Chapter 21

Transportation Design for Livable Communities

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21.1 General

It is the policy of the Department to consider Transportation Design for Livable Communities (TDLC) features on the State Highway System when such features are desired, appropriate and feasible. This involves providing a balance between mobility and livability. TDLC features should be based on consideration of the following principles:

1. Safety of pedestrians, bicyclists, motorists and public transit users.
2. Balancing community values and mobility needs.
3. Efficient use of energy resources.
4. Protection of the natural and manmade environment.
5. Coordinated land use and transportation planning.
6. Local and state economic development goals.
7. Complementing and enhancing existing Department standards, systems and processes.

21.2 Planning

TDLC features are to be considered when they are desired, appropriate and feasible. Incorporating TDLC features are contingent upon involvement of the local stakeholders in the planning and project development processes. Therefore, it is essential that all stakeholders are included from the initial planning phase of the project through design, construction and maintenance.

During the initial planning and scoping phases it is important to identify and assess the desires and willingness of the community or stakeholder to accept all of the ramifications of TDLC, including funding allocations and maintenance agreements of the TDLC features included in a project.

21.3 Application

A team approach is recommended to evaluate TDLC projects or features. Depending on the complexity and/or controversial TDLC features and the district resources available, the team may include representation from Planning, Traffic Operations, Environmental Management, Roadway Design, Right of Way, Public Transportation, Maintenance, Safety, Pedestrian/Bicycle Coordinator and the Community Impact Assessment Coordinator. This team should also include the respective Metropolitan Planning Organization(s), local governments/agencies, transit agencies, citizen groups and any others affected by the proposed projects or features.

TDLC projects require a concept report documenting the desired project features determined to be appropriate and feasible for implementation and the respective responsibilities of all involved stakeholders.

TDLC features can be incorporated into new construction, reconstruction, and resurfacing, restoration and rehabilitation (RRR) projects using existing design standards and criteria found in ***Chapters 2*** and ***25*** of this volume. When a concept report identifies TDLC features for a project or segments of a project, the criteria provided in this chapter may also be used with the approval of the District Design Engineer.

21.4 Techniques

Selected TDLC techniques applied by type of highway system are shown in ***Exhibits 21-A, B, C*** and ***D*** at the end of this chapter. These techniques are intended as guidance for balancing the need for mobility with the desire for livable communities, and not as standards, policies or procedures of the Department.

21.5 Design Criteria

The criteria in this chapter meets or exceeds ***AASHTO*** minimums. All TDLC projects are subject to the requirements for Design Exceptions and Design Variations found in ***Chapter 23*** of this volume.

21.5.1 Design Speed

Recommended design speeds are found in ***Section 1.9*** of this volume.

21.5.2 Number of Lanes

In developed urban areas, reducing the number of lanes may provide space for pedestrians, bicycles, parking, landscaping etc. This technique may be appropriate depending on the volume and character of traffic, the availability of right of way, the function of the street, the level of pedestrian crossing, the intensity of adjacent land use and availability of alternate routes.

The decision to reduce the number of lanes on a project shall be supported by an appropriate traffic capacity study. If transit vehicles and school busses are currently operating in the area of the project, appropriate local agencies should be consulted.

21.5.3 Lane Widths

Minimum lane widths for TDLC projects or segments are shown in ***Table 21.1.***

Table 21.1 Lane Widths

Lane Types	Width (feet)
Through Lanes	11[1]
Turn Lanes	11[1]
Parking Lanes (parallel)	8[2]
Bicycle Lanes	4[3]

1. May be reduced to 10 feet in highly restricted areas with design speed < 40 mph having little or no truck traffic.
2. May be reduced to 7 feet (measured from face of curb) in residential areas
3. 5 feet adjacent to on-street parking.

21.5.4 Horizontal Alignment

A curvilinear alignment can be used to control vehicle speed by introducing a bend or curve on a tangent roadway. Design should meet criteria in ***Chapter 2*** of this volume.

21.5.5 Medians

Requirements for medians are provided in ***Section 2.2*** of this volume. Where continuous raised medians are not provided, such as on 5-lane sections, refuge areas should be provided at appropriate locations. These locations are typically near high pedestrian generators such as schools, park entrances, transit stops and parking lots. Refuge Islands must provide a large enough area for several pedestrians at once while at the same time be of sufficient size and spacing as to not create a hazard. For wheelchair accessibility, it is preferable to provide at-grade cuts rather than ramps.

For landscaping in medians see ***Section 21.5.10***.

21.5.6 Horizontal Clearance

Horizontal clearance is the lateral distance from a specified point on the roadway such as the edge of travel lane or face of curb, to a roadside feature or object. Horizontal clearance applies to all highways. Horizontal clearance requirements vary depending on design speed, whether rural or urban with curb, traffic volumes, lane type, and the object or feature.

Rural highways with flush shoulders and highways with curb or curb and gutter where right of way is not restricted have roadsides of sufficient widths to provide clear zones; therefore, horizontal clearance requirements for certain features and objects are based on maintaining a clear zone wide enough to provide the recoverable terrain in ***Table 21.6.*** The procedure for determining required clear zone widths is further described in ***Chapter 4*** of this volume.

In urban areas, horizontal clearance based on clear zone requirements for rural highways should be provided wherever practical. However, urban areas are typically characterized with lower speed, more dense abutting development, closer spaced intersections and accesses to property, higher traffic volumes, more bicyclists and pedestrians, and restricted right of way. In these areas, curb with closed drainage systems are often used to minimize the amount of right of way needed. Highways with curb or curb and gutter in urban areas

where right of way is restricted do not have roadsides of sufficient widths to provide clear zones; therefore, while there are specific horizontal clearance requirements for these highways, they are based on clearances for normal operation and not based on maintaining a clear roadside for errant vehicles. It should be noted that curb has no redirectional capabilities except at speeds less than the lowest design speeds used on the State Highway System. Therefore curb should not be considered effective in shielding a hazard. Curb is not to be used to reduce horizontal clearance requirements.

Crashworthy objects shall meet or exceed the offsets listed in ***Tables 21.2*** through ***Table 21.5*** and objects that are not crashworthy are to be as close to the right of way as practical and no closer than the requirements listed in ***Tables 21.2*** through ***Table 21.5.***

Table 21.2 Horizontal Clearance to Utility Installations

ABOVE GROUND FIXED OBJECTS (Such as Poles)	Shall not be located within the limited access right of way, except as allowed by Department ***Policy No. 000-625-025, Telecommunications Facilities on Limited Access Rights of Way***. Shall not be located in the median. Rural and Urban Flush Shoulders: Not within the clear zone. Install as close as practical to the right of way without aerial encroachments onto private property. Urban Curb or Curb and Gutter: At the R/W line or as close to the R/W line as practical. Must maintain 1.5 ft. clear from face of curb. Placement within sidewalks shall be such that an unobstructed sidewalk width of 4 ft. or more (not including the width of the curb) is provided. See the ***Utility Accommodation Manual, (Topic No. 710-020-001***) for additional information. Note: may be located behind barriers that are justified for other reasons.
BREAKAWAY OBJECTS (Such as Fire Hydrants)	Rural and Urban Flush Shoulders: Locate as close to the right of way as practical. Urban Curb or Curb and Gutter: Locate no less than 1.5 feet from face of curb.

Table 21.3 Horizontal Clearance to Trees

Minimum horizontal clearance for new plantings where the diameter is or is expected to be greater than 4 inches measured 6 inches above the ground shall be:

Rural and Urban Flush Shoulders:
Outside the clear zone.

Urban Curb or Curb and Gutter:
4 ft. from face of outside curb and 6 ft. from edge of inside traffic lane. In areas where the border width or median width are constrained and this criteria cannot be met, this horizontal clearance may be reduced to 1.5 ft. from the face of outside curb and 3 ft. from the edge of the inside traffic lane.

On existing roadways, the minimum horizontal clearance to existing trees where the diameter is or is expected to be greater than 4 inches measured 6 inches above the ground shall be:

Rural and Urban Flush Shoulders:
Outside the clear zone.

Urban Curb or Curb and Gutter:
1.5 ft. from the face of outside curb and 3 ft. from the edge of the inside traffic lane.

Table 21.4 Horizontal Clearance to Drop-off and Canal Hazards

Canals: (See also ***Chapter 4*** of this Volume.)

Rural and Urban Flush Shoulders:

Design Speeds ≧ 50 mph: 60 ft. from the travel lane.

Design Speeds < 50 mph: 50 ft. from the travel lane.

Urban Curb or Curb and Gutter:

40 ft. from the edge of the travel lane.

Drop-offs: (See also ***Chapter 4*** of this Volume.)

Rural and Urban Flush Shoulders:

Treat as roadside slopes in accordance with ***Design Standard 700***.

Urban Curb or Curb and Gutter:

22 ft. from traveled way to the point that is 6 ft. below the hinge point.

Table 21.5 Horizontal Clearance to Other Roadside Obstacles

Minimum horizontal clearance to other roadside obstacles:

Rural and Urban Flush Shoulders:

Outside the clear zone.

Urban Curb or Curb and Gutter:

1.5 ft. from the face of curb.

Note: Horizontal clearance to mailboxes is specified in the construction details contained in the ***Design Standards, Index 532***.

Note: Transit and school bus shelters shall be placed in accordance with ***Rule Chapter 14-20.003, Florida Administrative Code***. Transit bus benches shall be placed in accordance with ***Rule Chapter 14-20.0032, F.A.C.***.

Table 21.6 TDLC Recoverable Terrain

Design Speed (mph)	(feet)
≤ 30	12
35	14
40	16

21.5.7 Intersections

Intersection designs must adequately meet the needs of motorists, transit riders, bicyclists and pedestrians. Large return radii increases the crossing distance for pedestrians while small return radii decreases a vehicle's ability to negotiate the turn. Return radii must balance the needs of the pedestrian and the design vehicle. See ***Figure 21.1***.

21.5.8 Lighting

Lighting requirements are discussed in ***Chapters 2*** and ***7*** of this volume.

21.5.9 Traffic Control

Where traffic volumes are high enough to require traffic signals, they should be placed to allow good progression of traffic from signal to signal. Optimal spacing of signals depends on vehicle operating speeds and signal cycle lengths. At speeds of 35 mph and standard cycle lengths, signals must be at least a fourth of a mile apart. Such spacing is consistent with FDOT's requirements for state highways, and with its recommended minimums for local arterials and collectors.

Where traffic volumes are not high enough to warrant traffic signals, 4-way stop signs and roundabouts should be considered. Four-way stops are considered to have a traffic calming effect and cause minimal delays under light traffic conditions. Roundabouts allow traffic from different directions to share space in the intersection, while signals require traffic to take turns.

Where traffic volumes are high enough to warrant traffic signals but does not require them, roundabouts should also be considered.

If Roundabouts are being considered in a TDLC project, refer to ***Florida Roundabout Guide*** for requirements.

21.5.10 Landscaping

Landscaping on a TDLC project can be provided when a local agency or organization agrees to assume the maintenance of the landscaped area in accordance with all Department requirements. See ***Chapter 9*** of this volume and the ***Florida Highway Landscape Guide*** for landscape requirements.

Landscaping shall not interfere with the visibility of "permitted" outdoor advertising in accordance with ***Rule 14-40*** of the ***Florida Administrative Code***. Landscaping shall provide required sight distances in accordance with the ***Design Standards, Index 546***. Landscaping shall also comply with the horizontal clearance requirements found in ***Section 21.5.6*** of this chapter, and ***Chapters 2***, ***4***, and ***25*** of this volume.

Community Structures placed in the right of way to represent the community are discussed in ***Section 9.4*** of this volume.

21.5.11 Parking

On-street parallel parking is preferred over angled parking on low speed urban streets. Angled parking causes conflicts with cars and bicycles, since drivers have poor visibility when backing out. Parallel parking can provide space for bike lanes, medians and wider sidewalks. The design of parking facilities should be coordinated with local transit agencies. For parking lane widths see ***Table 21.1***.

21.5.12 Alternative Roadway Paving Treatments

Alternative paving treatments such as patterned/textured pavement may be used to accent the roadway in accordance with the ***Standard Specifications***. Architectural pavers, however, shall not be used on the traveled way of the State Highway System. See ***Section 2.1.6.1*** for additional requirements.

21.5.13 Conversion to One-Way Pairs

Converting to one-way pairs is the conversion of 2 two-way corridors to 2 one-way corridors operating in opposite directions. This technique requires a great deal of consideration, planning and public involvement.

Advantages to one-way pairs are increased safety for pedestrians and motorists, increased traffic capacity, retention of on-street parking, and easier signal progression along the corridor. One-way pairs may allow enough space to create bus lanes, more bus stops and improve the safe boarding for transit riders.

Disadvantages to one-way pairs are, motorists are likely to drive faster, transit circulation is less direct, and signal progression for cross streets is difficult to achieve.

21.6 Pedestrian and Bicycle Considerations

21.6.1 Sidewalks

For criteria refer to ***Chapter 2***, ***Section 2.1.4*** and ***Chapter 8*** of this volume.

21.6.2 Crosswalks

Marked crosswalks should be provided at signalized intersections. Marked crosswalks should also be provided at midblock crossing locations that are controlled by traffic signals and pedestrian signals, and school crossing locations that are controlled by guards during school crossing periods.

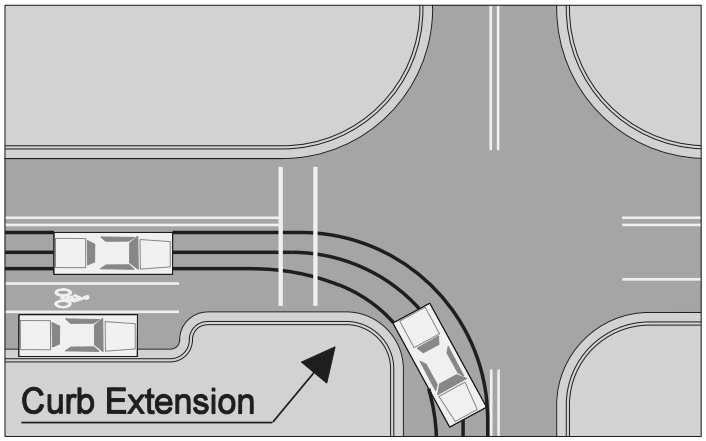
The use of unsignalized midblock crosswalks should be carefully considered. Refer to ***Section 8.3.3*** for further guidance on designing midblock crosswalks.

21.6.3 Curb Extensions (Bulb-Outs)

Curb extensions, sometimes called bulb-outs, may be used at intersections, or at mid-block locations where there is a marked crosswalk, provided there is a parking lane into which the curb may be extended. Curb extensions shorten the crossing distance, and provide additional space at intersections allowing pedestrians to see and be seen before entering a crosswalk. A curb extension is not generally used where there is no parking lane because of potential hazard to bicycle travel. The design must also take into consideration the needs of transit vehicles. See ***Figure 21.1***.

Curb extensions affect drainage. The design must take into consideration runoff, and ponding. When retrofitting existing facilities, drainage structures may be affected.

Figure 21.1 Curb Extension



21.6.4 Personal Security and Safety Amenities

Personal security and safety is promoted by maximizing visibility in and along parking areas, building entrances, transit stops, sidewalks and roadways. This can be provided by the following techniques:

1. Providing lighting.
2. Lowering vegetation heights.
3. Removing hiding places.

Examples for designing safer communities can be found in The National Crime Prevention Council's publication: ***Crime Prevention Through Environmental Design.***

21.6.5 Bicycle Facilities

Refer to ***Chapter 8*** of this volume for design of bicycle facilities.

21.7 Transit-Systems and Amenities

Transit accommodations should be developed in cooperation with the local jurisdictions and transit agencies.

Exhibit 21-A General Techniques

TECHNIQUE	FIHS/SIS		SHS URBAN	SHS RURAL	NON-SHS
	LIMITED ACCESS	CONTROLLED ACCESS			
Improved location, oversized or redundant directional signs	A	A	A	M	M
Use of route markings/ signing for historical and cultural resources	M	A	A	A	A
Increased use of variable message signing	A	A	A	M	M
Landscaping	M	M	M	M	M
Sidewalks or wider sidewalks	N	M	A	M	M
Street furniture	N	M	M	N	M
Bicycle lanes	N	M	M	M	M
Independent Shared Use Paths	N	M	M	M	M
Conversion to one-way street pairs	N	M	M	N	M
Alternative paving materials	N	N	M	N	M
Pedestrian signals, midblock crossings, median refuge areas	N	M	A	M	M
Parking modifications or restoration	N	N	M	N	M
Safety and personal security amenities	M	M	M	M	M
Street mall	N	N	N	N	M

A Appropriate for the system or facility indicated.

M May be appropriate for the system or facility indicated.

N Not appropriate for the system or facility indicated.

Exhibit 21-B Techniques To Reduce Speed Or Traffic Volume

TECHNIQUE	FIHS/SIS		SHS URBAN	SHS RURAL	NON-SHS
	LIMITED ACCESS	CONTROLLED ACCESS			
Lower speed limits	N	N	N	N	N
Increase use of stop or multiway stop signs	N	N	N	N	N
Speed humps	N	N	N	N	M
On-street parking to serve as buffer between travel and pedestrian areas	N	N	M	N	M
Curb bulb-outs at ends of blocks	N	N	M	N	M
Traffic “chokers” oriented to slowing traffic	N	N	N	N	M
“Compact” intersections	N	A	A	A	A
Traffic roundabouts to facilitate intersection movement	N	M	M	M	M
Curvilinear alignment (with redesign, chicanes, winding paths, etc.)	N	N	M	N	M
Street closing or route relocation	N	N	M	N	M

A Appropriate for the system or facility indicated.

M May be appropriate for the system or facility indicated.

N Not appropriate for the system or facility indicated.

Exhibit 21-C Techniques To Support Shifts Between Modes

TECHNIQUE	FIHS/SIS		SHS URBAN	SHS RURAL	NON-SHS
	LIMITED ACCESS	CONTROLLED ACCESS			
Sidewalks	N	M	A	M	M
"Pedestrian friendly" crosswalk design	N	M	A	M	M
Midblock pedestrian signals	N	M	M	M	M
Illuminated pedestrian crossings	N	M	M	M	M
Bicycle lanes/paved shoulders	N	M	A	A	M
Independent Shared Use Path	N	M	M	M	M
"Bicycle friendly" design	N	M	A	A	A
Transit system amenities	N	M	A	M	M
Transit user amenities	N	M	A	M	M
HOV/Exclusive lanes	A	A	A	M	M
Linking modal facilities	A	A	A	A	A
Lower speed limits	N	N	N	N	N
Removal of street parking	N	N	M	M	M

A Appropriate for the system or facility indicated.

M May be appropriate for the system or facility indicated.

N Not appropriate for the system or facility indicated.

Exhibit 21-D Area-Wide Techniques

TECHNIQUE	FIHS/SIS		SHS URBAN	SHS RURAL	NON-SHS
	LIMITED ACCESS	CONTROLLED ACCESS			
Design the street network with multiple connections and relatively direct routes	N	N	N	N	M
Space through-streets no more than a half mile apart.	N	N	N	N	M
Use traffic calming measures	N	M	M	N	M
Limit local speed to 20 mph	N	N	N	N	M
Limit lanes	M	M	M	M	M
Align streets to give buildings “energy-efficient” orientations	N	N	M	N	M
Avoid using traffic signals wherever possible. Space them for good traffic progression	N	A	A	A	A
Incorporate pedestrian and bicyclist design features	N	A	A	A	A
Incorporate “transit-oriented” design	A	A	A	A	A
Use car pooling, flex-time and telecommuting	A	A	A	A	A
Design attractive “greenway” corridors	A	A	A	A	A
Design attractive storm water facilities	A	A	A	A	A

A Appropriate for the system or facility indicated.

M May be appropriate for the system or facility indicated.

N Not appropriate for the system or facility indicated.