**STREET DESIGN MANUAL** 

# **APPENDICES**

The City of San Diego | Street Design Manual | March 2017 Edition

#### Appendices

# Appendix

# **Street Classification**

# A.1. Functional Classification

- **1. Alley**: A roadway, usually unnamed, which primarily provides secondary vehicular access to the rear and side entrances of abutting property. It should be a minimum of 20 feet and a maximum of 24 feet in width.
- **2. Private Street**: A street that primarily provides direct access to abutting property. It carries low vehicular movement, low-to-heavy pedestrian movement, and low-to-moderate bicycle movement. It has the same overall standards, design, and construction as a public street with the exception that the responsibility for maintenance is private.
- **3. Pedestrianway/Bikeway**: A facility that primarily provides for pedestrian and bicycle circulation between two closely-spaced (250 feet or less) streets. It has a walkway/riding surface and landscaping, and may include pedestrian-scale lighting and an underground utility corridor.
- **4. Bike Path**: A facility that provides exclusively for bicycle circulation along major corridors. It has an all-weather riding surface.
- **5. Transitway**: A street that primarily provides for moderate-to-heavy transit movement and moderate-to-heavy pedestrian movement in a pedestrian-transit mall setting, with commercial retail, food service, and entertainment uses. It has a narrow transit roadway, wide sidewalks, street trees, traffic safety street lighting, and landscaping. It may include planter boxes, pedestrian-scale lighting and other pedestrian amenities, and an underground utility corridor.
- **6.** Local Street: A street that primarily provides direct access to abutting property. It carries low vehicular movement, low-to-heavy pedestrian movement, and low-to-moderate bicycle movement. It has on-street parking, street trees, traffic safety street lighting, and sidewalks. It may include landscaping, pedestrian-scale lighting, and underground utilities.
- **7. Collector Street**: A street that primarily provides movement between local/collector streets and streets of higher classification; secondarily, it provides access to abutting property. It carries low-to-moderate vehicular movement, low-to-heavy pedestrian movement, moderate-to-heavy bicycle movement, and low-to-moderate transit movement. It has on-street parking, street trees, traffic safety street lighting, and sidewalks. It may also include landscaping, pedestrian-scale lighting, and underground utilities.
- 8. **Major Street**: A street that primarily provides network connecting vehicles and transit to other major streets and primary arterials and to the freeway system; secondarily, it provides access to abutting commercial and industrial property. It carries moderate-to-heavy vehicular



#### **Appendix A: Street Classification**

movement, low-to-high pedestrian and bicycle movement, and moderate-to-high transit movement. It has a raised center median, street trees, traffic safety street lighting, and sidewalks; it may include landscaping, pedestrian-scale lighting, underground utilities, on-street parking, and/or bike lanes.

- **9. Primary Arterial**: A street that primarily provides a network connecting vehicles and transit to other primary arterials and to the freeway system. It carries heavy vehicular movement while providing low pedestrian movement and moderate bicycle and transit movements. It has a raised center median, bicycle lanes, street trees, traffic safety street lighting, sidewalks, and no access from abutting property. It may include underground utilities.
- **10. Rural Local Road**: A road in agricultural, natural open space, and large lot (greater than 2.5 acres) residential areas that primarily provides direct access to abutting property. It carries low vehicular movement, low pedestrian movement, and low bicycle movement. It may include traffic safety street lighting and underground utilities. It typically does not have sidewalks or landscaping.
- **11. Rural Collector Road**: A road in agricultural, natural open space, and large lot (greater than 2.5 acres) residential areas that primarily provides movement between local and collector roads and roads or streets of higher classification; secondarily, it provides access to abutting property. It carries low-to-moderate vehicular movement, low pedestrian movement, low-to-moderate bicycle movement, and low transit movement. It may include traffic safety street lighting and underground utilities. It typically does not have sidewalks or landscaping.

### A.2. Boulevards

The Progress Guide and General Plan and various community plans designate certain streets as being of great importance to a community and recommend special treatment to recognize this. The Bay-Park Link and Broadway in Centre City are two such examples.

The recommendations may call for the street to be designed as a *boulevard*, which is defined as "a street or promenade planted with trees." *The Boulevard Book* describes three boulevard types:

- 1. A street with a wide central landscaped median flanked on either side by roadways and sidewalks. The central median may be a pedestrian promenade or planted with grass.
- 2. A street with a wide central roadway and broad, tree-lined sidewalks along each side.
- 3. A multi-way boulevard is designed to separate through traffic from local traffic and, often, to provide special pedestrian ways on tree-lined malls. It is characterized by a central roadway of at least four lanes for generally fast and non-local traffic. On either side of this roadway are tree-lined medians that separate it from parallel, one-way side access roads for slow-moving traffic.

Each street designated as a boulevard will require a unique and specialized design treatment; therefore, no standards are provided in this Street Design Manual. Boulevard designers are referred to the design and policy guidelines found in *The Boulevard Book*.



#### Appendix A: Street Classification



Source: Allan B. Jacobs et al., The Boulevard Book (2000).



Appendix A: Street Classification



# Appendix B

# Land Use

## **B.1. Open Space**

Land protected for outdoor recreation and education, for scenic and visual enjoyment, and for controlling urban form and design. Environmentally sensitive lands are also preserved in open space.

- 1. **Open Space Park:** Public parks and facilities, once they are dedicated as park land, and providing for various types of recreational needs of the community.
- 2. **Open Space-Conservation:** Land preserved for the purpose of protecting natural and cultural resources and environmentally sensitive lands.
- 3. **Open Space-Floodplain:** Land within floodplains where development is controlled to protect the public health, safety, and general welfare, and land areas identified by the flood insurance rate maps on file with the City of San Diego Development Services Department.

# **B.2. Agriculture**

Areas that are rural in character and are designated for agricultural uses or are not designated for long-term agricultural use but are awaiting development at urban intensities. Includes all types of agricultural uses and some minor agricultural sales.

# **B.3. Residential**

- 1. Large Lot Single Dwelling Residential: Single dwelling units on large lots with some accessory agricultural uses. Applies to areas that are rural in character. Lots are greater than 2.5 acres. Densities are 0.4 dwelling units per acre or less.
- 2. **Single Dwelling Residential:** Single dwelling units on individual lots that have a variety of lot sizes and residential product types. Lot sizes range from 3,000 square feet to 2.5 acres. Densities range from 0.4 dwelling units per acre to 8.7 dwelling units per acre.
- 3. Low Density Multiple Dwelling Residential: Two dwelling units per lot, with lot sizes ranging from 4,000 square feet to over 6,000 square feet and densities up to 21.8 dwelling units per acre. Includes townhouse developments with densities up to 19.8 dwelling units per acre.
- 4. **Medium- to Very High-Density Multiple Dwelling:** More than 2 dwelling units per lot with densities ranging up to 217.8 dwelling units per acre.



#### Appendix B: Land Use

## **B.4.** Commercial

Includes a wide range of uses for the employment, shopping, services, recreational, and lodging needs of the residents of and visitors to the City of San Diego. Also includes mixed-use development.

- 1. **Neighborhood Commercial**: Smaller scale, lower-density developments that are consistent with the character of the surrounding residential areas. May include mixed-use (commercial/residential). Primarily located along local and selected collector streets.
- 2. **Pedestrian-Oriented Commercial Retail**: Developed in a pedestrian-oriented pattern. A functional, convenient, and pleasant environment has been created for people arriving on foot, bicycle, and transit. Also accessible by the automobile.
- 3. **Community Commercial**: Developments with community-serving commercial services, retail uses of moderate intensity and small-to-medium scale. Includes shopping centers and autooriented strip commercial areas. Primarily located along collector streets, major streets, and public transportation lines.
- 4. **Regional Commercial**: Has the broadest mix of retail, wholesale, commercial service, and business/professional office uses. Includes large scale, high intensity developments. Primarily located along arterials, major streets, and major public transportation lines.
- 5. **Commercial Office**: Includes employment uses together with limited complementary retail and medium-to-high density residential development.
- 6. **Visitor Commercial**: Provides for the lodging, dining, and recreational needs of both tourists and the local population.
- 7. **Urban Village**: A compact pattern of land use including housing, public parks and plazas, offices, stores, and major transit stops on the existing and planned transit system, where pedestrian and bicycle activity is desired. Urban Villages are characterized by interconnected streets, building entries along the street, and architectural features and outdoor activities that encourage pedestrian and bicycle activity and transit accessibility. Urban Villages have their highest intensity of development focused near transit and have a mix of land uses convenient to residents and employees.

### **B.5. Industrial**

Includes a wide range of industrial/manufacturing activities.

- 1. **Industrial Park:** Includes high-quality science and business park development in a campuslike environment characterized by comprehensive site design and substantial landscaping.
- 2. Small Lot Industrial: Small-scale industrial activities within urbanized areas





# **Midblock Pedestrian Crosswalk**



#### NOTES:

1. Refer to CAMUTCD for appropriate pavement markings and signage.

2. Drainage requirements must be evaluated and addressed.

3. Crosswalks must meet traffic requirements per City Council Policy 200–07.

4. "No Parking" shall be determined based on visibility requirements.

5. Placement of landscaping shall be consistent with the Landscape Technical Manual and shall allow for sight distance requirements.

6. Curb extensions as shown may be installed to improve pedestrian visibility and reduce crossing distance.

#### Figure C-1. Midblock Pedestrian Crosswalk





# Appendix D

# **Summary of Traffic Calming Measures**

Category	Traffic Calming Device	Description	Applicability	Advantages	Disadvantages
Horizontal Deflections	Chicanes	A channelization that causes a series of tight turns in opposite directions in an otherwise straight stretch of road	<ul> <li>May be used on local streets.</li> <li>Inappropriate for use on: <ul> <li>Streets classified as collector or higher</li> <li>Bus routes</li> <li>Emergency response routes</li> <li>-Where there is limited stopping sight distance</li> <li>Where there is a grade that exceeds 5%</li> </ul> </li> </ul>	<ul> <li>Slows traffic</li> <li>Creates opportunity for landscaping</li> <li>Tends not to divert traffic to nearby streets</li> </ul>	May: • Cause some loss of on-street parking • Increase emergency response time • Impact driveways • Affect drainage and street sweeping
	Traffic Circles	A raised circular island placed in the center of an intersection	May be used on two- lane streets with alternative access points. Inappropriate for use on: • Streets classified as major or higher • Bus routes • Emergency response routes • Where there is limited sight distance • Where there is a grade that exceeds 5%	<ul> <li>Slows traffic on each approach</li> <li>Creates landscaping opportunity</li> <li>Reduces ROW conflict</li> <li>Tends not to divert traffic to nearby streets</li> </ul>	May: • Impact large vehicles' turns • Increase emergency response time

#### Table D-1. Traffic Calming Measures



#### Appendix D: Summary of Traffic Calming Measures

Category	Traffic Calming Device	Description	Applicability	Advantages	Disadvantages
	Median Slow Points	A small median or island placed in the center of a roadway; causes traffic to shift its path to the right in order to travel around it. May be installed on an approach to an intersection or mid-block.	May be used on two- lane streets. If installed at an intersection, street should have alternative access points Inappropriate for use on: • Streets classified as major or higher • Where there is limited stopping sight distance	<ul> <li>Slows traffic</li> <li>Creates pedestrian refuge area</li> <li>Creates landscaping opportunity</li> <li>Tends not to divert traffic to nearby streets</li> </ul>	May: • Cause some loss of on-street parking • Impact large vehicles' turns when placed at intersections



#### Appendix D: Summary of Traffic Calming Measures

Category	Traffic Calming Device	Description	Applicability	Advantages	Disadvantages
	Road Lumps	Rounded raised areas placed across the road, approximately 12 feet long, 3.5 inches high, and parabolic in shape. Most effective when used in groups spaced appropriately to discourage speeding between lumps.	<ul> <li>May be used on local streets.</li> <li>Inappropriate for use on: <ul> <li>Streets classified as collector or higher</li> <li>Bus routes</li> <li>Emergency</li> <li>response routes</li> <li>Where there is</li> <li>limited stopping</li> <li>sight distance</li> <li>Where there is a</li> <li>grade that exceeds</li> <li>5%</li> </ul></li></ul>	<ul> <li>Slows traffic</li> <li>Discourages short-cutting</li> </ul>	May: • Divert traffic • Increase noise • Increase emergency response time
Vertical Deflections	Speed Tables	Flat-topped road lumps often constructed with concrete or other textured materials on the flat section. They have a gentler effect on buses than road lumps.	<ul> <li>May be used on local streets.</li> <li>Inappropriate for use on: <ul> <li>Streets classified as collector or higher</li> <li>Emergency response routes</li> <li>Where there is limited stopping sight distance</li> <li>Where there is a grade that exceeds 5%</li> </ul> </li> </ul>	<ul> <li>Slows traffic</li> <li>Discourages short-cutting</li> </ul>	May: • Divert traffic • Increase noise • Increase emergency response time • Impact buses
	Raised Crosswalks	An extension of speed table where street is brought up to sidewalk level.	<ul> <li>May be used on local streets.</li> <li>Inappropriate for use on: <ul> <li>Streets classified as collector or higher</li> <li>Emergency response routes</li> <li>Where there is limited stopping sight distance</li> <li>Where there is a grade that exceeds 5%</li> </ul> </li> </ul>	<ul> <li>Slows traffic</li> <li>Discourages short-cutting</li> <li>Enhances pedestrian safety</li> </ul>	May: • Divert traffic to nearby streets • Increase noise • Increase emergency response time • Impact buses • Require special drainage considerations



#### Appendix D: Summary of Traffic Calming Measures

Category	Traffic Calming Device	Description	Applicability	Advantages	Disadvantages
Intersection Pop-Out	Intersection Pop-Outs	Curb extensions that narrow the street at intersections by widening the sidewalks at the point of crossing. Can be used at intersections to create a street gateway effect visually announcing an entrance to a neighborhood.	• May be used on local streets, collector streets, or urban major streets.	<ul> <li>Improve pedestrian visibility</li> <li>Create shorter pedestrian crossing width</li> <li>May reduce vehicle speeds</li> </ul>	May: • Impact large vehicles' turns • Impact accessibility by transit vehicles and emergency vehicles • Require parking removal
Traffic Diverters	Semi– Diverters	Barriers placed at the end of a block that prevent entrance by blocking traffic in one direction of a street that allow exit by permitting traffic in the opposite direction to pass through. They include provisions for emergency vehicles and continuation of pedestrian or bicycle routing.	<ul> <li>May be used on low-volume local residential streets.</li> <li>Inappropriate for use on: <ul> <li>Emergency response routes</li> <li>Bus routes</li> </ul> </li> <li>Streets classified as collector or higher</li> </ul>	<ul> <li>Reduce cut- through traffic</li> <li>Reduce pedestrian crossing widths</li> <li>Create opportunities for landscaping</li> </ul>	May: • Divert traffic to other low- volume streets • Increase trip lengths • Cause loss of parking • Increase emergency response time
Channelization	Regulatory Signs, Markings, Landscaping, or Raised Islands Aimed at Motorized, Non- Motorized, or Pedestrian Traffic	Channelization may be achieved through ROW controls at intersections, controls affecting or restricting the direction or speed of traffic, or design features that physically restrict the movement of traffic.	Channelization is site-specific and should be evaluated on a case-by-case basis.	<ul> <li>Prevent cut-through traffic</li> <li>Reduce speed</li> <li>Create opportunities for landscaping</li> <li>Control turning traffic in/out of a neighborhood</li> <li>Physically control pedestrian movements</li> </ul>	May: • Increase trip lengths • Impact emergency response time • Impact accessibility



# Appendix

# **Green Infrastructure (GI) and Street Design**

The intent of this appendix is to provide developers, project engineers, and planners with ideas for GI that could potentially be incorporated into the design of streets to address adverse impacts to water quality associated with storm water runoff. It is important to note that other City regulations, including but not limited to the latest version of the Storm Water Standards Manual, will dictate the mandatory applicability criteria and site design, source control, and treatment control requirements related to development projects, including streets.

Certain GI discussed in the appendix may not be appropriate for a street classification due to constraints associated with site conditions.

# E.1. Site Design GI for Roadways

#### E.1.1. Descriptions of GI for Rural Swale System Roadway Classifications

Rural swale systems are a combination of street design elements that allow for surface drainage while simultaneously protecting the roadway edge, organizing parking and allowing for driveway access (see BASMAA, 1999). A section of a typical rural swale system is illustrated in Figure E–1. As shown in the figure, curb and gutter are not required. The street is crowned to direct runoff to shoulders where it is collected into a vegetated swale or gravel shoulder. The rural swale system would be appropriate for Private Street, Rural Local Road, and Rural Collector Road classifications.



Figure E-1. Rural Swale System Diagram (BASMAA, 1999)



## E.1.2. Description of GI for Concave Medians

Conventional medians are normally designed as a convex surface to shed water onto adjacent pavement and into a curb and gutter system. Concave medians reverse this relationship by designing the median to receive runoff. A diagram and section of a typical concave median is shown in Figure E–2

The landscaped median can be designed as a landscaped swale or biofilter to treat runoff. Catch basin and underground storm drain systems may be required for over flows depending on the infiltration conditions and the duration that water is retained (see BASMAA, 1999).



#### Figure E-2. Concave Median Diagram and Section (BASMAA, 1999)

Note: Conditions, dimensions, and materials shown are typical. Modifications may be required for proper application; consult qualified professional.



# E.1.3. Description of GI for Cul-de-Sacs

Typical cul-de-sacs are paved across their entire diameter. This large impervious area adds to environmental degradation by increasing runoff. Adding a landscaped area in the center of the culde-sac (see Figure E–3) can reduce impervious land coverage by 30-40 percent, depending on configuration, while maintaining the required turning radius.



Figure E-3. Cul-de-Sac GI (BASMAA, 1999)



Appendix E: Green Infrastructure (GI) and Street Design





# Transit

The General Plan and the Climate Action Plan require that the City promote and encourage public transit on our streets. The design of all streets that include transit stops, transit routes, or are identified for public transit in the Regional Transportation Plan, need to be coordinated with the San Diego Association of Governments and the San Diego Metropolitan Transit System in order to provide enhancements and improved accessibility for public transit. This may include transit lanes, curb popouts or bays at transit stations, median transit lanes or stations, and special designs to combine a transit street with a bikeway.

Appendix F: Transit Streets



STREET DESIGN MANUAL



**Deviation from Standards Form** 





#### Appendix G: Deviation from Standards Form

City of San Developm 1222 First San Diego (619) 446-5	Diego ent Services Ave., MS-302 , CA 92101 5000	Dev	viation From Standards	FORM DS-266 May 2010
Drawing Number:	Pro	oject Number:	I.O. No:	
Project Description/Locatio	on:			
Engineer of Work:	(Print Name)	RCE No		
(Signature)		(Date)	PLACE RCE STAMF	HERE
Description of Deviation:				
<u>Reason for Deviation:</u>				
Mitigation Measures for De	eviation:			
Pariana d Dra		Data		
Approved By:		Date:		
Deputy City Engineer:		Date:		
Deputy Director:		Date:	PLAGE RCE STAMP	Here
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Figure G-1. Deviation from Standards Form

