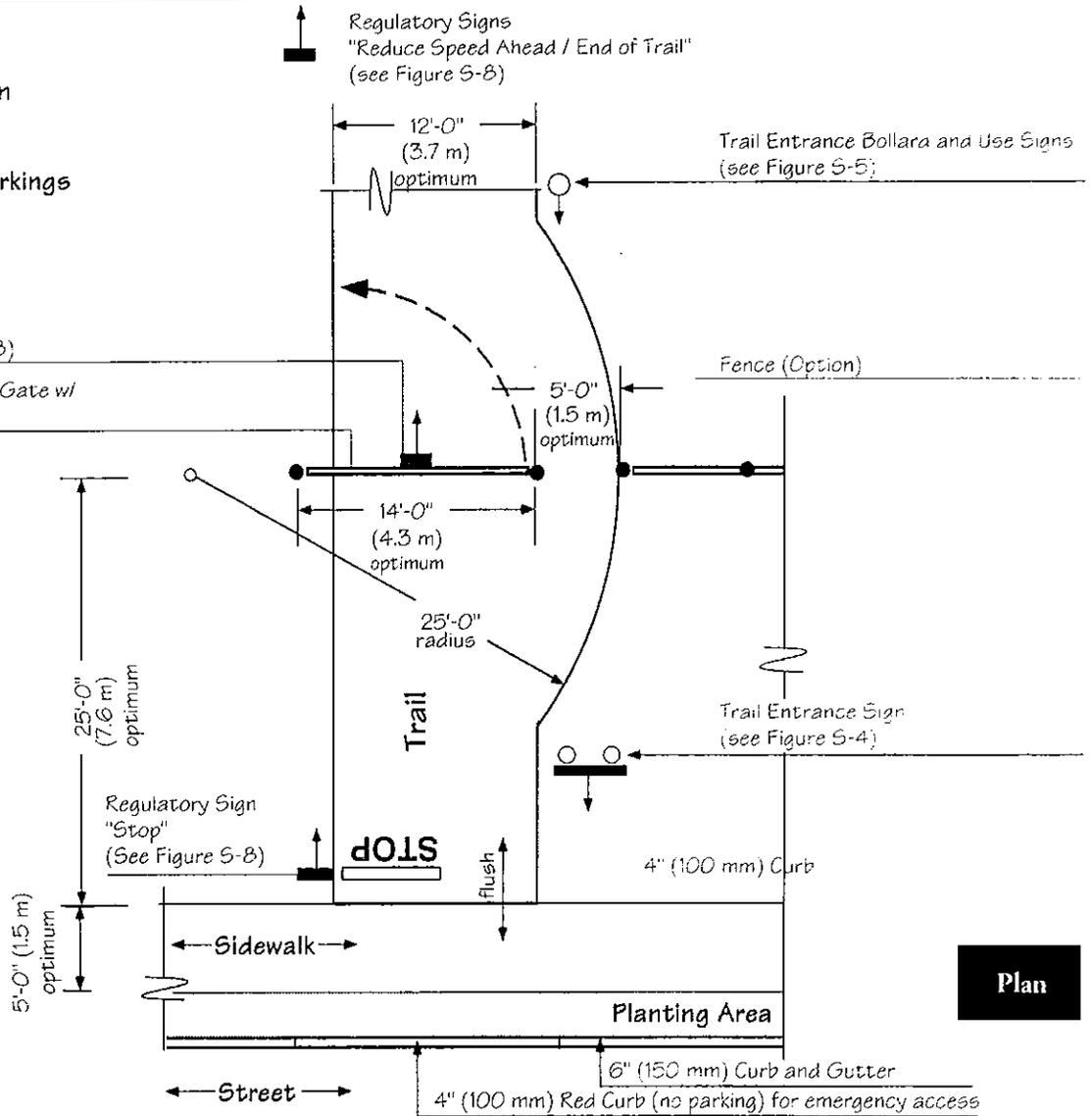
Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

Legend



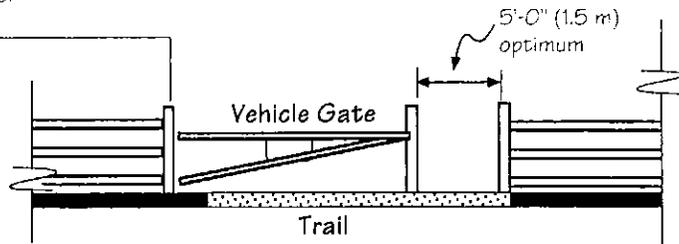
Regulatory Sign
 "End of Trail"
 Place on gate (see Figure S-8)

Emergency Access Vehicular Gate w/
 universal combination lock



Plan

5' (1.5 m) High; 8" (200 mm) Diameter Steel
 Pipe Post w/ smoothed top edge (brown)



Elevation

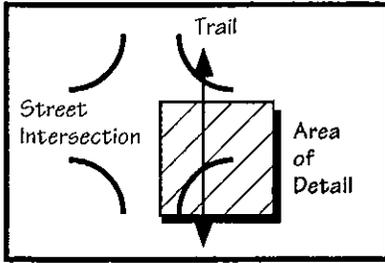
Related Policies: UD-4.2.1; UD-4.2.3

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

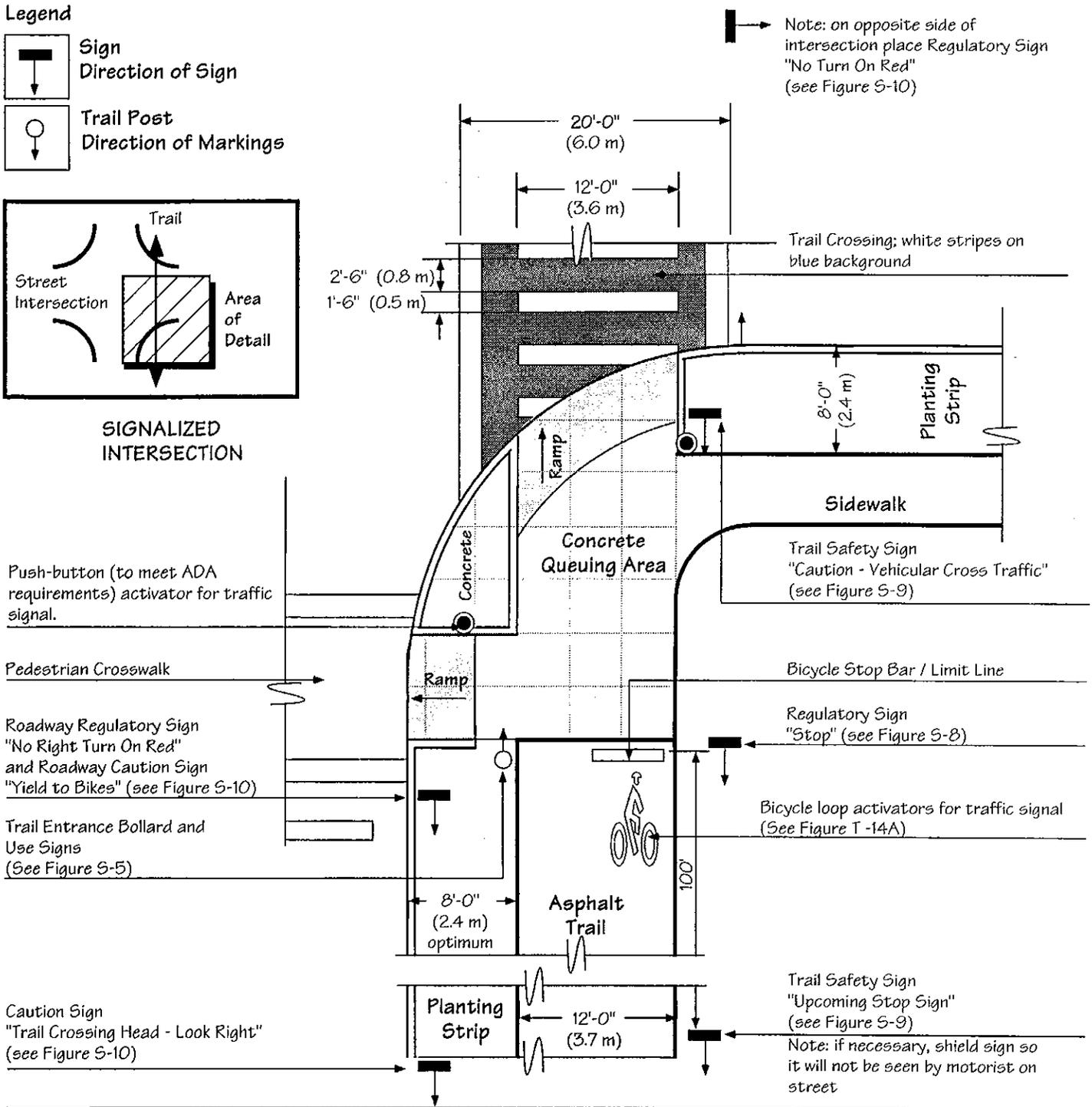
Major Street / Signalized Street Intersection T-12A

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

Legend



SIGNALIZED INTERSECTION



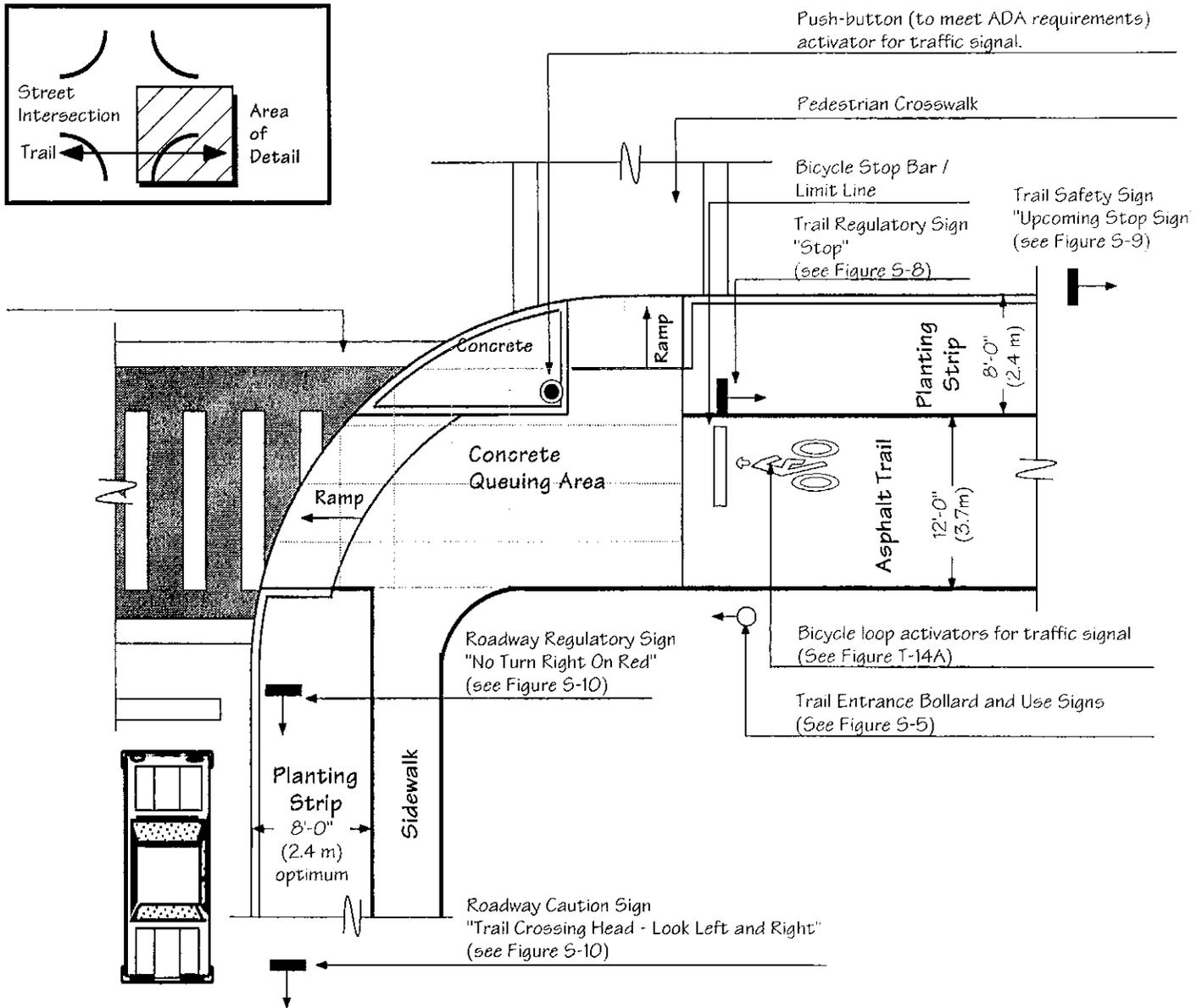
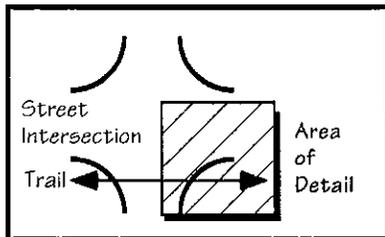
Related Policies: UD-1.1.5; UD-4.16; UD-4.17

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

T-12B Major Street / Signalized Street Intersection

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

Legend



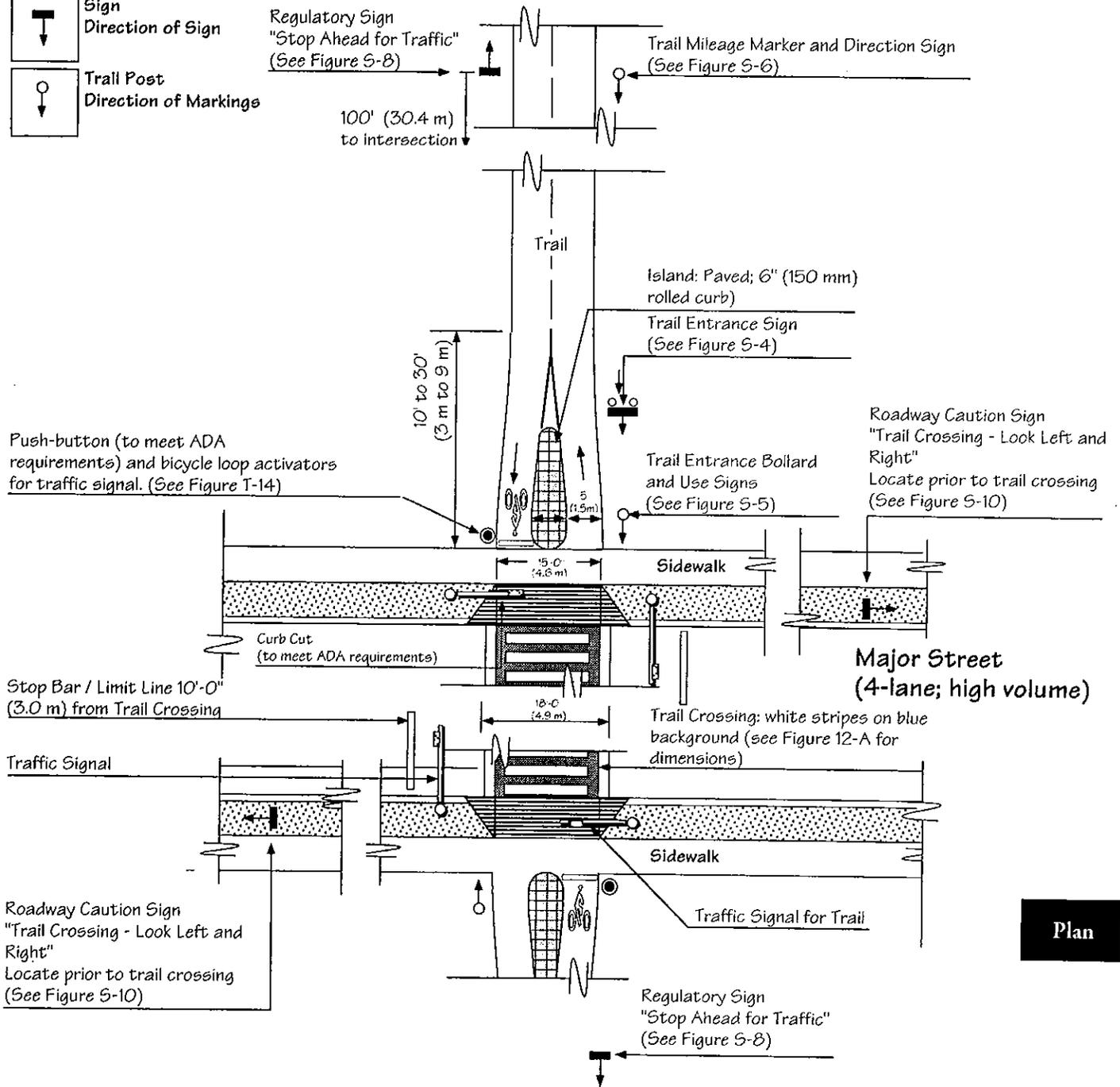
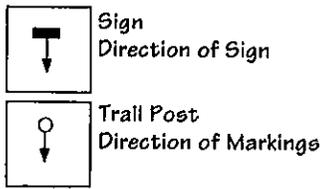
Related Policies: UD-1.1.5; UD-4.16; UD-4.17

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

Trail / Major Street Intersection - Signalized T-13A

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

Legend



Plan

Related Policies: UD-1.1.5; UD-1.1.6.2; UD-4.16; UD-4.17

• "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
 • Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

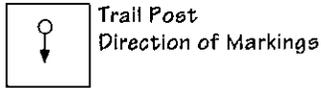
T-13B Trail / Minor Street Intersection - Not Signalized

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

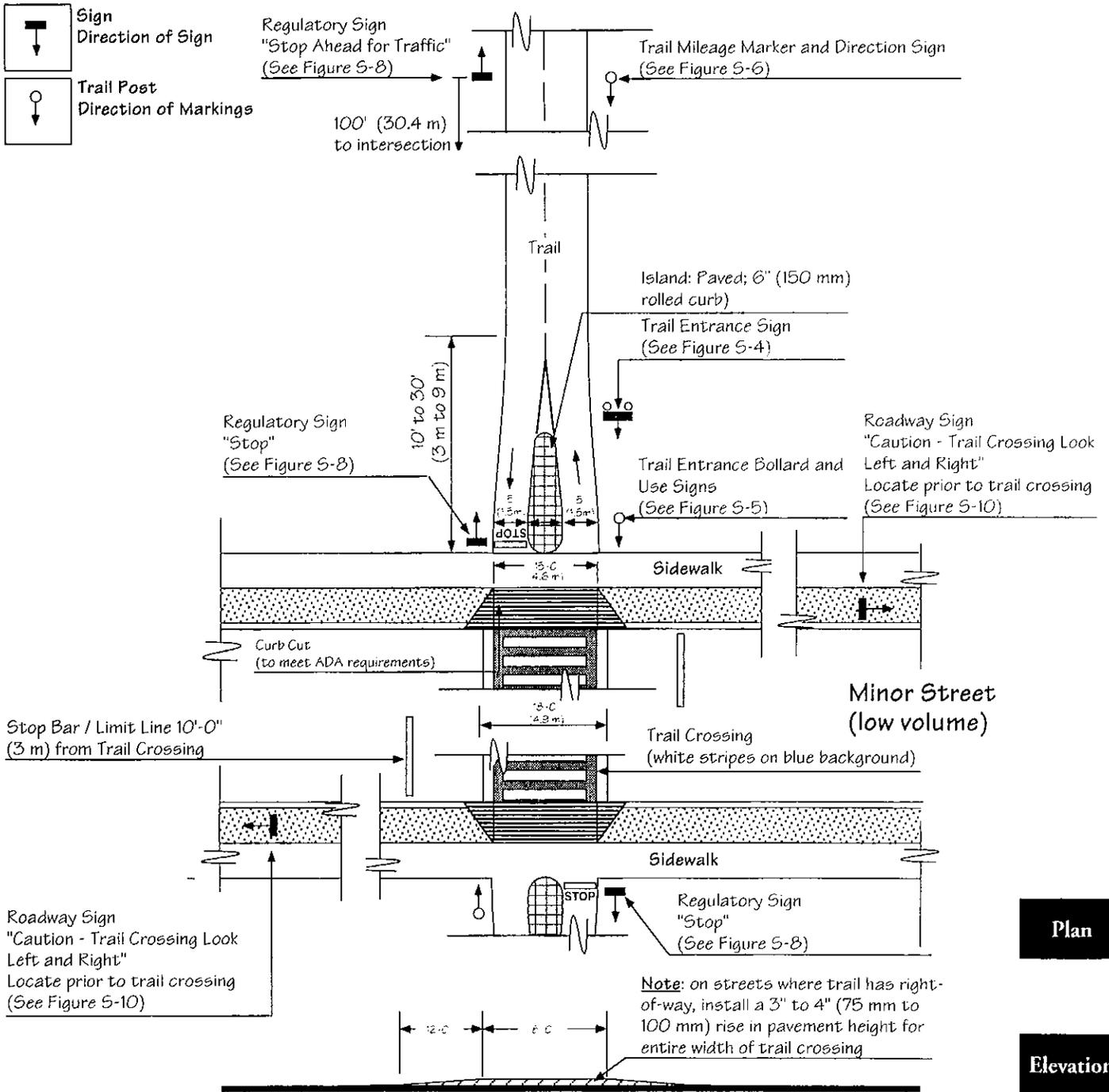
Legend



Sign
Direction of Sign



Trail Post
Direction of Markings



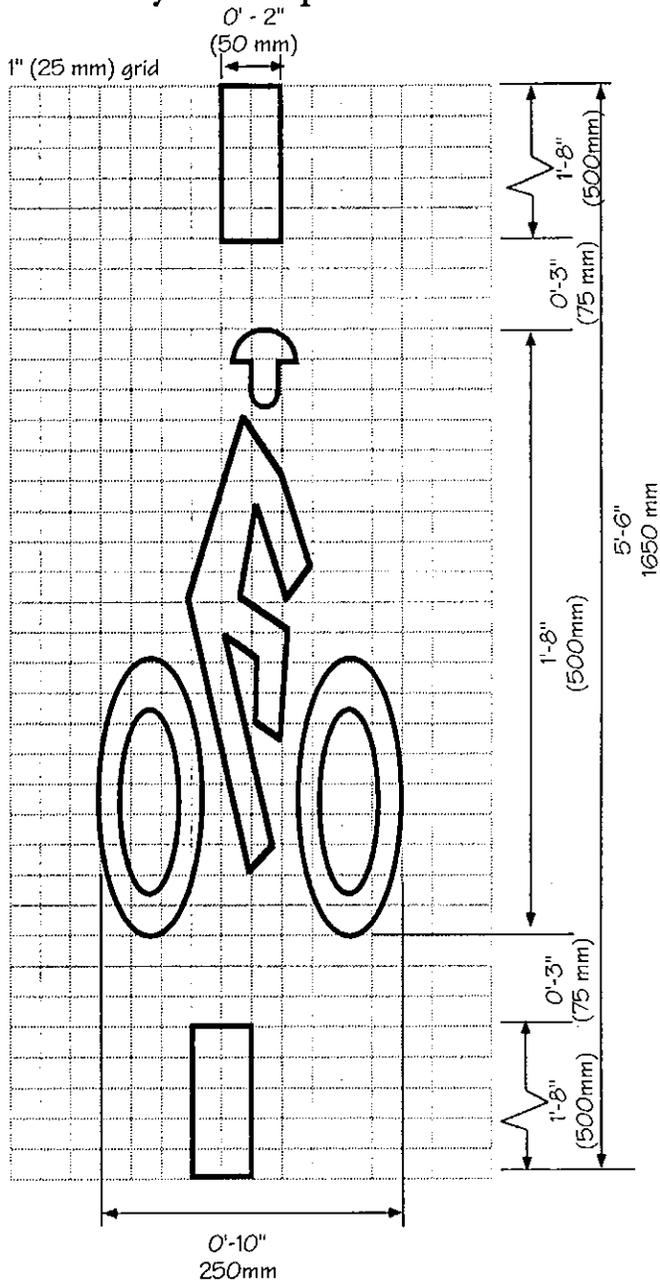
Plan

Elevation

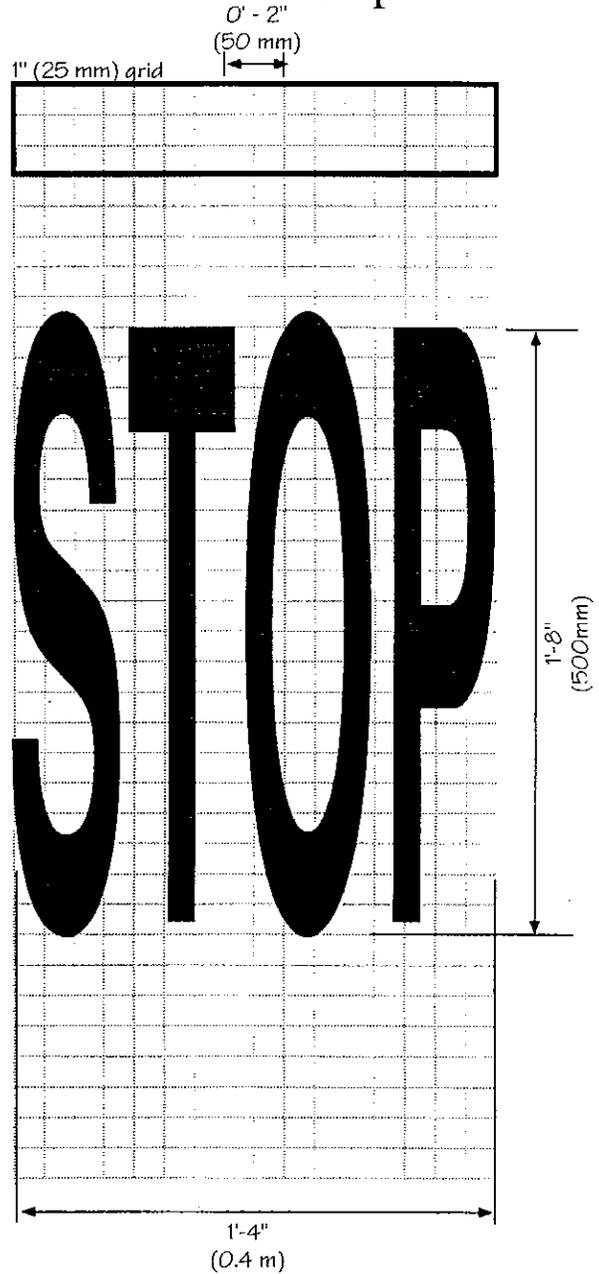
Related Policies: UD-1.1.5; UD-1.1.6.2; UD 4.1.6; UD-4.17

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

Bicycle Loop Detector



Stop

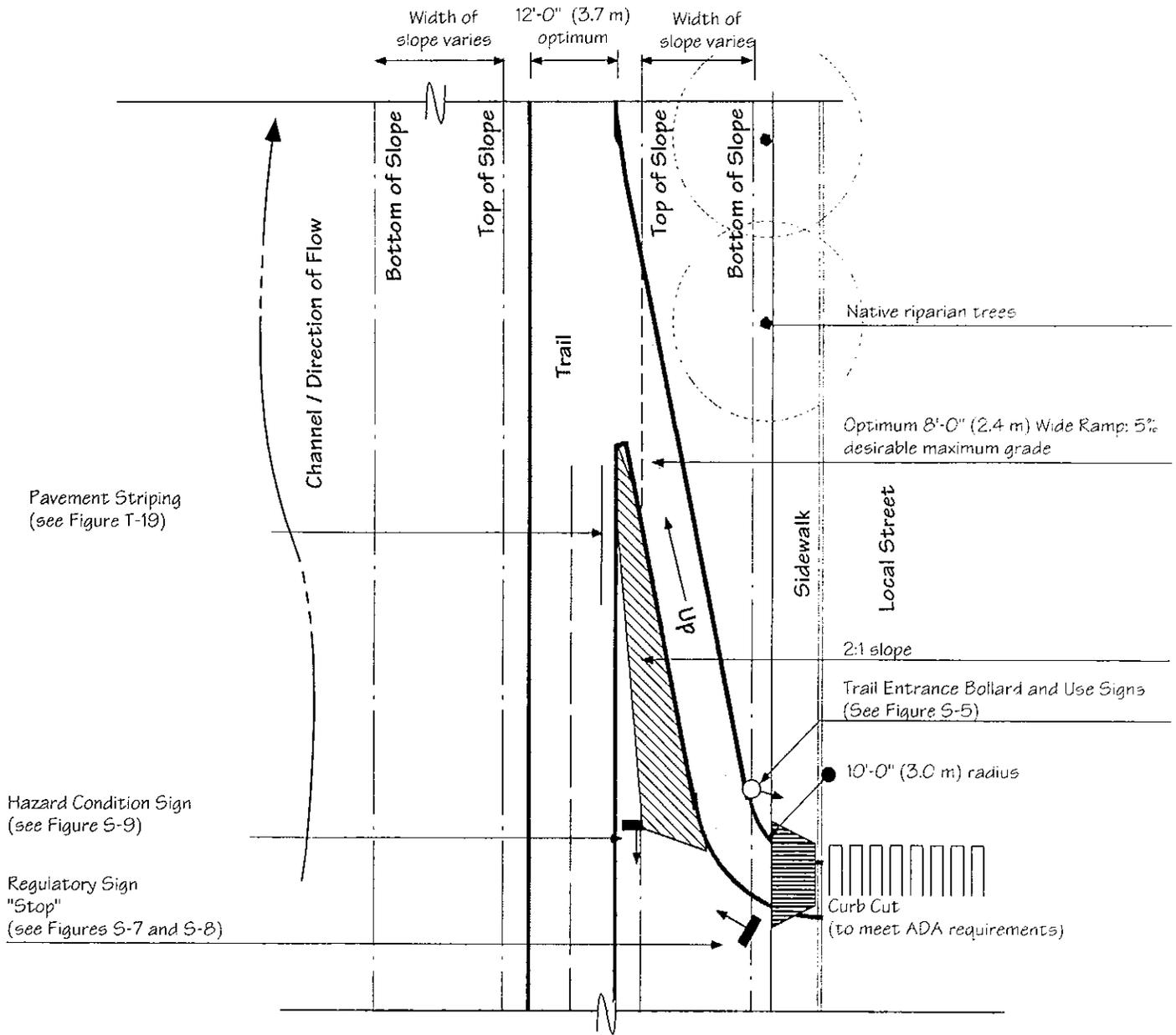


Related Policies: UD -4.11.3; UD-4.17

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

T-15 Plan: Trail on Levee

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee



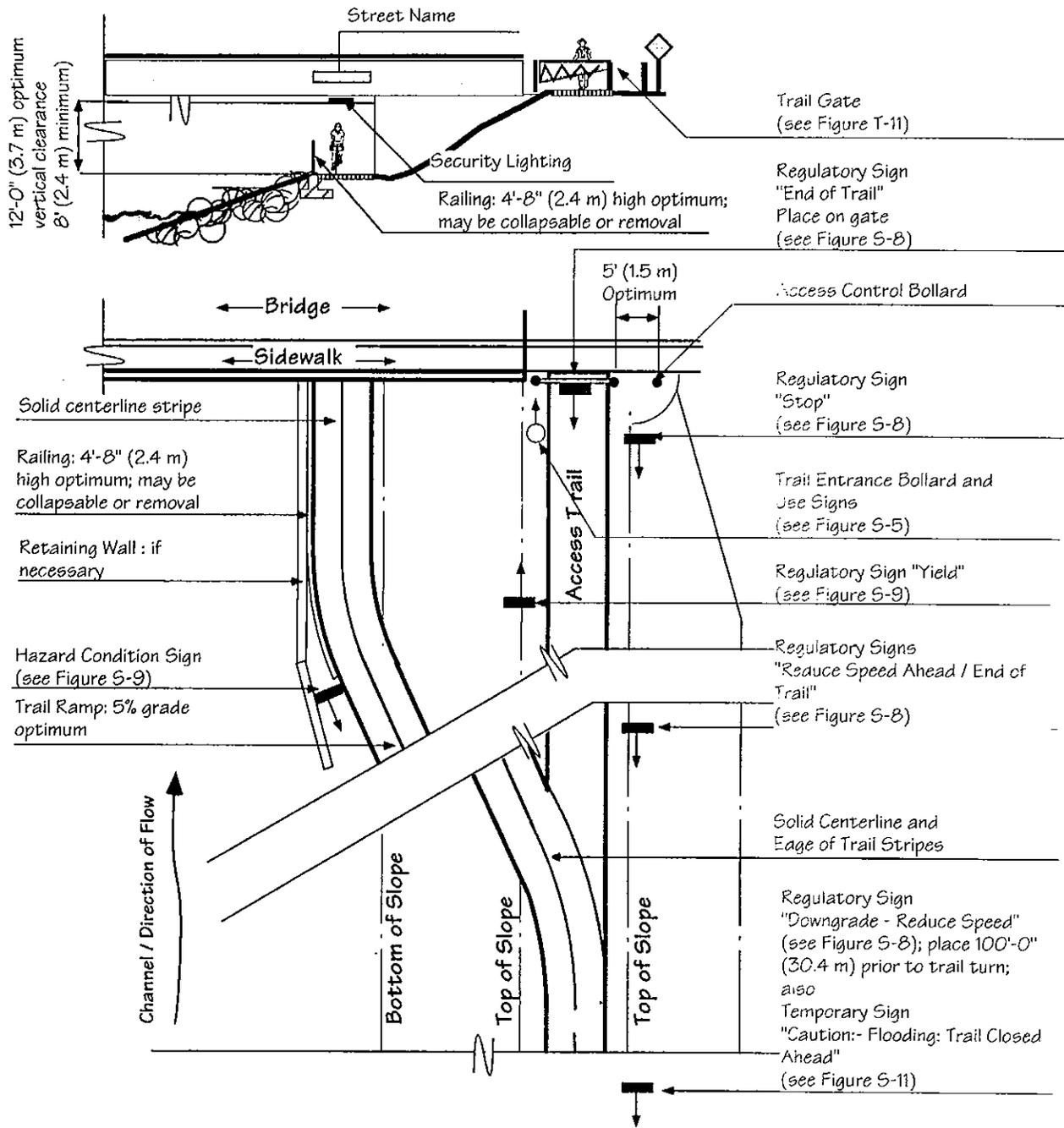
Related Policies: UD-1.3.2.3

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

Plan and Section: Levee Trail Undercrossing T-16

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

Elevation



Plan

Related Policies: UD-2.6; UD 4.1.5

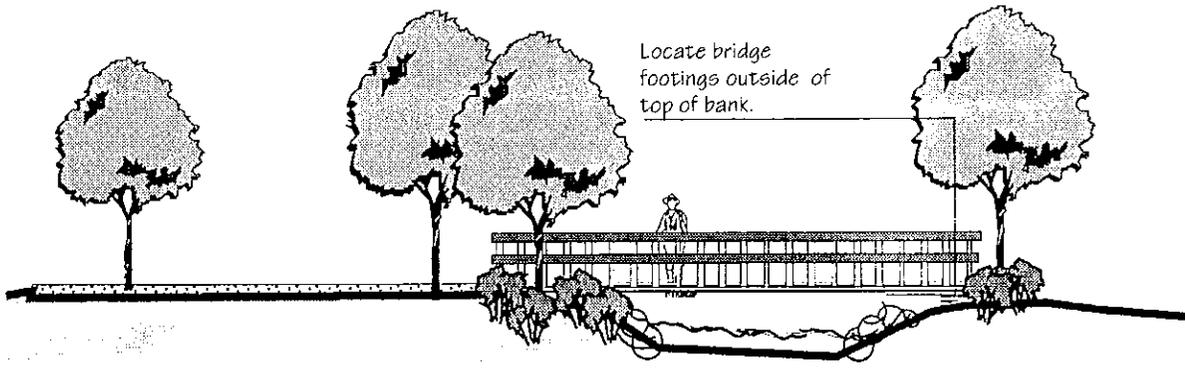
Notes

- Trail connections will likely occur on both sides of road bridge

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

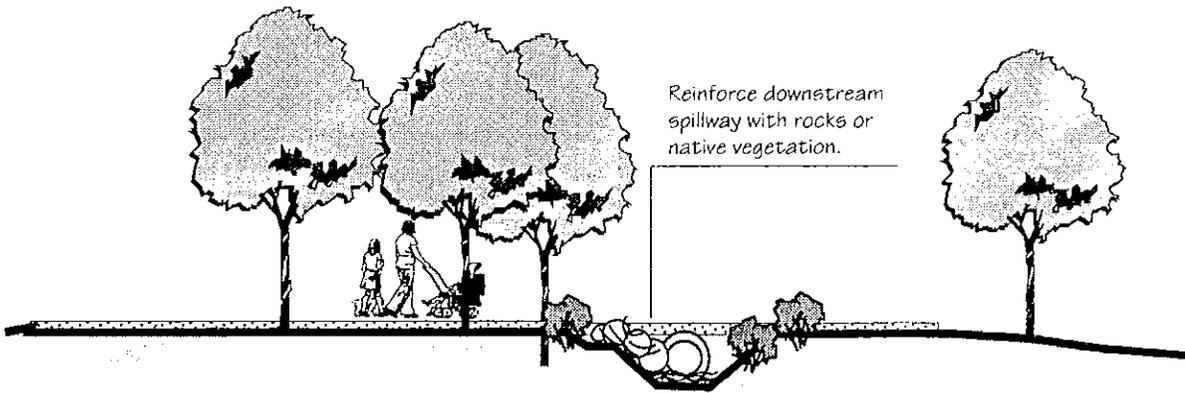
T-17 Creek Crossings & Water Quality

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
Santa Clara County Interjurisdictional Trails Committee



Bridge major streams and drainages

A



Culvert crossings of small streams and drainages

B

Related Policies: UD-1.3.3.14

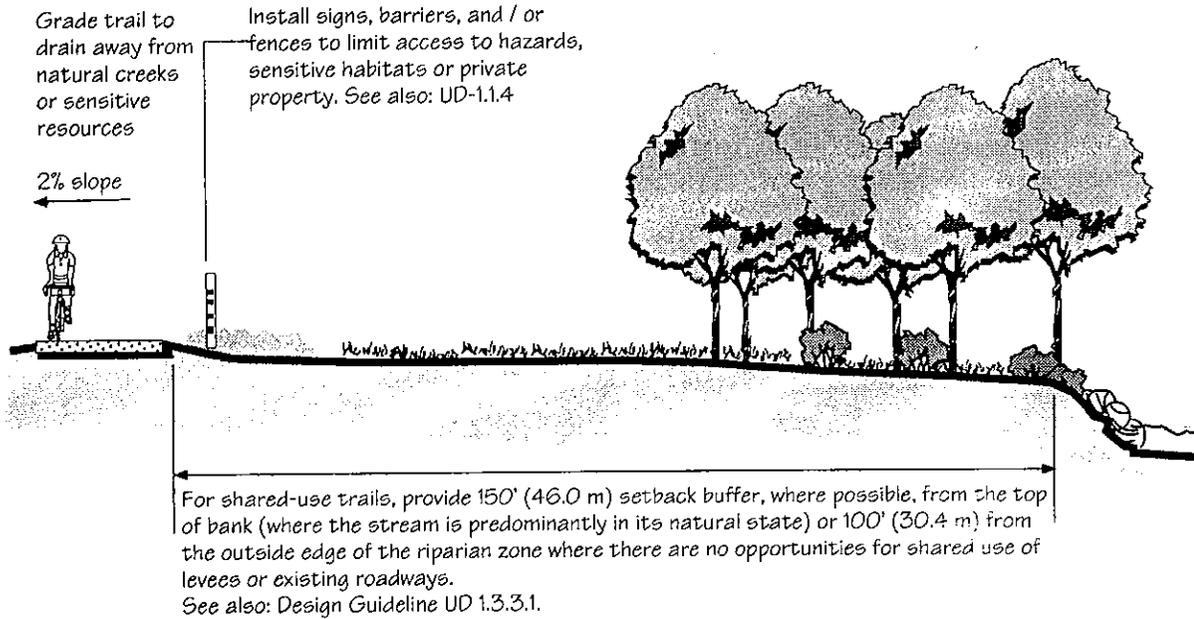
- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management.
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

Final: April 15, 1999

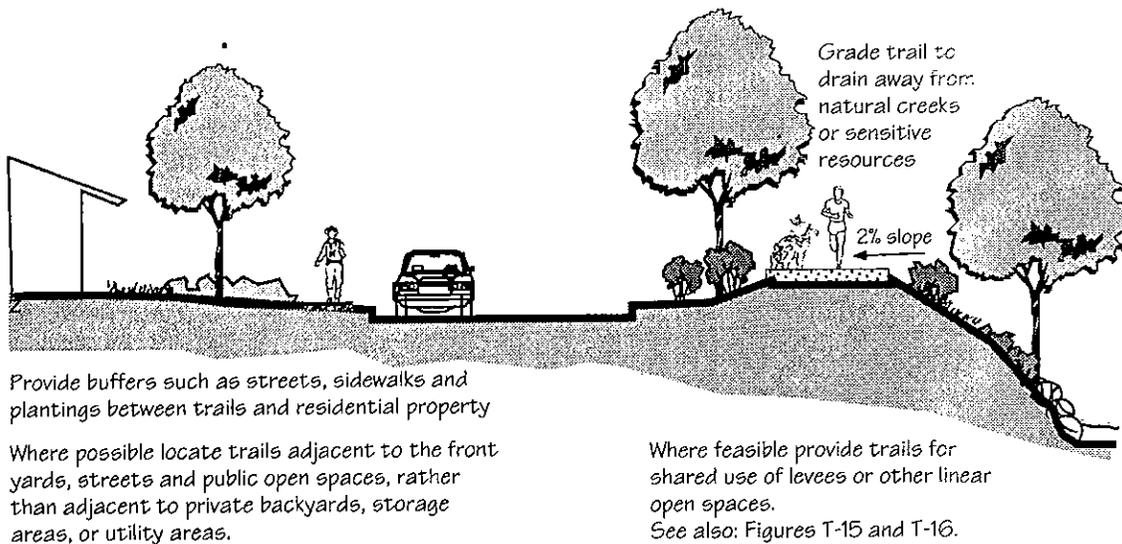
Trail Placement Adjacent to Streams T-18

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
 Santa Clara County Interjurisdictional Trails Committee

Relationship to property lines, environmentally sensitive areas & residences



A



B

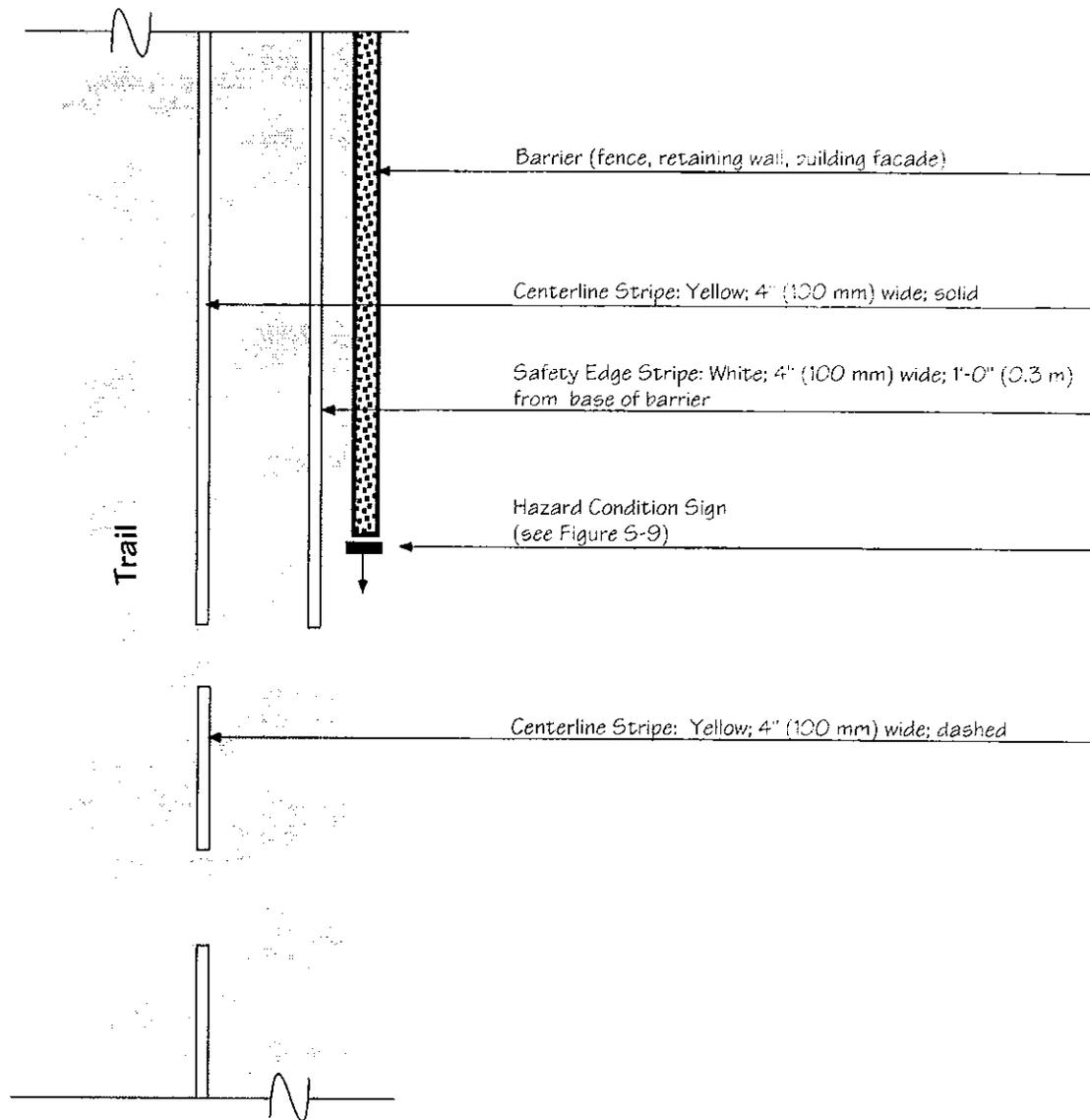
See also: Design Guideline UD 2.1, Tables UD-1 and UD-2

Related Policies: UD-1.1.1; UD-1.3.3.14; UD 1.1.4

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

T-19 Pavement Striping Adjacent to Walls and Barriers

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
Santa Clara County Interjurisdictional Trails Committee



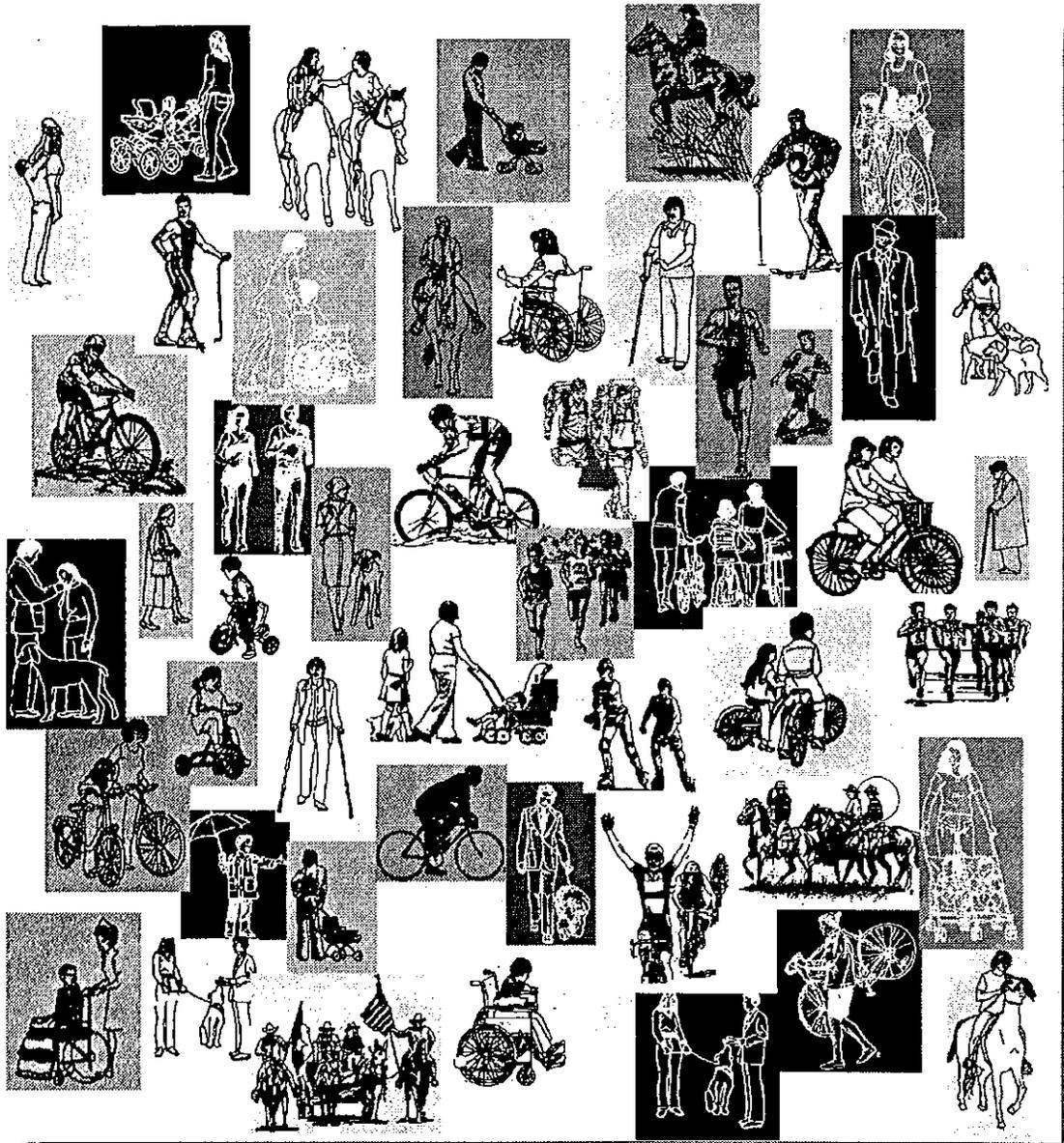
Related Policies: UD-1.1.4; UD-4.11

- "Optimum": The best or most favorable condition for a particular trail situation from the perspective of responsible management.
- Reference Also: Highway Design Manual, Chapter 1000 Bikeway Planning and Design; Topic 1003 - Design Criteria; and Topic 1004 - Uniform Signs. California State Department of Transportation.

Final: April 15, 1999



Sign Guidelines



Uniform Interjurisdictional Trail Design, Use, and Management Guidelines

*Santa Clara County
Interjurisdictional Trails Committee*

A Program of the Santa Clara County Trails Master Plan



White letters / Red background: Stop or prohibition



Black letters / Bicycle Yellow background: General warning (except construction and maintenance zones)



Black letters / White background: Regulatory signs



Black letters / Orange background: Warning or guidance in construction and maintenance zones



White letters / Blue background: Services information and allowable use signs



White letters / Brown background: Guide and information signs related to points of recreational or cultural interest



White letters / Green background: Route markers, guide signs, and mileposts

Sign Colors follow the conventions used for streets and highways (source: *Manual on Uniform Traffic Control Devices for Streets and Highways*. U.S. Department of Transportation, Federal Highway Administration).

Regional Trail Identity Signs

Uniform Interjurisdictional Trail Design, Use, and Management Guidelines
Santa Clara County Interjurisdictional Trails Committee



Juan Bautista deAnza National Historic Trail



Monterey-Yosemite State Trail

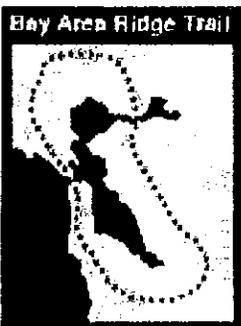


Benito-Clara Trail



San Francisco Bay Trail

Source: Association of Bay Area Governments - Bay Trail Project

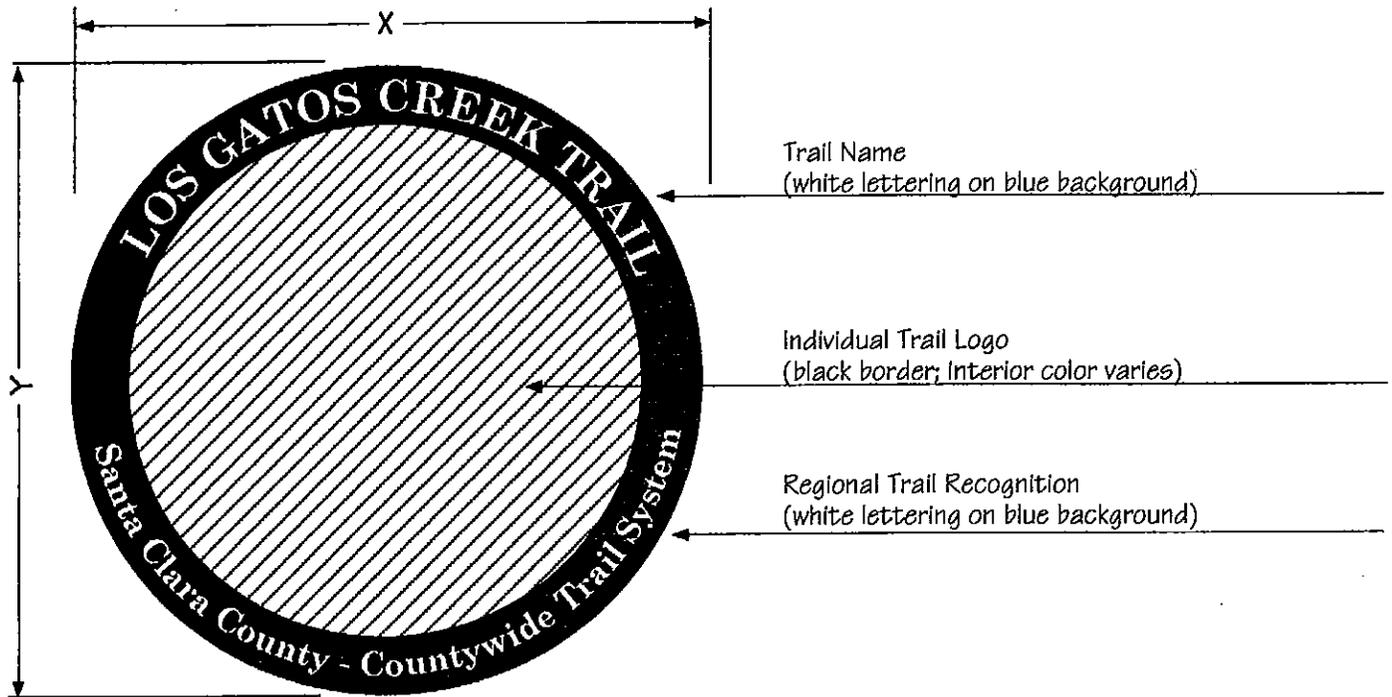


Bay Area Ridge Trail

Source: Bay Area Ridge Trail Council

Related Policies: UD 4.3.1.1

Regional Trail Identity Signs are available through the sponsoring agency. Signs typically are available in two large and small, and dimensions vary. Regional Trail Identity Signs are placed on Trail Entrance Signs (see Figure S-5) and Trail Entrance Bollards (See Figures S5-) and Trail Mile Marker and Direction Signs (see Figure S-6).



Dimension	Trail Entrance Bollard (See Fig. S-5)	Trail Entrance Sign (See Fig. S-4)
X	3", 4", or 6" (75 mm, 100 mm, or 125 mm)	1'-6" (0.6 m)
Y	3", 4", or 6" (75 mm, 100 mm, or 125 mm)	1'-6" (0.6 m)

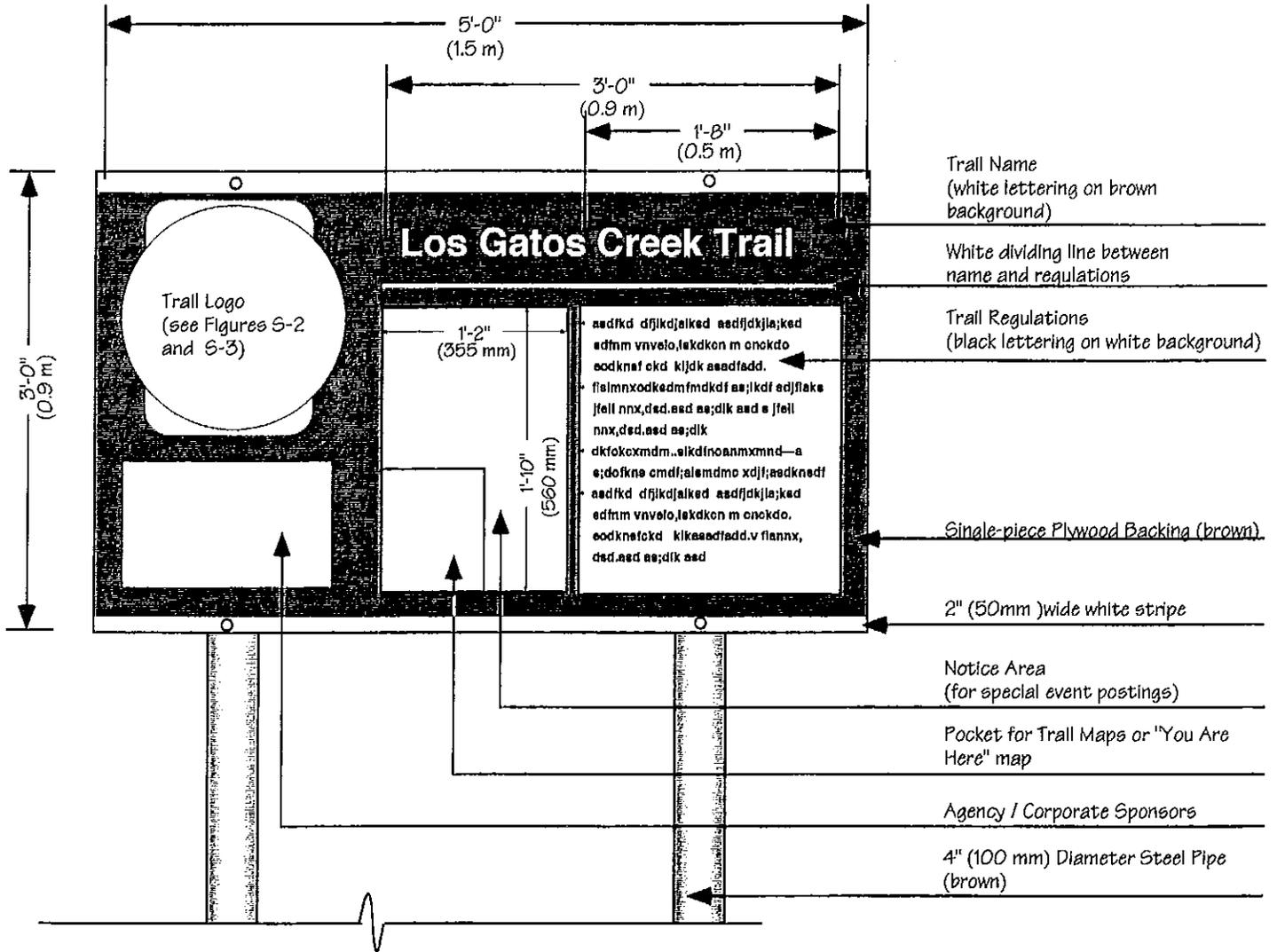
Countywide Sub-Regional Trail Routes

- Matadero Creek / Page Mill Trail
- Stevens Creek Trail
- Guadalupe Trail
- Los Gatos Creek Trail
- Coyote Creek / Llagas Creek Trail
- West Valley Trail
- Morgan Hill Cross-Valley Trail
- San Martin Cross-Valley Trail

Identity Logos should be located at all staging areas, countywide trails intersections, intersections with other trails as deemed appropriate by the managing agency, and intersections with roads. Sub-Regional Trail logos are placed on Trail Entrance Signs (see Figure S-4) and Trail Entrance Bollards (See Figures S-5) and Trail Mile Marker and Direction Signs (see Figure S-6).

S-4 Trail Entrance Sign

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 Santa Clara County Interjurisdictional Trails Committee



Note: all lettering to be a minimum of 18-point size.

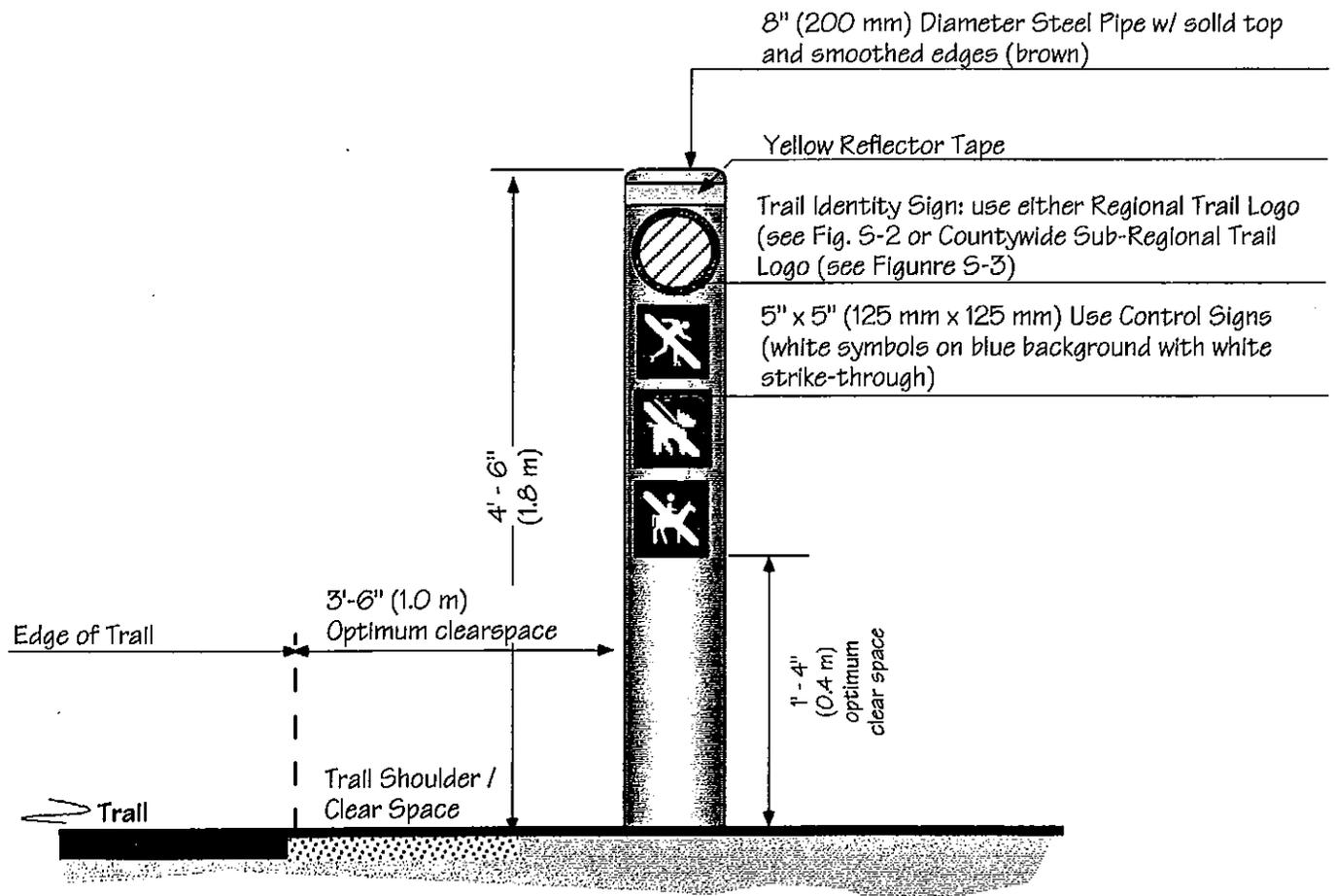
Related Policies: UD-4.3.1.1; UM-3.3; UM-1.4.3

Trail Entrance Signs at major entry and staging areas announce the trail and is visible from nearby parking/staging areas. Information presented includes applicable use and management regulations with references to appropriate governing ordinances. For neighborhood access points refer to Figures S-5 and S-6.

Placement: At the beginning or entrance to the trail an optimum of 10 feet (3.0 m) away from the trail shoulder (Note: access to the sign should be accommodated for all trail users)

Trail Entrance Bollards and Use Control Signs S-5

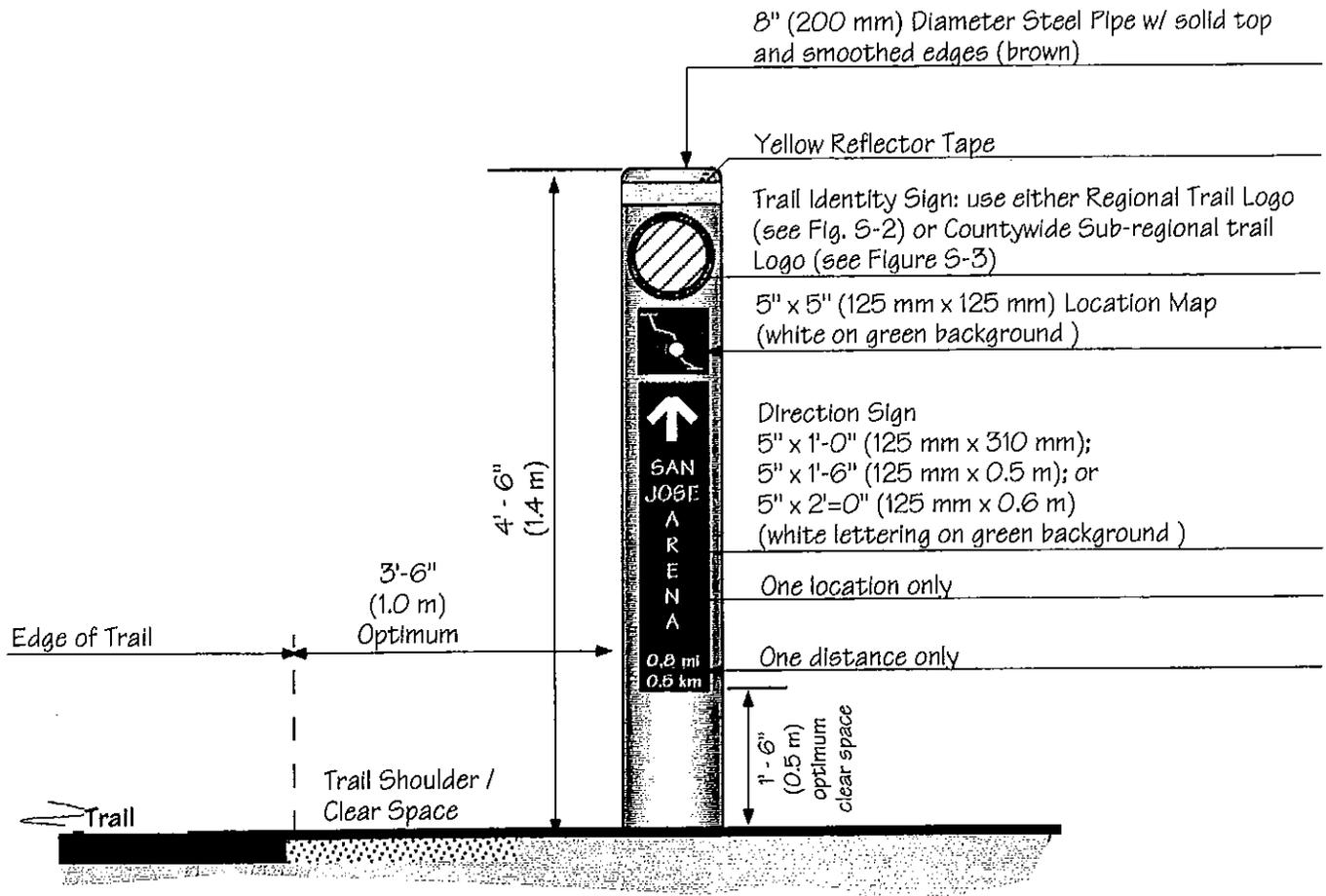
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Related Policies: UD-1.3.2.2; UD 4.3.1.2; UM 1.3.1

Trail Entrance Bollards and Allowable Use Signs portray which types of trail use are appropriate and permitted on the trail. Use signs should be placed at each entrance to a trail from a street, sidewalk, or parking area.

Placement: Within 25' of a trail intersection with a street, sidewalk or parking area.

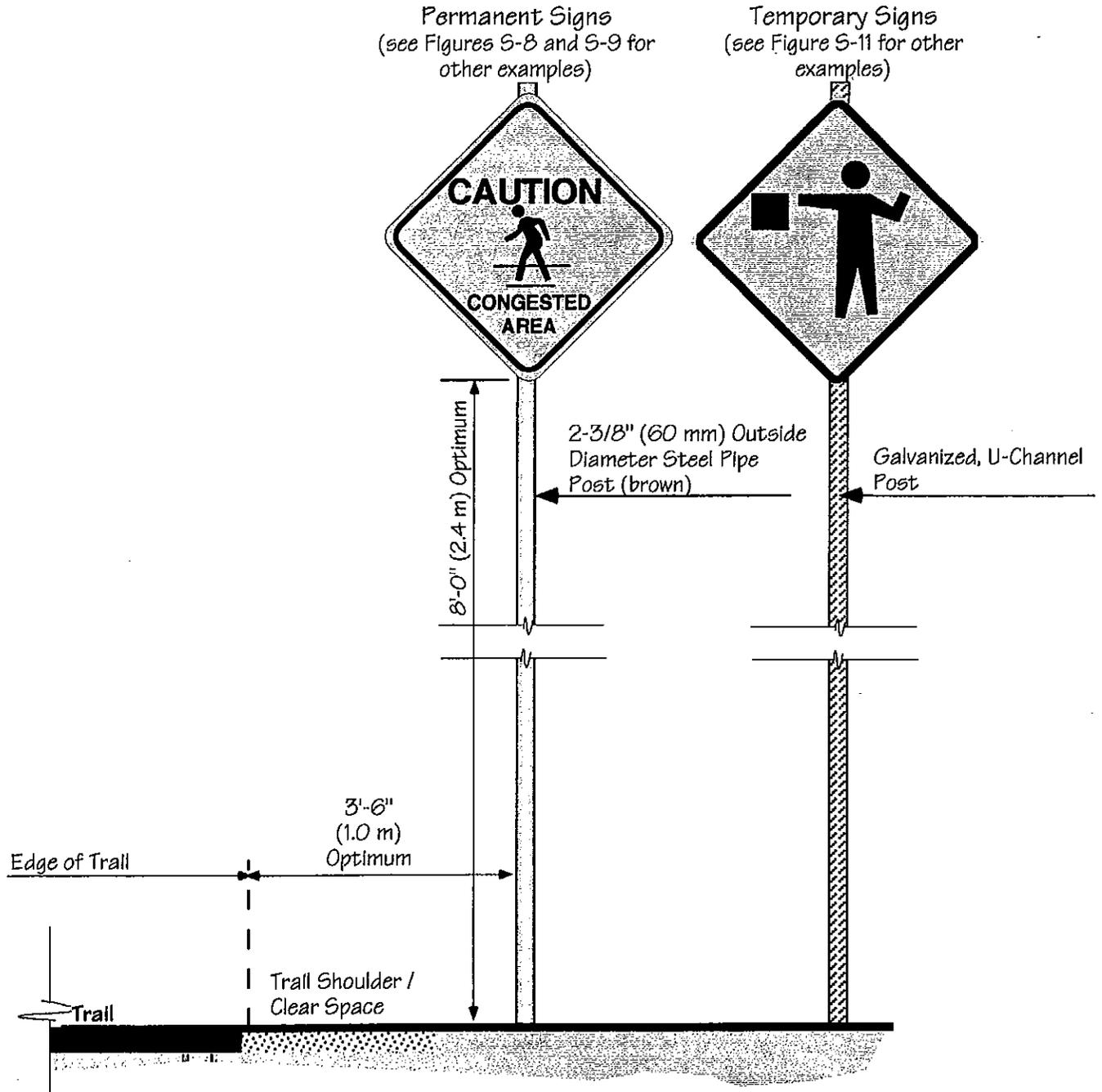


Related Policies: UD-4.3.1.3

Mile Marker / Direction Signs provide information to the trail user about distances along the trail and distances to points of interest. Mile markers can be provided independently from information about points of interest. Placement: If used, mile marker signs should be placed at regular intervals (such as every 1/2 mile / 0.8 km.) and be based on distinct beginning and ending points of the trail.

Trail Management Sign Posts S-7

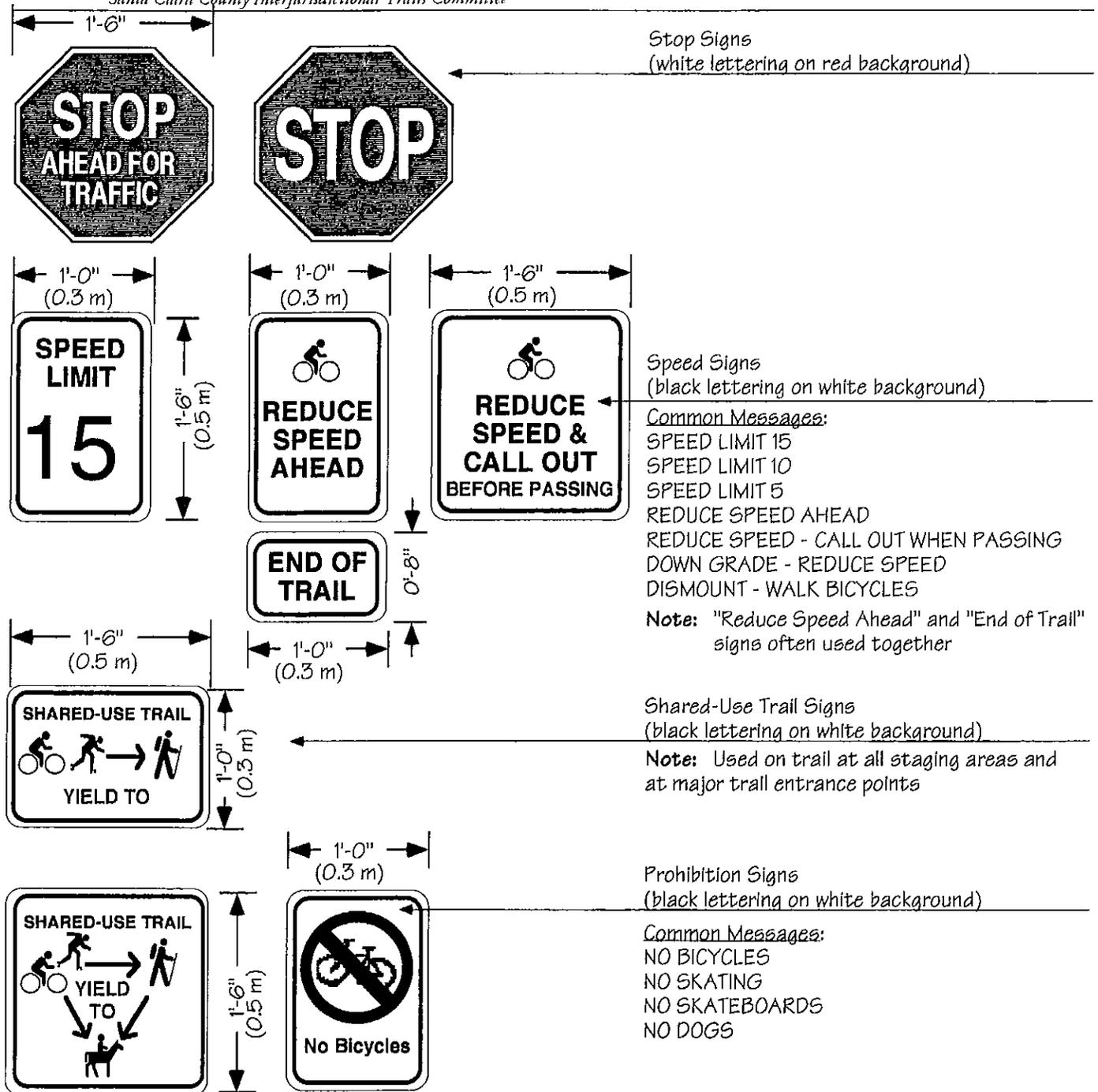
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Related Policies: UD-2.2; UD-2.5

S-8 Trail Regulatory Signs

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 Santa Clara County Interjurisdictional Trails Committee



Related Policies: UD-2.2; UD-2.5; UD-4.3.1.4

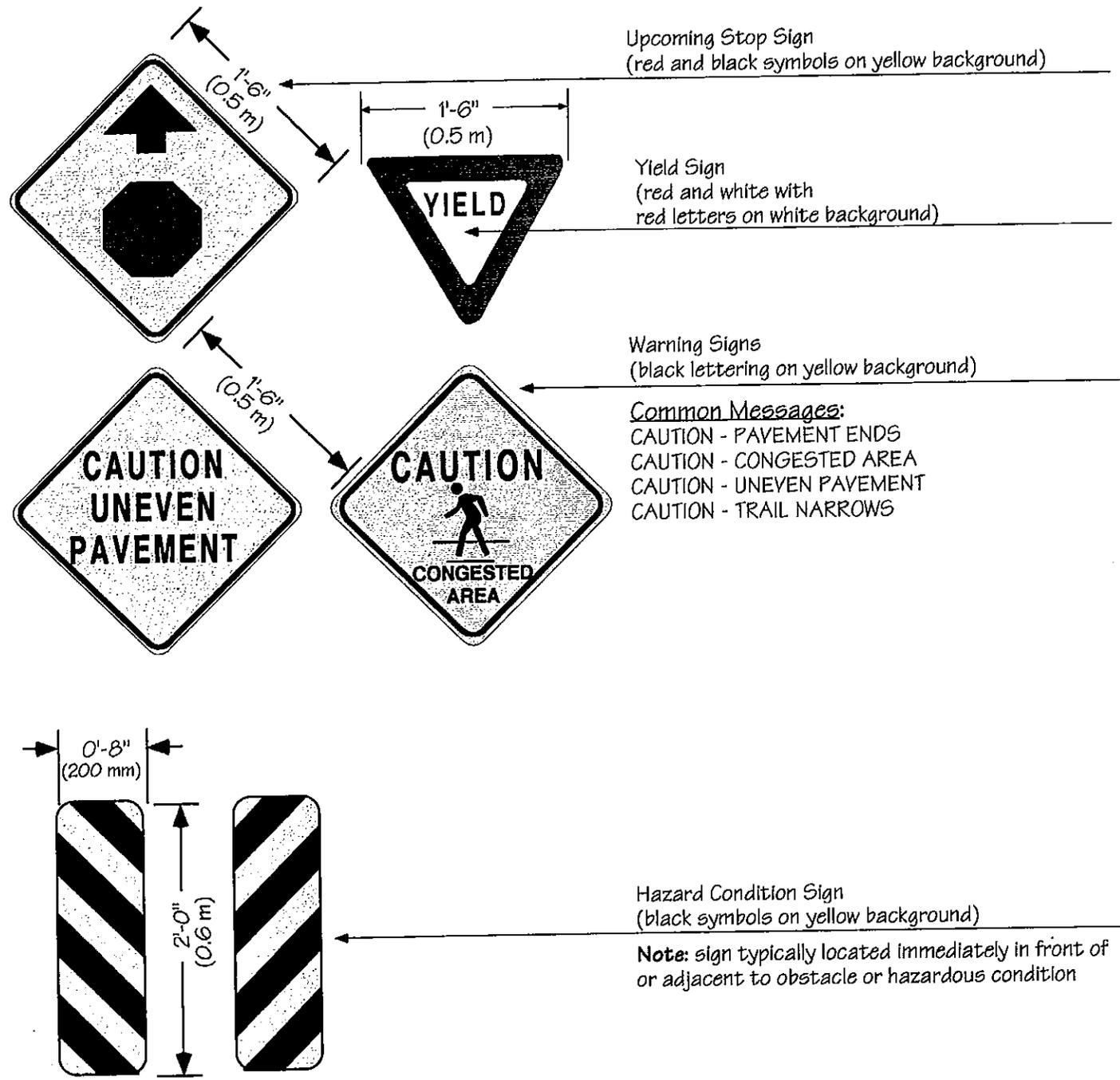
Trail Regulatory Signs provide information to trail users about rules and regulations that affect trail use such as: the need to stop; reduce speed; dismount and walk bicycles; trail endings; use restrictions during the fire season; and the hierarchy of yielding among trail users. If sight distances are less than 100' (30.4m), reduced speed limits should be considered. Where a trail must pass under a bridge and optimum horizontal dimensions (see Figure T-16) are not possible, safety / regulatory signs should be used to reduce speeds or dismount if necessary.

Placement: Location may vary based on circumstances; optimally at least 100' (30.4m) before any event. Reference also:

- Highway Design Manual (HDM); Chapter 1000 - Bikeway Planning and Design; Topic 1004 - Uniform Signs, Markings and Traffic Control Device. California State Department of Transportation.
- Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways. U.S. Department of Transportation, Federal Highway Administration, Office of Highway Safety.

Trail Safety Signs S-9

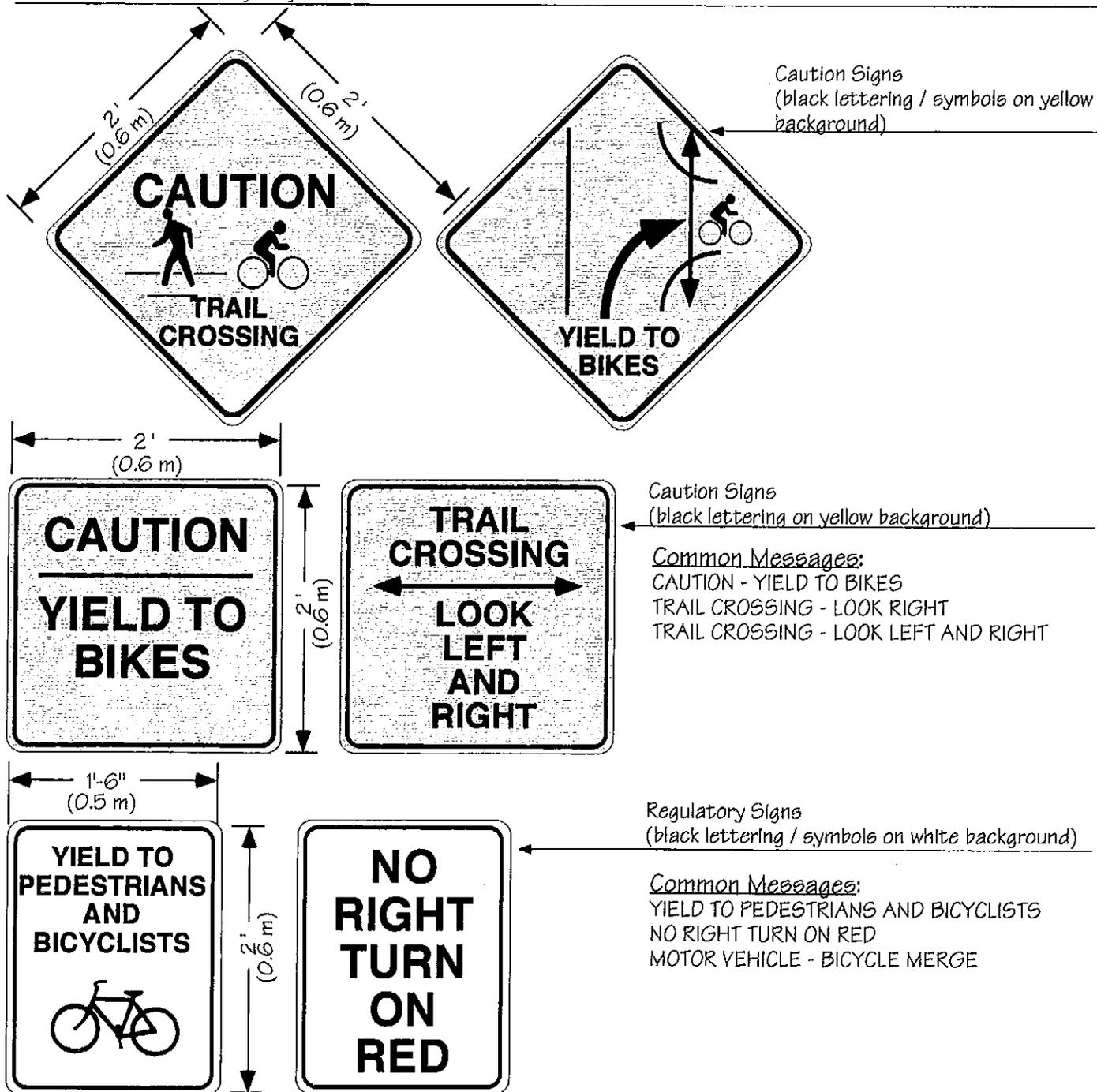
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Related Policies: UD-2.2; UD-4.2.1; UD-4.3.1.5; UM-1.3.2; UM-1.4.1

Safety Signs display warnings of such items as upcoming obstacles, street intersections, blind curves, vertical clearances and special wildlife conditions. If sight distances on curves, around hills or buildings or through densely vegetated areas are less than 100 (30.4 m) feet, safety signs should be considered. Where a trail must pass under a bridge and optimum horizontal dimensions (see Figure T-16) are not possible, safety signs should be placed on either side of the undercrossing involved to inform trail users of such conditions.

- Placement:** Location may vary based on circumstances; optimally at least 100' before any event. Reference also:
- *Highway Design Manual (HDM); Chapter 1000 - Bikeway Planning and Design; Topic 1004 - Uniform Signs, Markings and Traffic Control Device.* California State Department of Transportation.
 - *Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways.* U.S. Department of Transportation, Federal Highway Administration, Office of Highway Safety.



Related Policies: UD-4.3.1.5

Road Signs can be caution signs used to alert vehicles on the street system about an upcoming trail crossing or regulatory signs used at intersections where typical crosswalks or signal controls are not sufficient to safely manage traffic/trail conflicts.

Placement: Caution signs generally placed erect in the standard position on the right of road; 250 feet to 750 feet in advance of trail crossing. Reference also:

- *Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways*. U.S. Department of Transportation, Federal Highway Administration, Office of Highway Safety.



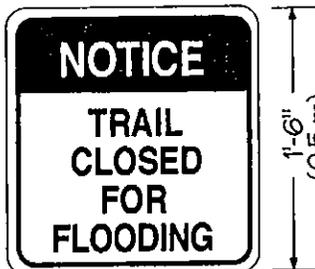
Construction / Maintenance Signs
 (black lettering / symbols on orange background)

Common Messages:
 TRAIL WORK AHEAD
 SURVEY CREW AHEAD
 BE PREPARED TO STOP
 TRAIL TEMPORARILY CLOSED (see also Guideline UM - 1.4.4)



Temporary Condition / Closure Signs
 (yellow lettering and black background /
 black lettering on yellow background)

Common Messages:
 CAUTION - STORM DAMAGED TRAIL
 CAUTION - STAY ON TRAIL



Closure Signs
 (whitelettering on red background /
 red lettering and white background)

Common Messages:
 NOTICE - TEMPORARILY CLOSED FOR WILDLIFE
 NESTING
 NOTICE - TRAIL CLOSED FOR FLOODING

Related Policies: UD-1.3.2.2; UD-2.2; UD-4.2.1; UD-4.3.1.5; UM-1.3.2; UM-1.4.1

Temporary Signs are typically used to warn the trail user of upcoming maintenance activities along the trail and for temporary trail closures which include, but are not limited to: seasonal periods critical to special status species; during high fire season; when a hazardous condition exists (e.g. landslide or washout); during periods of flooding or extremely wet weather where such weather renders the trail dangerously slippery or where use would damage the trail; where overuse threatens resource values; during special events; or where adjacent land uses may present unsafe conditions that could affect the trail user.

Placement: Location may vary based on circumstances but typically 100' (30.4 m) before any the hazard or closure point.