

MEETING MINUTES

1. David O'Hagan (Committee Chairperson / Florida Department of Transportation (FDOT) State Roadway Design Engineer) opened the meeting at 8:00am. David stated this meeting was being held under the Sunshine Law and minutes were being taken. David asked to make sure all in attendance had received a [Meeting Review Package](#) and he briefly discussed the [Agenda](#).
2. The [Sign-In Sheet](#) was passed around and meeting attendees introduced themselves. The attendance roster is attached as an amendment to these minutes.
3. David O'Hagan discussed the [Committee Member Changes](#) (since last meeting). Replacing Chuck Meister as the District 3 Urban Area Member, is Keith Bryant, the Traffic Engineering Manager for Bay County. Replacing Jim Davis as the District 4 Rural Area Member, is Chris Mora, the Public Works Director for Indian River County. Replacing Charles Mixson as the District 7 Rural Area Member, is Charles Balut, the Engineering Services Director for Citrus County.
4. Rob Quigley reviewed the [2009 Meeting Minutes](#). The minutes were reviewed with one correction was made regarding the Highway Safety Manual in item 17. All were in favor to accept the minutes as amended.
5. Rob Quigley discussed ownership of the Florida Greenbook. The objective is to have the members to take ownership of the individual chapters so that changes can be better managed. One of the goals for the FDOT Central Office Roadway Design staff is to better define the role of the Associate Members for the next year's meeting. Associate Members are currently involved as technical advisors and participate in chapter development, but they do not participate in voting. The Committee Chairperson is also an Associate Member and does not participate in voting.
6. Rob Quigley stated that the [Rule Making Process](#) will begin after comments from this meeting are resolved. The Rule Making Process generally takes about 6 months to complete.
7. Rob Quigley said that according to the [Sunshine Law](#) all meetings, including subcommittee meetings, are open to the public and must be advertised. Therefore, the subcommittees need to work with Rob by giving him at least a one-week notice on any meetings so he can post the meeting information. Meeting minutes must be sent to Rob following the meetings so they can be posted.
8. The following issues were presented:

Issue #1: Strategic Highway Safety Plan (SHSP) Update

Marianne Trussell made a [Presentation on the SHSP](#) started in 2006. The plan is being updated by the Leadership Group to include teen drivers, elderly drivers, distracted driving, work zones and impaired driving. The SHSP is located at: <http://www.dot.state.fl.us/safety/SHSP/StrategicHwySafetyPlan.shtm>

Marianne noted that there is a web site for tracking roadway safety improvements as part of implementation of the SHSP. Local Agencies can enter information directly

into the system. Upgrades related to pedestrian facilities and guardrail should be entered into the system. Such upgrades have been included in resurfacing projects paid for with stimulus money. The program tracking web site is located at: <http://www2.dot.state.fl.us/safetyprogramtracking>. For further information, please contact [Marianne Trussell](#) or [Joe Santos](#).

Issue #2: Design Issues / AASHTO Update

Jim Mills gave an update on the American Association of State Highway and Transportation Officials (AASHTO) publication of three manuals: the Highway Safety Manual (HSM), the Roadside Design Guide (RSDG) and the AASHTO Policy on Geometric Design of Highways and Streets (AASHTO Green Book). The HSM is at the printer and will be sold for a cost of around \$350-\$400. The RSDG updated version should be published this year, but we do not have a target date. The AASHTO Green Book is in the balloting process now and will be published this year. There are several changes; however, none that will affect the Florida Greenbook significantly. There will be some modifications to the design vehicles and to the passing sight distance values. Also, the term ‘horizontal clearance’ will be changed to ‘lateral offset’ which will make the RSDG and the AASHTO Green Book in agreement. More information on these documents may be found on the AASHTO website: <http://www.transportation.org/>.

The question was asked as to the relationship of the Florida Greenbook to these three AASHTO documents. Jim said that there was no mandate for the Florida Greenbook Committee to adopt these manuals; however, any roadway improvements to a National Highway System roadway will require the use of these manuals. If the Florida Greenbook refers to any of these manuals, we should refer to a particular publication year since the Rule-Making process requires it.

Issue #3: Signing, Marking & Signalization

Chester Henson provided an update on the 2009 Manual on Uniform Traffic Control Devices (MUTCD), vibratory markings, mast arm policy area and new specifications for mast arm finishes.

Table 2B-1 titled “Regulatory Sign and Plaque Sizes” was revised so that conventional roadways are separated into multi-lane and single-lane. In general, the sign sizes are larger for multi-lane roadways. The Department intends to adopt the 2009 MUTCD effective January 1, 2011 with specific implementation dates for some components. These implementation dates are covered in Mark Wilson’s presentation.

The Department has updated their Plans Preparation Manual (PPM) to include the use of audible and vibratory markings. The following language is included in Section 7.2.8.2 of the PPM:

“Audible and vibratory markings shall be installed on all flush shoulder rural projects excluding limited access facilities. These markings are a countermeasure for lane departure crashes. These markings shall be installed on the outside edge lines for all two lane and multi-lane undivided rural roadways; and on the inside and outside edge lines of all multi-lane divided rural roadways.”

There is new standard for mast arm poles within 10 miles of the coast. The FDOT also selected a standard galvanized finish. If paint is to be used, the contractor must put up a bond to maintain the finish for five years after installation, afterwards the local government must maintain the finish. A policy has been instituted to inspect the structural aspects of mast arms on the State Highway System; however, no official inspection cycle has been implemented yet.

For further information, please contact [Chester Henson](#).

Issue #4: MUTCD Update

Mark Wilson gave a [Presentation on the 2009 MUTCD](#) covering several of the updates. Some of the issues covered included:

1. Although sign sizes have increased, 30” signs can remain in place until the useful life is reached.
2. A ‘wireless internet’ access sign is now included as a General Service Sign.
3. A motorcycle plaque is included in Section 6F.54 for use in work zones and may be mounted below a LOOSE GRAVEL (W8-7) sign, a GROOVED PAVEMENT (W8-15) sign, a METAL BRIDGE DECK (W8-16) sign, or a STEEL PLATE AHEAD (W8-24) sign if the warning is intended to be directed primarily to motorcyclists.
4. The dotted line pavement marking applies to intersections to separate a through lane that continues beyond the intersection from a turn lane.
5. A major revision to Signal Warrant #4 (pedestrian volume) was made in Section 4C.05. The former warrant’s two criteria to meet in order to satisfy Warrant 4 are replaced with two new criteria that are based on a combination of vehicular and pedestrian volumes for either 4-hours or a single peak hour, and only one of the criteria needs to be met. This is based on an extensive National Cooperative Highway Research Program (NCHRP) research study conducted by the Texas Transportation Institute (TTI).
6. The optional use of flashing yellow arrows for permissive turns has been incorporated in Chapter 4D. This is an alternative for circular green and has a high level of understanding and correct response by left-turn drivers and a lower fail-critical rate than the circular green.

The following is a link to MUTCD training: <http://mutcd.fhwa.dot.gov/ser-Training.htm>

For further information, please contact [Mark Wilson](#).

Issue #5: Review and Vote of the Edits for 2010 (Chapters 3, 6, 11, 18 and 19)

The [Previously Discussed Edits](#) for 2010 are contained in the Meeting Review Package dated March 24, 2010 except as noted below.

Chapter 3 – revisions approved by vote with no changes

Chapter 6 – revisions approved by vote with proposed changes

Chapter 11 – revisions approved by vote with no changes

Chapter 18 – reference on page 18-4 to ‘Table 4D-1 of the MUTCD’ should read ‘Table 4D-2 of the MUTCD’ to correspond with the 2009 MUTCD. Rob Quigley said that he would review the chapter for references to the MUTCD and change the table references to so that they are more generic where appropriate. Revisions approved by vote with proposed changes.

Chapter 19 – the issue of referencing coordination with local services appears only in Section E.1.c. Discussion ensued as to whether coordination should be referenced in other sections of the chapter. Specifically, a motion was made to add a note under Table 19-1 requiring 12’ wide outside lanes on transit routes. This motion failed by vote.

A change was proposed to E.5.b so that the second sentence reads “that would interfere with vehicle access” instead of “to allow for vehicles to negotiate access”. The language change approved by vote.

A Traditional Neighborhood Development (TND) handbook will be developed within the next 3 to 6 months.

Revisions to Chapter 19 were approved by vote with proposed changes.

Issue #6: Updating Committee Membership Information

Rob Quigley asked the committee to review their [Member Information](#) and provide updates. [Subcommittee Membership](#) was also briefly reviewed and updated. Updated Member and Subcommittee Membership information is posted on the Florida Greenbook Web Page: <http://www.dot.state.fl.us/rddesign/FloridaGreenbook/FGB.shtm>.

Issue #7: Updating the Florida Greenbook

David O’Hagan gave a short [Presentation on the “Florida Greenbook Update 2010”](#) that included the need for a general revision to the Florida Greenbook to address things like American Recovery and Reinvestment Act (ARRA) Projects, Multimodal Transportation (Chapters 8, 9 and 13), ADA Requirements and Safety issues. One of the safety issues discussed was the “Safety Edge”, which is on the FHWA web page: http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/.

Issue # 8: Workshops for 2010 Updates

David O'Hagan discussed the [Comments made by Department Technical Reviewers](#) on each chapter of the Florida Greenbook. The comments were based on indentifying issues for the subcommittees to consider for future updates to the Florida Greenbook.

The Chapter Subcommittees worked in groups to discuss the comments made through the Department technical review, and any other needed changes. Then the Subcommittees were asked to develop and report back plans for needed updates to each chapter.

Issue # 9: Chapter Author Reports

Introduction

Although there is no subcommittee for the Introduction, the terms defined here will need to be updated in coordination with the other chapter updates. All existing definitions will need to be reviewed and updated as necessary.

Chapter 1: Planning

- A. Move 1A (INTRODUCTION) and 1D (OPERATION) into Guidebook
- B. Move 1B and 1C into Chapter 2

Chapter 2: Land Development

- A. Chapter 2 will be reviewed by the chapter subcommittee.
- B. The comments from the technical reviewers will be reviewed by the committee and addressed in the next update.

Chapter 3: Geometric Design

- A. Chapter 3 will be reviewed by the chapter subcommittee.
- B. The comments from the technical reviewers will be reviewed by the committee and addressed in the next update.
- C. Coordinate and integrate changes from other chapters like TND, Residential Street Design, Maintenance, Pedestrian Facilities, etc., and check for any conflicts.
- D. Revisit definition of "Reconstruction".
- E. Update section on Roadside clear zone.
- F. Evaluate intersection sight distance criteria as it applies to driveways.

Chapter 4: Roadside Design

- A. Chapter 4 will be reviewed by the chapter subcommittee.
- B. The comments from the technical reviewers will be reviewed by the committee and addressed in the next update.

- C. A “Chapter Author” will need to be identified.
- D. Evaluate the inclusion of new or updated references or studies relating to roadside design.

Chapter 5: Pavement Design and Construction

- A. Safety edge will be added as a treatment to mitigate pavement edge drop-offs.
- B. Further discussion may be needed to address guidance for unpaved roads. *{To follow up, this issue may need to be addressed in other chapters. Perhaps AASHTO’s “Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT <= 400) 2001” could be considered as a reference since it addresses the design of unpaved roads. The US EPA also has a document available titled “Recommended Practices Manual: A Guideline for Maintenance and Service of Unpaved Roads” and is available online at: <http://water.epa.gov/polwaste/nps/unpavedroads.cfm>}*

Chapter 6: Roadway Lighting

- A. Section E – Uniformity of Illumination: change the first sentence of the second paragraph that reads “uniformity ratio of 10:1 should not be exceeded.” to “uniformity ratio of 10:1 shall not be exceeded.”
- B. Section H – Light Poles: paragraph two will be reworded will be reworded as most conventional lighting is mounted on breakaway poles.

Chapter 7: Rail Highway Grade Crossings

- A. Add a new “Section E” that will describe the need to address railroad crossing upgrades, as per Title 23 U.S.C. on Federal-aid projects.
- B. Add language that describes the 2009 MUTCD requirements for passive crossings.
- C. Evaluate language in Chapter 5 of the 2009 MUTCD for requirements at railroad crossings on low volume roads.
- D. Section B2 – Update some Rule references and references to the Design Standards, Indexes 600 and 280.
- E. Section B2 - Modify language in the 3rd line of the top paragraph.
- F. Incorporate 2009 MUTCD requirements into Figure 7-2 “Grade Crossing Configuration”.

Chapter 8: Pedestrian Facilities

A number of changes had already been discussed at previous Committee Meetings, and the subcommittee felt these changes were close to being ready for voting. An additional Committee Meeting will be scheduled to review and vote on these changes. *{To follow up, this meeting was held on [April 29, 2010](#) and the revisions to Chapter 8 were approved by vote as amended.}*

Chapter 9: Bicycle Facilities

- A. Chapter 9 will be reviewed by the chapter subcommittee.
- B. The comments from the technical reviewers will be reviewed by the committee and addressed in the next update.

Chapter 10: Maintenance

- A. Add federal-aid (Allen and Scott)
- B. Maintenance Resurfacing (Allen)
- C. Rename chapter to “Maintenance and Resurfacing”
- D. ADA and Curb-cut Ramps

Chapter 11: Work Zone Safety - no changes proposed since this chapter has just been updated for 2010.

Chapter 12: Construction – Chapter author, Tanzer Kalayci, will review and offer comments.

Chapter 13: Public Transit:

- A. Chapter 13 will be reviewed by the chapter subcommittee.
- B. The comments from the technical reviewers will be reviewed by the committee and addressed in the next update.

Chapter 14: Design Exceptions

- A. Chapter 14 will be reviewed by the chapter subcommittee.
- B. The comments from the technical reviewers will be reviewed by the committee and addressed in the next update.

Chapter 15: Traffic Calming

- A. Move 15A (INTRODUCTION) and 15B (PLANNING CRITERIA) into Guidebook
- B. Move 15C (INAPPROPRIATE TRAFFIC CALMING TECHNIQUES), 15D (APPROPRIATE TRAFFIC CALMING TECHNIQUES) and 15E (OTHER SOURCES) into Chapter 16.

Chapter 16: Residential Street Design – Chapter 16 will be reviewed by the chapter subcommittee.

Chapter 17: Bridges and Other Structures

- A. Chapter 17 will be reviewed by the chapter subcommittee.
- B. Improve guidance in the following sections:
 - a. C.4.a: Pier Locations - add reference to FDOT fender design standard.
 - b. C.4.b: Vessel Impact - add reference to FDOT vessel traffic data for ships and barges.
 - c. H.2: Sign, Lighting and Traffic Signal Supports – add guidance for Dynamic Message Signs.
 - d. Add guidance for hurricane susceptibility to storm surge.
- C. Add information on policy for inspecting pedestrian bridges
- D. These updates will be submitted for ballot next year along with the revision already proposed.

Chapter 18: Signing and Marking

- A. Table 4D-1 in old manual is now Table 4D-2 in 2009 MUTCD
- B. Revise wording of C.5 to change “should” to “shall”
- C. These revisions can be ready for balloting next year.

Chapter 19: Traditional Neighborhood Development (TND) Subcommittee – complete the new guidebook.

- 9. The chapter workshop discussions varied in duration, and were permitted to continue past the allotted time slot so their progress would not be interrupted. As each group finished, the Chapter Authors were asked to hand their reports in to David O’Hagan (or submit by email). The workshop groups that had finished were then permitted to leave.

Florida Greenbook Advisory Committee Meeting

March 24, 2010

Attendee Sign In

#	Name	Representing	E-mail (if not on committee)
1	Frank Sullivan	FDOT-CO	frank.sullivan@dot.state.fl.us
2	Jim Mills	FDOT-CO	jim.mills@dot.state.fl.us
3	Bob Quigley	" "	
4	David C O'Hara	FDOT-CO	david.o'hara-co@dot.state.fl.us
5	Howard Webb	FDOT-DA	howard.webb@dot.state.fl.us
6	Ronald Chin	FDOT-D7	ronald.chin@dot.state.fl.us
7	Keith Bryant	Bay Co.	kbryant@baycountyfl.gov
8	Scott Golden	FDOT-D3	john.golden@dot.state.fl.us
9	FRANK CHUPKA	FDOT-D1	frank.chupka@dot.state.fl.us
10	Allen SCHRUMPF	DRMP	aschrumpf@drmp.com
11	MARIO Bizzio	FDOT-D5	MARIO.Bizzio@DOT.STATE.FL.US
12	GEORGE T. WEBB	PALM BEACH CO	GWEBB@PBCGOV.ORG
13	Chris Mora	INDIAN RIVER CO.	cmora@ircgov.com
14	Harold Desdunes	FDOT-D6	harold.desdunes@dot.state.fl.us
15	Jim Pitman	FDOT-D2	jimmy.pitman@dot.state.fl.us
16	Gene Howerton	Arcadis	gene.howerton@arcadis.us.com
17	Craig Batterson	PEC IBT	cbatterson@aol.com
18	Elyrosa Estevez	City of Miami PW	eestevez@miamigov.com
19	CHARLES BALUT	CITRUS COUNTY	charles.balut@kccc.citrus.fl.us
20	STEVE NEFF	CITY OF CAPE CORAL	sneff@capecoral.net
21	Charles Ramdatt	City of Orlando	charles.ramdatt@cityoforlando.net
22	Elius Nortelus	Highlands Co.	enortelu@hcbcc.org
23	DAVID CERLANEK	ALACHUA COUNTY	DCERLANEK@ALACHUACOUNTY.US
24	Andy Tilton	Johnson Engineering, Inc.	atilton@johnsoneng.com
25	DAVID KUHLMAN	FPL	DAVID.F.KUHLMAN@FPL.COM

Florida Greenbook Advisory Committee Meeting

March 24, 2010

Attendee Sign In

#	Name	Representing	E-mail (if not on committee)
26	Dennis Scott	FDOT Safety Office	
27	Billy HATTAWAY	Vanasse Hanen Bruetlin	bhattaway@vhb.com
28	Joy Puerta	City of Boca Raton	jpuerta@myboca.us
29	Amy Datz	FDOT Transit	amy.datz@dot.state.fl.us
30	MARIANNE TRUSSELL	FDOT Safety	Marianne.Trussell@dot.state.fl.us
31	Robert Robertson	DOT Structure	Robert.Robertson2@dot.state.fl.us
32	Chester Henson	FDOT Roadway Design	chester.henson@dot.state.fl.us
33	Andre Pavlov	FDOT Structures Design	andre.pavlov@dot.state.fl.us
34	Duane Brautigam	FDOT Specs/Estimates	duane.brautigam@dot.state.fl.us
35	Fred Schneider	Florida Association of County Engineers & Road Superintendents	
36	Mark C. Wilson	FDOT - Traffic Operations	mark.wilson@dot.state.fl.us
37	JOE SANTOS	FDOT - SAFETY OFFICE	Joseph.Santos@dot.state.fl.us
38	MONICA GOURDINE	FHWA	monica.gourdine@DOT.GOV
39	Anette Brennan	FDOT-DS	
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March 24, 2010

Florida Greenbook Advisory Committee Meeting
Meeting Review Package

Agenda

AGENDA

FLORIDA GREENBOOK ADVISORY COMMITTEE MEETING

Wednesday, March 24, 2010 8:00am – 5:00pm

Florida Turnpike Headquarters
Turkey Lake Service Plaza
Building 5315, Auditorium A
Mile Marker 263 on Florida Turnpike
Ocoee, Florida 34761

- 8:00 – 8:15** General Information (15min) (Review Package Page #)
- Introductions (David O’Hagan)
 - Committee Member Changes (David O’Hagan) (11)
 - Review March 2009 Meeting Minutes & VOTE (David O’Hagan) (15)
 - Discuss Florida Greenbook Ownership (Rob Quigley)
 - Rulemaking Process (Rob Quigley)
 - Sunshine Law (Rob Quigley) (21)
- 8:15 – 8:30** Strategic Highway Safety Plan Update (Marianne Trussell) (15min)
- 8:30 – 9:00** Design Issues (30min)
- AASHTO Update (Jim Mills - 15min)
 - Signing, Marking & Signalization Issues (Chester Henson - 15min)
- 9:00 – 9:30** 2009 MUTCD Update (Mark Wilson – 30min)
- 9:30 – 9:45** Review Previously Discussed Edits for 2010 (Ch. 3, 6, 11&18) (15min) (25)
- 9:45 – 10:00** *Morning Break (15min)*
- 10:00 – 11:00** Review Previously Discussed Edits for 2010 Continued (Ch. 19) (60min) (47)
- 11:00 – 11:15** VOTE on Previously Discussed Edits for 2010 (Ch. 3, 6, 11, 18 & 19) (15min)
- 11:15 – 12:00** Updating the Florida Greenbook (David O’Hagan - 45min)
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- 12:00 – 1:00** *Lunch (60min)*
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- 1:00 – 3:00** Workshops for Updates (post-2010 Manual) (Chapter Subcommittees – 120min) (71)
- 3:00 – 3:15** *Afternoon Break (15min)*
- 3:15 – 4:00** Chapter Author Reports (45min)
- 4:00 – 4:15** Committee Member Issues (15min)
- 4:15 – 4:45** Open Comment Period (30min)
- 4:45 – 5:00** Closing Items (Rob Quigley - 15min)
- Review Contact Information / Update Subcommittee Assignments (75)
 - Meeting Critique

5:00pm – 7:00pm **TUESDAY, MARCH 23, 2010: OPTIONAL TND Field Trip:**
Baldwin Park Tour (See Next Pages for Details) - RSVP to Billy Hattaway by Noon 3/22/2010

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>

TND Chapter – Baldwin Park Tour

5:00 pm – 7:00, March 23, 2010

In the spirit of providing the Green Book Committee members with the opportunity to experience a Traditional Neighborhood Development that has incorporated many of the proposed design elements into a major TND development, Vanasse, Hangen and Brustlin would like to host a tour of Baldwin Park. The tour would occur on Tuesday, March 23rd starting and ending at Colibri Mexican, a restaurant in downtown Baldwin Park on Lake Baldwin. We will host a walking tour of downtown Baldwin Park and the adjacent neighborhoods and end with appetizers, a cash bar and dinner (optional) at Colibri Mexican restaurant.

Detailed directions are attached for your information. The drive from Florida' Turnpike headquarters is about 30 minutes.

Contact Information: Billy Hattaway 407.704.0782

Colibri Mexican
4963 New Broad Street
Orlando, FL 32814
Phone: 407.629.6601



9:00 AM	0.0 mi	1 Depart Florida's Tpke, Orlando, FL 32835 on Local road(s) (South) for 43 yds
9:00 AM	0.1 mi	Turn RIGHT (North-West) onto Local road(s) for 0.3 mi
9:01 AM	0.3 mi	*Toll road* Merge onto Florida's Tpke [Ronald Reagan Tpke] for 1.8 mi
9:03 AM	2.1 mi	*Toll road* At exit 265, take Ramp (RIGHT) onto SR-408 Toll [East-West Expy] for 11.1 mi towards SR-408-Toll E / Orlando / Titusville
9:14 AM	13.1 mi	At exit 12A, turn RIGHT onto Ramp for 0.3 mi towards Bumby Ave
9:15 AM	13.5 mi	Merge onto SR-15 [E Anderson St] for 131 yds
9:15 AM	13.5 mi	Turn LEFT (North) onto (S) Bumby Ave for 98 yds
9:15 AM	13.6 mi	2 At near Orlando, stay on S Bumby Ave (North) for 1.0 mi
9:17 AM	14.6 mi	Turn RIGHT (East) onto SR-50 [E Colonial Dr] for 1.1 mi
9:20 AM	15.7 mi	Turn LEFT (North) onto Local road(s) for 21 yds
9:20 AM	15.7 mi	Road name changes to Bennet Rd for 0.5 mi
9:22 AM	16.2 mi	Turn RIGHT (East) onto New Broad St for 0.7 mi
9:24 AM	17.0 mi	3 Arrive 4963 New Broad St, Orlando, FL 32814 [4963 New Broad St, Orlando, FL 32814]

Committee Member Changes

FLORIDA GREENBOOK ADVISORY COMMITTEE

2009/2010 MEMBERSHIP CHANGES

MEMBERS

DISTRICT 3

Last year, Chuck Meister retired from his position as the City Engineer for the City of Destin. The D-3 Urban Area Member vacancy has been filled by **Keith Bryant**, the Traffic Engineering Manager for Bay County.

DISTRICT 4

Last year, Jim Davis retired from his position as Public Works Director for Indian River County. The D-4 Rural Area Member vacancy has been filled by **Chris Mora**, the Public Works Director for Indian River County.

DISTRICT 7

Last Year, **Charles Mixson** left his position as the County Engineer for Hernando County, leaving the D-7 Rural Area Member position VACANT.

March 2009 Meeting Minutes

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 Schrupf (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 HSM will include calibration factors that can be utilized for local areas and/or jurisdictions. 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.

Sunshine Law

A Summary of Florida's Government in the Sunshine Law

September 22, 2005

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.

FLORIDA'S STRATEGIC HIGHWAY SAFETY PLAN (SHSP)

Developed 2006
Process Approved by FHWA Sept. 2006
The FDOT is the Lead Agency



Florida's SHSP

13 Member Executive Committee

12 Signatories to the SHSP –
including the MPOAC

20 Member Steering Committee

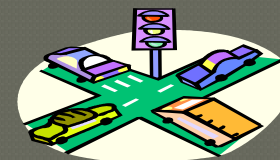
Goal: develop a comprehensive plan to strategically address roadway safety issues to reduce deaths and serious injuries

Four Emphasis Areas

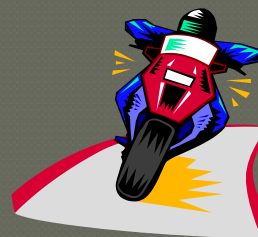
ž Aggressive Driving



ž Intersection Crashes



ž Vulnerable Road Users

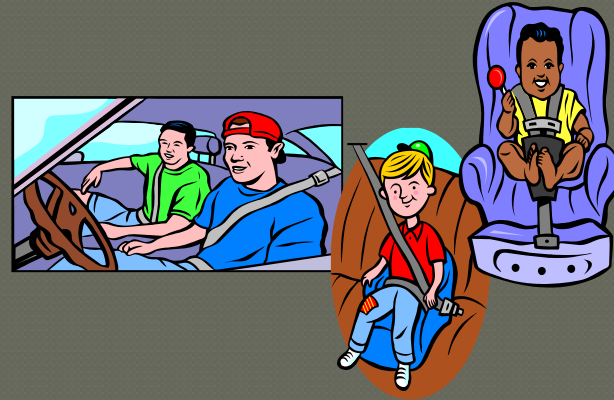


ž Lane Departures



Three Other Priority Areas

ž Occupant Protection



ž Impaired Driving



ž Data



SHSP – THE 2ND GENERATION

- ž FHWA looking for update
- ž Some states have updated 2-3 times
- ž What to do in Florida?
 - Affirm as written for continued implementation
 - Amend in part
 - Start anew

SHSP LEADERSHIP GROUP

- ž Consists of members from Executive and Steering Committees and Emphasis Area Teams
- ž Meet Quarterly
- ž January straw poll on what to do next
 - Zero votes to start anew
 - 50/50 split to amend in part and affirm as written

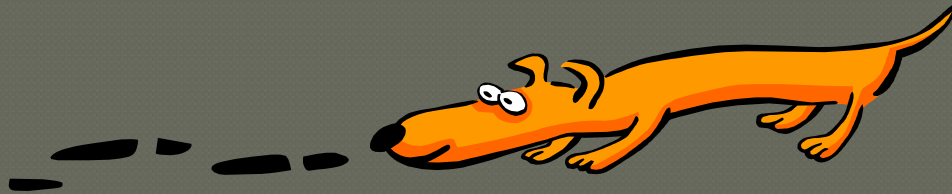
How to amend?

- ž Add teen drivers
- ž Add elder drivers
- ž Add distracted driving
- ž Add work zones
- ž Elevate impaired driving to an Emphasis Area
- ž Elevate data to an Emphasis Area

Next Steps

- ž Leadership Group meets again June 3
- ž Update web survey to gain wide input
- ž Planning statewide summit in conjunction with 2060 Florida Transportation Plan summit in August 2010
- ž Present results and recommendations to Executive Board Fall 2010

Tracking Implementation Efforts



www2.dot.state.fl.us/safetyprogramtracking

This internet site was created for all agencies/entities to enter their programs/projects that promote and implement the SHSP.

It looks like this:



Safety Program Tracking

Friday, February 29, 2008

- [Home](#)
- [Add a Project](#)
- [Search / Reports](#)
- [Administration](#)
- [Help](#)
- [Log Out](#)

Filter by:

[Calendar](#) [Export](#)

Status: -- Disregard Status -- Agency: -- All -- Emphasis Area:

-- All -- [Print Report](#)

Show Project Dates Show Contacts Show Agency Names Show Approved Projects Only

Records per page: 10 per page

Emphasis Areas

Aggressive Driving	Impaired Driving
Intersection Crashes	Occupant Protection
Vulnerable Road Users	Traffic Data
Lane Departure Crashes	

Entered On	Project Name	Agency	Primary Funding	Status	Approved	Emphasis Areas
2/28/08	421715-1, LAP, CR 2321 @ Kingswood intersection	Department of Transportation/FDOT DISTRICT 3	Federal Dollars	In Progress Note: Change status to Complete	Y	x
2/28/08	421630-1, LAP, SR 166 sidewalk	Department of Transportation/FDOT DISTRICT 3	Federal Dollars	In Progress Note: Change status to Complete	Y	 x
2/28/08	419374-1, LAP, SR 77 sidewalk	Department of Transportation/FDOT DISTRICT 3	Federal Dollars	In Progress Note: Change status to Complete	Y	 x

For More Information

Contact:

Marianne Trussell, Chief Safety Officer

Marianne.Trussell@dot.state.fl.us

Office: 850-245-1504

Cell: 850-933-1947

You can find the SHSP here:

<http://www.dot.state.fl.us/safety/>

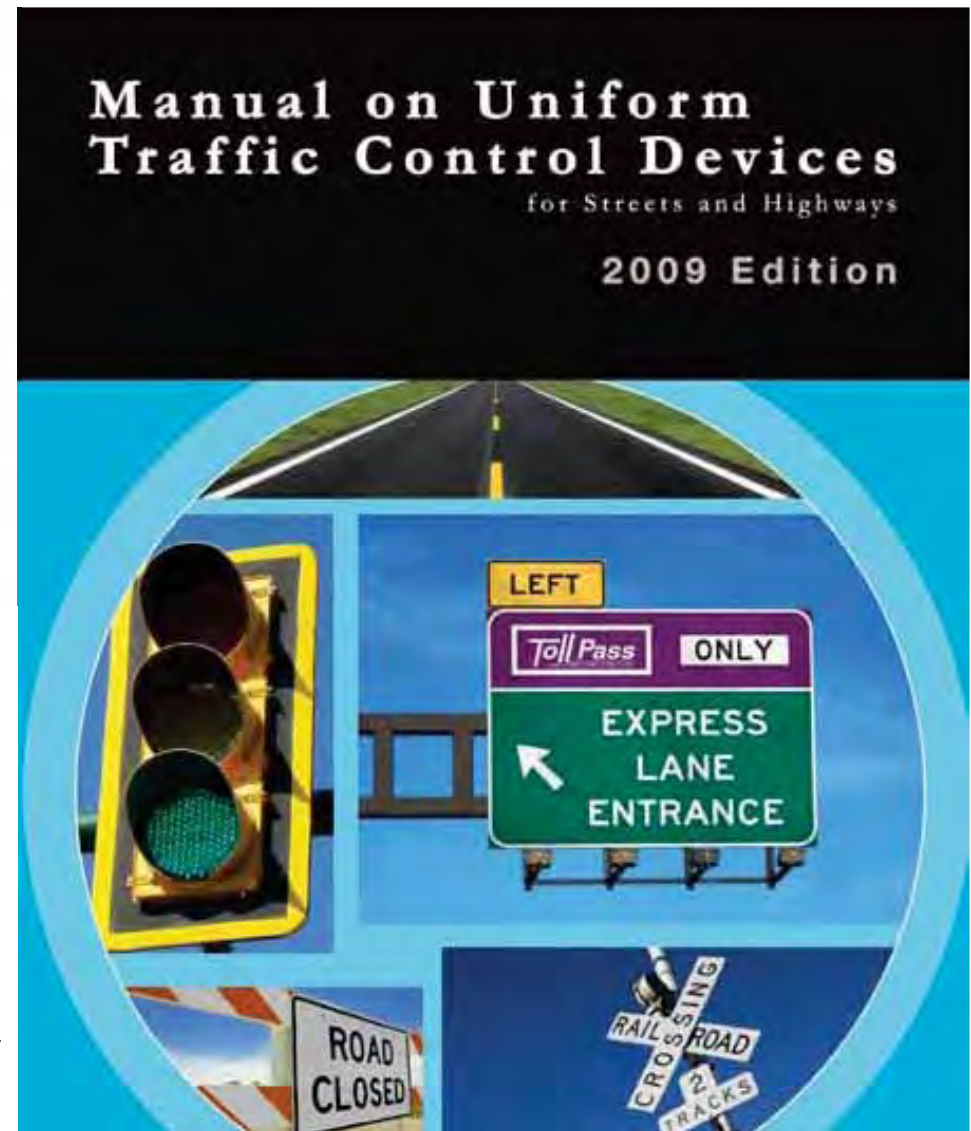
(click on Strategic Highway Safety Plan link)

QUESTIONS?



FDOT Impact to the Adoption of the FHWA's MUTCD 2009

Mark C. Wilson, P.E.
State Traffic Operations Engineer
March 23, 2010



Adoption of the MUTCD 2009

- FHWA published on 12/16/2009
- FHWA effective date is 1/15/2010
- Gives states two years to adopt
- State of Florida will adopt on January 1, 2011



How does the 2009 MUTCD relate to the Final Rule on Maintaining Sign Retroreflectivity?

- Sign Retroreflectivity Rule modified the 2003 MUTCD as Revision 2 of that edition, and became effective on January 22, 2008
- The final rule for the 2009 MUTCD incorporates the sign retroreflectivity material that is already in effect
- Compliance Date: 1/22/2012



Compliance Dates

- New installations, replacements, rebuilds – must comply immediately
- New Table I-2 with specific compliance dates to retrofit or replace existing devices to meet 11 of the new Standards in the 2009 MUTCD

Table I-2. Target Compliance Dates Established by FHWA (Sheet 2 of 3)

2009 MUTCD Section Number(s)	2009 MUTCD Section Title	Specific Provision	Compliance Date
2C.50	Non-Vehicular Warning Signs	Elimination of crosswalk lines from crossing signs and use of diagonal downward pointing arrow (W16-7P) supplemental plaque if at the crossing (2003 MUTCD Section 2C.41)	January 17, 2011 (a)(b)
2C.61	PHOTO ENFORCED Plaque (W16-10P)	New plaque (2003 MUTCD Section 2C.53) (*)	December 22, 2013 (b)
2C.63	Object Marker Design and Placement Height	Width of stripes on Type 3 striped marker (2003 MUTCD Section 3C.01)	December 22, 2013 (b)
2D.43	Street Name Signs (D3-1 or D3-1a)	6-inch letter height for lettering on post-mounted Street Name signs (except on multi-lane streets with speed limits greater than 40 mph) (2000 MUTCD Section 2D.38)	January 9, 2012 (a)
2D.43	Street Name Signs (D3-1 or D3-1a)	8-inch letter height on post-mounted signs on multi-lane streets with speed limits greater than 40 mph and 12-inch letter height on overhead signs (2003 MUTCD Section 2D.38)	December 22, 2018 (b)
2D.44	Advance Street Name Signs (D3-2)	Requirements of new Section 2D.39 in the 2003 MUTCD	December 22, 2018 (b)
2D.45	Signing on Conventional Roads on Approaches to Interchanges	New requirement in the 2009 MUTCD for multi-lane approaches to interchanges to have guide signs to identify which direction of turn is to be made for access to each direction of the freeway or expressway	December 31, 2019



Meanings of text headings (Standard, Guidance, Option, Support)

- Relocated from MUTCD Introduction to Section 1A.13
- Standard statements shall not be modified or compromised based on engineering judgment or engineering study

Section 1A.13 Definitions of Headings, Words, and Phrases in this Manual

Standard:

- 01 When used in this Manual, the text headings of Standard, Guidance, Option, and Support shall be defined as follows:
- Standard**—a statement of required, mandatory, or specifically prohibitive practice regarding a traffic control device. All Standard statements are labeled, and the text appears in bold type. The verb “shall” is typically used. The verbs “should” and “may” are not used in Standard statements. Standard statements are sometimes modified by Options. Standard statements shall not be modified or compromised based on engineering judgment or engineering study.
 - Guidance**—a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate. All Guidance statements are labeled, and the text appears in unbold type. The verb



New Recommendation: Size of sign lettering based on 1 inch letter height per 30 feet of legibility

- Based on 20/40 vision
- 2003 MUTCD recommended 1 inch per 40 feet based on 20/33 vision
- 1988 and earlier MUTCDs were 1 inch per 50 feet of legibility based on 20/20 vision
- Compliance Date: Ranges from 1/9/2012 to 12/31/2019 depending on sign.



Larger Sizes for Certain Signs on 40 mph or More Multi-Lane Roads (Table 2B-1)



Compliance Date: 12/22/2013

Larger Sizes for STOP Signs (Table 2B-1)

- 36 inches for any STOP sign facing a multi-lane approach
- 36 inches for any multi-lane side road approach to a multi-lane road
- 36 inches for any side road approach to a multi-lane road with a speed limit of 45 mph or higher
- Compliance Date: 12/22/2013



New Recommendation: Use of Overhead Lane-Use Control Signs



New Criteria: To Determine Advisory Speeds

Support: Among the established engineering practices that are appropriate for the determination of the recommended advisory speed for a horizontal curve are the following:

- A. An accelerometer that provides a direct determination of side friction factors
- B. A design speed equation
- C. A traditional ball-bank indicator using the following criteria:

16 degrees of ball-bank for speeds of 20 mph or less

14 degrees of ball-bank for speeds of 25 to 30 mph

12 degrees of ball-bank for speeds of 35 mph and higher



New Requirement: Use of Mixed-Case Lettering



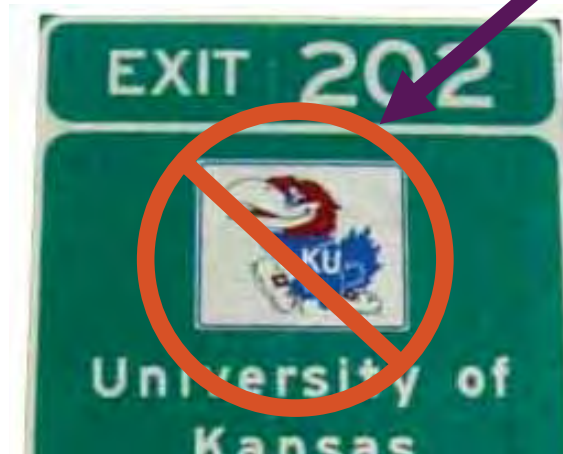
Compliance Date: 12/22/2018



New Provision: Use of Pictographs on Guide Signs



Exceeds maximum size,
not official seal



New: Symbol Signs



New Requirement regarding E-mail and Internet addresses and telephone numbers

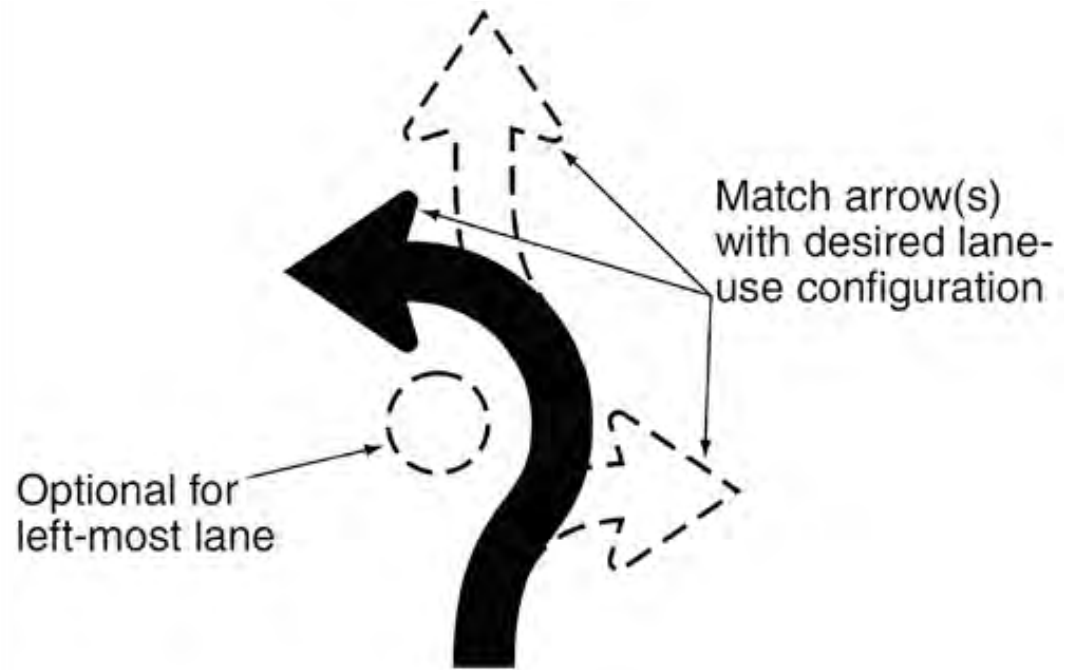
- Internet and email addresses, domain names and URLs: prohibited on any sign
- Phone numbers with more than 4 characters should not be shown on any sign



OK

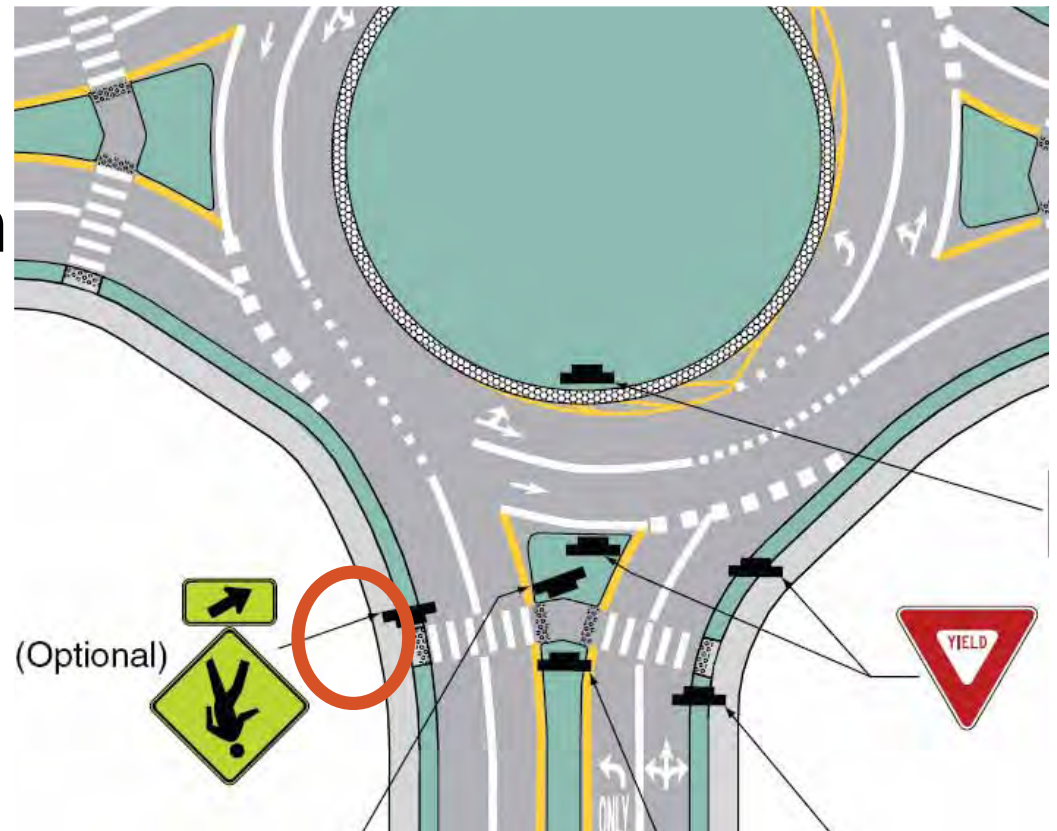


New optional fish-hook arrows for use on lane-use control signs at roundabouts

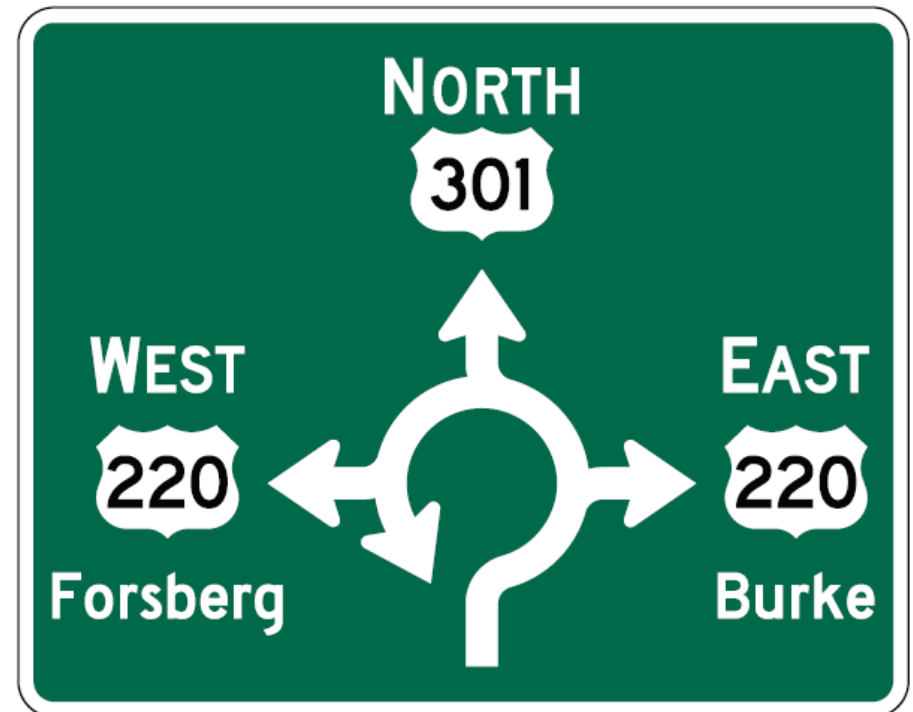


Supplemental YIELD sign for Roundabout

- Revised from required to recommended on the left-hand side of a multi-lane approach to a roundabout



New Signs: Roundabout Guide Signs



On Multi-Lane Approach to Interchanges, Guide Signs to Identify Turn or Lane Direction for Each Ramp Shall be Provided



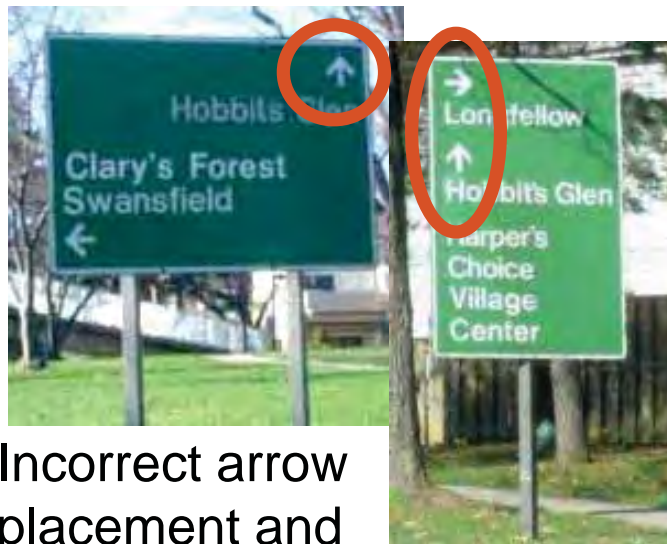
Compliance Date: 12/31/2019



New Provisions: Wayfinding Signs



Not for primary destinations



Incorrect arrow placement and order of destinations

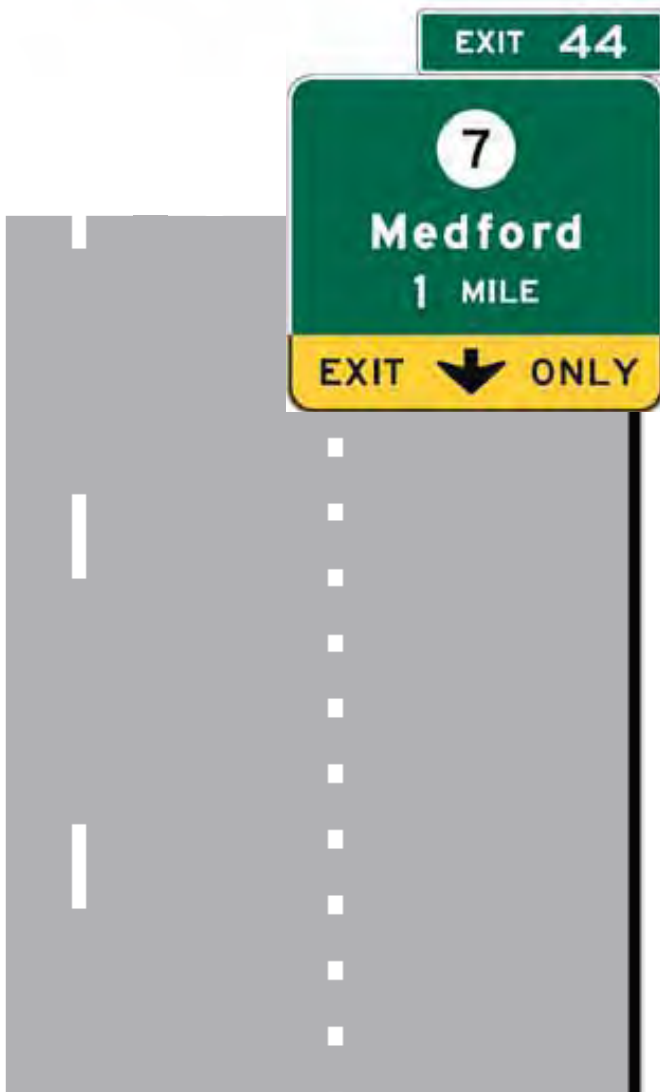


Incorrect use of boundary sign, excessive info

- Use on freeways, expressways, or ramps not allowed
- Position of arrows, order and number of destinations
- Guidance on location of pedestrian wayfinding

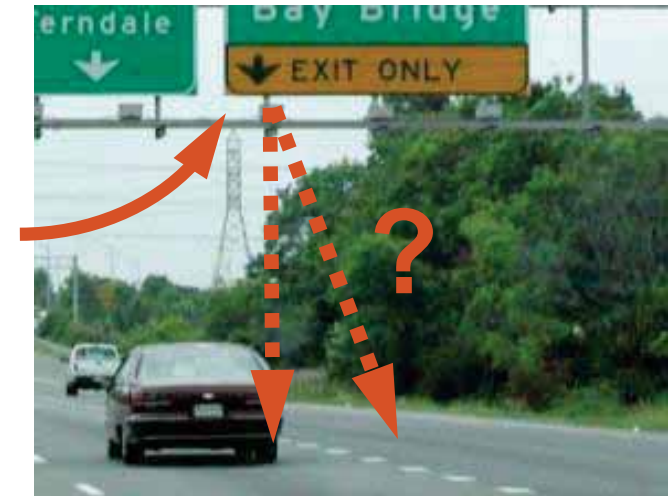


New Standard: Down Arrows Over Center of Lane Required for Guide Signs

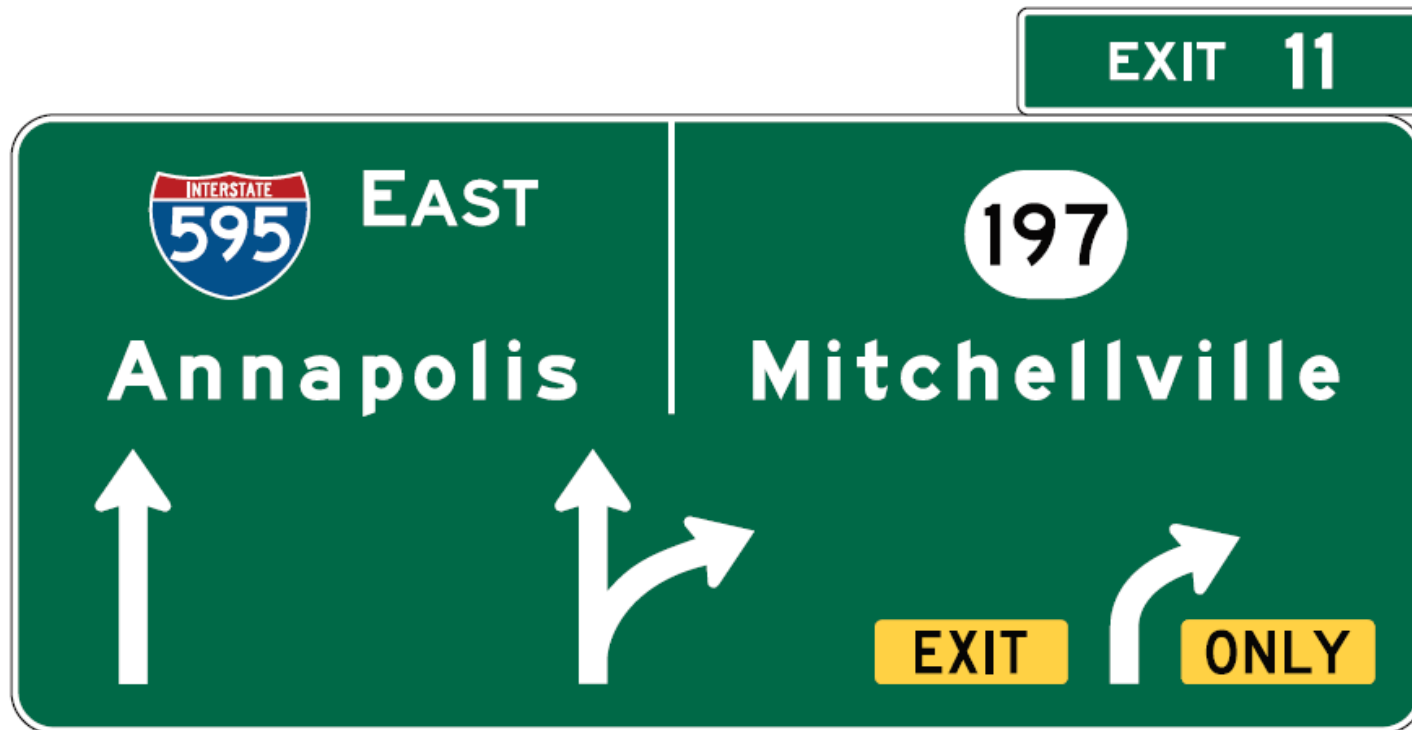


- Approximate center of lane
- Arrow must point vertically down
- Arrow and sign above applicable lane
- Arrow clearly relates to lane

Avoid ambiguous placement of down arrow



New: Overhead Arrow-per-Lane Signs for Option-Lane Exits and Splits Feature an Upward-Pointing Arrow



Overhead Arrow-per-Lane Guide Signs



- Required at new or reconstructed option lane locations (major interchanges, splits)
- Provision for conversion from diagrammatic (interim gore sign location)



Diagrammatic Signs



- Existing concept retained
- Limited to locations with an option lane
- Limited to existing facilities only



New Requirement: Exit Numbering by Reference Location

EXITS 33 A-B

Space required between the number and letter



Compliance Date: 12/22/2013



New Requirement: LEFT Plaques Used for All Exits to the Left



Compliance Date: 12/31/2014



New Option: Advisory Speed Legend May be Added to an Exit Direction Sign



Exit Direction sign with E13-2 sign panel

OR



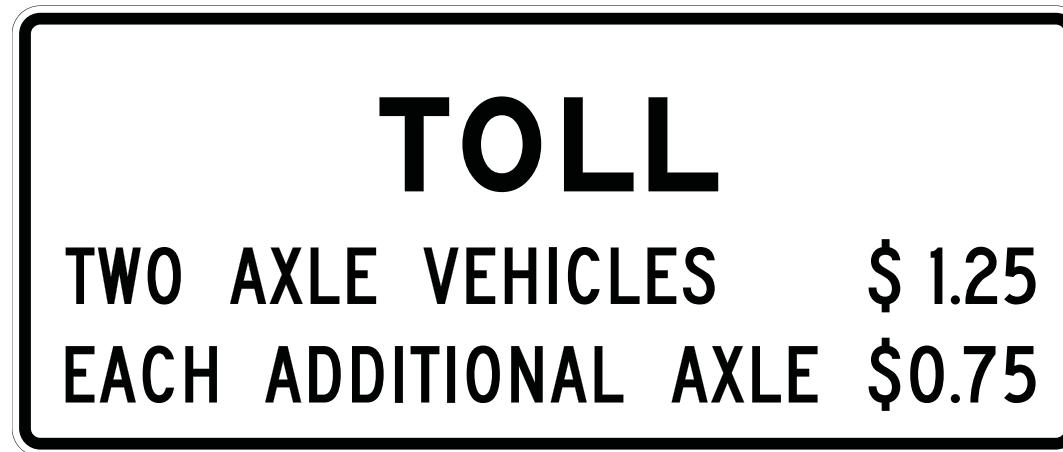
Exit Direction sign with E13-2 sign panel and flashing yellow beacons



New Signs: Toll Plaza Symbols



New Guidance: Toll Rate Sign



Limited to three lines of text unless used at toll booths where vehicles must stop



New Signs: Managed Lanes — Comparative Travel Times



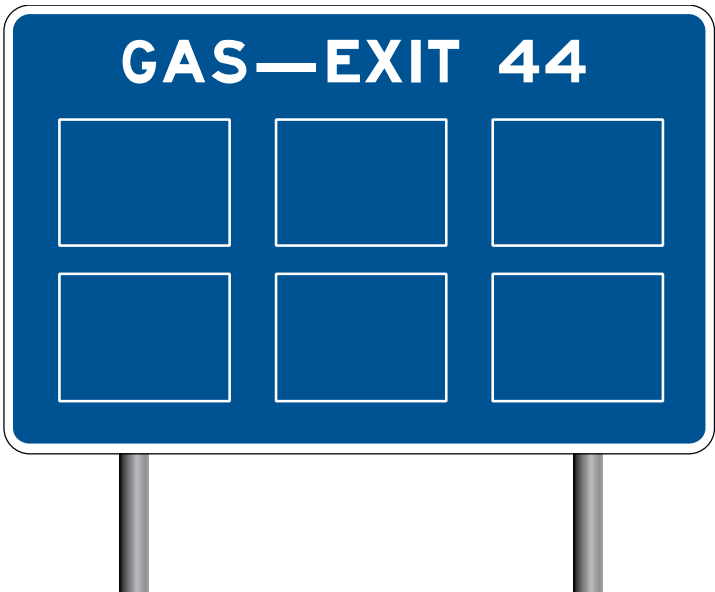
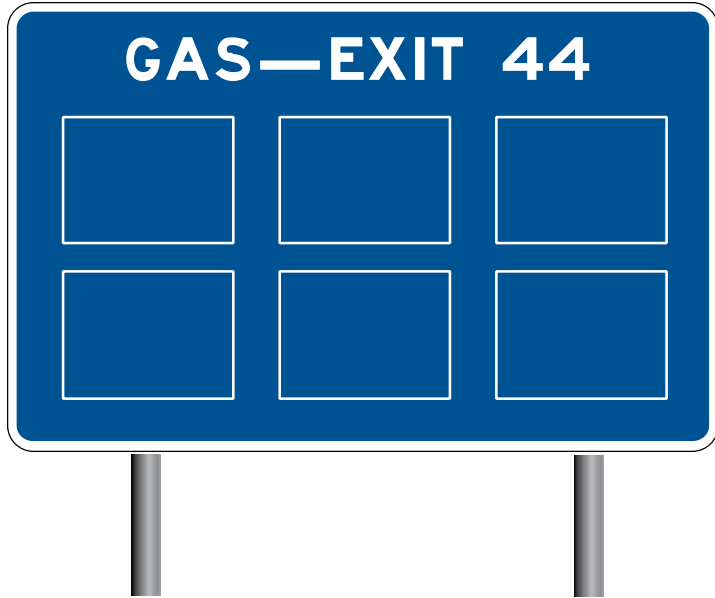
Legend Changed from “Dial” to “Call”



Compliance Date: 12/22/2013

Logo Signs

12 logos on two signs allowed for one service type at an interchange



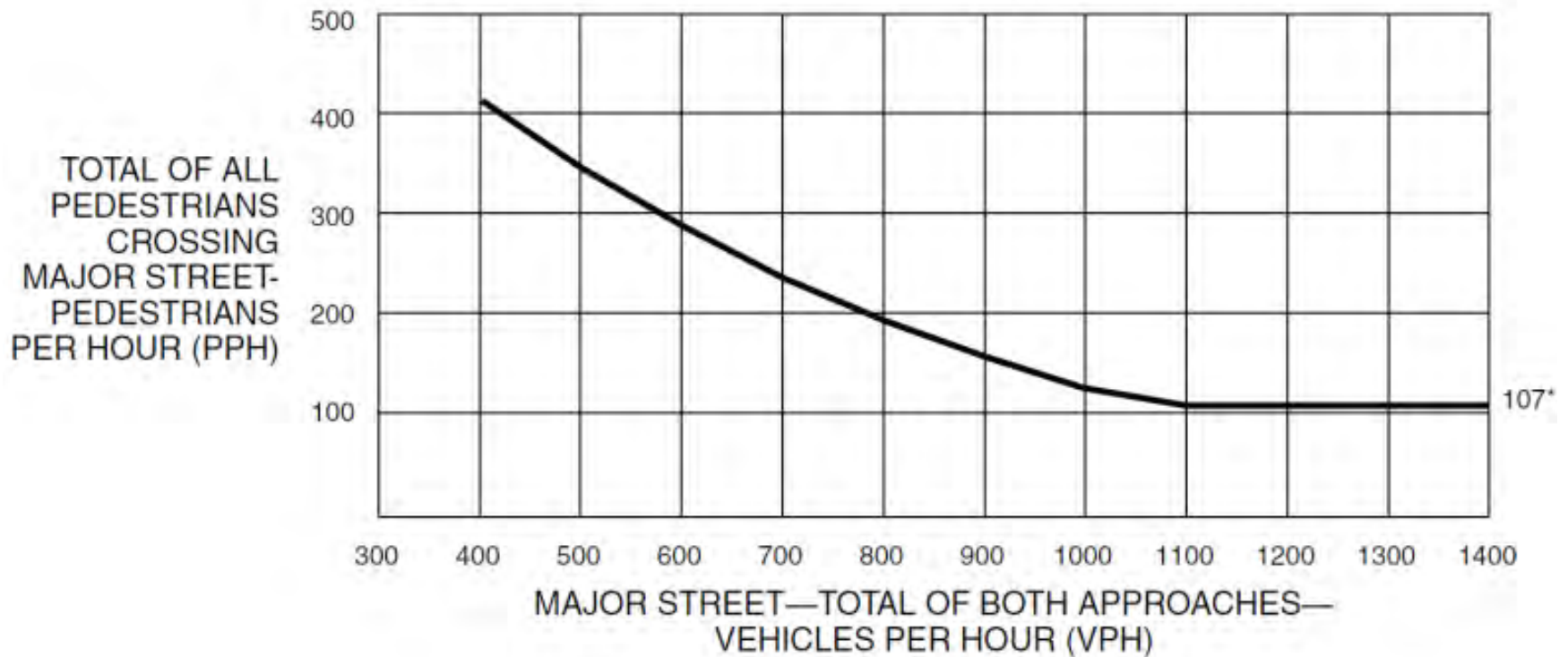
White Lane Line Markings

- Dotted (not broken) lane lines shall be used for non-continuing lanes:
 - Lane Drops (wide dotted)
 - Auxiliary Lanes (wide dotted)
 - Acceleration Lanes (normal width dotted)
 - Deceleration Lanes (normal width dotted)
- Applies to limited and non-limited roads
- Compliance Date: 12/31/2016 or resurfacing whichever occurs first



New Revision: Traffic Signal Warrant 4 (pedestrian volume)

Figure 4C-5. Warrant 4, Pedestrian Four-Hour Volume

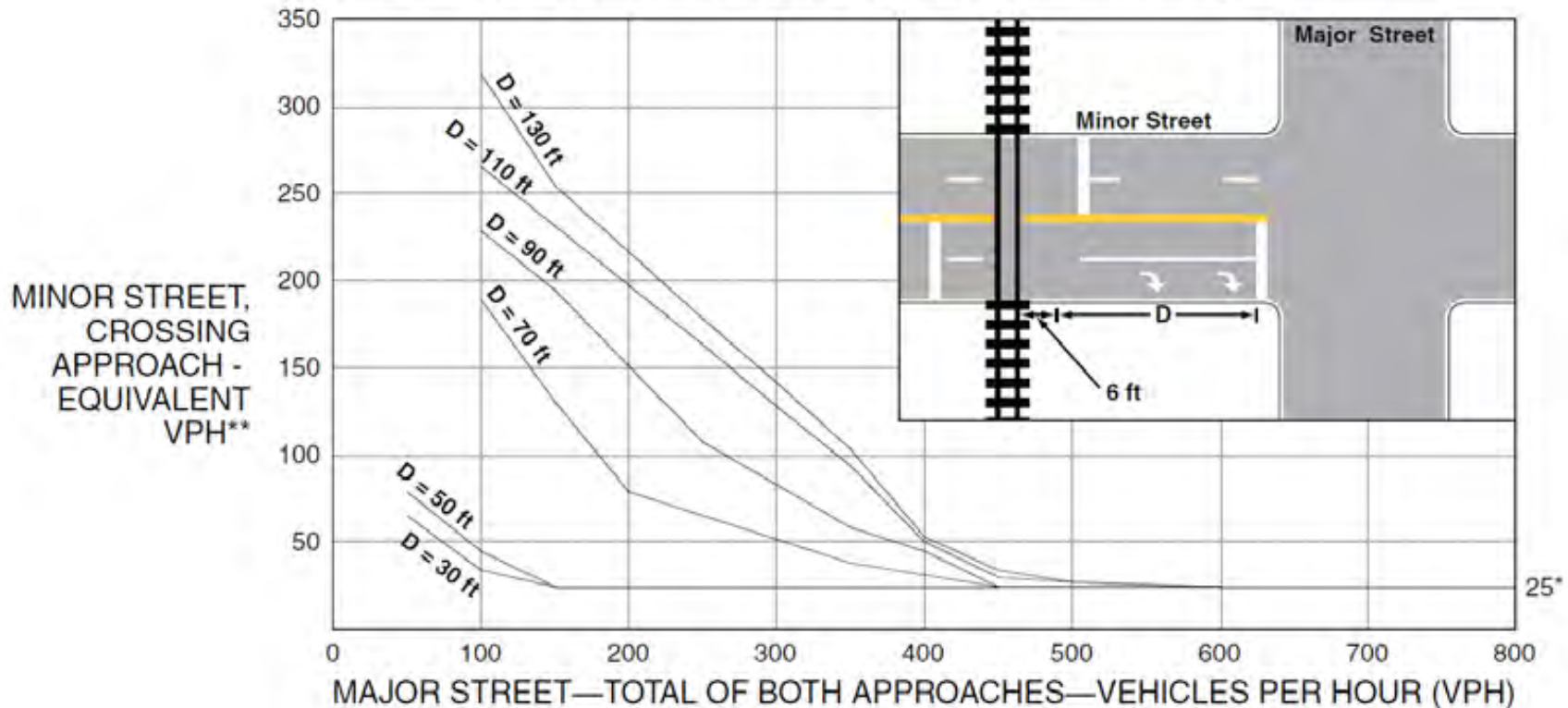


*Note: 107 pph applies as the lower threshold volume.



New: Traffic Signal Warrant 9 (Intersections Near Grade Crossings)

Figure 4C-10. Warrant 9, Intersection Near a Grade Crossing
(Two or More Approach Lanes at the Track Crossing)

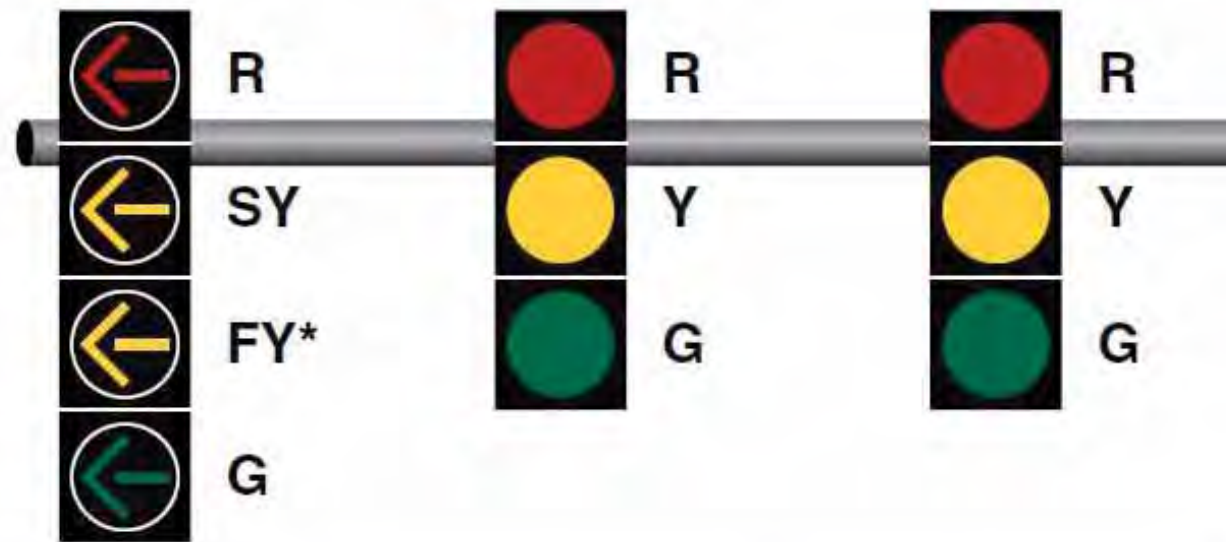


* 25 vph applies as the lower threshold volume

** VPH after applying the adjustment factors in Tables 4C-2, 4C-3, and/or 4C-4, if appropriate



New Option: Use of Flashing Yellow Arrow for Permissive Turns



New Option: U-turn Arrow Indications



R

Y

G



New Option: Yellow Retroreflective Borders Around Backplates



New Standard: Protected-Only Mode Shall Not Be Used without Exclusive Turn Lane

...unless turn phase always begins and ends simultaneously with the adjacent through movement (“split-phased”)



New Standard: Yellow Change Intervals and Red Clearance Intervals

- Durations shall be determined using engineering practices
 - Compliance Date: December 31, 2014 or when timing adjustments are made (whichever occurs first)
- Use of red clearance – changed from option to guidance, when indicated by application of engineering practices



New Guidance: Back-up Power Should Be Provided for Signals with RR Preemption



New Recommendation: Slower Walking Speed for Calculating Pedestrian Clearance Time

~~**4.0 feet per second**~~

Ped. Clearance Time based on 3.5 feet / sec

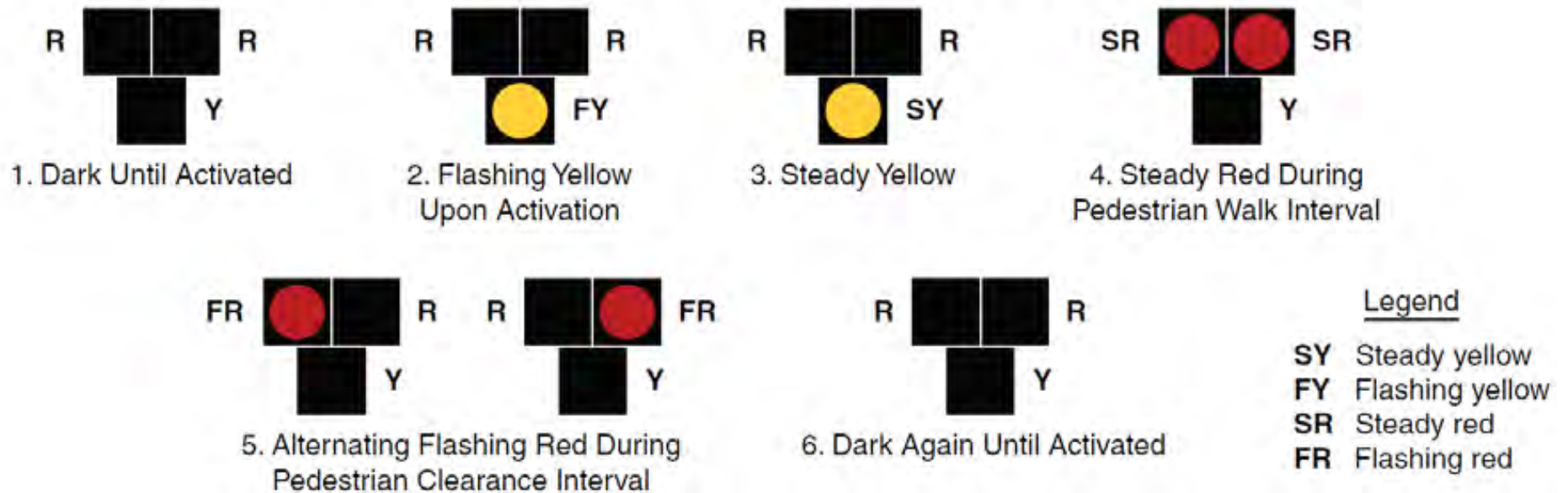
[Exception allows 4.0 ft /sec if extended button press or passive ped detection allows slower peds to request additional crossing time]

Sum of Walk time + Ped. Clearance Time based on 3.0 feet per second for distance from ped detector to far side



New: Pedestrian Hybrid Beacon

Figure 4F-3. Sequence for a Pedestrian Hybrid Beacon



New Sign: State Laws Requiring Full Stop for Pedestrians in Crosswalk



R1-5



R1-5a



R1-5b

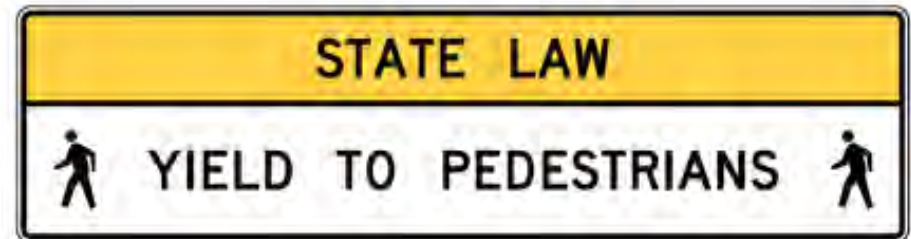


R1-5c

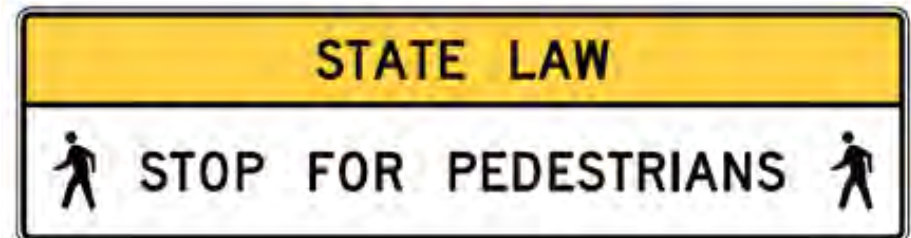
Compliance Date: 12/22/2013



New: Overhead Pedestrian Crossing Signs



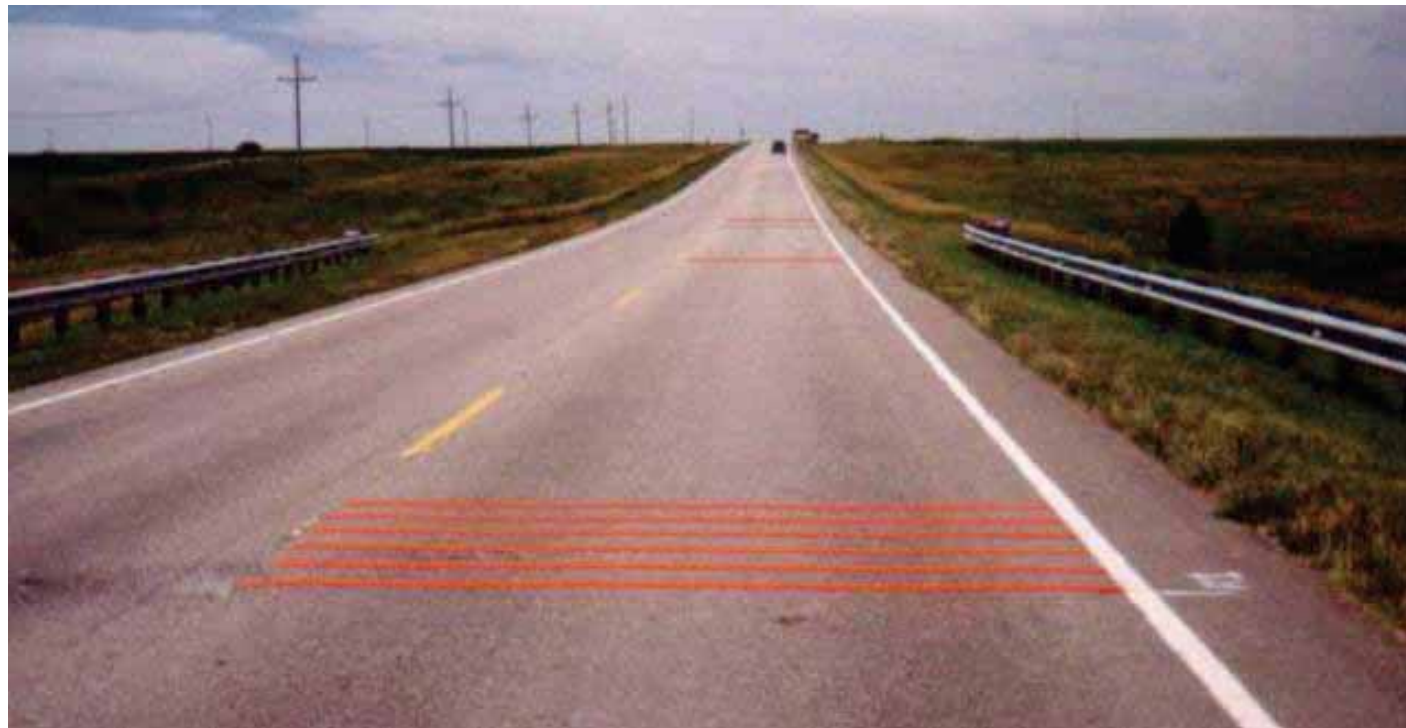
R1-9



Compliance Date: 12/22/2013



New Standard: Black and Orange are Acceptable Colors for Transverse Rumble Strips in Work Zones



Provisions for Traffic Incident Management

- A reference is made to the Incident Command System (ICS)
- All on-scene responders and news media personnel should wear high-visibility apparel
- Light sticks may be used in lieu of flares



New Requirement: Fluorescent Yellow Green for All School Warning Signs



Compliance Date: 1/17/2011



New Symbol Sign to Replace the Word Message Sign



S3-1



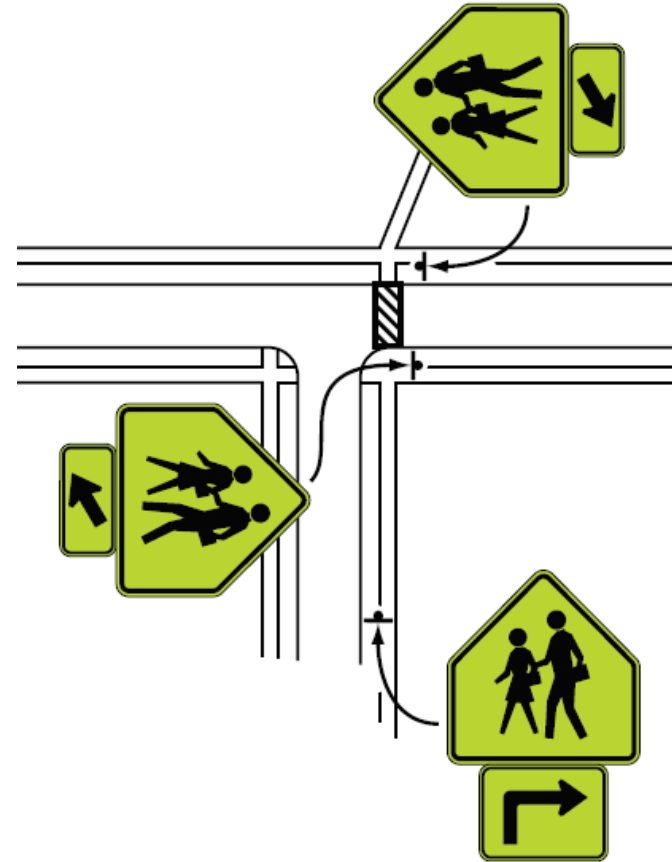
New Option: Warning of School Zone in Close Proximity to an Intersection



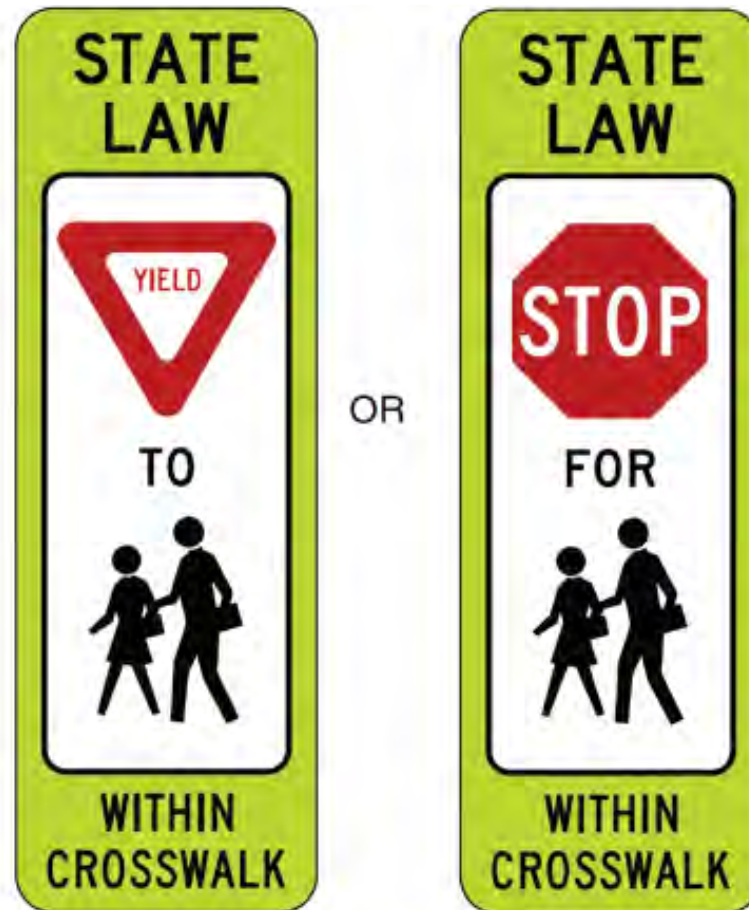
S1-1



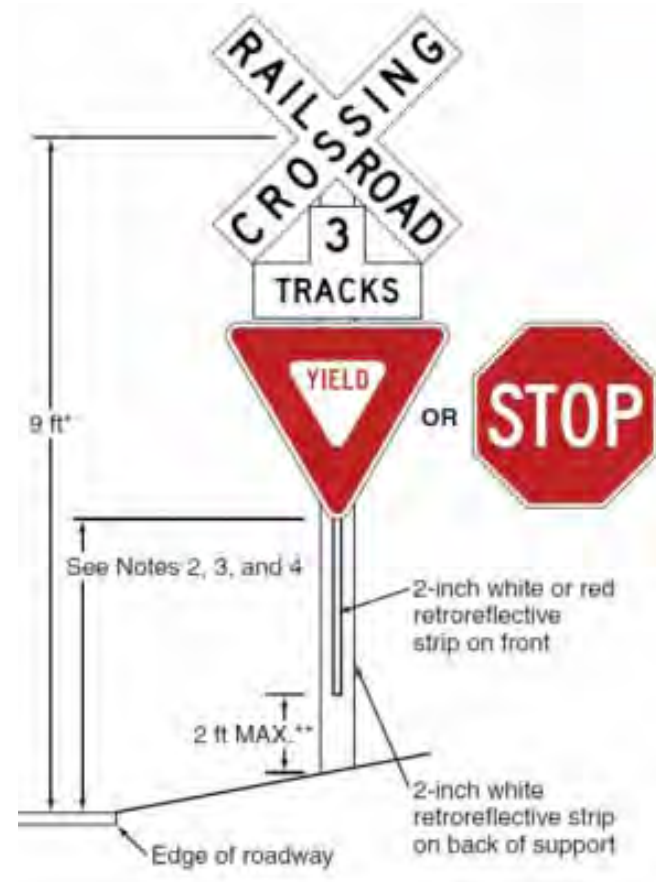
W16-6P



Schoolchildren symbol may be used on in-street signs at school crossings

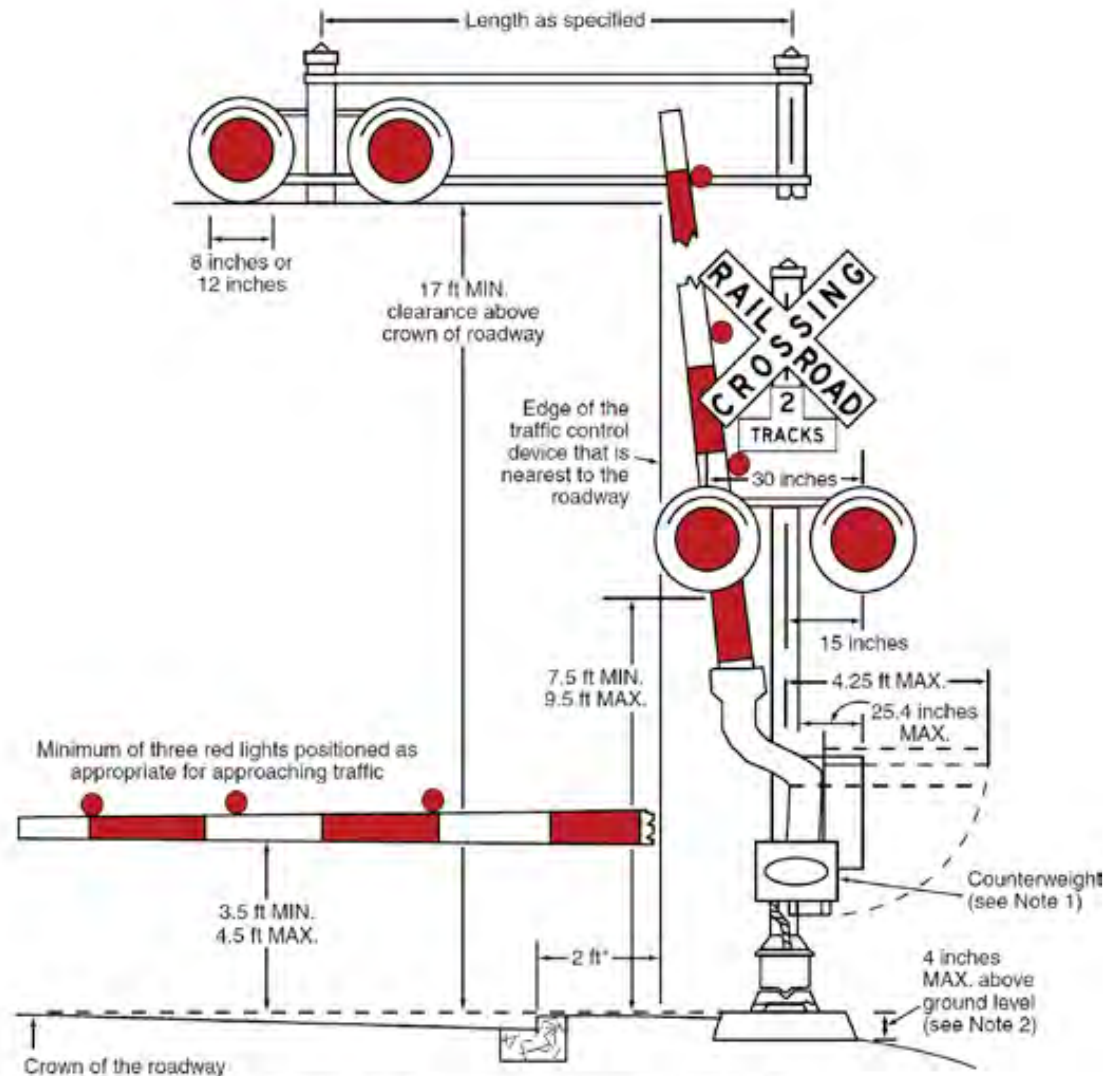


New Requirement: YIELD or STOP Signs at Passive Highway-Rail Grade Crossings



Compliance Date: 12/31/2019

New Requirement: Stripes on Gate Arms Shall be Vertical



*For locating this reference line on an approach that does not have a curb, see Section 8C.01.



New Sign and Plaque: Combined Pedestrian/Bicycle Crossing



Compliance Date: 1/17/2011

New Bicycle Destination Guide Signs

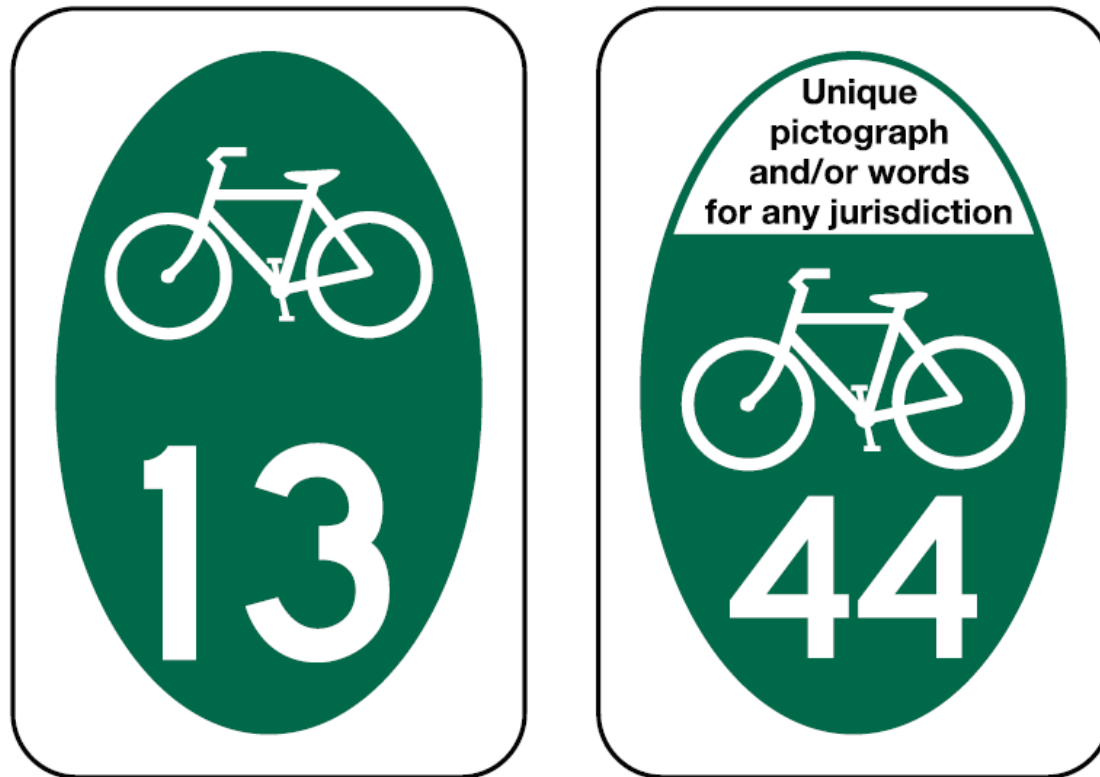


D1-3c

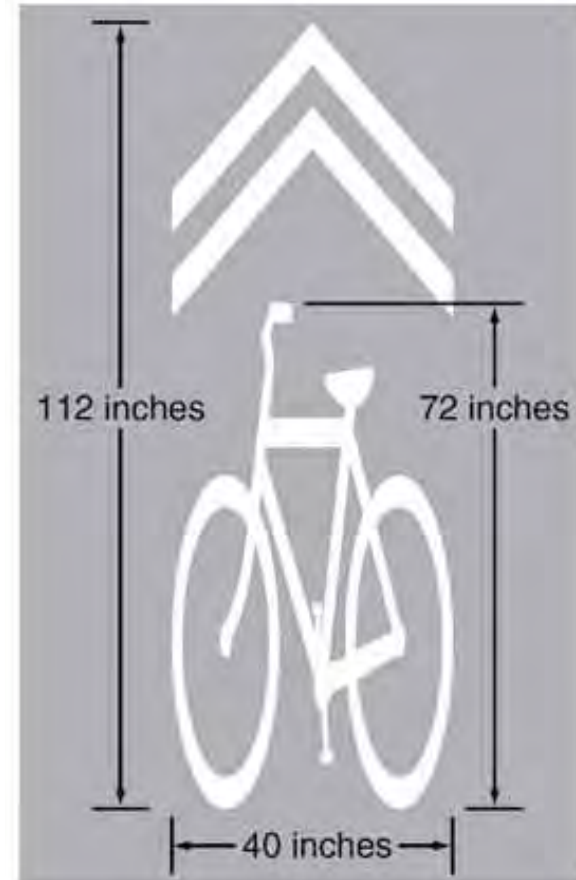


D11-1c

New: Bicycle Route Sign That Provides a Place for a Pictograph



New: Shared Lane Pavement Marking



Task Team Recommendations

- Meet 2009 MUTCD for new projects and multi-lane widening (starting with July 2010 lettings)
- Design Build projects (implement MUTCD 2009 now where technical proposal phase not started yet)
- Resurfacing and all other projects (January 2011 lettings)
 - Most signs are not being replaced in resurfacing plans
 - Will impact budget if we replace all signs
- Maintenance replaces damaged signs to MUTCD 2009 standards after Dec. 2013 (for increased sign sizes Table 2B-1 and Table 2C-2)
- Existing signs remain for useful life
- Dotted lane lines for dropped lanes, acceleration, deceleration and auxiliary lanes (address in Construction)
- Permit applications: new signs meet MUTCD 2009 now, existing signs can remain

To Do List

- Revise Design Standard sheets
- Update CADD cells
- Analyze mast arms for larger signs
- Update Traffic Engineering Manual
- Update Plans Preparation Manual
- Training for FDOT and Local Agencies
- Specs and pay Item impacts are minimal
- Issue Bulletin (dotted lines)
- Issue Bulletin (MUTCD implementation)
- Revise Rule 14-15

Compliance Issues That Affect FDOT

Section No.	Provision	Compliance Date
2A.08	Need to develop and implement management method for maintaining minimum sign retroreflectivity.	January 22, 2012
2A.09	Replacement of regulatory, warning and post mounted guide (except street name) signs that are identified as failing to meet minimum levels.	January 22, 2015
2A.08	Replacement of street name signs and overhead guide signs that are identified as failing to meet minimum levels.	January 22, 2018
2B. 03	Increased sign sizes Table 2B-1 and Table 2C-2	December 22, 2013 (life of device)

Compliance Issues That Affect FDOT

Section No.	Provision	Compliance Date
2B.40	New 2009 MUTCD requirement for number of and locations of One Way Signs	December 21, 2019
2D.45	New requirement in 2009 MUTCD for multi-lane approaches to interchanges to have guide signs to identify which direction (lane) of turn is to be made for access to each direction of freeway.	December 31, 2019
2E.31 2E.33 2E.36	New requirement in 2009 MUTCD to use E1-5aP and E1-5bP plaques for left-hand exits.	December 31, 2014
3B.04 3B.05	New requirement in 2009 MUTCD for dotted lane lines for dropped lanes, acceleration, deceleration and auxiliary lanes.	December 31, 2016 or resurfacing whichever comes first.

Compliance Issues That Affect FDOT

Section No.	Provision	Compliance Date
7D.04	2009 MUTCD requirement for High-visibility apparel for adult Crossing Guards	December 31, 2011
8B.03	Retroreflective Stripe on Crossbuck support.	January 17, 2017
8B.04	2009 MUTCD for use of STOP or YIELD at passive grade crossing.	December 31, 2019

Stop Sign Changes from 2003 MUTCD

Sign	Sign No.	Section No.	Single Lane	Less than 45 mph (Multi-Lane)	45 mph or Greater
Stop	R1-1	2B.03	30 x 30	30 x 30	36 x 36

New for Multi-Lane Conventional Road (Regulatory)

Sign or Plaque	Sign No.	Section No.	Multi-Lane Road
To Oncoming Traffic (plaque)	R1-2aP	2B.10	24 x 18
All Way (plaque)	R1-3P	2B.05	18 x 6
Speed Limit	R2-1	2B.13	30 x 36
Movement Prohibition	R3-1,2,3,4,18,27	2B.18	36 x 36
Right (Left) Lane Must Turn Right (Left)	R3-7	2B.20	36 x 36
Reversible Lane Control (post-mounted)	R3-9f	2B.26	36 x 54
Do Not Enter	R5-1	2B.37	36 x 36
Wrong Way	R5-1a	2B.38	42 x 30
One Way	R6-1	2B.40	54 x 18
One Way	R6-2	2B.40	30 x 36
No Turn on Red	R10-11	2B.54	36 x 48
No Turn on Red	R10-11a	2B.54	36 x 48
Weigh Station	R13-1	2B.60	72 x 54

Sign Size Increased from 2003 MUTCD (Regulatory)

Sign or Plaque	Sign No.	Section No.	Single Lane Road
To Oncoming Traffic (plaque)	R1-2aP	2B.10	24 x 18
All Way (plaque)	R1-3P	2B.05	18 x 6
Left on Green Arrow Only	R10-5	2B.53	30 x 36
Use Lane with Green Arrow	R10-8	2B.53	36 x 42
Left (Right) Turn Signal	R10-10	2B.53	30 x 36
Left Turn Yield on Green	R10-12	2B.53	30 x 36
Emergency Signal	R10-13	2B.53	42 x 30
Right on Red Arrow After Stop	R10-17a	2B.54	36 x 48
Traffic Laws Photo Enforced	R10-18	2B.55	36 x 24
Weigh Station	R13-1	2B.60	72 x 54
National Network	R14-4,5	2B.63	30 x 30

Sign Size Decreased from 2003 MUTCD (Regulatory)

Sign or Plaque	Sign No.	Section No.	Single Lane Road
Turning Vehicles Yield to Peds	R10-15	2B.53	30 x 30

New for Multi-Lane Conventional Road (Warning)

Sign or Plaque	Sign No.	Section No.	Multi-Lane Road
Horizontal Alignment	W1-1,2,3,4,5	2C.07	36 x 36
Hill Blocks View	W7-6	2C.18	36 x 36
Bump or Dip	W8-1,2	2C.28	36 x 36
Slippery When Wet	W8-5	2C.32	36 x 36
Grooved Pavement	W8-15	2C.33	36 x 36
Metal Bridge Deck	W8-16	2C.33	36 x 36
Shoulder Drop Off (symbol)	W8-17	2C.31	36 x 36
Bicycle	W11-1	2C.49	30 x 30
Pedestrian	W11-2	2C.50	36 x 36
Large Animals	W11-3,4,16,17,18,19,20,21,22	2C.50	36 x 36
Farm Vehicle	W11-5,5a	2C.49	36 x 36
Snowmobile	W11-6	2C.50	36 x 36

New for Multi-Lane Conventional Road (Warning)

Sign or Plaque	Sign No.	Section No.	Multi-Lane Road
Equestrian	W11-7	2C.50	36 x 36
Emergency Vehicle	W11-8	2C.49	36 x 36
Handicapped	W11-9	2C.50	36 x 36
Truck	W11-10	2C.49	36 x 36
Golf Cart	W11-11	2C.49	36 x 36
Emergency Signal Ahead (plaque)	W11-12P	2C.49	36 x 30
Horse-Drawn Vehicle	W11-14	2C.49	36 x 36
Bicycle/Pedestrian	W11-15	2C.49	36 x 36
Trail Crossing	W11-15a	2C.49	36 x 36
Double Arrow	W12-1	2C.25	36 x 36
Playground	W15-1	2C.51	36 x 36
Speed Hump	W17-1	2C.29	36 x 36

Questions

***Previously Discussed Edits
(Chapters 3, 6, 11, 18 &19)***

**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.

H LIGHT POLES

Light poles should not be placed in the sidewalk when adequate right of way is available beyond the sidewalk.

Light poles should not be placed so as to provide a hazard to out of control vehicles. Light poles are generally not of a ~~frangible or~~ breakaway design and should be placed outside of the roadway recovery area. They should be as far removed from the travel lane as possible or behind adequate guardrail or other barriers. Light poles should be placed on the inside of the curves when feasible. Foundations or poles and rigid auxiliary lighting components that are not behind suitable barriers should be constructed flush with or below the ground level. Breakaway ~~or frangible~~ poles should not be used where there is a high probability that a falling pole may strike a pedestrian or fall on a building or the roadway and create a greater hazard.

The use of high mast lighting should be considered, particularly for lighting interchanges and other large plaza areas. This use tends to produce a more uniform illumination level, reduces glare, and allows placement of the poles farther from the roadway. Additional emphasis lighting should be considered to illuminate specific and desired pedestrian crossings.

The placement of light poles should not interfere with the driver's sight distance nor the view of signs, signals, or other traffic control devices. Further criteria regarding the placement of roadside structures, including light poles, is specified in CHAPTER 4 - ROADSIDE DESIGN.

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)~~

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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 Administration Chapter 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 a All highway construction projects financed in whole or in part with Federal-aid highway funds shall comply with Title 23 Code of Federal Regulations (CFR) 630 Subpart J, more commonly known as the Work Zone Safety and Mobility Rule.

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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, emergency traffic 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 Management Operations**

~~Emergency operations~~Traffic 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.

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ED.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.

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ED.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, pedestrians and~~ bicyclists 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 should ~~ould~~ 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

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ED.4 Coordination with ~~Other~~ Agencies

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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

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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 must should be given advanced warning notice 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

{General Comments:

1. This is a New chapter, and insertion/deletion formatting has been disabled.
2. Address audible/vibratory markings?
3. Address parking area markings?}

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 C and D 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 with 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 for 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 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 Modified	
	Upper	Lower
30 - 35	8	6
40 or Greater	10.67	8

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

Overhead street name signs with mixed-case lettering should be used at major intersections (with multi-lane approaches) 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.

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

Internally illuminated overhead street names signs 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, 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

6-inch pavement markings should be used for all centerline pavement and edge line pavement markings.

D.2 Reflective Pavement Markers

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

CHAPTER 19

TRADITIONAL NEIGHBORHOOD DEVELOPMENT

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CHAPTER 19

TRADITIONAL NEIGHBORHOOD DEVELOPMENT

A INTRODUCTION

{General Comments:

1. This is a New chapter, and insertion/deletion formatting has been disabled.

2. A corresponding handbook is being developed to be posted on the Florida Greenbook web page.}

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. TND communities rely on a strong integration of land use and transportation. A 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. 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

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. This chapter provides criteria that may be used for the design of streets within a TND that may be used when such features are desired, appropriate and feasible. This involves providing a balance between mobility and livability. This chapter may be used in planning and designing applicable new construction, urban infill, and redevelopment projects.

Section B of this chapter discusses the primary objectives of TND in more detail, to aid the designer in the selection of proper criteria. Section C sets forth specific design criteria for the transportation system within Traditional Neighborhood Developments.

Additionally, the following link contains essential information in the form of a handbook

- 1 to provide designers guidance in the successful application of Chapter 19 Traditional
- 2 Neighborhood Development:
- 3
- 4 http://www.dot.state.fl.us/rddesign/FloridaGreenbook/TND_Handbook
- 5

1 **B APPLICATION**

2 A project or community plan may be considered a TND where at least the first seven of
3 the following principles are included. The design criteria in this chapter shall only apply
4 within the area defined as TND.

- 5 1. Has a compact, pedestrian-oriented scale that can be traversed in a five to
6 ten-minute walk from center to edge.
- 7 2. Is designed with low speed, low volume, interconnected streets with short
8 block lengths that are between 150 to 500 feet and cul-de-sacs only where no
9 alternative exists. Cul-de-sacs, if necessary should have walkway and
10 bicycle connections to other sidewalks and streets to provide connectivity
11 within and to adjacent neighborhoods.
- 12 3. Orients buildings at the back of sidewalk or close to the street with off-street
13 parking located to the side or back of buildings as not to interfere with
14 pedestrian activity.
- 15 4. Has building designs that emphasize higher intensities, narrow street
16 frontages, connectivity of sidewalks and paths, and transit stops to promote
17 pedestrian activity and accessibility.
- 18 5. Incorporates a continuous bike and pedestrian network with wider sidewalks
19 in commercial, civic and core areas, but at a minimum has sidewalks of at
20 least five feet that are on both sides of a street. Accommodates pedestrians
21 with short street crossings, which may include mid-block crossings, bulb-outs,
22 raised crosswalks, specialty pavers, or pavement markings.
- 23 6. Uses on-street parking adjacent to the sidewalk, to calm traffic, and offer
24 diverse parking options but planned so that it does not obstruct access to
25 transit stops.
- 26 7. Varies residential densities, lot sizes, and housing types, while maintaining an
27 average gross density of at least eight dwelling units per acre and higher
28 density in the center.
- 29 8. Integrate in the plan at least ten percent of the developed area for
30 nonresidential uses, civic uses and open spaces.
- 31 9. Has only the minimum rights of way necessary for the street, median, planting
32 strips, sidewalks, utilities, and maintenance and which are appropriate to
33 adjacent land uses and building types.
- 34 10. Locates arterial highways, major collector roads, and other high-volume
35 corridors at the edge of the TND, not through the TND.

36

37

1 **C PLANNING CRITERIA**

2 Planning for TND communities occurs at several levels, including the region, the
3 city/town, the community, the block, and, finally, the street and building. Planning
4 should be holistic, looking carefully at the relationship between land use, buildings and
5 transportation in an integrated fashion. This approach and the use of form based codes
6 can create development patterns that balance pedestrian, transit and bicycling with
7 motor vehicle modes of transportation

8 **C.1 LAND USE**

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

13 A well-integrated or “fine grained” land use mix within buildings and blocks is
14 essential. These buildings and blocks aggregate into neighborhoods, which
15 should be designed with a mix of uses to form a comprehensive planning unit
16 that aggregates into larger villages, towns, and regions. Except at the regional
17 scale, each of these scales requires land uses to be designed at a pedestrian
18 scale and to be served by “complete streets” that safely and attractively
19 accommodate many modes of travel.

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

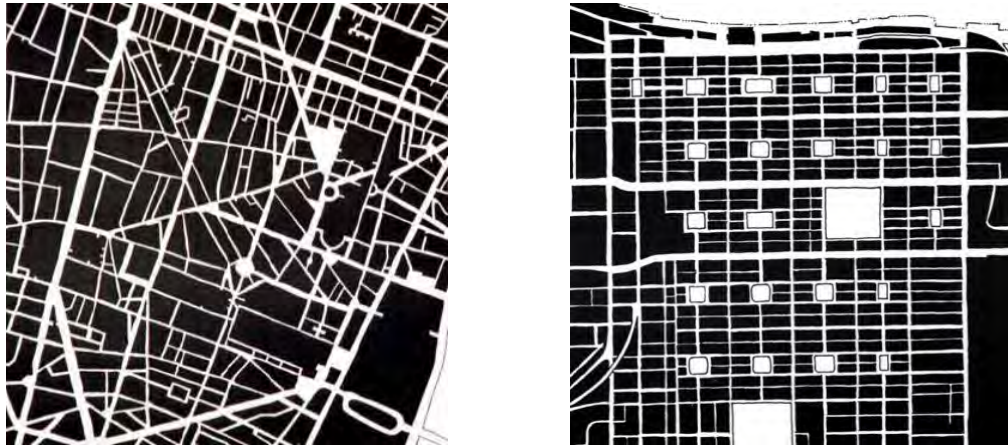
28 **C.2 NETWORKS**

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

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Figure 19-1 Traditional Network



Paris

Savannah, GA

(Source: Great Streets – Alan Jacobs)

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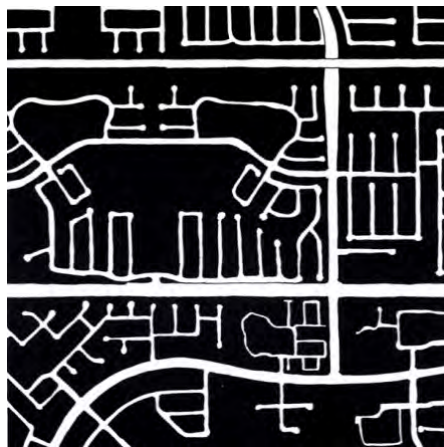
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The typical conventional street network, in contrast, often includes a framework of widely-spaced arterial roads with limited connectivity provided by a system of large blocks, curving streets and a branching hierarchical pattern, often terminating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

9

Figure 19-2 Conventional Network



Irvine, CA

(Source: Great Streets – Alan Jacobs)

10

11

12

13

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

5 Advantages of traditional networks include:

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

16 It is important in TND networks to have a highly interconnected network of streets
17 with smaller block sizes than in conventional networks. There are several ways
18 to ensure that these goals are achieved.

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

- 21 1. Limit block size to an average perimeter of approximately 1,320 feet.
- 22 2. Encourage average intersection spacing for local streets to be 300-400
23 feet.
- 24 3. Limits maximum intersection spacing for local streets to about 600 feet.
- 25 4. Limits maximum spacing between pedestrian/bicycle connections to about
26 300 feet (that is, it creates mid-block paths and pedestrian shortcuts).

27

1 **D OBJECTIVES**

2 The basic objectives of a Traditional Neighborhood Development are:

- 3 1. Safety
- 4 2. Mobility of all users (vehicles, pedestrians, bicyclists and transit)
- 5 3. Compact and livable development patterns
- 6 4. Context-sensitive transportation network

7 TND features are based on the consideration of the following concepts. These concepts
8 are not intended as absolute criteria, since instances may occur where certain concepts
9 conflict. The concepts should therefore be used for layout of proper street systems.

- 10 1. A strong integration of land use and transportation.
- 11 2. Very supportive of pedestrian, bicycle and transit modes.
- 12 3. Block sizes are a smaller scale to improve walkability and to create a fine
13 network of streets that accommodate bicyclists and pedestrians, providing
14 a variety of routes for all users.
- 15 4. On-street parking is favored over surface parking lots.
- 16 5. Limited use of one way streets.
- 17 6. Speeds for motor vehicles ideally are kept in the range of 20-35 mph
18 through the design of the street, curb extensions, use of on-street parking,
19 the creation of enclosure through building and tree placement.
- 20 7. The street geometry (narrow streets and compact intersections), adjacent
21 land use, and other elements within a TND must support a high level of
22 transit, pedestrian and bicycle activity.
- 23 8. Providing access to emergency services, transit, waste management,
24 delivery trucks.
- 25 9. Providing access to property.

26 This approach to street design requires designers to pay close attention to the
27 operational needs of transit, fire and rescue, waste collection and delivery trucks. For
28 this reason, early coordination with transit, fire and rescue, waste collection and other
29 stakeholder groups is essential. For fire and rescue, determination of the importance of
30 that corridor for community access should be determined, e.g. primary or secondary
31 access.

32 More regular encroachment of turning vehicles into opposing lanes will occur at
33 intersections. Therefore, frequency of transit service, traffic volumes and the speeds at

- 1 those intersections must be considered when designing intersections.

- 2 When designing features and streets for TND communities, creativity and careful
3 attention to safety for pedestrians and bicyclists must be balanced with the operational
4 needs for motor vehicles.

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

- 9

1 **E DESIGN ELEMENTS**

2 The criteria provided in this chapter shall require the approval of the maintaining
3 authority's designated Professional Engineer representative with project oversight or
4 general compliance responsibilities.

5 The criteria in this chapter are generally in agreement with AASHTO guidelines with a
6 special emphasis on urban, low-speed environments. Design elements within TND
7 projects not meeting the requirements of this chapter are subject to the requirements for
8 Design Exceptions found in Chapter 14 of this manual.

9 **E.1 Design Controls**

10 **E.1.a Design Speed**

11 The application of design speed for TND communities is philosophically
12 different than for conventional transportation and CSD communities.
13 Traditionally, the approach for setting design speed was to use as high a
14 design speed as practical.

15 In contrast to this approach, the goal for TND communities is to establish
16 a design speed that creates a safer and more comfortable environment for
17 pedestrians and bicyclists, and is appropriate for the surrounding context.

18 For TND streets, design speeds of 20 to 35 mph are desirable. Alleys and
19 narrow roadways intended to function as shared spaces may have design
20 speeds as low as 10 mph.

21 **E.1.b Movement Types**

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

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

1 **Slow:** Drivers can proceed carefully with an occasional stop to allow a
2 pedestrian to cross or another car to park. Drivers should feel
3 uncomfortable exceeding design speed due to presence of parked cars,
4 enclosure, tight turn radii, and other design elements. Design speed of
5 20-25 mph; this type should accommodate bicycle routes through the use
6 of shared lanes.

7 **Low:** Drivers can expect to travel generally without delay at the design
8 speed; street design supports safe pedestrian movement at the higher
9 design speed. This movement type is appropriate for thoroughfares
10 designed to traverse longer distances or that connect to higher intensity
11 locations. Design speeds of 30-35 mph; this type can accommodate
12 bicycle routes through the use of bike lanes.

13 Design speeds higher than 35 mph should not normally be used in TND
14 communities due to the concerns for pedestrian and bicyclist safety and
15 comfort. There may be locations where planned TND communities border
16 or are divided by existing corridors with posted/design speeds higher than
17 35 mph. In those locations, coordination with the regulating agency for
18 that corridor should occur with a goal to re-design the corridor to reduce
19 the speed to 35 mph or less. The increase in motorist travel time due to
20 the speed reduction is usually insignificant because TND communities are
21 generally compact.

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

25 **E.1.c Design Vehicles**

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

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

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

6 **E.2 Sight Distance**

7 See CHAPTER 3 GEOMETRIC DESIGN, C.3 Sight Distance

8 **E.2.a Stopping Sight Distance**

9 See CHAPTER 3 GEOMETRIC DESIGN, C.3.a Stopping Sight Distance
10

11 **E.2.b Passing Sight Distance**

12 Due to the importance of low speeds and concerns with pedestrian
13 comfort and safety, passing should be discouraged or prohibited.

14 **E.2.c Intersection Sight Distance**

15 Sight distance should be calculated in accordance with CHAPTER 3
16 GEOMETRIC DESIGN, Section C.9.b, of the Florida Greenbook using the
17 design speeds appropriate for the street being evaluated. When
18 executing a crossing or turning maneuver after stopping at a stop sign,
19 stop bar, or crosswalk as required in Section 316.123, Florida Statutes, it
20 is assumed that the vehicle will move slowly forward to obtain sight
21 distance (without intruding into the crossing travel lane) stopping a second
22 time as necessary.

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

29 Nationally, cities and towns routinely locate on-street parking 20' from
30 crosswalks at intersections based on the MUTCD requirement that on
31 street parking not be located closer than 20' from crosswalks. The
32 minimum stopping sight distance is 60' for low volume (< 400 ADT)

1 streets. Even on slow speed, low volume urban streets, the combination
2 of curb return, crosswalk width and 20' setback to the first parking space
3 may not meet the minimum stopping distance. Justification for locating
4 parking spaces 20' from crosswalks may be achieved based on
5 community history with existing installations.

6 **E.3 Horizontal Alignment**

7 **E.3.a Minimum Centerline Radius**

8 See CHAPTER 3 GEOMETRIC DESIGN, C.4 Horizontal Alignment and
9 Table 3-3 Horizontal Curvature, Low-Speed Urban Streets

10 **E.3.b Minimum Curb Return Radius**

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

15 **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

16
17 * Dimensions with parking on each leg of the intersection. Both
18 tangent sections adjacent to the curb return must provide for on-
19 street parking or else curb radii must be evaluated using "design
20 vehicle" and software or turning templates.

21 **E.4 Vertical Alignment**

22 See CHAPTER 3 GEOMETRIC DESIGN, C.5 Vertical Alignment

23 **E.5 Cross Section Elements**

24 **E.5.a Introduction**

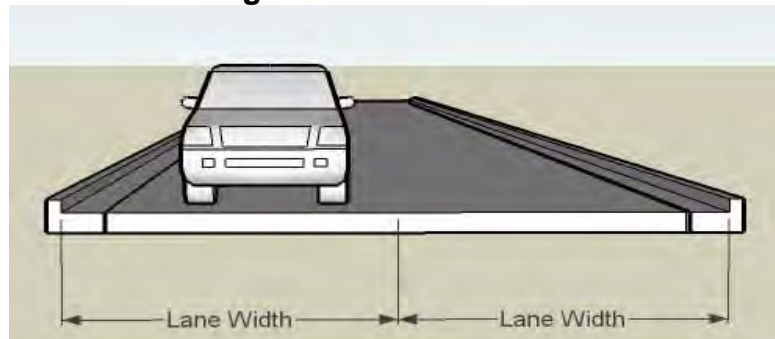
25 As discussed earlier in the document, TND street design places

1 importance on how the streets are treated since they are part of the public
2 realm. The street portion of the public realm is shaped by the features
3 and cross section elements used in creating the street. For this reason
4 more attention to what features are included; where they are placed and
5 how the cross section elements are assembled is necessary.

6 **E.5.b Lane Width**

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

15 **Figure 19-3 Lane Width**



16
17 In order for drivers to understand how fast they should drive, lane widths
18 have to create some level of discomfort with driving too fast. The
19 presence of on street parking is important in achieving the speeds shown
20 in the table. When designated bike lanes or multi-lane configurations are
21 used, there is more room for vehicles to operate in, such as buses, but car
22 drivers will feel more comfortable driving faster than desired.

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

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Table 19-1 Minimum Lane Width

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

*Yield streets are typically residential two-way streets with parking on one or both sides. When the street is parked both sides, the remaining space between parked vehicles (10' minimum) is adequate for one vehicle to pass through. Minimum width for a yield street with parking on both sides should be 24' curb face to curb face. Minimum width for a yield street with parking on one side should be 20' curb face to curb face, which allows for two 10' lanes when the street is not parked.

Alleys can be designed as one way or two way. Right of way width should be a minimum of 20' with no permanent structures located within the right of way to allow for vehicles to negotiate access to garages or parking spaces, access for trash collection and other operational needs. Pavement width should be a minimum of 12'. Coordination with local municipalities on operational requirements is essential to ensure that trash collection and fire protection services can be completed.

E.5.c 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

E.5.d 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 border width 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.

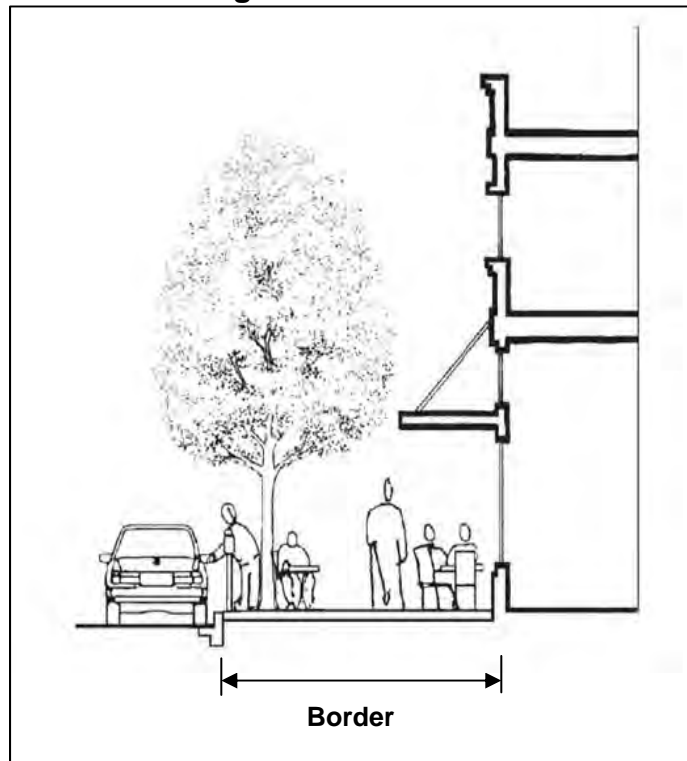
Left turn lanes are considered to be acceptable in an urban environment since there are negative impacts to roadway capacity when left turns block the through movement of vehicles. The installation of a left turn lane can be beneficial when used to perform a road diet such as reducing a four lane section 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 right 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.

1 **E.7 Pedestrian Considerations**

2 In urban environments, the “border,” the area between the face of building or
3 right of way line and the curb face serves as the pedestrian realm because it is
4 the place where pedestrian activity is provided for, including space to walk,
5 socialize, places for street furniture, landscaping, and outdoor cafes. In an urban
6 environment, the border consists of the furniture, walking and shy zones.
7
8

Figure 19-4 Border



9

10 **E.7.a Furniture Zone**

11 The furniture zone can be located adjacent to the building face but more
12 commonly is adjacent to the curb face. The furniture zone contains
13 parking meters, lighting, tree planters, benches, trash receptacles,
14 magazine and newspaper racks and other street furniture. The furniture
15 zone is provided separate from the walking/pedestrian and shy zones to
16 keep the walking area clear for pedestrians including proper access to
17 transit stops.

1 **E.7.b Walking/Pedestrian Zone**

2 Chapter 8 addresses considerations for pedestrians. In a properly
3 designed urban environment where buildings are at the back of sidewalk
4 and vehicle speeds are low, the “separation” from traffic is normally
5 provided by on street parking which also helps to calm traffic. The width
6 of the walking/pedestrian zone should be at least four feet and should be
7 increased based on expected pedestrian activity.

8 **E.7.c Shy Zone**

9 The shy zone is the area adjacent to buildings and fences that pedestrians
10 generally “shy” away from. A minimum of one foot is provided as part of
11 the sidewalk width. This space should not be included in the normal
12 walking zone of the sidewalk.

13 **E.7.d Mid-Block Crossings**

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

18 **E.7.e Curb Extensions**

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

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

26 **E.8 Bicyclist Considerations**

27 **E.8.a Bicycle Facilities**

28 CHAPTER 9 BICYCLE FACILITIES of this document contains information
29 on Bicycle Facilities. Much of that information is appropriate so the
30 information contained in this section is directed to designing bike facilities

1 in TND communities. Designing for bicycles on thoroughfares in TND
2 communities should be as follows: Bicycles and vehicles should share
3 lanes on thoroughfares with design speeds of twenty five mph or less. It is
4 important to recognize that the addition of bike lanes does increase
5 roadway widths and can increase the tendency for drivers to speed.

6 When bicycle lanes are used in TND communities, they should be a
7 minimum of 5 feet wide and designated as bike lanes. On curb and gutter
8 roadways, a 4-foot width measured from the lip of the gutter is required.
9 The gutter width should not be considered as part of the rideable surface
10 area, but this width provides useable clearance to the curb face. Drainage
11 inlets, grates and utility covers are potential problems to bicyclists. When
12 a roadway is designed, all such grates and covers should be kept out of
13 the bicyclists' expected path. If drainage inlets are located in the expected
14 path of bicyclists, they should be flush with the pavement, well seated, and
15 have bicycle compatible grates.

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

22 Shared-lane markings or "sharrows" can be used instead of bike lanes
23 adjacent to on-street parking. The sharrow allows the bicyclist to occupy
24 the lane and therefore avoids placing cyclists in the "door zone", does not
25 require and increase is lane width or ROW width for the thoroughfare,
26 which also aids in speed management. Guidance for use of the sharrow
27 is included in the 2009 MUTCD. Following is a photograph of a sharrow
28 with cyclists sharing the lane.

29 **Figure 19-5 Sharrow**



30

1 **E.8.b Shared Use Paths**

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

6 **E.9 Transit**

7 See “Accessing Transit, Design Handbook for Florida Bus Passenger Facilities,
8 2008” for information.

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

10 **E.10 Clear Zone**

11 In urban areas, horizontal clearance based on clear zone requirements for rural
12 highways are not practical because urban areas are characterized by lower
13 speed, more dense abutting development, closer spaced intersections and
14 accesses to property, higher traffic volumes, more bicyclists and pedestrians,
15 and restricted right of way. The minimum horizontal clearance shall be 1.5 feet
16 measured from the face of curb.

17 Streets with curb or curb and gutter in urban areas where right of way is
18 restricted do not have roadsides of sufficient widths to provide clear zones;
19 therefore, while there are specific horizontal clearance requirements for these
20 streets, they are based on clearances for normal operation and not based on
21 maintaining a clear roadside for errant vehicles. It should be noted that curb has
22 essentially no redirection capability, therefore curb should not be considered
23 effective in shielding a hazard.

24

1 **F REFERENCES**

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

- 5 1. Draft ITE Recommended Practice: Context Sensitive Solutions in Designing
6 Major Urban Thoroughfares for Walkable Communities, 2006
7 <http://www.ite.org/css/>
- 8 2. SmartCode 9.2 <http://www.smartcodecentral.org/>
- 9 3. A Guide for Achieving Flexibility in Highway Design, AASHTO, May, 2004
- 10 4. Accessing Transit, Design Handbook for Florida Bus Passenger Facilities, 2008,
11 FDOT Public Transit Office
- 12 5. http://www.dot.state.fl.us/transit/Pages/2008_Transit_Handbook.pdf
- 13 6. Safe Routes to Schools Program, FDOT Safety Office <http://www.srtsfl.org/>

General Presentation to the Committee

FLORIDA GREENBOOK UPDATE 2010

MANUAL FOR UNIFORM MINIMUM STANDARDS...

- ✘ “Shall”, “Must”, & “Required”: 306
- ✘ “Should”, “May”, & : 1050

DO WE NEED A GENERAL REVISION ?

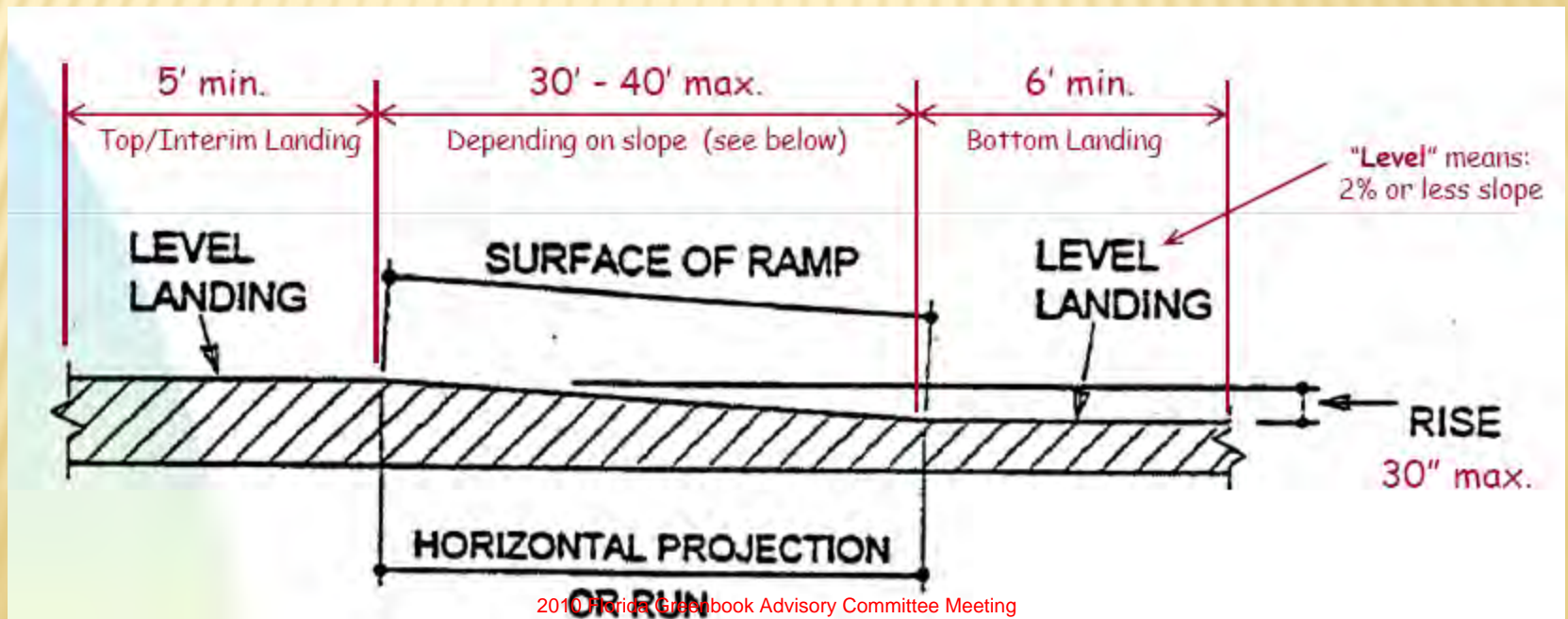
- ARRA Projects
- Emphasis on Multimodal Transportation
- ADA Considerations/Requirements
- Safety

ARRA PROJECTS

- × Resurfacing Projects
- × Minimum Requirements from FHWA
- × Railroad Crossings

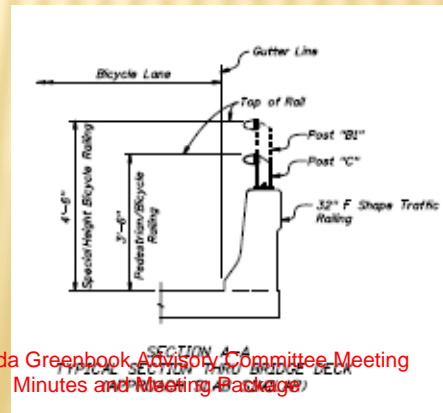
EMPHASIS ON MULTIMODAL TRANSPORTATION

- ✘ Pedestrians (Chapter 8)
 - + “Full consideration” statute
 - + ADA (landings & railings)
 - + Marked & Midblock Crosswalks



EMPHASIS ON MULTIMODAL TRANSPORTATION

- ✘ Bicycles (Chapter 9)
 - + “Full consideration” statute
 - + Designated/Undesignated
 - + Drainage Grates
 - + Bridge/Drop-Off Railings
 - + “Sharrows”



EMPHASIS ON MULTIMODAL TRANSPORTATION

- ✘ Transit (Chapter 13)
 - + Bus Stops
 - + Benches (ADA)
 - + Lane Width
 - + Park-and-Ride Facilities



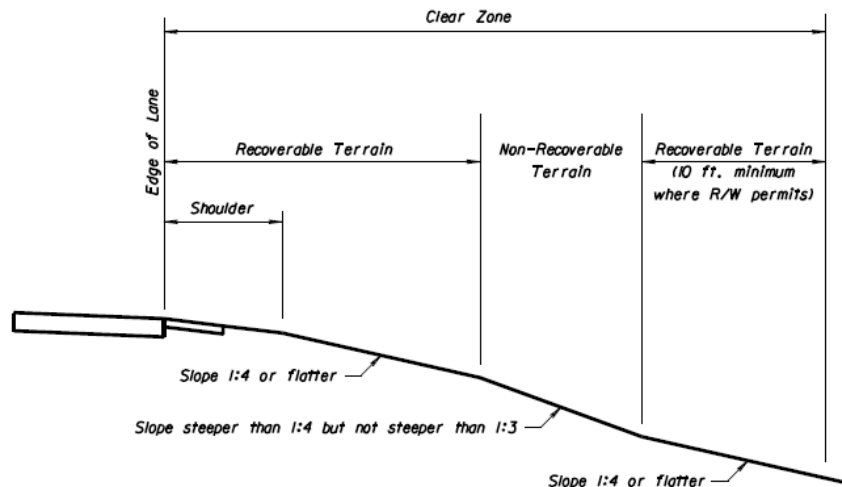
SAFETY

✘ Lane Departures

- + Hardware Crash Test Compliance
- + Cable Barrier
- + Recoverable Terrain Width



Figure 4.1.2.2 Clear Zone Cross Section



SAFETY

- ✘ Lane Departures
 - + Audible/Vibratory Stripes



- + Pavement Safety Edge



QUESTIONS?

Review of DRAFT Changes

DRAFT MAY – 2010

Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Commonly known as the "Florida Greenbook")

Printed 3/4/2010

This DRAFT is available online:

<http://www.dot.state.fl.us/rddesign/FloridaGreenbook/DRAFT-3-4-10-FloridaGreenbook.pdf>

Each chapter of the Florida Greenbook has recently been reviewed by Department "Technical Reviewers". This draft includes several comments, suggestions and questions from this review, as well as previously proposed updates. This draft will be discussed at the March 24, 2010 Florida Greenbook Advisory Committee Meeting.

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Additional Information

Final Report

INTEGRATING TRANSIT INTO COMPLETE STREETS DESIGN POLICIES - THE INFLUENCE OF LANE WIDTH ON BUS SAFETY

Report Prepared for:

**Florida Department of Transportation
Public Transit Office**

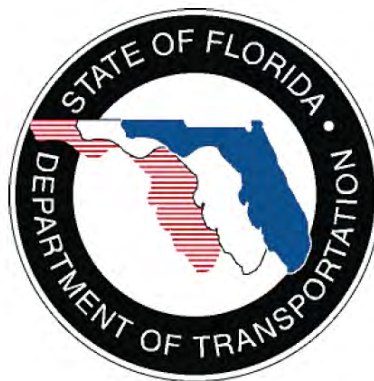
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Integrating Transit into Complete Streets Design Policies

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DISCLAIMER

The opinions, findings, and conclusions, expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

The main objective of this study was to evaluate the influence of lane width on the safety of transit vehicles. The research team conducted a comprehensive analysis of the influence of lane width on transit vehicle safety using a combination of methods. Each method was geared towards investigating whether there is a significant relationship between lane widths and bus safety. The five methods employed were: (1) Questionnaire Survey, (2) Statewide Bus Crash Analysis, (3) Transit Agencies Incident Reporting Analysis, (4) Field Observational Study, and (5) Physical Constraints Analysis. The results pertaining to each of the five methods are summarized below.

9.1.1 Questionnaire survey

The questionnaire survey revealed that most bus collisions occur on roadways with lane widths of 11 feet or less. The survey also revealed a relationship between tight turning geometry and lane width. Most of the intersections that were categorized as having tight turning geometry and most prone to bus crashes were found to have lane widths of less than or equal to 11 feet.

9.1.2 Statewide bus crash analysis

Nine out of ten segments in the list of the top ten segments with the highest frequency of sideswipe crashes had lane widths ranging from 9 feet to 11 feet. Seven out of ten were found to be 10 feet wide or narrower. The results of the Poisson Regression Analysis indicated a negative relationship between number of crashes on a segment and the lane width, suggesting that the decrease in lane width is likely to increase the frequency of crash occurrence. Apart from lane width, the results of the Poisson regression analysis indicated that the average annual traffic volume, posted speed limit, and median width have influence on occurrence of bus sideswipe crashes.

9.1.3 Transit agencies incident reporting analysis

The average width of the roadways that had sideswipe and mirror collisions was found to be 10.55 feet. A one-tail two-sample *t*-test revealed a significant difference exists with a *p*-value of less than 0.001. The results strongly suggest that sideswipe and mirror crashes occur predominantly on narrow roadways. A comparative analysis was performed to compare the percentage of each lane width on transit routes for three agencies – Tallahassee StarMetro, Jacksonville Transit Authority, and Miami-Dade Transit Authority. The analysis revealed that only 1.56% of the roadways used by transit routes are 9 feet while 67.49% of the roadways on transit routes were found to be 12 feet wide. The percentages of 10-foot and 11-foot wide roadways on transit routes were found to be 3.89% and 27.05%, respectively. Despite the fact that there are only 1.56% of the roadways on transit routes which were 9 feet wide, they represented about 23.22% of the sideswipe and mirror collisions. Overrepresentations in sideswipe and mirror crashes were also observed on 10-foot wide roadways. Ten-foot wide roadways accounted for 24.64% of all sideswipe and mirror collisions. On the other hand, the results indicate that 12-foot wide roadways accounted for only 26.07% of sideswipe and mirror

crashes while they represent over 67% of the transit routes network. The ratio of the percentage of crashes to the percentage of roadways used for each lane width category suggests overrepresentation of 9 and 10-foot wide lanes on sideswipe crashes. Further analysis indicated that narrow lanes have higher rate of bus sideswipe crashes per miles traveled.

9.1.4 Field observational study

The results of the lane encroachment analysis led to the following conclusions.

- Narrower lanes make it difficult for bus drivers to position their vehicle completely within their lane.
- Buses fail to maintain their lanes when maneuvering tight horizontal curves on narrow lanes.
- The passing maneuver between two opposing buses on 10-foot, two-way, two-lane roadways was hard to perform. One bus had to stop to give room for another bus to pass.
- Buses were encroaching an adjacent lane whenever performing right turning maneuver onto a street with narrower lanes.
- Field observation also revealed a problem with location of bus stops. Most of the bus stops were located close to the intersections where in most cases the lanes were narrow. One of the reasons for the reduction of lane width at intersections was to allow for the addition of exclusive left-turn lanes by repainting the existing roadway surface. This forces buses to encroach on adjacent lanes, causing potential of mirror collisions.

9.1.5 Physical constraints analysis

Physical constraints analysis was conducted to determine the minimum space requirements for buses to operate safely without encroaching into an adjacent lane. It was assumed that streets will be designed using complete streets design principles. Two main requirements were considered: adhering to a 3-foot clearance for bicyclists (Florida Statute 316.083), and maintain the bus including its mirrors in the same lane without encroaching into the adjacent lane. The results of this analysis indicate that a minimum of 11.25 feet and 11.75 feet for the outside lane is required for curbed roadways and roadways without curb and gutter, respectively, to meet these requirements. However, a 12-foot wide outside lane is recommended for all bus routes. The physical constraints analysis suggests a minimum lane width of 11 feet for the inside lane for four-lane, two-way roadways (both curbed and uncurbed). Minimum requirements for roadways with on-street parking are the same as for the streets with curb and gutter.

In summary, this research project employed five different study methods to determine the influence of lane width on bus safety. The study considered sideswipe and mirror crashes as they are predominantly caused by narrow lane geometry. All five studies consistently suggest a strong relationship between lane width and bus safety. The results suggest that the narrower the lane width, the higher the likelihood of having bus sideswipe and mirror crashes. The results also indicate that locations with tight turning geometry were associated with narrow lane widths.

9.2 Recommendations

Based on the findings of this study it is recommended that 12-foot wide lanes be provided as practical as possible for roadways located on transit routes. Narrower lanes cannot accommodate buses fully without causing encroachments into adjacent lanes. However, other streets that connect to designated bus routes may have narrower lane widths. Figures 9.1 to 9.4 depict prototypes of possible scenarios when bus routes can be utilized.



Figure 9.1. Mixed-Use Prototype

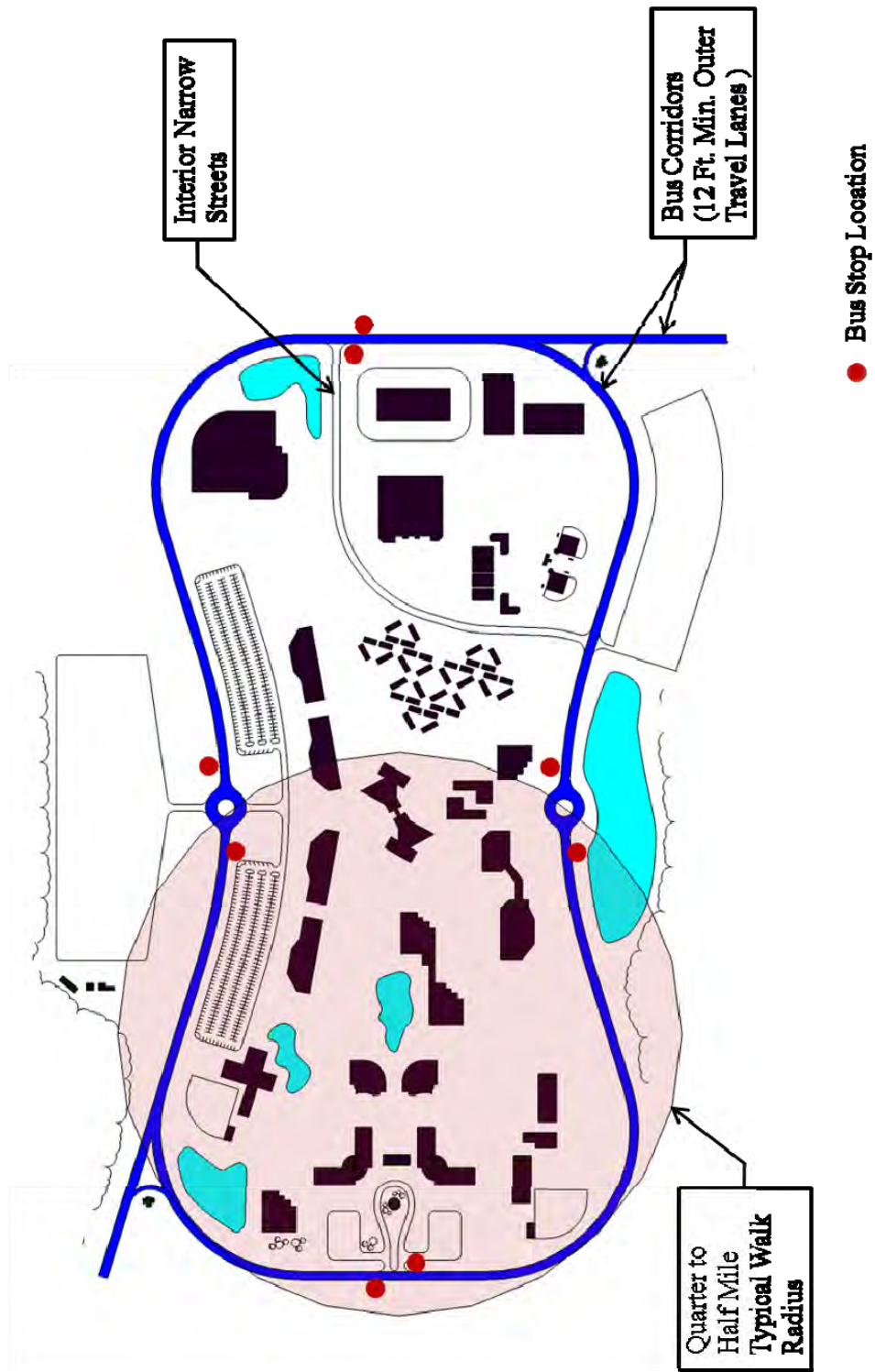


Figure 9.2. Campus/Institutional Prototype



Figure 9.3. Central Business District Prototype

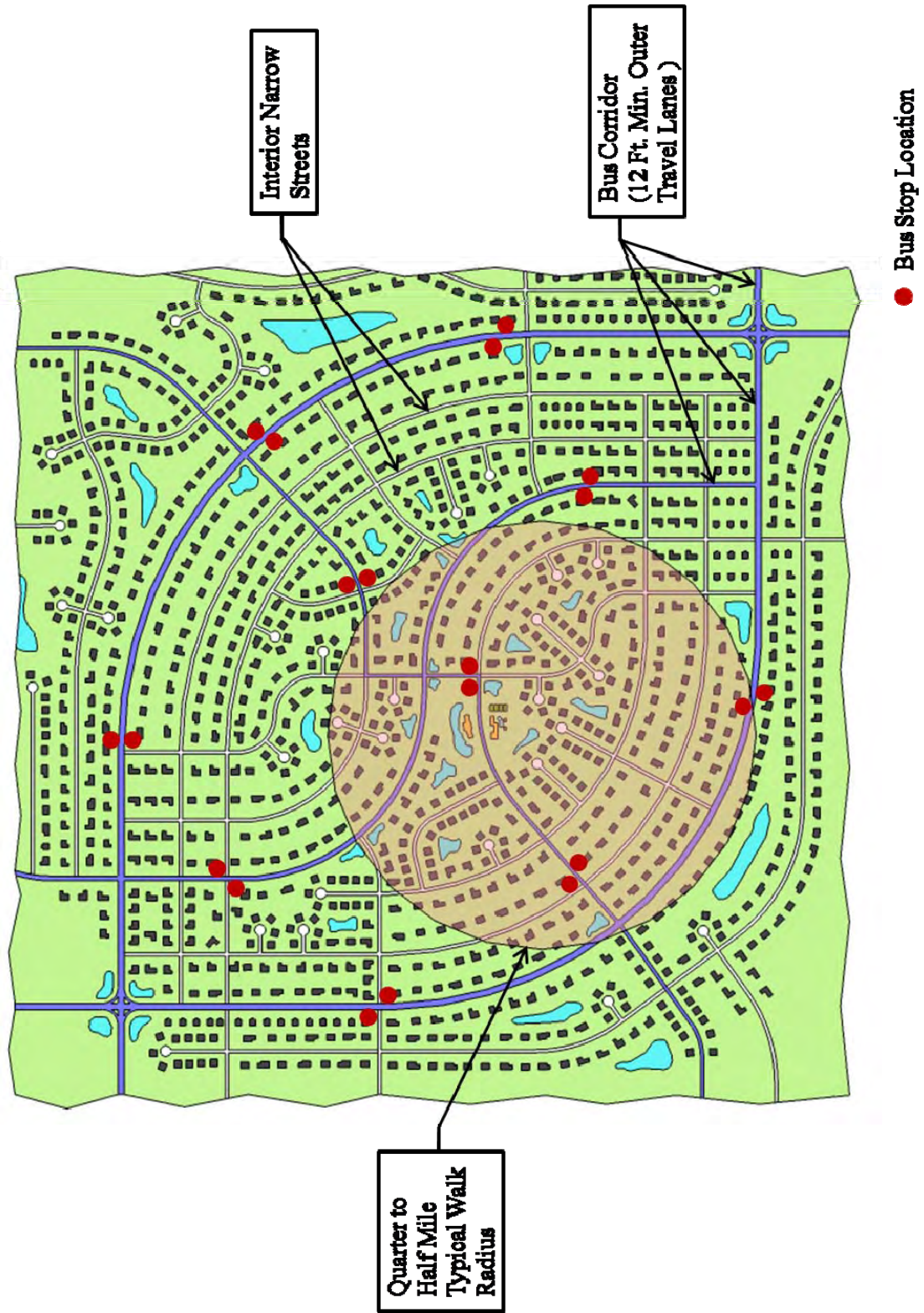


Figure 9.4. Suburban Residential Prototype