MEETING MINUTES

1. David O'Hagan (Committee Chairperson / Florida Department of Transportation (FDOT) State Roadway Design Engineer) opened the meeting at 8:30 am. He stated this meeting was being held under the Sunshine Law and minutes were being taken. David stated that a change to the **Agenda** in which he would like to discuss Stimulus Projects at 11:15am for 15 minutes. David also suggested that due to the teleconference format of this meeting, attendees put their microphones on mute when not speaking and keep interruptions to a minimum.

2. The **Sign-In Sheet** was passed around in Central Office and meeting attendees introduced themselves. Each District Office hosted a teleconference line, and district attendees introduced themselves as well. ***{Teleconference attendees were added to the sign-in sheet}***.

3. David O'Hagan discussed the **Committee Member Changes** (since last meeting). The committee took a moment to recognize the contributions of Chuck Meister (District 3), Forrest Banks (District 1), and Jim Davis (District 4), who were retiring from the committee. Certificates were presented to these members for their years of service. The position left vacant by Forrest Banks was filled by Andy Tilton (Johnson Engineering) as the Consultant Member from District 1. The District 3 Urban Area and the District 4 Rural Area positions remain vacant. ***{The District 3 vacancy has since been filled by Keith Bryant of Bay County, and the District 4 vacancy has since been filled by Chris Mora of Indian River County}*.** Dwayne Kile left FDOT in District 7, and Ron Chin became the District Design Engineer.

4. David O'Hagan said that everybody should have received a **Meeting Package**. He then asked that everybody turn to and review the **2008 Meeting Minutes**. The minutes were reviewed with no comments, and all were in favor to accept the minutes as written.

5. Rob Quigley (FDOT Roadway Design) discussed Florida Greenbook ownership, FDOT's role and the committee's role and responsibilities. Rob also noted that active committee participation is essential and asked that each member participate in at least one subcommittee. Rob stated that participation is also measured by meeting attendance and that although attendance at every meeting is preferred, members that could not attend at least one annual meeting every three years would be questioned on whether or not they were able to remain on the committee.

6. Rob Quigley gave a brief overview of the **Rulemaking Process** in general and for the 2007 Florida Greenbook, which was effective October 16, 2007. Edits to the Greenbook for this meeting will be for the 2010 manual.

7. Rob Quigley briefly discussed the **Sunshine Law** and what is required during annual meetings and subcommittee meetings. These requirements were outlined in the **2006 Meeting Minutes**.

8. Rob Quigley reviewed some previously discussed changes to **Chapter 3 – Geometric Design**. The term "raised medians" was added to the note below Table 3-11 with no comments.

9. Bernie Masing (FDOT District 1) reviewed some previously discussed changes on Intersection Lighting in **Chapter 6 - Lighting**, of the Greenbook. The revisions were approved with changes.

10. Allen Schrumpf (DRMP, Inc) reviewed some previously discussed changes to **Chapter 11 - Work Zone Safety**. Many of these changes were made for consistency with the MUTCD, Part 6. The revisions in Chapter 11 were approved with changes.

11. Chester Henson (FDOT Roadway Design) summarized some proposed changes to the DRAFT Signing and Marking chapter **(Chapter 18)**. Changes were made to bring this chapter into compliance with the requirements of the MUTCD. The revisions to the Chapter 18 DRAFT were approved with changes. For more information on these issues, contact **Chester Henson.**

12. ***Morning Break***

13. Billy Hattaway (Vanasse, Hangen, Brustlin, Inc.) discussed the subcommittee progress and the latest changes to the DRAFT **Traditional Neighborhood Development (TND) Chapter** (Chapter 19). The changes were reviewed and many comments were made at the meeting and the discussion continued after lunch. Due to time constraints, the committee agreed that the future meetings needed to be held to discuss this chapter. Rob Quigley agreed to work with Billy to set up these meetings. Any other comments on the proposed chapter should be forwarded to chapter author **Billy Hattaway**. ***{Two follow up meetings were conducted on April 9, 2009 and April 21, 2009. These meetings resulted in the need for the chapter to be reorganized and rewritten. Additionally, the committee agreed that the portions of the chapter dealing with "best practices" (and other general TND guidelines) be removed from the chapter and developed into a TND "handbook" which could be posted on the Florida Greenbook web page.}***

14. David O'Hagan gave a presentation on stimulus fund (ARRA) projects. Some suggestions included adding some of the language from the AASHTO Roadside Design Guide into Chapter 4 of the Florida Greenbook, and that the committee consider the incorporation of criteria for Resurfacing, Restoration and Rehabilitation (RRR) projects. Some of this information is found in Chapter 10 - Maintenance. A question was asked regarding the requirements for connecting sidewalks to streets on resurfacing type projects. It was noted that cities and counties had some level of ADA and Federal compliance to be fulfilled on these types of projects and that the requirement for curb ramps on resurfacing projects is based on case law. The case law referenced was the **Yerusalem case in Pennsylvania (US Court of Appeals Case: 93-1168)**.

15. Joe Santos (FDOT Safety Office) gave an update on the **Strategic Highway Safety Plan (SHSP)**. He discussed the plan, the priority areas, and the Safety Program Tracking page: **http://www2.dot.state.fl.us/safetyprogramtracking/.** Florida crash data is shared with the District offices and can be passed on to local agencies as well. For more information on these issues, please contact **Joe Santos**.

16. ***Lunch Break (11:45am – 1:00pm)***

17. Jim Mills (FDOT Roadway Design) gave an update on the proposed **AASHTO Highway Safety Manual (HSM)**. This manual will give Designers more tools and processes for evaluating the safety impacts of a roadway improvement. The committee asked that the following web link be included in the minutes:
http://www.highwaysafetymanual.org/Pages/default.aspx.
For more information on these issues, please contact **Jim Mills**.

18. Mary Anne Koos (FDOT Roadway Design) gave a presentation on **US Bicycle Routes**. She discussed some of the routes and showed some of the maps that were proposed throughout Florida. There was a question as to whether this was endorsed by AASHTO. ***{In 2003, AASHTO passed a resolution to establish and extend US bicycle routes. See the following web link: http://design.transportation.org/Documents/Sullivan,UpdateBikeRoutesAASHTOFactSheet.pdf}***

19. Mary Anne Koos gave another presentation on recent changes to the FDOT Plans Preparation Manual (PPM) regarding **bicycle facilities**. Changes were made in the PPM to the Glossary, and Chapters 2, 8, 10 and 25 regarding bicycle and pedestrian facilities. She also mentioned the new **urban area buffer maps** which are now available online. These maps are referenced in the **FDOT PPM.** For more information on these issues, please contact **Mary Anne Koos**.

20. Chester Henson gave a presentation on some changes to **Chapter 7** (Traffic and ITS Design) of the PPM. He discussed some changes to the FDOT Mast Arm Policy and how the coastline boundaries were determined. He additionally discussed the new FDOT audible-vibratory marking requirements. For more information on these issues, contact **Chester Henson.**

21. Jim Mills discussed the preliminary draft of the **Horizontal Clearance** section of Chapter 3. These changes are intended to rewrite the current section on roadside clear zone. The committee gave some comments and agreed with the general concept of the proposed language, however the committee felt that the proposed changes go through the chapter subcommittee.

22. Joy Puerta (City of Boca Raton) discussed some proposed changes to **Chapter 8 – Pedestrian Facilities** of the Florida Greenbook. There was some discussion as to whether sidewalks are required along local roads. The committee discussed on the proposed changes, and provided comments. The committee felt the proposed changes needed work and suggested changes will go back through subcommittee review.

23. ***Due to time constraints, the agenda item for Updating Chapter 4 and Other Chapters was postponed until the 2010 meeting.***

24. Committee Member Issues

    a. George Webb mentioned the possibility of discussing of the Florida Greenbook at the Florida Association of County Engineers (FACERS) meeting June 23-June 26, 2009 at Marco Island.

    b. Chuck Meister asked to remain a participant as an associate member. The committee approved of this.

    c. The GoToMeeting/Teleconference format of this meeting was discussed, and many participants felt this format was not as effective as meeting in person. Many also stated they would be willing to travel to a meeting in a central location.

25. Rob Quigley asked the committee to review their **Member Information** and provide updates. Updated Member Info is posted on the Florida Greenbook Web Page **http://www.dot.state.fl.us/rddesign/FloridaGreenbook/FGB.htm**.

26. **Subcommittee Membership** was briefly reviewed and updated. Updated Subcommittee Membership information is posted on the Florida Greenbook Web Page: **http://www.dot.state.fl.us/rddesign/FloridaGreenbook/FGB.htm**.

27. Meeting critique: Improvements were discussed for the next meeting. Suggestions included having the meeting as a videoconference, but most preferred an in-person meeting. It was noted that there was approximately 75% participation at this meeting.

28. Meeting adjourned at 4:40pm.

Florida Greenbook Advisory Committee Meeting

March 10, 2009

Attendee Sign In

#	Name	Representing	E-mail (if not on committee)
1	ROB QUIGLEY	CO ROADWAY DESIGN	
2	Jim Mills	CO Roadway Design	
3	Mary Lou Woos	"	
4	Chester Henson	CO Roadway Design	
5	JOE SANTOS	CO SAFETY	
6	Jeremy Fletcher	CO ROADWAY	
7	DAVID O'Hara	" "	
8	BILLY HATTAWAY	VHB	bhattaway@vhb.com
9	Duane Braftigam	DOT Specs & Estimates	
10	Rick Hall	HPE, Inc.	
11	Gail Holley	CO Traffic Engr Ops	
12	Amy Datz	CO/Transit	
13	Dennis Scott	CO Safety	
14			
15	Continued on next page for teleconference attendees.		
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Florida Greenbook Advisory Committee Meeting
March 10, 2009
Teleconference Attendee Sign In

#	Name	Representing	E-mail (if not on committee)
1			
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13	***See Attached sign-in sheet for Central Office attendees.*		
14	Bernie Masing	FDOT Dist. 1 DDE	
15	Andy Tilton	Johnson Engineering	
16	Steven Neff	City of Cape Coral	
17	Allen Schrumpf	DRMP, Inc.	
18	Jimmy Pitman	FDOT Dist. 2 DDE	
19	David Cerlanek	Alachua County	
20	Kenneth Dudley	Taylor County	
21	Gene Howerton	Arcadis U.S., Inc.	
22	Scott Golden	FDOT Dist. 3 DDE	
23	Chuck Meister	City of Destin	
24	Howard Webb	FDOT Dist. 4 DDE	
25	George Webb	Palm Beach County	

Florida Greenbook Advisory Committee Meeting
March 10, 2009

Teleconference Attendee Sign In (Continued)

#	Name	Representing	E-mail (if not on committee)
26	Joy Puerta	City of Boca Raton	
27	David Kuhlman	Florida Power and Light	
28	Jim Davis	Indian River County	
29	Annette Brennan	FDOT Dist 5 DDE	
30	Charles Ramdatt	City of Orlando	
31	Fred Schneider	FACERS Rep, Lake County	
32	Harold Desdunes	FDOT Dist 6, DDE	
33	Andres Garganta	Consul-Tech Transportation, Inc.	
34	Gaspar Miranda	Miami-Dade County	
35	Elyrosa Estevez	City of Miami	
36	Chris Tavella	FDOT Dist 6, Senior Designer	
37	Ron Chin	FDOT Dist. 7 DDE	
38	Jim Burnside	City of Tampa	
39	Richard Diaz, Jr.	Diaz, Pearson & Associates, Inc.	

March 10, 2009

Florida Greenbook Advisory Committee Meeting

Meeting Review Package

Agenda

REVISED AGENDA

FLORIDA GREENBOOK ADVISORY COMMITTEE MEETING

Tuesday, March 10, 2009 8:3000am – 3:305:00pm

Florida Department of Transportation
Haydon Burns Building
Suwannee Room
605 Suwannee Street
Tallahassee, Florida 32399-0450
(and other various locations around the state – see next page)

8:30 – 8:45	General Information (15min)	(Review Package Page#)
	• Introductions (David O'Hagan)	
	• Committee Member Changes (David O'Hagan)	(9)
	• Review March 2008 Meeting Minutes (David O'Hagan)	(13)
	• Discuss Florida Greenbook Ownership (Rob Quigley)	
	• Rulemaking Process (Rob Quigley)	
	• Sunshine Law (Rob Quigley)	(19)
8:45 – 10:00	Review of previously discussed changes (recommended by Committee) (75min)	
	• Chapter 3 - Medians (Rob Quigley - 5min)	(27)
	• Chapter 6 - Lighting (Bernie Masing - 10min)	(28)
	• Chapter 11 - Work Zone Safety – Chapter Update (Allen Schrumpf - 30min)	(29)
	• Chapter 18-Signing&Marking Chapter Update (G. Holley/C. Henson-30min)	(41)
10:00 – 10:15	***Morning Break (15min)***	
10:15 – 11:15	Review of previously discussed changes (continued) (60min)	
	• Traditional Neighborhood Development (TND) Chapter Subcommittee Update (Billy Hattaway) (60min)	(49)
11:15 – 11:30	**Stimulus Projects** (David O'Hagan) (15min)	
11:30 – 11:45	Strategic Highway Safety Plan (Marianne Trussell/Joe Santos) (15min)	
11:45 – 1:00	***Lunch (1.25 hrs)***	
1:00 – 2:00	Design Issues (60min)	
	• Highway Safety Manual Update (Jim Mills - 10min)	(99)
	• US Bicycle Routes (Mary Anne Koos - 10min)	(101)
	• Changes to PPM regarding Bicycle Facilities (Mary Anne Koos - 25min)	(103)
	• Signing, Marking & Signalization Issues (Chester Henson - 15min)	(121)
2:00 – 2:30	Issues Still needing to go through Subcommittee Review (30min)	
	• Horizontal Clearance - Chapter 3 preliminary DRAFT (Jim Mills - 10min)	(127)
	• Proposed Edits to Chapters 8 (Joy Puerta - 15min)	(133)
	• Chapter 4 and other chapters (Plan to update) (Rob Quigley - 5min)	
2:30 – 2:45	***Afternoon Break (15min)***	
2:45 – 3:15	Committee Member Issues (Committee - 30min)	
3:15 – 3:30	Closing Items (Rob Quigley - 15min)	
	• Review Contact Information / Update Subcommittee Assignments	(149)
	• Meeting Critique	

Note: Time slots are tentative. Any other information provided at the meeting will be posted with the Minutes at: http://www.dot.state.fl.us/rddesign/FloridaGreenbook/FGB.shtm

FLORIDA GREENBOOK ADVISORY COMMITTEE MEETING

Tuesday, March 10, 2009 8:00am – 5:00pm

MEETING LOCATIONS

FDOT District	Meeting Address	Contact Info
Central Office	Florida Department of Transportation Haydon Burns Building Suwannee Room 605 Suwannee Street Tallahassee, Florida 32399-0450	Rob Quigley robert.quigley@dot.state.fl.us (850) 414-4356
District One	Florida Department of Transportation District 1 Headquarters Elizabeth Moore Room 214 801 N. Broadway Street Bartow, Florida 33830-3809	Bernie Masing bernie.masing@dot.state.fl.us (863) 519-2543
District Two	Florida Department of Transportation District 2 Headquarters Jimmy Pitman's Office 1109 South Marion Avenue Lake City, Florida 32025-5874	Jimmy Pitman jimmy.pitman@dot.state.fl.us (386) 961-7583
District Three	Florida Department of Transportation District 3 Headquarters Emergency Operations Center Conf. Room Highway 90 East Chipley, Florida 32428-0607	Scott Golden john.golden@dot.state.fl.us (850) 638-0250
District Four	Florida Department of Transportation District 4 Headquarters Conference Room 2 3400 West Commercial Boulevard Fort Lauderdale, Florida 33309	Howard Webb howard.webb@dot.state.fl.us (954) 777-4439
District Five	Florida Department of Transportation District 5 Headquarters Lake County Room 719 South Woodland Boulevard DeLand, Florida 32720	Annette Brennan annette.brennan@dot.state.fl.us (386) 943-5543
District Six	Florida Department of Transportation District 6 Headquarters Conference Room A 1000 N.W. 111 Avenue Miami, Florida 33172	Harold Desdunes harold.desdunes@dot.state.fl.us (305) 470-5271
District Seven	Florida Department of Transportation District 7 Headquarters Production Conference Room 11201 N. Malcolm McKinley Drive Tampa, Florida 33612-6403	Ron Chin ronald.chin@dot.state.fl.us (813) 975-6030

Committee Member Changes

FLORIDA GREENBOOK ADVISORY COMMITTEE

2008/2009 MEMBERSHIP CHANGES

MEMBERS

DISTRICT 1
This year, **Forrest Banks** retired from his position as Senior Project Manager for Johnson Engineering, Inc. Chuck has been an active member on the committee for 18 years!!!

Andy Tilton of Johnson Engineering has been selected to fill the D-1 non-governmental member position.

DISTRICT 2
The vacant D-2 Urban Area Member position has been filled by **David Cerlanek,** the Assistant Public Works Director / County Engineer for Alachua County.

DISTRICT 3
This year, **Chuck Meister** retired from his position as the City Engineer for the City of Destin. Chuck has been an active member on the committee for 26 years!!! His retirement leaves the D-3 Urban Area Member position VACANT.

DISTRICT 4
This year, **Jim Davis** is retiring from his position as Public Works Director for Indian River County. Jim has been an active member on the committee for 25 years!!! His retirement leaves the D-4 Rural Area Member position VACANT.

DISTRICT 7
Last Year, **Dwayne Kile**, left his position as the D-7 District Design Engineer to become a consultant. The District Design Engineer position was filled by **Ron Chin.**

ASSOCIATE MEMBERS

Billy Hattaway took on a new position with Vanasse Hangen Brustlin, Inc. as the Managing Director of Transportation – Florida.

March 2008 Meeting Minutes

MEETING MINUTES

1. David O'Hagan (Committee Chairperson / Florida Department of Transportation (FDOT) State Roadway Design Engineer) opened the meeting. He stated this meeting was being held under the Sunshine Law and minutes were being taken. David also mentioned the **Sign-In Sheet** was being passed around. David stated that there may be some changes to the **Agenda** depending on when Rick Renna is able to call in, since he was unable to travel to the meeting.

2. The meeting attendees introduced themselves.

3. David O'Hagan discussed **Committee Member Changes** (since last meeting): David Evans was replaced by Gene Howerton as the District 2 non-governmental representative. The vacant District 2 Rural Area position was filled by Kenneth Dudley of Taylor County (leaving only the District 2 Urban Area position vacant). ***{The District 2 vacancy has since been filled by David Cerlanek of Alachua County}***. Larry Kelley became the District 3 Secretary and Scott Golden became the District Design Engineer. David Ponitz was replaced by Charles Ramdatt of Orlando as the District 5 Urban Area member.

4. David O'Hagan said that everybody should have picked up a **Meeting Package**. He then asked that everybody turn to and review the **2007 Meeting Minutes**. One member questioned Item #18 and if the 4' width could be clarified. The committee agreed that it should be clarified to specify that the 4' is for the width of the accessible route. There were no other comments, and all were in favor to accept the minutes as amended.

5. Rob Quigley (FDOT Roadway Design) discussed Florida Greenbook ownership, FDOT's role and the committee's role and responsibilities. Rob also noted that active committee participation is essential and asked that each member participate in at least one subcommittee. Rob stated that participation is also measured by meeting attendance and that although attendance at every meeting is preferred, members that could not attend at least one annual meeting every three years would be questioned on whether or not they were able to remain on the committee.

6. Rob Quigley gave a brief overview of the **Rulemaking Process** in general and for the 2007 Florida Greenbook, which was effective October 16, 2007.

7. Rob Quigley briefly discussed the **Sunshine Law** and what is required during annual meetings and subcommittee meetings. These requirements were outlined in the **2006 Meeting Minutes**.

8. Joe Santos (FDOT Safety Office) gave a presentation on the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (**SAFETEA-LU**) and the Highway Safety Improvement Program. He gave an update on the tools that are in place to analyze Florida roads in an effort to improve safety. Joe also gave a presentation on the **Strategic Highway Safety Plan (SHSP)**. He discussed the plan, the priority areas, and the Safety Program Tracking page: **http://www2.dot.state.fl.us/safetyprogramtracking/** Joe also provided data from a Safety Belt Use study. For more information on these issues, please contact **Joe Santos**.

9. Chester Henson (FDOT Roadway Design) gave a presentation on **Audible and Vibratory Pavement Markings**. He gave examples of different types of markings as well as some recent test placement areas he has been involved in. Chester also discussed the Strategic Highway Safety Plan emphasis area on reducing lane departure crashes. He discussed FDOT's current policy for rumble strips and the proposed policies for audible and vibratory pavement markings. ***{The audible and vibratory pavement marking policy was since adopted and is covered in Roadway Design Bulletin 08-07 / Estimates Bulletin 08-05}.*** For more information on these issues, contact **Chester Henson**.

10. Mark Wilson (FDOT Traffic Operations) discussed the DRAFT Signing and Marking chapter (**Chapter 18**) proposed for inclusion in the next edition of the Florida Greenbook. Some discussion followed and the committee agreed that this chapter should include a link to the referenced MUTCD. The committee also agreed with the sections on advance street name signs, advance warning signs, street name signs, and pavement markings that have been proposed. Several comments were made at the meeting and any other comments on the proposed chapter should be forwarded to chapter author **Chester Henson**. When all comments are incorporated, the next draft of the chapter will be posted online on the Florida Greenbook Web Page for review **(http://www.dot.state.fl.us/rddesign/FloridaGreenbook/FGB.htm),** and the committee will vote on approving the chapter at the 2009 meeting.

11. Jim Harrison (Orange County) discussed the subcommittee progress on the **Traditional Neighborhood Development (TND) Chapter**. A very preliminary draft of the proposed chapter was presented to the committee. Jim stated that the progress is not where they had hoped to be at this point in time, but this draft will be further reviewed with and edited by the subcommittee. Several comments were made at the meeting and any other comments on the proposed chapter should be forwarded to chapter author **Billy Hattaway**.

12. Harrison Higgins (Florida State University) gave a presentation on the proposed **Version 2 of the Accessing Transit Handbook** and discussed the changes. Electronic versions of the current edition are available on the FDOT Transit Web Page: **http://www.dot.state.fl.us/transit/**, and draft handbook will be posted on the Roadway Design Office FTP site (for approximately 2 weeks) once received: **ftp://ftp.dot.state.fl.us/fdot/co/roadway design/Permanent/FGBAC/** For more information on the handbook, or to request a copy, please contact **Amy Datz**.

13. ***Lunch Break***

14. Allen Schrumpf (Dyer, Riddle, Mills, & Precourt, Inc.) gave a presentation on the updates for **Chapter 11 – Work Zone Safety** which the Chapter 11 subcommittee has recommended. After the presentation, the committee reviewed the proposed updates to **Chapter 11**, and most of the comments made were related to existing text in the chapter. Allen said that he and the subcommittee will work on the chapter to address those comments and present their recommendations at the 2009 Committee Meeting.

15. Rob Quigley discussed new requirements for FDOT projects involving **Bridge Demolition**. These requirements ware added to the Department's Plans Preparation Manual and Project Management Handbook in response to Section 1805 of

the SAFETEA-LU Legislation, which requires the Department to make the debris from demolished bridges available to other government agencies for beneficial use. ***{Since the meeting, a Sample Agreement has been added to the Project Management Handbook: http://www.dot.state.fl.us/projectmanagementoffice/PMhandbook/P2_Ch03.pdf}***

16. Jim Mills (FDOT Roadway Design) discussed the preliminary draft of the **Horizontal Clearance** section of Chapter 3. These changes are intended to rewrite the current section on roadside clear zone. The committee gave some comments and agreed with the general concept of the proposed language. The committee asked that the proposed changes be worked out with the Chapter 3 subcommittee and their recommendations can be presented at the 2009 Committee Meeting.

17. Jim Mills discussed the draft recommendations made by Dean Perkins (Statewide ADA Coordinator) for **Chapters 3 and 8**. These proposed changes are based on the draft Public Rights of Way Guidelines. The committee provided some comments and agreed with the general concept of the proposed language however they did not feel that the changes to the new minimum values should be made as requirements (recommendations were acceptable) until the Access Board adopts the new Public Right Of Way Guidelines. The committee asked that the proposed changes be worked out with Dean Perkins the Chapter 3 and 8 subcommittees and their recommendations can be presented at the 2009 Committee Meeting.

18. Fred Schneider (Lake County) had originally brought up **Intersection Lighting** issues but was unable to attend, so Jim Davis (Indian River County) led the discussion. The issue was mainly the need to address spot lighting at rural intersections. The Chapter 6 subcommittee will work on addressing this and their recommendations can be presented at the 2009 Committee Meeting. George Webb (Palm Beach County) had a few other **Issues Related to Lighting** which he handed out and discussed.

19. Rob Quigley brought up a question received regarding **Lane Width**. The committee agreed that this issue should not be addressed in the Florida Greenbook since the project in question was not a new construction project; it is a Resurfacing, Restoration and Rehabilitation (RRR) project which the Florida Greenbook does not specifically address.

20. Gaspar Miranda (Miami-Dade County) gave a presentation discussing his recommendations regarding **Median Width**. This recommendation would allow a raised 10 foot median to be used when design speeds are 40mph or less. The committee agreed to adopt the recommended change.

21. Rick Renna (FDOT Drainage Design) via telephone discussed several current FDOT drainage design issues. The issues discussed included: The Department of Environmental Protection (DEP) Statewide Stormwater Treatment Rule and the Technical Advisory Committee (TAC) established to assist in this rule development (information on this is available on the DEP web page: **http://www.dep.state.fl.us/water/wetlands/erp/rules/sw_swt_rule_dvlpmt.htm**); The proposed Statewide Erosion and Sediment Control Manual for designers and reviewers (available on the FDOT web page: **http://www.dot.state.fl.us/rddesign/dr/Drainage.htm**); A brief update on High Density Polyethylene Pipe (HDPE). Rick also gave a brief

presentation of a recent study regarding the **Impacts of Drainage Inlets on Bicyclists**. For more information on these issues, contact **Rick Renna**.

22. Duane Brautigam (FDOT Specifications and Estimates) gave an update on the Local Agency Program (LAP) and the LAP Specifications for Landscape (580), Earthwork (120), Hot Mix Asphalt (334), and Concrete (344). Duane also discussed some additional guidelines for LAP projects on the State Highway System. The LAP Specifications and Guidelines are available on the Specifications web page: **http://www.dot.state.fl.us/specificationsoffice/.**

23. David O'Hagan had several more items for discussion with the group. He talked about **Section 120.69, Florida Statutes**, and described the Department's authority to enforce the Florida Greenbook. David also described a recent county project issue in which he became involved. Then David mentioned that the FDOT Driveway Handbook is being updated for 2008. A DRAFT is available on the FDOT FTP site (for approximately 2 weeks) at: **ftp://ftp.dot.state.fl.us/fdot/co/roadway%20design/Permanent/FGBAC/**, and the final should be ready mid-2008. Finally, David mentioned that the 2008 FDOT Design Update training would be available on the Design Office web page: **http://wbt.dot.state.fl.us/ois/UT2008/**

24. Open discussion :

    a. Ed Kant (Florida Transportation Technology Transfer Center (T^2)) mentioned that T^2 is developing an "Introduction to the Florida Greenbook" course. He expects the pilot to be a 2.5 day course, and they are looking for volunteers to review and give feedback on the sessions. Anyone interested can contact **Ed Kant**.

    b. Joe Santos mentioned that the SHSP is available online at: **http://www.dot.state.fl.us/safety/StrategicHwySafetyPlan.htm**

    c. Rick Hall (Hall Planning & Engineering) mentioned that some other information related to Traditional Neighborhood Developments could be found on the Congress for New Urbanism webpage: **http://www.cnuflorida.org/.** Also, those interested in a TND workshop can contact **Rick Hall**.

25. Rob Quigley asked the committee to review their **Member Information** and provide updates. **Updated Member Info is posted on the Florida Greenbook Web Page http://www.dot.state.fl.us/rddesign/FloridaGreenbook/FGB.htm**.

26. **Subcommittee Membership** was briefly reviewed and updated as well**. Updated Subcommittee Membership information is posted on the Florida Greenbook Web Page: http://www.dot.state.fl.us/rddesign/FloridaGreenbook/FGB.htm**.

27. Travel Form Reminder. Contact **Rob Quigley** if you have any questions.

28. Meeting critique: Improvements were discussed for the next meeting: Suggestions included having a bit more table space and more elbow room. Other comments included extending future meetings to 1½ days for an agenda this size, and that this meeting was in a good location, but there was no wireless internet connectivity.

29. Meeting adjourned.

Sunshine Law

A Summary of Florida's Government in the Sunshine Law

September 22, 2005

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1. Scope of the Sunshine Law

The Sunshine Law provides public access to governmental proceedings, including meetings of public boards or commissions. § 286.011, Fla. Stat. (2004)

Section 286.011, Florida Statutes, provides that 1) meetings of public boards or commissions must be open to the public, 2) reasonable notice of such meetings must be given; and 3) minutes of the meeting must be taken.

2. Definition of a Meeting

The Sunshine Law does not only apply to formal proceedings by boards and commissions. It applies to any gathering, casual or not, concerning matters upon which *foreseeable action* may be taken by the applicable agency or organization. *See Hough v. Stembridge*, 278 So. 2d 288 (Fla. 3d DCA 1973). Meetings in defiance of the Sunshine Law are those that are "violative of the statute's spirit, intent and purpose." *Id.*

Because the Sunshine Law applies to *any* gathering, formal or casual, concerning matters upon which action may be taken, the statute also applies to discussions over the telephone or communications via computer.

3. Individuals/Organizations Subject to the Sunshine Law

The Sunshine Law applies to any meeting between two or more members of "any board or commission of any state agency or authority or of any agency or authority of any county, municipal corporation, or political subdivision." *See* § 286.011, Fla. Stat. (2004). The courts have stated that it was the Legislature's intent to bind "every board or commission of the state, or of any county or political subdivision over which it has domain and control." *Times Publishing Company v. Williams*, 222 So. 2d 470 (Fla. 2d DCA 1969). All public agencies, including elected and appointed boards or commissions and even collegial bodies, are subject to the statute. The Florida Department of Transportation (the Department) is a public agency and thus falls under the authority of the Sunshine Law.

3(a). Advisory Boards or Committees

Advisory boards or committees appointed by public agencies are subject to the Sunshine Law, even if their recommendations are not acted upon. *See* AGO 82-35, *Town of Palm Beach v. Gradison*, 296 So. 2d 473 (Fla. 1974). A limited exception applies to committees established strictly for fact-finding such as information gathering and reporting.

3(b). Staff Members

The meetings of staff members of a board or commission covered by the Sunshine Law are generally not subject to the Sunshine law. This exception also applies to staff members of advisory boards or committees. *See* § 286.011, Fla. Stat., *Occidental Chemical Co. v. Mayo*, 351 So. 2d 336 (Fla. 1977). However, when a staff member ceases to function in a staff capacity and is appointed to a committee which is delegated authority to make recommendations to a board or official, the staff member loses his or her identity as staff while working on the committee and the Sunshine Law applies to the committee. Thus, it is the nature of the act performed, not the makeup of the committee or the proximity of the act to the final decision which determines whether a committee composed of staff is subject to the Sunshine Law.

3(c). Purchasing or Bid Evaluation Committees

Generally committees appointed by agencies subject to Sunshine Law to consider purchases or bids by contractors are themselves subject to the Sunshine Law. However, meetings involving confidential bid estimates are not subject to the Sunshine Law because the Department's contract award process has been adopted in recognition of Sunshine Law requirements.

4. Notice Requirements

As previously mentioned, meetings covered by the Sunshine Law require that "reasonable notice" be given beforehand. The Attorney General's Office has suggested notice guidelines, which include: 1) the notice should contain the time and place of the meeting and, if available, an agenda, 2) the notice should be prominently displayed in the area in the agency's office set aside for that purpose, 3) emergency sessions should be afforded the most effective notice under the circumstances and 4) effective methods include press releases, phone calls to wire services, and advertising in local newspapers of general circulation.

5. Consequences for Failure to Comply

The consequences for violation of the Sunshine Law vary. There can be criminal penalties if any board or commission member *knowingly* violates the Sunshine Law, including the possibility of a second degree misdemeanor charge (which can include imprisonment and/or a fine). Additional consequences include removal from office, non-criminal penalties such as fines, attorney's fees, and civil actions for injunctive or declaratory relief.

Violation of the Sunshine Law also renders actions taken by boards or commissions invalid. Section 286.011, Florida Statute provides that no resolution, rule, regulation or formal action shall be considered binding except as taken or made at an open meeting.

6. Conclusion

It is advisable to be well acquainted with Florida's Government-in-the-Sunshine Law. The overarching policy behind the law is very simple. Actions should be analyzed in light of the Sunshine Law's spirit and intent to provide the public a right of access to government proceedings.

FLORIDA DEPARTMENT OF TRANSPORTATION
GOVERNMENT IN THE SUNSHINE
September 2005

Caveat: This briefing paper is intended as an overview of the complex legal issues involving Florida's Government in the Sunshine Law, Public Record Law, and Ethics Laws. Readers are cautioned that these laws contain traps for the unwary, which can cause seemingly innocent activities to become a crime. The advice of an attorney should he sought for their application to particular circumstances.

OPEN MEETINGS

All meetings at which public business is discussed or transacted shall be duly noticed and open to the public.[1]

YOU CANNOT:

- Discuss with any other member any item that is under consideration by the authority, except at a duly noticed public meeting

YOU CAN:

- Discuss other matters with other members at any time.
- Discuss authority business with any person who is not a member, except that the person cannot act as a liaison between or among members.

A continuing concern is the sending of e-mail by a member to other members. An e-mail that states factual background material is permissible[2] so long as there is no interaction between or among members. E-mails that solicit comments from other members or that circulate responses from members are prohibited. [3]

Minutes of each meeting must be taken, which must include a record of all voting.[4]

PUBLIC RECORDS

Records of "any board or commission of any state agency or authority of any agency or authority of any county, municipal corporation, or political subdivision," except those that are specifically exempted by statute, are public records and must be available for inspection and copying by any person at a reasonable place and time.[5]

A public record is defined very broadly and includes tape recordings, hand written notes, and information in a computer.[6] All materials made or received in connection with official business regardless of form are to be open for public review unless exempted by the legislature. This includes notes that are intended to be kept as a record or that are circulated or communicated to another.[7] However, notes prepared for personal use are not public records.[8]

Electronic mail comes within the public records law, and any e-mail sent or received relating to official business must be made available to the public if requested. As noted above, the Public Meeting Law prohibits interactive e-mail between or among members relating to official business of the authority.

ETHICS

Certain provisions of the Florida Code of Ethics for Public Officers and Employees, Sections 112.311-112.326, Florida Statutes, apply. It is not the intent of this summary to cover the multifarious aspects of governmental ethics. For more information, visit the Commission of Ethics Website: http://ww.ethics.state.fl.us/ Certain key provisions are summarized below.

- Prohibited actions or conduct:[9] Solicitation or acceptance of gifts or unlawful compensation to influence official action; misuse of public position; or use of information not available to the public generally for personal pecuniary gain for themselves or anyone else. Note: For the gifts that are allowed by the statute,[10] the Governor's Code of Ethics places further restrictions.[11]

- Restricted business and contractual relationships:[12] Certain restrictions and prohibitions apply to members or their relatives.

- Voting Conflicts of Interest:[13] Persons present at a meeting are required to vote, unless the member has a voting conflict of interest, in which case the member may abstain from voting.[14] A voting conflict occurs when the measure being voted on inures to the private gain or loss of the member, a relative, the member's employer, or a client of the member. The member must disclose the conflict prior to participating in discussion or voting on the matter, or if unknown at the time, as soon as possible. The member must file Commission on Ethic's Form 8A[15] with the recording secretary within fifteen days of the vote.

Reference Materials:

Attorney General's Website: http://myfloridalegal.com/sunshine
Government-in-the-Sunshine Manual, First Amendment Foundation, Tallahassee, FL
First Amendment's Website: http://www.floridafaf.org/

ENDNOTES:

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[1] Article 1, Section 24(b), Florida Constitution, and Section 286.011, Florida Statutes (Florida Government in the Sunshine Law), apply to agencies of the state. Sections 343.80-343.89, Florida Statutes, created the Northwest Florida Transportation Corridor Authority as an agency of the state.
[2] Attorney General Opinion 2001-20, March 20, 2001.

[3] Attorney General Informal Opinion, October 31, 2000.
[4] Sections 286.011(2) and 286.012, Florida Statutes.

[5] Article I, Section 24(a), Florida Constitution; Section 119.07, Florida Statutes.
[6] Section 119.011(1), Florida Statutes; Orange County v. Florida Land Co., 450 So. 2d 341 (Fla. 5th DCA 1984).
[7] Shevin v. Byron, Harless, Schaffer, Reid & Assoc., Inc., 379 So. 2d 633 (Fla. 1980).
[8] Times Publishing Co. v. City of St. Petersburg, 558 So. 2d 487 (Fla. 2d DCA 1990).
[9] Section 112.313(7), Florida Statutes.
[10] Sections 112.312(12) and 112.313(2), Florida Statutes.
[11] Governor Bush's Code of Ethics, available at:
http://www.myflorida.com/myflorida/government/policies/ethicscode.html
[12] Sections 112.313(3), (7), and (12), Florida Statutes.
[13] Section 112.3143, Florida Statutes.
[14] Section 286.012, Florida Statutes.
[15] http://www.ethics.state.fl.us/forms/Form8a_2000.PDF.

Review of Previously Discussed Changes

TABLE 3 – 10
MEDIAN WIDTH FOR FREEWAYS
(URBAN AND RURAL)

DESIGN SPEED (MPH)	MINIMUM PERMITTED MEDIAN WIDTH (FEET)
60 and Over	60 **
Under 60	40 *

* Applicable for urban areas ONLY.

** For new construction ONLY.
(40 feet minimum allowed when lanes added to median)

TABLE 3 – 11
MEDIAN WIDTH FOR RURAL HIGHWAYS
(MULTILANE FACILITIES)

DESIGN SPEED (MPH)	MINIMUM WIDTH (FEET)
55 and Over	40
Under 55	22

MEDIAN WIDTH FOR URBAN STREETS

DESIGN SPEED (MPH)	MINIMUM WIDTH (FEET)
50	19.5
45 and LESS	15.5

Paved medians with a minimum width of 10 feet may be used for two-way turn lanes and painted or raised medians when design speeds are 40 mph or less.

E UNIFORMITY OF ILLUMINATION

In order to avoid vision problems due to varying illumination, it is important to maintain illumination uniformity over the roadway. It is recommended the ratio of the average to the minimum initial illumination on the roadway be between 3:1 to 4:1.

A maximum to minimum uniformity ratio of 10:1 should not be exceeded. It is important to allow time for the driver's eye to adjust to lower light levels. The first poles should be located on the side of the incoming traffic approaching the illuminated area. The eye can more quickly adjust to increased or increasing light level. In transition from a lighted to an unlighted portion of the highways, the level should be gradually reduced from the level maintained on the lighted section. This may be accomplished by having the last pole occur on the opposite roadway. The roadway section following lighting termination should be free of hazards or decision points. Lighting should not be terminated before changes in background lighting or roadway geometry, or at the location of traffic control devices. It is also important to ensure color consistency when lighting a highway/pedestrian corridor, as white and yellow conflict with each other.

The use of spot lighting at unsignalized, unlit rural intersections with substantial patterns of nighttime crashes may be an option for consideration. Close coordination between the Engineer of Record and the responsible local governmental agency is essential when utilizing this approach.

CHAPTER 11

WORK ZONE SAFETY

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CHAPTER 11

WORK ZONE SAFETY

A INTRODUCTION

Construction, maintenance, and utility operations produce serious highway safety problems. The changes in normal traffic flow and the unexpected conditions at many work zones provide hazardous situations and serious traffic conflicts. A comprehensive plan for work zone safety is required to minimize the effects of these construction and maintenance operations and management of traffic incidents..~~-~~

B BACKGROUND

Section 316.0745, Florida Statutes, mandates the Department of Transportation compile and publish a manual of traffic control devices for use on the streets and highways of the state. To comply with this statute, the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) has been adopted for use in the state of Florida by Rule 14-15.010, Florida Administrative Code (F.A.C.).

The intent of this chapter is to require conformance to the MUTCD, Part 6.

C. OBJECTIVES

The general objective of a program of work zone safety is to protect workers, pedestrians, ~~transit passengers and facilities,~~ bicyclists, and motorists during construction and maintenance operations. This general objective may be achieved by meeting the following specific objectives:

- Provide adequate advance warning and information regarding upcoming work zones ~~in the traffic stream.~~
- Provide the driver clear directions to understanding the situation he will be facing as he proceeds through or around the work zone
- Reduce the consequences of an out of control vehicle

- Provide safe access and storage for equipment and material
- Promote speedy completion of projects (including thorough cleanup of the site)
- Promote use of the appropriate traffic control and protection devices
- Provide safe passageways for pedestrians through, in, and/or around construction or maintenance work zones, including people with disabilities in accordance with the Americans with Disabilities Act of 1990.

~~Provide adequate advance warning (3 months) to transit agencies of plans, programs and actions that are anticipated to occur on currently operating bus routes.~~

~~(Allen: during the teleconference someone suggested addressing the site distance issue in this section but I did not have any specific wording in my notes. This may be adequately addressed in the 8th bullet in Section D.1.b)~~

DC POLICY

Each highway agency with responsibilities for construction, maintenance, and operation of streets and highways shall develop and maintain a program of work zone safety, as set forth in the MUTCD, (Rule 14-15.010) as published by the Federal Department of Transportation (Federal Highway AdministrationChapter 6A). All State and local governments that receive Federal-aid highway funding shall comply with 23 Code of Federal Regulations (CFR) 630 Subpart J, more commonly know as the Work Zone Safety and Mobility Rule. The provisions of this rule apply to all highway construction projects financed in whole or in part with Federal-aid highway funds.

ED PLANNING OF OPERATIONS

The achievement of work zone safety requires careful and complete planning prior to the initiation of any work project. The planning objective is to develop a complete operational plan which would include consideration of the following:

ED.1 Project Requirements

ED.1.a Type of Operation

Construction and maintenance projects may be classified as routine, emergencytraffic incident management, or special operations.

ED.1.a.1 Routine Operations

Routine operations would involve projects such as mowing, street cleaning, and preventive maintenance operations conducted on a regularly scheduled basis.

ED.1.a.2 Emergency Traffic Incident ManagementOperations

Emergency operationsTraffic Incident operations require prompt,

efficient action to restore the roadway to a safe condition. These include operations such as clearing storm or crash debris, hazardous materials spills, repairing or replacing damaged highway safety components and restoring inoperative traffic control devices.

E~~D~~.1.a.3 Special Operations

Special operations are defined as those projects neither routine nor emergency in nature, but are occasionally required to maintain or upgrade a street or highway. These include any construction, maintenance, utility, or other operation producing a hazard to workers, ~~transit passengers,~~ bicyclists, pedestrians, or motorists.

Any activity involving encroachment upon the highway right of way by workers, equipment, or material storage and transfer shall be subjected to the requirements of work zone safety.

E~~D~~.1.b Nature of Work

The development of the operation plan for work zone safety should include consideration of the following factors:

- Time span required
- Requirements for continuous operation or occupation of the work zone
- Capability of clearing the site during cessation of work activity
- The various construction methods, equipment, and procedures that may be utilized. Evaluation of alternate methods should be undertaken to determine the safest and most efficient procedures
- The necessity for storing equipment or material in the highway right of way
- Operations that may expose workers to hazards from through traffic
- Hazards to out of control vehicles such as excavations or unguarded structures or equipment
- Site conditions that may be confusing or distracting to the driver, ~~transit passengers,~~ pedestrian~~s and~~or bicyclist~~s~~ or produce sight distance problems
- Particular problems associated with night safety~~.~~

- Equipment inspection and preventive maintenance program

ED.1.c Nature of Work Zone

The nature of the work zone and the prevailing traffic conditions should, to a large degree, influence the procedures incorporated into the operation plan for work zone safety. A determination of the normal vehicle speeds and traffic volumes is essential. The distribution of traffic with respect to time (hour, day, etc.) types of traffic, and direction is also important for establishing traffic control procedures. If there is a transit route in the area where work is planned consideration for stopping buses and their passengers boarding or alighting the who need to reconnect to the sidewalk system or bike lanes.

ED.2 Work Scheduling

Proper work scheduling and sequencing of operations will not only promote efficiency, but also improve the safety aspects of construction and maintenance operations. Where feasible, routine operations and special projects should be conducted during periods of low traffic volume to reduce conflicts. Projects that may be carried out concurrently at the same site should be scheduled simultaneously to eliminate successive disruptions of traffic. Major projects that impede or restrict traffic flow should be coordinated and sequenced with similar projects in adjacent areas, to produce a minimum of disruption to orderly traffic flow in the overall highway network. The scheduling of work at a given location should include consideration of traffic generation (including special events), as well as traffic restrictions by work activities on the surrounding highway network. Transit agencies must be notified if it is anticipated that the work will disrupt their operational schedule.

ED.3 Traffic Control and Protection

Plans for traffic control around or through work zones should be developed with safety receiving a high priority. Plans should include protection at work zones when work is in progress and when operations have been halted (such as during the night). Provisions for the protection of work crews, traffic control personnel, bicyclists, pedestrians (in areas of high pedestrian use, construction of temporary facilities should be considered), transit passengers and motorists shall be included in the operation plans. In all cases, the operation plan for traffic control and protection shouldall include provisions for the following:

- Advance warning
- Clear view of work zone
- Roadway delineation
- Regulatory information
- Hazard warning
- Barriers
- Pedestrian and bicyclist safety
- Access for pedestrians, bicyclists and vehicles
- Access to adjacent properties by the public during construction
- Location of construction vehicles and equipment, including access into and out of the work zone
- Night safety (CHAPTER 6 - ROADWAY LIGHTING)
- Personnel training
- Traffic control and protective devices
- Transit Stops – including passenger access and egress

ED.4 Coordination with Others Agencies

To ensure safe and efficient construction and maintenance operations, the operation plan should be developed and executed in cooperation with all interested individuals and agencies including the following:

- Highway agencies
- Police agencies
- Emergency agencies
- Contractors

- Utilities
- Building departments
- Mass transit agencies
- Traffic generators
- Local residents and businesses
- Neighboring jurisdictions
- School Boards

FE WORK ZONE OPERATIONS

Construction and maintenance projects should follow the operation plan and should include:

FE.1 Public Information

All reasonable effort should be made to inform the public of the location, duration, and nature of impending construction of maintenance projects. Transit agencies muststhould be given advanced warningnotice of operations planned so they can be responsible for notifying their passengers.

FE.2 Contracts and Permits

For construction and reconstruction projects, the general work zone layout; traffic control and protection procedures; occupational safety and health requirements; and specific traffic control devices required should be incorporated in the contract plans and specifications.

New utility installations in public rights of way are prohibited unless a permit by the appropriate highway agency is issued. A plan must be in place before any action is taken. Permits for routine maintenance (e.g., deteriorated pole/equipment replacement), minor alterations (e.g., changes in cable, wire, or transformer size), service drops, or emergency work should generally not be required. Any construction by utility companies involving encroachment of the highway right of way by workers, equipment, material storage and transfer, or other hazardous conditions shall be conducted in accordance with the requirements of the MUTCD for work zone safety and the Occupational Safety and Health Administration (OSHA).

FE.3 Inspection and Supervision

A regular program of inspection and supervision of all construction and maintenance projects shall be established and executed.

GF EVALUATION OF PROGRAM

The entire program for work zone safety should be periodically evaluated and revised to provide the safest practicable environment for workers, pedestrians, and motorists during utility. construction, utility and maintenance operations.

CHAPTER 18

SIGNING AND MARKING

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CHAPTER 18

SIGNING AND MARKING

A INTRODUCTION

Signing and pavement markings help improve highway safety by providing guidance information to road users. Both signs and pavement markings should provide sufficient visibility to meet the driver's needs. The design of signs and pavement markings should complement the basic highway design. Designers and engineers should also be aware of the capabilities and needs of senior drivers and consider appropriate measures to better meet their needs and capabilities."

Section CB and CD of this chapter specifically discuss the traffic control devices for both signing and marking that accommodate not only the needs of drivers but also the special needs of senior drivers.

B BACKGROUND

Section 316.0745, Florida Statutes, mandates that the Department of Transportation compile and publish a manual of uniform traffic control devices for use on the streets and highways of the state. To comply with this statute, the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) has been adopted for use in the State of Florida by Rule 14-15.010, Florida Administrative Code (F.A.C.): https://www.flrules.org/gateway/ruleNo.asp?ID=14-15.010 .

All references in this chapter are in conformance towith the MUTCD: http://mutcd.fhwa.dot.gov/.

C SIGNS

C.1 Advance Street Name Signs

The use of advance street name signs provides advance notification to drivers to assist them in making safe roadway decisions. Signs should be used atfor signalized or non-signalized intersections that are classified as a minor arterial or higher, or a cross street that provides access to a traffic generator or possesses other comparable physical or traffic characteristics deemed to be critical or significant.

C.1.a Standards

The word Street, Boulevard, Avenue, etc., may be abbreviated or deleted to conserve sign panel length. However, if confusion would result due to similar street names in the area, this deletion should not be made.

Use of the local name is preferred on the advance street name sign.

When a cross street has a different name on each side of the intersection, both names shall be shown on the advance street name sign with an arrow beside each name to designate direction.

Additional legend such as NEXT SIGNAL or XX FEET may be added to the advance street name sign.

C.1.b Installation

Advance street name guide signs should be installed in advance of the intersection in accordance with the distances shown in “Condition A” of Table 2C-4 of the MUTCD. These distances are to be considered the minimum for a single lane change maneuver and should be measured from the Begin taper point for the longest auxiliary lane designed for the intersection. The degree of traffic congestion and the potential number of lane change maneuvers that may be required should also be considered when determining the advance placement distance.

C.1.c Sign Design

Advance street name signs shall be designed in accordance with Section 2D.~~39~~ of the MUTCD. The lettering for the signs shall be composed of a combination of lower case letters with initial upper case letters.

Letter height should conform to Table 18-1, Design Guidelines for Advance Street Name Signs.

Table 18-1 Design Guidelines for Advance Street Name Signs						
Posted Speed Limit (mph)	Letter Size (inches) Series E ~~(upper case)~~		Letter Size (inches) Series E Modified ~~(upper case)~~		~~Letter Size (inches) Series E Modified (lower case)~~	
	~~Rural~~ Upper	~~Urban~~ Lower	~~Rural~~ Upper	~~Urban~~ Lower	~~Rural~~	~~Urban~~
~~30-35~~ 25 or Less	6	6	N/A	N/A	~~N/A~~	~~N/A~~
~~40-45~~ 30 - 35	N/A	N/A	8	~~8~~6	~~6~~	~~6~~
~~50-55~~ 40 or Greater	N/A	N/A	10.67	8	~~8~~	~~6~~

C.2 Advance Warning Signs

Advance Warning Signs, i.e., Stop Ahead (W3-1), Yield Ahead (W3-2), and Signal Ahead (W3-3) signs, shall be installed on an approach to a primary traffic control device that is not visible for a sufficient distance to permit the driver to respond to the device. The visibility criteria for a traffic control device shall be based on having a continuous view of at least two signal faces for the distance specified in Table 4D-1 of the MUTCD.

Advance Warning Signs may also be used to provide advance notification to give drivers sufficient time to react to the upcoming primary traffic control device even when the visibility to the driver seems satisfactory.

C.3 Overhead Street Name Signs

~~The use of o~~Overhead street name signs with mixed-case lettering should be used ~~is recommended~~ at major intersections as a supplement to post mounted street name signs.

C.3.a Standards

Overhead street name signs shall only be used to identify cross streets, not to identify destinations, such as cities or facilities.

The word Street, Boulevard, Avenue, etc., may be abbreviated or deleted to conserve sign panel length.

~~It is recommended that t~~The border should be eliminated on overhead street name signs to minimize sign panel size.

When a cross street is known by both route number and a local name, use of the local name is preferred.

When a cross street has dual local street name designations, both names may be used on the overhead street name sign.

When a cross street has a different name on each side of the intersection, both names shall be shown on the overhead street name sign. When one sign panel is used, the names shall be separated with a border, with the left name displayed over the right. The display of block numbers is not required when two street names with arrows are provided on a single panel. When two signs are used, they should be installed with one sign panel on the left and one on the right side of the intersection.

Due to the possibility of hurricane strength winds, overhead street name signs should not be installed on span wire.

C.3.b Installation

The location of the overhead street name sign on a signal strain pole and/or mast arm may vary. However, it shall not interfere in any way with the motorist's view of the signal heads. The preferred location is shown in the Department's Design Standards, Index No. 17748. In the case of separate street names on each side of the street, one sign should be placed to the right of the centerline and signal heads and the other to the left side of the centerline and signal heads.

C.3.c Sign Design

On roadways with speeds 40 mph or above, at a minimum the sign panel should be 24 inches in height with length determined by text. At a minimum, 8-inch upper and 6-inch lower case lettering for the street name and 6-inch all upper case lettering for the block numbering text on the second line shall be used. The preferred font is Series E-Modified; however, Series E may be used to accommodate the amount of legend so as not to exceed the 96-inch maximum length.

Where structurally possible, overhead street name signs should be

designed in compliance with the FHWA recommendations for older drivers using a minimum lettering size of 12-inch upper case with 9-inch lower case.

C.4 Internally Illuminated Signs

~~It is recommended that i~~Internally illuminated overhead street names signs ~~are the standard~~ should be used to improve night-time visibility and to benefit older drivers.

Internally illuminated overhead street name signs should have a standardized height of 24-inches and length of 72-inches, with either Series E Modified or Series E font, which may vary to accommodate the amount of text on the panel. In extreme cases, a 96-inch maximum length sign may be used.

Internally illuminated signs shall be on the Florida Department of Transportation's Approved Products List in accordance with Section 316.0745, Florida Statutes.

C.5 Panel Size for Regulatory and Warning Signs

At a minimum, in order to increase visibility, ~~it is recommended to use~~ the Conventional Road size should be used on all regulatory and warning signs. Reference Table 2B-1 for regulatory sign sizes and Table 2C-2 for warning sign sizes in the MUTCD.

D PAVEMENT MARKINGS

D.1 6-inch Pavement Markings

~~It is recommended that~~ 6-inch pavement markings ~~are~~ should be used for all centerline pavement and edge line pavement markings.

D~~C~~.2 Reflective Pavement Markers

In order to provide greater emphasis and increase visibility, ~~it is recommended that~~ reflective (raised) pavement markers (RPM) should be placed at 40-foot spacings along the centerline markings of roadways with speeds 40 mph or greater~~above~~.

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CHAPTER 19

TRADITIONAL NEIGHBORHOOD DEVELOPMENT

TABLES

FIGURES

CHAPTER 19

TRADITIONAL NEIGHBORHOOD DEVELOPMENT

A INTRODUCTION

Florida is a national leader in planning, design and construction of Traditional Neighborhood Development (TND) communities' and in the renovation of downtown neighborhoods and business districts. These represent patterns of development aligned with the state's growth management, smart growth and sprawl containment goals. This approach with its greater focus on pedestrian, bicycle and transit mobility is distinct from Conventional Suburban Development (CSD), comprised largely of subdivision and commercial strip development. The treatment of land use, development patterns, and transportation network necessary for successful TND communities is a major departure from those same elements currently utilized in other Greenbook chapters, which generally apply to CSD communities.

This chapter is intended to provide best practices to facilitate proper design of TND communities. Consequently, the emphasis varies from the rest of the Greenbook where the focus is on establishing minimum standards. To provide a design that accomplishes the goals set out in this chapter, designers will be guided by the context of the built environment established or desired for a portion of the communities, as TND communities rely on a stronger integration of land use and transportation than seen in CSD communities. TND has clearly defined characteristics and design features necessary to achieve the goals for compact and livable development patterns reinforced by a context-sensitive transportation network.

This chapter provides guidance for planning and designing Greenfield (new), Brownfield or urban infill, and redevelopment projects. It also clearly differentiates between CSD and TND communities to maximize the possibility that proper design criteria is used to create well executed TND communities. This is important, as the street geometry, adjacent land use, and other elements must support a higher level of transit, pedestrian and bicycle activity than seen in a CSD.

Differences between Conventional and Traditional Neighborhood Development:

The characteristics of CSD typically include separated land uses, where housing, retail, office and industrial uses are isolated from one another in separate buildings, areas of a development or areas of a community. Housing is usually further separated into neighborhoods, such that apartments, condominiums and other higher density housing are separate from single family housing. Parks, schools, post offices, health facilities, and other community resources are at such a large scale and separated from other

uses to the degree that they can only be reached by motor vehicle.

In CSD, the scale of big box retail, office parks and other commerce can only be sustained in an auto dominant environment since they must have a regional market to succeed. Their site design includes land parcels so large that walking to a given building from the adjacent thoroughfare or other buildings is not practical.

Finally, the roadway system is hierarchal and very much like a plumbing system, where "local" streets with lower traffic volumes feed into "collector" streets with higher levels of traffic, then finally onto the "arterial", where speeds and volumes are typically much higher. Block sizes are large to minimize the number of intersections. This type of roadway network puts essentially all trips onto the arterial with little to no alternate routes for travelers.

Design speeds are rarely less than 35 mph and may be as high as 50 mph. Thus, longer distance through traffic is mixed with shorter trip traffic accessing local services. Higher volume, high speed streets fronted by the walls of subdivisions or surface parking lots of commercial developments result in a built environment that is uncomfortable for and impedes pedestrian, transit and bicycle modes of transportation. See the top of Figure 19-1 below for an illustration of Conventional Suburban Development.

Figure 19-1 Comparison of CSD and TND Communities

(Source: DPZ and Treasure Coast Regional Planning Council)

TND which is illustrated in the bottom of Figure 19-1, in contrast, is very supportive of pedestrian, bicycle and transit modes. Land uses are mixed, with retail, office, civic buildings and residential interwoven throughout the community, and often located in the same buildings. Block sizes are a smaller scale to improve walkability and to create a fine network of streets that accommodate bicyclists and pedestrians, providing a variety of routes for all users.

Multi-family and single family housing are located in close proximity or adjacent to each other and housing of various sizes and prices are mixed into neighborhoods. On-street

parking is favored over surface parking, lots and one way streets are rarely used. Travel speeds for motor vehicles ideally are kept in the range of 20-35 mph. This creates an environment that is safer and more comfortable for pedestrians, bicyclists, and transit users.

Due to the differences in the desired character of the community and the desired goal to create appropriate speeds for pedestrian and bicyclists, there are differences in the design philosophy for TND streets and CSD streets. Ideally, street speeds are kept low through the design of the street, curb extensions, use of on street parking, the creation of enclosure through building and tree placement.

This approach to street design with narrow streets and compact intersections requires designers to pay close attention to the operational needs of transit, fire and rescue, waste collection and delivery trucks. For this reason, early coordination with transit, fire and rescue, waste collection and other stakeholder groups is essential.

More regular encroachment of turning vehicles into opposing lanes will occur at intersections. Therefore, frequency of transit service, traffic volumes and the speeds at those intersections must be considered when designing intersections. For fire and rescue, determination of the importance of that corridor for community access should be determined, e.g. primary or secondary access.

When designing features and streets for TND communities in an infill or redevelopment site, designers needs to understand that they will have to “do the best they can.” In other words flexibility in the approach to design in what is a constrained environment is required. Creativity and careful attention to safety for pedestrians and bicyclists must be balanced with the operational needs for motor vehicles.

Likewise, designers should recognize that where TND streets transition into CSD streets, the design criteria such as intersection sight distance, use of on street parking, and other features should be evaluated to ensure that safety for users is provided. This is due to the higher speeds on most CSD streets.

Finally, it is very important when designing TND communities to ensure that a continuous network is created for pedestrians, bicyclists and transit throughout the community to create higher levels of mobility, that are less dependent on automobile travel.

B PLANNING CRITERIA

Planning for TND communities occurs at several levels, including the region, the city/town, the community, the block, and, finally, the street and building. Planning should be holistic, looking carefully at the relationship between land use, buildings and transportation in an integrated fashion. This approach and the use of form based codes can create development patterns that balance pedestrian, transit and bicycling with motor vehicle modes of transportation. The following sections help to define considerations for developing communities at different scales in order to increase the potential for creating TND patterns.

Planners should determine the applicable regional plans that guide their area. Plans can be generated for or coordinated with the Metropolitan Planning Organization planning process for urbanized areas. Sector planning and comprehensive planning at the city, county and regional level, i.e., any level above that of the individual community, also yield documented regional plans. Regional planning practice varies by jurisdiction; however most plans designate undeveloped land areas as either open space or areas for future growth.

Clear definitions of regional sectors or districts will identify where development is encouraged and discouraged by local and state policy. Only then can regional sectors guide the development and location of community types. Existing comprehensive plans should be reviewed to determine areas for planned future growth.

One example of regional sector definitions can be found in the SmartCode, a model form based code available for use in any region. SmartCode documents define the following regional sectors; also shown in the center of **Figure 19-2.**

O-1 Preserved Open Sector - Permanently set-aside open space, such as park or wilderness area, or lands set aside via easements or land grants. Communities do not occur in O-1.

O-2 Reserved Open Sector - Comprised of lands that are currently open but may be expected to develop at some point in the future, such as land for agriculture or silviculture. Communities do not occur in O-2. O-2 is a temporary designation

G-1 Restricted Growth Sector and **G2 Controlled Growth Sector** - These are undeveloped areas with little existing development at the beginning of the planning period, thus, any development will be new development. The less-intensive G1 Sector is intended for hamlets only and the more-intensive G2 sector, anticipates heavier development. These Sectors might be farmland, forests, or fields at the edge of existing urban development.

G-3 Intended Growth Sector and **G-4 Infill Growth Sector** - G-4 is developed, G-3 is not. Locations for G-1, G-2, and G-3 depend on terrain, thoroughfares and rail lines.

Regardless of the regional comprehensive plan terms and definitions, once the regional sectors/areas are mapped then refined planning is possible at the community level with the designation of community types.

Each community type is made up of transect zones to further define its character. The jurisdiction's existing comprehensive plan should again be reviewed to identify available community type definitions. If none are adopted, the SmartCode offers a set of definitions. As an example, **Figure 19-3,** describes the community types, in order from least to most intensive:

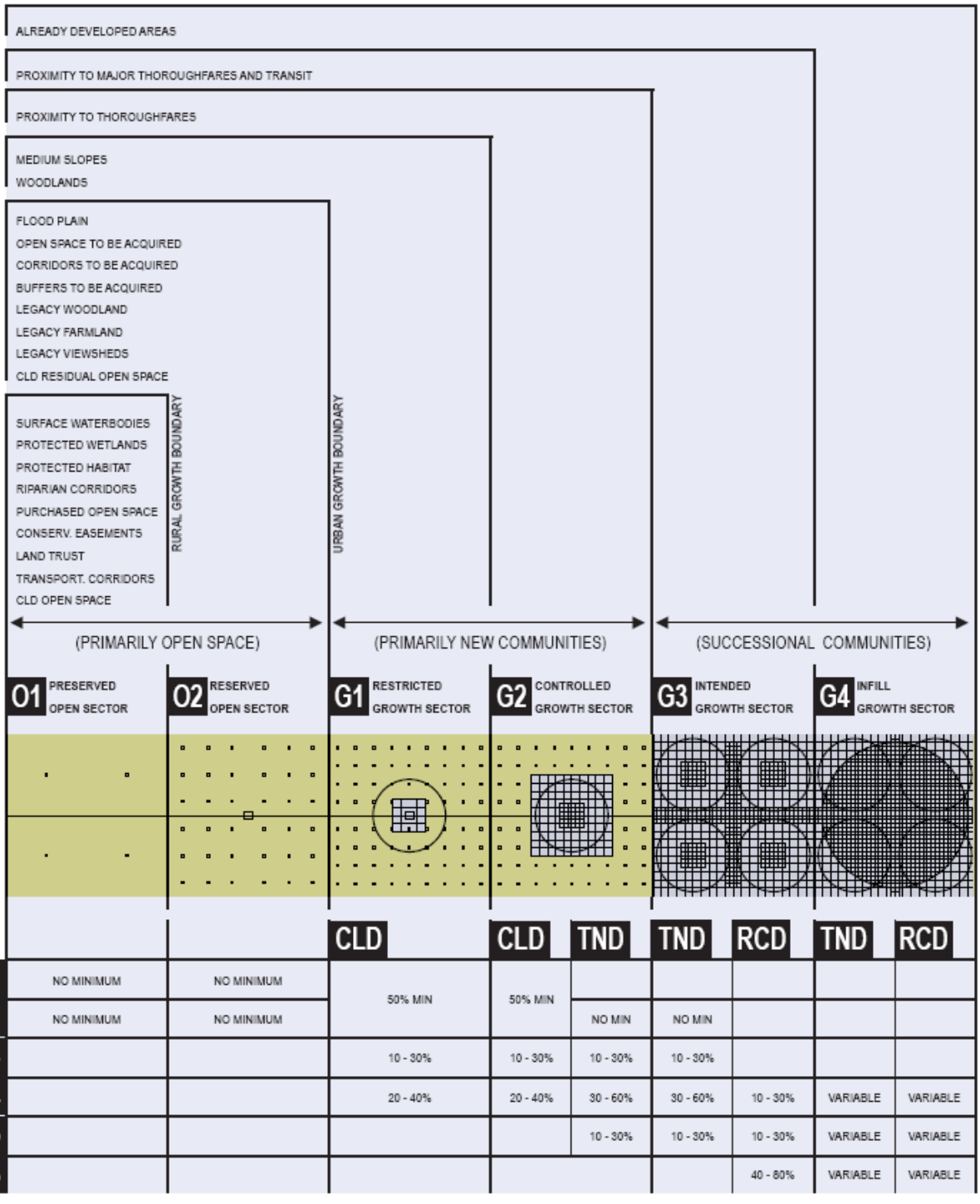
CLD – Clustered Land Development – an incomplete neighborhood standing alone in the countryside. (Syn: hamlet)

TND – Traditional Neighborhood Development –a village or small town composed of one or more neighborhoods (Infill TND occurs in the G-4 Sector)

RCD – Regional Center Development – a large town or part of a city with regionally significant development. (Infill RCD occurs in the G-4 Sector.)

Figure 19-2 Transect Zone Descriptions

(Source SmartCode 9.2)



As noted in the following Community Guiding Principles section, planning for a specific community type focuses the scale of land pattern and the transportation facilities.

The principles for defining or creating the context should be considered based on the scale of the area that is being evaluated, developed, or redeveloped. Regional scale considerations yield the recommended locations of cities and towns in areas where growth is encouraged. Then cities and towns can be planned.

The City/Town – Guiding Principles

- The city should retain its natural infrastructure and visual character derived from its location and climate, including topography, landscape and coastline.
- Growth strategies should encourage infill and redevelopment.
- New development should be structured to reinforce a pattern of neighborhoods and urban centers, with growth and higher density focused at transit nodes rather than along corridors.
- Transportation corridors should be planned and reserved in coordination with land use.
- Green corridors should be encouraged to enhance and connect the urbanized areas.
- The city should include a framework of transit, pedestrian, and bicycle systems that provide alternatives to automobile use.
- A diversity of land use should be distributed throughout the city to enable a variety of economic activity, workplace, residence, recreation and civic activity.
- Affordable and workforce housing should be distributed throughout the city to match job opportunities and to avoid concentrations of poverty.

The Community - Guiding Principles

- Neighborhoods and urban centers with a mix of uses should be the preferred pattern of development; single-use area should be the exception.
- Neighborhoods and urban centers should be compact, bicycle and pedestrian-oriented and mixed-use. Density and intensity of use should relate to the degree of existing or planned transit service.
- The ordinary activities of daily living should occur within walking or bicycling distance within a half mile of most dwellings, allowing independence to those who do not drive.
- Interconnected networks of thoroughfares should be designed to disperse and reduce the length of automobile trips and to encourage transit use, walking and bicycling. A range of open space, including parks, squares and playgrounds, should be distributed within neighborhoods and urban centers.

- Appropriate building densities and land uses should occur within walking or bicycling distance of transit stops.
- Civic, institutional and commercial activity should be embedded in mixed-use urban centers, not isolated in remote single-use complexes.
- Schools should be located to enable children to walk or bicycle to them. Programs such as Florida's Safe Routes to Schools may be referenced for additional information. Note that this program is intended for retrofitting CSD communities and many of the recommendations may not apply to properly designed TND communities.
- Within neighborhoods, a range of housing types and price levels should accommodate diverse ages and incomes.

The Block and the Building - Guiding Principles

- Buildings and landscaping should contribute to the physical definition of thoroughfares as civic places.
- Development should adequately accommodate automobiles, while respecting the pedestrian, bicyclist and transit user in the spatial form of public space.
- The design of streets and buildings should reinforce safe environments, while ensuring access is provided in a way that walking and bicycling are encouraged and that neighborhoods have multiple access points either through streets or pathways.
- Architecture and landscape design should grow from local climate, topography, history, culture and building practice.
- Buildings should allow their inhabitants to experience the geography and climate through energy efficient design with sustainable building and operating practices.
- Civic buildings and public gathering places should be located to reinforce community identity and support self-government.

The following principles are intended to offer guidance on the most appropriate setting for the design principles of this chapter. The principles are not intended to be criteria, but it is recommended that at least the first seven of the principles or their intent be reflected in a project or community plan for it to be considered a TND.

- Has a compact, pedestrian-oriented scale that can be traversed in a five to ten-minute walk from center to edge.
- Is designed with low speed, low volume, interconnected streets with short block lengths that are between 150 to 500 feet and cul-de-sacs only where no alternative exists. Cul-de-sacs, if necessary should have walkway or bicycle connections to other sidewalks and streets to provide connectivity within and to adjacent neighborhoods.

- Orients buildings at the back of sidewalk or close to the street with off-street parking located to the side or back of buildings as not to interfere with pedestrian activity.
- Has building designs that emphasize higher intensities, narrow street frontages, connectivity of sidewalks and paths, and transit stops to promote pedestrian activity and accessibility.
- Incorporates a continuous bike and pedestrian network with wider sidewalks in commercial, civic and core areas, but at a minimum has sidewalks of at least five feet that are on both sides of a street. Accommodates pedestrians with short street crossings, which may include mid-block crossings, bulb-outs, raised crosswalks, specialty pavers, or pavement markings.
- Uses on-street parking adjacent to the sidewalk, to calm traffic, and offer diverse parking options but planned so that it does not obstruct transit operations.
- Varies residential densities, lot sizes, and housing types, while maintaining an average gross density of at least eight dwellings per acre and higher density in the center.
- Integrate in the plan at least ten percent of the developed area for nonresidential uses, civic uses and open spaces.
- Has only the minimum rights of way necessary for the street, median, planting strips, sidewalks, utilities, and maintenance and which are appropriate to adjacent land uses and building types.
- Locates arterial highways, major collector roads, and other high-volume corridors at the edge of the TND, not through the TND.

C CONTEXT

Context is the environment in which the roadway is built and includes the placement and frontage of buildings, adjacent land uses and open space, historic, cultural, and other characteristics that form the built and natural environments of a given place. The "Draft" ITE Recommended Practice: Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities is one of the documents included in the listing of reference material at the end of this chapter. While that document refers to the Transect Zones used in this document as "Context Zones" the zones are in fact the same.

It is essential to describe the urban context in a way that sufficiently informs transportation design. Transportation planners and designers should know the form and scale of urban development to best serve its traveling population. As noted above in the Planning Criteria section, a broader perspective is needed to move beyond the planning and zoning classification of land by use and the transportation classification of travel mode as motor vehicle dominant.

For application in walkable communities, the context through which the thoroughfare passes must be identified. For this document, context can defined at three levels as defined in the Planning Criteria section:

- The Region – by Sector
- The Community – by Community Types
- The Block – by Transect Zones

Rural-Urban Transect

The transect zones within each community type define the human habitats ranging from the very rural to the very urban. All T-Zones allow some mix of uses, from home occupations and civic spaces/buildings allowed in otherwise residential T-3, to the most intense mixed use in T-5 and T-6. The mix of T-zones in a community offers a greater diversity of building types, thoroughfare types, and civic space types than conventional zoning allows, thus, greater walkability follows.

In the least-intensive transect zones of a community, T1 and T2, a rural road or highway is appropriate. Open space outside the community types, whether preserved or reserved, is guided by its regional sector designation, not by a transect zone. All T-Zone designations occur inside community units.

By definition, the urban transect zones T3 through T6 do not exist as standalone zones, but rather are organized in relation to each other within a community. Each transect zone is highly walkable and assumes the pedestrian mode as a viable and often

preferred travel mode, especially for the ¼ mile, five minute walk.

The T-3 Sub-urban zone defines the urban to rural edge. It is therefore potentially misunderstood. Of all the transect zones, T-3 appears most like conventional sprawl. It has single-family dwellings, a limited mix of uses and housing types, and tends to be more automobile-oriented than T4, T5 or T6. To earn its place as a walkable transect zone, it must be located within the same pedestrian shed as T4, T5 and/or T6. The 5 minute test of walkable distance (¼ mile radius) limits the overall size, of a T-3 transect zone. The T3 zone often defines the edge of the more developed urban condition, so is sometimes called neighborhood edge.

Transect zones, T-4 through T-6, are relatively simple to recognize and assign properly.

Knowing that a particular area is a T-5, Town Center, immediately provides known thoroughfare design elements that are appropriate (and ones that are not). Buildings to the sidewalk with parking on street and behind, for instance, are appropriate in T-5 and T-6. Referring to a set of tables and design recommendations correlated to the transect helps the designer determine how a thoroughfare should function in each transect zone.

To further define the transect zones used throughout the document, the transect zones and their related characteristics are listed in Figure 2 below.

Figure 19-3 Transect Zone Descriptions

(Source SmartCode 9.2)

T-1 NATURAL

T-1 Natural Zone consists of lands approximating or reverting to a wilderness condition, including lands unsuitable for settlement due to topography, hydrology or vegetation.

General Character:	Natural landscape with some agricultural use
Building Placement:	Not applicable
Frontage Types:	Not applicable
Typical Building Height:	Not applicable
Type of Civic Space:	Parks, Greenways

T-2 RURAL

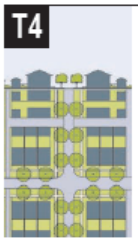
T-2 Rural Zone consists of sparsely settled lands in open or cultivated states. These include woodland, agricultural land, grassland, and irrigable desert. Typical buildings are farmhouses, agricultural buildings, cabins, and villas.

General Character:	Primarily agricultural with woodland & wetland and scattered buildings
Building Placement:	Variable Setbacks
Frontage Types:	Not applicable
Typical Building Height:	1- to 2-Story
Type of Civic Space:	Parks, Greenways

T-3 SUB-URBAN

T-3 Sub-Urban Zone consists of low density residential areas, adjacent to higher zones that some mixed use. Home occupations and outbuildings are allowed. Planting is naturalistic and setbacks are relatively deep. Blocks may be large and the roads irregular to accommodate natural conditions.

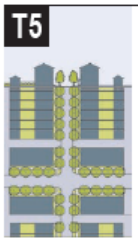
General Character:	Lawns, and landscaped yards surrounding detached single-family houses; pedestrians occasionally
Building Placement:	Large and variable front and side yard Setbacks
Frontage Types:	Porches, fences, naturalistic tree planting
Typical Building Height:	1- to 2-Story with some 3-Story
Type of Civic Space:	Parks, Greenways



T-4 GENERAL URBAN

T-4 General Urban Zone consists of a mixed use but primarily residential urban fabric. It may have a wide range of building types: single, sideyard, and rowhouses. Setbacks and landscaping are variable. Streets with curbs and sidewalks define medium-sized blocks.

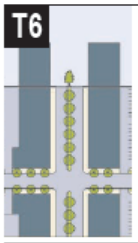
General Character:	Mix of Houses, Townhouses & small Apartment buildings, with scattered Commercial activity; balance between landscape and buildings; presence of pedestrians
Building Placement:	Shallow to medium front and side yard Setbacks
Frontage Types:	Porches, fences, Dooryards
Typical Building Height:	2- to 3-Story with a few taller Mixed Use buildings
Type of Civic Space:	Squares, Greens



T-5 URBAN CENTER

T-5 Urban Center Zone consists of higher density mixed use building that accommodate etail, offices, rowhouses and apartments. It has a tight network of streets, with wide sidewalks, steady street tree planting and buildings set close to the sidewalks.

General Character:	Shops mixed with Townhouses, larger Apartment houses, Offices, workplace, and Civic buildings; predominantly attached buildings; trees within the public right-of-way; substantial pedestrian activit
Building Placement:	Shallow Setbacks or none; buildings oriented to street defining a street wall
Frontage Types:	Stoops, Shopfronts, Galleries
Typical Building Height:	3- to 5-Story with some variation
Type of Civic Space:	Parks, Plazas and Squares, median landscaping



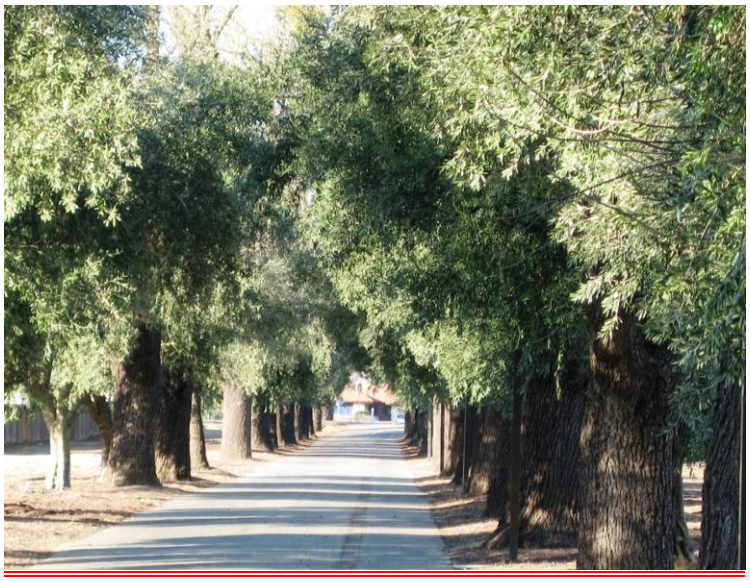
T-6 URBAN CORE

T-6 Urban Core Zone consists of the highest density and height, with the greatest variety of uses, and civic buildings of regional importance. It may have larger blocks; streets have steady street tree planting and buildings are set close to wide sidewalks. Typically only large towns and cities have an Urban Core Zone.

General Character:	Medium to high-Density Mixed Use buildings, entertainment, Civic and cultural uses. Attached buildings forming a continuous street wall; trees within the public right-of-way; highest pedestrian and transit activity
Building Placement:	Shallow Setbacks or none; buildings oriented to street, defining a street wall
Frontage Types:	Stoops, Dooryards, Forecourts, Shopfronts, Galleries, and Arcades
Typical Building Height:	4-plus Story with a few shorter buildings
Type of Civic Space:	Parks, Plazas and Squares; median landscaping

D DEFINITIONS

- **Allee** - A walkway, path or street lined with trees or tall shrubs.



Allee, Davis, CA
(Source: Billy Hattaway)

- **Alley** - a narrow street, especially one through the middle of a block giving access to the rear of lots or buildings.

- **Avenue** (AV) – an avenue is a thoroughfare of high vehicular capacity and low to moderate speed, acting as a short distance connector between urban centers, and usually equipped with a landscaped median.

  It is important to note that many municipalities use the terms, "avenue" and "street" in combination with the thoroughfare name as a way to differentiate streets running north and south from those running east and west. (e.g. 1st Street, 1st Avenue). These are street names, however, not to be confused with thoroughfare types.

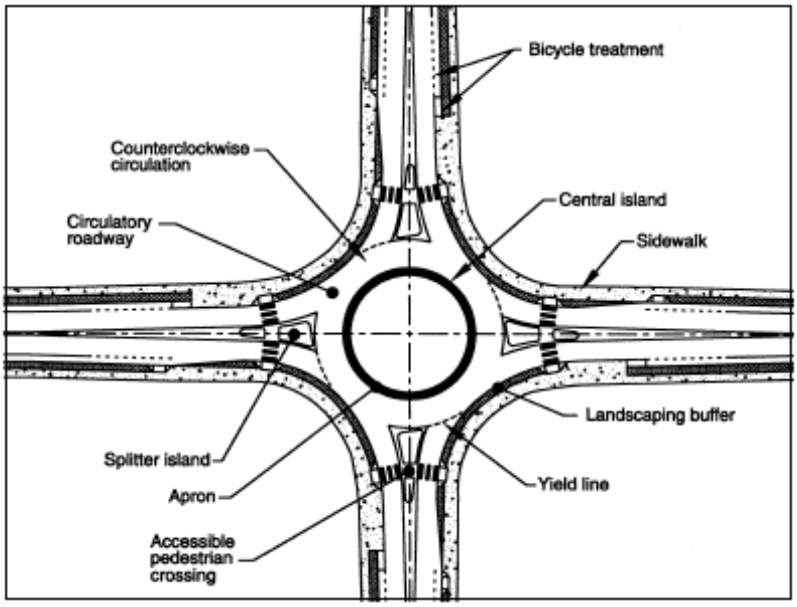
- **Boulevard** – a boulevard is a thoroughfare designed for high vehicular capacity and moderate speed, traversing an urbanized area. Boulevards are usually equipped with slip roads buffering sidewalks and buildings.

- **Context** – the financial, environmental, historical, cultural, land use types, activities and built environment which help to establish the configuration of thoroughfares.

- **Context sensitive solutions** (CSS) - a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total

context within which a transportation improvement project will exist.

- **Design speed** - A selected rate of travel used to determine the various geometric features of the roadway.
- **Drive -** A drive is located along the boundary between an urbanized and a natural condition, usually along a waterfront or park. One side has the urban character of a thoroughfare, with sidewalk and buildings, while the other has the qualities of a road or parkway, with naturalistic planting and rural details.
- **Human scale** - describes buildings, block structure and other aspects of the built environment which are designed in consideration for pedestrians and bicyclists, their rate of travel and other physical needs
- **Liner building** - a building specifically designed to mask a parking lot or a parking garage from the frontage.
- **Live-work** - a dwelling unit that contains a commercial component in the unit.
- **Mixed use development** - the practice of allowing more than one type of use in a building or set of buildings. This can mean some combination of residential, commercial, industrial, office, institutional, or other land uses.
- **Modern roundabout** - a circular intersection with specific design and traffic control features. These features include yield control of all entering traffic, channelized approaches, and appropriate geometric curvature to ensure that travel speeds on the circulatory roadway are typically less than 30 mph.



Modern Roundabout
(Source: FHWA Roundabouts: An Informational Guide)

- **Neighborhood** - an urbanized area at least 40 acres that is primarily residential. A neighborhood shall be based upon a partial or entire standard pedestrian shed.
- **New Urbanism** - a development philosophy based on the principles of traditional neighborhood development designed for the pedestrian, bicyclist and transit, as well as the car; cities and towns should be shaped by physically defined and universally accessible public spaces and community institutions; urban places should be framed by architecture and landscape design that celebrate local history, climate, ecology, and building practice. See the Charter of the New Urbanism for more information. http://www.cnu.org/charter
- **Passage** - a pedestrian connector passing between buildings, providing shortcuts through long blocks and connecting rear parking areas to frontages.
- **Path** - a pedestrian way traversing a park or rural area.
- **Pedestrian shed** - an area, approximately circular, that is centered on a common destination. A pedestrian shed is applied to determine the approximate size of a neighborhood. A standard pedestrian shed is 1/4 mile radius or 1320 feet, about the distance of a five-minute walk at a leisurely pace.

Pedestrian Shed
(Source: Glatting Jackson, Project: Viera)

- **Private frontage** - the privately held area between the right of way line and the building facade.
- **Public frontage** - the area between the curb of the thoroughfare and the right of way line. Elements of the public frontage include the type of curb, sidewalk, planter, street tree and streetlights.
- **Rear alley/Lane** - a vehicular way located to the rear of lots providing access to service areas, parking, and outbuildings and containing utility easements. Rear Lanes may be paved lightly to driveway standards. The streetscape consists of gravel or landscaped edges, has no raised curb, and is drained by percolation.

- **Retail** - premises available for the sale of merchandise and food service.
- **Smart Growth** - an urban planning and transportation theory that concentrates growth in the center of a city to avoid urban sprawl and advocates compact, transit-oriented, walkable, bicycle friendly land use, including mixed use development with a range of housing choices.
- **Road** - a local, slow-movement thoroughfare suitable for more rural transect zones. Roads provide frontage for low-density buildings with a substantial setback. Roads have narrow pavement and open swales drained by percolation, with or without sidewalks. The landscaping may be informal with multiple species arrayed in naturalistic clusters.
- **Setback** - the area of a lot measured from the right of way line to a building facade or elevation.
- **Street** – a local, multi-movement thoroughfare suitable for all urbanized transect zones and all frontages and uses. A street is urban in character, with raised curbs, drainage inlets, wide sidewalks, parallel parking, and trees in individual or continuous planters aligned in an allee. Character may vary somewhat, however, responding to the commercial or residential uses lining the street.

  It is important to note that many municipalities use the terms, “avenue” and “street” in combination with the thoroughfare name as a way to differentiate streets running north and south from those running east and west (e.g. 1st Street, 1st Avenue). These are street names, however, not to be confused with thoroughfare types.
- **Terminated vista** - a building or feature located at the end of a thoroughfare in a position of prominence.

Terminated Vista, Monticello, FL
(Source: Billy Hattaway)

- **Thoroughfare** - a corridor incorporating sidewalks, travel lanes and parking lanes within a right of way.

- **Traditional Neighborhood Development** (TND)- a community unit type structured by a standard Pedestrian Shed oriented towards a common destination consisting of a mixed use center or corridor.

- **Transit-Oriented Development** (TOD)- a regional center development with transit available or proposed. TODs are developments that are moderate to high density, mixed-use, and walkable development designed to facilitate transit and accommodate multiple modes of transportation. TODs generally encompass a radius of ¼ or ½ miles of a transit station, a distance most pedestrians are willing to walk. It incorporates features such as interconnected street networks, bicycle and pedestrian facilities, and street-oriented site design, to encourage transit ridership. This form of development optimizes use of the transit network and maximizes pedestrian accessibility. Successful TOD provides a mix of land uses and densities that create a convenient, interesting and vibrant community.

- **Town center** - the mixed-use center or main commercial corridor of a community. A Town Center in a hamlet or small TND may consist of little more than a meeting hall, corner store, and main civic space.

- **Transect** - a system of ordering human habitats in a range from the most natural to the most urban. The SmartCode is based upon six Transect Zones which describe the physical character of place at any scale, according to the density and intensity of land use and urbanism.

- **Transect Zone (T-Zone)** - Transect Zones are administratively similar to the land use zones in conventional codes, except that in addition to the usual building use, density, height, and setback requirements, other elements of the intended habitat are integrated, including those of the private lot and building and the adjacent public streetscape. The elements are determined by their location on the Transect scale. The T-Zones are: T1 Natural, T2 Rural, T3 Sub-Urban, T4 General Urban, T5 Urban Center, and T6 Urban Core.

- **Yield street -** a thoroughfare that has two-way traffic but only one effective travel lane because of parked cars, necessitating slow movement and driver negotiation.

E LAND USE

In addition to its importance in calculating trip generation, ITE recognizes land use as fundamental to establishing context, design criteria, cross-section elements, and right of way allocation. The pedestrian travel generated by the land uses also is important to the design process for various facilities.

Land use considerations for TNDs are outlined in the Planning Criteria section and are applied at a variety of scales. A well-integrated or "fine grained" land use mix within buildings and blocks is essential. These buildings and blocks aggregate into neighborhoods, which should be designed with a mix of uses to form a comprehensive planning unit that aggregates into larger villages, towns, and regions. Except at the regional scale, each of these scales requires land uses to be designed at a pedestrian scale and to be served by "complete streets" that safely and attractively accommodate many modes of travel.

The proposed land uses, residential densities, building size and placement, proposed parking (on-street and off-street) and circulation, the location and use of open space, and the development phasing are all considerations in facility design for TNDs. ITE recommends a high level of connectivity, short blocks that provide many choices of routes to destinations, and a fine-grained urban land use and lot pattern. Higher residential density and nonresidential intensity, as measured by floor area ratios of building area to site area, are required for well-designed TNDs.

F NETWORKS

Urban network types are frequently characterized as either traditional or conventional. Traditional networks are typically characterized by a relatively non-hierarchical pattern of short blocks and straight streets with a high density of intersections that support all modes of travel in a balanced fashion.

Paris Savannah, GA

Traditional Network

(Source: Great Streets – Alan Jacobs)

The typical conventional street network, in contrast, often includes a framework of widely-spaced arterial roads with limited connectivity provided by a system of large blocks, curving streets and a branching hierarchical pattern, often terminating in cul-de-sacs.

Irvine, CA

Conventional Network

(Source: Great Streets – Alan Jacobs)

Traditional and conventional networks differ in three easily measurable respects: (1) block size, (2) degree of connectivity and (3) degree of curvature. While the last does not significantly impact network performance, block size and connectivity create very different performance characteristics.

Advantages of traditional networks include:

- Distribution of traffic over a network of streets, reducing the need to widen roads;
- A highly interconnected network providing a choice of multiple routes for travel for all modes, including emergency services;
- More direct routes between origin and destination points, which generate fewer vehicle miles of travel (VMT) than conventional suburban networks;
- Smaller block sizes in a network that is highly supportive to pedestrian, bicycle and transit modes of travel;
- A block structure that provides greater flexibility for land use to evolve over time.

It is important in TND networks to have a highly interconnected network of streets with smaller block sizes than in conventional networks. There are several ways to ensure that these goals are achieved. Two of those methods are illustrated here.

One method is based on the physical dimensions used to layout streets and blocks. The following list identifies those parameters:

- Limit block size to an average perimeter of approximately 1,320 feet.
- Encourage average intersection spacing for local streets to be 300-400 feet.
- Limits maximum intersection spacing for local streets to about 600 feet.
- Limits maximum spacing between pedestrian/bicycle connections to about 300 feet (that is, it creates mid-block paths and pedestrian shortcuts).

The Connectivity Index (Reid Ewing, 1996) can be used to quantify how well a roadway network connects destinations. Links are the segments between intersections and intersections are considered to be nodes. Cul-de-sac heads are treated as a node. A higher index means that travelers have increased route choice, providing more connections available for travel between any two locations. The Connectivity Index is calculated by dividing the number of links by the number of nodes. A score of 1.4 is the minimum needed for a walkable community.

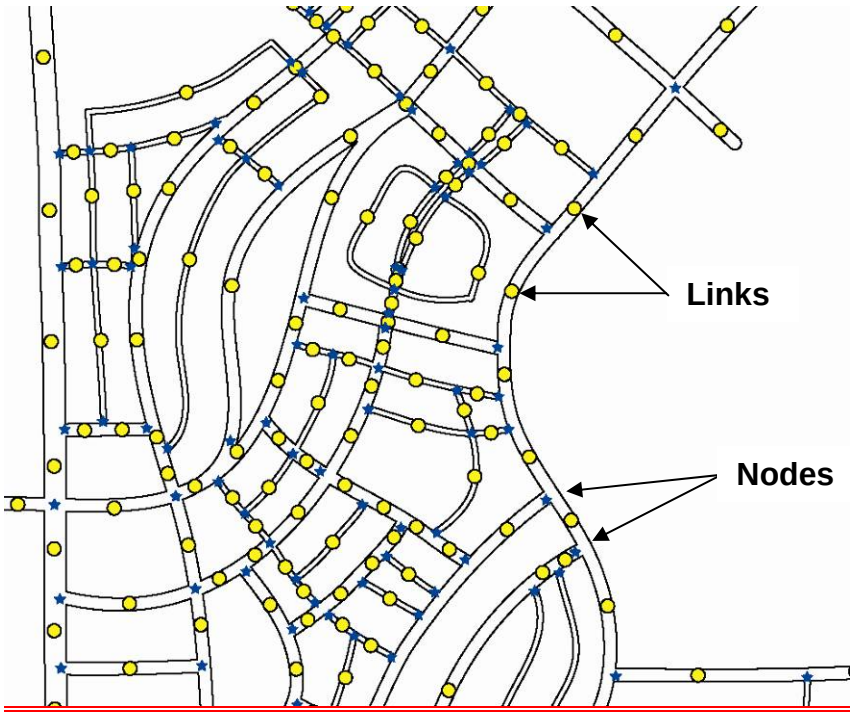
An example illustration on how to calculate a Connectivity Index is included below:

To establish a Connectivity Index, using a map of the network under consideration, first

establish the area to be evaluated. Identify and count the number of intersections, cul-de-sacs and street segments between intersections/cul-de-sacs within the study area.

The Starkey Ranch project, a portion of which is shown below, illustrates the identification of nodes and links. For the entire community, there were a total of 242 road segments, or links, and 146 intersections/cul-de-sacs or nodes identified. The calculation for this community yielded a Connectivity Index of 1.66, which is greater than 1.4, therefore, based on the Connectifity Index, the Starkey Ranch should be considered walkable.

Connectivity Index = 242 Links/146 Nodes = 1.66



Connectivity Index, Odessa, FL
(Source: Glatting Jackson Project: Starkey Ranch)

G THOROUGHFARE TYPES

Section C, Highway Function and Classification in Planning Chapter 1 contains the conventional classification system that is commonly accepted to define the function and operational requirements for roadways. These classifications are also used as the primary basis for geometric design criteria.

Traffic volume, trip characteristics, speed and level of service, and other factors in the functional classification system relate to the mobility of motor vehicles, not bicyclists or pedestrians, and do not consider the context or land use of the surrounding environment. This approach, while appropriate for high speed rural and suburban roadways, does not provide designers with guidance on how to design for a Traditional Neighborhood Development or in a context sensitive manner.

The thoroughfare types described here provide mobility for all modes of transportation with a greater focus on the pedestrian. The functional classification system can be generally applied to the thoroughfare types in this chapter. What designers should recognize is the need for greater flexibility in applying design criteria based more heavily on context and the need to create a safe environment for pedestrians, rather than strictly following the conventional application of functional classification in determining geometric criteria.

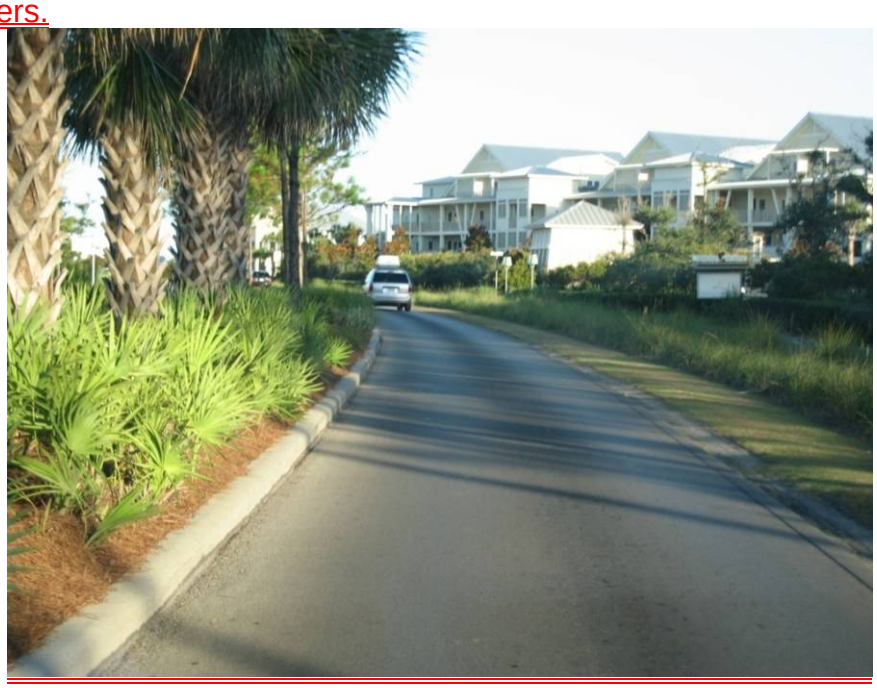
General Principles

- The thoroughfares are intended for use by vehicular, transit, bicycle, and pedestrian traffic and to provide access to lots and open spaces.
- The thoroughfares consist of vehicular lanes and public frontages. The lanes provide the traffic and parking capacity. Thoroughfares consist of vehicular lanes in a variety of widths for parked and for moving vehicles. The public frontages contribute to the character of the transect zone. They may include swales, sidewalks, curbing, planters, bicycle paths and street trees.
- Thoroughfares should be designed in context with the urban form and desired design speed of the transect zones through which they pass. The public frontages that pass from one transect zone to another should be adjusted accordingly.

The terms for thoroughfare types that are used in Traditional Neighborhood Development include:

RD-Road

A road is a local, slow-movement thoroughfare suitable for more rural transect zones. Roads provide frontage for low-density buildings with a substantial setback. Roads have narrow pavement and open swales drained by percolation, with or without sidewalks. The landscaping may be informal with multiple species arrayed in naturalistic clusters.



Road, Santa Rosa Beach, FL

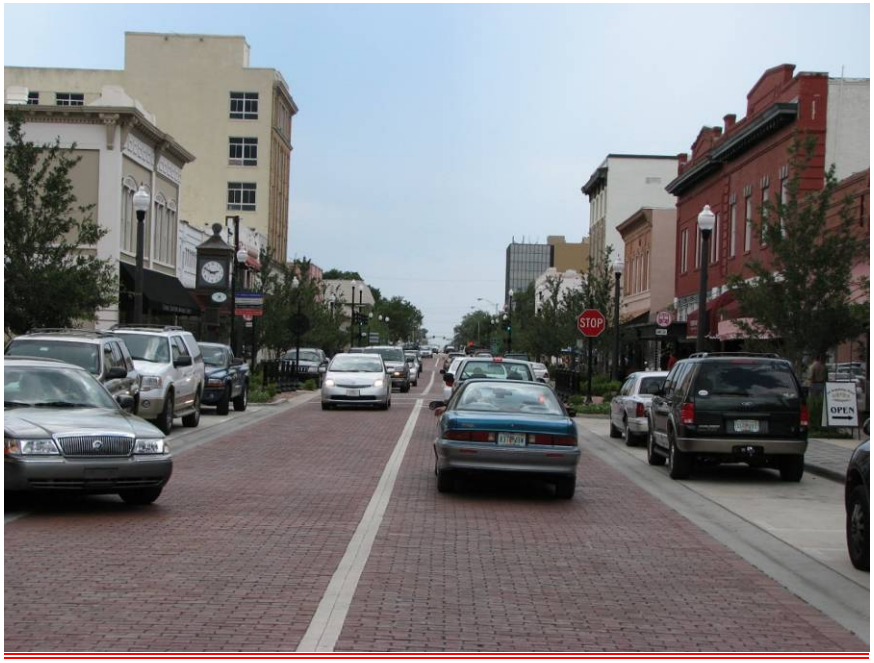
(Source: Cooper, Robertson & Partners Project: Watercolor, Photo - Billy Hattaway)

Since roads are located in more rural transect zones where larger setbacks are created, on street parking is not provided for. Lot size and driveways should be provided to allow for parking on site and should allow for unobstructed sidewalks to allow for pedestrian activity.

ST-Street

A street is a local, multi-movement thoroughfare suitable for all urbanized transect zones and all frontages and uses. A street is urban in character, with raised curbs, drainage inlets, wide sidewalks, parallel parking, and trees in individual or continuous planters aligned in an allee. Character may vary somewhat, however, responding to the commercial or residential uses lining the street.

It is important to note that many municipalities use the terms, "avenue" and "street" in combination with the thoroughfare name as a way to differentiate streets running north and south from those running east and west. (e.g. 1st Street, 1st Avenue)



Street, Sanford, FL

(Source: Glatting Jackson Project, Photo - Billy Hattaway)

DR-Drive

A drive is located along the boundary between an urbanized and a natural condition, usually along a waterfront or park. One side has the urban character of a thoroughfare, with sidewalk and buildings, while the other has the qualities of a road or parkway, with naturalistic planting and rural details.

Drive, Franklin, TN

(Source: DPZ Project: Westhaven, Photo - Billy Hattaway)

AV-Avenue

An avenue is a thoroughfare of high vehicular capacity and low to moderate speed, acting as a short distance connector between urban centers, and usually equipped with a landscaped median.

It is important to note that many municipalities use the terms, "avenue" and "street" in combination with the thoroughfare name as a way to differentiate streets running north and south from those running east and west. (e.g. 1st Street, 1st Avenue)

Avenue, Albany, NY
(Source: Photo – Dan Burden)

BV-Boulevard

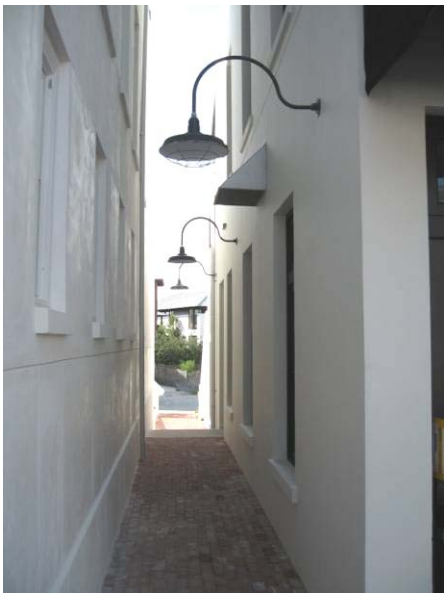
A boulevard is a thoroughfare designed for high vehicular capacity and moderate speed, traversing an urbanized area. Boulevards are usually equipped with side access lanes buffering sidewalks and buildings.

Octavia Boulevard, San Francisco, CA

(Source: Alan Jacobs & Elizabeth McDonald Project, Photo – sfcityscape)

PP-Pedestrian Passage

A pedestrian passage is a narrow connector restricted to pedestrian use and limited vehicular use that passes between buildings or between a building and a public open space. Passages provide shortcuts through long blocks and connect rear parking areas with frontages. In T3, Pedestrian Passages may be unpaved and informally landscaped. In T4, T5 and T6, they should be paved and landscaped and may provide limited vehicular access. When in civic zones, passages should correspond with their context and abutting transect zones.



Pedestrian Passage, Rosemary Beach, FL

(Source: DPZ Project: Rosemary Beach, Photo – Billy Hattaway)

Pedestrian Passage, Franklin, TN

(Source: DPZ Project: Westhaven, Photo – Billy Hattaway)

AL-Alley

An Alley is a narrow vehicular access-way at the rear or side of buildings providing service and parking access, and utility easements. Alleys have no sidewalks, landscaping, or building frontage requirements. They accommodate trucks and dumpsters and may be paved from building face to building face, with drainage by an inverted crown using impervious or pervious pavement. In older residential neighborhoods alleys may be unpaved.

Alley, Franklin, TN

(Source: DPZ Project: Westhaven, Photo – Billy Hattaway)

H DESIGN PRINCIPLES

H.1 Introduction

The principles for designing streets in TND communities are similar in many respects to designing streets for conventional transportation.

- Providing mobility for users
- Creating a safe roadway for users
- Movement of goods
- Providing access to emergency services, transit, waste management , delivery trucks
- Providing access to property
- TND street design principles have a different emphasis in the following manner.
- The basis for selecting criteria and features used in designing TND communities is the transect zone.
- Streets that are created in context with the desired public realm or other contextual elements
- A focus on reducing speed to create a safer and more comfortable environment for pedestrians and bicyclists

This approach to street design with narrow streets and compact intersections requires designers to pay close attention to the operational needs of transit, fire and rescue, waste collection and delivery trucks. For this reason, early coordination with transit, fire and rescue, waste collection and other stakeholder groups is essential.

More regular encroachment of turning vehicles into opposing lanes will occur at intersections. Therefore, frequency of transit service, traffic volumes and the speeds at those intersections must be considered when designing intersections. For fire and rescue, determination of the importance of that corridor for community access should be determined, e.g. primary or secondary access.

When designing features and streets for TND communities in an infill or redevelopment site, designers need to understand that they will have to “do the best they can.” In other words flexibility in the approach to design in what is a constrained environment is required. Creativity and careful attention to safety for pedestrians and bicyclists must be balanced with the operational needs for motor vehicles.

Likewise, designers should recognize that where TND streets transition into CSD streets, the design criteria such as intersection sight distance, use of on street parking, and other features should be evaluated to ensure that safety for users is provided. This is due to the higher speeds on most CSD streets

H.2 Design Process

The design process for TND communities treats streets as an important part of the public realm, which is the totality of spaces used freely on a day-to-day basis by the general public, such as streets, plazas, parks and other public infrastructure. TND balances the mobility of all users, and pays a great deal of attention to the context or transect zone in which the street is located. The process also pays attention to creating a high degree of connectivity and an extensive network of streets.

H.3 Design Speed

The application of design speed for TND communities is philosophically different than for conventional transportation and CSD communities. AASHTO language for design speed recommends that "Every effort should be made to *use as high a design speed as practical.*"

In contrast to this approach, the goal for TND communities is to establish a design speed that creates a safer and more comfortable environment for pedestrians and bicyclists, and is appropriate for the surrounding context. Consequently, if the goal is to have a street posted at 20 mph, designers should use 20 mph as the design speed.

Ideally, street speeds are kept low through the design of the street, narrow lanes, use of on street parking, the creation of enclosure through building and tree placement.

This approach to street design with more narrow streets and intersections requires designers to pay close attention to the operational needs of transit, fire and rescue, waste collection and delivery trucks. For this reason, early coordination with transit, fire and rescue, waste collection and other stakeholder groups is essential.

More regular encroachment of turning vehicles into opposing lanes will occur at intersections. Therefore, frequency of transit service, traffic volumes and the speeds at those intersections must be considered when designing intersections.

For fire and rescue, determination of the importance of that corridor for community access should be determined, e.g. primary or secondary access.

Movement Types

Movement types are used to describe the expected driver experience on a given thoroughfare and the design speed for pedestrian safety and mobility established for each of these movement types. They are also used to establish the components and criteria for design of streets in TND communities.

Yield: Drivers must proceed slowly and with extreme care and must yield in order to pass a parked car or approaching vehicle. This is the functional equivalent of traffic calming. Design speed of less than 20 mph; this type should accommodate bicycle routes through the use of shared lanes.

Slow: Drivers can proceed carefully with an occasional stop to allow a pedestrian to cross or another car to park. Drivers should feel uncomfortable exceeding design speed due to presence of parked cars, enclosure, tight turn radii, and other design elements. Design speed of 20-25 mph; this type should accommodate bicycle routes through the use of shared lanes.

Low: Drivers can expect to travel generally without delay at the design speed; street design supports safe pedestrian movement at the higher design speed. This movement type is appropriate for thoroughfares designed to traverse longer distances or that connect to higher intensity locations. Design speed of 30-35 mph; this type can accommodate bicycle routes.

Design speeds higher than 35 mph should not normally be used in TND communities due to the concerns for pedestrian and bicyclist safety and comfort. There may be locations where planned TND communities border or are divided by existing corridors with posted/design speeds higher than 35 mph. In those locations, coordination with the regulating agency for that corridor should occur with a goal to re-design the corridor to reduce the speed at or below 35 mph. The increase in motorist travel time due to the speed reduction is usually insignificant because TND communities are generally compact.

When the speed reduction cannot be achieved, measures to improve pedestrian safety for those crossing the corridor should be evaluated and installed when appropriate.

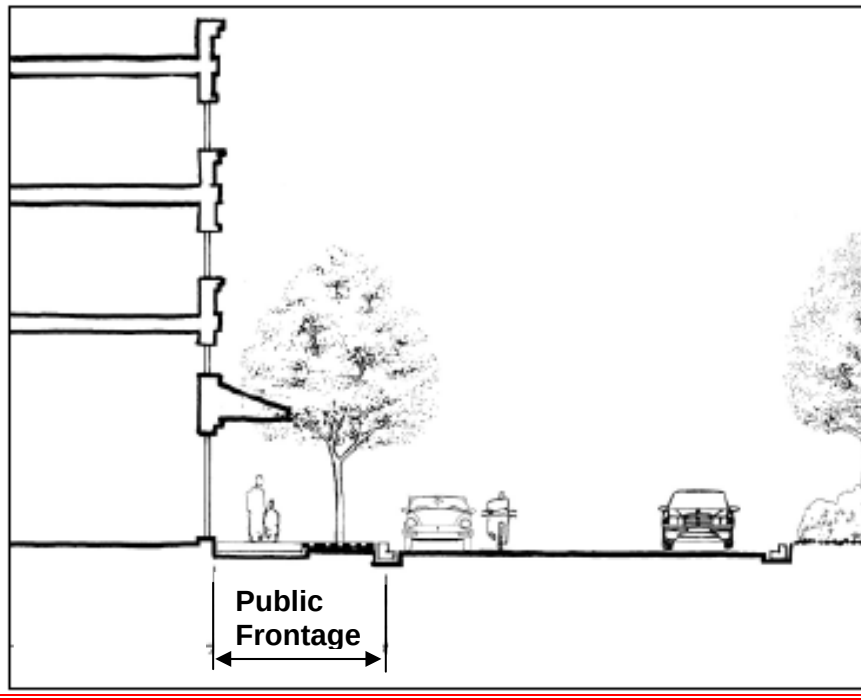
I CROSS SECTION ELEMENTS

I.1 Introduction

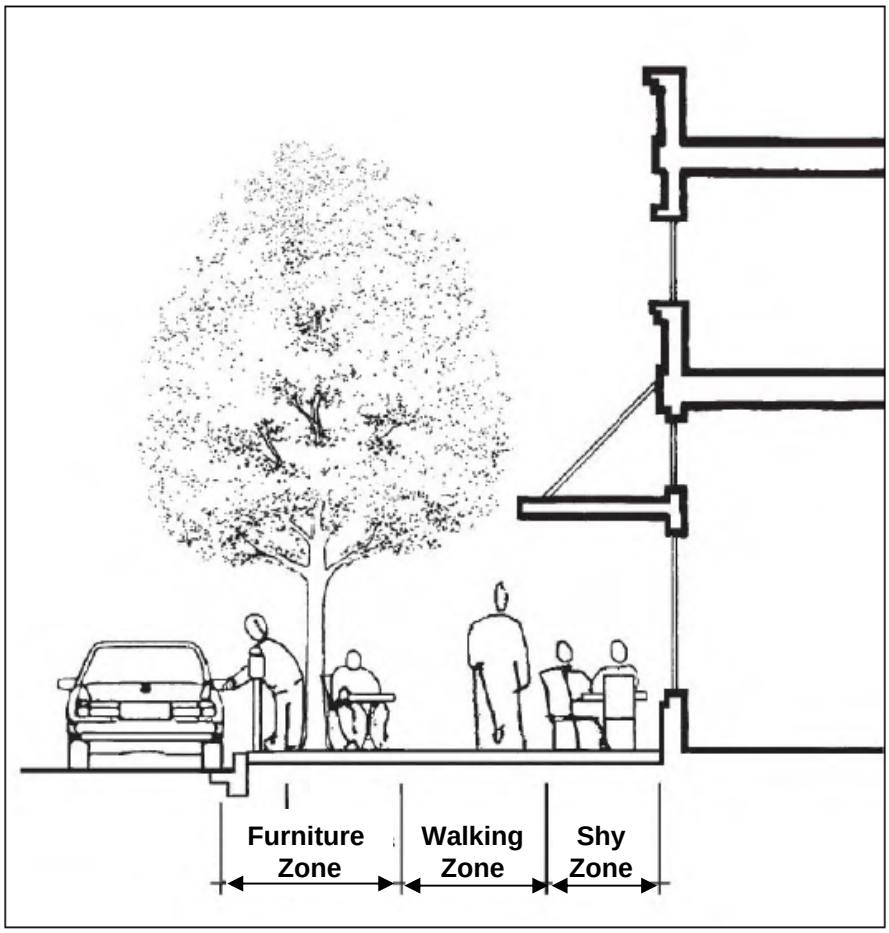
As discussed earlier in the document, TND street design places importance on how the streets are treated since they are part of the public realm. The street portion of the public realm is shaped by the features and cross section elements used in creating the street. For this reason more attention to what features are included; where they are placed and how the cross section elements are assembled is necessary.

I.2 Public Frontage

The area between the face of building or right of way line and the curb face is known as the "public frontage". This is also commonly referred to as the pedestrian realm because it is the place where pedestrian activity is provided for, including space to walk, socialize, places for street furniture, landscaping, and outdoor cafes.



Public Frontage
(Source: Image - Community, Design + Architecture)



Public Frontage Zones
(Source: Image - Community, Design + Architecture)

I.3 Furniture Zone

The furniture zone can be located adjacent to the building face but more commonly is adjacent to the curb face. The furniture zone contains parking meters, lighting, tree planters, benches, trash receptacles, magazine and newspaper racks and other street furniture. The furniture zone is provided separate from the walking/pedestrian zone to keep the walking area clear for pedestrians to walk without obstruction including proper access to transit stops.

I.4 Walking/Pedestrian Zone

Chapter 8 addresses considerations for pedestrians. It is important to keep in mind that the discussion in Chapter 8 is focused on designing for conventional

development patterns with higher design speeds. That is demonstrated by the discussion about providing separation by keeping sidewalks far away from the travel lanes. This approach is appropriate for higher speed corridors where buildings are set back from the roadway.

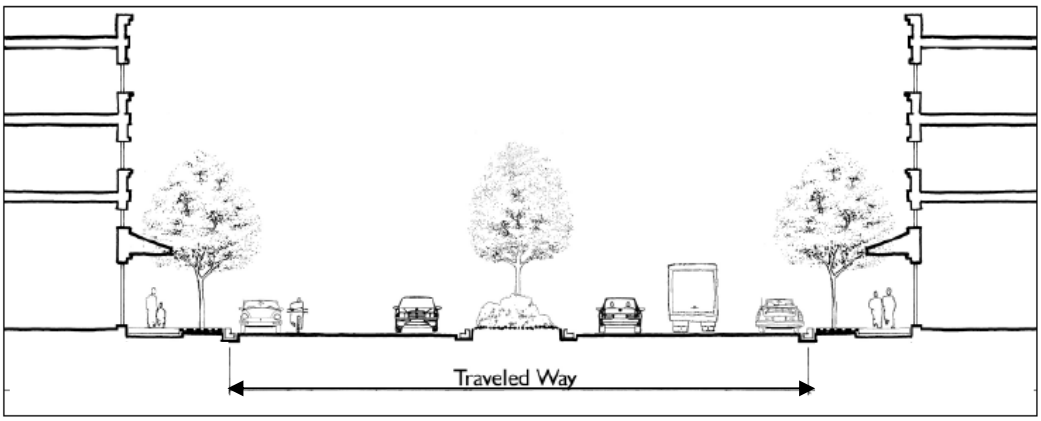
In a properly designed urban environment where buildings are at the back of sidewalk and vehicle speeds are low, the "separation" is typically provided by on street parking which also helps to calm traffic. The appropriate transect zone helps to define the width and location of sidewalks, planting strips and tree wells.

I.5 Shy Zone

The shy zone is the area adjacent to buildings and fences that pedestrians generally "shy" away from. Usually a minimum of one foot is provided as part of the sidewalk width. This space should not be included in the normal walking zone of the sidewalk.

J TRAVELED WAY

The traveled way is the central part of the thoroughfare between the curb faces where vehicle movement and on street parking occurs.



Traveled Way
(Source: Image - Community, Design + Architecture)

J.1 Introduction

Since every community has different equipment in service for transit, waste collection and emergency services, coordination with operators should occur early in the planning process to ensure that those service providers can operate their equipment on the streets. The frequency of access by these vehicles should be considered when setting lane widths. The use of narrower lane widths requires that designers recognize the impacts on turning at intersections and u-turns for multi-lane roads.

J.2 Travel Lanes

Travel lane widths should be provided based on the context and desired speed for the area that the street is located in. The table below shows lane widths and associated speeds that are appropriate. It is important to note that in low speed urban environments, lane widths are typically measured to the curb face instead of the edge of gutter pan. Consequently, when curb sections with gutter pans are used, the vehicle, bike and parking lane all include the width of the gutter pan. A typical measurement is shown below.

Lane Width, Orlando, Florida

(Source: Torti Gallas and Partners Project: Baldwin Park, Photo – Billy Hattaway)

In order for drivers to understand how fast they should drive, lane widths have to create some level of discomfort with driving too fast. The presence of on street parking is important in achieving the speeds shown in the table. When designated bike lanes or multi-lane configurations are used, there is more room for vehicles to operate in, such as buses, but car drivers will feel more comfortable driving faster than desired.

Alleys and narrow roadways that act as shared spaces can have design speeds as low as 10 mph, as noted in CHAPTER 16 – RESIDENTIAL STREET DESIGN.

Table 19-1 Recommended Lane Width

Movement Type	Design Speed	Travel Lane Width
Yield	Less than 20 mph	8 feet
Slow	20-25 mph	9-10 feet
Low	30-35 mph	10-11 feet

J.3 Medians

Medians used in low-speed urban thoroughfares provide for access management, turning traffic, safety, pedestrian refuge, landscaping, lighting and utilities. These medians are usually raised with raised curb.

Landscaped medians can enhance the street they are located within or help to create a gateway entrance into a community. Medians can be used to create tree canopies over travel lanes for multi-lane roadways contributing to a sense of enclosure.

Medians vary in width depending on available right of way and function. Because medians require a wider right of way, the designer must weigh the benefits of a median with the issues of pedestrian crossing distance, speed, context and available roadside width.

Table 19-2 Recommended Median Width

Median Type	Minimum Width	Recommended Width
Median for access control	4 feet	6 feet
Median for pedestrian refuge	6 feet	8 feet
Median for trees and lighting	6 feet [1]	10 feet [2]
Median for single left turn lane	10 feet [3]	14 feet [4]

Table Notes:
[1] Six feet measured curb face to curb face is generally considered the minimum width for proper growth of small caliper trees (less than 4 inches)
[2] Wider medians provide room for larger caliper trees and more extensive landscaping
[3] A ten foot lane provides for a turn lane without a concrete traffic separator
[4] Fourteen feet provides for a turn lane with a concrete traffic separator

J.4 On Street Parking

On street parking is important in the urban environment, both for the success of those retail businesses that line the street, but also to provide a buffer for the pedestrian and to help calm traffic speeds. When angle parking is proposed for on street parking, designers should consider the use of back in angle parking in lieu of front in angle parking. Back in angle parking has the following advantages:

- Loading and unloading of passengers naturally encourages passenger movement towards the sidewalk.
- Loading and unloading from the trunk or tailgate occurs at the sidewalk.

Back in Angle Parking, Columbus, OH
(Source: Photo - Dan Burden)

- When the vehicle leaves, the driver has a better view of oncoming traffic, therefore reducing the risk of crashes.

Back in Angle Parking, Seattle, WA
(Source: Photo - Dan Burden)

When designated bike lanes are needed in conjunction with on street parking, designers should consider increasing the bike lane to 6 feet in lieu of increasing parallel parking width from 7 to 8 feet. This helps encourage vehicles to park closer to the curb, and provides more room for door swing, potentially reducing conflict with cyclists.

Since roads are located in more rural transect zones where larger setbacks are created, on street parking is not provided for. Lot size and driveways should be provided to allow for parking on site and should provide unobstructed sidewalks to allow for pedestrian activity.

Table 19-3 Parking Lane Width

Movement Type	Design Speed	Parking Lane Width
Yield	Less than 20 mph	(Parallel) 7 feet
Yield	Less than 20 mph	(Angle) 17-18 feet
Slow	20-25 mph	(Parallel) 7 feet
Low	30-35 mph	(Parallel) 7-8 feet

J.5 Mid-Block Crossings

Properly designed TND communities will not normally require mid-block crossings due to the use of shorter block size. When mid-block crossings are necessary, the use of curb extensions or bulbouts should be considered to reduce the crossing distance for pedestrians.

Mid-Block Crossing, Sanford, FL
(Source: Glatting Jackson project, Photo - Billy Hattaway)

J.6 Access Management

The philosophy of short block lengths in TND communities is intended to reduce travel speeds, increase access to property, and improve circulation for all users. This is in contrast to the use of access management in CSD which has the goal of keeping vehicles moving at higher speeds.

Since parking is usually located within blocks in mixed use blocks and in alleys in residential neighborhoods, access along streets is provided primarily through side streets and alleys. This greatly reduces driveway access along corridors, improving safety for bicyclists, pedestrians and vehicles due to the reduction in conflict points.

J.7 Design Vehicles

There is a need to understand that street design with narrow streets and compact intersections requires designers to pay close attention to the operational needs of transit, fire and rescue, waste collection and delivery trucks. For this reason, early coordination with transit, fire and rescue, waste collection and other stakeholder groups is essential.

More regular encroachment of turning vehicles into opposing lanes will occur at intersections. Therefore, frequency of transit service, traffic volumes and the speeds at those intersections must be considered when designing intersections. For fire and rescue, determination of the importance of that street for community access should be determined, e.g. primary or secondary access.

The designer should use turning templates or current software to evaluate intersections to ensure adequate operation of vehicles can occur. Treatment of on street parking around intersections should be evaluated during this analysis to identify potential conflicts between turning vehicles and on street parking.

J.8 Bike Facilities

Chapter 9 of this document contains information on Bicycle Facilities. Much of that information is appropriate so the information contained in this section is directed to designing bike facilities in TND communities. Designing for bicycles on thoroughfares in TND communities should be as follows: Bicycles and vehicles should share lanes on thoroughfares with design speeds of twenty five mph or less. It is important to recognize that the addition of bike lanes does increase roadway widths and can increase the tendency for drivers to speed.

When bicycle lanes are used in TND communities, they should be a minimum of 5 feet wide and designated as bike lanes. On curb and gutter roadways, a 4' width measured from the lip of the gutter is required. The gutter width should not be considered as part of the rideable surface area, but this width provides useable clearance to the curb face. Drainage inlets, grates and utility covers are potential problems to bicyclists. When a roadway is designed, all such grates and covers should be kept out of the bicyclists' expected path. If drainage grates are located in the expected path of bicyclists, they should be bicycle safe grates.

Where parking is present, the bike lane should be placed between the parking lane and the travel lane and have a minimum width of 5 feet. Designers should consider increasing the bike lane to 6 feet in lieu of increasing parallel parking width from 7 to 8 feet. This helps encourage vehicles to park closer to the curb, and provides more room for door swing, potentially reducing conflict with cyclists.

Shared-lane markings or "sharrows" can be used instead of bike lanes adjacent to on-street parking. The sharrow avoids placing cyclists in the "door zone" and does not affect lane width or ROW width for the thoroughfare, which also aids in speed management. Guidance for use of the sharrow is attached from the draft MUTCD. Following is a photograph of a sharrow with cyclists sharing the lane.

Sharrow, Vancouver, BC
(Source: Photo – Billy Hattaway)

Greenways, waterfront walks, and other civic spaces should include multi-use or bicycle paths and bicycle storage or parking. Bicycle storage or parking should also be included in areas near transit facilities to maximize connectivity between the modes.

J.9 Transit

See "Accessing Transit, Design Handbook for Florida Bus Passenger Facilities, 2008" for information.

http://www.dot.state.fl.us/transit/Pages/2008_Transit_Handbook.pdf

K INTERSECTIONS

K.1 Introduction

The proper design of intersections is very important to the safety of all users. Research reveals that intersections are disproportionately responsible for crashes and injuries, especially for pedestrians. This is due to the number of conflict points that occur.

The goal should be to keep intersections compact to keep vehicle speeds down, and reduce pedestrian crossing distance. The benefits of compact intersections are reduced exposure of pedestrians to vehicles and shorter cycle times for the pedestrian phase of signals.

The TND approach to street design with more narrow streets and compact intersections requires designers to pay close attention to the operational needs of transit, fire and rescue, waste collection and delivery trucks. For this reason, early coordination with transit, fire and rescue, waste collection and other stakeholder groups is essential.

More regular encroachment of turning vehicles into opposing lanes will occur at intersections. Therefore, frequency of transit service, traffic volumes and the speeds at those intersections must be considered when designing intersections. For fire and rescue, determination of the importance of that corridor for community access should be determined, e.g. primary or secondary access.

K.2 Sight Distance

Sight distance should be calculated in accordance with Chapter 3, Section C.9.b, of the Greenbook using the design speeds appropriate for the street being evaluated. When executing a crossing or turning maneuver after stopping at a stop sign, stop bar, or crosswalk as required in Section 316.123, Florida Statutes, it is assumed that the vehicle will move slowly forward to obtain sight distance (without intruding while recognizing that the guidance recognizes that a two step

movement is into the crossing travel lane) stopping a second time as necessary.

Therefore, when curb extensions are used or on street parking is in place, the vehicle can be assumed to move forward on the second step movement, stopping just shy of the travel lane, increasing the driver's potential to see further than when stopped at the stop bar. As, a result the increased sight distance provided by the two step movement allows parking to be located closer to the intersection.

K.3 Curb Return Radii

Curb return radii should be kept small to keep intersections compact. The use of on street parking and/or bike lanes increases the effective size of the curb radii, further improving the ability of design vehicles to negotiate turns without running over the curb return.

Table 19-4 Curb Return Radii

Movement Type	Design Speed	Curb Radius w/Parallel Parking
Yield	Less than 20 mph	5-10 feet
Slow	20-25 mph	10-15 feet
Low	30-35 mph	15-20 feet

*Dimensions with parking on each leg of the intersection. Both tangent sections adjacent to the curb return must be parked or else curb radii must be evaluated using "design vehicle" and AutoTurn or turning templates.

K.4 Turn Lanes

The need for turn lanes for vehicle mobility should be balanced with the need to manage vehicle speeds and the potential impact on the public frontage such as sidewalk width. Turn lanes tend to allow higher speeds to occur through intersections, since turning vehicles can move over and slow in the turn lane, allowing the through vehicles to maintain their speed.

Left turn lanes are considered to be acceptable in an urban environment since there are negative impacts to roadway capacity when left turns block the through movement of vehicles. The installation of a left turn lane can be beneficial when used to perform a road diet such as reducing a four lane section to three lanes with the center lane providing for turning movements. In urban places, no more than one left turn lane should be provided.

Right turns from through lanes do not block through movements, but do create a

reduction in speed due to the slowing of turning vehicles, so right turn lanes are used to maintain speed through intersections and to reduce the potential for rear end crashes. However, the installation of turn lanes increases the crossing distance for pedestrians and the speed of vehicles, therefore the use of exclusive right turn lanes are rarely used except at "T" intersections.

K.5 Crosswalks

See Chapter 8 for information on crosswalks.

K.6 Curb Extensions

Curb extensions are may be helpful tools for reducing the crossing distance for pedestrians, providing a location for transit stops, managing the location of parking, providing unobstructed access to fire and rescue, increasing space for landscaping and street furniture.

Designers should recognize coordinate with public works staff to ensure that street cleaning can be achieved with their equipment, and provide adequate drainage to avoid ponding at curb extensions.

L REFERENCES

The following is a list of the publications used in the preparation of this chapter or which may be helpful to use in designing Traditional Neighborhood Communities and understanding the flexibility in AASHTO design criteria:

- Draft ITE Recommended Practice: Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities, 2006 http://www.ite.org/css/
- SmartCode 9.2 http://www.smartcodecentral.org/
- A Guide for Achieving Flexibility in Highway Design, AASHTO, May, 2004
- Accessing Transit, Design Handbook for Florida Bus Passenger Facilities, 2008, FDOT Public Transit Office

  http://www.dot.state.fl.us/transit/Pages/2008_Transit_Handbook.pdf
- Safe Routes to Schools Program, FDOT Safety Office http://www.srtsfl.org/

Design Issues

DRAFT

Proposed AASHTO Highway Safety Manual

The Highway Safety Manual (HSM) provides analytical tools and techniques for quantifying the potential effects on crashes as a result of decisions made in planning, design, operations, and maintenance.

Contents of First Edition

The HSM is being developed through NCHRP project #17-36. A final draft will be submitted for balloting by AASHTO April 2009. It is expected the AASHTO balloting process will take 6 months to 1 year to complete. Therefore, the first edition is expected late 2009 or early 2010.

DRAFT

Proposed Highway Safety Manual – Selected Excerpts

Safety Performance Function (SPF) for predicted average crash frequency for rural two-lane two-way roadway segments

$$N_{spfrs} = AADT \times L \times 365 \times 10^{-6} \times e^{(-0.312)}$$

Where,

N_{spfrs} = estimated total crash frequency for roadway segment base conditions;

AADT = average annual daily traffic volume (vehicles per day);

L = length of roadway segment (miles)

Base Conditions:

Lane width	12 feet
Shoulder width	6 feet
Roadside hazard rating	3
Driveway density	5 driveways per mile
Horizontal curvature	None
Vertical curvature	None
Grade	Level (0 percent)
Centerline rumble strips	None
Passing lanes	None

Accident Modification Factors for Lane Width on Roadway Segments

Lane Width	AADT		
	< 400	400 to 2000	> 2000
9 ft or less	1.05	$1.05 + 2.81 \times 10^{-4}(AADT-400)$	1.50
10 ft	1.02	$1.02 + 1.75 \times 10^{-4}(AADT-400)$	1.30
11 ft	1.01	$1.01 + 2.5 \times 10^{-5}(AADT-400)$	1.05
12 ft or more	1.00	1.00	1.00

U.S. Bicycle Route System

In 2003, the **American Association of State Highway and Transportation Officials** (AASHTO) Standing Committee on Highways passed a resolution to establish and extend U.S. bicycle routes. It was resolved that the AASHTO Subcommittee on Traffic Engineering would work in partnership with the AASHTO Joint Technical Committee on Nonmotorized Transportation to convene an ad hoc Task Force for developing a recommended national systems-level or corridor–level plan for use by the State DOTs and other agencies in designating potential future U.S. bicycle routes.

Since 1973, **Adventure Cycling Association's** (ACA) non-profit mission has been to inspire people of all ages to travel by bicycle. With over 38,000 mapped miles of bicycle routes, ACA is committed to seeing a national bike route network established. As a member of the AASHTO Task Force, ACA has provided staff assistance since 2005 to support the effort to create a national corridor-level bicycle route system. For an in-depth overview of the project, visit www.adventurecycling.org/usbrs

PLAN OF ACTION

1. **Collect, compile, and review** information on existing and proposed multi-state bicycle routes. Completed fall 2006, this compilation includes:
   - ACA Route Network, Mississippi River Trail (MRT), East Coast Greenway Alliance (ECGA)
   - Official major state bicycle routes (state bicycle maps & designated routes)
   - Bicycle advocacy group suggestions
   - "Possible cross state routes" created from state suitability maps and cross referenced with advocacy group suggestions
   - Rail trails and other suitable bicycle trails over 50 miles in length

   Download the report at www.adventurecycling.org/usbrsinventoryreport
2. **Develop recommended corridors** to comprise a logical national system, called the U.S. Bicycle Route Corridor Plan. Corridors demonstrate an area (+/- 50 mile width) where a route should exist. Corridor-level criteria established an effective method for recommending corridors of national significance. *View the criteria established by the Task Force at www.adventurecycling.org/corridorplancriteria. View the Draft Corridor Plan Map at www.adventurecycling.org/corridorplanmap*
3. **Develop a logical designation system** for U.S. bicycle routes and assign appropriate designations to each corridor. Phase 3 involved documenting existing state systems; the bike route number system established by AASHTO in the 1970's; and sought input from task force members, other transportation officials and bicycle experts. Designations under consideration accommodated future expansion and included numbers (similar to U.S. highway numbers), name (i.e. Mississippi River Trail), letter(s), and combinations. The recommended designation system is a numbered system.
4. **Produce a map** of the draft U.S. Bicycle Corridor Plan including recommended designations. View the map at www.adventurecycling.org/routes/nbrn/FrontDesigFly.pdf
5. **Distribute the draft Corridor Plan for review** by the Joint Task Force on Non-motorized Transportation, Subcommittee on Design, and Subcommittee on Traffic Engineering. Comments were reviewed and resolved by the Task Force.
6. **Present revised draft Corridor Plan for review by the Standing Committee on Highways** for endorsement as an "official corridor plan." The endorsed Plan will serve as a tool for State DOTs and other agencies in proposing the designation of roads and trails as part of an interconnected system of bike routes across the nation. The AASHTO Task Force recognizes that implementation of the Corridor Plan will be determined by each State, regional, county and metro/city transportation agency. Like any good plan, it can be amended as needed and as appropriate. For more information please contact:

Task Force Members

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Richard Moeur, Arizona

Subcommittee on Traffic Engineering
Wes Dean, Mississippi
Barry Warhoftig, West Virginia
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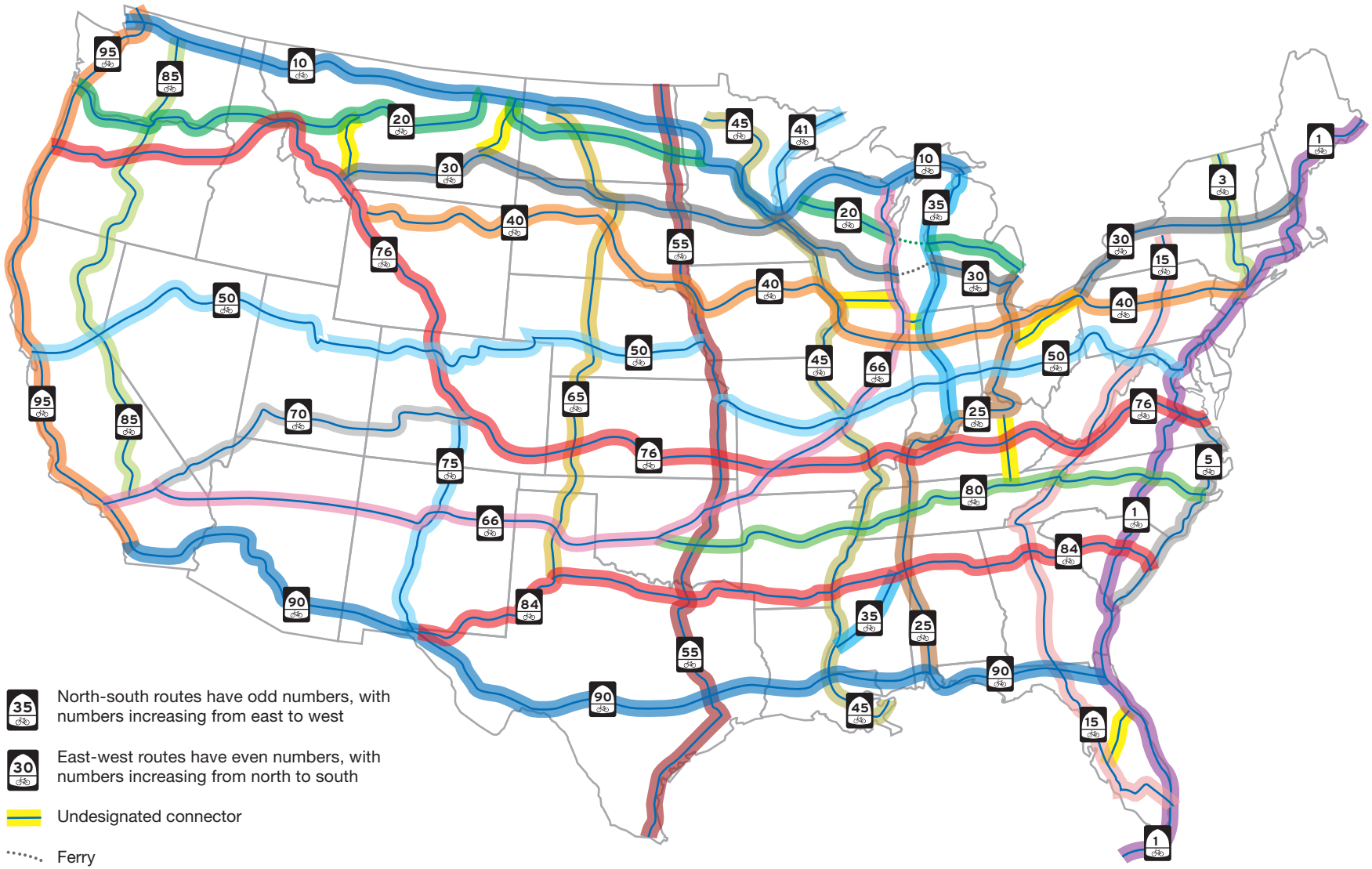
2 Digit Number Designation

A logical and easily implemented designation system that will accommodate expansion over time is a key component to the U.S. Bicycle Route System. The Task Force on US Bicycle Routes reviewed existing systems from each state and other countries. Proposed systems from members, bike/pedestrian coordinators and others were also considered. Five versions were mapped and reviewed. Below is the preferred designation system as ranked by the Task Force in March 2008.

Advantages of this system:

- Follows existing U.S. Bicycle Route System established in the 1970's.
- Allows for orderly expansion of U.S. Bicycle Routes over time.
- Easy to determine designation as system is implemented.
- Opposite Interstate Highway System.
- States/Organizations can also co-designate or name routes using their own system.



GLOSSARY OF TERMS:

In the application of the criteria in this manual, the following definitions are assigned for consistency of understanding and interpretation.

1. **Arterials:** Divided or undivided, relatively continuous routes that primarily serve through traffic, high traffic volumes, and long average trip lengths. Traffic movement is of primary importance, with abutting land access of secondary importance. Arterials include expressways without full control of access, US numbered routes and principal state routes. May be classified as urban or rural.

2. **Auxiliary Lane:** The designated widths of roadway pavement marked to separate speed change, turning, passing and climbing maneuvers from through traffic. They may also provide short capacity segments.

3. **Bicycle Lane:** A bicycle lane (bike lane) is a portion of a roadway (either with curb and gutter or a flush shoulder) which has been designated by striping, special pavement markings, and signing for the preferential use by bicyclists.

4. **Bicycle Way:** Any road, path or way which by law is open to bicycle travel, regardless of whether such facilities are signed and marked for the preferential use by bicyclists or are to be shared with other transportation modes. Examples include bicycle lanes, paved shoulders, shared use paths, and traffic lanes.

5. **C-D Roads:** Collector-Distributor Roads are limited access roadways provided within a single interchange, or continuously through two or more interchanges on a freeway segment. They provide access to and from the freeway, and reduce and control the number of ingress and egress points on the through freeway. They are similar to continuous frontage roads except that access to abutting property is not permitted.

6. **Collectors:** Divided or undivided routes which serve to link arterial routes with local roads or major traffic generators. They serve as transition link between mobility needs and land use needs. Collectors include minor state routes, major county roads, and major urban and suburban streets.

7. **Florida Intrastate Highway System (FIHS):** An interconnected statewide system of limited access facilities and controlled access facilities developed and managed by the Department to meet standards and criteria established for the FIHS. It is part of the State Highway System, and is developed for high-speed and high-volume traffic movements. The FIHS also accommodates High-Occupancy Vehicles (HOVs), express bus transit and in some corridors, interregional and high speed intercity passenger rail service. Access to abutting land is subordinate to movement of traffic and such access must be prohibited or highly regulated.

8. **Freeways:** Divided arterial highways, with full control of access. Movement of traffic free of interference and conflicts is of primary importance. Essential elements include medians, grade separations, interchanges, and, in some cases, collector-distributor roads and frontage roads. Freeways include Interstate, toll road and expressway systems. May be classified as urban or rural.

9. **High Speed:** Descriptive term used to summarize all conditions governing the selection of Design Speeds 50 mph and greater.

10. **HOV Lane:** Special designated widths of pavement marked to provide travel lanes for high occupancy vehicles (HOV). They may be directly adjacent to other travel lanes or separated.

11. **Local Roads:** Routes which provide high access to abutting property, low average traffic volumes, short average trip lengths and on which through traffic movements are not of primary importance. Local roads include minor county roads, minor urban and suburban subdivision streets, and graded or unimproved roads.

12. **Low Speed:** Descriptive term used to summarize all conditions governing the selection of Design Speed of less than 50 mph.

13. **Low Volume and High Volume:** Descriptive terms used to describe certain operating characteristics and driver expectancy on highways. Criteria for some elements are selected according to these qualifying controls. Standards for these controls are given in the table following this section.

14. **Pedestrian Way:** A space for pedestrian travel separated from traffic lanes. Sidewalks, shared use paths, footpaths and shoulders are considered to be pedestrian ways. However, footpaths and shoulders are not accessible facilities, since they lack specific improvements or provisions to accommodate or encourage walking.

15. **Ramp:** A turning roadway that connects two or more legs at an interchange. The components of a ramp are a terminal at each leg and a connecting road. The geometry of the connecting road usually involves some curvature and a grade.

16. **Roadway:** The portion of a highway, including shoulders, for vehicular use. A divided highway has two or more roadways.

17. **Rural Areas:** Places outside the boundaries of concentrated populations that accommodate higher speeds, longer trip lengths and freedom of movement, and are relatively free of street and highway networks. Rural environments are surroundings of similar characteristics.

18. **Strategic Intermodal System (SIS):** A transportation system comprised of facilities and services of statewide and interregional significance, including appropriate components of all modes. The highway component includes all designated SIS Highway Corridors, Emerging SIS Highway Corridors, SIS Intermodal Connectors, and Emerging SIS Highway Intermodal Connectors.

19. **Streets:** The local system which provides direct access to residential neighborhoods and business districts, connects these areas to the higher order road systems and offers the highest access to abutting property; sometimes deliberately discouraging through-traffic movement and high speeds.

    Note: Local roads and streets are not generally a part of the State Highway System and therefore, may not be governed by the FDOT roadway design criteria, but by the ***Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways*** and/or criteria established by the local government.

20. **Traffic Lane/Traveled Way:** The designated widths of roadway pavement, exclusive of shoulders and marked bicycle lanes, marked to separate opposing traffic or vehicles traveling in the same direction. Traffic lanes include through travel lanes, auxiliary lanes, turn lanes, weaving, passing, and climbing lanes. They provide space for passenger cars, trucks, buses, recreational vehicles and, in some cases, bicycles.

21. **Travel Lane:** The designated widths of roadway pavement marked to carry through traffic and to separate it from opposing traffic or traffic occupying other traffic lanes. Generally, travel lanes equate to the basic number of lanes for a facility.

22. **Truck Traffic:** When significant, heavy, substantial, high percent, etc. truck traffic is used as a qualifying control, it shall mean 10% of the AADT or 10% of the daily count (24 hr.)

23. **Urban Area:** A geographic region comprising as a minimum the area inside the United States Bureau of the Census boundary of an urban place with a population of 5,000 or more persons, expanded to include adjacent developed areas as provided for by Federal Highway Administration (FHWA) regulations. The FHWA Urban Boundary maps are available from the District Planning Office.

24. **Urbanized Area:** A geographic region comprising as a minimum the area inside an urban place of 50,000 or more persons, as designated by the United States Bureau of the Census, expanded to include adjacent developed areas as provided for by Federal Highway Administration regulations. Urban areas with a population of fewer than 50,000 persons which are located within the expanded boundary of an urbanized area are not separately recognized.

2.1.2 Other Lane Widths

Collector-distributor lanes and auxiliary lanes for speed change, turning, storage for turning, weaving and other purposes supplementary to through-traffic movement should be of the same width as the through lanes. See ***Table 2.1.2***.

Table 2.1.2 Lane Widths - Special

LANE WIDTHS (FEET)					
FACILITY		**SPECIAL**			
TYPE	**AREA**	**HOV[1]**	**BICYCLE**	**OFF SYSTEM DETOUR**	**URBAN MULTI-PURPOSE [4]**
FREEWAY	Rural	12	----	11 [3]	----
	Urban	12	----	11 [3]	----
ARTERIAL	Rural	12	5	11	----
	Urban	12	4 [2]	11	8 [5]
COLLECTOR	Rural	----	5	11	----
	Urban	----	4 [2]	11	8 [5]

1. Separated or concurrent flow.
2. A minimum width of 5 feet shall be provided when the bicycle lane is adjacent to on-street parking, a right-turn lane, guardrail or other barrier. See ***Section 8.4*** of this volume.
3. For Freeway detours, at least one 12 ft. lane must be provided in each direction.
4. Urban multi-purpose lanes are usually used as refuge lanes but may be used for loading zones, bus stops, emergency access and other purposes. Parking that adversely impacts capacity or safety is to be eliminated whenever practical. Standard parking width is measured from lip of gutter, with a minimum width of 8 ft. measured from face of curb.
5. 10 ft. to 12 ft. lanes for commercial and transit vehicles.

2.1.4 Pedestrian, Bicycle and Public Transit Facilities

2.1.4.1 Sidewalks

Sidewalks shall be considered on all projects. Although the standard sidewalk width is 5 feet, it may be desirable to create wider sidewalks in business districts, near schools, transit stops, or where there are other significant pedestrian attractors. The District Pedestrian/Bicycle Coordinator shall be consulted during design to establish appropriate pedestrian elements on a project-by-project basis. ***Chapter 8*** of this volume contains additional guidelines for sidewalks.

2.1.4.2 Bicycle Facilities

Bicycle facilities shall be provided as required by ***Chapter 8*** of this volume. Bicycle lanes on the approaches to bridges should be continued across the structure. When a project includes a bus bay, a bicycle lane is to be included between the through lane and the bus bay.

The District Pedestrian/Bicycle Coordinator should be consulted during planning and design to establish appropriate bicycle facility elements on a project-by-project basis.

Chapter 8 of this volume contains definitions for bicycle facilities as well as additional guidelines for the accommodation of bicycles.

2.1.4.3 Public Transit Facilities

Coordinate with the District Modal Development Office and local transit agency for the need for public transit facilities. ***Chapter 8*** of this volume contains additional guidelines for street side bus stop facilities, location and design.

Chapter 8

Pedestrian, Bicycle and Public Transit Facilities

8.1 General

8.1.1 Pedestrians and Bicyclists

It is the goal of the Department and in accordance with ***Section 335.065, Florida Statutes***, ***Bicycle and pedestrian ways along state roads and transportation facilities:***

"(1)(a) Bicycle and pedestrian ways shall be given full consideration in the planning and development of transportation facilities, including the incorporation of such ways into state, regional, and local transportation plans and programs. Bicycle and pedestrian ways shall be established in conjunction with the construction, reconstruction, or other change of any state transportation facility, and special emphasis shall be given to projects in or within 1 mile of an urban area.

(b) Notwithstanding the provisions of paragraph (a), bicycle and pedestrian ways are not required to be established:

1. Where their establishment would be contrary to public safety;
2. When the cost would be excessively disproportionate to the need or probable use;
3. Where other available means or factors indicate an absence of need."

Projects that comply with the design criteria contained within the PPM are considered to meet the requirements of the statute. If the design criteria contained within the PPM for pedestrian and bicycle facilities are not met, a Design Variation is required. The documentation shall reference which of the three conditions under ***Section 335.065 (1)(b), Florida Statutes*** support not providing a bicycle or pedestrian facility.

Sidewalks and shared use paths are appropriate pedestrian facilities for all types of projects and locations. ***Table 8.1.1*** identifies appropriate bicycle facilities for various types of projects.

Table 8.1.1 Bicycle Facilities

Location	Condition	Type of Work		
		New Construction, Reconstruction	Resurfacing, Restoration, Rehabilitation (RRR) [1, 2]	Traffic Operations, Intersection Improvements
In or within one mile of an urban area	All	Bicycle Lane	Bicycle Lane or Wide Curb Lane	Bicycle Lane or Wide Curb Lane
Beyond one mile of an urban area	Curb and gutter (DS ≤ 45mph)	Bicycle Lane	Bicycle Lane or Wide Curb Lane	Bicycle Lane or Wide Curb Lane
	All other	Bicycle Lane or Paved Shoulder	Bicycle Lane, Paved Shoulder or Wide Curb Lane	Bicycle Lane, Paved Shoulder or Wide Curb Lane

1. Widening existing curbed sections for the project length on RRR projects for the sole purpose of providing a bicycle lane is considered to be an excessively disproportionate cost, given the costs associated with relocating/reconstructing the curb, sidewalk, and drainage system, acquisition of additional right of way, or utility impacts. No Design Variation is necessary.
2. On existing multilane roadways without bicycle lanes, if truck volumes are 10% or less, consideration shall be given to reducing traffic lane width(s) to provide a bicycle lane or wide curb lane.

Bicyclists and pedestrians should be expected on all of Florida's state roadways except where restricted on limited access facilities and interstate highways (***Section 316.091 Florida Statutes***).

Decisions on appropriate pedestrian and bicycle facilities shall be determined with input from the District Pedestrian/Bicycle Coordinator, throughout the project development and implementation process. Further coordination may also be necessary with the District Americans with Disabilities Act (ADA) Coordinator.

When considering other available means, the alternate route or facility should include accommodation for cyclists and pedestrians which meet the design criteria for bicycle and pedestrian facilities on state roadways, and provide access to the same services, origination and destination sites, and transit connections as the project corridor. The alternate route shall not result in a significant increase in travel time or trip length, exposure to motorized traffic or substantial elevation changes. If the alternate route requires the pedestrian or bicyclist to cross limited access, arterial or collector roadways, or rail corridors, appropriate crossing locations shall be provided.

8.1.2 Transit

For projects within the operational limits of a local transit agency service area, consideration should be given to connectivity of pedestrian and bicycle facilities with transit stops. Bicycle access to transit facilities should be provided because most bus service has bike-on-bus (bicycle rack) capability.

Decisions on appropriate pedestrian and bicycle facilities to connect with transit service shall be determined with input from the District Pedestrian/Bicycle Coordinators, District Modal Development Office Coordinators, District Americans with Disabilities Act (ADA) Coordinators, and the District Public Transportation staff. Where there is a demand for pedestrian and bicycle facilities, there could also be a demand for public transit or public transportation facilities. Public transit street side facilities should be considered in all phases of a project, including planning, preliminary design and engineering, design, and construction. Coordination with the District Modal Development Office and/or the local public transit provider(s) will help determine the need for and justification of bus bays and transit shelters on a project by project basis.

Multimodalism is the ultimate goal of the Department. The integration of public transit street facilities along with pedestrian and bicycle facilities furthers the implementation of this goal.

Federal and State legislation provide the stimulus for planning, designing, and constructing a fully integrated transportation system benefiting the traveling public and the environment. Examples of legislation include ***The Safe, Accountable, Flexible, and Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU)***, ***The Federal Transit Act***, as amended, ***The Americans with Disabilities Act of 1990 (ADA)***, and ***The Clean Air Act Amendment of 1990 (CAAA)***. In response to this legislation, the surface transportation system should provide for concurrent use by automobiles, public transit and rail, and to the extent possible, bicycles and pedestrians. Throughout the entire process, coordination with transit is essential.

8.2 References

1. ***Manual on Uniform Traffic Control Devices (MUTCD)***
2. ***Design Standards***
3. ***FDOT Pedestrian Planning and Design Handbook***
4. ***FDOT Bicycle Facilities Planning and Design Handbook***
5. ***FDOT Trail Intersection Design Handbook***
6. ***AASHTO Guide for the Development of Bicycle Facilities***
7. ***Highway Capacity Manual***
8. ***Americans With Disabilities Act (ADA)/Florida Accessibility Code for Building Construction (FACBC)***
9. ***Uniform Vehicle Code (UVC)***
10. ***AASHTO LRFD Bridge Design Specifications, Current Edition***
11. ***AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities***
12. ***Transportation Research Board (TRB). Guidelines for the Location and Design of Bus Stops adapted from TCRP Report 19. Washington D.C.: National Academy Press***
13. ***FDOT Accessing Transit: Design Handbook for Florida Bus Passenger Facilities***
14. ***Transit Facilities Guidelines on the Public Transportation Office website***
15. ***FDOT Structures Manual, Current Edition***

8.3 Pedestrian Facilities

All roadways and bridges where pedestrian travel is expected should have separate walking areas such as sidewalks or shared use paths that are outside the vehicle travel lanes. Refer to ***Section 8.6*** for shared use paths.

8.3.1 Sidewalks

Sidewalks are walkways parallel to the roadway and designed for use by pedestrians. Generally, sidewalks should be constructed along both sides of arterial roadways that are not provided with shoulders, even though pedestrian traffic may be light. However, the construction of sidewalks on both sides of the street would not be required in such cases as when the roadway parallels a railroad or drainage canal and pedestrians would not be expected. If sidewalks are constructed on the approaches to bridges, they should be continued across the structure. If continuous sidewalks are constructed on only one side of the street, pedestrians should be provided access to transit facilities located on the opposite side of the street.

On curbed roadways, the minimum width of a sidewalk shall be 5 ft. when separated from the curb by a buffer strip. The minimum separation for a 5 ft. sidewalk from the back of curb is 2 ft. The buffer strip should be 6 ft. where possible to eliminate the need to narrow or reroute sidewalks around driveways. If the sidewalk is located adjacent to the curb, the minimum width of sidewalk is 6 ft.

Grades on sidewalks should not exceed 5% when not adjacent to a travel way. There should be enough sidewalk cross slope to allow for adequate drainage, however the maximum shall be no more than 2% to comply with ADA requirements. Edge drop-offs should be avoided. When drop-offs cannot be avoided, they should be shielded as discussed in ***Section 8.8***.

A 5-foot wide sidewalk that connects a transit stop or facility with an existing sidewalk or shared use path shall be included to comply with ADA accessibility standards.

Particular attention should be given to pedestrian accommodations at the termini of each project. If full accommodations cannot be provided due to the limited scope or an existing sidewalk isn't present at the termini, then temporary measures should be considered such as extending the sidewalk and project limits to next appropriate pedestrian crossing or access point. If special accommodations are made, it is equally important to address these measures on the adjoining projects. In all cases, the District Pedestrian/Bicycle

Coordinator shall be contacted for input on making a determination regarding continuous passage.

On roadways with flush shoulders, the minimum width of sidewalk is 5 feet. On roadways with flush shoulders, new sidewalks should be placed as far from the roadway as practical in the following sequence of desirability:

1. At or near the right of way line.
2. Outside of the clear zone.
3. Five feet from the shoulder point
4. As far from edge of driving lane as practical.

Nearing intersections, the sidewalk should be transitioned as necessary to provide a more functional crossing location that also meets driver expectation. Further guidance on the placement of stop or yield lines and crosswalks is provided in the ***MUTCD*** and the ***Design Standards.***

8.3.2 Disability Considerations

Pedestrian facilities must be designed in accordance with ADA to accommodate the physically and visually challenged citizens whose mobility is dependent on wheelchairs and other devices. Refer to the ***Design Standards*** for additional details.

Pull boxes, manholes (and other utility covers), and other types of existing surface features in the location of a proposed curb ramp should be relocated when feasible. When relocation is not feasible, the feature shall be adjusted to the new ramp to meet the ADA requirements for surfaces (including the provision of a non-slip top surface, and adjustment to be flush with and at the same slope as the curb ramp).

The detectable warning systems on the QPL are designed to work with concrete surfaces. In areas where the pedestrian facility has an asphalt surface, such as a shared use path, the engineer must specify an appropriate detectable warning system. In these cases, consider including a short section of concrete that will accommodate any system.

To assist pedestrians who are visually or mobility impaired, curb ramps should be parallel to the crossing. By providing ramps parallel to the crossing, the pedestrian is directed into the crossing. At intersections where more than one road is crossed, each crossing should have a separate curb ramp. Under no circumstance shall a curb ramp be installed allowing

8.4 Bicycle Facilities

Appropriately designed and located bicycle facilities play an important role in supporting safe bicycle travel. Bicycle facilities include bicycle lanes, paved shoulders, wide curb lanes, shared use paths, traffic control devices, and bicycle parking facilities.

Measures that can considerably enhance a corridor's safety and capacity for bicycle travel are:

1. Providing bicycle facilities.
2. Maintaining a smooth, clean riding surface, free of obstructions. This includes ensuring drainage inlets and utility covers that cannot be moved out of the travel way are flush with grade, well seated, and use bicycle-safe grates and covers.
3. Responsive and appropriate traffic control devices, consistent with guidance in the ***MUTCD***, including providing bicycle oriented directional signage.

8.4.1 Bicycle Lanes

Where required by ***Table 8.1.1,*** a bicycle lane shall be provided for each direction of travel on the roadway. Bicycle lanes shall be marked in accordance with ***Design Standards*** and the ***MUTCD.***

On curb and gutter roadways, a 4-foot minimum bicycle lane width measured from the lip of the gutter is required. This provides for a 5.5-foot width to the face of curb when FDOT Type F curb and gutter is used. The 1.5-foot gutter width should not be considered as part of the rideable surface area, but this width provides useable clearance to the curb face. A minimum width of 5 feet shall be provided when the bicycle lane is adjacent to on-street parking, a right-turn lane, guardrail or other barrier.

On flush shoulder roadways, the paved shoulder described in ***Section 8.4.2*** should be marked as a bicycle lane in or within 1 mile of an urban area.

Where parking is present, the bicycle lane shall be placed between the parking lane and the travel lane and have a minimum width of 5 feet. If the parking volume is substantial or the turnover is high, an additional 1 to 2 feet of width should be provided if available.

At intersections with right turn lanes, the bicycle lane shall continue adjacent to the through lane; between the through lane and the right turn lane, and shall be 5 feet in width for new

construction and reconstruction projects. On RRR projects where the bicycle lane is required in accordance with ***Chapter 25***, a 5-foot bicycle lane width should be provided (4-foot minimum).

Bicycle lanes shall be one-way facilities and carry bicycle traffic in the same direction as adjacent motor vehicle traffic. On one-way streets, bicycle lanes should generally be placed on the right side of the street. A bicycle lane on the left side of the street can be considered if it will substantially reduce the number of potential conflicts, such as those caused by frequent bus traffic, heavy right-turn movements, high-turnover parking lanes, or if there is a significant number of left-turning bicyclists.

8.4.2 Paved Shoulders

A paved shoulder is a portion of a roadway which has been delineated by edge line striping, but does not include special pavement markings or signing for the preferential use by bicyclists. Paved shoulders shall be 5 feet in width for new construction, reconstruction and RRR projects, however existing 4-foot paved shoulders on RRR projects may be retained. A paved shoulder of at least 4 feet in width is considered to be a bicycle facility, however a minimum 5-foot clear width between the traveled way and the face of curb, guardrail or other roadside barrier is required.

8.4.3 Wide Curb Lanes

Wide outside curb lanes are through lanes which provide a minimum of 14 feet in width. This width allows most motor vehicles to pass cyclists within the travel lane, which is not possible in more typical 10- to 12-foot wide travel lanes. Wide curb lanes do not meet Department requirements for bicycle facilities on new construction or reconstruction projects. However, in some conditions, such as RRR projects, they may be the only practical option for a bicycle facility.

8.4.4 Bicycle Route Systems

Bicycle route systems are linked by signs to aid bicyclists. Bicycle route systems are ineffectual unless signs are highly specific, giving a clear indication of destination. It may be advantageous to sign some urban and rural roadways as bicycle route systems. Bicycle route signing should not end at a barrier. Information directing the bicyclists around the barrier should be provided.

The decision whether to provide bicycle route systems should be based on the advisability of encouraging bicycle use on a particular road, instead of on parallel and adjacent roadways. The roadway width, along with factors such as volume, speed, types of traffic, parking conditions, grade, sight distance and connectivity to transit, should be considered when determining the feasibility of bicycle route systems. Roadway improvements such as adequate pavement width, drainage grates, railroad crossings, pavement surface, maintenance schedules and signals responsive to bicycles should always be considered before a roadway is identified as a bicycle route system. Further guidance on signing bicycle route systems is provided in the ***MUTCD***.

10.12.3 Sight Distance to Delineation Devices

Merging (lane closure) tapers should be obvious to drivers. If restricted sight distance is a problem (e.g., a sharp vertical or horizontal curve approaching the closed lane), the taper should begin well in advance of the view obstruction. The beginning of tapers should not be hidden behind curves.

10.12.4 Pedestrians and Bicyclists

Transportation plans and projects must consider safety and contiguous routes for pedestrians and bicyclists. In developing Temporary Traffic Control (TTC) Plans, when an existing pedestrian way or bicycle way is located within a traffic control work zone, accommodation must be maintained and provision for the disabled must be provided.

When existing pedestrian facilities are disrupted, closed or relocated in a TTC zone, the temporary facility or route shall be detectable and include accessibility features consistent with the features present in the existing facility. See ***Chapter 6D*** of the ***MUTCD*** for additional guidance.

10.12.4.1 Pedestrian Considerations

There are three threshold considerations in planning for pedestrian safety in work zones on highways and streets:

1. Pedestrians should not be led into direct conflicts with work site vehicles, equipment or operations.
2. Pedestrians should not be led into direct conflicts with mainline traffic moving through or around the work site.
3. Pedestrians should be provided with a safe, convenient travel path that replicates as nearly as possible the most desirable characteristics of sidewalks or footpaths.

Pedestrian accommodations through work zones must include provisions for the disabled. Temporary traffic control devices for vehicular traffic should not be allowed within the pedestrians' travel path.

At transit stops, provisions should be made to ensure passengers have the ability to board and depart from transit vehicles safely.

Signing should be used to direct pedestrians to safe street crossings in advance of an encounter with a work zone. Signs should be placed at intersections so pedestrians, particularly in high-traffic-volume urban and urbanized areas, are not confronted with midblock crossings.

10.12.4.2 Bicycle Considerations

There are several considerations in planning for bicyclists in work zones on highways and streets:

1. Bicyclists should not be led into direct conflicts with mainline traffic, work site vehicles, or equipment moving through or around traffic control zones.
2. Bicyclists should be provided with a travel route that replicates the most desirable characteristics of a wide paved shoulder or bicycle lane through or around the work zone.
3. If the work zone interrupts the continuity of an existing shared use path or bike route system, signs directing bicyclists through or around the work zone and back to the path or route should be provided.
4. The bicyclist should not be directed onto the same path used by pedestrians.

10.12.5 Superelevation

Horizontal curves constructed in conjunction with temporary work zone diversions, transitions, and crossovers should have the required superelevation. Under conditions where superelevation is not used, the minimum radii that can be applied are listed in the ***Table 10.12.2***. Superelevation must be included with the design whenever the minimum radii cannot be achieved.

Table 10.12.2 Minimum Radii for Normal 0.02 Cross Slopes

SPEED (mph)	MINIMUM RADIUS (feet)
65	3130
60	2400
55	1840
50	1390
45	1080
40	820
35	610
30	430

7.4.11 Foundation Criteria

Refer to ***Section 7.6, Foundation Design***, for geotechnical requirements.

7.4.12 Mast Arm Supports

All new signals installed on the State Highway System shall meet the following criteria:

1. Signalized Intersections within ten (10) miles of the coastline (considered the mast arm policy area):

   Signals shall be supported by galvanized mast arms, with the signal head(s) rigidly attached to the mast arm, along corridors within the ten mile coastline boundary defined by the State Traffic Engineering Office Implementation Guidelines. When it is impractical to use a mast arm or overhead rigid structure within the ten mile coastline boundary, a single point span wire assembly shall be used and a Design Variation must be approved in accordance with ***Chapter 23*** of this volume. The Department will cover the cost for a galvanized mast arm only. If the Local Maintaining Agency wants a painted mast arm, they must provide the additional funding and commit to cover the maintenance cost.

2. Signalized Intersections outside ten (10) miles of the coastline:

   Signals shall be supported by single point span wire assemblies along all corridors outside the ten mile coastline boundary. A two point span wire assembly may be used when a Design Variation has been approved in accordance with ***Chapter 23*** of this volume. If the Local Maintaining Agency wants a mast arm, they must provide the additional funding and commit to cover the maintenance cost if it is painted.

In addition, an underground communication cable infrastructure shall be utilized for those signals operating as part of an advanced traffic management system on these designated corridors.

The Department has developed a Traffic Signal Mast Arm Design Standard. The standard includes single arm designs, with and without luminaires and double arm designs without luminaires. The standard designs include 110, 130 and 150 mph design wind speeds. A foundation and base plate design has been developed for each pole type.

The manufacturer of the standard mast arms will be pre-approved by the Department and added to the Qualified Products List (QPL). When the standard assemblies are used, design details in the plans or shop drawing submittals will not be required. Custom designs, for

those locations where the standard design is not appropriate, will require complete design details for the pole, arm and foundation to be included in the plans, and will require shop drawings.

Mast arm design will require close coordination between the signal designer and the Structures Office. If standard designs are utilized, the Structures Engineer shall review applicability of structural parts with site conditions. Early coordination is important.

The Signal Designer will provide the Structures Office a copy of the mast arm tabulation sheet that includes the following information:

1. The pole and arm locations
2. Elevations and offsets
3. Signal and sign sizes and locations on the mast arm

The Structures Office will analyze the data and determine the standard pole and arm configuration required, and complete the "Standard Mast Arm Assemblies Data Table" (Structures CADD cell table) for the plans. If a custom design is required the Structures Office will provide the complete design details for the custom mast arm assembly. A custom design will require additional design time for either the Department or Consultant Structures Office. As noted above, the standard includes a foundation design for each pole. These designs were based on assumed soil conditions. The Structures Office will verify the project soil conditions to ensure the standard foundations are adequate. A custom design will be developed if required.

The engineer responsible for signal design will seal the mast arm tabulation sheet and the Structures Design Engineer will seal the structures data table and custom design details if required for the plans.

Refer to ***Volume 2, Chapter 24*** for instructions on the mast arm tabulation sheet.

7.4.13 Traffic Signal Project Coordination

Coordination with other offices and other agencies is a very important aspect of project design. The offices discussed in this section are not intended to be an all inclusive list with which the designer should coordinate, instead it includes offices that are normally involved in projects.

Roadway Design - Normally the designer of a signal project receives the base sheets for

design from the roadway designer. The roadway designer can also provide any required cross sections. If the signal project is not an active roadway design project, base sheets may be obtained from existing plans.

Utilities - The District Utilities Engineer provides the coordination between the designer and the various utilities involved in the project. This usually is limited to agreements with the power company for electrical service. The Utilities Section can also identify potential conflicts with overhead and underground utilities or verify those that have previously been identified.

The Utilities Engineer should be contacted early in the design phase. The designer should indicate a preferred location for the electrical service.

Structures Design - The Engineer of Record for Structures Design provides the design of the traffic signal mast arms and strain poles. This includes the design of the foundation for these structures. The Engineer of Record must be contacted early in the design phase to allow adequate time for coordination with the Geotechnical Engineer in obtaining the necessary soils information.

Pedestrian and Bicycle Coordinator - The pedestrian and bicycle coordinator should be consulted to be sure that all of the pedestrian and bicyclist concerns have been fully considered.

7.4.14 LED Light Sources

The Light Emitting Diode (LED) is the standard light source for all signal indications.

7.4.15 Pedestrian Countdown Signal Applications

Countdown pedestrian signals are the Department's standard installation on all projects that include pedestrian signal head devices. The Department's ***Traffic Engineering Manual, Section 3.9***, contains specific criteria for their installation and operation.

7.4.16 Number of Signal Heads for Through Lanes

For two lane approaches, a three-section head shall be placed over the center of each lane. If a single left turn lane is provided and protected/permissive phasing is used, a five-section cluster can serve as one of the two indications required for the through lane.

For three or more lane approaches, a three-section head shall be placed over the center of each lane. If a single left turn lane is provided, a five-section cluster can serve as one of the indications required for the inside through lane.

7.4.17 Backplates

Louvered backplates shall be installed on all signal sections for all approaches. Retroreflective backplate borders are required for all backplates where the posted speed for the approach is 45 mph or greater. Retroreflective backplates are encouraged on all backplates where the posted speed for the approach is less than 45 mph.

7.4.18 Span Wire Assemblies

Perpendicular spans, box spans or drop box spans shall be used for all signal span wire assemblies. Diagonal span assemblies shall only be used for flashing beacon installations. A design variation is required for other diagonal installations. The design variation shall be signed by both the District Design Engineer and the District Traffic Operations Engineer.

Other DRAFT Changes for Subcommittee Review

C.7.f Horizontal Clearance~~Roadside Clear Zone~~

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 roadways. Horizontal clearance requirements vary depending on design speed, whether rural or urban with curb, traffic volumes, lane type, and the object or feature.

Rural roadways with flush shoulders and roadways 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 3-12A***.

In urban areas, horizontal clearance based on clear zone requirements for rural roadways 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. Roadways 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 roadways, they are based on clearances for normal operation and not based on maintaining a clear roadside for errant vehicles. These horizontal clearance requirements are shown in ***Table 3-12B***. These horizontal clearance requirements can only be applied if all of the following restricting conditions are met:

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 either ***Table 3-12A*** or ***Table 3-12B*** depending on the condition. 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 ***Table 3-12A*** and ***Table 3-12B.***

C.7.f.1 Roadside Clear Zone

The roadside clear zone is that area outside the traveled way available for use by errant vehicles. Vehicles frequently leave the traveled way during avoidance maneuvers, due to loss of control by the driver (e.g., falling asleep) or due to collisions with other vehicles. The primary function of the clear zone is to allow space and time for the driver to retain control of his vehicle and avoid or reduce the consequences of collision with roadside objects. This area also serves as an emergency refuge location for disabled vehicles.

The design of the roadway must also provide for adequate drainage of the roadway. Drainage swales within the clear zone should be gently rounded and free of discontinuities. Where large volumes of water must be carried, the approach should be to provide wide, rather than deep drainage channels. Side slopes and drainage swales that lie within the clear zone should be free of protruding drainage structures (CHAPTER 4 - ROADSIDE DESIGN, D.6.c. Culverts).

In the design of the roadside, the designer should consider the consequences of a vehicle leaving the traveled way at any location. It should always be the policy that protection of vehicles and occupants shall take priority over the protection of roadside objects. Further criteria and requirements for safe roadside design are given in CHAPTER 4 - ROADSIDE DESIGN.

C.7.f.2~~1~~ Roadside Clear Zone Width

The clear zone width is defined as follows:

- Rural sections - measured from the edge of the outside motor vehicular travel way
- Urban sections - measured from the face of the curb

- The clear zone must be wide enough so that the sum of all the recoverable terrain within is equal to or greater than the recoverable terrain value obtained in the appropriate ***Table 3-12A or Table 3-12B***. These are minimum values only and should be increased wherever practical. The process for determining the clear zone width is to

extend the clear zone width as shown in ***Figure 3-14*** and ***Figure 3-15*** until the recoverable terrain is obtained. If non-recoverable terrain is encountered before obtaining the full amount of recoverable terrain, then the remaining amount must be provided beyond the non-recoverable terrain. Where right of way permits, the portion of recoverable terrain provided beyond the non-recoverable terrain must be a minimum of 10 feet. The clear zone is to be free of hazardous objects, hazardous terrain, and non-traversable terrain. Also, clear zones may be widened based on crash history.

~~The minimum permitted widths are provided in Table 3 - 12. These are minimum values only and should be increased wherever practical.~~

In rural areas, it is desirable, and frequently economically feasible, to increase the width of the clear zone. Where traffic volumes and speeds are high, the width should be increased. The clear zone on the outside of horizontal curves should be increased due to the possibility of vehicles leaving the roadway at a steeper angle.

C.7.f.3~~2~~ Roadside Slopes

The slopes of all roadsides should be as flat as possible to allow for safe traversal by out of control vehicles. A slope of 1:4 or flatter should be used. The transition between the shoulder and adjacent side slope should be rounded and free from discontinuities. The adjacent side slope, within the clear zone, shall not be steeper than 1:3. The side slopes should be reduced flatter on the outside of horizontal curves.

Where roadside ditches or cuts require backslope, these slopes should not exceed 1:3 in steepness within the clear zone. The desirable backslope is 1:4. Ditch bottoms should be at least 4 feet wide and can be flat or gently rounded.

C.7.f.4~~3~~ Criteria for Guardrail

If space and economic constraints are severe, it is permissible, but not desirable, to use guardrails in lieu of the requirements for width and slope of clear zone. Where the previously described

TABLE 3 – 12A
MINIMUM WIDTH OF RECOVERABLE TERRAIN
FOR DETERMINATION OF CLEAR ZONE

Rural and Urban Flush Shoulder Roadways

DESIGN SPEED (MPH)							
25 and Below	30	35	40	45	50	55	60 and Above
MINIMUM WIDTH OF RECOVERABLE TERRAIN -(FEET) (From edge of traveled way)							
6	6 Local 10 Collectors 14 Arterials	6 Local 10 Collectors 14 Arterials	10 Collectors 14 Arterials	14 Arterials and Collectors ADT < 1500 18 Arterials and Collectors ADT ≥ 1500	14 Arterials and Collectors ADT < 1500 18 Arterials and Collectors ADT ≥ 1500	18 Arterials and Collectors ADT < 1500 24 Arterials and Collectors ADT ≥ 1500	18 Arterials and Collectors ADT < 1500 30 Arterials and Collectors ADT ≥ 1500

Note: ADT in Table 3 - 12A refers to Design Year ADT.

TABLE 3 – 12B
MINIMUM HORIZONTAL CLEARANCE[1]

Urban Curb or Curb and Gutter Roadways

DESIGN SPEED[2] (MPH)				
25 and Below	30	35	40	45
MINIMUM HORIZONTAL CLEARANCE (FEET) (From face of curb)				
1.5	4[3]	4[3]	4[3]	4[3]

1. These horizontal clearance requirements can be applied only if all of the following conditions are met:
   - The facility is an urban facility.
   - The facility's design speed is 45 mph or less.
   - The facililty is predominantly a curbed facility.
   - Right of way is restricted.
2. Curb and gutter not to be used on facilities with design speed > 45mph
3. On projects where the 4-foot minimum offset cannot be reasonably obtained and other alternatives are deemed impractical, the minimum may be reduced to 1.5 feet.

~~TABLE 3 – 12~~
~~MINIMUM WIDTH OF CLEAR ZONE~~

~~Type of Facility~~	~~DESIGN SPEED (MPH)~~							
	~~25 and Below~~	~~30~~	~~35~~	~~40~~	~~45~~	~~50~~	~~55~~	~~60 and Above~~
	~~MINIMUM CLEAR ZONE (FEET)~~							
~~Rural~~ *	~~6~~	~~6 Local 10 Collectors 14 Arterials~~	~~6 Local 10 Collectors 14 Arterials~~	~~10 Collectors 14 Arterials~~	~~14 Arterials and Collectors ADT < 1500 18 Arterials and Collectors ADT ≥ 1500~~	~~14 Arterials and Collectors ADT < 1500 18 Arterials and Collectors ADT ≥ 1500~~	~~18 Arterials and Collectors ADT < 1500 24 Arterials and Collectors ADT ≥ 1500~~	~~18 Arterials and Collectors ADT < 1500 30 Arterials and Collectors ADT ≥ 1500~~
~~Urban~~ *	~~1 ½~~	~~4~~ **	~~4~~ **	~~4~~ **	~~4~~ **	~~N/A~~ ••	~~N/A~~ ••	~~N/A~~ ••

* ~~From face of curb~~

** ~~On projects where the 4 foot minimum offset cannot be reasonably obtained and other alternatives are deemed impractical, the minimum may be reduced to 1 ½'.~~

* ~~Use rural for urban facilities when no curb and gutter is present. Measured from the edge of through travel lane on rural section.~~

•• ~~Curb and gutter not to be used on facilities with design speed > 45mph.~~

~~NOTE: ADT in Table 3 - 12 refers to Design Year ADT.~~

Figure 3-14 Clear Zone Plan View

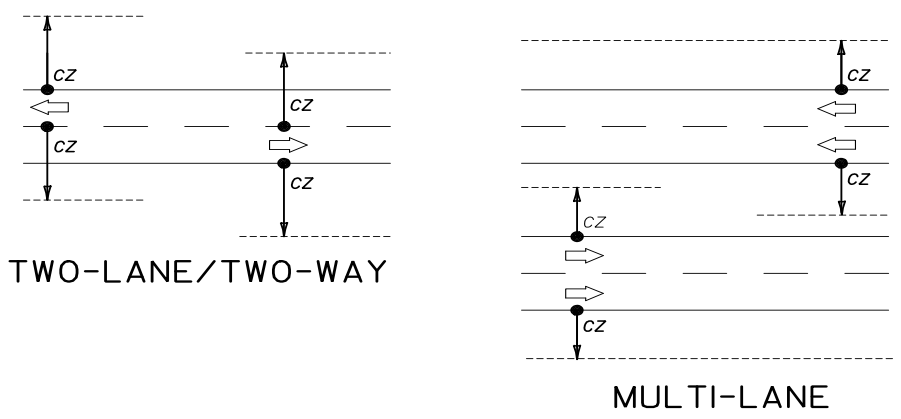
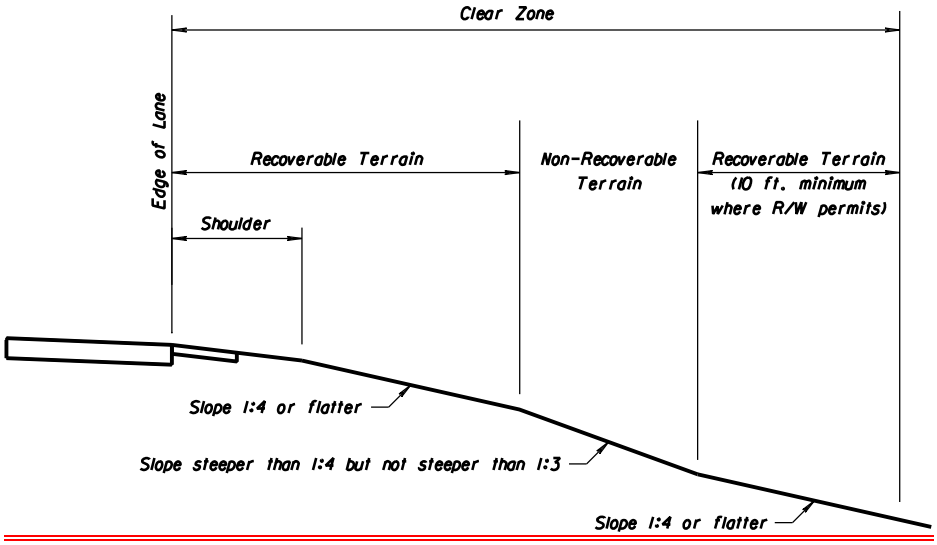


Figure 3-15 Clear Zone Cross Section



Note: Roadside Terrain includes all surfaces along the roadway other than Travel Lanes, Auxiliary Lanes, and Ramps. For the purpose of establishing Clear Zones, Roadside Terrain is defined as recoverable, non-recoverable, non-traversable, and hazardous as follows:

1. Recoverable when it is safely traversable and on a slope that is 1:4 or flatter.
2. Non-recoverable when it is safely traversable and on a slope that is steeper than 1:4 but not steeper than 1:3.
3. Non-traversable when it is not safely traversable or on a slope that is steeper than 1:3.
4. Hazardous when a slope is steeper than 1:3 and deeper than 6 feet.

CHAPTER 8

PEDESTRIAN FACILITIES

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CHAPTER 8

PEDESTRIAN FACILITIES

A INTRODUCTION

It is the goal of the State and in accordance with Section 335.065, Florida Statutes, Bicycle and pedestrian ways along state roads and transportation facilities that"

"Bicycle and pedestrian ways shall be given full consideration in the planning and development of transportation facilities, including the incorporation o such ways into state, regional, and local transportation plans and programs. Bicycle and pedestrian ways shall be established in conjunction with the construction, reconstruction, or other change of any state transportation facility, and special emphasis shall be given to projects in or within 1 mile of an urban area."

The design and construction of streets and highways in public rights-of-way must consider pedestrians. All new and reconstruction transportation projects~~highways, except limited access highways,~~ should be designed and constructed under the assumption they will be traveled along~~used~~ or crossed by pedestrians unless pedestrians are prohibited by law from using the roadway. Provisions for pedestrian traffic should be incorporated into the original highway design.

In addition to providing pedestrian facilities on new and reconstruction transportation projects, each highway agency responsible for maintaining or operating streets and urban highways should establish and maintain a program of pedestrian facilities implementation, maintenance and safety for the urban highway network.

For additional information concerning the design of sidewalks, refer to Section C.7.d of CHAPTER 3 – GEOMETRIC DESIGN.

For information concerning the design of shared use paths, refer to CHAPTER 9 - BICYCLE FACILITIES.

B TYPES OF PEDESTRIAN FACILITIES

There are several ways in which pedestrians can be accommodated in the public right-of-

way.

B.1 Sidewalks

Sidewalks provided on both sides of a street, are the preferred pedestrian facility. Where one side of the street is undeveloped, sidewalks may be provided only on the developed side of the street. Sidewalks usually have a hard surface, but can also be constructed of compacted aggregate. To comply with ADA guidelines, newly constructed, reconstructed, or altered sidewalks must be accessible to persons with disabilities.

B.2 Off-Road Paths

An off-road path, paved or unpaved, can be an appropriate facility in rural or low-density suburban areas. Paths are usually set back from the road and separated by a green area, ditch, swales or trees.

B.3 Shared-Use Paths

Shared use paths are designed for the use by both pedestrians and bicyclists and are referenced in Chapter 9 Bicycle facilities.

C~~B~~ MINIMIZING CONFLICTS

The planning and design of new streets and urban highways shall include provisions that minimize vehicle-pedestrian conflicts. These~~Features requiring special attention~~ include sidewalks and/or shared use paths parallel to the roadway, marked pedestrian crossings, detectable warnings at roadway and major driveway connections,~~center~~ raised median~~s~~ or refuge islands, pedestrian signal features such as walk lights and push buttons, ~~pathways parallel to the roadway,~~ and transit~~bus~~ stops and shelters.~~, and other pedestrian activity adjacent to the street or highway.~~

In some situations it may be possible to eliminate a vehicle-pedestrian conflict. The elimination of vehicle-pedestrian conflict points requires close coordination with the planning of pedestrian pathways and activity outside of the highway right of way. Care should be exercised to ensure the elimination of a given conflict point does not merely transfer the problem to a different location. A reduction in the number of conflict points allows for economical and effective control and protection at the remaining points of

conflict, thus providing an efficient method of pedestrian hazard reduction. Procedures for the elimination of vehicle-pedestrian conflicts are given in the subsequent material.

Any effort to minimize or eliminate conflict points must consider the mobility needs of the pedestrian: desired travel path should not be severed or the number of required crossing points and/or~~and~~ walking distances should not be significantly increased. Some conflict areas will have to be redesigned rather than eliminated or relocated.

C~~B~~.1 General Needs

Minimizing vehicle-pedestrian conflicts can be accomplished by providing adequate horizontal, physical, or vertical (primarily for crossings) separation between the roadway and the pedestrian pathways.

C~~B~~.2 Independent Systems

One ideal method for eliminating vehicle-pedestrian conflicts is to provide essentially independent systems for vehicular and pedestrian traffic. This requires adequate land use allocation and restriction (CHAPTER 2 - LAND DEVELOPMENT) and the proper layout and design of pedestrian pathways and the surface transportation network.

Where independent systems are provided, intersections between the two modes (i.e., parking areas) are still required. Due to the small number of these intersections or conflict points, they can be economically developed for safe and efficient operation.

C~~B~~.3 Horizontal Separation

The development of independent systems for pedestrian and vehicular traffic is the preferred method for providing adequate horizontal separation.

C~~B~~.3.a General Criteria

Pedestrian pathways should be placed at least as far from the rural roadway, particularly those with flush shoulders, as stipulated by the following criteria, which are given in a sequence of desirability:

- Outside of the highway right of way in a separately dedicated corridor adjacent to the highway right of way.
- At or near the right of way line (ideally, 3 feet width should be provided behind the sidewalk for above ground utilities).
- Outside of the ~~designed roadside~~ clear zone.
- Five feet from the shoulder point.~~Outside of the minimum required roadside clear zone (CHAPTER 3 - GEOMETRIC DESIGN).~~
- As far from the edge of the driving lane as possible.

Sidewalks which are set back from the roadway will need to be brought closer to the roadway at intersections. This will allow for proper placement of crosswalks and stop bars.

C~~B~~.3.b Buffer Widths

Providing a buffer can improve pedestrian safety and enhance the overall walking experience. Buffer width is the distance between the sidewalk and the adjacent roadway. On-street parking or bike lanes can act as a buffer. In areas where there is no on-street parking or bike lane, the ideal width of a planting stripe is 6 feet.

C~~B~~.4 Other Considerations

When designing urban highways with substantial pedestrian-vehicle conflict points, the following are ~~some~~ measures that may be considered to help reduce these conflicts and may increase the safety and efficient operation of the roadway.

- Control, reduce or e~~E~~liminate left and/or right turns
- Prohibit free flow right turn movements
- Prohibit right turn on red
- Use lane reductions

- Use narrower lanes and introducing raised medians, both as pedestrian refuges and to provide space for aesthetic plantings

- ~~Convert from two-way to one-way street operation~~

- Provide ~~separate signal phases for~~ pedestrian signal features

- ~~Eliminate selected crosswalks~~

- Provide pedestrian grade separations

D~~C~~ BARRIER SEPARATION

Barriers may be used to assist in the separation of vehicular and pedestrian traffic.

D~~C~~.1 Longitudinal Barriers

Longitudinal barriers such as guardrails, rigid barriers, and bridge railings are designed primarily to redirect errant vehicles away from roadside hazards. These barriers can also be used to provide valuable protection of pedestrian pathways from out of control vehicles.

Where adequate horizontal separation is not feasible, or where there is a significant hazard from out of control vehicles, longitudinal barriers may be utilized.

D~~C~~.2 Fencing or Landscaping

~~The elimination of many potential vehicle-pedestrian conflicts may be accomplished by f~~Fencing or landscaping may be used to discourage~~prevent~~ pedestrian access to the roadway and ~~to~~ aid in channeling pedestrian traffic to the proper crossing points. Fencing or landscaping shall not be considered a substitute for longitudinal barriers, but may be used in conjunction with redirection devices.

~~Fencing or landscaping may be utilized to prevent access to streets and highways at the locations described in B.1 General Needs.~~ Fencing ~~at the right of way line~~ and placement of pedestrian (and bicycle) pathways in separate corridors ~~outside of this line~~ is a necessary procedure on limited access facilities.

E~~D~~ VERTICAL SEPARATION

Vertical separation may be selectively utilized to support~~effect~~ the crossing of large pedestrian volumes across~~and~~ high speed highways particularly where the traffic volume on the roadway is at or near capacity or speeds are high. Over and underpasses would more likely be~~This method of conflict elimination is often~~ justified at major pedestrian generators such as schools, shopping centers, sports and amusement facilities, transit centers, commercial buildings, parks and playgrounds, and parking facilities.

E~~D~~.1 Overpasses

The design of pedestrian bridges or overpasses should meet current requirements~~include provisions~~ for ~~additional~~ vertical clearance.~~, as the consequences of being struck by a vehicle may be quite serious.~~ Overpasses need to either provide elevator access or meet ADA ramp criteria for maximum slope (8.33 percent), level landings for every 30 inch rise in elevation, and handrails on both sides. The minimum clear width of a pedestrian bridge on a pedestrian accessible route is 8 feet. Bridges over roadways should be covered or screened to reduce the likelihood of objects being dropped or thrown ~~onto the roadway~~ below. If the bridge is enclosed, the visual tunnel effect may require widening the bridge to 14 feet to provide a feeling of security of all bridge users. The area adjacent to overpasses may be fenced to prevent unsafe crossings and to channel pedestrians to the vertical separation structure.

E~~D~~.2 Underpasses

Pedestrian underpasses or tunnels perform the same function as overpasses. Their use is often convenient when the roadway if elevated somewhat above the surrounding terrain.

Underpasses should be adequately maintained to reduce potential problems in lighting, cleaning, policing, and flooding and to maximize safety. The area adjacent to underpasses may be fenced to prevent unsafe crossings and to channel pedestrians to the vertical separation structure. Underpasses should be wide enough to invite use by all persons. The longer the tunnel, the wider the tunnel should be to give people a feeling of security when they pass one another. A desirable minimum width is 12 feet, with wider widths suggested for lengths over 60 feet. In urban areas, a desirable minimum width is 14 feet to 16 feet.

F~~E~~ PROTECTION

The design of all pedestrian crossings and parallel pathways within the right of way shall be considered an integral part of the overall design of a street or urban highway.

The development of protection at any remaining crossings or conflict points must be adequate to achieve a total pedestrian transportation mode that is reasonably safe.

F~~E~~.1 ~~Crossings~~Crosswalks

Crosswalks serve as the pedestrian right-of-way across the street. An intersection crosswalk is defined as the extension of a sidewalk or shoulder across an intersection, whether it is marked or not.

The design of pedestrian ~~crossings~~crosswalks should be based on the following requirements:

- ~~Crossings~~ Crosswalks should be placed at locations with ample sight distances.
- At crossings, the roadway should be free from changes in alignment or cross section.
- The entire length of crosswalk shall be visible to drivers at a sufficient distance to allow a stopping maneuver.
- Stop bars shall be provided prior ~~adjacent~~ to all signalized crosswalks to inform drivers of the proper location to stop. The stop bar should be well separated from the crosswalk, but should not be closer than 4 feet.
- Stop bars shall be provided prior to all new unsignalized mid block crossings and existing crosswalks that currently operate under yield conditions may continue to do so.
- All crosswalks shall be easily identified and clearly delineated, in accordance with Manual on Uniform Traffic Control Devices (MUTCD) (Rule 14-15.010).

~~Curb ramps meeting the requirements of ADA Accessibility Guidelines (as described in the Federal Register) and the Florida Accessibility Code for Building Construction (Rule 9B-7.0042), shall be provided at all intersections where curbs and sidewalks are constructed in order to give persons with disabilities safe access.~~

F.1.a Marked Crosswalks

Marked crosswalks are one tool to get pedestrians safety across the street, though they are often best used in combination with other treatments (signs, flashing beacons, curb extensions, raised median or refuge islands, and enhanced overhead lighting). Marked crosswalks serve two purposes: 1) to inform motorists of the location of a pedestrian crossing so that they have time to lawfully yield to a crossing pedestrian; and 2) to assure the pedestrian that a legal crosswalk exists at a particular location. Marked crosswalks provide guidance for pedestrians who are crossing the roadway by defining and delineating paths on approaches to and within signalized intersections, and on approaches to other intersections where traffic stops. Marked crosswalks also serve to alert road users of a pedestrian crossing point across roadways not controlled by highway traffic signal or STOP signs.

Marked crosswalks shall not be installed in an uncontrolled environment (without signals, stop signs, or yield signs) when the posted speeds are greater than 40 mph or on multilane roads where traffic volumes exceed 12,000 vpd (without raised median) or 15,000 vpd (with raised median).

Marked crosswalks can also be used to create midblock crossings.

F.1.b Midblock Crosswalks

Midblock crossings can help supplement the crossing needs within an area. Midblock crossings are preferred because pedestrians should not be expected to make excessive or inconvenient diversions in their travel path to cross at an intersection, However, because midblock crossings are not generally expected by motorists, they should be used only where truly needed and should be sell signed and marked. Midblock crossings should be illuminated, marked and outfitted with advanced warning signs or warning flasher in accordance with the Manual of Uniform Traffic Control Devices. (MUTCD).

Midblock crossing are located according to a number of factors including pedestrian volume, traffic volume, roadway width, traffic speed and type, desired paths for pedestrians and land use.

Midblock crossings should not be installed where sight distance or sight lines are limited for either the motorist or pedestrian.

F.1.c Crossing Distance Considerations

At midblock locations where the crossing exceeds 60 feet, or where there are a limited number of gaps in traffic, a median or crossing island should be considered. A median or crossing island is a raised area separating the two main directions of traffic movement. Medians tend to be long and continuous, while crossing islands are much shorter.

Islands that use ramps should have a level landing at least 4 feet square to provide a rest area for wheelchair users. Ramped islands are only feasible where the median or island width is at least 16 feet. Medians and crossing islands should be at least 6 feet wide so that more than one pedestrian can wait.

A pedestrian pushbutton should be placed in the median of all signalize midblock crossing with actuated controllers where the total crossing distance exceeds 60 feet. Pedestrian pushbuttons in the median should be equipped with locator tones that pedestrians with vision impairments will be able to locate and use them.

F.2 Curb Ramps

Curb ramps provide access between the sidewalk and the street for people who use mobility aids such as wheelchairs and scooters, people pushing strollers and pulling suitcases, children on bicycles, and delivery services. Curb ramps meeting the requirements of ADA Accessibility Guidelines (as described in the Federal Register) and the Florida Accessibility Code for Building Construction (Rule 9B-7.0042), shall be provided at all pedestrian crossings, including mid block crossings as well as at intersections in order to give persons with disabilities safe access. A level landing is necessary for turning, maneuvering, or bypassing the sloped surface.

A curb ramp in new construction should be a minimum of 4 feet, not including the widths of the flared sides. Detectable truncated dome warning, 2 feet wide, shall be provided for the full width of ramps and blended connections to mark the street edge.

F~~E~~.3~~2~~ Controls

Signs, signals, and markings should be utilized to provide the necessary information and direction for pedestrians. All directions and regulations should be clear, consistent and logical and should, as a minimum, conform to the requirements given in the MUTCD. The use of audible tactile as well as visual signals should be considered for pedestrian traffic control and regulation.

F~~E~~.4~~3~~ Sight Distance

The general requirements for sight distances for the driver are given in CHAPTER 3 - GEOMETRIC DESIGN.

Stopping sight distances greater than the minimum should be provided at all pedestrian crossings. These sight distances should include a clear view of the pedestrian approach pathway for at least 15 feet from the outside travel lane. Where parallel pedestrian pathways are within the roadside recovery area, or where casual pedestrian crossings are likely, the normal required stopping sight distance should also include a clear view of the entire roadside recovery area.

Sight distances shall be based upon a driver's eye and object height as discussed in CHAPTER 3 – GEOMETRIC DESIGN. Due to the small height and diameter of pedestrians (particularly children), they are generally easy to confuse with other background objects.

Parking shall be prohibited where it would interfere with the required sight distance. Particular care should be exercised to ensure ample mutual sight distances are provided at all intersections and driveways.

F~~E~~.5~~4~~ Lighting

Illumination of the roadway itself is not only important for the safety of vehicular traffic, but also valuable for the protection of pedestrians. Vehicle headlamps often do not provide sufficient illumination to achieve the required stopping sight distance. Since this requirement is of vital importance at any potential pedestrian crossing point, illumination of the crossing should be considered. Lighting a street or highway is also valuable in improving the pedestrian's view of an oncoming vehicle. At intersections or other locations with vehicle turning maneuvers, the vehicle headlights may not be readily visible to the pedestrian.

The general requirements for lighting on streets and highways are given in CHAPTER 6 - ROADWAY LIGHTING. Pathways adjacent to a street or highway should not be illuminated to a level more than twice that of the roadway itself.

In general, lighting should be considered as warranted when it is necessary, at night, to provide the mutual sight distance capabilities described in the preceding CHAPTER 3 - GEOMETRIC DESIGN. Locations with significant night time pedestrian traffic that should be considered for lighting of the roadway and adjacent pedestrian pathways include the following:

- Any street or highway that meets the warranting criteria given in CHAPTER 6 - ROADWAY LIGHTING.
- Streets and highways with a speed limit in excess of 40 mph that do not have adequate pedestrian conflict elimination.
- Sections of highway with minimal separation of parallel pedestrian pathways.
- Intersections, access and decision points, and areas adjacent to changes in alignment or cross sections.
- Areas adjacent to pedestrian generators.
- Bus stops and other mass transit transfer locations.
- Parking facilities.
- Entertainment districts, sports/recreation complexes, schools, and other activity centers generating night travel.
- Pedestrian crossings.
- Any location where improvement of night time sight distance will reduce the hazard of vehicle-pedestrian conflicts.

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9.	Bicycle Facilities	Joy Puerta
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