FDOT Transportation Symposium Webinar Series

2022 Florida Greenbook (Draft)
2022 Florida Greenbook

• Has been approved by the Greenbook Advisory Committee, reviewed by FDOT’s legal office, but not completed rulemaking.
• No effective date yet.
• Can be downloaded from FDOT Greenbook web page.
• https://www.fdot.gov/roadway/floridagreenbook/fgb.shtm
Purpose of Florida Greenbook

- Chapter 335.01, F.S. Designation and systemization of public roads.
  
  (1) All roads which are open and available for use by the public and dedicated to the public use, according to law or by prescription, are hereby declared to be, and are established as, public roads.

  (2) Public roads shall be divided into four systems:
  
  (a) The State Highway System;
  (b) The State Park Road System;
  (c) The county road system; and
  (d) The city street system.
Purpose of Florida Greenbook

- Chapter 336.045, F.S. Uniform minimum standards for design, construction, and maintenance; advisory committees.
  - (1) ... department shall develop and adopt uniform minimum standards and criteria for the design, construction and maintenance of all public streets, roads, ... bridges, ...sidewalks, ...bicycle ways... used by the public for vehicular and pedestrian traffic. ...consider design approaches which provide for the compatibility of such facilities with the surrounding natural or manmade environment.
  - (2) An advisory committee of professional engineers ... composed of: one member representing an urban center...; one member representing a rural area...; one member within each district who is a professional engineer ... not employed by any governmental agency; and one member employed by the department for each district.
2009 MUTCD with Revisions 1 and 2 (May 2012)
• 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
2018 AASHTO Green Book was adopted by FHWA on January 3, 2022

- Published Final Rule to Title 23, Code of Federal Regulations Part 625 (Design Standards for Highways)
- Use of the updated standards is required for all National Highway System (NHS) projects authorized to proceed with design activities on or after February 2, 2023.

- [http://downloads.transportation.org/publications/GDHS-7_SummaryOfChanges.pdf](http://downloads.transportation.org/publications/GDHS-7_SummaryOfChanges.pdf)
2001 AASHTO Geometric Design of Very Low-Volume Roads

- Local roads and minor collectors with ADT of \( \leq 400 \) vehicles per day
  - Lane Widths
  - Bridge Width
  - Roadside Design
On or Off the State Highway System (SHS)?

- Intended for use on all streets and highways OFF the SHS
- Unless using federal funds and project is:
  - On the National Highway System (NHS),
  - Has a construction value ≥ $10 million, or
  - Includes a vehicular bridge, pedestrian bridge over a roadway, certain box culverts.
- Then use FDOT’s Design Manual (FDM) and Standard Plans

Fort George/Talbot Island Bridge, FL
# What Criteria To Use?

For LAP Projects with federal funds Only!

- Check Table 1: Project Classification in Chapter 17 of Local Programs Manual
- [https://www.fdot.gov/programmanagement/lap/lap-toc.shtm](https://www.fdot.gov/programmanagement/lap/lap-toc.shtm)

<table>
<thead>
<tr>
<th>Project Classifications</th>
<th>Design Criteria and Standards*</th>
<th>Specifications*</th>
<th>Materials Testing*</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class B</strong> Off the State and National Highway Systems with an estimated construction value of $10 million or greater.</td>
<td><strong>FDOT Design Manual and FDOT Standard Plans</strong></td>
<td><strong>FDOT Standard Specifications for Road &amp; Bridge Construction</strong></td>
<td><strong>Samples Testing and Reporting Guide and FDOT Materials Manual</strong></td>
<td>FDOT Prequalified Consultants and Contractors</td>
</tr>
</tbody>
</table>
| **Class C** Off the State and National Highway Systems and includes structural components:  
  • 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 Design Manual and FDOT Standard Plans**  
  2) For all other components, use the **Florida Greenbook** | 1) For the structure components, **FDOT Standard Specifications**  
  2) For all other components, **LAP Big 4 or approved Local Agency Specs** | **Samples Testing and Reporting Guide and FDOT Materials Manual** | FDOT Prequalified Consultants and Contractors |
| **Class D** Off the State and National Highway Systems, may include structural components:  
  • 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** | **Local Agency materials testing process** | **Local Agency qualified consultants and contractors** |
Purpose

- Provides information on –
  - Statutory Authority
  - Intended Use (new, reconstruction, resurfacing, maintenance)
  - Adoption of 2009 MUTCD and Revisions 1 and 2
  - Reference to Local Programs Manual (former LAP Manual for further requirements)
  - Context based design policy and key objectives
  - Definition of terms
• Policies and Objectives
  • Requires that policies developed by local governments related to streets and highways support context based design objectives.
    • Specifies all users
    • Applies to all projects
    • Procedure for exceptions and variations
    • Creates a network
    • Adoptable by all agencies
    • Latest and best design criteria
    • Context-sensitive
    • Establishes performance measures
    • Includes specific steps for implementation
Purpose, Policies and Objectives, and Definitions

- Tampa’s East West Green Spine Cycle Track
- [https://www.tampa.gov/tss-transportation/info/projects/green_spine](https://www.tampa.gov/tss-transportation/info/projects/green_spine)

---

**Phase 2**
(W. Cass St)

**Phase 3**
(Nuccio Pkwy & 15th St)
Ft. Myers Beach and Lee County

• Refresh Estero Boulevard
• Refresh Ft. Myers Beach Waterlines
• https://refreshfmbeach.com/overview/
Ft. Myers Beach and Lee County

- Refresh Estero Boulevard
- Refresh Ft. Myers Beach Waterlines
- [https://refreshfmbeach.com/overview/](https://refreshfmbeach.com/overview/)
Chapter 1 – Planning and Land Development

- Functional and context based design classification determined by the local government
- Terms rural and urban are based upon population density
- Encouraged to use the same definitions for land areas as in FDOT’s Context Classification Guide
Context Based Design

FDOT CONTEXT CLASSIFICATIONS

- **C1-Natural**: Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions.
- **C2-Rural**: Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.
- **C2T-Rural Town**: Small concentrations of development areas immediately surrounding rural lands and natural areas; includes many historic towns.
- **C3R-Suburban Residential**: Mostly residential uses within large blocks and a disconnected or sparse roadway network.
- **C3C-Suburban Commercial**: Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.
- **C4-Urban General**: Mix of uses set within small blocks with a well-connected roadway network. May external long distances. Roadway network usually connects to residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.
- **C5-Urban Center**: Mix of uses set within small blocks with a well-connected roadway network. Typically concentrated around a few blocks and identified as part of a civic or economic center of a community, town, or city.
- **C6-Urban Core**: Areas with the highest densities and mixed-use layouts, with within FDOT assigned Large Unseparated Areas (separation >1,000,000). Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadway, and are within a well-connected roadway network.
Chapter 1 – Planning and Land Development

• Lane Repurposing
  – Data Needs
  – Multidisciplinary Review Team
  – Concept Reports
  – Project Description
  – Proposed Modifications
  – Traffic Analysis
  – Safety Analysis
  – Public Involvement

Franklin Blvd, Tallahassee, Florida
Chapter 2 – Land Development

• Merged into Chapter 1 – Planning and Land Development
• Parking
  – Parallel or angle (traditional or reverse)
  – Posted speeds of 35 mph or less
  – Recognizes that on-street parking may:
    • Help manage traffic speeds
    • Provides separation between the sidewalk and travel lanes
    • May decrease through capacity, reduce traffic flow, and increase crash potential
  – ADA Requirements
  – Parking Restrictions at driveways, intersections, mid-block pedestrian crossings
Chapter 3 – Geometric Design

• Parking
  – Parallel or angle (traditional or reverse)
  – Posted speeds of 35 mph or less
  – Recognizes that on-street parking may:
    • Help manage traffic speeds
    • Provides separation between the sidewalk and travel lanes
    • May decrease through capacity, reduce traffic flow, and increase crash potential
  – ADA Requirements
  – Parking Restrictions at driveways, intersections, mid-block pedestrian crossings

FAMU Way, Tallahassee, Florida
Chapter 3 – Geometric Design

- Accessibility Requirements for Sidewalks and Shared Use Paths
  - Design criteria provided in Greenbook
  - USDOT ADA Standards for Transportation Facilities (2006) and Department of Justice ADA Standards (2010) as required by 49 C.F.R 37.41 or 37.43
  - Proposed Public Rights-of-Way Accessibility Guidelines (PROWAG) provides additional information on the design of accessible pedestrian facilities

Palm Beach Operations Center, Palm Beach County, Florida
Chapter 4 – Roadside Design

• Clarified that Table 4 – 1 for Clear Zones applied to both curbed and flush shoulder roadways

• Lateral Offset:
  – Distance from a specified point on the roadway to roadside hazard
  – Applies to all roadways and determined by type of facility (curbed or flush shoulder), design speed, design element, project type (new construction, RRR)
  – Table 4 – 2 now includes criteria for urban curbed roadways with design speeds ≤ 25 mph

Park Avenue, Winter Park, Florida
### Table 4-1 Minimum Width of Clear Zone (feet)
(Curbed and Flush Shoulder Roadways)

<table>
<thead>
<tr>
<th>Design Speed mph</th>
<th>AADT ≥ 1500</th>
<th>AADT &lt; 1500</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Travel Lanes &amp; Multilane Ramps</td>
<td>Aux Lanes and Single Lane Ramps</td>
</tr>
<tr>
<td></td>
<td>1V:6H or flatter</td>
<td>1V:5H to 1V:4H</td>
</tr>
<tr>
<td>≤ 40</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>45 – 50</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>55</td>
<td>22</td>
<td>26</td>
</tr>
<tr>
<td>60</td>
<td>30</td>
<td>30&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>65 – 70</td>
<td>30</td>
<td>30&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
</tbody>
</table>
### Table 4-2 Lateral Offset (feet)

<table>
<thead>
<tr>
<th>Roadside Feature</th>
<th>Urban Curbed Roadways Design Speed (\leq 25) (mph)</th>
<th>Urban Curbed Roadways Design Speed (\leq 45) (mph)</th>
<th>All Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above Ground Objects(^1)</td>
<td>1.5 ft. from Face of Curb(^3,4)</td>
<td>4 ft. from Face of Curb(^3,4)</td>
<td>Clear Zone Width</td>
</tr>
<tr>
<td>Drop Off Hazards(^2)</td>
<td>Clear Zone Width</td>
<td>Clear Zone Width</td>
<td>Clear Zone Width</td>
</tr>
<tr>
<td>Water Bodies</td>
<td>Clear Zone Width</td>
<td>Clear Zone Width</td>
<td>Clear Zone Width</td>
</tr>
<tr>
<td>Canal Hazards</td>
<td>See Section B.2.c</td>
<td>See Section B.2.c</td>
<td>See Section B.2.c</td>
</tr>
</tbody>
</table>

1. Above ground objects are anything greater than 4 inches in height and are firm and unyielding or do not meet crashworthy or breakaway criteria. For urban curbed areas \(\leq 45\) mph this also includes crashworthy or breakaway objects except those necessary for the safe operation of the roadway.

2. May be reduced to 1.5 ft. from Face of Curb on roads functionally classified as Local Streets and, on all roads, where the 4 ft. minimum offset cannot be reasonably obtained and other alternatives are deemed impractical. For very low-volume roads, \(\leq 400\) vpd, a minimum of 1.5 feet of clearance is desirable but may be reduced to 6” from the face of curb where the corridor is constrained. AASHTO’s Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT \(\leq 400\)) provides additional information.

3. May only be used in areas where development patterns and land use would qualify as an Urban Center or Urban Core Context Classification.
   a. **Urban Center** - Mix of uses set within small blocks with a well-connected roadway network, typically concentrated around a few blocks and identified as part of the community, town, or city of a civic or economic center.
   b. **Urban Core** - Areas with the highest densities and with building heights typically greater than four stories. Many are regional centers and destinations. Buildings have mixed uses, are built up to the roadway, and are within a well-connected transportation network.

4. A design variation for failure to meet clear zone criteria is not required for existing, low speed, curbed roadways if the requirements for the placement of above ground fixed objects are met.
Chapter 4 – Roadside Design

- End Treatments and Crash Cushions
  - Figures added to illustrate how to determine when an approach terminal, trailing anchorage or crash cushion should be selected when using guardrail to provide protection for a hazard.
Chapter 4 – Roadside Design

• Roadside Design in Work Zones
  – Clear zone widths
  – Above ground hazards
  – Non-traversable edge drop-offs, critical slopes and roadside excavations
    • Table 4 – 6 Device Requirements for Edge Drop Offs
  – Temporary barriers in work zones when clear zone widths can not be met
    • Shield edge drop-offs and roadside excavations
    • Shield above ground hazards, including roadside structures, falsework for bridges, material storage sites and/or other exposed objects
    • Provide positive protection for workers
    • Separate two-way traffic
    • Separate pedestrians from vehicular traffic

US 98, Destin, Florida
Chapter 5 – Pavement Design and Construction

- Safety Edge information consolidated and moved to Chapter 10 – Maintenance and Resurfacing

Shady Hills Road, District 7, Florida
Chapter 6 – Lighting

- **Wildlife Sensitive Lighting** –
  - In coordination with Florida’s Marine Turtle Protection Act (F.S. 379.2431)
  - May require lower lighting levels, adjusting the direction of luminaires, and different types and colors of lighting
  - KMZ layers and shape files to determine wildlife areas of concern can be found on [FDOT’s Office of Environmental Management “OEM Resources”](#) web page, under Turtle Lighting
  - See FDOT’s [Approved Product List (APL)](#) in the Wildlife-Sensitive Conventional Lighting category or FWC’s [Certified Wildlife Lighting Guidelines](#) for information on luminaires which met the wildlife sensitive lighting criteria.
  - For night work along coastal roadways, direct work zone lighting away from beach and shield luminaires
Chapter 7 – Rail-Highway Grade Crossings

- Railroad Dynamic Envelope
  - Use to delineate area around at-grade railroad crossings where vehicles should not stop
Chapter 8 – Pedestrian Facilities

• Curb ramps shall be provided at all intersections with curb (Section 336.045 (3) F.S.)

• Each crossing should have separate curb ramps, perpendicular with the curb, and landing within the crosswalk

• Curb ramp width:
  – Sidewalks - minimum of 4 feet; curb ramp widths equal to crosswalk widths are encouraged
  – Shared Use Paths - the curb ramp shall be at least as wide as the approaching width of the path

• A turning space at least 4 feet by 4 feet wide shall be provided at the top of the curb ramp

Franklin Blvd, Tallahassee, Florida
• Provide a minimum 1-foot wide level graded area with a maximum slope of 1:6 along both sides of the sidewalk.
• This would not apply to the side of the sidewalk located immediately adjacent to a curb, structure or the right of way line.
Chapter 8 – Pedestrian Facilities

• Curb Extensions
  – Used in conjunction with on-street parking at intersections or midblock locations where there is a crosswalk
  – Shorten the crossing distance, and provide additional space at intersections, allowing pedestrians to see and be seen before entering a crosswalk

• Pedestrian Signals
  – Where pedestrian facilities are provided or planned, include provisions (e.g., conduit, conductors, signal cables, push button pedestals, curb ramps) needed for future installation of APS on all new and reconstructed signalized intersections and signalized crossing locations.
  – Provide a 30 x 48” level landing (in either direction) at the base of all pedestrian pushbutton locations.

Venice, Florida
Chapter 8 – Pedestrian Facilities

- U.S. Access Board
  - Public Rights of Way - Sidewalks, Shared Use Paths, Parking
    - https://www.access-board.gov/prowag/
- Florida Building Code
  - Accessibility, 7th Edition
    - https://codes.iccsafe.org/codes/florida
Chapter 9 – Bicycle Facilities

• Separated Bicycle Lanes
  – One-way or two-way traffic
  – Amount of separation tends to increase as motorized traffic volumes and speeds increase
    • Adjacent to on-street parking – at least 3’ separation
    • Adjacent to travel lanes – varies by posted speed and whether a vertical element is added, from 2 – 8’ minimum separation
  – Width
    • One-way – 7’ preferred, 6’ minimum
    • Two-way – 12’ preferred, 10’ minimum
  – Separation is maintained between bicycle and motorized vehicle traffic through intersections
  – Conflict points are minimal and mitigated through pavement markings, color or other treatment
Chapter 9 – Bicycle Facilities

- Shared Use Path Width and Clearance
  - At least 2’ wide graded, clear area with a maximum 1:6 slope shall be maintained adjacent to both sides of the path
  - 3 feet + is desirable to provide clearance from trees, poles, walls, fences, guardrails, or other lateral obstructions
Chapter 9 – Bicycle Facilities

- Shared Use Paths require a separation from the roadway (horizontal space of at least 5’ or barrier)
  - Curbed – measured from face of curb to nearest edge of the path
  - Paved Shoulder – outside edge of the paved shoulder to nearest edge of the path
  - Unpaved Shoulder – outside edge of traveled way to inside edge of the path
  - Where the separation is less than 5 feet, a physical barrier or railing should be provided between the path and the roadway.
Sign Placement on Shared Use Paths

- Overhead Sign or Other Traffic Control Device:
  - Min. 2'
  - Min. 8'

- Post-Mounted Sign or Other Traffic Control Device:
  - Min. 2'
  - Min. 4'
  - Max. 5'

Edge of Shared-Use Path
• Shared Use Path Grade
  – Within a highway right of way, grade shall not exceed the general grade established for the highway
  – Where not within a highway right of way, the grade shall be 5 percent maximum
  – Compliance to the max. extent feasible allowed when not practicable to meet the 5% max. due to existing terrain or infrastructure, right-of-way availability, a notable natural feature, or similar existing physical constraints

• The cross slope of a shared use path shall be 2% maximum
Chapter 9 – Bicycle Facilities

• Curb Ramps and Blended Transitions
  – Shall be parallel to and the full width of the approaching path width.

• Shared Use Path Roadway Intersections
  – Grade Separated Crossings – Crossings consisting of either a bridge over the roadway or an underpass beneath the roadway.
  – Sidepath/Intersection Crossings – Crossings that are located within the functional area of an intersection of two or more roadways and the path is running parallel with the roadway.
  – Midblock Crossings – Crossings that are located outside the functional area of an intersection.

Deland, FL
Chapter 9 – Bicycle Facilities

• Structures Width on Shared Use Paths
  – Clear Width - Shall be the same as the approach width of the path
  – Additional Buffer - At least a 2’ wide clear area on each side should be provided

• Structures Grade on Shared Use Paths
  – Where compliance with the 5% max running slope is not practicable due to existing terrain or infrastructure, right-of-way availability, a notable natural feature, or similar existing physical constraints, compliance is required to the extent practicable.
Safety Edge should be provided adjacent to the travel lane on roadways:
- without curb or paved shoulders,
- with a posted speed of 45 mph or greater, and
- a history of lane departure crashes.

Additional Resources:
- FHWA’s Office of Safety – Safety Edge
- FHWA’s Crash Modification Factors Clearinghouse
- FDOT’s Developmental Specification for Safety Edge – Dev330SE
Chapter 11 – Work Zone Safety and Mobility

• Develop and maintain a program consistent with the **MUTCD**
  – If federal-aid highway funds are provided, also follow **Title 23 Code of Federal Regulations (CFR) 630 Subpart J**, more commonly known as the **Work Zone Safety and Mobility Rule** and **Temporary Traffic Control Devices Rule (Subpart K)**

• When an existing pedestrian facility is in place, an accessible and continuous route for pedestrians through, in, and/or around construction or maintenance work zones must be provided.
Chapter 11 – Work Zone Safety and Mobility

- **Short Term Transverse Rumble Strips**
  - In locations with existing raised rumble strip sets (e.g., intersections, approaches to horizontal curves, toll plazas), maintain or replace the raised rumble strip sets throughout construction.

- **Temporary Raised Rumble Strip Sets**
  - Temporary raised rumble strip sets may be used to supplement the required signs, channelizing devices, and flagging operations in the work zone
    - Lane closure on a two-lane, two-way roadway
    - Existing posted speed prior to construction is 55 mph or greater
Number and Width of Travel Lanes, Bike Lanes, Sidewalks and Shared Use Paths

- Freeways – 11’
- Arterials – 10’ except on transit or truck routes, where a minimum width outside through lane of 10.5’ is required
- Collectors – 10’
- Local – 10’ or to match existing lane widths if less than 10’
- Sidewalks – 5’
- Shared Use Paths – 8’
- Bike Lanes – 4’ plus 1’ offset from barrier or curb

Do not allow traffic control and warning devices to encroach on travel lanes, bike lanes, paved shoulders, sidewalks, and shared use paths
Chapter 11 – Work Zone Safety and Mobility

- Figure 11 – 4 Sidewalk/Shared Use Path Diversion (Temporary Sidewalk/Shared Use Path)
Chapter 12 – Construction

- Defined the Engineer of Record (EOR) and the Construction Engineer (CE)
  - EOR - Professional Engineer that develops the criteria and concept for the project, performs the analysis, and is responsible for the preparation of the Plans and Specifications. The Maintaining Authority’s Engineer of Record may be in-house staff or a consultant.
  - (CE) - Professional Engineer that supervises the construction of the project. The Maintaining Authority’s Construction Engineer or Designee may assign in-house staff or a consultant to act on their behalf.

US 98, Franklin County, FL
• Alterations in Plans
  – No changes shall be made on any plan or drawing after it is approved by the EOR, except as authorized in writing by the EOR
    • Minor changes may be approved by the CE in consultation with the EOR

• Authority of the CE
  – All work shall be performed to the satisfaction of the CE

• Qualifications for Services for FDOT Administered Projects
  – For projects administered by a local government that are wholly or partially funded by the Florida Dept. of Transportation, there are limitations on who may perform design, and Construction Engineering and Inspection services (CEI). See F.S. 337.14 (7) Application for qualification; certificate of qualification; restrictions, request for hearing.
Shelters
- Shelters should be installed at locations where demand warrants installation and in accordance with clear zone and lateral offset criteria

Red-Colored Pavement for Transit Lanes
- FHWA has issued an interim approval for the optional use of red-colored pavement
  - to enhance the conspicuity of station stops, travel lanes, or other locations in the roadway
  - MUTCD – Interim 1A-22
• Design Exceptions are required when existing or proposed design elements are below both the criteria in this Manual and AASHTO’s new construction criteria for the Controlling Design Elements

  • For projects using safety funds and developed to improve specific safety problems, only the elements identified under the scope of work for the safety improvement project are subject to these approval processes.
  • For drainage projects, only elements identified in the scope of services for the drainage project are subject to these approval processes.
  • For landscape-only projects, intersection sight distance Design Variations may be processed by the Responsible Landscape Architect of Record. For design projects with landscaping, intersection sight distance Design Variations must be processed by a Professional Engineer.
  • Maintenance Resurfacing, Ride Only (a.k.a., Ride Rehabilitation) and Skid Hazard Projects do not require Design Exceptions or Variations other than for accessible curb ramp or blended transition requirements. If compliance with accessible curb ramp or blended transition requirements is determined to be technically infeasible, documentation as a Design Variation is required.
Wildlife Crossing Features

- Consider the use of wildlife connectivity features (e.g. shelves and wildlife fencing) in accordance with the **FDOT Wildlife Crossing Guidelines**
- New or modified structures, such as bridges, bridges with shelves, specially designed culverts, enlarged culverts or drainage culverts and/or exclusionary devices such as fencing, walls or other barriers, or some combination of these features
- Wildlife refers to listed, protected, or otherwise regulated species
• Pavement Markings
  – When the installation of pavement markings are included on a roadway project with flush shoulders and posted speeds of 50 mph or greater, use Standard Thermoplastic, Profiled Thermoplastic, Preformed Thermoplastic, Permanent Tape, or a Two Reactive Component material for the final pavement markings.

• Longitudinal Audible Vibratory Treatments (AVTs)
  – AVTs are a countermeasure to reduce the severity and frequency of lane departure crashes. Longitudinal AVTs shall be used on high speed roadways (posted speed 50 mph or greater) with flush shoulders. Longitudinal AVTs must not be placed within the limits of intersections or crosswalks.
  – AVT options include cylindrical ground-in rumble strips, sinusoidal ground-in rumble strips, and profiled thermoplastic. The sinusoidal ground-in rumble strip option provides the most durable solution with less noise pollution.
• Information historically in this chapter has been incorporated into the remaining chapters of the Florida Greenbook

Ft. Myers, FL
Chapter 20 – Drainage

• Regulatory Requirements
  – Chapter 62-330 F.A.C., implements the comprehensive, statewide environmental resource permit (ERP) program under Section 373.4131, F.S.

• Stormwater Management Strategies
  – Watershed Approach to Evaluate Regional Stormwater Solutions (WATERSS)
  – Pond Siting Process

• Green Stormwater Elements
  – Bioretention/Biofiltration Planter
  – Bioretention Swale
  – Hybrid Bioretention Cell
  – Pervious Strips
  – Street Trees
  – Pervious Pavers/Permeable Pavement

Port Townsend, Washington
Chapter 20 – Drainage

• Hydrologic Analysis
  – Stormwater modeling software, approved by the maintaining agency or local government jurisdiction

• Hydraulic Openings
  – Design stage for a ditch bottom inlet may be allowed to exceed the inlet top when the ditch or swale can accommodate the capacity

• Cross Drain Hydraulics
  – One-dimensional models - best suited for in-channel flows and when floodplain flows are minor
  – Two-dimensional models - used when flow patterns are complex and one-dimensional model assumptions are significantly violated
  – Table 20 – 9 Bridge Hydraulic Modelling Selection may be used to determine the appropriate modeling approach
Chapter 20 – Drainage

• Culvert Materials
  – Durability
    • In tannic water need to consider the effect of microbially induced corrosion of concrete pipes, especially in industrial or sewer systems
    • The Culvert Service Life Estimator based on standard measurement of soil and water parameters. Tannic water can provide an environment for organisms to grow on the material surface that is not taken into consideration by this tool, which will over-predict the facility life.
  – Structural Design
    • The structural design of all culverts, storm drain pipes and drainage structures shall be in accordance with specifications (including guide specifications) published by the American Association of State Highway and Transportation Officials (AASHTO). At a minimum, the AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications, 9th Edition (2020) shall be used.
• How can I find out when its effective?
• “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
Questions?

Mary Anne Koos, CPM
Special Projects Coordinator
Office of Design, FDOT

MaryAnne.Koos@dot.state.fl.us
850-414-4321