

Heads Up on Future Changes for the Florida Greenbook

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Overview

- ▶ Where does the Greenbook apply?
- ▶ How do Greenbook revisions come about?
- ▶ What are the major changes?
- ▶ How can I find out more about the Greenbook?

Purpose of Greenbook

- ▶ Section 334.044, F.S. Florida Statutes
 - ▶ Provide uniform minimum standards and criteria
 - ▶ Covers design, construction, and maintenance
 - ▶ Applies to all streets, roads, highways, bridges, sidewalks, curbs and curb ramps, crosswalks, bicycle facilities, underpasses and overpasses traveled by the public



56th Street, Temple Terrace

Florida Greenbook

- ▶ 2013 Florida Greenbook is the current edition
- ▶ 2016 Florida Greenbook drafted
 - ▶ Revisions developed and approved by Committee
 - ▶ Begun rulemaking process
 - ▶ Expected to be adopted end of 2016
- ▶ Draft posted on FDOT's Florida Greenbook web page
 - ✓ <http://www.dot.state.fl.us/rddesign/FloridaGreenbook/FGB.shtm>

MANUAL OF UNIFORM MINIMUM STANDARDS
FOR DESIGN, CONSTRUCTION AND MAINTENANCE
FOR STREETS AND HIGHWAYS

(Commonly known as the "Florida Greenbook")



State of Florida
Department of Transportation

MAY 2013
EDITION

The Florida Greenbook will be posted on the FDOT Web Site
at: <http://www.dot.state.fl.us/rddesign/FloridaGreenbook/FGB.shtm>

Florida Greenbook Advisory Committee

- ▶ 4 members per FDOT District (28 total)
 - ▶ Urban center
 - ▶ Rural area
 - ▶ Professional engineer not employed by a government agency
 - ▶ FDOT's District Design Engineer
- ▶ Established by statute



Greenbook Rulemaking Process

Greenbook Committee Drafts and Approves Changes

Publish “Notice of Rule Development”

Prepare Statement of Estimated Regulatory Costs (SERC)

Conduct Rule Development Workshop if Requested

Publish Notice of Proposed Rule

Review by Joint Administrative Procedures Committee (JAPC)

Conduct Hearing if Requested

Rule Filed for Adoption

What Criteria To Use?

- ✓ Check Table 3.1 in LAP Manual
- ✓ http://www.dot.state.fl.us/programmanagement/LAP/Current/CHAPTER_19_2016.pdf

TABLE 1: Project Classifications

*Full Manual titles and Topic Numbers are identified in the following paragraphs and Chapter 20

Project Classifications	Design Criteria and Standards*	Specifications*	Materials*
Class A On the State or National Highway Systems	FDOT Plans Preparation Manual and FDOT Design Standards	FDOT Standard Specifications for Road & Bridge Construction	Samples Testing and Reporting Guide and FDOT Materials Manual
Class B Off the State and National Highway Systems with an estimated construction value of \$10 million or greater.	FDOT Plans Preparation Manual and FDOT Design Standards	FDOT Standard Specifications for Road & Bridge Construction	Samples Testing and Reporting Guide and FDOT Materials Manual
Class C Off the State and National Highway Systems and includes structural components: <ul style="list-style-type: none"> • a vehicular bridge • pedestrian bridge over a roadway • box culvert meeting the definition of a bridge as stated in 23 CFR 305 	1) For structures components, use the FDOT Plans Preparation Manual and FDOT Design Standards 2) For all other components, use the Florida Greenbook	1) For the structures components, FDOT Standard Specifications 2) For all other components, LAP Big 4 or approved Local Agency Specs	1) For structures components, use the Samples Testing and Reporting Guide and FDOT Materials Manual 2) For all other components, use Local Agency materials testing process
Class D Off the State and National Highway Systems, may include structural components: <ul style="list-style-type: none"> • pedestrian bridges not over a roadway • bridges on shared use path not over a roadway • box culverts that do not meet the definition of a bridge as stated in 23 CFR 305 	Florida Greenbook Or Approved Minimum Design Standards chosen by local agency which conform to the minimum criteria provided in Florida Greenbook	LAP Big 4 or approved Local Agency Specs 7	Local Agency materials testing process

Table 3.1 LAP Manual

<p><u>Class D</u> Off the State and National Highway Systems, may include structural components:</p> <ul style="list-style-type: none">• pedestrian bridges not over a roadway• bridges on shared use path not over a roadway• box culverts that do not meet the definition of a bridge as stated in 23 CFR 305	<p>Florida Greenbook</p> <p>-Or-</p> <p>Approved Minimum Design Standards chosen by local agency which conform to the minimum criteria provided in Florida Greenbook</p>	<p>LAP Big 4 or approved Local Agency Specs</p>
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- ▶ Introduction and Definition of Terms
- ▶ Chapter 3 - Geometric Design
- ▶ Chapter 4 - Roadside Design
- ▶ Chapter 6 - Lighting
- ▶ Chapter 7 - Rail-Highway Crossings
- ▶ Chapter 8 - Pedestrian Facilities
- ▶ Chapter 9 - Bicycle Facilities
- ▶ Chapter 11 - Work Zone Safety
- ▶ Chapter 13 - Public Transit
- ▶ Chapter 15 - Traffic Calming
- ▶ Chapter 16 - Residential Street Design
- ▶ Chapter 17 - Bridges and Other Structures
- ▶ Chapter 18 - Signing and Marking
- ▶ Chapter 19 - Traditional Neighborhood Design
- ▶ Chapter 20 - Drainage

Major Changes

Definition of Terms

- ▶ New definitions for alley, corridor, design vehicle, driveway, federal aid highway, high-speed rail, paratransit, pedestrian access route, public way, ramp, shared roadway, vertical clearance, very low-volume road
- ▶ Revised definitions for recovery area, rural areas, shared street, slopes, wide outside lane



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Estero Blvd., Ft. Myers Beach

Major Changes for 2016

► Chapter 3 – Geometric Design

- Greater range of design speeds and lane widths
- Updated for Florida specific design vehicles
- Stopping sight distance and rounded “K” values now based upon 2’ object height
- Passing sight distance consistent with MUTCD method of calculation and 2011 AASHTO Greenbook
- Shoulder widths for flush shoulder highways based upon traffic volume and number of lanes
- Criteria for shoulder cross slopes based upon surface (paved, gravel, grass)



Franklin Blvd, Tallahassee, FL

Major Changes for 2016

▶ Chapter 4 – Roadside Design

- ▶ Canals defined and criteria for location and shielding included
- ▶ Mitered end sections for cross drains and side drains in clear zone

▶ Chapter 6 – Lighting

- ▶ New tables for required level of illumination for streets and highways based upon facility, road surface
- ▶ New table for overhead sign lighting
- ▶ Mid-block pedestrian crosswalks require vertical illumination of 2.0 foot candles if night time activity expected



Summerlin Road, Ft. Myers

Major Changes for 2016

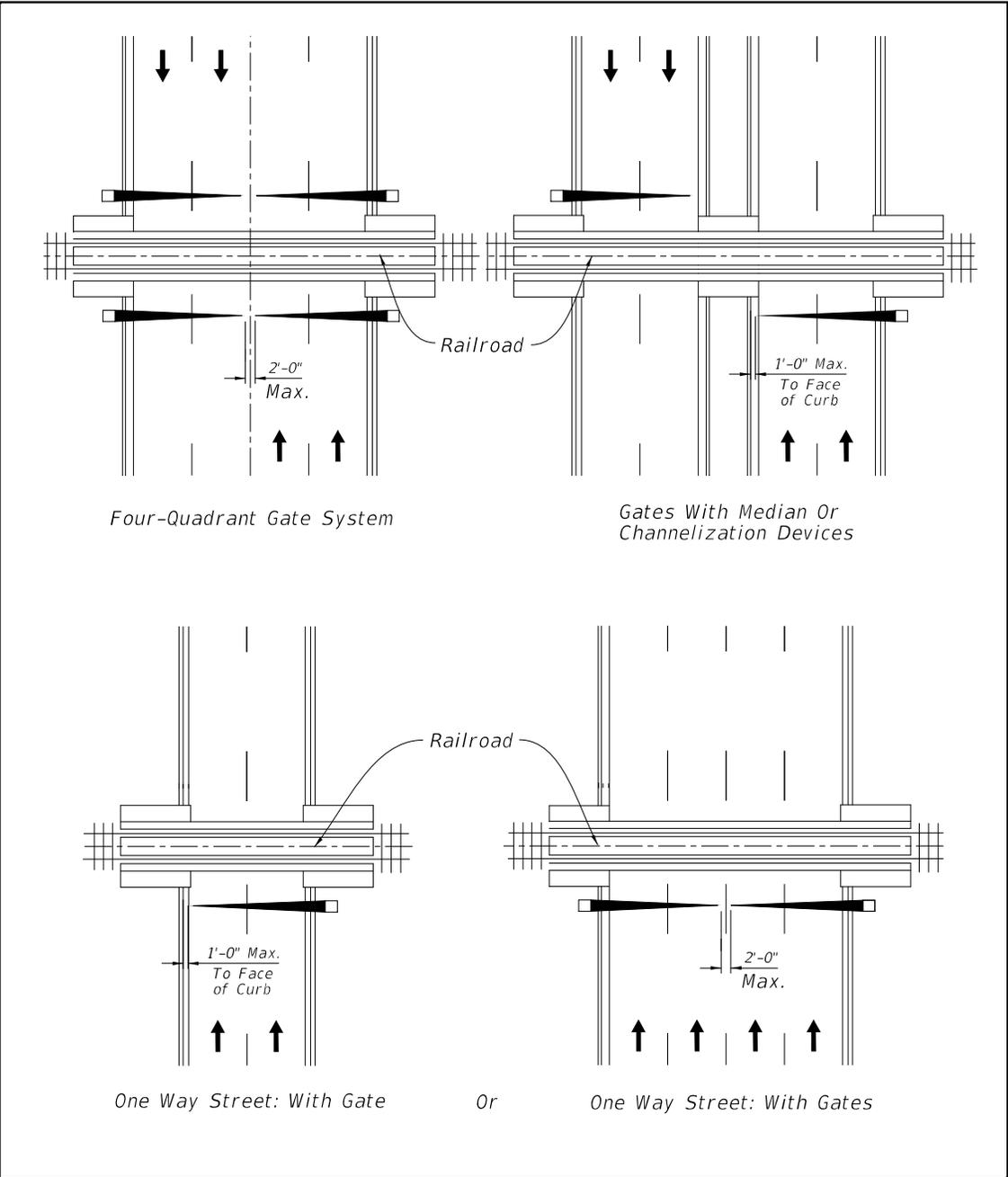


4 Quadrant Gate System

▶ Chapter 7 - Rail-Highway Crossings

- ▶ New criteria for vertical and horizontal clearance at crossings
- ▶ Requires sidewalks and shared use paths be continued through grade crossings
- ▶ Added requirements for “Quiet Zones”
- ▶ Updated passive and active crossing configurations to be consistent with MUTCD
- ▶ Categorizes high speed rail by speed

Figure 7 - 8 Gate Configuration for Quiet Zones



Major Changes for 2016

- ▶ Chapter 8 - Pedestrian Facilities
 - ▶ Sidewalks should be provide on both sides of roadways in or within one mile of an urban area
 - ▶ Link to urban area maps
<http://www.dot.state.fl.us/rddesign/PPMManual/BufferMaps.shtm>
 - ▶ Establishes 5' (6' back of curb) as the min. width for sidewalks
 - ▶ Defines drop off hazards and when shielding needed
 - ▶ New guidance for mid-block crossings, median refuge, and pedestrian hybrid beacon
 - ▶ New criteria for horizontal separation of sidewalk from roadway
 - ▶ New figures for location of sidewalk with guardrail



4th Street North, St. Petersburg

Major Changes for 2016

▶ Chapter 9 - Bicycle Facilities

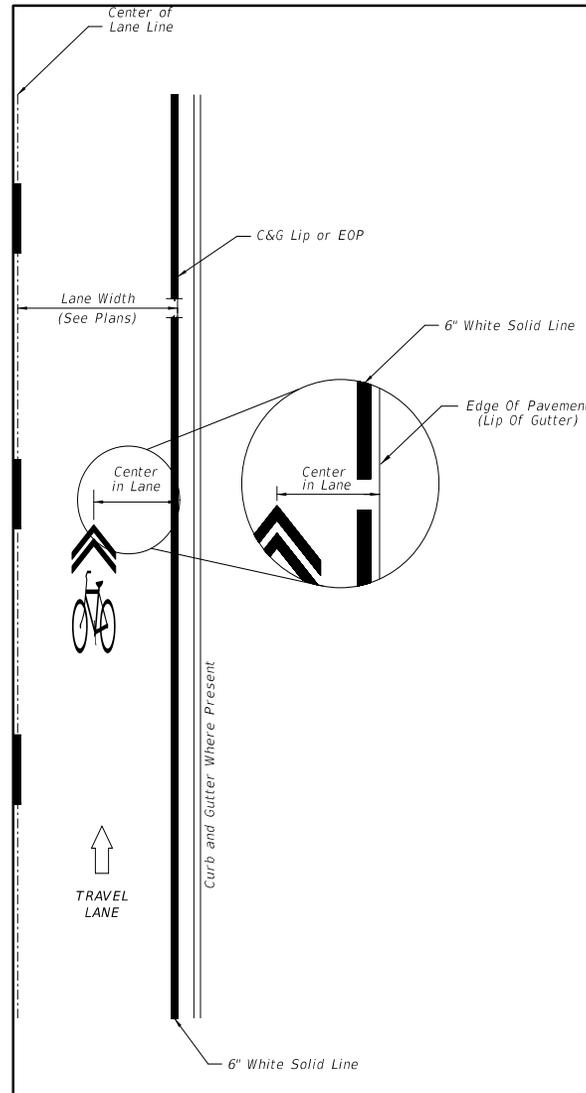
- ▶ More bike lanes types - standard, buffered and green
- ▶ Ability to adjust lane widths to provide bicycle facilities
- ▶ Table 9-1 Lane Widths for Existing Urban Multilane or Two-Lane with Curb and Gutter
 - ▶ 11' where trucks are >10% of Design Year Traffic or Design Speed is 40 mph or greater
 - ▶ 10 ft. for 2 Way Left Turn Lanes

Design Year AADT	Design Speed (mph)	Minimum Thru Lane (ft.)	Minimum Turn Lane (ft.)	Minimum Parking Lane (ft.)
ALL	ALL	10 ₁	9 ₂	7 ₃

Major Changes for 2016

► Chapter 9 - Bicycle Facilities

- Revised placement of shared lane marking



56th Street , Temple Terrace

Major Changes for 2016

Camp Helen State Park, Bay County

▶ Chapter 9 - Bicycle Facilities

- ▶ Complete update of shared use path section
- ▶ Criteria established for type, size and location of signs on shared use paths
- ▶ Permission for grade to match slope of roadway when constrained in right of way extended to shared use paths



Basics - Shared Use Paths/Multi-Use Trails

- ▶ Paved facilities separated from motorized traffic by open space or barrier
 - ▶ Within the highway right of way or an independent right of way
 - ▶ Minimal cross flow by motor vehicles
 - ▶ Used by bicyclists, pedestrians, runners, skaters, and in some cases equestrians
- ▶ Bicycle's operating characteristics govern the design
 - ▶ Typical adult bicyclist is the design user, 18 mph design speed
- ▶ Serve as pedestrian facilities
 - ▶ 2006 Americans with Disabilities Act - Standards for Transportation Facilities
 - ▶ 2012 Florida Accessibility Code

Accessibility

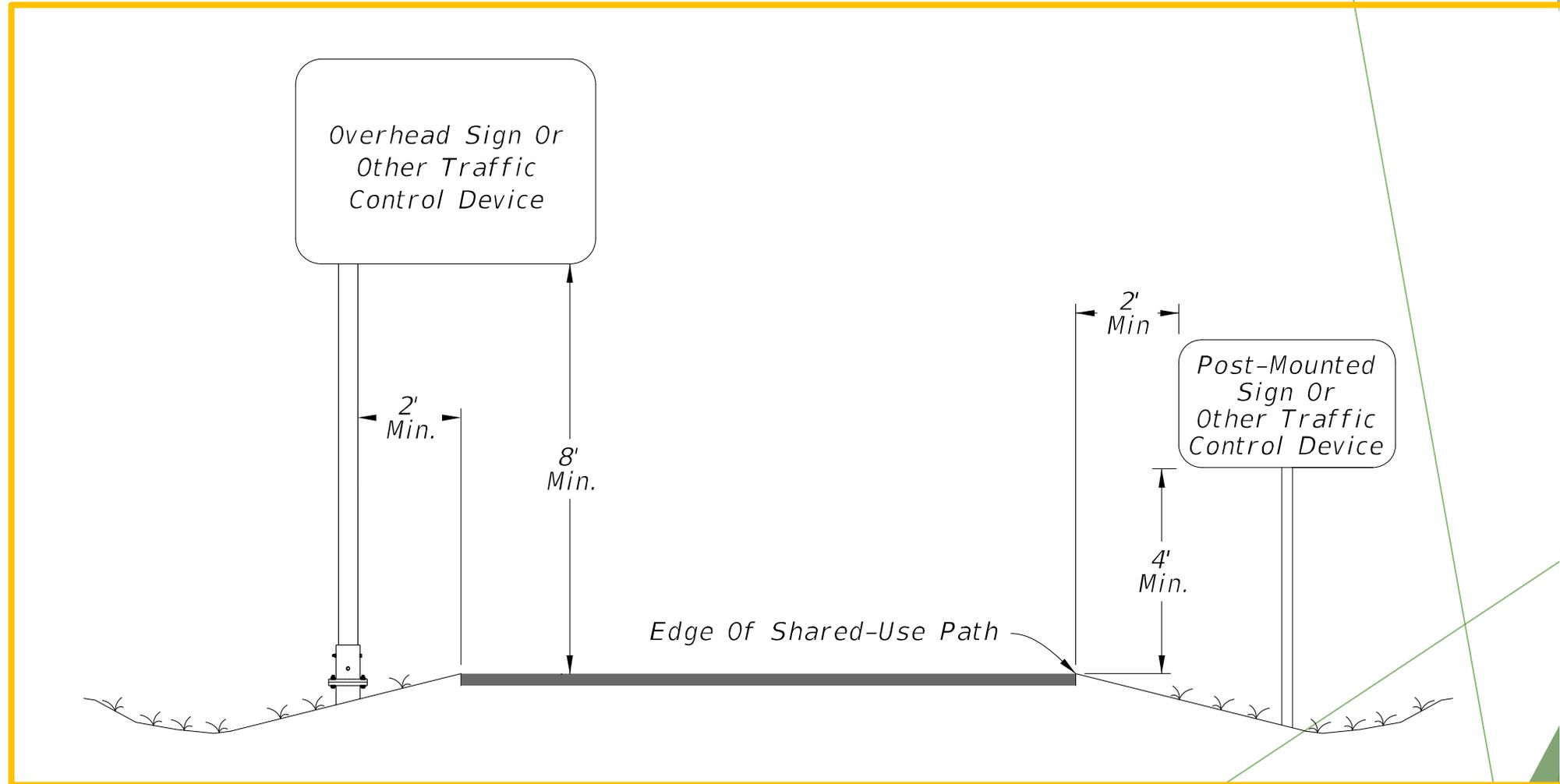
- ▶ Americans with Disabilities Act applies
- ▶ Curb ramps should be parallel to and the full width of the path
- ▶ Same grade and cross slope requirements as sidewalks
 - ▶ Grade should not exceed 5%, cross slope no more than 2%
- ▶ Pull boxes, manholes, etc. in the curb ramp or detectable warning should be relocated when feasible
- ▶ Specify an appropriate detectable warning system compatible with path surface
- ▶ Evaluate existing driveways
 - ▶ Feasible to upgrade nonconforming driveway turnouts
 - ▶ Not required to be upgraded if not feasible within scope of project
- ▶ Chapter 8 - Pedestrian Facilities provides additional information

Pavement Markings and Signage

- ▶ MUTCD regulates the design and use of all traffic control devices on shared use paths
- ▶ Sign Placement on Shared Use Paths shown in Figure 9-27
 - ▶ Maximum height from the outside edge of the path to the bottom elevation of a sign is 5'
 - ▶ Sign dimensions provided in MUTCD, Table 9B-1 Bicycle Sign and Plaque Sizes
 - ▶ Placement of stop or yield lines and crosswalks provided in the MUTCD, Part 3



Pavement Markings and Signage



Resources

- ▶ [Manual of Uniform Traffic Control Devices \(MUTCD, 2009 Edition with 2012 revisions\)](#)
- ▶ [Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way; Shared Use Paths, United States Access Board](#)
- ▶ [AASHTO Guide for the Development of Bicycle Facilities \(2012, 4th Edition\)](#)
- ▶ [Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds \(USFS, August 2009\)](#)
- ▶ [Manuals and Guides for Trail Design, Construction, Maintenance, and Operation and for Signs, National Recreational Trails Program, FHWA](#)

Major Changes for 2016

- ▶ Chapter 11 - Work Zone Safety
 - ▶ Applies to any activity within the right of way
 - ▶ Temporary Traffic Control Plan (TTC) must address all road users (pedestrians, cyclists, drivers, transit, trucks)



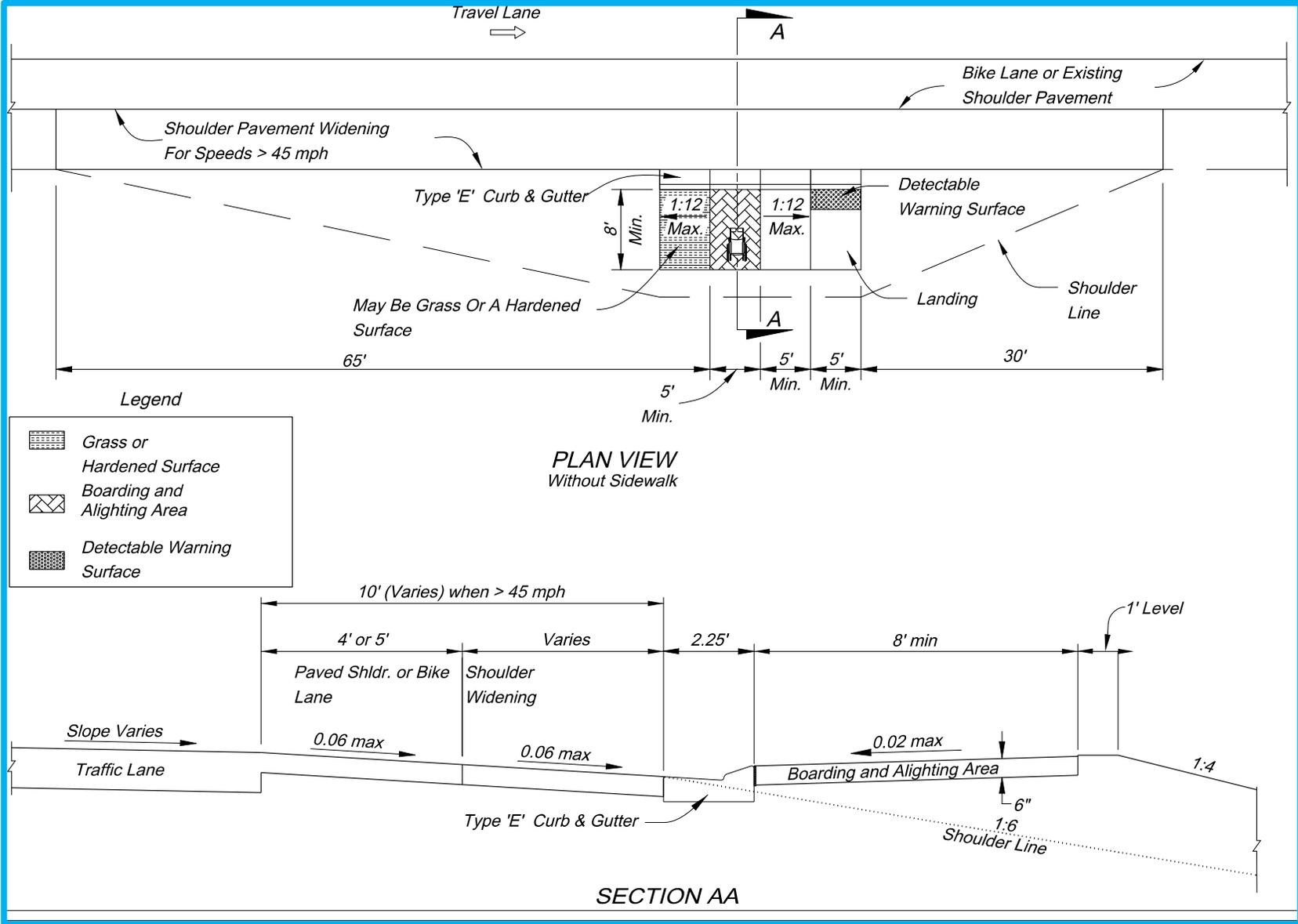
Major Changes for 2016

- ▶ Chapter 13 - Transit
 - ▶ New criteria for boarding and alighting areas, including details for design
 - ▶ Description for boarding and alighting areas (B&A)
 - ▶ When projects include a new bus stop or impact existing bus stops they should comply with FAC 14-20.



Lakeland, FL

Boarding and Alighting Area



Major Changes for 2016

- ▶ Chapter 15 - Traffic Calming
 - ▶ Added information for curb extensions, speed cushions/pillows, chicanes, roundabouts, raised crosswalks



Major Changes for 2016

- ▶ Chapter 16 - Residential Street Design
 - ▶ Added criteria for narrower lanes in constrained or rural conditions
 - ▶ Expanded criteria for sidewalks, bicycle facilities, shared use paths and connectivity between facilities
- ▶ Chapter 17 - Bridges and Other Structures
 - ▶ Sign, lighting and traffic supports required to meet AASHTO and FDOT criteria
 - ▶ Requires noise walls to meet FDOT's Structures Design Guidelines (SDG)
- ▶ Chapter 18 - Signing and Marking
 - ▶ Overhead street name signs should be installed on mast arm or strain pole, not span wires



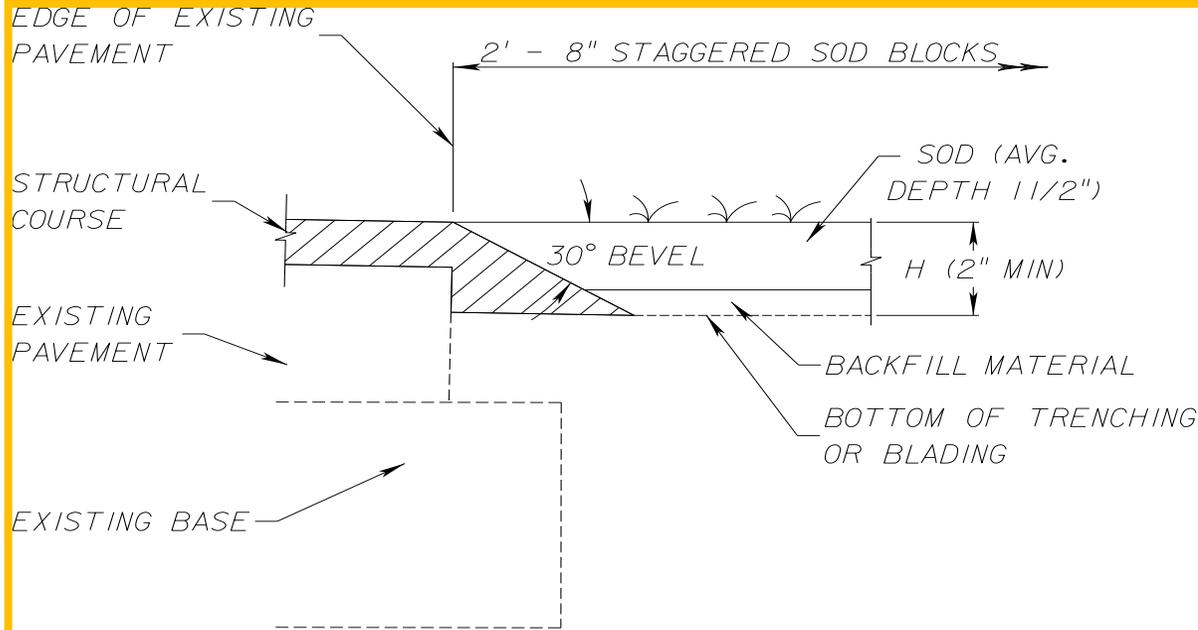
San Carlos Blvd., Ft. Myers Beach

Safety Edge Adopted in 2013 Greenbook

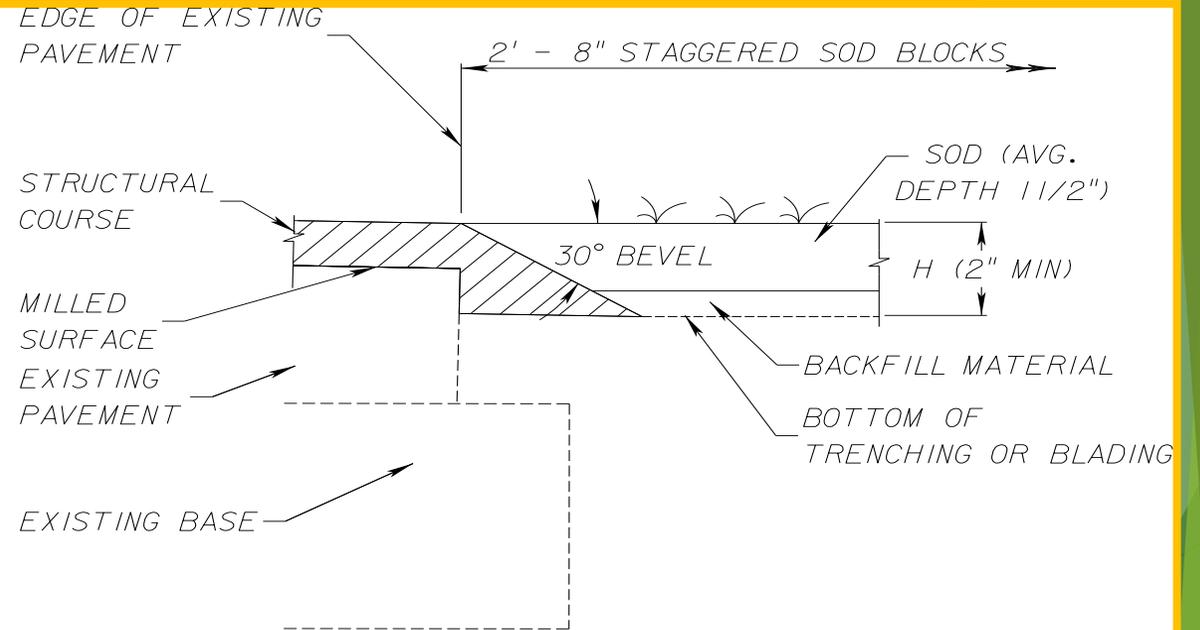
- ▶ Should be constructed adjacent to pavement edge on rural roadways with no paved shoulder and posted speeds \geq 45 mph



Safety Edge Detail



RESURFACING WITH SAFETY EDGE



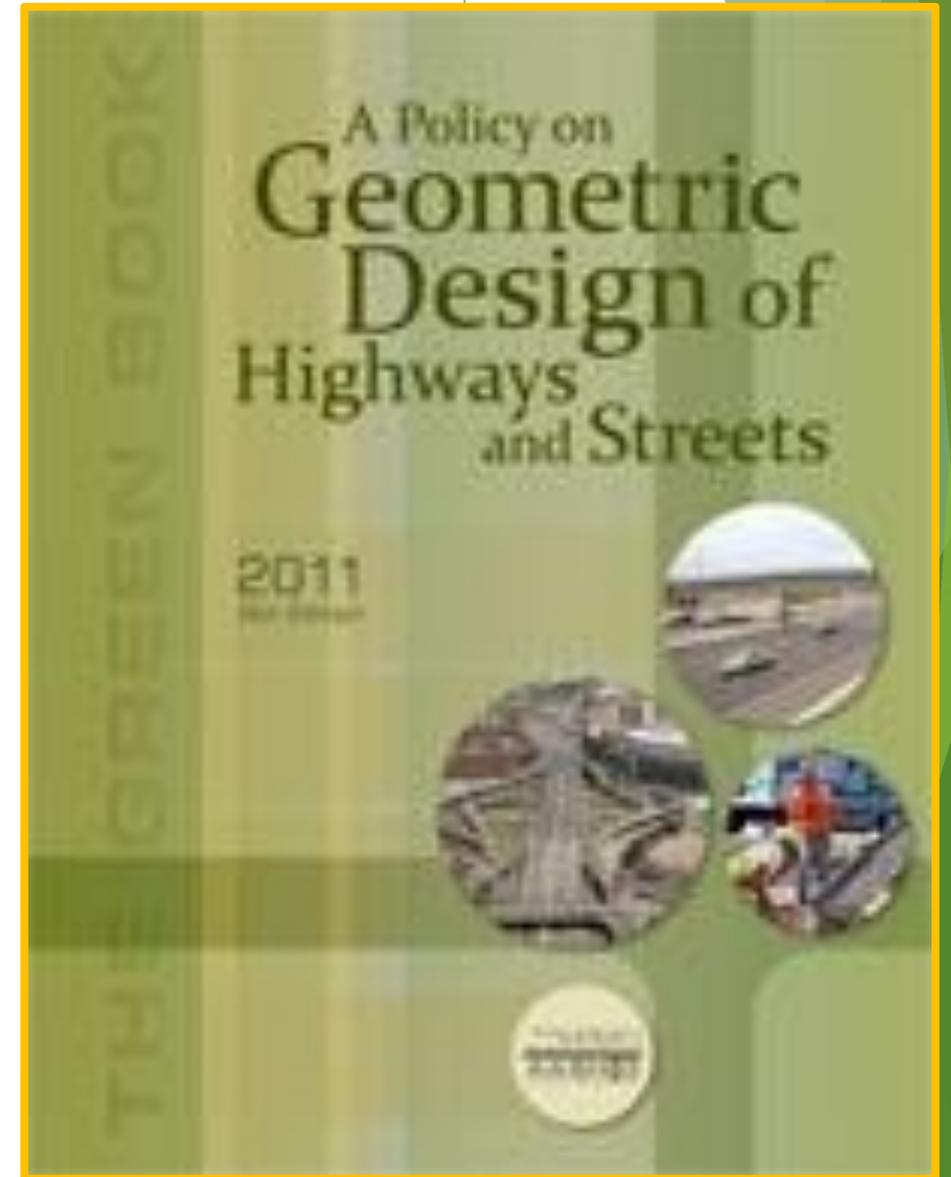
MILLING AND RESURFACING WITH SAFETY EDGE

FOR $2" \leq H \leq 5"$

SINGLE LIFT
SAFETY EDGE DETAIL

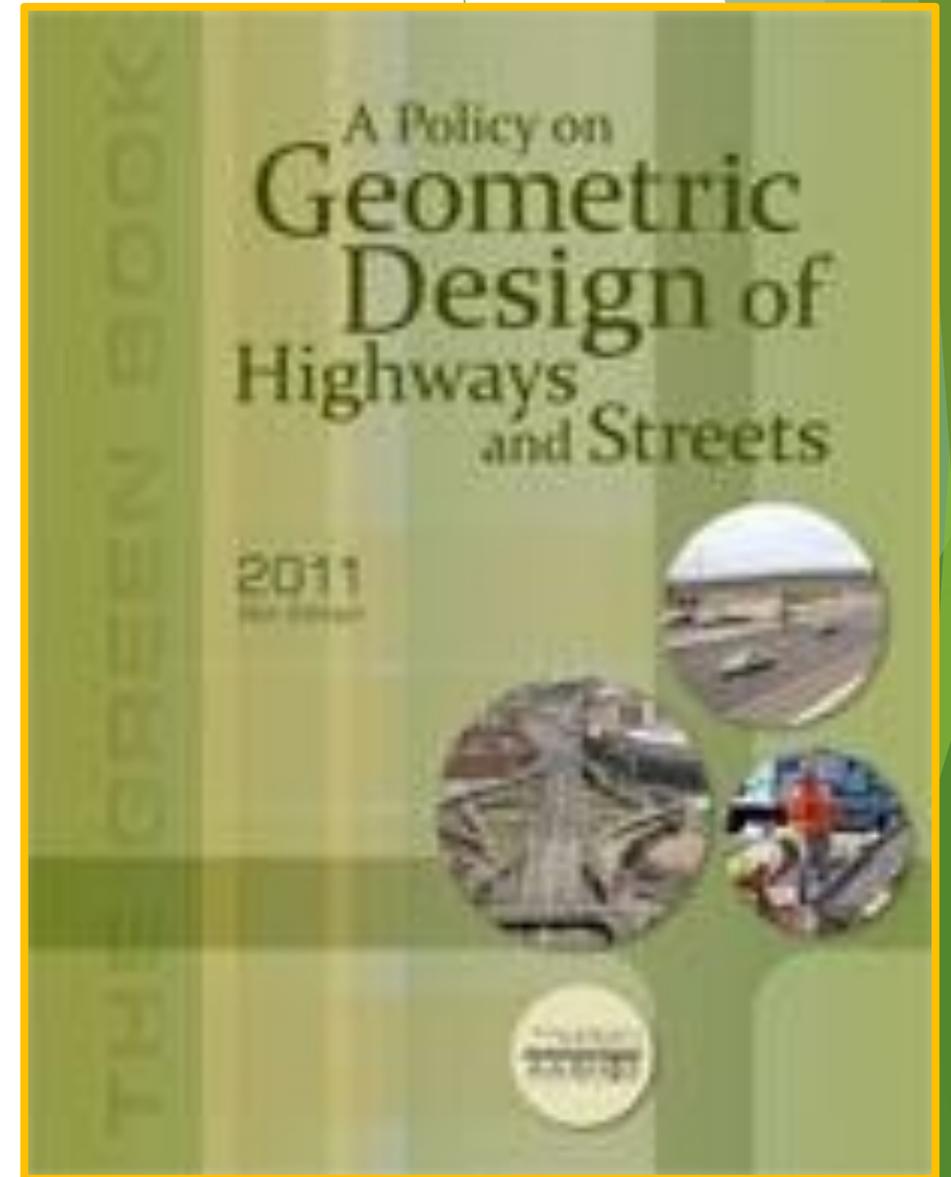
2011 AASHTO Greenbook

- ▶ Effective November 12, 2015
- ▶ FHWA published the Final Rule to Title 23 Code of Federal Regulations Part 625
- ▶ The rule modifies regulations governing new construction, reconstruction, resurfacing (except for maintenance resurfacing), restoration, and rehabilitation projects on the NHS



2011 AASHTO Greenbook

- ▶ The revisions include referencing current versions of:
 - ▶ AASHTO A Policy on Geometric Design of Highways and Streets (Green Book, 2011 edition)
 - ▶ AASHTO's Load and Resistance Factor Design (LRFD) Bridge Design Specifications
 - ▶ LRFD Movable Highway Bridge Design Specifications
 - ▶ Standard Specifications for Structural Supports of Highway Signs, Luminaires and Traffic Signals
 - ▶ AWS Bridge Welding Code and the Structural Welding Code—Reinforcing Steel



13 Controlling Criteria - FHWA

- ▶ FHWA issued a notice and request for comments in November 2015
- ▶ Based on comments received, FHWA's experience and findings of NCHRP Report 783 “Evaluation of the 13 Controlling Criteria for Geometric Design” (2014), the 10 controlling criteria for design on high speed roadways (≥ 50 mph) are:
 - ▶ Design Speed
 - ▶ Lane Width
 - ▶ Shoulder Width
 - ▶ Horizontal Curve Radius
 - ▶ Superelevation Rate
 - ▶ Stopping Sight Distance (SSD)
 - ▶ Maximum Grade
 - ▶ Cross Slope
 - ▶ Vertical Clearance
 - ▶ Design Loading Structural Capacity

13 Controlling Criteria - FHWA

- ▶ On low-speed roadways (*i.e.*, non-freeways with design speed <50 mph) on the NHS, only the following two controlling criteria apply:
 - ▶ Design Loading Structural Capacity
 - ▶ Design Speed
- ▶ Greenbook is working to revise Chapter 14 - Design Exceptions
 - ▶ To be included in 2018 Edition of the Florida Greenbook

Contact Mailer

- ▶ How can I find out when new publications are available?
- ▶ “Self Service” web page where you can register to receive information from FDOT
- ▶ Options include information on design criteria and standard changes, specifications and estimates updates, training opportunities, and **Greenbook!**
- ▶ <http://www.dot.state.fl.us/projectmanagementoffice/ContactDatabase.shtm>