4. SEGMENTS

The previous chapters of this document have focused on the need for, objectives of, and methods for applying Charlotte's new Urban Street Design Guidelines. This chapter contains the detailed guidelines for the street segments or blocks: *those portions of the street between intersections* (Chapter 5 provides guidelines for the intersections).

The following sections describe, for each of the street types, the design elements that should be included, with the preferred dimensions of those elements along the segment portions of a street. Each of the detailed descriptions included in this chapter is intended to accomplish the overall objective of providing safe, functional, multi-modal streets that serve all users - i.e., complete streets.

While the sections in this chapter describe how to design various types of street segments, it is important to remember that any given street, particularly if it is a thoroughfare, will traverse several types of land uses. Therefore, this chapter contains information about how to match relevant street elements to the existing or desired land uses along the street. This chapter *does not*, however, provide specific information about designing the transitions between different street types. These transitions will most likely occur at intersections, which are described in detail in the next chapter. The reader should refer to both chapters when designing a segment or an intersection that transitions between street types.

Sections 4.1 - 4.4: *Non-Local Streets*

Sections 4.1-4.4 describe the guidelines for segments on non-local streets (Main Streets, Avenues, Boulevards, and Parkways). The information in these sections is detailed, but not entirely prescriptive. The design team should use this detailed information about dimensions in conjunction with the design method and tradeoff analyses outlined in Chapter 3.

The cross-section diagrams do not show dimensions for these non-local street types, since the focus is on understanding and evaluating the tradeoffs among the various (possibly competing) uses of the right-of-way.

Many of the design element dimensions described in this chapter refer to evaluating tradeoffs in a "constrained" environment. Design teams should take care to consider what constitutes a "constraint." For example, when a streetscape is being designed with existing buildings, those buildings might constitute a constraint. However, when a street is built "from scratch" or when new buildings are being constructed along an existing street, these buildings would not typically be considered a constraint. In those cases, the preferred dimensions should generally be provided, or the design team should justify why they are not.

Block Lengths for Non-Local Streets

One of the design elements described in Sections 4.1 – 4.4 is block length, which refers to the expected spacing of cross-streets along a given street type. The relationship between block length and street network density, as well as the many advantages of a dense network are described in more detail in the section below titled "Block Lengths for Local Streets."

It is important, however, to note that the spacing of non-local streets (Main Streets, Avenues, Boulevards, and Parkways) is not described in this chapter. That is to say, there are no expected distances defined between streets that are likely to function as thoroughfares. In most areas of Charlotte, Avenues, Boulevards, or Parkways would not be spaced within one or several blocks of each other. Unless specifically defined in an area plan, these types of streets would typically be ½ mile or further from each other.

Sections 4.5 – 4.7: *Local Streets*

Sections 4.5-4.7 describe the guidelines for segments of local streets (Residential, Office/Commercial, and Industrial). The elements and dimensions described for these local streets are more prescriptive than those for the non-local streets, since local streets are typically designed and built through the land development process. Although most of the design elements for Local Streets are described in Sections 4.5 – 4.7, the recommendations for block lengths are described here, because block length is critical to creating the street network that will meet the many objectives defined for Charlotte's streets.

Block Lengths for Local Streets

Block length is a critical component of the street network. In general, the shorter the block length, the denser the street network. A dense street network provides:

- capacity for vehicle traffic,
- multiple route options,
- shorter trip options,
- future development flexibility,
- more dispersed traffic flows, and
- more opportunities for traffic calming.

Shorter blocks create a high degree of connectivity to help ensure that vehicular traffic does not become focused on only one or two streets. Shorter blocks also create a better walking environment, by providing numerous direct and indirect routes throughout neighborhoods and between land uses. In the Local Street network, frequently spaced intersections created by shorter blocks can also serve as a form of traffic calming.

The general intent of the block lengths recommended here is to ensure that the density of the Local Street network appropriately reflects development density/intensity and provides the type of network structure that has stood the test of time elsewhere in the City. To integrate the street network with development density/intensity, the block lengths are organized by their geographic location relative to Charlotte's Centers, Corridors and Wedges growth framework, and by land uses. Defining typical and maximum lengths for block faces does not always imply a "grid", but allows the possibility of different block and lot configurations. This adds flexibility for mixing housing and lot sizes, as well as for working with constrained or oddly-shaped parcels. Finally, the block lengths described here also include the spacing for external connections, including creek crossings, to ensure that neighborhoods and complementary land-uses are well-connected and that, over time, the street network over larger areas is as well-developed as possible.

For Local Streets, the block lengths shown in Table 4.1 and Creek Crossings described in Table 4.2 should be applied **(recommended block lengths for Main Streets, Avenues, Boulevards, and Parkways are described in sections 4.1-4.4).** Connections to surrounding land uses (external connections) that do not cross creeks should follow the recommended block lengths shown in Table 4.1 and connections to non-local streets (thoroughfares) should meet the block length recommendations described in Sections 4.1-4.4 for those street types.

Table 4.1 Block Lengths for Local Streets

Land Use/Location	Preferred or Typical Block Lengths for Local Streets	Maximum Block Length for Local Streets
Transit Station Areas[1]	400′	600′
Centers[1]	500′	650′
Corridors[1]	600′	650′
Non-Residential Uses[1,2]	500′	650′
Industrial	600′	1,000′
Residential ≥ 5 dua (gross) in Wedges	600′	650′
Residential < 5 dua (gross) in Wedges	600′	800′

Notes:

1. Parks, schools, cemeteries, and places of worship would not typically be expected to include these types of blocks, but would have appropriate external connections.

2. Includes mainly commercial and office land uses.

Table 4.2 Spacing for Creek Crossings

Land Use/Location	Creek Crossing Spacing[3]
Transit Station Areas[1]	650´ - 1300´ spacing
Centers[1]	650´ - 1300´ spacing
Corridors[1]	650´ - 1300´ spacing
Non-Residential Uses[1,2]	650´ - 1300´ spacing
Residential ≥ 5 dua (gross)	650´ - 2600´ spacing
Residential < 5 dua (gross)	1300´ - 2600´ spacing

Notes:

1. Parks, schools, cemeteries, and places of worship would not typically be expected to include these types of crossings, except to provide appropriate external connections.

2. Includes mainly commercial and office land uses.

3. Site developer and staff will justify why the preferred crossing spacing (described in more detail below) could not be implemented.

Table 4.2 shows the ranges of expected intervals between creek crossings. In general, creek crossings should occur approximately every 1300', with bike/pedestrian crossings in between (650' from street crossings). In high-density areas, such as transit station areas, activity centers, or areas with similar development intensities (> 20 dua and/or concentrated, mixed-use development), more frequent creek crossings should be provided – generally in the range of every 650'. In areas deemed to be particularly environmentally-sensitive, the crossings could occur as infrequently as every 2600'.

Exclusions and Allowances

While the expectation is that the preferred or typical block lengths in Table 4.1 will be provided on Local Streets, it may not always be possible to construct all external connections or all block lengths exactly as described. With the adoption of the Urban Street Design Guidelines, the City Code and Subdivision and Zoning Ordinances will be updated to reflect the Guidelines and appropriate exceptions will be defined. The process for defining these code and ordinance changes is described in more detail in the preamble to this document.

Section 4.1 Main Streets

Overview

Main Streets are, most importantly, destination locations that provide access to and function as centers of civic, social, and commercial activity. Main Streets may currently exist as older neighborhood centers or potentially refurbished business areas. New Main Streets may be developed in mixed-use developments or as part of pedestrian-oriented developments. There will be relatively few Main Streets in our street network, and they will likely be minor thoroughfares or connector/collectors.

Downtown Davidson's "Main Street".

Main Streets are designed to be pedestrian-oriented to complement the development next to the street. Main Street development is people-intensive and pedestrian-scaled, both in terms of design and land use. Main Street land uses should be generators and attractors of pedestrian activity. These uses may include institutional, (libraries or government buildings, e.g.); retail (especially store-front retail, cafés, and restaurants); offices; public gathering spaces (squares and plazas, e.g.); and, especially on upper stories, multi-family residential uses (apartments, condos, and townhouses). Mixed uses are particularly effective for enhancing the pedestrian nature and around the clock use of Main Streets.

Building design also complements the Main Street's pedestrian orientation. Good pedestrian-oriented design, as outlined in the 2003 General Development Policies, requires that buildings be placed close to the street, with doors and transparent windows fronting onto the sidewalk. Buildings should not have blank or similarly unappealing walls along the sidewalk. Pedestrian-level ornamentation and architectural details may be used to make the pedestrian environment more attractive. Parking areas should be located behind buildings to minimize conflicts between pedestrians and motor vehicles and also to avoid separating the pedestrians from the building entrances.

A Main Street intersection in California.

Main Streets

Because Main Streets serve as pedestrian-oriented activity centers, walking receives the highest priority of all the transport modes. Although they also serve transit, bicyclists, and automobiles, Main Streets are designed to provide the highest level of pedestrian comfort, access, and security of all of Charlotte's (non-local) street types. For example, Main Streets are kept relatively narrow to provide easy and safe pedestrian crossings, and priority is given to pedestrians' safety and convenience instead of motor vehicles' speeds and volumes. Traffic speeds are maintained at no more than 25 mph, to ensure that vehicle speeds are compatible with the pedestrian environment. They are typically 2 lanes with on-street parking, but Main Streets may also include a 3rd, center turn lane. Roadway capacity for vehicles is not expanded to maintain free flows and congestion is accepted as a positive, traffic calming aspect of the Main Street environment.

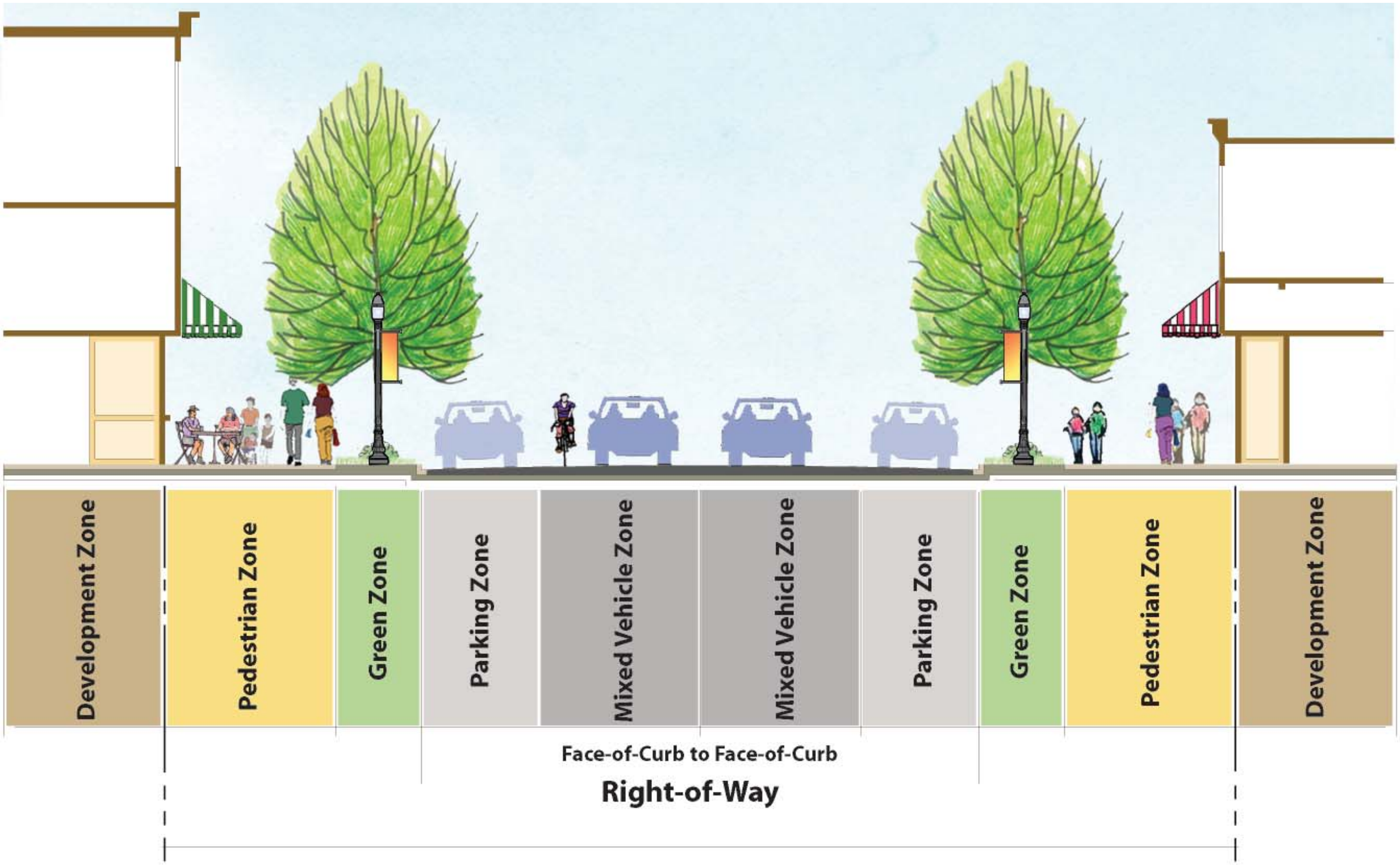
Pedestrian-oriented features on Main Streets include generous sidewalks and amenity zones. An amenity zone provides space for street furniture, trees, pedestrian-scale lighting and signs, public art, and last, but not least, maintains unobstructed sidewalk space for pedestrians. To minimize conflicts between pedestrians and vehicles, driveways on Main Streets are restricted or very limited – motor vehicle access is ideally provided behind the buildings.

Main Streets' block lengths are ideally no more than 400', to provide frequent locations for pedestrian crossings and numerous connections to adjacent streets. Main Streets will typically not be long streets. They function best at total lengths of 1000'-1500', which is considered a comfortable walking distance.

On-street parking is encouraged, to provide traffic calming and convenient parking for Main Street land uses. Special lanes for bicyclists are not typically provided, since bicyclists can travel in mixed traffic due to the low operating speeds.

Because of the nature of their land uses and pedestrian-oriented design, Main Streets are also ideal settings for transit service. The short block lengths and heavy pedestrian traffic suggest that transit stops can be closely spaced.

Main Streets



Main Street

For specific dimensional information refer to the guidelines in this section.

Main Streets

Development Zone:

Important to maintaining Main Street character and function, development should include pedestrian-oriented land use and design, with narrow setbacks, functioning doors and windows facing onto the sidewalk, no expanses of blank walls, and first floor active spaces.

Pedestrian Zone:

Crucial to Main Street purpose and function; because of expected high pedestrian volumes, this zone should include spacious, unobstructed sidewalks and pedestrian scale lighting.

Green Zone:

Very important for supporting the pedestrian character of the Main Street, this zone includes street trees and other landscaping in appropriately designed planters, as well as interspersed street furnishings in a hardscaped amenity zone. This zone also provides extra buffering between pedestrians and vehicles.

Parking Zone:

Important for supporting Main Street pedestrians and businesses, the parking zone calms traffic, provides parking for businesses, and buffers pedestrians from moving traffic.

Mixed Vehicle Zone:

Because the Main Street emphasis is on the pedestrian, this zone serves cars, trucks, buses, and bicycles as mixed traffic in a limited number of travel lanes. Main Streets are low-speed, relatively low-volume streets.

Main Streets

Priority Elements:

- Maximum Posted Speed – 25 mph - equal to design speed and comfortable for both bicyclists and pedestrians.

- Number of Through Lanes – Typically, 1 in each direction (2 total). Where short block lengths (400' or less) are maintained, an alternative "typical" design would provide 1 lane in each direction, with a center lane used as back-to-back turn lanes (3 total). Where longer blocks are necessary, the 3rd lane is still allowable, but should be intermittently broken with landscaped islands or, in rare cases, pedestrian refuges or a median. Four lanes are inappropriate. In cases where existing 4 lane sections are deemed to be Main Streets, the extra lane width can be used to accommodate parking or other elements, thereby "dieting" to an ideal Main Street cross-section.

- Lane Width – Should typically allow 13' for lanes next to parking to maintain the necessary clear distance for opening car doors and to accommodate commercial vehicles – in the 3 lane situation, 10' is suitable for the third lane. In constrained conditions, lanes next to parking should not be less than 12' wide. In the case of angled parking, the travel lane should be at least 13' wide.

- Sidewalks – Sidewalks are the most important element on a Main Street, because pedestrians are the priority - sidewalk width should be at least 10' , unobstructed. In constrained circumstances and where uses such as sidewalk dining are desirable, the unobstructed portion of the sidewalk can be reduced to 8', which allows for some intrusion into the sidewalk area by adjacent outdoor dining areas, while maintaining a comfortable walking space. Even in those cases, however, no railings or other permanent or semi-permanent fixtures should encroach into the 10' sidewalk width. Even in constrained conditions, sidewalks should not be less than 6' unobstructed width.

- Sidewalk Amenity Zone – This zone enhances the pedestrian environment along a Main Street. It should be 8' wide (not including the sidewalk). This width provides space for street trees, streetlights, benches, transit amenities, and trash receptacles. Even in constrained conditions, the minimum sidewalk amenity zone is 5' (without trees) or 6' (with small maturing trees).

- On-Street Parking Lanes – On-street parking supports businesses and provides a buffer between pedestrians and traffic – 7' from the face-of-curb is ideal to minimize street widths, to provide a small measure of clear width for opening doors, and to provide adequate travel lane width for shared use by bicycles, transit, autos, and commercial vehicles. Even in constrained conditions, on-street parking lanes should not be less than 7' wide.

- Curb and Gutter – Main Streets will typically have 6" vertical curb, in keeping with the urban context.

- Curb Extensions – Should be provided at mid-block crossing points. The width should match the width of on-street parking lanes (7' typical). Curb extensions provide for reduced pedestrian crossing distances and increased pedestrian visibility when crossing the street – they also add space for trees, other landscaping, and street furniture.

- Lighting – Since pedestrian activity is expected and encouraged in Main Street locations, decorative pedestrian-scale lighting should be provided. Pedestrian lighting should be sufficient to illuminate the sidewalk, as well as to provide for pedestrian visibility and safety from crime. Pedestrian lighting should be placed so that light is not obscured by branches and leaves. In some cases, the pedestrian-scale lighting can also be sufficient for street lighting. Where street lighting is provided, sharp cut-off, ornamental fixtures should be used rather than Cobraheads.

- Block Length – Typically, should not exceed 400'. Short block lengths provide for traffic calming and more frequent and accessible crossing points for pedestrians, as well as improved connectivity for all travel modes.

Main Streets

Other Elements to Consider

- Utilities – To preserve sidewalk capacity for pedestrians, maintain a clear zone per ADA requirements, and allow larger trees and other aesthetic treatments (thereby enhancing the pedestrian nature of Main Streets), utilities should be placed underground, wherever feasible. If underground placement is not feasible, the next most preferable location is at the back of property. If poles must be located along the street frontage, they should be placed in the sidewalk amenity zone. Under no circumstances should they be placed in the sidewalk. Utility poles should be consolidated where possible, with redundant poles removed in retrofit situations.

- Traffic Calming – Typically not necessary if other elements are in place, but may be used to maintain desired speeds. See CDOT's Traffic Calming Report for more details on appropriate applications of traffic calming tools.

- Mid-Block Pedestrian Crossings - Should be considered on blocks of more than 600' to ensure accessible pedestrian crossing points. Curb extensions and high visibility markings should be provided at these mid-block crossing locations. See CDOT's Mid-Block Crossing Policy for more information on safe crossings.

- Angled Parking – Allowable in special cases where adequate right-of-way exists, parking demand exceeds the capacity of parallel parking, and traffic volumes and speeds are low enough for safe operation. Angled parking requires 20' for the parking, next to a 13' travel lane. Back-in angled parking may be used in situations where it is deemed necessary, due to increased visibility for the driver.

- Medians – Medians are typically inappropriate in a Main Street, because they increase the crossing distance required for pedestrians. However, they may be allowable in circumstances requiring special treatment for aesthetics, open space needs, pedestrian safety, or to provide intermittent breaks in the third lane on longer, 3 lane segments. If provided, should be a minimum of 6', and paved at appropriate locations to facilitate their use for mid-block crossing.

- Median Planting – If median is provided (see above), landscaping should be provided, except in portions of the median designated for pedestrian access. Where provided, plants should be no higher than 30 inches and tree limbs should fall no lower than 6' to provide a "visibility zone" for pedestrians and motorists.

Inappropriate Elements:

- Bus Stops/Bus Zones – Excluded in segments, because block lengths are short and stops will typically be located at the intersections. See Chapter 5 for details on bus stops at Main Street intersections.

- Bike Lanes – Excluded to minimize street widths and conflicts between bicyclists and parked cars – bicyclists can operate in mixed traffic due to the low operating speeds and wide lanes on Main Streets.

- Planting Strips – Excluded to maximize sidewalk space for pedestrians and to provide unrestricted access from parking to the sidewalk. Planting would typically be street trees in appropriately designed planters, located within the sidewalk amenity zone.

- Driveways – Excluded to eliminate conflicts between pedestrians and motor vehicles turning into businesses. Service access should be at the rear of the commercial properties. In constrained conditions where driveways cannot be excluded, shared driveways are encouraged.

- Pedestrian Refuge – Since Main Streets have short blocks (providing frequent crossing opportunities at intersections), pedestrian refuges are typically not recommended. However, refuges may be allowable under certain circumstances, as described in this section under "Number of Through Lanes", and "Medians", and also in Section 5.1: "Main Street Intersections".

Section 4.2 Avenues

Overview

Avenues can serve a diverse set of functions in a wide variety of land use contexts. Therefore, they are the most common (non-local) street type in our city. Avenues provide access from neighborhoods to commercial areas, between areas of the city and, in some cases, through neighborhoods.

Charlotte's East Boulevard, a re-configured commercial Avenue in a constrained environment.

Avenues serve an important function in providing transportation choices, because they are designed to provide a balance of service for all modes of transport. They include high-quality pedestrian access, high levels of transit accessibility, and bicycle accommodations such as bike lanes, yet they also may carry high volumes of traffic. Most thoroughfares in our street network would be classified as Avenues. Some collectors/connectors would also be classified as Avenues.

Avenues perform an important mobility function for motorists, but they are expected to provide a higher level of comfort and convenience for other users of the street than are Boulevards or Parkways. Therefore, posted speeds are limited to 25-35 miles per hour to allow safe and comfortable pedestrian travel along and across these streets. Since Avenues are expected to balance the interests of many types of travelers, property owners, and residents, roadway (vehicle) capacity will not necessarily be expanded to maintain free flows and some congestion is to be expected, especially during peak travel periods.

Development along Avenues may include a wide range of land uses, from single-family houses to multifamily development (townhouses, apartments, condos) to commercial (retail or office) to mixed-use to institutional (schools, churches) or industrial uses. Development patterns along Avenues may include a dense mix of uses in some locations and lower-density, single uses in others.

An Avenue in a mixed use area in another city.

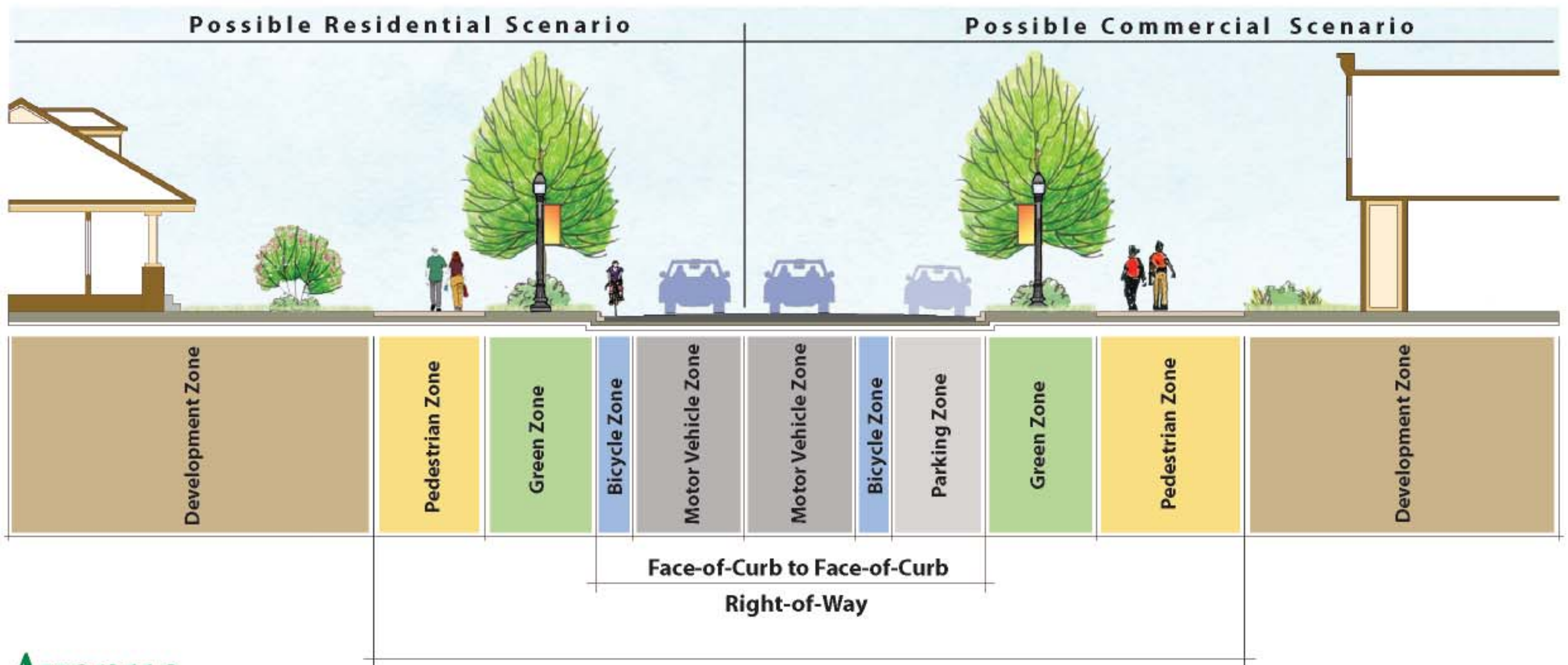
Avenues

Although land uses may vary greatly, certain design elements help to provide the best access for pedestrians and maintain the desired modal balance along Avenues. In keeping with good design practices and as outlined in the 2003 General Development Policies, non-residential buildings on Avenues should typically be oriented toward the street and located closer to the street than on Boulevards. Windows and doors should front onto the street, with direct pedestrian access to the streetfront sidewalk. Parking should generally be located to the rear or sides of buildings or, in some cases, on-street. If parking is located between the street and the building, it should generally be no more than one row, to avoid large expanses of parking that separate buildings from the sidewalks. Residential development, particularly single family, may be located further from (but should still face) the street, with direct pedestrian access to the streetfront sidewalk. For both residential and non-residential uses, blank walls and non-transparent windows should be avoided along pedestrian areas, to help provide for pedestrian comfort, security, and points of interest.

Since they serve so many functions and contexts, there are a number of alternative Avenue cross-sections and design teams should carefully review the information on design elements provided later in this section. Avenues can have two, three or four lanes. Continuous medians are allowed on Avenues, but are not typical. Avenue block lengths should be limited to 600' to provide frequent locations for safe pedestrian crossings, as well as frequent, convenient connections to adjacent neighborhoods. Signalized intersections are specially designed for pedestrian crossings, and refuge islands may also be provided between signalized intersections to allow pedestrian crossings. Common elements included in all Avenue cross-sections are sidewalks, planting strips or amenity zones with street trees, and bike lanes along both sides of the street.

Avenues provide an ideal transit environment, since they are well designed for pedestrians and provide many connections to adjacent neighborhoods. Transit stops are closely spaced, creating high levels of accessibility to service, and transit use is relatively heavy.

Avenues



Avenue

For specific dimensional information refer to the guidelines in this section.

Avenues

Development Zone:	Setbacks, design, and land uses will vary, but the basic intent for this zone is that development orients toward and has good functional and visual connections to the street.
Pedestrian Zone:	Very important for modal balance, pedestrian travel should be comfortable on Avenues; this zone should include unobstructed sidewalks, at appropriate widths for adjacent and surrounding land uses.
Green Zone:	To maintain comfortable pedestrian travel and serve an important buffer function, as well as enhancing the street for other users, this zone should include grass, landscaping, and shade trees in spacious planting strips or, in some cases, replaced by or interspersed with hardscaped amenity zones. **In some Avenue configurations, this zone will also include a median or intermittent "islands" with trees and landscaping.**
Parking Zone:	The need for this zone varies on Avenues, but the potential for traffic calming, buffering between vehicles and pedestrians, and access to adjacent land uses should be considered. **Some Avenues will have on-street parking and some will not.**
Exclusive Bicycle Zone:	Avenues are higher-speed and volume streets than Main Streets, so cyclists are less likely to feel comfortable in mixed traffic; this zone is important and should be considered for modal balance, safety, and additional buffering for other modes.
Motor Vehicle Zone:	This zone serves motor vehicles, in **a variety of possible lane configurations,** to accomodate higher volumes than Main Streets, while maintaining modal balance.

Avenues

The 3-lane cross-section with intermittent landscaped islands, not to be confused with 2-lanes and a median. This configuration can also be used for a 5-lane cross-section. The advantages of this configuration include: better access, while removing turning traffic from through lanes; opportunities for pedestrian refuge; lower right-of-way requirements; and an additional source for the "green zone".

Avenues

Priority Elements:

- Posted Speed – 25-30 mph preferred, with 35 mph allowable. This is higher than Main Street speeds, but lower than Boulevard speeds, reflecting the desire to provide reasonably safe and comfortable speeds for all modes.

- Design Speed – 30-40 mph. The design speed should be slightly higher than the posted speed, but not so high as to encourage speeding.

- Number of Through Lanes – 1 in each direction (2 total), 1 in each direction plus an intermittently landscaped or (on short blocks) back-to-back turning lane (3 total), 2 in each direction (4 total), or 2 in each direction plus an intermittently landscaped turning lane (5 total). The diagram on the preceding page shows the general configuration of the 3-lane cross-section with the intermittent landscaped islands. The 5-lane cross-section is similar and this configuration is generally preferable to using a continuous median on Avenues. In special circumstances, may have 1 lane in each direction with a median.

- Lane Width – Should typically provide 10' lanes, in addition to the gutter, where curb and gutter is present. 11' lanes are acceptable. Twelve foot outside lanes should be provided where there is vertical curb, but no bike lane or on-street parking (to allow adequate clearance from curb for vehicles). Fourteen foot outside lanes are appropriate where there is on-street parking but no bike lane. In the case of a median-divided Avenue with only 1 lane in each direction, lanes should be 14' wide.

- Bicycle Accommodations – Bicycle lanes are desirable on Avenues, to allow cyclists space to operate in a higher speed (though still urban) environment. They are especially important when needed to complete or continue a bicycle network or when there are few other options for network continuity. Bicycle lanes should be a minimum of 4' wide and striped, in the absence of on-street parking. Where on-street parking exists, the bicycle lane should be 6' wide and striped, to allow additional clear space between cyclists and opening car doors. Wide outside lanes may also be considered under constrained conditions.

- Sidewalks – Pedestrian activity is expected and encouraged along Avenues. Therefore, minimum 6' wide unobstructed sidewalks should be provided on an Avenue. In areas that are currently or are planned to be pedestrian-oriented retail or mixed-use development (which should face onto the sidewalk), minimum 8' wide unobstructed sidewalks should be provided. In this case, a sidewalk amenity zone would typically be provided, as well.

Avenues

- Planting Strips – Should be provided on Avenues to separate pedestrians from vehicles, provide a better walking environment, and enhance the streetscape. Planting strips should ideally be 8' minimum between curb and sidewalk to allow for grass and large maturing trees. Even in retrofit or constrained situations, the 8' planting strip and large-maturing street trees should be the design priority. The design team should justify and document any deviations from the preferred width. In that case, the guidelines described in Section 4.5 (Planting Strips) for City-built retrofits (item 2) and developer-built infill projects (item 3) on Local Residential Streets will also apply to Avenues.

  Where an 8' planting strip cannot be provided (as described in Section 4.5, items 2 and 3), the following guidelines apply. For planting strips between 6' and 8', small maturing trees may be acceptable. If the planting strip is less than 5', trees should not be planted in the planting strip, but shrubbery or ground cover may be acceptable, depending on maintenance needs. Even in constrained conditions, the planting strip should never be less than 3'. When trees cannot be planted in the planting strip, they should be planted in back of the sidewalk, if possible. Sight distance should also be considered in the location and spacing of trees within the planting strip. Depending on factors such as street curvature, locations of driveways, land use context, and planting strip width, a mix of species, tree sizes, or different spacing may be necessary to maintain minimal sight distances for vehicles entering the street. In highly urban conditions, a sidewalk amenity zone should replace the planting strip.

- Bus Stops – Most Avenues will have local and/or express bus service. Preferred locations for bus stops, particularly for higher-volume bus stops, include cross streets (see Chapter 5: Intersections) and at mid-block crossings. Where there is full-time, dedicated on-street parking, bus stops must include curb extensions. At other locations, particularly in commercial or mixed-use areas, a hardscape pad for boarding and alighting passengers should be considered.

- Curb and Gutter – Should always have curb and gutter. 2'6" curb and gutter is typical, although 2'0 curb and gutter or 6" vertical curb may be used in constrained situations or in more urban environments. If a median exists, 1'6" curb and gutter is allowable on inside, median lanes.

- Lighting – Street lighting is to be provided. Separate, decorative pedestrian-scale lighting should also be provided when necessitated by adjacent land uses or the existence of mid-block crossings, bus stops, or other facilities where pedestrian activity is likely to occur. Where it is provided, pedestrian lighting should be sufficient to illuminate the sidewalk, as well as to provide for pedestrian visibility and safety from crime. Ideally, these fixtures should be located away from trees to maximize lighting.

- Block Length – Should not exceed 600', to provide more frequent and accessible opportunities for crossings and to enhance connectivity for all modes. In the case where a median is provided, median cuts should occur every 600'.

Other Elements to Consider

- Medians – Medians are typically not expected on Avenues, but they may be provided, primarily in residential areas. Where provided, medians should be at least 16' wide to provide continuity between the portions of median along the segment and at the intersection (where the 16' width allows a minimal 6' pedestrian refuge and a 10' left-turn lane, if necessary). If a median is provided in constrained conditions, it may be narrower along the segment, but never less than 6' wide.

- Median Treatment – If medians are at least 8' wide, they should be landscaped. Landscaping should include trees, where possible given sight distance. At specified mid-block crossing points, medians should be paved in a material that facilitates pedestrian use. If a median is located on a street with only two travel lanes, maintenance needs should be considered. Options to accommodate maintenance vehicles included mountable areas for the vehicles, no parking/loading zones reserved for maintenance vehicles, equipment turnout locations, frequent cross streets where vehicles can park, or wider lanes.

- Pedestrian Refuge – If there is a median, it provides a pedestrian refuge. Where a median serves as a pedestrian refuge at specified mid-block crossings, it should be paved in a material that facilitates pedestrian use. Absent a median, pedestrian refuges may be provided at mid-block pedestrian crossing points. Pedestrian refuges can also be used to break up the 3rd lane in a 3-lane cross-section (to create an "intermittent" 3rd lane).

- On-Street Parking – Desirable in areas with front facing development, especially retail development. Accompanying curb extensions are preferable when the on-street parking is full-time, dedicated. Off-peak, on-street parking is also allowable, depending on specific traffic and land development conditions. As a last resort, in very con strained circumstances, such as where historic buildings and narrow setbacks exist, cut-outs could be used for on-

Avenues

street parking. Parking lanes should be parallel lanes, marked 7' from the face-of-curb (e.g., 5' plus 2' of gutter).

- Curb Extensions – Must be provided at intersections, whenever full-time, dedicated on-street parking is provided in order to shorten the crossing distance for pedestrians. They are also desirable at other locations, such as mid-block crossings.

- Driveways – Avenues typically will have driveways to adjacent properties. However, driveways raise the potential for conflicts between pedestrians and turning vehicles. Therefore, in commercial or other areas with high pedestrian activity expected, efforts should be made to minimize the number of driveways and to maximize the distance between them. For example, in these types of pedestrian-oriented areas, access should be off of a side street rather than the Avenue. Shared driveways are also encouraged.

- Utilities - To preserve sidewalk capacity for pedestrians, maintain a clear zone per ADA requirements, and allow larger trees and other aesthetic treatments, utilities should be placed underground, wherever possible. Every attempt should be made, even with underground placement, to avoid or minimize conflicts with street trees. If underground placement is not possible, the next locations to consider for poles are at the back of the right-of-way or in the planting strip, depending on the land use context (e.g., it may be preferable to place poles in the planting strip rather than too close to buildings). In no circumstance should poles be placed in the sidewalk and, as with underground placement, every attempt should be made to avoid or minimize conflicts with street trees. Utility poles should be consolidated where possible, with redundant poles removed in retrofit situations.

- Mid-Block Pedestrian Crossings – Allowable. Should be considered when blocks are longer than 600', particularly in areas with land uses likely to create high pedestrian volumes. When provided, crossings should be striped (with high visibility markings) and combined with appropriate signage. Also consider pedestrian-actuated signals (consider Hawk signals when ADT exceeds 12,000), curb extensions, and a pedestrian refuge, depending on the circumstances. See CDOT's Mid-Block Crossing Policy for more information on safe crossings.

- Sidewalk Amenity Zone – Typically not necessary, because the planting strip provides aesthetic enhancement and separation between vehicles and pedestrians. However, in areas (blocks or portions of blocks) that are currently or are planned to be pedestrian-oriented retail or mixed-use, a sidewalk amenity zone should be provided in conjunction with the wider sidewalk (see "sidewalks" above). In this circumstance, the amenity zone replaces the planting strip. This is particularly important if on-street parking is provided, to allow space for opening car doors and unloading passengers. Where provided, the ideal amenity zone width is 8' minimum.

- Traffic Calming – Many of the ideal elements on Avenues will provide a measure of traffic calming (e.g. on-street parking, short block lengths, closer signal spacing). However, some forms of traffic calming, such as street-side landscaping treatments, are allowable if necessary to maintain desired speeds (see CDOT's Traffic Calming Report for more information on appropriate application of traffic calming tools).

Inappropriate Elements:

- Shoulder – Inappropriate in an urban setting, such as would occur along an Avenue.

Section 4.3 Boulevards

Overview

Boulevards are intended to move large numbers of vehicles, often as “through traffic”, from one part of the city to another and to other lower level streets in the network. As a result, the modal priority on Boulevards shifts (from the Main Street’s pedestrian priority and the Avenue’s modal balance) somewhat towards motor vehicles, while still accommodating pedestrians and cyclists as safely and comfortably as possible. Many major thoroughfares will be classified as Boulevards.

As with Avenues, a variety of land uses and development intensities will be found along Boulevards. However, given the nature of their vehicular mobility function (higher volumes and speeds than for Avenues), Boulevards are not suited for land uses that would foster high volumes of pedestrians crossing from one side of the street to the other.

Fairview Road is classified as a Boulevard, though it needs better separation between pedestrians and traffic.

Regardless of the actual land use, buildings along Boulevards will usually either be:

1) set farther back from the street than for Avenues,
2) located directly on a parallel frontage street, or
3) oriented to less highly traveled side streets.

In some cases, reverse frontage may be used, but it is generally preferable for buildings to be connected to and oriented towards the street, even with setbacks that are larger than on Avenues. In all cases, sites should allow easy pedestrian access from sidewalks, parking areas, and, if applicable, the frontage street. In cases 2 or 3 (listed above) the design recommendations offered for less vehicle-oriented streets (Local, Main, or Avenue) should be used. These include having sidewalks connecting parking and street sidewalks with entrances, functional windows and doors opening onto pedestrian areas, and avoidance of blank walls and empty space in pedestrian circulation areas.

Vehicle access to adjacent land uses along Boulevards must be managed carefully, with individual driveways permitted and shared driveways preferred. Driveways should be appropriately spaced and based on safety considerations along this

Boulevards

higher-speed, higher-volume street type. On-street parking should not be permitted on the Boulevard, but could be placed on a separate, parallel frontage street.

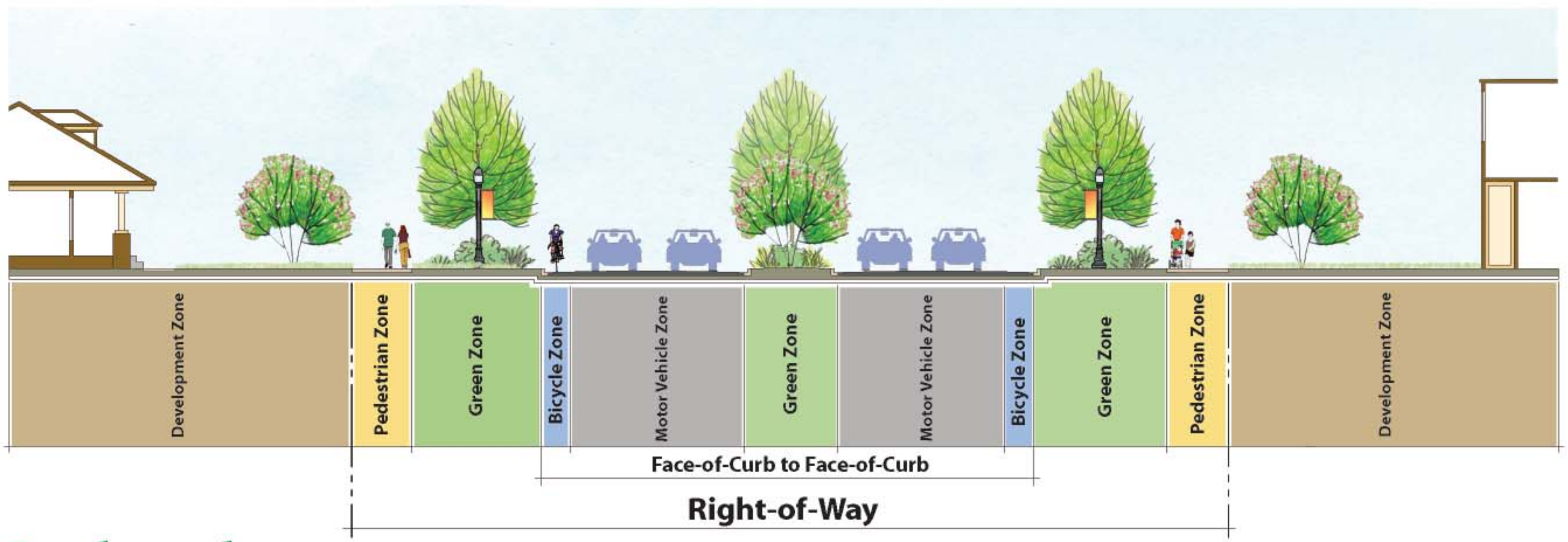
Boulevard in another city, with a narrow planting strip to buffer pedestrians from traffic.

Boulevard cross-sections typically include at least 2 lanes in each direction, but may include as many as 3 lanes in each direction, depending on the availability of alternate routes on the surrounding street network. The 4-lane (total) cross-section is generally preferable.

No matter how many lanes are included, Boulevards will always feature a wide, landscaped median. The median separates opposing traffic flows, provides additional green space (and trees), and, in some cases, allows for pedestrian refuge (since the typical distance between signalized intersections or median openings on Boulevards is 1000'-1200').

The Boulevard cross section also includes sidewalks, planting strips with street trees, bike lanes, and transit stops along both sides of the street. Transit stops on Boulevards are to be located near signalized intersections or other safe locations for pedestrians to cross. With the Boulevard's modal emphasis shifted towards motor vehicles, posted speeds on Boulevards are 35-40 mph with design speeds up to 45 mph. That is why the provision of the multi-modal elements becomes even more important for the safety and comfort of travelers other than motorists.

Boulevards



Boulevard

For specific dimensional information refer to the guidelines in this section.

Boulevards

Development Zone:

Land uses and design will vary, but setbacks will likely be deeper than on Avenues and frontage will not always be directly onto the street; in all cases, good physical connections to the street are still important.

Pedestrian Zone:

Although the balance shifts away from a pedestrian orientation, pedestrians need to be able to travel safely along the Boulevard. This zone should always include sidewalks of adequate width for the adjacent and surrounding land uses.

Green Zone:

Higher speeds and volumes on Boulevards require significant attention to this zone. To serve the important buffer function between pedestrians and vehicles, as well as enhancing the street for other users, this zone should include grass, landscaping, and shade trees in spacious planting strips and medians. Where a parking zone on a parallel access street is used, the Green Zone should also extend to the area between the parking and the pedestrian zones (back of sidewalk).

Parking Zone:

Given the emphasis on traffic flow and development characteristics, this zone should generally be removed from the main vehicle zone; it should either be non-existent or placed on an access street.

Exclusive Bicycle Zone:

Given the higher speeds and volumes on Boulevards, this zone should get strong consideration for treatment to increase cyclists' safety. Cyclists are generally not comfortable in mixed traffic on these types of streets.

Motor Vehicle Zone:

A very important zone since the Boulevard shifts more towards an auto-orientation; the number of travel lanes will vary by capacity needs, although the impact to other users should be considered in that decision.

Boulevards

Priority Elements:

- Posted Speed – 35-40 mph. Speeds are higher than on an Avenue, reflecting the Boulevard's function of serving longer distance, intra-city traffic flows.

- Design Speed – up to 45 mph. As with Avenues, design speed is slightly higher than posted speed, but not so high as to encourage speeding on these urban streets.

- Number of Through Lanes – Typically, 2 in each direction (4 total).

- Lane Width – 10 or 11' lanes, in addition to the concrete gutter where curb and gutter is present. 10' inside lanes are particularly appropriate where the posted speed is 35 mph. Can also use 14' wide outside lanes in some cases, as deemed by the *Bicycle Plan.*

- Medians – Should be provided on Boulevards. Typically, should be at least 17' wide to provide continuity between the portions of median along the segment and at the intersection (where the 17' width allows a minimal 6' pedestrian refuge and an 11' left-turn lane, if necessary). In constrained situations, the median can be narrower along a street segment, but never less than 6' wide, since it is also to be used for pedestrian refuge.

- Median Planting – All medians should be landscaped. Landscaping should include trees, where possible given sight distance. At specified mid-block crossing points, medians should be paved in a material that facilitates pedestrian use. Where pedestrian refuges are provided, plants should be no higher than 30 inches and tree limbs should fall no lower than 6' to provide a "visibility zone" for pedestrians and motorists.

- Bicycle Accommodations – Bike lanes are desirable to allow cyclists to operate in the higher speed Boulevard environment. They are especially important when needed to complete or continue a bicycle network or when there are few other options for network continuity. Bicycle lanes should be striped and a *minimum* of 4' wide. In most circumstances, 5' lanes are preferred and, under certain conditions, 6' lanes are preferred. Wide outside lanes (14') may also be considered under constrained conditions.

- Sidewalks – Although the characteristics of a Boulevard suggest that it is less pedestrian-oriented than either a Main Street or an Avenue, pedestrian activity is expected and encouraged along Boulevards. The higher speed, higher volume traffic characteristics make sidewalks a required element. Sidewalks should be a minimum of 6' unobstructed width, except in highly constrained situations, where 5' unobstructed width may be allowed.

- Planting Strips – Since Boulevards typically will have higher speeds, higher volumes, and wider cross-sections, good separation between vehicular and pedestrian traffic is desirable. Planting strips should be at least 8' between curb and sidewalk, to allow for grass and large maturing trees. Sight distance should be considered in the location and spacing of trees within the planting strip. Depending on factors such as street curvature, locations of driveways, land use context, and planting strip width, a mix of species, tree sizes, or different spacing may be necessary to maintain minimal sight distances for vehicles entering the street.

- Curb and Gutter – Boulevards are urban locations, and should always have curb and gutter. A minimum 2'0" curb and gutter should be used on the outside lane, but 1'6" is allowable on inside, median lanes.

- Lighting – Street lighting is to be provided. Separate, decorative pedestrian-scale lighting should also be provided when necessitated by adjacent land uses or the existence of mid-block crossings, bus stops, or other facilities where pedestrian activity is likely to occur. Where it is provided, pedestrian lighting should be sufficient to illuminate the sidewalk, as well as to provide for pedestrian visibility and safety from crime. Pedestrian lighting should be placed so that light is not obscured by branches and leaves.

- Block Length – Typical distance between signalized intersections or median openings on Boulevards is 1000'-1200' (approximately ¼ mile). It may be allowable or even desirable to provide more closely spaced side streets (to ensure a well-connected grid of streets off of the Boulevard), but median openings should not typically be provided at these more closely spaced locations. In some cases, directional crossovers may be used to reduce the number or frequency of median openings and signalized intersections. These should be used sparingly and no more frequently spaced than 1000'-1200'.

Boulevards

Other Elements to Consider

- Pedestrian Refuge - The median will typically provide for pedestrian refuge. Where the median serves as a pedestrian refuge at specified focal points, such as mid-block crossings, it should be paved in a material that facilitates pedestrian use.

- On-Street Parking - Should be separated from the travel lanes and provided along a separate, parallel facility (frontage street). At those locations, curb extensions, matching the parking width, should be provided. Parallel parking lanes should ideally be 7' wide. Angled parking may also be allowable since the parking is removed to the frontage street.

- Double Tree Rows – Allowable, for aesthetics, if right-of-way is available.

- Driveways – Driveways are to be expected in typical Boulevard land uses, and are acceptable. In cases where adjacent land uses will result in high levels of ingress/egress, consider the use of frontage roads to minimize impact on through lanes.

- Bus Stops/Bus Zones – Preferred locations are generally at cross streets and high traffic generators, although other locations are allowable. Pedestrian enhancements should be included at all locations and may, in some cases, include mid-block crossings and pedestrian refuges.

- Utilities – To preserve sidewalk capacity for pedestrians, maintain a clear zone per ADA requirements, and allow larger trees and other aesthetic treatments, utilities should be placed underground, wherever possible. Every attempt should be made, even with underground placement, to avoid or minimize conflicts with street trees. If underground placement is not possible, the preferred locations to consider for poles are at the back of the right-of-way or in the planting strip. In no circumstance should poles be placed in the sidewalk and, as with underground placement, every attempt should be made to avoid or minimize conflicts with street trees. Utility poles should be consolidated where possible, with redundant poles removed in retrofit situations.

- Mid-Block Pedestrian Crossings – Should typically be avoided on Boulevards, due to the higher speeds. However, may be allowable in rare situations where the nearest signalized intersection is 600' or more from an adjacent land use that is likely to create high pedestrian demand or at very heavy volume bus stops. When provided, crossings should include high visibility markings and appropriate signage. Hawk signals, curb extensions, and a pedestrian refuge should also be strongly considered. See CDOT's Mid-Block Crossing Policy for more information on safe crossings.

- Traffic Calming – Many traffic calming tools are inappropriate on Boulevards, given the Boulevard's higher volume, higher speed function. However, some forms of traffic calming, such as street-side landscaping treatments or changes in horizontal alignment, are allowable if necessary to maintain desired speeds (see CDOT's Traffic Calming Report for more information). Superelevation should be avoided or at least minimized.

Inappropriate Elements:

- Sidewalk Amenity Zone – Typically not necessary, because the planting strip provides aesthetic enhancement and separation between pedestrians and vehicles, which are operating at relatively high speeds.

- Shoulder – Inappropriate in an urban Boulevard setting.

- Curb Extensions – Inappropriate on Boulevards, because they present a safety issue on these higher speed and higher volume streets. Further, curb extensions are typically used with on-street parking, which is not allowed on Boulevards. In the case where a frontage street is provided, the frontage street should have curb extensions, with the width matching the parking lane (typically 7' wide).

Section 4.4 Parkways

Overview

Parkways are the most motor vehicle-oriented of Charlotte's street types. A Parkway's primary function is to move large volumes of motor vehicles efficiently from one part of the city to another. Therefore, these roadways are designed to serve high traffic volumes at relatively high speeds (posted speeds of 45-50 miles per hour and maximum design speeds of 55 miles per hour).

In keeping with their motor vehicle function and design orientation, there should not be pedestrian-oriented land uses located adjacent to Parkways. Parkway design is better matched to land uses that depend on vehicular accessibility from a nearby street and that do not foster large numbers of pedestrians crossing or walking along the Parkway. These types of uses may include regional or community malls, industrial or office parks, and some types of office/mixed-use/multi-use centers. While these types of sites should still be designed to encourage parking once and walking between land uses or buildings, the resulting pedestrian activity should be oriented away from the Parkway.

Harris Boulevard, a Parkway, with access to multi-family residential development along both sides of the street.

To accomplish this, development along Parkways includes stringent access control and include deep setbacks from the right-of-way, with buildings oriented towards intersecting or parallel roadways and away from the Parkway. Urban design features should be appropriate to the street type onto which the buildings actually front. Landscape treatments and buffers along Parkways should be extensive and serve to further separate adjacent land uses from the Parkway.

In keeping with the land use and development characteristics described above, as well as to facilitate traffic flow, access is controlled along Parkways. Parkways should include more shared entrances and larger "block lengths" than Charlotte's other street types. On Parkways, the desired distance between cross streets is ½ mile.

Parkways are designed to provide higher capacity than other street types and typically include 2 or 3 through lanes in each direction, as well as separate turn lanes. Wide landscaped medians and shoulders are important elements, in recognition of the high traffic volumes and speeds on

Parkways

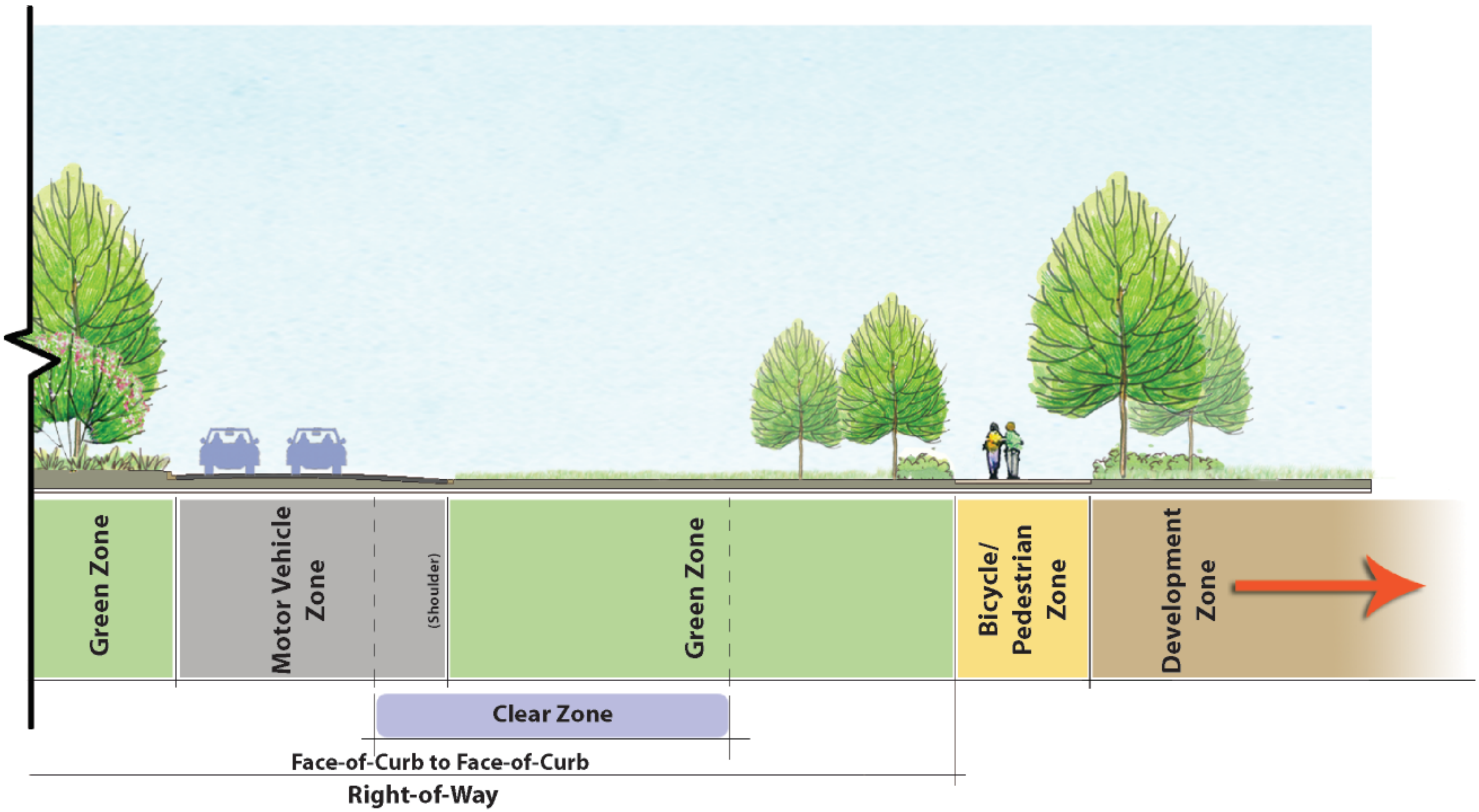
Parkways. In addition, this is the only street type for which a "clear zone" is explicitly specified to enhance motorist safety.

Another section of Harris Boulevard, approaching commercial land uses. This section has more access control.

Since the immediate Parkway environment is not well suited for pedestrian and bicycle traffic, pathways for these travelers should be provided on separate facilities. Ideally, bicycle and pedestrian facilities should be located on nearby, parallel streets. Those streets would provide most of the access to development adjacent to the Parkway, as well as a continual, connected network for cyclists and other travelers. If such routes are not available or feasible nearby, then provision should be made for cyclists and pedestrians to travel as far from the roadway and clear zone as possible.

Parkways are most appropriate for express bus or other limited-stop routes. When transit stops are provided, they should be located off the Parkway, either within adjacent developments or on cross-streets. If off-Parkway stops are not possible, bus pull-outs should be provided to remove buses from the high speed travel lanes.

Parkways



Parkway

For specific dimensional information refer to the guidelines in this section.

Parkways

Development Zone:

The land uses, along with building design and orientation to the street, are typically auto-oriented; access to this zone is limited or managed/controlled and setbacks are deep, with side or reverse frontage common; physical connections to the street are typically limited.

Bicycle/Pedestrian Zone:

This is a crucial zone for cyclist, pedestrian, and motorist safety, because it separates these modes; this zone should preferably be located beyond the right-of-way or on parallel streets.

Green Zone:

Important for buffering land uses from the high-speed, high-volume traffic, as well as enhancing the aesthetics of this auto-oriented street, the green zone should be wide, with large maturing trees. This zone also includes the median and the areas adjacent to the Bicycle/Pedestrian Zone, if one exists.

Clear Zone:

Unique to the Parkway, this zone is important for motorist safety due to high volumes and speeds.

Motor Vehicle Zone:

Reflecting the auto-orientation of the Parkway, the number of travel lanes (2 or 3 in each direction) will depend on travel demand.

Parkways

Priority Elements:

- Posted Speed – 45-50 mph, reflecting that this is a roadway used for high-speed, intra-city connectivity.

- Top Design Speed – Up to 55 mph.

- Number of Through Lanes – 2 in each direction (4 total) or 3 in each direction (6 total), as determined by capacity analysis.

- Lane Width – Typically 12' lanes (not including concrete gutter, if curb and gutter exists). In constrained situations, minimum 11' lanes are acceptable.

- Medians – Should be provided on Parkways. At least 20' wide is preferable, to provide continuity between the portions of median along the segment and at intersections (where the 20' width allows a minimal 9' pedestrian refuge and an 11' left-turn lane). If the right-of-way is severely constrained, the median can be narrower away from intersections (not less than 17' wide), but will need to transition to the wider dimension as it approaches an intersection.

- Median Planting – All medians should be landscaped. Landscaping should include trees, where possible given sight distance and an adequate clear zone.

- Shoulder – A shoulder should always be provided on a Parkway. The shoulder should ideally be 10' wide, but a minimum of 8' wide may be allowable in constrained situations.

- Sidewalks – The preferred pedestrian treatment along Parkways is a separate, parallel facility. This should be shared with bicycles if no preferred alternative for bicycle accommodations is possible (in which case, a 10' minimum unobstructed path is required and there must be very limited access along the Parkway). If it is not possible to construct a parallel facility and if right-of-way is available, sidewalks (minimum 5' wide unobstructed) may be provided for pedestrian network connectivity, particularly to connect transit stops to nearby pedes trian generating land uses. This side walk should be located as far as possible from travel lanes to provide a safer and more comfortable pedestrian environment.

- Planting Strips – If there is no sidewalk, the entire right-of-way should be treated as a planting strip. Trees are desirable, but should be located beyond the 25' clear zone (from the edge of the travel lane). In cases where a sidewalk is provided, a planting strip with grass and low ground cover should be included to separate pedestrians from the high-speed vehicular traffic. To provide adequate separation, the planting strip should be a minimum of 15' between curb (if curb exists) or shoulder and the side-walk.

- Lighting – Street lighting is desirable on Parkways. In cases where pedes-trian facilities exist along Parkways, it is generally expected that the regular street lighting should also provide for adequate pedestrian lighting. How-ever, where the pedestrian facility is removed from the Parkway (as a sepa-rate path, for example) and at bus stops, separate pedestrian lighting should be considered, depending on ambient light, location of street light-ing, and visibility/safety. Pedestrian lighting should be placed so that il-lumination is not obscured by branch-es and leaves.

- Block Length (distance between cross-streets) – Due to the function of Parkways, it is generally desirable to limit access. Therefore, the distance between cross-streets should ideally be at least ½ mile. Shorter "block lengths" are allowable only when existing inter-mediate streets cannot be closed, or when required by land parcel configu-ration.

Parkways

Other Elements to Consider

- Curb and Gutter – Either curb and gutter or drainage swales are allowable, though curb and gutter is atypical, since a shoulder should always be provided. If curb and gutter is provided, mountable curbs should be used.

- Bus Stops – If there are bus routes operating on Parkways, bus stops should be located off the roadway. If this is not feasible, bus pull-outs should be provided, so that the bus is not stopping in mixed traffic. Bus stops should have sidewalks (minimum 5' wide unobstructed) connecting to surrounding land uses, as well as pedestrian scale lighting, if deemed necessary for safety.

- Utilities – Where they are necessary, poles should be located at back of right-of-way, beyond the 25' clear zone (from edge of travel lane). In no circumstance should utility poles be placed in sidewalks or bicycle paths.

Parkways

Inappropriate Elements:

- Driveways – Inappropriate and unsafe on a Parkway. Should only be provided when no other access is possible to a property or when a driveway is pre-existing. Every effort should be made to provide alternate access in order to eliminate existing driveways.

- Bicycle Accommodations – Bicycle lanes are typically inappropriate on Parkways. In some cases, they may be allowable, but only when necessary for network connectivity. Bicycle routes on nearby, parallel streets (which are not Parkways) are preferable. In some cases, there could be a shared bicycle/pedestrian facility parallel to the Parkway (in which case, a 10' minimum unobstructed path is required and there must be very limited access along the Parkway).

- Sidewalk Amenity Zone – Although sidewalks may be provided in some cases (see above), a sidewalk amenity zone is inappropriate, due to the vehicular orientation of Parkways.

- On-Street Parking – Inappropriate, since the function of a Parkway is to move traffic at higher volumes and speeds than any other street type.

- Curb Extensions – Inappropriate, since the function of a Parkway is to move traffic at higher volumes and speeds than any other street type.

- Traffic Calming – Inappropriate, since the function of a Parkway is to move traffic at higher volumes and speeds than any other street type.

- Mid-block Pedestrian Crossings - Mid-block pedestrian crossings would be unsafe in the Parkway environment, since the function of a Parkway is to move traffic at higher volumes and speeds than any other street type. Further, the land use context of the Parkway is unlikely to create the need for mid-block crossings.

- Pedestrian Refuge – Pedestrians are typically not expected or encouraged on Parkways. Pedestrian refuges should not be provided along the segment, so as to not encourage mid-block pedestrian crossings.

Section 4.5 Local Residential Streets

Overview

The main function of Local Streets is to provide direct access to sites or land uses. There are several types of Local Streets, based on the predominant land uses found along the street, with Local Residential Streets serving the residential land uses.

Local Residential Streets are the most common street type and account for the most lane miles of all the City's streets. These streets are typically built during the land development process, rather than as a result of specific public projects. Further, Charlotteans consider Local Residential Streets (and their design) as particularly important to their quality of life, since they likely live along such streets. For all these reasons, the cross-sections and dimensions described in this section are less flexible than those described for non-local streets, to ensure high-quality neighborhood street design.

The predominant land use along Local Residential Streets will be either single family or multi-family housing, with a full range of possible densities. In keeping with the range of possible residential types found along these streets, there is also some variability in the development characteristics found along them. Building setbacks and lot sizes, for example, will vary by density and design, but in all cases building fronts should orient to the street. Related to both density and lot size is the location and amount of on-site parking, which is important in determining the appropriate street cross-section to use for a given development type. This is discussed in more detail below, under the heading "Alternative Cross-Sections".

A residential street where residents and visitors will park on the street.

Local Residential Streets

Regardless of the applicable cross-section, there are several common elements to all Local Residential Streets. These streets are designed for low traffic speeds and volumes since they are serving mostly neighborhood traffic, and a comfortable walking, cycling, and living environment is expected along them.

Local Residential Streets will have small blocks, which will provide both a high degree of connectivity for motorists, pedestrians, and cyclists, as well as a form of traffic calming for residents, through frequently spaced intersections. This is described in more detail in the Chapter 4 introduction, under the heading "Block Lengths for Local Streets." Local Residential Streets, therefore, will include built-in traffic calming features (such as intersections or other "slow points" every 300'-500') along with continuous sidewalks, planting strips, and street trees, to enhance safety, functionality, and aesthetic value for all users.

On this residential street in Myers Park, on-street parking has been limited to one side.

Because Local Residential Streets are intended to provide direct access to the residential land uses along them, individual driveways are the norm. However, in the case of higher-density, multi-family housing, shared driveways are encouraged to help reduce conflicts between pedestrians and turning vehicles, to reduce the number of and total space allotted to curb cuts (thereby allowing more space for on-street parking), and to increase potential green space.

Transit service is not typical on most local streets, but may be available, especially as feeder or neighborhood circulator service. The location and spacing of bus stops, therefore, is highly variable on these streets.

At these densities, on-street parking should be provided on both sides of the street.

Local Residential Streets

Cross-Section Alternatives

Local Residential Streets will reflect one of the following three cross-sections:

- Narrow (**<u>may</u> be used under conditions described below)**
- Medium **(the <u>default</u>)**
- Wide **(<u>must</u> be used under conditions described below)**

Selection of the appropriate cross-section depends primarily on the likely demand for on-street parking and the density of the street network. The general intent is to keep the curb-to-curb dimensions of Local Residential Streets as narrow as possible, while providing adequate width for emergency vehicles or for other vehicles to safely get around parked cars. In general, the more on-site parking provided, via longer driveways, rear or side loading garages, larger lots, shared parking, etc., the narrower the allowed cross-section.

The medium cross-section is used when it is likely that on-street parking will occur on both sides of the street with some frequency. The narrow cross-section is to be used only when it is likely that on-street parking will be relatively infrequent and likely to occur on only one side of the street at any given time, and the street network is well-connected. The wide cross-section applies where a high demand for on-street parking is likely. This cross-section includes a travel lane in each direction and parking on both sides of the street. This width will also allow emergency vehicle staging anywhere along the block.

The medium cross-section is the <u>default</u> cross-section for Local Residential Streets.

The "narrow" cross-section <u>may</u> be used if:

- net densities along the street are below 4 units per acre,
- lots are at least 80' wide,
- garages or parking areas are side loaded, rear loaded, recessed, or located behind the residence,
- there is more than one connection to the street (for redundant emergency access routes), and
- there are alternative, parallel routes available.

OR, if:

- net densities along the street are 4-7 units per acre,
- there is sufficient shared parking to allow for three vehicles per unit on-site,
- there is more than one connection to the street (for redundant emergency access routes),
- there are alternative, parallel routes available, and
- block length is a maximum of 650'.

Local Residential Streets

The "wide" cross-section <u>must</u> be used if:

- net densities along the street are at or above 8 units per acre, and
- there is insufficient on-site parking to allow for 2.5 vehicles per unit.

A medium residential street in Columbus, Ohio, with over-utilized on-street parking.
(photo courtesy of Dan Burden)

Both the medium and wide cross-sections may serve as collectors/connectors. This function will typically be served by creating a relatively direct connection to the thoroughfare network. However, the width of the cross-section should be related to the on-street parking demands (as discussed above), rather than the street's designation as a collector/connector. The narrow cross-section should not be used for a collector/connector street, except where there are many such connections to the thoroughfare in close proximity.

Infrequent parking on a narrow street.

Planting Strips

Planting strips, located between the curb and the sidewalk, improve the environment for pedestrians and neighborhood residents in two ways. First, by providing separation between pedestrian and vehicular traffic, and second, by providing shade and traffic calming when they are planted with large maturing street trees. In addition, citizen surveys and a broad variety of stakeholder discussions indicate that Charlotteans strongly support the provision of street trees. To achieve all of these goals, planting strips should be at least 8' wide. The cross-sections for Local Residential Streets included in this chapter show expected dimensions for planting strips, but the following describes the various ways in which planting strips will be provided on Local Residential Streets.

Local Residential Streets

1. New Local Residential Streets, built through the private development process in subdivisions or greenfields:

- The "Narrow" street includes an 8' planting strip planted with large maturing street trees.
- The "Medium" street includes an 8' planting strip (preferred) planted with large maturing street trees, or a 6' planting strip planted with medium maturing street trees*. The site developer and staff will be expected to justify why they are not providing the 8' planting strips. The 8' width is particularly recommended for entrance streets in new subdivisions and along any interior streets likely to carry the higher traffic volumes.

  *Approved species lists of appropriate street trees for 6' and 8' planting strips is provided by Landscape Management.
- The "Wide" street includes an 8' planting strip or an 8' amenity zone, either of which should be planted with large maturing trees.

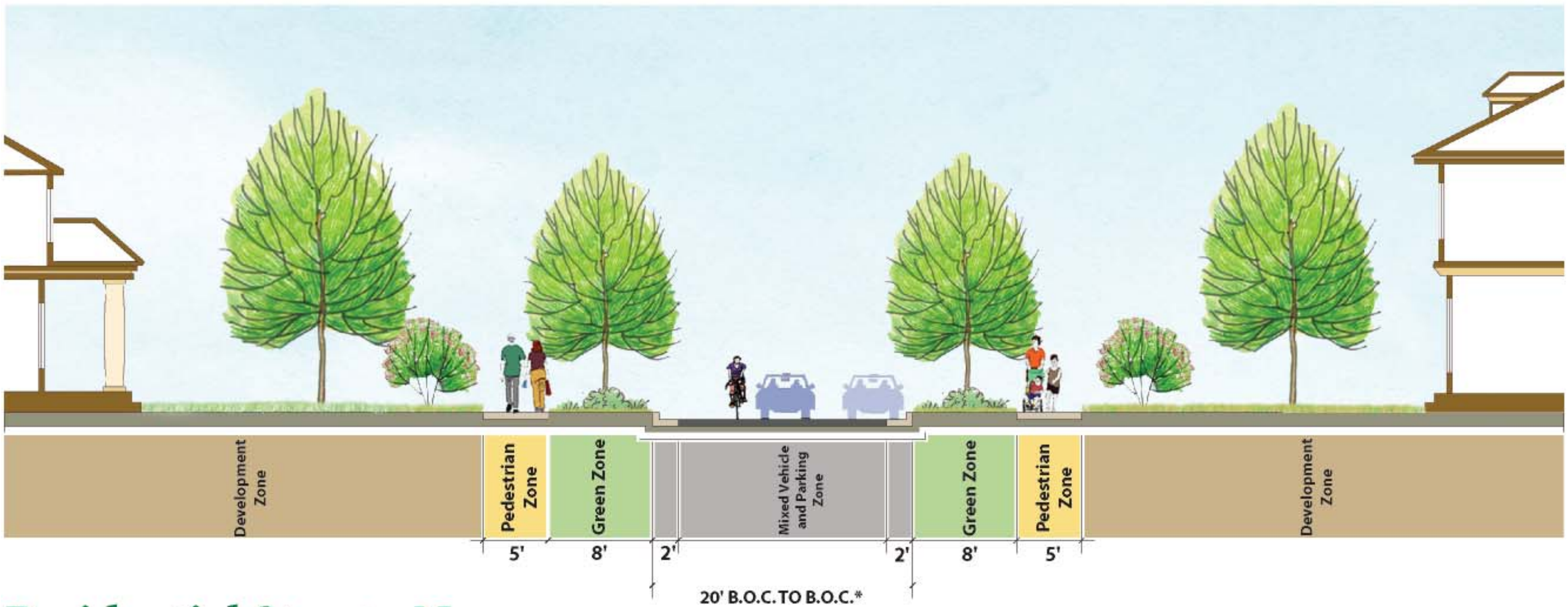
It may sometimes be allowable to "meander" the sidewalk for short distances (affecting planting strip width) to preserve existing trees (specifically, where large lot development allows the potential for significant frontyard tree save and the existing trees are in the vicinity of the sidewalk location). Even in these cases, the planting strip must be a minimum of 4' wide (or the sidewalk must go behind the preserved trees), to maintain an adequate buffer between pedestrians and vehicles, and the distance of the "meander" should be as short as possible.

2. Retrofit projects built by the City on existing Local Streets: where deemed reasonable, the project design team is expected to provide an 8' planting strip and incorporate large maturing street trees (with trees to be planted at the time the project is completed). The team will document any reasons for deviating from the preferred width. Reasons might include:

a) avoiding interference with existing stands of mature trees,
b) steep slopes,
c) retaining walls,
d) location of existing houses,
e) location of existing utilities, or
f) other issues related to existing houses and yards.

3. Infill development projects fronting along existing Local Streets: as with #2 above, the expectation is to provide, where possible, an 8' planting strip and large maturing street trees (with trees to be planted at the time the project is completed). Any deviation should be documented in much the same way as for City projects, with the exception that items d and f would not apply for new construction (infill development projects would typically be removing existing structures, allowing the appropriate planting strip and sidewalk widths to be constructed in most cases).

Local Residential Streets



Residential Street - Narrow

**B.O.C. - Back of Curb*

Local Residential Street - Narrow

Development Zone:

Crucial to maintaining the functionality of the Narrow Residential Street, this zone should typically include only lower-density, large-lot housing, with ample on-site parking.

Pedestrian Zone:

Crucial for safe, walkable neighborhoods, this zone includes sidewalks of adequate width for two adults to comfortably pass one another.

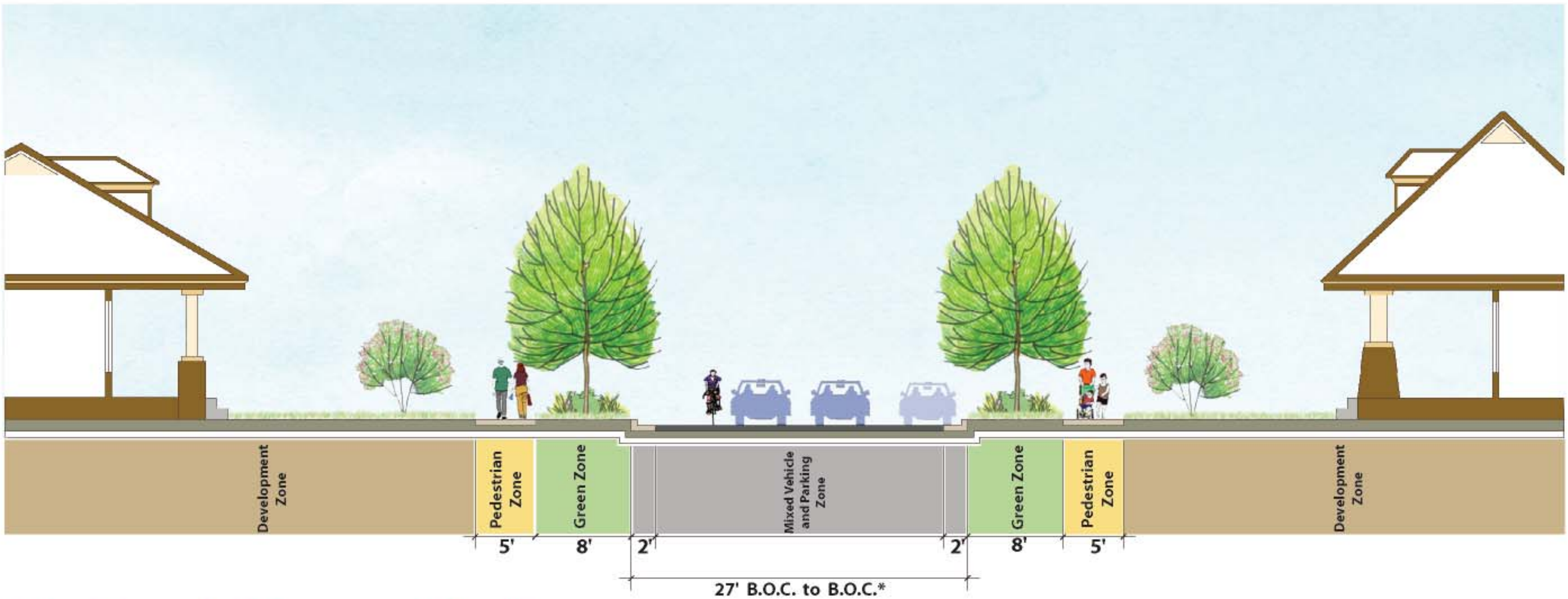
Green Zone:

Very important for pedestrian comfort and neighborhood livability, this zone should include grass, landscaping, and street trees in spacious planting strips. The tree canopy in neighborhoods can also help to calm traffic.

Mixed Vehicle and Parking Zone:

This zone sets the tone for the street's multiple objectives of allowing mobility and accessability for both motor vehicles and bicycles, while maintaining low volumes and speeds and, thereby, contributing to overall neighborhood livability. Parking will be infrequent, but can help to calm traffic.

Local Residential Streets



Residential Street - Medium

**B.O.C. - Back of Curb*

Local Residential Street - Medium

Development Zone:

This zone is characterized by low- to medium-density residential land uses, with direct access via driveways or alleys; on-site parking should be sufficient to allow most cars to be parked off of the street.

Pedestrian Zone:

Crucial for safe, walkable neighborhoods, this zone includes sidewalks of adequate width for two adults to comfortably pass one another.

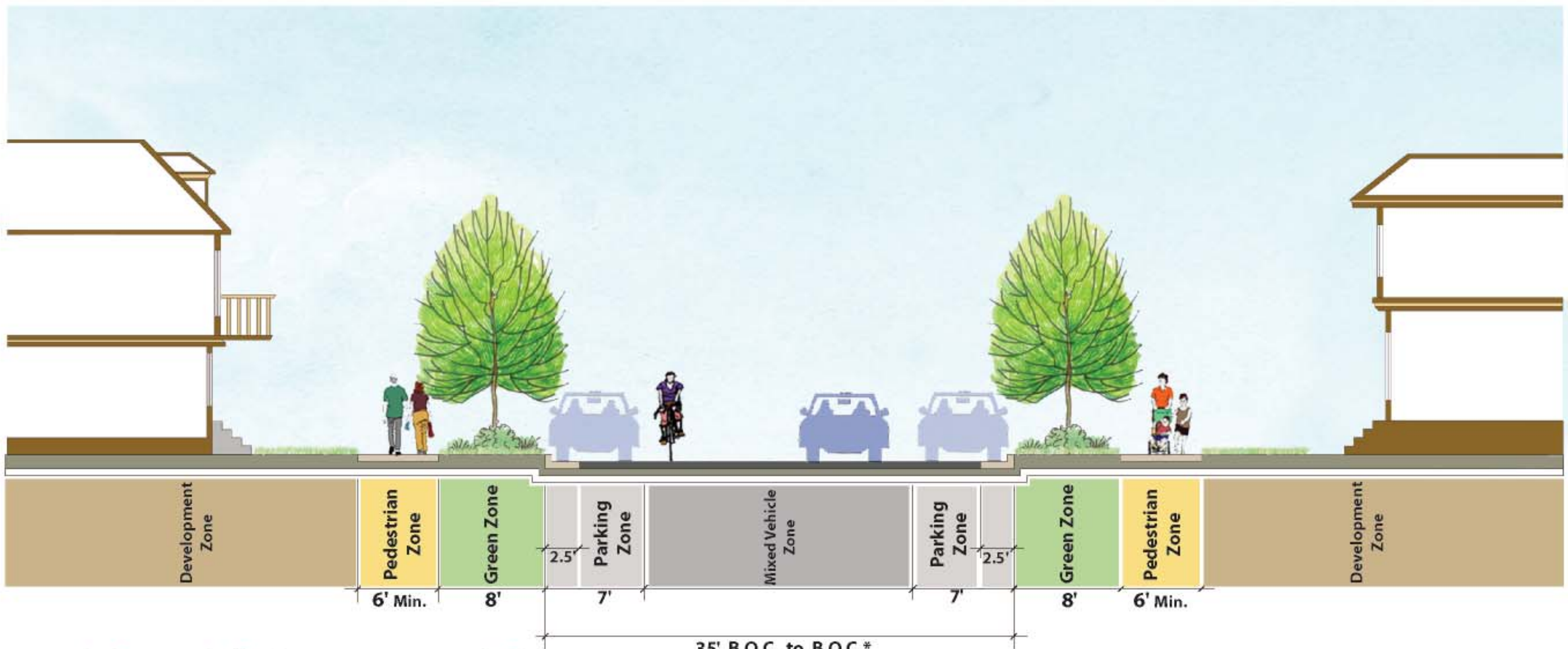
Green Zone:

Very important for pedestrian comfort and neighborhood livability, this zone should include grass, landscaping, and street trees in spacious planting strips. The tree canopy in neighborhoods can also help to calm traffic.

Mixed Vehicle and Parking Zone:

This zone sets the tone for the street's multiple objectives of allowing mobility and accessability for both motor vehicles and bicycles, while maintaining low volumes and speeds and, thereby, contributing to overall neighborhood livability. Parking on the street will occur more frequently than with the Narrow cross-section, helping to calm traffic, but most parking should be on-site.

Local Residential Streets



Residential Street - Wide

**B.O.C. - Back of Curb*

Local Residential Street - Wide

Development Zone:

This zone is characterized by medium- to high-density residential land uses, such as townhouses and other attached, multi-family uses. These land uses have small setbacks with strong functional and visual connections to the street, thereby reinforcing the pedestrian character of this street type.

Pedestrian Zone:

Crucial for safe and walkable neighborhoods and reflecting the higher density land uses characteristic of this street type, this zone includes wider sidewalks than do the other residential street types.

Green Zone:

Very important for pedestrian comfort and neighborhood livability, this zone should include grass, landscaping, and street trees in spacious planting strips or, alternatively, trees and landscaping in amenity zones.

Parking Zone:

Parking is offered in a separate zone for this residential street type, because it is expected that there will be much more demand for on-street parking in these higher-density areas.

Mixed Vehicle Zone:

Speeds and volumes are low enough on this street type for bicycles to operate in mixed traffic.

Local Residential Streets

Priority Elements

- Posted Speed – 25 mph, deemed a comfortable and safe speed allowing for residential neighborhood livability.

- Design Speed – 25 mph, set equal to the posted speed. Along with frequent "slow points", the low design speed is intended to discourage speeding.

- Number of Through Lanes – 1 in each direction (2 total).

- Lane Width – Where medians exist, the travel lanes should be 14' wide. Depending on the design context (described under "Cross-Section Alternatives"), the ideal cross-sections are:
    - The "narrow" dimension of 20' back-to-back, with parking allowed only on one side, and 12' left as open travel lane (21' back-to-back when using valley curb).
    - The "medium" dimension of 27' back-to-back, with parking allowed on both sides, and 12' left as open travel lane (28' back-to-back when using valley curb); or
    - The "wide" dimension of 35' back-to-back, with on-street parking on both sides and two 10' travel lanes left open.

- On-Street Parking – The need for on-street parking and its likely frequency of use is a major consideration in defining the appropriate cross-section for local residential streets. For the narrow cross-section, it is assumed that parking will only occur (and infrequently) on one side of the street. The medium cross-section assumes that on-street parking will sometimes occur along both sides of the street. In neither case does the parking need to be striped, but additional parking restrictions may be applied in cases where emergency vehicles are frequently or regularly blocked by on-street parking. The wide cross-section includes on-street parking (7' wide, from face-of-curb), which should preferably be striped, on both sides of the street. On-street parking will support the more urban, pedestrian nature of the higher density development adjacent to the "wide" street, help reduce on-site park ing needs, and provide a degree of traffic calming.

- Curb and Gutter – The "narrow" and "medium" streets may have 2' curb and gutter or 2' mountable/valley curbs (2'). For projects in existing developments, curb and gutter should always be used instead of valley curb. The "wide" street should always have curb and gutter (2' minimum) or vertical curb. Valley curb should not be used for the "wide" street, to avoid parking/pedestrian conflicts and because it

Local Residential Streets

is incompatible with the higher density land use context.

- Swales – This is not a typical urban treatment. However, swales (or other, more effective water quality bmps) may be used in some special circumstances. For example, if properly designed for water quality purposes, they may be used with the "narrow" cross-section, if densities are very low (less than 3 dua) and street frontage is at least 100'. When used, sidewalks must still be provided and there must still be sufficient drainage to keep sidewalks free from standing water. Other, similar treatments may also be considered in more urban or dense environments where there is little opportunity for adequate water quality bmps elsewhere on-site and where their design can be shown to meet not only water quality objectives, but the other objectives of the street such as adequate sidewalks, buffering from traffic, and provision of street trees. More research is needed on the applicability of these treatments in dense development, however, and these should not be considered typical for urban streets.

- Planting Strips – For appropriate planting strip dimensions, see the discussion on "Planting Strips" provided in the introduction to Section 4.5.

- Sidewalks – Sidewalks of a minimum 5' unobstructed width must be provided along the "narrow" and "medium" residential streets. For the "wide" residential street, sidewalks must be a minimum of 6' wide unobstructed at densities less than 12 dua and a minimum of 8' wide unobstructed at densities greater than 12 dua. Sidewalks may be provided in an easement.

- Driveways – Are appropriate, as direct access is allowed on local streets. For townhouse style or dense single family development, rear-accessed parking is encouraged, to minimize driveways.

- Lighting – Where ambient light is insufficient for pedestrian visibility, decorative pedestrian-scale lighting should be provided along "narrow" and "medium" segments. Decorative pedestrian-scale lighting should *always* be provided along the "wide" segments, since pedestrian activity is expected in this context. Pedestrian lighting should be sufficient to illuminate the sidewalk, as well as to provide for pedestrian visibility and safety from crime. Street lighting would typically not be provided mid-block on Local Residential Streets, except to address specific safety concerns. If absolutely necessary in a mid-block location, sharp cut-off ornamental fixtures should be used. In some cases, the pedestrian-scale lighting may also be sufficient for street lighting as determined by a lighting study.

Local Residential Streets

- Utilities – To preserve sidewalk capacity for pedestrians, maintain a clear zone per ADA requirements, and allow larger trees and other aesthetic treatments, utilities should be placed underground, wherever possible, taking care to minimize conflicts with street trees. If underground placement is not possible, the next locations to consider for poles are at the back of property (with an alley), behind the sidewalk (where greater setbacks allow) or, least preferred, in the planting strip (where lesser setbacks exist). Under no circumstances should poles be placed in the sidewalk and, as with underground placement, every attempt should be made to avoid or minimize conflicts with street trees. Utility poles should be consolidated where possible, with redundant poles removed in retrofit situations.

- Traffic Calming – Local Residential Streets are intended to be low-speed streets and traffic calming should be provided as part of the street design. In addition to design features that inherently provide traffic calming (on-street parking, for example), specific "slow points" should be incorporated into the design, every 300-500', to maintain the design speed. Given the short block length expected on these streets (see below), stop controlled intersections can serve as "slow points". See CDOT's Traffic Calming Report for other appropriate types of slow points.

- Block Length – Refer to Table 4.1 in the introduction to this chapter for block size dimensions for these streets. Whatever the block size and dimensions applied, the block face length should be related to the slow point spacing described above (under "Traffic Calming"). In other words, if a blockface is 600' long, then a mid-block slow point will be required. Conversely, a 400' blockface might not require a mid-block slow point, depending on whether the intersections at either end of the block can serve as slow points.

- Bus Stops – If there are bus routes on a Local Residential Street, mid-block stops are allowable, where necessary to maintain preferred spacing.

Other Elements to Consider

- Medians – Typically not appropriate, but may be allowable for aesthetic purposes, in which case they should be a minimum of 8' wide to provide enough space for trees.

- Median Planting – If medians exist, they should be landscaped, preferably with trees, since the purpose of the median in the local street context is for aesthetics.

- Sidewalk Amenity Zone – Inappropriate for lower density settings (with

Local Residential Streets

the "narrow" and "medium" cross-section), because planting strips are the preferred treatment to provide separation between pedestrian and vehicular traffic. Where the "wide" cross-section is used, the amenity zone is still not required, but should be considered in locations where on-street parking parallels high pedestrian activity zones, especially if the residential land use includes ground floor retail (though these uses could be more appropriately categorized as Local Office/ Commercial Streets). In such cases, the amenity zone could either substitute for or alternate with the planting strip. An amenity zone may also be appropriate in constrained situations where an 8' planting strip is impossible – as described under "Planting Strips" – and a narrower amenity zone will further enhance the sidewalk (by providing more space for pedestrians).

Inappropriate Elements:

- Pedestrian Refuge – Not necessary on a 2-lane local street, particularly when other traffic calming devices are provided to maintain the relatively low speeds.

- Curb Extensions – Typically inappropriate, except where used for traffic calming purposes. See Chapter 5 for a discussion of curb extensions at intersections.

- Shoulder – Inappropriate for a local street in an urban or suburban setting.

- Bicycle Lanes – Typically not necessary on local streets, because bicycles can share the lanes with low-volume, low-speed traffic. Local streets may be designated as bicycle routes, particularly in locations close to Parkways, where a nearby, alternative route is desirable.

- Mid-Block Pedestrian Crossings – Typically unnecessary on a 2 lane street with low volumes and speeds. May be considered under certain circumstances, as outlined in CDOT's Mid-Block Crossing Policy.

Section 4.6 Local Office/Commercial Streets

Overview

Local streets provide for direct access to specific land uses or sites, in this case to office, commercial, or mixed land uses. Local Office/Commercial Streets will apply to developments ranging from very pedestrian-oriented retail locations (similar to Main Streets) to business parks. Whatever the specific land use type or development style along these streets, the goal is to create a convenient and safe network of well-designed streets. The alternative cross-sections described in this section are intended to accommodate the variety of land uses served by Local Office/Commercial Streets, while also providing consistent, high-quality street design.

Land uses along Local Office/Commercial Streets include office, commercial, and/or mixed-use developments, which may be either pedestrian- or auto-oriented. Commercial uses could include restaurants and other convenience retail services, as well as concentrations of specialty shops or other, single retail uses. Office uses could be developed as mid or high-rise office buildings, or as a business park.

Camden Road in South End.

Although land uses on these streets may be pedestrian-oriented, auto-oriented, or somewhere in-between, the general intent is that these local streets (and the uses along them) will accommodate travel by a variety of modes. To maintain or foster a reasonably accessible pedestrian environment, buildings should have entrances that face the street and sidewalks connecting the buildings to the streetfront sidewalks, parking areas, and, where appropriate, adjacent buildings. Setbacks will vary, as will parcel size.

Even with the wide variety of land uses and two cross-section options (described below under "Cross-Section Alternatives"), there are several characteristics common to all Local Office/Commercial Streets. These characteristics recognize that the majority of the people traveling on these streets are searching for or visiting shops or businesses along them, or are either residents or visiting residents. Therefore, traffic speeds on these streets are lower than on Boulevards and most Avenues. Design and posted speeds are set equal to one another, with appropriate traffic calming built into the street design. Access to and from sites consists of individual driveways permitted in

Local Office/Commercial Streets

appropriate locations. However, along blocks with smaller setbacks and higher levels of concentrated pedestrian activity, shared driveways are highly encouraged.

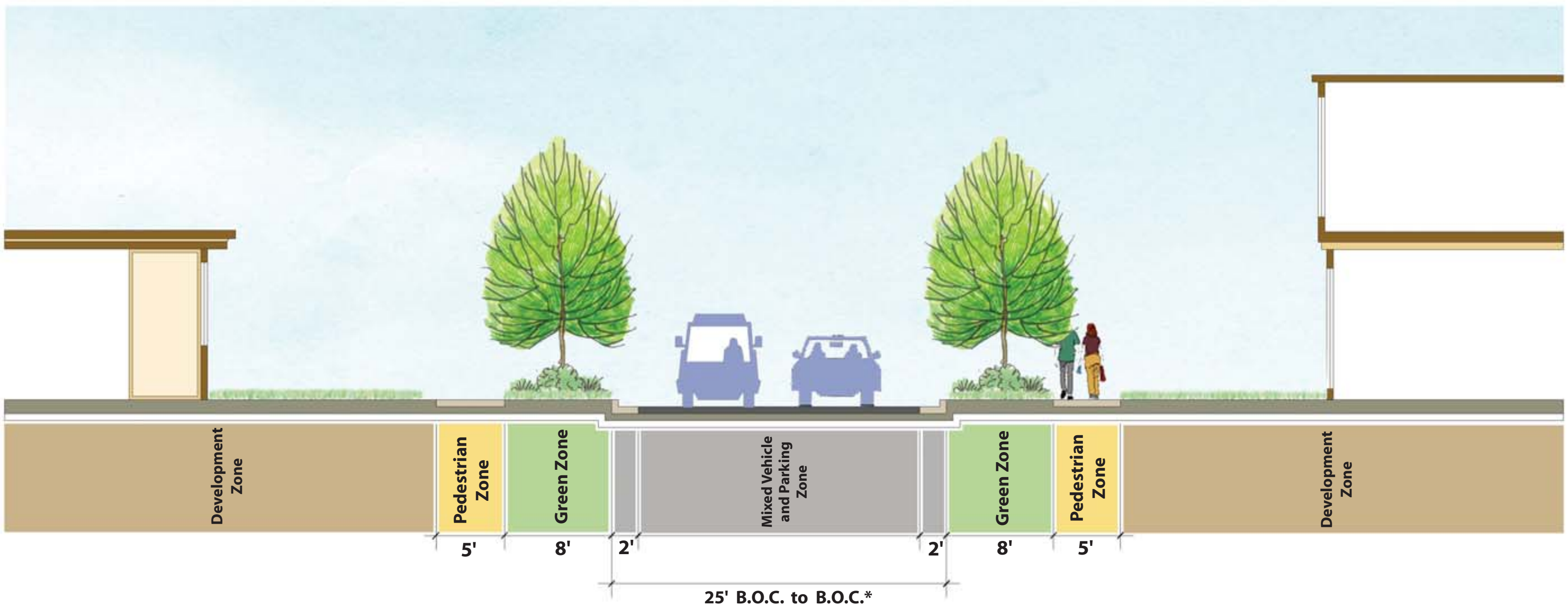
Birkdale Village.
Higher density, mixed uses increase the need for spacious pedestrian areas.

Local Office/Commercial Streets are designed to safely accommodate pedestrians and cyclists, as people travel between land uses along the street or to and from nearby residential areas. Continuous sidewalks are required along all of these streets. Other treatments include trees, street furniture in pedestrian activity areas, and appropriately scaled signage. Cyclists are expected to operate in mixed traffic, since the traffic volumes and speeds are low. Transit stop spacing and locations will vary, depending on the intensity of land uses along the street.

Cross-Section Alternatives

As with Local Residential Streets, there is more than one cross-section option available for the design of Local Office/Commercial Streets: a “narrow” cross-section and a “wide” cross-section. Both options are intended to maintain the desired functionality of Local Office/Commercial Streets, where both traffic volumes and speeds are relatively low. The “wide” option is ideal in a more commercial or mixed-use type of environment, where there is limited off-street parking nearby, short-term visitors are likely, and there is, therefore, a high demand for on-street parking. In an office park environment, where surface parking is offered off-street in sufficient quantity and proximity, on-street parking is less likely to be used. In that case, the “wide” option would result in a street that is too wide, so the “narrow” option is the ideal, to help maintain low speeds.

Local Office/Commercial Streets



Office/Commercial - Narrow

**B.O.C. - Back of Curb*

Local Office/Commercial Street - Narrow

Development Zone:

Important to maintaining the functionality of the narrow street, this zone will typically include office park style development, with ample on-site parking.

Pedestrian Zone:

Crucial for creating a safer, walkable environment, this zone includes sidewalks of adequate width for two adults to comfortably pass one another.

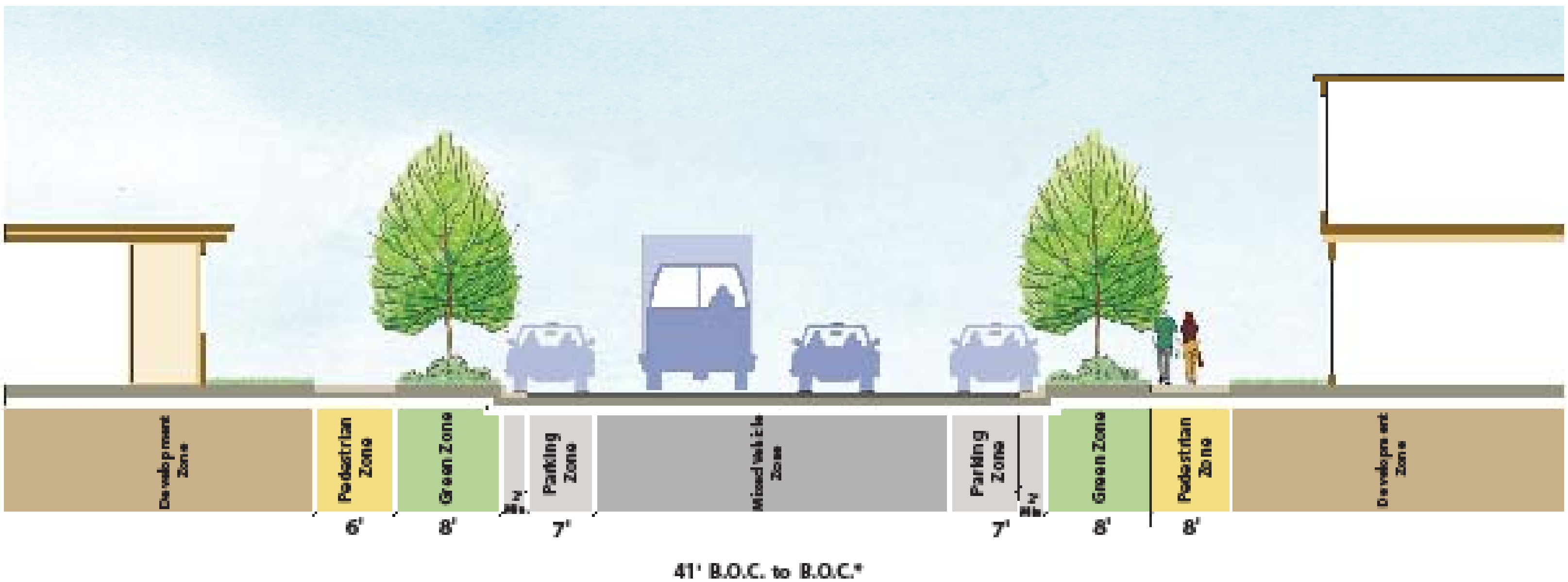
Green Zone:

Very important for pedestrian comfort, this zone should include grass, landscaping, and street trees in spacious planting strips. The tree canopy can also help to calm traffic.

Mixed Vehicle Zone:

This zone sets the tone for the street's multiple objectives of allowing mobility and accessibility for both motor vehicles and bicycles, while maintaining low volumes and speeds. Parking will be on-site, rather than on-street.

Local Office/Commercial Streets



Office/Commercial - Wide

*B.O.C. - Back of Curb

Local Office/Commercial Street - Wide

Development Zone:

Serving a variety of commercial land uses, this zone shares some characteristics with Main Street type development, including higher intensity development, buildings that front the street, and a greater likelihood of mixed uses than with the Narrow Office/Commercial Street.

Pedestrian Zone:

Important for reinforcing the pedestrian nature of this street type, this zone includes spacious sidewalks to complement the pedestrian-orientation of the buildings in the development zone.

Green Zone:

Very important for supporting the pedestrian character of the Wide Office/Commercial Street, this zone includes street trees and other landscaping in a planting strip or, alternatively, in appropriately designed planters in a hardscaped amenity zone. This zone also provides extra buffering between the pedestrian and vehicle zones.

Parking Zone:

Important for supporting the pedestrian character of this street type, the marked parking zone calms traffic, provides parking for businesses, and buffers pedestrians from moving traffic.

Mixed Vehicle Zone:

This zone sets the tone for the street's multiple objectives of allowing mobility and accessibility for both motor vehicles and bicycles, while maintaining low volumes and speeds. Motor vehicles and bicycles operate together in the travel lanes.

Local Office/Commercial Streets

Priority Elements:

- Posted Speed – 25 mph, deemed a comfortable and safe speed for local streets in urban environments.

- Design Speed – 25 mph, set equal to the posted speed. Along with frequent "slow points", the low design speed is intended to discourage speeding.

- Number of Through Lanes – 1 in each direction (2 total).

- Lane Width – Should provide at least 12' lanes to accommodate maneuvering delivery trucks and other large vehicles. The cross-section should reflect one of two options:

    - A "wide" dimension of 41' back-to-back, with two 13' travel lanes and on-street parking (7' wide) on both sides; or

    - A "narrow" dimension of 25' back-to-back, with two 12' travel lanes (including gutter) and no on-street parking.

- On-Street Parking – Parallel parking should typically be provided on both sides of the street (7' wide), preferably striped, where the wide cross-section is employed. In that case, on-street parking will help reduce off-street parking needs and provide a degree of traffic calming. On-street parking should not be provided where the narrow cross-section is employed.

- Curb and Gutter – Should always have curb and gutter or vertical curb. If curb and gutter is provided, 2'0" is the minimum.

- Planting Strips – Planting strips improve the pedestrian environment by providing separation between pedestrian and vehicular traffic, as well as shade when they are planted with large maturing trees. To achieve these goals, planting strips should be at least 8' wide. Where on-street parking is likely to be most intensely used (directly adjacent to commercial or mixed-use buildings, for example), consider alternating recessed on-street parking with the planting strip and paved amenity zones with trees in appropriately designed planters.

- Sidewalks – Pedestrian activity is to be expected, encouraged, and accommodated on these streets. In the higher density commercial or mixed-use context, where on-street parking and the wider cross-section are used, sidewalks should provide a minimum of 8' unobstructed width. In the lower density office setting, without on-street parking (and where the narrow cross-section is used), provide a 5' minimum unobstructed width.

Local Office/Commercial Streets

- Bus Stops – If there are bus routes on a Local Office/Commercial Street mid-block stops are allowable, where necessary to maintain preferred spacing.

- Driveways – Are appropriate, to allow frequent access to adjacent land uses. However, in higher density locations, shared driveways are encouraged.

- Lighting – Street lighting is to be provided. Separate pedestrian lighting should always be provided along the "wide" cross-section and should be considered anywhere higher levels of pedestrian activity are anticipated, either because of adjacent or surrounding commercial activity or because the area provides a major pedestrian route or pathway between land uses or to parking areas. Where provided, pedestrian lighting should be sufficient to illuminate the sidewalk, as well as to provide for pedestrian visibility and safety from crime. In some cases, the pedestrian-scale lighting may also be sufficient for street lighting, as determined through a lighting analysis.

- Utilities – To preserve sidewalk capacity for pedestrians, maintain a clear zone per ADA requirements, and allow larger trees and other aesthetic treatments, utilities should be placed underground, taking care to minimize conflicts with street trees. If underground placement is not possible, the next locations to consider for poles are at the back of property (with an alley), behind the sidewalk (where greater setbacks allow) or, least preferred, in the planting strip (where lesser setbacks exist). In no circumstance should poles be placed in the sidewalk and, as with underground placement, every attempt should be made to avoid or minimize conflicts with street trees. Utility poles should be consolidated where possible, with redundant poles removed in retrofit situations.

- Traffic Calming – Local Office/Commercial Streets are intended to be low speed streets and traffic calming should be provided as part of the street design. In addition to design features that inherently provide traffic calming (on-street parking, for example), specific "slow points" should be incorporated into the design, every 300'-500', to maintain the design speed. See CDOT's Traffic Calming Report for appropriate types of slow points.

- Block Length – To provide appropriate scale and connectivity options for all modes, the block lengths described in Table 4.1, located in the introduction to this chapter, should be applied.

Local Office/Commercial Streets

Other Elements to Consider

- Sidewalk Amenity Zone – Not required, but may be allowable in the higher density commercial or mixed-use context, where on-street parking and the wider cross-section are used. In such cases, the amenity zone could either substitute for or alternate with the planting strip (unless the planting strip is alternated with recessed on-street parking, in which case, the amenity zone is unnecessary).

- Medians – Typically not appropriate, but may be allowable for aesthetic purposes, in which case they should be a minimum of 8' wide. In addition, lane widths should be increased to 14', exclusive of parking lanes.

- Median Planting – If medians exist, they should be landscaped, preferably with trees, since the purpose of the median in the local street context is for aesthetics.

Local Office/Commercial Streets

Inappropriate Elements:

- Pedestrian Refuge – Not necessary on a 2-lane local street, particularly when other traffic calming devices are provided.

- Curb Extensions – Typically not provided on segments, unless they are to be used for traffic calming.

- Bicycle Lanes – Typically not necessary on local streets, because bicycles can share the lanes with lower-volume, low-speed traffic. Local streets may, however, be designated as bicycle routes, particularly in locations close to Parkways, where a nearby, alternative route is desirable.

- Shoulder – Inappropriate for a local street in an urban or suburban setting.

- Mid-Block Pedestrian Crossings – Typically unnecessary on a 2-lane street with low volumes and speeds. May be considered under certain circumstances, as outlined in CDOT's Mid-Block Crossing Policy.

Section 4.7 Local Industrial Streets

Overview

Local Industrial Streets provide direct access to predominantly industrial or warehouse/distribution land uses. Their design is geared toward the operational requirements of large volumes of trucks serving these land uses, while also recognizing that other modes and complementary land uses should be accommodated. These streets balance design elements derived from the space and maneuverability characteristics of large trucks with the design elements that create an aesthetic and traffic calmed environment for safer and more comfortable travel by pedestrians, bicyclists, and motorists.

Land uses located along Local Industrial Streets typically include warehousing, distribution, and manufacturing sites, interspersed with restaurants and some convenience retail to serve nearby employees and businesses. Relatively large parcels are prevalent on Local Industrial Streets to accommodate industrial or warehouse uses, and building setbacks will vary. These types of land uses will have some functional requirements that can make orienting buildings to the street difficult or even infeasible. However, any opportunities to front buildings onto the street should be strongly considered, because one design objective is to ensure that pedestrians are well-separated from truck and auto traffic, and another objective is to create "eyes on the street", an important aspect of pedestrian safety and comfort.

Local Industrial Streets are wider than other local streets and may include larger curb radii, for maneuverability of larger trucks. Blocks may be longer (up to 1,000') than for other local streets, due to the likelihood of larger parcels, freeway or rail frontage, and more land extensive uses. These sites should be well-connected to the rest of the street network, with multiple connections wherever possible. Traffic volumes on Local Industrial Streets are low. Designed and posted speeds are also low and are set equal to one another. Direct access is typical, with individual driveways permitted.

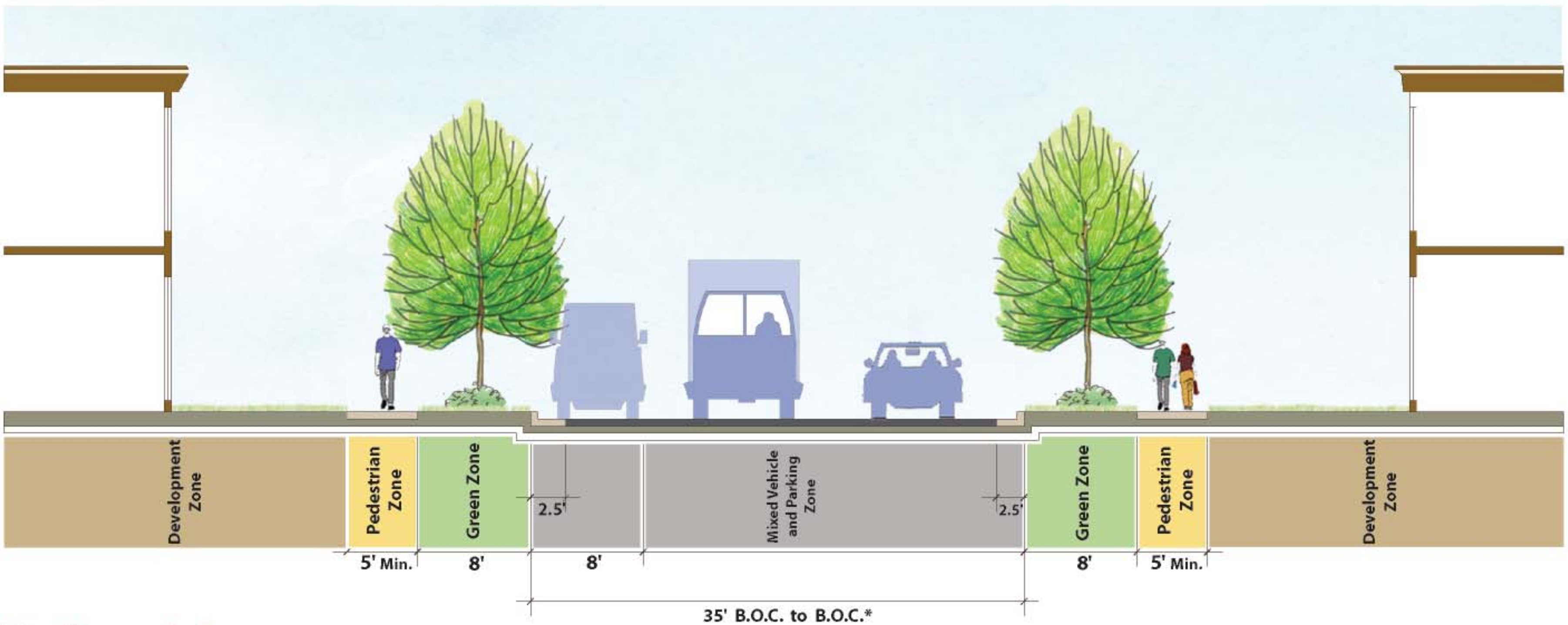
An Industrial Street where the buildings front the street, but the pedestrian pathway is non-existent or interrupted by driveways and parking lots.

Local Industrial Streets

Although Local Industrial Streets are assumed to have relatively low levels of pedestrian activity compared to other local streets, the higher volumes of truck traffic and the more auto- and truck-oriented street design do not eliminate the need to provide safe and comfortable pedestrian pathways. That is why continuous sidewalks are provided. These streets should also include the basic elements of other local streets, including planting strips with street trees, for shade and aesthetics. The frequency of bus stops along Local Industrial Streets will vary, depending on the locations of access points to individual sites or employment concentrations.

Buildings are likely to be set back from the street in industrial areas.

Local Industrial Streets



Industrial

**B.O.C. - Back of Curb*

Local Industrial Street

Development Zone:

The land uses in this zone are likely to be land extensive, with large parcels and varying setbacks.

Pedestrian Zone:

This zone is very important because of the auto/truck traffic found within this street type and the need to provide a separate pathway for pedestrians. This zone includes sidewalks of adequate width for two adults to comfortably pass one another.

Green Zone:

Very important for pedestrian comfort, this zone should include grass, landscaping, and street trees in spacious planting strips. The tree canopy can also help to calm traffic.

Mixed Vehicle/Parking Zone:

This zone sets the tone for the street's multiple objectives of allowing mobility and accessibility for both motor vehicles and bicycles, while maintaining low volumes and speeds. The demand for on-street parking will be influenced by the location of driveways and the layout of the industrial sites, but is generally expected to not require a separate zone within the right-of-way.

Local Industrial Streets

Priority Elements

- Posted Speed - 25 mph, deemed a safe and comfortable speed in urban environments.

- Design Speed - 25 mph, set equal to the posted speed. Low design speed is intended to discourage speeding.

- Number of Through Lanes - 1 in each direction (2 total).

- Lane Width - Typically, 12 ft lanes. The cross section is 35' back-of-curb to back-of-curb, to allow two 12' travel lanes, 8' for parking (on one side), and 2' gutter (on the side not used for parking). These dimensions should provide for adequate maneuverability and potential staging of vehicles, if necessary.

- On-Street Parking - Parallel parking typically provided on one side of the street, 8' wide (including the gutter), to allow for truck parking when necessary.

- Curb and Gutter-Should always have 2'6" curb and gutter.

- Planting Strips - The planting strip provides separation between pedestrian and vehicular traffic and room for healthy tree growth, an important consideration in a low density, industrial environment. Should be a minimum of 8' to support large maturing trees.

- Sidewalks - Pedestrian traffic may be lighter in industrial locations than in other local street contexts, but pedestrians must still be accommodated, particularly given the truck traffic on the Local Industrial Street. Minimum 5' unobstructed width sidewalks must be provided.

- Driveways - Appropriate, as direct access is expected.

- Lighting - Street lighting typically provided along segments only where necessary for safety. Separate pedestrian lighting is typically not necessary.

- Utilities - To preserve sidewalk capacity for pedestrians, maintain a clear zone per ADA requirements, and allow larger trees and other aesthetic treatments, utilities should be placed underground, taking care to minimize conflicts with street trees. If underground placement is not possible, the next locations to consider for poles are behind the sidewalk or in the planting strip. In no circumstance should poles be placed in the sidewalk and, as with underground placement, every attempt should be made to avoid or minimize conflicts with street trees. Utility poles should be consolidated where possible, with redundant poles removed in retrofit situations.

- Block Length - As described in Table 4.1, in the introduction to this chapter, Local Industrial Streets' block lengths may be longer than other local street types, due to the land uses and typically larger building footprints, but should not exceed 1000', to help maintain connectivity.

Local Industrial Streets

Other Elements to Consider

- Bus Stops – If there are bus routes on a Local Industrial Street, mid-block stops are allowable, where necessary to maintain preferred spacing.

Inappropriate Elements

- Medians – Inappropriate for a Local Industrial Street, since direct access to land uses and maneuverability for large vehicles is expected.

- Median Planting – Not applicable, since medians are not provided for a Local Industrial Street.

- Pedestrian Refuge – Typically not necessary on a 2-lane street, since the speeds and volumes are relatively low.

- Curb Extensions – Inappropriate for a Local Industrial Street with low volumes and speeds, particularly given the potential for truck traffic.

- Bicycle Lanes – Typically not necessary on local streets, because bicycles can share the lanes with the lower-volume, lower-speed traffic. Local streets may be designated as bicycle routes, particularly in locations close to Parkways, where a nearby, alternative route is desirable.

- Shoulder – Inappropriate for a Local Industrial Street in an urban or suburban environment.

- Sidewalk Amenity Zone – Inappropriate for a Local Industrial Street, since pedestrian traffic will be relatively low and the planting strip will provide separation between the pedestrian and the vehicular traffic.

- Mid-Block Pedestrian Crossings – Typically inappropriate on a 2-lane street with low volumes and speeds, although they may be considered under certain circumstances, as outlined in CDOT's Mid-Block Crossing Policy.

- Traffic Calming – Inappropriate for a Local Industrial Street because of the prevalence of large vehicles.