

## CHAPTER 900 LANDSCAPE ARCHITECTURE

### Topic 901 - General

#### Index 901.1 - Landscape Architecture Program

The Landscape Architecture Program is responsible for the development of policies, programs, procedures, and standards for all aspects of the Roadside Program which consists of highway planting, replacement highway planting, mitigation planting, highway planting revegetation, highway planting restoration, roadside rehabilitation, roadside protection and restoration, roadside improvements, safety roadside rest areas, scenic highways, classified landscaped freeways, transportation art, gateway monuments, community identification, blue star memorial highways, and planting in conjunction with noise barriers.

This chapter provides mandatory, advisory and permissive standards as defined in Index 82.1. The Chief, Division of Design is responsible for approving exceptions to all mandatory standards (**boldface** text) unless delegated as noted in Index 82.2(1). District Directors are responsible for approving exceptions to all advisory standards (indicated by underlining text) as discussed in Index 82.2(2). All other guidance in this Chapter pertaining to the design of planting and irrigation systems as well as when noted in the text is the responsibility of the Landscape Architecture Program. See the Project Development Procedures Manual (PDPM) Chapter 29 regarding process and procedures for approval of deviations from Landscape standards.

#### 901.2 Cross References

- Several highway landscape architectural terms are defined in Index 62.5 of this manual.
- The PDPM contains general definitions, policies, and procedures concerning planting and conservation of vegetation and explains procedures and responsibilities for developing highway planting projects.
- The Preliminary Environmental Analysis Report (PEAR), included in the Standard

Environmental Reference, contains guidelines and responsibilities for determining scenic resources during the project development process. <http://www.dot.ca.gov/ser/pear.htm>

- Chapter 500 of the Encroachments Permits Manual contains procedures and guidelines for planting design and administering planting by others, through permit projects.
- Chapters 4-20 and 4-21 of the Construction Manual discuss materials and methods involved in erosion control and planting and irrigation. Allowable options are described for materials and work methods called for in the project specifications as well as Landscape Architect involvement during construction.
- Chapter E of the Maintenance Manual contains instructions about the maintenance of highway planting and other roadside features. Chapter C2 of the Maintenance Manual contains instructions about the maintenance of native and naturalized roadside vegetation.
- The Landscape Architecture Program's website further explains the Department's policy and provides guidance for landscape architectural work, including water conservation. The website is located at: <http://www.dot.ca.gov/design/lap/>.

### Topic 902 - Planting Guidance

#### 902.1 General Guidance for Freeways and Expressways

This section provides standards and guidelines for the design of planting and irrigation systems.

Highway planting is vegetation placed for aesthetic, environmental mitigation, storm water pollution prevention, or erosion control purposes, and includes necessary irrigation systems, inert materials, and mulches.

In addition, highway planting is used to satisfy the need for headlight glare reduction, fire retardance, windbreak protection, or graffiti reduction on retaining walls and noise barriers.

- (1) *Design Considerations.* Design planting and irrigation systems to achieve a balance between aesthetics, safety, maintainability, cost-effectiveness, water and resource

conservation. Planting and irrigation design should respond to the following community goals:

- (a) Aesthetics. Select plants and replacement planting to integrate the facility with the adjacent community or natural surroundings; buffer objectionable views of the highway facility for adjacent homes, schools, parks, etc.; soften visual impacts of large structures or graded slopes; screen objectionable or distracting views; frame or enhance good views; and provide visually attractive interchanges as entrances to communities.

Select and arrange regionally appropriate drought tolerant native and non-native plants to be visually and culturally compatible with local indigenous plant communities and the surrounding landscape.

Place plants according to the perspective of the viewer. For example, compositions viewed by freeway motorists should be simplified and large scale. Compositions primarily viewed by pedestrians may be designed with greater detail.

Integrate the highway improvement within the existing environment using contour grading that preserves existing natural topographic features and plant material.

- (b) Safety. Planting and irrigation facilities are designed for the safety of both highway workers and the public.

To understand potential hazards to maintenance workers, designers should be familiar with Topic 706 as well as Chapter 8, "Protection of Workers", of the Maintenance Manual.

Select and locate plants to maintain sight distance and clear recovery zone distances. Planting, without exception, must not interfere with the function of safety devices (e.g., barriers, guardrail) and traffic control devices (e.g., signals and signs), shoulders and the view from the roadway of bicyclists and pedestrians.

Highway planting and irrigation work should incorporate design for safety concepts that include, but are not limited to, the following:

- Access - Provide access gates for maintenance personnel from local streets and frontage roads. Provide paved maintenance vehicle pullout areas away from traffic on high volume highways and other areas where access cannot be made from local streets and roads. Maintenance access roads provide access to the center of loop areas or other wide, flat areas.
- Minimize Exposure to Traffic and Reduce the Need for Shoulder or Lane Closures - Locate vegetation away from shoulder areas, gore areas, and narrow island areas between ramps and the traveled way to reduce the need for shoulder or lane closures to perform pruning or other maintenance operations. Narrow areas and areas beyond freeway gore entrances and exits should be paved. See Index 504.4(2) for further contrasting surface treatment guidance.
- Median Planting - Median planting should not be permitted on freeways. Exceptions for the planting of freeway medians are approved by the District Director if the planting can be maintained.

- (c) Maintainability. Planting and irrigation designs should minimize ongoing intensive maintenance activities through field observation and discussion with maintenance personnel during project development. Ongoing communication between designers, landscape specialists, landscape maintenance personnel, and construction inspectors will ensure that maintenance concerns are addressed.

Select and locate plants to reduce application of herbicides.

Specify plant establishment and irrigation test periods of sufficient time to identify

and resolve problems and minimize long term maintenance requirements.

- (d) **Cost-effectiveness.** The design should provide maximum long term benefit for the costs involved. Materials and methods specified should be commercial quality and closely matched to the project conditions.

- (e) **Water and Resource Conservation.** The use of potable water for irrigation is discouraged. Non-potable or recycled water should be used instead of potable water wherever possible.

Conserve water by using regionally appropriate drought tolerant native and non-native plants that will require little or no supplemental water at the completion of the plant establishment period. See Chapter 29 of the PDPM for plant establishment period requirements.

Conserve water by using wood or gravel mulches to reduce evapotranspiration.

Use “smart” irrigation controllers that automatically adjust water application based upon weather conditions.

## 902.2 Sight Distance and Clear Recovery Zone Standards for Freeways and Expressways

Sight distance and safety are of primary importance, and are not to be subordinate to aesthetics. Applicable minimum sight distance standards are set forth in Topic 201 Sight Distance and Topic 405 Intersection Design Standards.

Two types of plant setbacks affect the placement of landscape elements:

- To keep the continuous length of highway ahead visible to the driver (sight distance).
  - To keep the clear recovery zone free of physical obstructions.
- (1) *Sight Distance Plant Setbacks.* Sight distance limits are measured from the edge of traveled way to the outside edge of the mature growth. Plant setback is measured from the edge of traveled way to the face of tree trunk or face of shrub foliage mass. Care must be taken to

ensure that future growth will not obstruct sight distance.

Proposed mature planting should maintain sight distance required by the design speed of the facility. In cases where, due to geometric restrictions, the existing freeway facility does not provide 80 miles per hour sight distance, no further reduction should be caused by planting.

For interchanges, all planting must provide ramp and collector-distributor road sight distance equal to or greater than that required by the design speed criteria with a minimum provision of sight distance for 40 miles per hour. At points within an interchange area where ramp connections or channelization are provided, plantings must be clear of the shoulders and sight line shown in Figure 504.3J, Location of Ramp Intersections on the Crossroad.

Particular attention should be paid to planting on the inside of curves in interchange loops, in median areas, on the ends of ramps, and on cut slopes so that shoulders are clear and designed sight distances are retained for vehicles, bicycles and pedestrians. See Index 902.3.

Sight distance requirements restrict the height of plants or the horizontal distance of plants from the traveled way. Low growing plants may be planted within the plant setback distance as long as the requirements for sight distance are met as discussed in Index 201.6 and illustrated in Figure 201.6. Taller growing plants are to be placed beyond these plant setbacks. In interchange areas, generally, from the edge of traveled way, a 50-foot horizontal clearance within the loops is considered as the sight distance plant setback for trees and shrubs that will grow above a 2-foot height.

- (2) *Clear Recovery Zone.* The clear recovery zone provides an area for errant vehicles to potentially regain control. For tree setback purposes, large trees are defined as plants which at maturity, or within 10 years, have trunks 4 inches or greater in diameter, measured 4 feet above the ground. Examples

of large tree species are Coast Redwood (*Sequoia sempervirens*), Coast Live Oak (*Quercus agrifolia*) and Deodar Cedar (*Cedrus deodora*).

On freeways and expressways, including interchange areas, there should be 40 feet or more of clearance between the edge of traveled way and large trees; however, a minimum clearance of 30 feet must be provided. Special considerations should be given to providing additional clearance in potential recovery areas. The 30-foot distance is measured horizontally from the edge of traveled way to the face of the tree trunk. Large trees may be planted within the 30-foot limit where they will not constitute a fixed object; for example, on cut slopes above a retaining wall or in areas behind guardrail, which has been placed for reasons other than tree planting.

Exceptions to the 30-foot tree setback may also be considered on cut slopes which are 2:1 or steeper or where there are physical barriers such as retaining walls. The minimum tree setback in these cases should be 25 feet.

Offset distances greater than 30 feet should be provided at locations such as on the outside of horizontal curves and in the vicinity of ramp gores.

Large trees should not be planted in unprotected areas of freeway or expressway medians with the possible exception of separated roadways with medians of sufficient width to meet the plant setback requirements for tree planting.

Small trees are those with smaller trunks or plants usually considered shrubs, but trained in tree form which would not develop 4-inch diameter trunks within 10 years. Examples of small trees are Crape Myrtle (*Lagerstroemia indica*), and Bottle Brush trained as a standard (*Callistemon* sp.).

### 902.3 Planting Guidance for Large Trees on Conventional Highways

When proposing large trees for conventional highways the mature size, form, and growth characteristics of the species should be considered.

Select and locate large trees to maintain a minimum vertical clearance of 17 feet from the pavement to the lower foliage of overhanging branches over the traveled way and shoulder to provide visibility of highway signs, features, and appurtenances. Select and locate large trees to maintain a minimum vertical clearance of 8 feet from the sidewalk to the lower foliage of overhanging branches for pedestrian passage. Do not select tree species that will require regular pruning at maturity to maintain these clearances.

Large trees must not restrict sight distance requirements.

Large trees must not visually restrict existing signs and signals.

Large trees planted in conventional highways are to comply with the requirements in Table 902.3. All distances are measured from the frame of reference specified in Table 902.3 to the face of the tree trunk. See the District Landscape Architect for plant selection, plant setback, and spacing consistent with this guidance.

See Index 305.1(2) for median guidance on conventional highways.

### 902.4 Planting Procedures, Selection and Location

- (1) *Design Procedures.* An overview of the project development process is covered in the Project Development Procedures Manual.
- (2) *Plant Selection.* Select drought tolerant native or non-native plants that will survive if supplemental water is discontinued or becomes unavailable. Plants should be well suited to local environmental conditions such as sun exposure, aspect, climate, annual precipitation, temperature extremes, soil type, recycled water quality, and wind.

Plants should have a growth rate, longevity, size, and appearance appropriate for their intended use, and should not require ongoing maintenance. California plants that meet required planting criteria should be used to the greatest extent possible. Species availability and fire risk should also be taken into consideration.

Monoculture planting is discouraged.

**Table 902.3**

**Large Tree Setback Requirements on Conventional Highways**

ROADSIDE			
Condition	Posted Speed (mph)		
	≤ 35	40 – 45	> 45
With curb	<u>18” Min. from curb face</u>	30’ Min from ETW	
With barrier	<u>Min. deflection distance from barrier face (barrier type specific)</u>	<u>Min. deflection distance from barrier face (barrier type specific)</u>	
Without curb or barrier	<u>30’ Min from ETW</u>		
MEDIAN <sup>(1), (2)</sup>			
Condition	Posted Speed (mph)		
	≤ 35	40 – 45	> 45
With curb	<b>5’ Min. from curb face</b>	Not Allowed	
With curb in Main Street context; where median width of 12’ is not feasible and trees are a part of a community’s transportation plan to improve livability that also includes transportation features for traffic calming through physical design such as modifying intersections or relocating traffic lanes to make space for bike lanes, sidewalks and landscaping. See the Department’s “Main Street, California” document for more information.	18” Min. to 5’ from curb face if approved by the District Director	Not Allowed	
With barrier	<b>Concrete Barrier:</b> <b>18” Min. from face of barrier</b> <b>Other Barrier:</b> <b>Min. deflection distance for barrier type, 18” Min.</b>		Allowed if approved by the District Director
Without curb or barrier	Not Allowed		

Notes:

- (1) Trees in the median shall be located at least 20 feet from manholes.
- (2) Trees in the median shall be located at least 100 feet from the longitudinal end of the median.

Select diverse plant species with robust characteristics properly suited to the project environment.

Wherever feasible, trees should be used to create the main structure of the planting composition.

Trees generally recognized to be brittle, susceptible to disease, or that increase in size by suckering, should not be selected.

Plants with edible or attractive fruits, berries or nuts should not be selected.

When appropriate, planting projects must include California native wildflowers as an integral and permanent part of the planting design. Chapter 29 of the Project Development Procedures Manual discusses wildflower requirements.

- (3) *Plant Location.* When locating plants, the mature size, form, and characteristics of the species should be considered, particularly for safety of maintenance workers and the traveling public, and long-term maintenance costs.

Locate plants so that pruning will not be required. Do not plant trees under overhead utilities or structures.

Locate plants so that they will not obscure existing billboards, or on-premise business identification signs for a distance of 500 feet from the billboard sign.

Locate plants so they will not obscure pedestrians and bicyclists at intersections or other conflict points.

Planting designs that use permanent irrigation systems should group plants with similar water requirements together in hydrozones to conserve water.

Plants with thorns or known to be poisonous to humans and animals, (e.g., rose, oleander), should not be planted adjacent to sidewalks, bikeways, areas used for grazing animals, equestrian activities, with high public exposure, or where children have access to the planting. Designers should be aware of State and local restrictions on the planting of certain species in or adjacent to specified areas.

Contact District Landscape Architect for further information.

In areas subject to frost and snow, plantings should not be located where they will cast shade and create patches of ice on vehicle or pedestrian ways.

- (4) *Planting on or Near Walls.* Vine planting should be included with all sound barrier projects to reduce the potential for graffiti and to soften the appearance of the wall. If retaining walls or sound barriers are located within the clear recovery zone (see Index 902.2), plants may be placed behind the walls and be allowed to grow over (or through) the wall, or plants may be placed in front of the wall, but they must be behind a concrete safety shaped barrier that is placed to shield something other than plants. Plants are not permitted on concrete safety shaped barriers on the traffic side, unless an exception is granted from the Division of Traffic Operations and all of the following requirements are met:

- (a) Only vines which have a natural tendency to cling to noise barriers or retaining walls may be planted on the traffic side of barriers. Support structures on walls should not be used. The vines must readily adhere to the barriers. No shrubs or ground cover will be allowed. Vines such as Creeping Fig (*Ficus pumila*) and Algerian Ivy (*Hedera canariensis*) will not be allowed due to their habit of peeling off hard surfaces at maturity.
- (b) Plant basins must be depressed and minimal in size. Ground surface irregularities must be insignificant or nonexistent.
- (c) Each plant must be individually irrigated. The plants should not encroach onto the shoulder or create sight distance problems.

The Maintenance Unit should be consulted as vines planted on walls may require maintenance access for pruning. See Index 1102.7 for maintenance considerations in noise barrier design.

- (5) *Planting of Vines on Bridge Structures.* Vines should not be planted where they might grow over any portion of the bridge structure. When the regular inspection of bridge structures is required and where rapid visual inspection of these structures is required in areas of high seismic activity, the planting of vines on bridge structures or columns is not permitted. There are certain conditions such as low average daily traffic, high redundancy in the substructure, etc. where exceptions from Structure Maintenance may be granted, after all risk vs. benefit factors are considered, to plant vines.
- (6) *Planting in Vicinity of Airports and Heliports.* All plants must not exceed the height restriction standards contained in Topic 207 of this manual. Mature plant height must be used to determine if the plant(s) will be considered an obstruction to navigable airspace.

### 902.5 Irrigation Guidelines

- (1) *General.* Irrigation systems should be designed to conserve water, minimize maintenance, minimize worker exposure to traffic, and sustain the planting. The design should be simple, efficient, and straight forward.

Irrigation systems must comply with State and local water conservation requirements including the Model Water Efficient Landscape Ordinance (MWEL0).

Irrigation systems that use recycled, non-potable, or untreated water must comply with State and local water quality health standards and regulations.

Permanent irrigation systems must not use potable water if recycled or non-potable water is available. Temporary irrigation systems may use potable water if designed to be abandoned and removed at the completion of the plant establishment period. See Chapter 29 of the PDPM for plant establishment period requirements.

Water quality should be considered when selecting irrigation components. Design the irrigation system taking into consideration the

salinity level and increased particulate content often found in recycled and non-potable water sources.

Minimize exposure to traffic and reduce the need for shoulder or lane closures by locating irrigation system components away from shoulder areas, gore areas, and narrow island areas between ramps and the traveled way.

Design irrigation systems to take advantage of “smart” controllers and remote control devices that minimize worker exposure and conserve water.

Use standard, commercially available irrigation components, avoiding nonstandard features unless required to address unique site conditions.

Security measures, such as locking cabinets, enclosures and valve boxes should be provided.

Potential damage from pedestrians or vehicles should be considered when selecting and locating all irrigation components. Place irrigation components such as controllers, valves, backflow preventers, and booster pumps far away from gores, narrow areas, and decision points, preferably behind barriers or shielded by a structure.

- (2) *Valves and Sprinklers.* Irrigation systems should be designed for automatic operation. When systems are temporary or will be used infrequently, manual, battery, solar or timer-operated valves may be used.

Control valves are to be in manifolds where practical and a ball valve must be provided.

Cluster and locate valves adjacent to maintenance vehicle pullouts, access paths or in locations accessible from outside the right of way via access gates.

Place irrigation components that require regular maintenance, such as valves and controllers, outside the clear recovery zone or behind safety devices.

When possible, trees and shrubs that require permanent irrigation spaced greater than 10 feet on center should be watered individually.

Permanent or temporary overhead irrigation systems, e.g., impact or gear driven sprinklers, should be limited to irrigating low shrub masses, ground cover or establishing native grasses. Trees in overhead irrigated ground cover areas should receive supplemental basin water. Sprinklers should be appropriate for local wind and soil conditions. Sprinklers should be selected and placed to avoid spraying paved surfaces. Sprinklers, other than pop-up heads, subject to being damaged by vehicles, bicyclists, or pedestrians should be relocated or provided with sprinkler protectors, flexible risers, or flow shutoff devices. Sprinklers on fixed risers should not be placed adjacent to sidewalks and bikeways. Sprinkler protectors should be used on pop-up sprinklers and quick coupling valves adjacent to the roadway.

- (3) *Controllers.* Irrigation controllers should be “smart,” easily accessible, located in vandal resistant cabinets, protected from vehicular traffic, and in an area with good lighting. Install the irrigation controller cabinet with the back facing the direction of oncoming traffic in the nearest traffic lane. Controllers must not be located near shoulders, in or near dense shrubbery, or in the path of the spray of sprinklers.
- (4) *Backflow Preventers.* The use of reduced pressure principle backflow devices are required for highway planting projects. Master remote control valves should be used at all pressured water sources directly downstream of the backflow preventers. Backflow preventers should be located in enclosures.
- (5) *Booster Pump Systems.* When local agency water pressure is insufficient, booster pumps may be included in the irrigation design. Design of a booster pump system should be coordinated with DES-SD, Office of Electrical, Mechanical, Water and Wastewater Engineering (OEMW&W). After the irrigation system has been designed such that all branches have close to equal flowrate requirements, the booster pump system design request should be prepared including flowrate and discharge pressure needed for the pump,

the availability for power distribution, and maintenance access to the pump site. OEMW&W will either design the booster pump system, (including the equipment pad, enclosure, valves and piping, pump equipment, and pump control equipment) or recommend an off-the-shelf booster pump package.

## Topic 903 - Safety Roadside Rest Area Standards and Guidelines

### 903.1 Minimum Standards

The following standards generally represent minimum values. When consistent with sound judgment and in response to valid concerns, variations may be considered. Standards lower than those indicated herein may not be used without approval of the Principal Landscape Architect, Landscape Architecture Program. See Chapter 29 of the Project Development Procedures Manual (PDPM) for process and procedures for approval of deviations from standards.

The Division of Design is responsible for approving nonstandard geometric design as discussed in Topic 82 and Index 901.1. The District Design Liaison and Project Delivery Coordinator should be involved in reviewing the geometric features for the design of the on and off ramps of safety roadside rest areas. Structural sections and drainage should be designed in accordance with the standards contained in this manual.

### 903.2 General

Safety roadside rest areas should be designed to provide safe places for travelers in automobiles, commercial trucks, recreational vehicles, and bicycles where not prohibited, to stop for a short time, rest and manage their travel needs. Safety roadside rest areas may include vehicle parking, bicycle parking, picnic tables, sanitary facilities, telephones, water, landscape tourist information, traveler service information facilities and vending machines. Safety roadside rest areas should be provided at convenient intervals along the State highway system to accommodate traveler needs.

Safety roadside rest areas should comply with State and Federal codes and regulations that address

buildings, electrical work, plumbing, lighting, drinking water, wastewater treatment discharge, grading, storm water discharge, hazardous material containment and disposal, energy conservation, accessibility for persons with disabilities, and environmental protection and mitigation.

Safety roadside rest areas should be designed for cost effective and efficient maintenance. High quality, durable and easily cleanable materials should be used to accommodate the heavy use that rest area facilities receive. Replaceable components, such as mirrors, sinks, signs, and lighting fixtures, should be products that will be readily available during the lifetime of the facility. Crew rooms and storage space for cleaning supplies, tools and equipment should be provided in appropriate locations, away from direct public view. Maintenance access must be provided to plumbing, sewer, electrical, and equipment to facilitate inspection and repair.

The freeway interchange should accommodate, or be improved to accommodate, the volume and geometric movements of anticipated traffic. The safety roadside rest area should be within one-half mile of the freeway.

Auxiliary parking lots include parking areas and restrooms provided by or jointly developed and operated by partners (such as existing or new truck stops, or at other highway oriented commercial development). These are for longer-duration stops and overnight parking, primarily for commercial vehicle operators. These facilities are located outside of freeway right of way, within one-half mile of the freeway.

### 903.3 Site Selection

(1) *Need.* New safety roadside rest area and auxiliary truck parking sites should be consistent with the needs identified in the current Safety Roadside Rest Area System Master Plan. Proposed locations identified on the Safety Roadside Rest Area System Master Plan, available from the Landscape Architecture Program website, are approximate only. Actual sites may be located within several miles in either direction from the location indicated on the Safety Roadside Rest Area System Master Plan. More than one alternate site should be

identified and analyzed before selecting a preferred site. When offering potential sites for joint economic development proposals, it is best to allow for as many acceptable alternative sites as possible.

- (2) *Spacing.* New safety roadside rest area sites should be located per the current Safety Roadside Rest Area System Master Plan.
- (3) *Access.* Safety roadside rest areas located on a freeway or a highway of four lanes or more, should be planned as a pair of units, each unit serving a separate direction of traffic. Access (ingress/egress) should be by means of direct on and off ramps from the freeway or highway. Required minimum distances should be accommodated between existing and proposed ramps, in accordance with Chapter 500.

Federal law and regulations prohibit direct access from the freeway to commercial activities.

- (4) *Right of Way Requirements.* A safety roadside rest area unit may require 10 to 15 acres of right of way. Potential negative impacts to prime agricultural land, native vegetation, natural terrain, drainage and water features should be considered when identifying potential sites for rest areas. Consider sites where natural vegetation has already been disturbed and where rest area development may facilitate restoration.

Ideally, the Department should own safety roadside rest area right of way in fee simple.

However, it may be necessary or desirable for safety roadside rest areas to be located on land owned by other State, Federal or tribal entities. When seeking right of way agreements or easements, consider possible partnerships with the entity landowners that may facilitate right of way acquisition or project acceptance. The opportunity to cooperate on the development of integrated information, interpretive or welcome centers may be favorable to another entity.

- (5) *Economic Factors.* Right of way cost may be a significant factor in site selection. Advance protection or acquisition of right of way

should be considered when planning and programming future safety roadside rest area projects.

The impact of safety roadside rest areas on local tourism and economic development should be considered, addressed, and discussed. Stakeholders who may consider partnering to develop or operate the safety roadside rest area should be part of this discussion.

### 903.4 Facility Size and Capacity Analysis

Safety roadside rest area parking and restroom capacity should be designed to accommodate the anticipated demand in the design year (20 years from construction). When feasible, the design may allow the parking area to be expanded by 25 percent beyond the 20-year design period.

If budget prevents the full facility from being constructed initially, a master site plan should be developed that indicates the planned footprint of parking and rest rooms to accommodate anticipated demand. Areas designated for future expansion should be kept free of development, including underground utilities.

Safety roadside rest area expansion should not excessively diminish the scenic and environmental qualities of the existing site. If it is impractical to expand an existing rest area because of cost and site conditions, consider strategies for increasing capacity in the vicinity, such as relocation of the rest area, construction of an auxiliary parking facility, or construction of an additional safety roadside rest area.

(1) *Stopping Factor.* The process for estimating required parking capacity begins by calculating the percentage of daily traffic that is expected to stop at the safety roadside rest area. The Division of Traffic Operations provides data on annual average daily traffic (AADT) for State highway mainlines and ramps. The average daily ramp count for a safety roadside rest area, when divided by the mainline AADT, provides a percentage stopping factor.

$$\frac{\text{Ramp Count}}{\text{Mainline AADT}} = \text{Stopping Factor (\%)}$$

The calculated stopping factor for an existing rest area may not indicate the full demand for a facility. Overcrowded conditions at a rest area during weekends and holidays may discourage many travelers from stopping. Nevertheless, this method provides a reasonable estimate of the rough percentage of vehicles that stop at a rest area. Stopping factors typically range from 1 percent on high volume freeways to 35 percent on remote highways.

A stopping factor cannot be directly calculated for a new safety roadside rest area; however, an estimate may be derived from existing safety roadside rest areas of similar size and situation. The type of highway traffic, the remoteness of the site, and the availability of other traveler services should be considered. Stopping factors for new safety roadside rest areas generally range from about 10 percent to 15 percent of mainline traffic.

(2) *Number of Visitors.* The number of vehicles entering a safety roadside rest area during an average day may be estimated by multiplying the mainline AADT by the stopping factor.

The number of visitors using a safety roadside rest area during an average day then may be estimated by multiplying the number of vehicles per day by an average vehicle occupancy of 2.2 people.

$$\begin{aligned} & \text{Mainline AADT (Year of Traffic data)} \\ & \quad \times \text{Stopping Factor (\%)} \times 2.2 \\ & = \text{Total Visitors Per Day} \end{aligned}$$

To determine the 20-year design-need, it is necessary to apply a traffic-growth factor to the results. Generally, 3 percent compounded 20-year growth may be estimated by multiplying the number of visitors by a factor of 1.8.

$$\begin{aligned} & \text{Mainline AADT} \times \text{Stopping Factor (\%)} \\ & \quad \times 2.2 \times 1.8 \\ & = \text{Total Visitors Per Day (Year of} \\ & \quad \text{Traffic Data)} \end{aligned}$$

(3) *Number of Vehicle Parking Spaces.* The total number of parking spaces for all vehicle types may be estimated by multiplying the Peak Hour Traffic (see the Division of Traffic

Operations website) by the stopping factor, and dividing the result by the number of times the parking space is expected to turn over in one hour. Multiply by a factor of 1.8 to include the compounded 20-year growth.

Most visitors in automobiles stay about 10 minutes to 20 minutes. Some, however, will nap or sleep for longer periods. The California Code of Regulations allows travelers to stay up to 8 hours at each safety roadside rest area. For design purposes, it is common to assume a 20-minute stay for all types of vehicles (assume up to 6 hours, extended stay, for commercial truck drivers). That equals 3 turnovers of each parking space each hour.

$$\frac{\text{Peak Hour} \times \text{Stopping Factor (\%)} \times 1.8}{3 \text{ Turnovers per hour}} \\ = \text{Total Parking Spaces (Design Year)}$$

- (4) *Automobile/Long Vehicle Split.* Consider the percentage of commercial trucks in the mainline traffic when determining the appropriate ratio of automobile parking spaces to long-vehicle parking spaces. Typically, one third of the total parking is devoted to long vehicles (commercial trucks, transit, automobiles with trailers and recreational vehicles). On certain goods-movement routes, truck traffic can account for half of the vehicular traffic at certain rest areas (consult with District Traffic Operations). For these highly commercial route segments, consider the potential for auxiliary parking facilities to satisfy the long duration stopping needs of commercial drivers at off-line parking locations.
- (5) *Bicycle Parking.* On highways where bicycling is not prohibited, bicycle parking should be considered at safety roadside rest areas. Consult the District Bicycle Coordinator for information on placement, capacity, and design requirements for bicycle parking.
- (6) *Maximum Parking Capacity.* The maximum parking capacity for a safety roadside rest area unit should not exceed 120 total vehicular parking spaces. Larger facilities tend to lose pedestrian scale, context sensitivity and

environmental qualities appropriate for a restful experience. If more than 120 vehicular parking spaces are needed, it is advisable to consider the development of additional safety roadside rest areas as identified on the Safety Roadside Rest Area System Master Plan, or development of an auxiliary parking facility. Site conditions may limit the amount of parking that is practical to build. If construction or enlargement of parking areas to meet anticipated demand will significantly diminish the environmental character of the site, the quantity of parking should be reduced as appropriate.

Sites for auxiliary parking facilities should be chosen for their suitability in accommodating large numbers of commercial trucks for longer stays (up to 8 hours). Auxiliary parking facilities are not limited to 120 spaces; however, the amount of parking should be appropriate for the site and its surroundings.

- (7) *Restroom Capacity and Fixture Counts.* Restroom fixture counts (water closets, urinals for men's rooms, and lavatories) are developed by the Division of Engineering Services-Transportation Architecture, and based upon average daily visitor and peak hour visitor data provided by the District. The quantity of fixtures provided for men's rooms should be divided equally among water closets, urinals and lavatories. The quantity of water closets for women's rooms should be 1 to 1.5 times the combined quantity of toilets and urinals provided for men. Restroom facilities should be designed to accommodate visitor use during the cleaning of restrooms. When existing restrooms are replaced as part of rehabilitation projects, it is preferable that the 20-year design need be constructed, even when expansion of parking facilities is deferred. Restroom facilities must be designed and constructed to be accessible to persons with disabilities in accordance with all applicable State and Federal law.

### 903.5 Site Planning

- (1) *Ingress and Egress.* For safety and convenience, ingress to the safety roadside rest area, circulation within the facility and egress should be simple, direct and obvious to

the traveler. See Topic 403 regarding the principles of channelization.

**Rest areas designed for freeways shall have standard freeway exit and entrance ramps, in accordance with Chapter 500.** Projects to rehabilitate or modify existing ramps, roads, and parking lots must address any requirement to upgrade geometrics to current design standards. Safety roadside rest areas on expressways and conventional highways should be designed with standard public road connections and median left-turn lanes, according to Topic 405.

The minimum distance between successive exit ramps on collector-distributor roads into rest areas should be 600 feet. One-way vehicular circulation should be provided through the safety roadside rest area to reduce wrong-way reentry to the freeway. Re-circulation of traffic within the parking lot is acceptable if provisions are made to discourage wrong-way traffic. Travelers should be guided towards the proper exit at each decision point along internal roads and parking aisles by the angle of intersection and the placement of curbs, pavement markings, and signs.

If the highway will ultimately be a freeway, the design should accommodate future construction. Two-way ingress/egress roads, if used, should be a minimum 32 feet wide. When a rest area or auxiliary parking facility is developed outside the freeway right of way at an interchange location, the interchange ramps, bridges and general geometric design should be capable of accommodating the volume of traffic anticipated and the turning movements of commercial trucks. Geometric and structural improvements should be completed prior to public use of the safety roadside safety roadside rest area or parking facility.

Whenever possible, ingress maneuvers should utilize simple and direct movements. Egress may be more complex, if necessary, as travelers are more rested and better prepared for a circuitous route to the freeway or highway. Provide clear signage for travelers as they approach and depart the rest area.

Travelers entering a safety roadside rest area must be directed to the proper parking area - automobiles (cars, vans, motorcycles), bicycles, or long-vehicles. Where practical, provide ample ramps and transitions, good sight distance, and well-placed signs and pavement markings preceding the point where vehicle types separate. Avoid locating potential distractions (non-traffic-control signs, plantings, vehicle pullouts, dumpsters, artwork, etc.) at or preceding this point.

Within a safety roadside rest area, there are intersections and other points of conflict where design layout, signage, pavement markings and visibility must be carefully considered. One of these points is where long vehicle traffic, bicycle, and automobile traffic merge prior to egress from the safety roadside rest area. Consider the speed and angle at which the traffic types will merge. Avoid configurations where one type of traffic is allowed to gain excessive speed preceding a merge with slow moving traffic. Curvilinear road layout, narrow roads and landscaping can be used to manage traffic so that merging is done at slow and relatively similar speeds.

The angle of intersection should allow good visibility of oncoming traffic. Avoid blocking intersection sight lines with landscaping, signs and other elements.

Assess and improve, as necessary, ramp lengths, radii and superelevation, parking aisle widths, parking stall dimensions, and bicycle parking when rehabilitating a safety roadside rest area. When the scope of work is limited to routine pavement maintenance, such as minor repairs, seal coats and striping, or work on building, sidewalks, utilities and landscaping, upgrading to current design standards may be deferred.

- (2) *Layout.* Roads, parking areas and associated earthwork largely define the layout of a safety roadside rest area. Roads and parking areas should be arranged to fit the terrain, views and site configuration. If the site has few physical constraints, roads and parking areas should be designed with generous curves and curvilinear parking to help avoid circulation conflicts. If the site is heavily wooded, roads and parking

should be designed to retain the healthiest and most attractive trees and tree groupings.

Walking distance from the most remote parking space to restrooms should not exceed 350 feet.

Bicycle parking should be located in a safe area.

To maintain visual quality and avoid environmental damage to soils, vegetation and water quality, paved service roads should be provided for maintenance access to service facilities. Service roads should be 10 feet to 12 feet wide.

(3) *Grading and Drainage.* Grading should be designed to accommodate and integrate the required development with as little disturbance to the site as practical. Drainage should be designed in accordance with Chapter 800 through 860. Grading and drainage should be harmonious with natural landforms and follow the direction of existing slopes and drainage patterns. Cuts and fills should be shaped and rounded to blend with existing land forms, and the revised terrain should complement the layout of parking areas and sidewalks.

(4) *Parking Areas.* Ramps, interior roads and parking areas should be designed to encourage safe and orderly traffic movement and parking. These areas should be well defined and when appropriate include the use of concrete curbs and striping.

The design of all roads, aisles, parking spaces and parking lot islands should ensure that commercial truck maneuvers can be accommodated without damage to curbs, sidewalks, pavement edges or parked vehicles. See Topic 407 for truck and bus turning template guidance.

Provide one dedicated parking space for use by the California Highway Patrol (CHP). The CHP space should be located in an area that provides maximum visibility to the public. If a CHP drop-in office is planned, the CHP space should be visible from the office location. Provide a sign and pavement markings to designate the CHP space. A sign

advising “Patrolled by Highway Patrol” should be placed on the freeway exit sign preceding each rest area.

Parking facilities are to be designed accessible to all modes of travel and are to conform to California MUTCD and DIB 82 guidance. Designated accessible parking spaces must be provided for automobiles and vans. As space permits and need requires, one accessible parking space for long vehicles may be provided at each rest area unit. Refer to Chapters 600 through 670 for pavement structure guidance.

(5) *Pavement.* Pavement for ramps, roads and parking should be designed in accordance with Chapters 600 through 670. Parking lots may be constructed of flexible or rigid pavement. Rigid pavement has the advantage of being resistant to deterioration from dripping fuel and antifreeze.

**Table 903.5  
Vehicle Parking Stall Standards**

Vehicle Type	Min Stall Width (ft)	Aisle Width (ft)	Aisle Location
1 Auto	9	5	Passenger side
2 Autos	9	5	Between stalls
1 Van	9	8	Passenger side
1 Van/ 1 Auto	9	8	Between stalls
1 long vehicle	12	8	Passenger side
2 long vehicles	12	8	Between stalls

(6) *Signage.* Standard reflectorized signs should be placed along the roadside to inform and

direct travelers as they approach a safety roadside rest area. A roadside sign should be placed one mile in advance of each safety roadside rest area that indicates the distance to that rest area and to the next rest area beyond. In remote areas an additional sign may be placed in advance of a safety roadside rest area indicating the distance to the facility. Additional panels may be included on or near this sign to inform travelers of the availability of vending machines, recreational vehicle waste disposal stations, traveler information, wireless internet or other special services. A directional sign should be placed at the safety roadside rest area ingress ramp. Standard reflectorized traffic control signs should be used within the rest area for all traffic guidance. These signs may be enhanced with aesthetic backing or frames. Non-traffic signs may be of customized design, provided they are easy to maintain or replace should they be damaged or stolen.

Freestanding signs should be placed in safety roadside rest areas only to provide traveler direction. However, a welcome sign indicating the safety roadside rest area name may be placed within the pedestrian portion of the rest area. Welcome signs should not be placed along ramps or at traffic decision points. Welcome signs must not be placed within the clear recovery zone of the highway or ramps. Informational signs indicating use regulations, anti-litter regulations, reclaimed water use, safety roadside rest area adoptions, maintenance crews presence/hours, proximity/use of agricultural crops, scenic highways designation, environmental features, etc., should be placed in kiosks, display cases, or interpretive displays designed for pedestrian viewing (see DIB 82 for guidance on exhibits).

- (7) *Walkways.* It is important to provide a clearly defined and ADA compliant path of travel for pedestrians. Primary walkways should be located to direct users from automobile, bicycle, and long-vehicle parking areas to core facilities and restroom entrances. See DIB 82 for further information on accessibility requirements.

Walkways should be a minimum 10 feet wide. Steps should be avoided. Sidewalks in front of automobile parking spaces should be a minimum of 12 feet wide to compensate for the overhang of automobiles where wheel stops are not provided. Tree wells smaller than 4 feet in dimension should not be placed in sidewalks or pedestrian plazas to avoid displacement of pavement by tree roots. Trees adjacent to walkways are to provide a minimum clearance of 8 feet from pavement to lower foliage.

Accessible paths of travel must be provided to restrooms and other pedestrian facilities, including picnic shelters, picnic tables, benches, drinking fountains, telephones, vending machines, information kiosks, interpretive displays, and viewing areas. The path of travel from designated accessible parking to accessible facilities should be as short and direct as practical, must have an even surface, and must include curb ramps, marked aisles and crosswalks, and other features, as required to facilitate visitors with wheelchairs, walkers and other mobility aids. The Department of General Services, Division of State Architect, as well as the California Department of Transportation enforce the California Building Code (Title 24) for the various on-site improvements. Many of these design requirements are contained in DIB 82 for exterior features, but many other design requirements are not in DIB 82 and still must be followed. The Division of Engineering Services - Transportation Architecture may be consulted for assistance.

- (8) *Service Facilities.* Service facilities including, crew rooms, equipment storage rooms, dumpster enclosures, service yards, and utility equipment, can be distracting and unattractive to rest area users. Service facilities should be aesthetically attractive, separated and oriented away from public-use areas (restrooms, pedestrian core and picnic areas).

### 903.6 Utility Systems

Utility systems should be designed in conformance with Title 24 Energy Requirements of the California Code of Regulations (State Building

Code), and other applicable State and Federal requirements.

- (1) *Electrical Service.* Electrical power systems should be designed to accommodate the demands, as applicable, of outdoor lighting (ramps, parking areas, pedestrian walkways and plazas), water supply systems (pumps, pressure tanks, irrigation controllers), restrooms (lighting, hand dryers), pedestrian facilities (lighting, water chillers, telephones, wireless internet, kiosks), crew room (lighting, heating, air conditioning, refrigerator, microwave), CHP drop-in office (lighting, heating, air conditioning), and vending (lighting, vending machines, change machine, storage-room air conditioning).

Primary electrical power sufficient for basic safety needs should be supplied by conventional power providers. Supplemental power may be provided using innovative technologies such as solar panels or wind generation or conventional means, such as backup generators. Consider security, public safety and environmental protection when considering the type of fuel and fuel storage facilities for electrical generation. Provide vehicular access to fuel storage facilities for refueling, and include fencing and gates as necessary to prevent access by the general public.

- (2) *Water.* Water supply systems should be designed to accommodate the 20-year projected demand and to handle the peak flow required for restroom fixtures and landscape irrigation. Pumps, pressure tanks, chlorinators and associated equipment should be located outside of pedestrian use areas and screened from view. Enclosures should be provided for water supply equipment to discourage vandalism and minimize the appearance of clutter. Water lines beneath parking areas, pedestrian plazas and the highway should be placed in conduits. Maintain appropriate distance between wells and wastewater disposal facilities (applicable laws should be followed). Potable water must be provided to sinks, drinking fountains, exterior faucet assemblies and pet-watering stations. Untreated or non-potable water may be used

for toilets and landscape irrigation. Irrigation systems should be isolated from the general water system using appropriate backflow prevention devices.

- (3) *Wastewater Disposal.* Wastewater disposal facilities should be designed to handle the peak sewage demand. Waterborne sewage disposal systems should be provided. Structures Design will arrange for soil analysis and percolation tests, and upon completion of testing will obtain approval of the proposed sewage treatment system from the Regional Water Quality Control Board. Recreation vehicle waste disposal stations may be provided at rest areas where there is a recognized need and commercial disposal stations are not available.
- (4) *Telephones.* Provide locations, conduit and wiring for a minimum of three public pay telephones at each safety roadside rest area unit. To comply with accessibility laws and regulations, at least one telephone must be wheelchair accessible, at least one telephone must allow for audio amplification, and at least one telephone must include text messaging for the hearing impaired. Whenever possible, all telephones should allow for audio amplification.

Telephones should be wall or pedestal mounted, and located in pedestrian areas that are well lighted, and whenever possible, protected from rain, snow and wind. Consider placing telephones, commercial advertising displays and public information displays in close proximity. Information should be placed near telephones indicating local emergency numbers and indicating the rest area name and location. 120-volt power should be provided to operate keyboards and pedestal lighting.

Conduits and pull wires should be provided from the telephone service point to the maintenance crew room and to the California Highway Patrol (CHP) drop-in office. Provide telephone service for maintenance contractors and the CHP.

- (5) *Call Boxes.* Call Boxes generally are not placed in safety roadside rest areas.

- (6) *Telecommunications Equipment and Transmission Towers.* The Department seeks revenue from placement of wireless telecommunications facilities on State-owned right of way. Transmission towers and associated equipment, structures and fencing should be located outside of pedestrian use areas and views. Telecommunications equipment and transmission towers should be aesthetically integrated into the site. Consider future safety roadside rest area expansion, and, when possible, locate facilities outside of areas planned for future development.
- (7) *Lighting.* Site and building lighting are to be designed in conformance with Title 24 Energy Requirements of the California Code of Regulations (State Building Code). Also refer to the Traffic Manual, Chapter 9 for further Highway Lighting guidance. For functionality and safety, rest areas should be lighted for 24-hour-a-day use. Lighting should be automatically controlled and include manual-shutoff capability. Restroom entrances and the interiors of restrooms, utility corridors, crew rooms, CHP drop-in offices and storage buildings, pedestrian plazas, primary sidewalks, crosswalks, ramps, picnic areas, kiosks, bicycle parking, and interpretive displays should be brightly illuminated. Lighting should illuminate walking surfaces and avoid strong shadows. An average level of 1 foot-candle is generally acceptable for primary pedestrian areas. Peripheral areas of the site should be lighted only where nighttime pedestrian use is anticipated. Non-pedestrian areas of the site do not require lighting.

### 903.7 Structures

Safety roadside rest area structures include restrooms, storage rooms, equipment rooms, crew rooms, CHP drop-in offices, picnic shelters, utility enclosures, dumpster enclosures, kiosks, arbors and other architectural elements. Safety roadside rest area architecture should be designed for a service life of approximately 20 years. Safety roadside rest areas are high-profile public works projects, which represent the State, Department and local community to millions of visitors each year. Attention to quality architectural design,

construction and maintenance is warranted. Building forms, rooflines, construction materials (stone, timber, steel, etc.), colors and detailing should express the local context including history, cultural influences, climate, topography, geology and vegetation. Structures must be designed and constructed to be accessible to persons with disabilities in accordance with all applicable State and Federal law.

- (1) *Restrooms.* Two restrooms should be provided for each gender to allow for uninterrupted public access to facilities during janitorial cleaning operations. Unisex or family restrooms may be provided to facilitate assistance by others to young children, elderly persons and persons with disabilities. These facilities are not considered part of the total capacity used, but may be counted as women's restrooms.

Entrances to restrooms should be visible from the parking area. They should be well lighted and clearly identified with signs and/or graphics. Restroom entrances should not be located in areas of dead-end circulation. Facilities intended for general public use should not be located near restroom entrances. Privacy screens at restroom entrances should allow visibility from the ground to a height of 12 inches to 18 inches above the ground. Lockable steel doors should be provided for entrances to rest rooms, storage rooms, crew rooms and CHP drop-in offices.

To deter vandalism, signs should be made of metal or other durable material and should be recessed into, or securely mounted on a wall. Signs identifying the entrance to each restroom should be clearly visible from the parking area. A sign, in English and Braille, should be placed on the building wall or on the privacy screen at each restroom entrance to identify the gender. Signs may also be provided in other languages as appropriate. A standard sign should be installed near the entrance to each restroom advising that, pursuant to Streets and Highways Code Section 223.5, a person of the opposite sex may accompany a person with a disability into the restroom. A sign should be installed near the restroom doors advising that, State law

prohibits smoking in restrooms and the area within 20 feet of the restroom doors.

- (2) *Crew Room.* A maintenance crew room, separate from equipment and supply storage, should be provided at each safety roadside rest area. When appropriate, a single crew room may be provided for a pair of safety roadside rest area units. The crew room should be heated and air-conditioned. Conduits or wiring for telephone service, by others, may be provided.
- (3) *CHP Drop-in Office.* A dedicated office and restroom should be provided for use by the CHP. Consult with the CHP to determine need. The office should be located adjacent to the pedestrian core and near the dedicated CHP parking stall. The restroom may have double entries to allow cleaning by maintenance crews; however, the CHP office should be designed to allow access only by CHP.
- (4) *Vending Machine Facilities.* Accommodations for vending machines should be considered when designing safety roadside rest areas. Vending machines may be installed with a project or installed at any other time by initiative of the California Department of Rehabilitation, Business Enterprise Program (BEP).

A storage room should be provided within 150 feet of the vending machines for storage of vended products. The safety roadside rest area project should provide conduits from the electrical service panel to the vending storage room for possible installation of air conditioning by the BEP.
- (5) *Storage Rooms or Buildings.* Storage rooms or buildings should be provided to house maintenance equipment, tools and supplies. Janitorial cleaning supplies and tools should be located in the vicinity of the restrooms, reasonably close to parking for maintenance service vehicles. Grounds-maintenance equipment and supplies should be located outside of public-use areas and views. Shelving for paper goods, cleaning supplies and other materials must be provided.

(6) *Caretakers/Managers.* Residential facilities or offices for caretakers or managers may be included with a safety roadside rest area when prior provisions have been made for the use and staffing of such facilities. Caretakers and managers may be employed or otherwise compensated, sponsored by others, or work as volunteers.

(7) *Public Information Facilities.* At least 96 square feet of lighted display space should be provided at each safety roadside rest area for display of public information, such as rest area regulations, maps, road conditions, rest area closures, safety tips, and missing children posters. Space should consist of wall-mounted cases or freestanding kiosks.

### 903.8 Security and Pedestrian Amenities

Proper safety roadside rest area design will help ensure user safety with the installation of adequate lighting, providing accessible walking surfaces and allowing open visibility through the site. Vegetation, walls, recesses and other areas that allow concealment should not be located near restroom entrances. Site security may also include the presence of a CHP office and the use of surveillance cameras. Fences should be provided only for access control, traffic control, or safety purposes. Fencing should be designed to be as unobtrusive as practical. A 4-foot high fence must be provided between the highway and the safety roadside rest area. Perimeter fencing should be of the minimum height and design necessary. Where adjacent property is developed, more substantial fencing or screening may be required. Fencing in rural or natural areas may be required to control or protect wildlife or livestock.

Pedestrian amenities include trash and recycling facilities, pedestrian signs, pet areas and drinking fountains. Landscape architectural elements such as shade structures, kiosks, benches, seat walls, picnic tables, and other miscellaneous features should be included. Landscaping should be provided and may include areas for monuments, artwork, interpretive facilities, and informal exercise and play facilities. Newspaper and traveler coupon booklet vending machines are owned by others and placed in safety roadside rest areas by encroachment permit. Pedestrian amenities must be designed and constructed to be

accessible to persons with disabilities in accordance with all applicable State and Federal law.

Wireless internet facilities may be installed in safety roadside rest areas with funding borne by the provider or others.

Coin operated binocular viewing as authorized by law is provided privately through a competitively awarded revenue-generating agreement.

## Topic 904 - Vista Point Standards and Guidelines

### 904.1 General

New vista points should be considered during planning and design of new alignments for inclusion with the highway contract (see Index 109.3). Vista points may also be provided on existing routes. Existing vista points should be periodically inspected for needed restoration or upgrading.

The District Landscape Architect is responsible for approving site selection, concept, and design for all areas to be signed as vista points. Pavement structure and drainage should be designed in accordance with the standards contained in this manual.

Vista points should be designed to be accessible to all travelers and conform to the Americans with Disabilities Act and DIB 82.

### 904.2 Site Selection

Site selection is based on the following criteria:

- (1) *Quality.* A site should have views and scenery of outstanding merit or beauty. Locations on designated State scenic highways or in areas of historical or environmental significance should be given special emphasis. A site should provide the best viewing opportunities compared to other potential locations within the vicinity.
- (2) *Compatibility.* A site should be located on State highway right of way or on right of way secured by easement or agreement with another public agency. A site should be obtainable without condemnation. Sites on or adjacent to developed property or property

where development is anticipated should be avoided.

- (3) *Access.* A site must be accessible from a State highway or intersecting road. A site must have adequate sight distance for safe access.
- (4) *Adequate Space.* A site must be of adequate size to accommodate the necessary features and facilities. However, development of a site can not detract from the scenic quality of the area. Adequate space should be available for earth mounding and planting to minimize the visual impact of larger facilities. Adequate space for future expansion is desirable.

### 904.3 Design Features and Facilities

- (1) *Road Connections.* The design of connections to vista points should be in accordance with Index 107.1. **Vista points designed for freeways shall have standard freeway exit and entrance ramps (see Chapter 500).**
- (2) *Parking.* Parking areas should be inclusive of all user modes. Parking capacity should be based on an analysis of current traffic data. However, at least five vehicle spaces should be provided. Parking should not exceed 0.025 times the DHV or 50 spaces, whichever is less. This number may be exceeded at high use trailheads. Parking stalls should be delineated by striping. Approximately one-quarter to one-third of the spaces should be allocated to long vehicles (cars with trailers, recreational vehicles, and buses). Geometrics should be such that all types of vehicles entering the vista point can safely negotiate and exit the facility. Accessible parking should be provided as discussed in Index 903.5(4) and DIB 82.

Consult the District Bicycle Coordinator for guidance on bicycle parking.

- (3) *Pedestrian Areas.* Vista points should provide a safe place where motorists can observe the view from outside their vehicles and bicyclists off their bicycles. Accessible walkways that exclude vehicles may be provided within the viewing area.
- (4) *Interpretive Displays.* An interpretive display should be provided within the pedestrian area of each vista point. The display should be

appropriate to the site, both in design and content and accessible; see DIB 82 for exhibit guidance. Display structures should not overwhelm or dominate the site, and they should be placed at the proper location for viewing the attraction.

Information should pertain to local environmental, ecological, and historical features. It should interpret the features being viewed to inform and educate the public.

Historical plaques, monuments, vicinity maps, and directions to other public facilities are examples of other appropriate informational items.

- (5) *Vending Machines and Public Information Displays.* Designers should be familiar with the provisions of the California Streets and Highways Code, Section 225-225.5. The designer should adequately consider and plan for uses and facilities that may reasonably be anticipated.
- (6) *Sanitary Facilities.* Comfort stations are usually not provided. Exceptions must be approved by the Principal Landscape Architect, Landscape Architecture Program.
- (7) *Water.* Potable water may be provided at a reasonable cost. Non-potable water should not be provided in a vista point.
- (8) *Trash Receptacles.* Trash receptacles should be provided in each vista point. As a guide, one receptacle should be provided for every four cars, but a minimum of two receptacles should be provided per vista point. Dumpsters should not be located at a vista point.
- (9) *Signs.* Directional, regulatory, and warning signs must conform to the California MUTCD.
- (10) *Planting.* Existing vegetation, rock outcroppings, and other natural features should be conserved and highlighted. Removal or pruning of existing plants to frame the view should be held to a minimum and be directed by the District Landscape Architect. Earth mounding and contour grading may be employed to restore and naturalize the site. Planting, including erosion control, should be provided to revegetate

graded areas. Plants requiring permanent irrigation should be avoided.

- (11) *Barriers.* Railings, bollards, or other appropriate barriers should be used to protect pedestrians, and discourage entry into sensitive or hazardous areas.

The design of such barriers should be sensitive to pedestrian scale and reflect the scenic character of the site.

- (12) *Other Features.* Benches, telephones, and viewing machines are optional items. Picnic tables are not to be included in vista points.

In general, the inclusion of items which do not either facilitate the viewing of the scenic attraction, or blend the vista point into its surroundings, should be avoided.

## Topic 905 - Park and Ride Standards and Guidelines

### 905.1 General

Park and Ride facilities must be considered for inclusion on all major transportation projects that include, but are not limited to, new freeways, interchange modifications, lane additions, transit facilities, and HOV lanes. See Chapter 8, Section 7 of the Project Development Procedures Manual for additional information.

The District Park and Ride Coordinator is responsible for approving site selection. The concept and general design for Park and Ride facilities must be coordinated by the District Landscape Architect. Additional information on Park and Ride facilities can be obtained from the Headquarters Park and Ride Coordinator in the Office of System Management Operations in the Division of Traffic Operations. Additional guidance on Park and Ride facilities can be found in the AASHTO Publication "Guide for Park and Ride Facilities" (2004).

Park and Ride facilities must accommodate all modes of travel and conform to the American with Disabilities Act and DIB 82.

### 905.2 Site Selection

Park and Ride facilities are typically placed to enhance corridor efforts to reduce congestion, and

to improve air quality usually associated with other transportation opportunities such as HOV lanes and transit. The specific choice as to location and design should be supported by a detailed analysis of demand and the impact of a Park and Ride facility based upon these parameters:

- Corridor congestion
- Community Values
- Air Quality
- Transit Operations
- Overall Safety
- Multi-modal Opportunities

Full involvement of the project development team should be engaged in the evaluation and recommendation of Park and Ride type, classification, site and appurtenant facilities.

### **905.3 Design Features and Facilities**

Park and Ride facilities are to be designed as multi-modal facilities. Provisions for pedestrians, bicyclists, transit, single-occupancy vehicles, and multi-occupancy vehicles are to be provided as appropriate. The local transit provider should be consulted to determine if the facility should provide connections to transit. In general, the function of the facility is to take precedent over the form of the facility; however, special consideration for the safety and security of all users is fundamental to the success of the facility.

The design of a Park and Ride facility should take into account the operations and maintenance of the facility, both in terms of effort as well as safety. Appurtenant facilities as allowed by law should be carefully evaluated and included as appropriate. Any necessary funding and agreements need to allow appurtenant facilities on site and should be in place early in the project development process.