

MEETING MINUTES

1. David O'Hagan (FDOT State Roadway Design Engineer) opened the meeting by introducing himself as the new FDOT State Roadway Design Engineer and the new Committee Chairperson. He stated this meeting is being held under the Sunshine Law and minutes were taken. David also asked that everybody fill out their information on the [sign-in sheet](#) that was being passed around. David stated that the [agenda](#) was very full and we would try to stay on schedule.
2. Meeting attendees introduced themselves.
3. David said that everybody should have picked up a [meeting package](#). He then asked that everybody turn to and review the [2005 meeting minutes](#). There were no comments.
4. Rob Quigley (FDOT Roadway Design) discussed Committee Member changes (since last meeting): Steve Neff (replaced Dennis Daughters), Craig Batterson (replaced Robert Shutts), David Ponitz (replaced James Sloane) David O'Hagan (replaced Brian Blanchard) and Marianne Trussell (replaced Ed Rice). Also several associate members were added at the last meeting (William Nickas, Duane Brautigam, and Allen Schruppf).
5. Rob Quigley stated that the 2005 Florida Greenbook went through rulemaking and became effective on November 24, 2005. Rob also gave a brief overview of the [Rulemaking Process](#).
6. Rob Quigley 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 also 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.
7. Gail Holley (FDOT Traffic Operations) made a presentation on the FDOT [Elder Road User Program](#). After her presentation the committee discussed the need for a chapter on signing and marking to include additional information for such things as designing for elder road users, and wayfinding signs. **The committee members unanimously voted (13 yes - 0 no) to establish a subcommittee to develop the chapter.** (Updated Subcommittee Membership information is posted on the [Florida Greenbook Web Page \(http://www.dot.state.fl.us/rddesign/Florida%20Greenbook/FGB.htm\)](#). (Additional information on the Elder Road User Program can be found on the Traffic Operations web page: <http://www.dot.state.fl.us/trafficoperations/Operations/ElderRdUser.htm>)
8. The new [Federal Rule on Work Zone Safety and Mobility](#) and how it applies to local agencies was discussed. The Rule applies to all local agencies but only on projects of significant impact. Dennis Filloon (FDOT's Central Office Local Agency Program (LAP) Administrator) to give the LAP perspective on the new Rule. If the LAP

agreements already take the Rule into account, then it may not need to be specifically covered in the Greenbook. **The Chapter 11 (Work Zone Safety) subcommittee will review the Rule, define “projects of significant impact,” and make a recommendation to the Committee. Jim Mills will also report back at next meeting on what changes have been made in FDOT standards and criteria in response to the Rule.**

9. Duane Brautigam (FDOT Specifications) handed out four DRAFT Local Agency Project Specifications and discussed each of them: [Landscape \(580\)](#), [Earthwork \(120\)](#), [Hot Mix Asphalt \(334\)](#), and [Concrete \(344\)](#). **The Local Agency Specifications subcommittee will review these draft specifications to determine if these are what they needed, and to determine where to go from here. {These are available for review and comment on the FDOT Specifications web page: http://www.dot.state.fl.us/specificationoffice/LAP_IndustryReview.html }** Also, Dennis Filloon mentioned that the LAP Checklist would be posted on the **LAP Web Page: http://www.dot.state.fl.us/ProjectManagementResearchDevelopment/LAP%20Files/lap_pmr&d.htm** and not in the LAP Manual (which will be updated and issued soon). Dennis also mentioned that he had looked at the 2004-2005 work mix on LAP projects and found that 2/3 of the LAP projects were projects like sidewalks, bike paths, culverts, etc.
10. Todd Buckles (FACERS) presented the training issue mentioned in the [FACERS Letter to FDOT](#). He stated that current IMSA training is not Florida specific, it is expensive (and has renewal fees) and it is not provided often enough. T² representative Nina Barker was also present because T² is developing training in several areas. Todd said that FACERS would like that training to be recognized in lieu of IMSA training to meet requirements on some city or county employee position descriptions. Todd said that FACERS would like to lend subject matter experts to provide review of the courses and he presented a plan to add something to the Florida Greenbook. Jim Mills (FDOT Roadway Design) pointed out that FDOT is **[not placing any certification requirements](#)** on city or county employees. **Todd said that FACERS will re-evaluate their request and decide which direction they want to go.** No proposed language was added to the Florida Greenbook.
11. Nina Barker (T²) was also present to give an update on the Florida Greenbook Seminar Series that T² is developing as discussed at last year’s meeting. Funding has been delayed but they will be moving forward with the development of the course and FACERS may be able to beta test the course. Nina also mentioned that T² has a quarterly newsletter on their **Web Page <http://t2.ce.ufl.edu/>** and the **February 2006 Newsletter <http://t2.ce.ufl.edu/nl/2006-02.pdf>** has a work zone traffic control equipment and training needs application.
12. Amy Datz (FDOT Transit Office) and Rick Sparer (Earth Tech) discussed the proposed changes to **Chapter 13** (addressing bus stops and bus bays) that were updated since the last meeting and reviewed by the Chapter 13 Subcommittee. Amy also handed out the **[Transit Facilities Guidelines](#)** that are available on the **[FDOT Transit Web Page](#)**

<http://www.dot.state.fl.us/transit/>). The committee had a few additional comments to be incorporated in the chapter, and the updated chapter will be sent out to the subcommittee and committee once the changes have been incorporated.

13. Jim Mills discussed current FDOT design issues. These issues included information on [patterned/textured pavement](#) (the new Specification is in place), the new Mast Arm Policy Area ([updated in the Plans Preparation Manual\(PPM\)](#)) and the [Design Update Training CD](#) (This was sent to registered PPM users and is available for purchase through the FDOT Maps and Publications Sales Office Web Page (<http://www.dot.state.fl.us/mapsandpublications/>)).
14. Billy Hattaway (Hall Planning and Engineering, Inc.) gave a [Presentation on Livable Communities](#). A Livable Communities Subcommittee was established by unanimous vote. **This committee will determine what aspects of livable community design need to be addressed in the Florida Greenbook. They will also determine if a new chapter is needed or if the information can be integrated into current chapters.**
15. Martin Guttenplan (FDOT Systems Planning Office) gave a presentation on Planning Issues. The first issue presented was the current research project on [Establishing Guidelines for Midblock Crosswalks at Uncontrolled Locations](#) being conducted with the Center for Urban Transportation Research (CUTR). Dr. Xuehao Chu (CUTR) was also present to discuss the project.

Martin also presented an overview of the [2025 Florida Transportation Plan](#) (FTP).

16. Bruce Conroy (FDOT General Counsel) presented the [Sunshine Law](#) and how it applies to committee activities. **David O’Hagan said that guidelines will need to be developed for the subcommittee activities.**

{These Subcommittee were subsequently determined to be as follows:

- a. *Subcommittees (author) shall provide advance public notification of any meetings or conference calls. This can be accomplished by forwarding the information to the FDOT Roadway Design Office for posting on the Florida Greenbook web page (which will be rearranged with subcommittee pages). Meetings must be held in a facility that is open to the public. For teleconferences, at least one physical location (i.e. conference room that is dialed into teleconference) must be provided in a facility that is open to the public. That location will be posted online with the meeting notice.*
- b. *Minutes must be taken for each meeting/teleconference. Meeting minutes can be brief, however at a minimum, the meeting minutes must document any committee action taken*
- c. *The minutes from all subcommittee meetings must be sent to the FDOT Roadway Design Office for posting on the Florida Greenbook web page.*

- d. *Any email correspondence relating to the subcommittee's tasks and efforts, must be kept on file by the Subcommittee author. The author must keep them until the changes are incorporated into the final manual and adopted by Rule. At that point, copies of the email correspondence can be submitted to the FDOT Roadway Design Office.*
17. Open discussion / Committee Member issues.
- a. David O'Hagan and Andre Pavlov discussed the Chapter 17 changes needed for the 2007 Florida Greenbook.
- b. Craig Batterson asked whether or not members could receive Professional Development Hour (PDH) credits for attending future meetings. **(This is being researched).**
18. Rob Quigley asked the committee to review their [member information](#) and provide updates. (Updated Member Info posted on the [Florida Greenbook Web Page \(http://www.dot.state.fl.us/rddesign/Florida%20Greenbook/FGB.htm\)](http://www.dot.state.fl.us/rddesign/Florida%20Greenbook/FGB.htm)).
19. [Subcommittee membership](#) was briefly reviewed and updated as well. *{If any other members need their subcommittee membership updated, please contact [Rob Quigley](#).}* (Updated Subcommittee Membership information is posted on the [Florida Greenbook Web Page: \(http://www.dot.state.fl.us/rddesign/Florida%20Greenbook/FGB.htm\)](http://www.dot.state.fl.us/rddesign/Florida%20Greenbook/FGB.htm)).
20. Rob Quigley discussed the [Tentative Schedule](#) for the 2007 Florida Greenbook.
21. Travel Form Reminder. Contact [Rob Quigley](#) if you have any questions.
22. Discussed improvements for the next meeting: Suggestions included having a microphone for presenters and teleconference capabilities.
23. Marianne Trussell discussed Florida's Strategic Highway Safety Plan and mentioned the Florida Safety Summit in Orlando on March 30, 2006. Details can be found on the [State Safety Office Web Page \(http://www.dot.state.fl.us/safety/\)](http://www.dot.state.fl.us/safety/).
24. Meeting adjourned.

Florida Greenbook Advisory Committee Meeting

March 7, 2006

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Florida Greenbook Advisory Committee Meeting

March 7, 2006

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March 7, 2006

Florida Greenbook Advisory Committee Meeting

*Doubletree Hotel – Tampa Westshore Airport
Tampa, Florida*

Contents

Early Morning

Agenda

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Final Rule on Work Zone Safety and Mobility

Local Agency Project Specifications
(Handouts provided separately)

Late Morning

FACERS Issues

DRAFT - Chapter 13 Public Transit

Early Afternoon

Current FDOT Issues

Livable Communities

(Materials available for download and will be provided with meeting minutes)

Planning Issues

(Handouts provided separately)

Late Afternoon

Sunshine Law

Chapter Subcommittee Assignments

Tentative Key Dates – 2007 Florida Greenbook

AGENDA

FLORIDA GREENBOOK ADVISORY COMMITTEE MEETING

Tuesday, March 7, 2006 8:00am – 5:00pm

Double Tree Hotel, Tampa Westshore

4500 West Cypress Street

Tampa, FL 33607

(813) 879-4800

- 8:00 – 8:15** General Information (15min)
- Introductions
 - Committee Member Changes
 - Review March 2005 Meeting Minutes
 - Discuss Florida Greenbook Ownership
 - 2005 FGB / Rulemaking Process
- 8:15 – 8:45** Elder Road User Standards (Gail Holley) (30min)
- 8:45 – 9:05** Final Rule on Work Zone Safety and Mobility (20min)
- 9:05 – 10:05** Local Agency Project (LAP) Specifications (Duane Brautigam) (1hr)
- 10:05 – 10:15** *Morning Break (10min)*
- 10:15 – 10:45** FACERS Issues (30min)
- 10:45 – 11:00** T² Florida Greenbook Seminar Series - Update (Nina Barker) (15min)
- 11:00 – 11:30** Transit Chapter – Proposed Updates (Amy Datz / Richard Sparer) (30min)
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- 11:30 – 12:30** *Lunch (1hr)*
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- 12:30 – 1:00** FDOT Design Issues (30min)
- 1:00 – 2:00** Livable Communities (Billy Hattaway) (1hr)
- 2:00 – 2:45** Planning Issues (Martin Guttenplan) (45min)
- Midblock Crosswalks
 - 2025 Florida Transportation Plan (FTP)
- 2:45 – 3:00** *Afternoon Break (15min)*
- 3:00 – 4:00** Sunshine Law (Bruce Conroy) (1hr)
- 4:00 – 4:50** Roundtable Discussion / Committee Member Issues (50min)
- 4:50 – 5:00** Closing Items
- Review / Update Subcommittee Assignments
 - Tentative Schedule for 2007 Manual
 - Travel Form Reminder / Reimbursement Info
 - Meeting Critique
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Time slots for the agenda are tentative and could change slightly due to individual schedules of guests.

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March 2005 Meeting Minutes

MINUTES – Florida Greenbook Advisory Committee Meeting
Holiday Inn - Oceanfront, Cocoa Beach, March 9, 2005

1. Rob Quigley opened the meeting by introducing himself and going over the [agenda](#) and handouts that included a [Meeting Package](#) and a [Final Draft 2005 Florida Greenbook](#) (dated 3/5/2005) (*[Committee Member Access Only](#)*).
2. Meeting [attendees](#) introduced themselves.
3. Rob discussed Committee Member changes (since last meeting): Andres Garganta (replaced Eugene Bechamps) and Richard McCubbin (replaced John Pappas).
4. Rob asked the committee to review their [member information](#) and provide any updates prior to publication the Final version of the 2005 Florida Greenbook. (*[Updated Member Information is posted on the Florida Greenbook web page](#)*).
5. Rob briefly reviewed the [March 2004 meeting minutes](#). No comments.
6. Rob discussed Florida Greenbook ownership, DOT's role and the Committee's role and responsibilities. Rob also noted that active Committee participation is essential. Joy Puerta asked if the Chapter Authors could get electronic versions of each of their respective chapters. (*[This will be done once the 2005 edition is finalized](#)*).
7. Rob gave a status of the 2005 Florida Greenbook. It will be sent to FDOT's Legal Office for review after any final comments from this meeting have been incorporated (*[this Version dated 3/29/2005 \(Committee Member Access Only\) was submitted on 3/30/2005](#)*). Once the Legal Office's comments have been addressed, the Florida Greenbook will be sent to the Joint Administrative Procedures Committee (JAPC) for review. After all review comments have been addressed, the [Rulemaking Process](#) will begin (Rob also gave a brief overview of this process).
8. Rob mentioned the Travel Packages that were handed out and the information required for reimbursement.
9. Rob discussed with the committee [Duane Brautigam's presentation](#) from the 2003 meeting regarding Local Agency Specifications. Many of the same questions were asked this time that were asked in 2003. Several members discussed how they are handling specifications that FDOT no longer maintains. Most members agreed that something needs to be done to address the issues that keep coming up regarding these specifications used by local agencies. The Committee decided to form a "Local Agency Specifications" subcommittee to define the problems and recommend solutions. (*[Updated Subcommittee Membership information is posted on the Florida Greenbook web page](#)*).
10. Rob discussed an issue that had recently come up regarding horizontal clearance requirements for canals. The Meeting Package included a [summary](#) of crash reports involving run off the road into canals that resulted in fatalities as well as some [draft language](#) on canal hazards proposed for Chapter 4. Also provided in the Meeting Package were the current Plans Preparation Manual ([PPM sections on Canal Hazards](#)). The committee evaluated the crash summary and determined that the canal horizontal clearance was not a contributing factor in any of the cases. Because of this, the committee elected to make no changes the current section on Horizontal Clearance for Roadside Canals.
11. Rob discussed with the committee [Tom Bane's presentation](#) from the 2003 meeting regarding Horizontal Clearance & Clear Zone. Also provided in the Meeting Package were the current PPM sections on [Horizontal Clearance](#) and [Clear Zone](#) (which differ slightly from the presentation) and [Index 700](#) of the Design Standards. Rob covered the

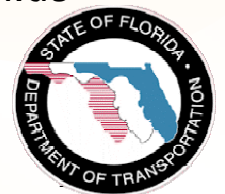
- changes made to the PPM in 2003 and how they differ from the way the Florida Greenbook addresses horizontal clearance. The committee agreed that some proposed language should be drafted for the next meeting for the committee to consider for the 2007 edition of the Florida Greenbook. The proposed language should also address deep standing water in clear zone, bus bench requirements, and minimum clearance measured from bike lanes.
12. Amy Datz (FDOT Transit Office), Rick Sparer (Earth Tech), and Lynn Kendrick (Earth Tech) handed out a [summary](#) of the Transit Safety Study and an [Outline](#) for the Chapter 13 changes. They then discussed the proposed changes to [Chapter 13](#) (addressing bus stops and bus bays) as well as [additional edits](#) that were not in the original meeting package. The committee had some good comments and was in favor of the additions. The committee agreed that the chapter needs to be fine-tuned by the Chapter Subcommittee and presented at the next meeting. Any further comments may be submitted to [Amy Datz](#).
 13. Technology Transfer Center (T²) representative Nina Barker and consultant Allen Schrupf (DRMP) handed out [Draft Review Material](#) for their planned Florida Greenbook Seminar Series. They discussed the program and asked the committee to review the draft material for the planned training series and send comments to [Nina and Allen](#).
 14. David O'Hagan of the State Structures office gave a [Presentation](#) on the effects of last year's hurricanes on Florida structures. This included discussions on the Escambia Bay Bridge, as well as sign, signal, and lighting support structures. David also discussed some changes that are being worked on regarding wind maps, costal structures, and wind loading.
 15. Jim Mills gave a [Presentation](#) on current FDOT design issues. These issues included information on cable barrier systems, low profile barriers, Type K barriers, truncated domes, patterned/textured pavement, pavement markings/nighttime visibility, and the 2006 Design Standards.
 16. Workshop on changes presented in the [Draft 2005 Florida Greenbook \(Committee Member Access Only\)](#) that were new since the last meeting. Items discussed at the previous meeting that had been incorporated were the changes in intersection sight distance based on the 2001 AASHTO Greenbook, changes to the figures in Chapter 9 based on the 2003 MUTCD, and other changes to Chapter 9 regarding railroad crossings and rumble strips. The Committee had several comments which will be addressed for the final version.
 17. Open discussion / Committee Member issues.
 18. [Subcommittee membership](#) was briefly reviewed and updated as well. (*Updated Subcommittee Membership information is posted on the [Florida Greenbook web page](#)*).
 19. Rick Renna discussed High Density Polyethylene Pipe.
 20. Rob discussed the [tentative schedule](#) for the 2007 Florida Greenbook.
 21. Travel Form Reminder. Contact [Felicia Bush](#) if you have any questions.
 22. Discussed improvements for the next meeting: Suggestions included meeting in a larger, "squarer" room with a bit more table space and finding out if future meetings could qualify for Continuing Education Credits.
 23. Meeting adjourned.

Elder Road User Standards

Florida's Elder Road User Program

Gail Holley

FL Department of Transportation
State Traffic Engineering
and Operations Office
850-410-5414
gail.holley@dot.state.fl.us



Make Personal Transportation Safer

- Improve the driving abilities of older persons
- Consider the needs and travel patterns of older persons
- Design and operate roadways to compensate for age related changes

Florida's Elder Road User Program

- It is the policy of the Department to provide specific improvements to the State Highway System and to assist local governments with improvements to local systems that accommodate the special needs of elder citizens. These improvements shall include, but are not limited to, roadway, traffic operations, pedestrian and bicycle considerations.

– ***Policy #000-750-001***

Roadway Improvements

- Based on FHWA's Highway Design Handbook for Older Drivers and Pedestrians
- Increased pavement markings to 6 inches
- Reflective Pavement Markers at 40 foot spacings
- Overhead Street Name Signs
- Advance Street Name Signs
- Increased Markings/RPMs and Adv. Signing in Work Zones
- Pedestrian Improvements

Elder Road User Program Goals

- Maintain/enhance partnerships
- Increasing Communication/Outreach
- Additional Roadway Improvements
- Tier 4 Business Plan
 - Based on NCHRP Report 500, Volume 9: A Guide for Reducing Collisions Involving Older Drivers

Strategies of the Elder Road User Program Business Plan

- Enhance the safety, accessibility, and mobility of Florida's aging population
- Establish and maintain partnerships with both state, local, and private agencies
- Reflect the FDOT Elder Road User Program on the non-State Highway System network

Enhance Safety, Accessibility, and Mobility - Activities

- Plan for Aging Population
- Establish broad-based coalition plan for addressing transportation needs of older adults
- Perform before/after evaluations
- Develop training for planners & designers tailored specifically for FL roadways
- Develop research topics

Establish and Maintain Partnerships - Activities

- Current partners: DHSMV, DOEA, DCA, DOH, Transportation Disadvantage, Safety, Planning, Design, Maintenance, Transit, FHWA, FL At Risk Drivers Council, District Traffic Operations
- Future partners: AARP, AAA, FACERS, Multi-modal agencies

Roadway Improvements on Non-State Highway System - Activities

- Determine current level of roadway improvements on local roads
- Identify existing local senior mobility programs
- Establish cost benefit ratio
- Determine possible funding sources
- Communicate benefits of program to local governments
- Standardize roadway improvements in the Florida Greenbook

Proposal: Signing and Marking Chapter in Florida Greenbook

- Does not contain current ERUP roadway improvements
- Some FL standards go beyond MUTCD and affect local governments
 - Wayfinding Signs
- Great tool to get the information to locals

What is safer for older drivers is.....



.....safer for everyone.

Final Rule on Work Zone Safety and Mobility

Final Rule on Work Zone Safety and Mobility

The *Final Rule on Work Zone Safety and Mobility* was published on September 9, 2004, in the *Federal Register*. This rule updates and broadens the former regulation on “Traffic Safety in Highway and Street Work Zones” (23 CFR 630 Subpart J). All state and local governments that receive federal-aid highway funding are affected by this rule and are required to comply with the provisions of this rule no later than October 12, 2007.

The Rule:

- Focuses on a state-level work zone policy approach to institutionalize work zone processes and procedures.
- Reflects changing times to address more traffic, more congestion, greater safety issues, and more work zones.
- Broadens the regulation to address more of the current issues affecting work zone “safety” and “mobility.”
- Facilitates customer-focused project development for comprehensive consideration of “work zone impacts.”

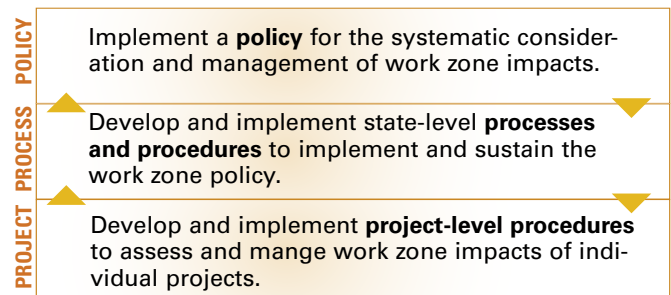
Why Update the Rule?

- Many of our roads are facing growing traffic volumes and congestion.
 - Vehicle travel is up, but there has been very little growth in road miles.
- Our highways are approaching middle age.
 - More construction and repair are needed, which means more work zones.
- A growing portion of this work is rehabilitation done under traffic.
 - More traffic exposed to work zones and more workers exposed to traffic.
 - Compressed contractor schedules.
 - Increasing night work.
- Work zone safety is a concern.
 - More than 41,000 injuries and 1,028 fatalities in 2003
- Travelers are not happy with work zones.
 - Unexpected road conditions, delays, and inconsistency cause traveler frustration.

Rule Overview

The full text of the rule can be found at http://www.ops.fhwa.dot.gov/wz/docs/wz_final_rule.pdf. A summary of the rule follows.

The new rule was written to be flexible, taking into account different project types. The rule has three primary components, illustrated in the figure below:



As indicated in the figure, the policy will affect the state- and project-level processes and procedures, and the outcomes of projects may cause states to reassess their processes and procedures and policy.

For each of the components, the rule includes provisions and guidance intended to help transportation agencies address work zone considerations starting early in planning, and progressing through project design, implementation, and performance assessment.

Policy-Level Provisions

- Implement a policy for the systematic consideration and management of work zone impacts. The policy:
 - May take the form of processes, procedures, and/or guidance.
 - Should be customized as appropriate to an individual state’s needs.
 - Should be sensitive to varying project characteristics and expected work zone impacts.
- Work in partnership with the FHWA to develop and implement the policy.

State-Level Processes and Procedures

- Develop and implement processes/procedures for systematic work zone impact assessment and management

- Use work zone safety and mobility information and data to manage impacts on ongoing projects, and to conduct performance assessments across multiple projects to improve state work zone procedures.
- Require training for personnel involved in work zone planning, design, implementation, management, and enforcement.
- Conduct process reviews to assess widescale performance of work zones with the goal of improving work zone processes and procedures.

Project-Level Provisions

- Identify significant projects early in the project development process. Significant projects are those anticipated to cause sustained work zone impacts greater than what is considered tolerable based on state policy and/or engineering judgment.
- Develop transportation management plans (TMPs) that consist of strategies to manage the work zone impacts of projects.
 - TMPs for **significant projects** must consist of a temporary traffic control (TTC) plan. The TMPs must address transportation operations (TO) strategies that will be used to ease work zone impacts. They must also address public information (PI) strategies to inform the public and concerned stakeholders about the project, its expected work zone impacts, and changing conditions.
 - TMPs for **all other projects** must consist at least of a TTC plan and may include TO and PI strategies as well.
- Include appropriate TMP provisions in the plans, specifications, and estimates (PS&Es).
- In the PS&Es, include appropriate pay item provisions for implementing the TMP—either unit pay items or lump sum pay items.
- Assign a responsible person (state and contractor) to monitor the TMP and other safety and mobility aspects of the project.

FHWA Support Efforts

FHWA is committed to providing the guidance that practitioners need to implement this rule. An outreach strategy has been developed to promote awareness of the rule and the availability of implementation guidance. A comprehensive implementation guide will be available in late 2005. This guide will address each component of the rule and provide related case studies, examples, and resources. Other guidance includes:

- **Work Zone Impacts Assessment**—guidance on developing procedures to assess work zone impacts of projects.
- **Transportation Management Plans**—guidance on developing TMPs for managing work zone impacts of projects.
- **Public Information and Outreach**—guidance on the development of communications strategies that seek to inform affected audiences about construction projects, the expected work zone impacts, and the changing conditions on projects.
- **Roadside Safety Audits**—guidance on performing audits to assess a project's accident potential and safety performance.
- **QuickZone Traffic Impact Analysis Tool**—a tool that can be used to estimate work zone delays, allowing road owners and contractors to analyze and compare project alternatives, such as the effects of doing highway work at night instead of during the day, or of diverting the traffic to different roads at various stages of construction. Information on the tool is available at <http://www.tfrc.gov/its/quickzon.htm>.
- **Full Road Closure for Work Zone Operations**—a series of documents providing a description of how several state DOTs each used a full closure approach to reduce the impacts of a road rehabilitation/reconstruction project. The documents are available at http://www.ops.fhwa.dot.gov/wz/construction/full_rd_closures.htm.
- **Innovative Contracting Guidance**—resources for innovative contracting methods, including a link to an online knowledge exchange, are available at <http://www.ops.fhwa.dot.gov/wz/contracting/index.htm>.
- **ITS in Work Zones**—a series of documents to raise awareness among maintenance and construction engineers and managers of the applications and benefits of ITS in work zones. These documents are available at <http://www.ops.fhwa.dot.gov/wz/its/index.htm>.
- **Work Zone Training Courses**—a new NHI course, Advanced Work Zone Management and Design (#380072A), will provide planners, designers, construction managers, and other transportation professionals with additional skill and knowledge of both technical and non-technical aspects of work zone design and traffic management practices. The course is expected to become available in Summer 2005.

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FHWA-HOP-05-011

Work Zone Impacts Assessment

The **Final Rule on Work Zone Safety and Mobility** was published on September 9, 2004, in the *Federal Register*. All state and local governments that receive federal-aid funding are required to comply with the provisions of this rule no later than October 12, 2007.

The rule updates and broadens the former regulation at 23 CFR 630 Subpart J to address more of the current issues affecting work zone safety and mobility. Within the rule are three primary components:

- Implementation of an overall, state-level work zone safety and mobility **policy**.
- Development and implementation of standard **processes and procedures** to support policy implementation, including procedures for work zone impacts assessment, analyzing work zone data, training, and process reviews.
- Development and implementation of procedures to assess and manage work zone impacts on individual **projects**. This includes requirements for identifying *significant projects* and developing and implementing transportation management plans (TMPs). A *significant project* is defined in the rule as one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered tolerable based on state policy and/or engineering judgment.

The full text of the rule can be found at http://www.ops.fhwa.dot.gov/wz/docs/wz_final_rule.pdf.

While the rule encourages agencies to develop and implement procedures for work zone impacts assessment, it does not prescribe any specific approach. To assist agencies with developing their own procedures for assessing the work zone impacts of road projects, the Federal Highway Administration (FHWA) is developing a work zone impacts assessment guidance document. The document will set forth some guiding principles for work zone impacts assessment.

This fact sheet provides an introduction to the forthcoming guidance document.

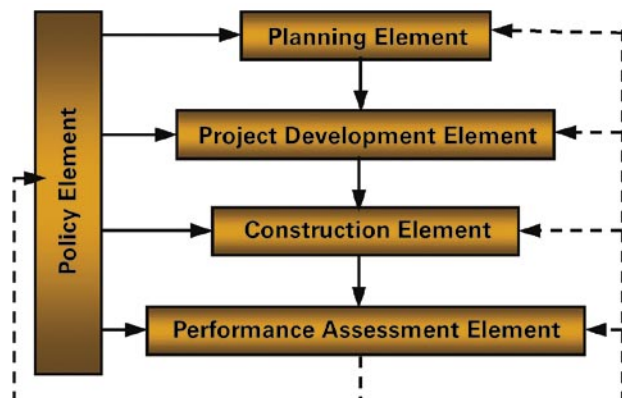
What Are the Benefits of Work Zone Impacts Assessment?

Assessing work zone impacts is intended to help transportation professionals:

- Understand the work zone safety and mobility impacts of their road projects.
- Understand the work zone safety and mobility implications of alternative project options and design strategies.
- Identify *significant projects*.
- Identify transportation management strategies that help manage the expected work zone impacts of a project.
- Develop a suitable TMP for a road project.
- Implement a TMP and monitor and manage the impacts of a project during construction.
- Provide guidance and input to conduct post-construction performance assessment studies.

Contents of the Guidance Document

The guidance document provides a general approach for assessing the potential impacts of road projects and developing strategies to manage the expected impacts. The approach is envisioned as a decision support tool. The impacts assessment process presented in the guidance document consists of five elements that represent the major activities of program delivery. As illustrated in the following figure, information from one element of the impacts assessment process feeds into the other elements. For example, what is learned through performance assessment could lead to changes in a state's policies.



- **Policy Element.** The policy element provides guidance on assessing, developing, and applying work zone safety and mobility policies. It is intended to help agencies use their existing policies and further develop them, as needed, to implement an overall work zone safety and mobility policy.
- **Systems Planning Element.** The systems planning element sets forth guidance on incorporating work zone safety and mobility in long range and short-term transportation planning. It provides a systematic decision structure at the systems planning level to identify potential work zone impacts of projects; identify potential transportation management strategies and estimate their costs; and schedule projects so as to minimize their cumulative impacts.
- **Project Development Element.** The project development element provides decision support in progressively assessing the work zone impacts of individual projects through the various stages of project development, and in developing an appropriate TMP for the project. The level of impacts assessment and the strategies included in the TMP will vary with the type, duration, size, length, and anticipated work zone impacts of the project.
- **Construction Element.** The construction element provides guidance on implementing the TMP, monitoring the impacts of the project during construction, and revising the TMP, if necessary.
- **Performance Assessment Element.** The performance assessment element provides guidance on assessing the performance of individual work zones, conducting process reviews, and using the information from the reviews to improve the agency's work zone processes and procedures.

Within the guidance document, a variety of methods will be used to describe recommended activities and decision-making factors for each of these elements:

- Process diagrams
- Work-flow explanations
- Decision matrices
- Real-world examples
- Links to locations where more detailed information may be obtained on the example cases

Implementation Guidance

The Federal Highway Administration (FHWA) is currently developing an Implementation Guidance document to help state and local transportation agencies implement the provisions of the work zone final rule and attain compliance. To supplement the overall Implementation Guidance document, FHWA is also developing a suite of companion guidance documents that will provide more detail on the following aspects of the final rule:

- Work Zone Impacts Assessment
- Work Zone Transportation Management Plans (TMPs)
- Work Zone Public Information and Outreach Strategies

The guidance documents will be available in late 2005 and will provide guidelines and sample approaches for implementing the rule, examples from states using practices that relate to the rule, and sources for more information.

This fact sheet is one in a series of final rule fact sheets meant to increase awareness and understanding of the rule and the products being developed to assist agencies with implementation of the rule. Fact sheets are available for the three specific guidance document topics as well as for the final rule itself.

All final rule resources will be posted to http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm as they become available.

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FHWA-HOP-05-023

Transportation Management Plans (TMPs) for Work Zones

The *Final Rule on Work Zone Safety and Mobility* was published on September 9, 2004, in the *Federal Register*. All state and local governments that receive federal-aid funding are required to comply with the provisions of this rule no later than October 12, 2007.

The rule updates and broadens the former regulation at 23 CFR 630 Subpart J to address more of the current issues affecting work zone safety and mobility. Within the rule are three primary components:

- Implementation of an overall, state-level work zone safety and mobility **policy**.
- Development and implementation of standard **processes and procedures** to support policy implementation, including procedures for work zone impacts assessment, analyzing work zone data, training, and process reviews.
- Development and implementation of procedures to assess and manage work zone impacts on individual **projects**. This includes requirements for identifying *significant projects* and developing and implementing transportation management plans (TMPs). A *significant project* is defined in the rule as one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered tolerable based on state policy and/or engineering judgment.

The full text of the rule can be found at http://www.ops.fhwa.dot.gov/wz/docs/wz_final_rule.pdf.

The Federal Highway Administration (FHWA) is developing a guidance document to help state and local agencies developing TMPs. This fact sheet provides an introduction to the forthcoming guidance document.

What Is a TMP?

A TMP lays out a set of strategies for managing the work zone impacts of a project. The TMP requirement in the rule helps to expand mitigation of work zone impacts beyond traffic safety and control. The scope and content of the TMP required for a project are based on the agency's work zone policies, its understanding of the expected work zone impacts of the project, and whether a project is determined to be *significant*.

For all projects, the TMP called for in the rule will contain a Temporary Traffic Control (TTC) plan that addresses

traffic safety and control through the work zone. Some states refer to TTC plans as Traffic Control Plans (TCPs) or Maintenance of Traffic (MOT) plans.

If a project is expected to be significant, the TMP for that project must also contain both transportation operations and public information components. The transportation operations (TO) component addresses operations and management of the transportation system in the work zone impact area. Examples of TO strategies include travel demand management, signal retiming, use of intelligent transportation systems (ITS), speed enforcement, and traffic incident management. The public information (PI) component addresses communication with the public and concerned stakeholders, both before and during the project, about the project, what to expect in and around the work zone, and available travel alternatives. Examples of PI strategies include using brochures, web sites, radio, and/or variable message signs to disseminate this information both pre-trip and in-route.

What Are the Benefits of a TMP?

Some of the key benefits of a TMP are to help:

- Address the broader safety and mobility impacts of work zones at the corridor and network levels.
- Promote more efficient and effective construction staging, duration, and costs.
- Improve work zone safety for construction workers and the traveling public.
- Minimize traffic and mobility impacts.
- Improve public awareness.
- Minimize impacts to local communities and businesses.
- Improve intra and interagency coordination.

"TMPs would streamline the process through which road user impacts due to work zones can be properly analyzed and addressed."

– **Jawad Paracha**,
Maryland State
Highway Administration

"[TMPs] bring all stakeholders into the discussions in advance, so we can work out the best detour routes, signal retiming, and other geometric improvements."

– **Tom Notbohm**, Wisconsin DOT

TMP Development and Implementation

The guidance document suggests an approach in which TMP development begins during the design phase (or earlier) of a project. In this approach, TMP development starts with **gathering relevant information** about the project, including materials created during earlier project planning and preliminary engineering. Relevant information includes the project's characteristics, its potential impacts, and potential mitigation strategies to address the impacts. This information, along with the agency's work zone policies and its determination of whether a project is significant, will help the agency **determine what the TMP needs to address**.

Once the TMP requirements are identified, the project team can **develop the TMP**. The TMP will need to consider project constraints and include proposed mitigation strategies and estimated implementation costs. After review and approval of the TMP, it will then be **implemented and monitored** during the construction phase. In this phase, the contractor and/or design team may need to adjust the TMP based on the performance of the work zone.

Following completion of construction, a post-project **evaluation** is done to assess how well the TMP worked. The findings from this performance assessment can be used by an agency to improve the effectiveness of future TMPs.

"Effective TMPs are ones that are developed early, and address both the traffic control design and traffic operational components of the work zone."

– Steve Kite, North Carolina DOT

Tips for an Effective TMP

- Look to involve relevant stakeholders early in the process.
- Consider potential management strategies and implementation costs early in planning and programming.
- Consider and develop management strategies for impacts beyond the physical location of the work zone itself (e.g., on adjacent roadways, on local businesses).
- Consider a range of alternative transportation management strategies. Avoid constraining the number and/or type considered.
- Constructability needs and work zone management strategies need to be balanced.

- Recognize that cost is often a constraint for the development of a TMP, particularly for major TMPs.
- The TMP is a 'dynamic document' that needs to be maintained and revised by the project team as project development progresses.
- During construction, monitoring the implementation of the TMP and field conditions enables an agency to identify potential safety and mobility concerns, and to adjust the TMP as necessary.
- Evaluating the effectiveness of your TMPs can provide valuable lessons learned for future projects.

"Based on our experience, public information is the TMP mitigation strategy that gives us the 'biggest bang for the buck'—its effectiveness is greater in urban areas, but still holds true in rural areas."

– Robert Copp, Caltrans

Implementation Guidance

The Federal Highway Administration (FHWA) is currently developing an Implementation Guidance document to help state and local transportation agencies implement the provisions of the work zone final rule and attain compliance. To supplement the overall Implementation Guidance document, FHWA is also developing a suite of companion guidance documents that will provide more detail on the following aspects of the final rule:

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- Work Zone Transportation Management Plans (TMPs)
- Work Zone Public Information and Outreach Strategies

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Public Information and Outreach Strategies for Work Zones

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The full text of the rule can be found at http://www.ops.fhwa.dot.gov/wz/docs/wz_final_rule.pdf.

For significant projects, the TMP must include public information and outreach strategies to inform those affected by the project of expected work zone impacts and changing conditions. To assist state and local agencies with these strategies, the Federal Highway Administration (FHWA) is developing a Public Information and Outreach guidance document. This document will include information to help agencies plan and evaluate an outreach campaign; identify the audiences for a campaign; decide when to begin a campaign and what types of information to convey to the public and other audiences and what methods of communication to use; and work with the mass media to spread the message.

This fact sheet provides an introduction to the forthcoming guidance document.

What Is a Public Information and Outreach Campaign?

A public information and outreach campaign involves communicating to road users, the general public, area residents and businesses, and appropriate public entities about a road project, the impacts expected from the project's work zone, and changing conditions on the

"Illinois DOT (IDOT) has made a concerted effort to communicate to the public in advance. We've been consistent in our messaging of how important this project is for our future safety and this has really resonated with the public."

– Beth Mosher, IDOT, on the Upgrade 74 project

project. A typical campaign will include traveler information strategies for providing information about what to expect in and around the work zone—such as lane and shoulder closings, new traffic patterns, and traffic delay—

and available travel alternatives such as different routes and travel modes.

What Are the Benefits of a Public Information and Outreach Campaign?

Public information campaigns are increasingly being viewed by transportation professionals as an integral part of highway construction programs, large or small.



Park and ride sign for the Hyperfix project on I-65/I-70 in Indianapolis, Indiana

"Because Indiana DOT (INDOT) partnered with the news media throughout the process from the very first day of the closure, we did not experience the gloom and doom gridlock that was feared would have the entire city shut down. People changed their travel behaviors and the overall project was a huge success."

– Roger Manning, INDOT, on the I-65/70 "Hyperfix" reconstruction project

Some of the main benefits of a public information and outreach campaign are:

- Improved driver and worker safety.
- Less traffic delay.
- Reduced driver frustration.

Successful Practices for Effective Public Outreach Campaigns

A review of approximately 30 project-specific work zone public outreach campaigns used around the country found that:

- Successful public information and outreach campaigns are typically planned well in advance of work zone deployment.
- Public information needs can be determined by identifying the scale and patterns of disruption.



Logo for the reconstruction of I-74 in Peoria, Illinois

- Target audiences are often diverse and may include drivers (private and commercial, local and long distance), residents, employers, other public agencies, organizers of special events, and emergency responders/hospitals.

- A range of communication methods is the best way to

reach a diverse audience. Methods may include a Web site, e-mail alerts, printed materials, videos, public meetings, mass media, traveler information, and information centers.

- The underlying messages of most public outreach campaigns are safety first, plan ahead, know your surroundings (delays, change in traffic patterns), and "we care."
- Partnerships with other organizations will help shape and communicate a public outreach message. Other organizations may include public agencies, major employers, and mass media.
- Information should be provided before and during work zone deployment and, in some cases, after completion.
- The strategies used should be evaluated to improve public outreach in the long run.

"Overwhelmingly, the reaction from both the target audience and the media to the outreach program has been positive. The Public Information team and the Texas DOT regularly receive positive feedback from the community regarding the regular and timely dissemination of information."

– Raquelle Wooten, TxDOT, on the Katy Freeway reconstruction project

Implementation Guidance

The Federal Highway Administration (FHWA) is currently developing an Implementation Guidance document to help state and local transportation agencies implement the provisions of the work zone final rule and attain compliance. To supplement the overall Implementation Guidance document, FHWA is also developing a suite of companion guidance documents that will provide more detail on the following aspects of the final rule:

- Work Zone Impacts Assessment
- Work Zone Transportation Management Plans (TMPs)
- Work Zone Public Information and Outreach Strategies

The guidance documents will be available in late 2005 and will provide guidelines and sample approaches for implementing the rule, examples from states using practices that relate to the rule, and sources for more information.

This fact sheet is one in a series of final rule fact sheets meant to increase awareness and understanding of the rule and the products being developed to assist agencies with implementation of the rule. Fact sheets are available for the three specific guidance document topics as well as for the final rule itself.

All final rule resources will be posted to http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm as they become available.

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FHWA-HOP-05-021

Local Agency Project Specifications

LOCAL AGENCY PROGRAM LANDSCAPING.

(REV 3-3-06)

SECTION 580 LANDSCAPE INSTALLATION

580-1 Description.

Plant trees and shrubs of the species, size, and quality indicated in the plans.

The Engineer reserves the right to adjust the number and location of any of the designated types and species to be used at any of the locations shown, in order to provide for any unanticipated effects which might become apparent after the substantial completion of other phases of the project, or for other causes.

580-2 Materials.

580-2.1 Plants:

580-2.1.1 Authority for Nomenclature; Species, etc.: For the designated authority in the identification of all plant material, refer to two publications of L.H. Bailey: "Hortus III" and "Manual of Cultivated Plants," and ensure that all specimens are true to type, name, etc., as described therein. For the standard nomenclature, refer to the publication of the American Joint Committee on Horticultural Nomenclature, "Standardized Plant Names."

580-2.1.2 Grade Standards and Conformity with Type and Species: Only use nursery grown plant material except where specified as Collected Material. Use nursery grown plant material that complies with all required inspection, grading standards, and plant regulations in accordance with the latest edition of the Florida Department of Agriculture's "Grades and Standards for Nursery Plants".

Except where a lesser grade might be specifically specified in the plans, ensure that the minimum grade for all trees and shrubs is Florida No. 1. Ensure that all plants are the proper size and grade at the time of delivery to the site, throughout the project construction period and during any designated plant establishment period.

Ensure that plant materials are true to type and species and that any plant materials not specifically covered in Florida Department of Agriculture's "Grades and Standards for Nursery Plants" conform in type and species with the standards and designations in general acceptance by Florida nurseries.

Ensure that plant materials are shipped with tags stating the botanical and common name of the plant.

580-2.1.3 Inspection and Transporting: Move nursery stock in accordance with all Federal and State regulations therefor, and accompany each shipment with the required inspection certificates for filing with the Engineer.

580-2.2 Water: Water used in landscaping operations may be obtained from any approved source. Ensure that water is free of any substance which might be detrimental to plant

growth. The use of effluent water is subject to approval and must meet all Federal, State and Local requirements.

580-3 Specific Requirements for the Various Plant Designations.

580-3.1 Balled-and-Burlapped Plants (B&B), and Wired Balled-and-Burlapped (WB & B):

580-3.1.1 General: Properly protect the root ball of these plants until planting them. The Engineer may reject any plant which shows evidence of having been mishandled.

Set the B&B and WB&B plants then remove the top 2/3 of all wire, rope, and binding surrounding the plant. Remove the burlap from the top 4 inches [100 mm] of the root ball. Do not disturb the root ball in any way. Bare root material is not allowed for substitution.

At least 90 days before digging out B & B and WB & B plants, root-prune those 1 1/2 inches [38 mm] or greater in diameter and certify such fact on accompanying invoices.

580-3.1.2 Provisions for Wiring: For plants grown in soil of a loose texture, which does not readily adhere to the root system (and especially in the case of large plants or trees), the Engineer may require WB & B plants. For WB & B plants, before removing the plant from the excavated hole, place sound hog wire around the burlapped ball, and loop and tension it until the tightened wire netting substantially packages the burlapped ball such as to prevent disturbing of the loose soil around the roots during handling.

580-3.2 Container-Grown Plants (CG): The Engineer will not accept any CG plants with roots which have become pot-bound or for which the top system is too large for the size of the container. Fully cut and open all containers in a manner that will not damage the root system. Do not remove CG plants from the container until immediately before planting to prevent damage to the root system.

580-3.3 Collected Plants (Trees and Shrubs) (C): Use C plants which have a root ball according to "Florida Grades and Standards for Nursery Plants". Do not plant any C plant before the Engineer's inspection and acceptance at the planting site.

580-3.4 Collected Plants (Herbaceous) (HC): The root mass and vegetative portions of collected herbaceous plants shall be as large as the specified container-grown equivalent. Do not plant any collected plant before inspection and acceptance by the Engineer.

580-3.5 Specimen Plants (Special Grade): When Specimen (or Special Grade) plants are required, label them as such on the plant list, and tag the plant to be furnished.

580-3.6 Palms: Wrap the roots of all plants of the palm species before transporting, except if they are CG plants and ensure that they have an adequate root ball structure and mass for healthy transplantation as defined in "Florida Grades and Standards for Nursery Plants".

The Engineer will not require burlapping if the palm is carefully dug from marl or heavy soil that adheres to the roots and retains its shape without crumbling. During transporting and after arrival, carefully protect root balls of palms from wind and exposure to the sun. Muck grown palms are not allowed. After delivery to the job site, if not planting the palm within 24 hours, cover the root ball with a moist material. Plant all palms within 48 hours of delivery to the site.

Move sabal and coconut palms in accordance with the “Florida Grades and Standards for Nursery Plants.”

580-3.7 Substitution of Container-Grown (CG) Plants: With the Engineer’s approval, the Contractor may substitute CG plants for any other root classification types, if he has met all other requirements of the Contract Documents.

580-4 Planting Requirements.

580-4.1 Layout: Prior to any excavation or planting, mark all planting beds and individual locations of palms, trees, large shrubs and proposed art and architectural structures, as shown in the plans, on the ground with a common bright orange colored spray paint, or with other approved methods, within the project limits. Obtain the Engineer’s approval and make necessary utility clearance requests.

580-4.2 Excavation of Plant Holes: Excavate plant holes after an area around the plant three times the size of the root ball has been tilled to a depth of the root ball. Ensure that the plant hole is made in the center of the tilled area only to the depth of the plant root ball.

Where excess material has been excavated from the plant hole, use the excavated material to backfill to proper level.

580-4.3 Setting of Plants: Center plants in the hole. Lower the plant into the hole so that it rests on a prepared hole bottom such that the roots are level with, or slightly above, the level of their previous growth and so oriented such as to present the best appearance.

Backfill with native soil, unless otherwise specified on the plans. Firmly rod and water-in the backfill so that no air pockets remain. Apply a sufficient quantity of water immediately upon planting to thoroughly moisten all of the backfilled earth. Keep plants in a moistened condition for the duration of the planting period.

When so directed, form a water ring 6 inches [150 mm] in width to make a water collecting basin with an inside diameter equal to the diameter of the excavated hole. Maintain the water ring in an acceptable condition.

580-4.4 Special Bed Preparation: Where multiple or mass plantings are to be made in extended bedding areas, and the plans specify Special Bed Preparation, prepare the planting beds as follows:

Remove all vegetation from within the area of the planting bed and excavate the surface soil to a depth of 6 inches [150 mm]. Backfill the excavated area with peat, sand, finish soil layer material or other material to the elevation of the original surface. Till the entire area to provide a loose, friable mixture to a depth of at least 8 inches [200 mm]. Level the bed only slightly above the adjacent ground level. Then mulch the entire bedding area, in accordance with 580-8.

580-5 Staking and Guying.

580-5.1 General: When specified in the plans, or as directed by the Engineer, stake plants in accordance with the following.

Use wide plastic, rubber or other flexible strapping materials to support the tree to stakes or ground anchors that will give as the tree moves in any direction up to 30 degrees. Do not use rope or wire through a hose. Use guy chords, hose or any other thin bracing or anchorage

material which has a minimum 12 inches [300 mm] length of high visibility flagging tape secured to guys, midway between the tree and stakes for safety.

Stake trees larger than 1 inch [25 mm] diameter and smaller than 2 inches [50 mm] diameter with a 2 by 2 inch [50 by 50 mm] stake, set at least 2 feet [0.6 m] in the ground and extending to the crown of the plant. Firmly fasten the plant to the stake with flexible strapping materials as noted above.

580-5.2 Trees of 2 to 3 1/2 inches [50 to 90 mm] Caliper: Stake all trees, other than palm trees, larger than 2 inches [50 mm] caliper and smaller than 3 1/2 inches [90 mm] caliper with two 2 by 4 inch [50 by 100 mm] stakes, 8 feet [2.4 m] long, set 2 feet [0.6 m] in the ground. Place the tree midway between the stakes and hold it firmly in place by flexible strapping materials as noted above.

580-5.3 Large Trees: Guy all trees, other than palm trees, larger than 3 1/2 inches [90 mm] caliper, from at least three points, with flexible strapping materials as noted above.

Anchor flexible strapping to 2 by 4 by 24 inch [50 by 100 by 600 mm] stakes, driven into the ground such that the top of the stake is at least 3 inches [75 mm] below the finished ground.

580-5.4 Special Requirements for Palm Trees: Brace palms which are to be staked with three 2 by 4 inch [50 by 100 mm] wood braces, toe-nailed to cleats which are securely banded at two points to the palm, at a point one third the height of the trunk. Pad the trunk with five layers of burlap under the cleats. Place braces approximately 120 degrees apart and secure them underground by 2 by 4 by 12 inch [50 by 100 by 300 mm] stake pads.

580-6 Tree Protection and Root Barriers.

Install tree barricades when called for in the Contract Documents or by the Engineer to protect existing trees from damage during project construction. Place barricades at the drip line of the tree foliage or as far from the base of the tree trunk as possible. Barricades shall be able to withstand bumps by heavy equipment and trucks. Maintain barricades in good condition.

When called for in the Contract Documents, install root barriers or fabrics in accordance with the details shown.

580-7 Pruning.

Prune all broken or damaged roots and limbs in accordance with established arboriculture practices. When pruning is completed ensure that all remaining wood is alive. Do not reduce the size or quality of the plant below the minimum specified.

580-8 Mulching.

Uniformly apply mulch material, consisting of wood chips (no Cypress Mulch is allowed), pine straw, compost, or other suitable material approved by the Engineer, to a minimum loose thickness of 3 inches [75 mm] over the entire area of the backfilled hole or bed within two days after the planting. Maintain the mulch continuously in place until the time of final inspection.

580-9 Disposal of Surplus Materials and Debris.

Dispose of surplus excavated material from plant holes by scattering or otherwise as might be directed so that it is not readily visible or conspicuous to the passing motorist or pedestrian. Remove all debris and other objectionable material from the site and clean up the entire area and leave it in neat condition.

580-10 Contractor's Responsibility for Condition of the Plantings.

Ensure that the plants are kept watered, that the staking and guying is kept adjusted as necessary, that all planting areas and beds are kept free of weeds and undesirable plant growth and that the plants are maintained so that they are healthy, vigorous, and undamaged at the time of acceptance.

580-11 Plant Establishment Period.

If the Contract Documents designate a Plant Establishment Period, assume responsibility for the proper maintenance, survival and condition of all landscape items during such period at no additional cost.

580-12 Method of Measurement.

The quantities to be paid for will be the items shown in the plans, completed and accepted.

580-13 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section.

**LOCAL AGENCY PROGRAM EARTHWORK AND RELATED OPERATIONS.
(REV 3-3-06)**

**SECTION 120
LOCAL AGENCY PROGRAM EARTHWORK AND RELATED OPERATIONS**

120-1 Description.

120-1.1 General: Perform Local Agency Program (LAP) Earthwork and Related Operations based on the type of work specified in the Contract and the Earthwork Categories as defined below. Meet the applicable requirements for materials, equipment and construction as specified.

Earthwork and Related Operations consists of excavation for the construction of the roadway, excavation for structures and pipe, constructing backfill around structures and pipe, and constructing embankments as required for the roadway, ditches, and channel changes.

120-1.2 Earthwork Categories: Performance of LAP Earthwork Operations will fall into one of the following Earthwork Categories:

120-1.2.1 Earthwork Category 1: Includes the earthwork and related operations associated with the construction of sidewalks and bike paths along with any drainage structures associated with these facilities.

120-1.2.2 Earthwork Category 2: Includes the earthwork and related operations associated with the construction of turn lanes and other non-mainline traffic lanes, widening, roadway shoulders, concrete box culverts, retaining walls, and other drainage structures on the non-mainline pavement.

120-1.2.3 Earthwork Category 3: Includes the earthwork and related operations associated with the construction of new mainline pavement, along with concrete box culverts, retaining walls, and other drainage structures on the mainline pavement.

120-2 Classes of Excavation.

120-2.1 Excavation of Unsuitable Material: Excavation of unsuitable material consists of the removal of muck, clay, rock or any other material that is unsuitable in its original position and that is excavated below the finished grading template. For stabilized bases and sand bituminous road mixes, the finished grading template is the top of the finished base, shoulders and slopes. For all other bases and rigid pavement, the finished grading template is the finished shoulder and slope lines and bottom of completed base or rigid pavement.

120-2.2 Lateral Ditch Excavation: Lateral Ditch Excavation consists of all excavation of inlet and outlet ditches to structures and roadway, changes in channels of streams, and ditches parallel to the roadway right-of-way. Dress lateral ditches to the grade and cross-section shown in the plans.

120-2.3 Channel Excavation: Channel Excavation consists of the excavation and satisfactory disposal of all materials from the limits of the channel as shown in the plans.

120-2.4 Excavation for Structures and Pipe: Excavation for Structures consists of the excavation for bridge foundations, box culverts, pipe culverts, storm sewers and all other pipe lines, retaining walls, headwalls for pipe culverts and drains, catch basins, drop inlets, manholes, and similar structures.

120-3 Excavation Requirements.

120-3.1 Excavation and Replacement of Unsuitable Materials: Where rock, muck, clay, or other material within the limits of the roadway is unsuitable in its original position, excavate such material to the cross-sections shown in the plans or indicated by the Engineer, and backfill with suitable material. Shape backfill materials to the required cross-sections. Where the removal of plastic soils below the finished earthwork grade is required, meet a construction tolerance of ± 0.2 foot in depth and ± 6 inches (each side) in width.

120-3.2 Lateral Ditch Excavation: Excavate inlet and outlet ditches to structures and roadway, changes in channels of streams and ditches parallel to the roadway. Dress lateral ditches to the grade and cross-section shown in the plans.

120-3.3 Channel Excavation: Excavate and dispose of all materials from the limits of the channel as shown in the plans. Excavate for bridge foundations, box culverts, pipe culverts, storm sewers and all other pipe lines, retaining walls, headwalls for pipe culverts and drains, catch basins, drop inlets, manholes, and similar structures.

120-3.4 Excavation for Structures and Pipe.

120-3.4.1 Requirements for all Excavation: Excavate foundation pits to permit the placing of the full widths and lengths of footings shown in the plans, with full horizontal beds. Do not round or undercut corners or edges of footings. Perform all excavation to foundation materials, satisfactory to the Engineer, regardless of the elevation shown on the plans. Perform all excavation in stream beds to a depth at least 4 feet below the permanent bed of the stream, unless a firm footing can be established on solid rock before such depth is reached, and excavate to such additional depth as may be necessary to eliminate any danger of undermining. Wherever rock bottom is secured, excavate in such manner as to allow the solid rock to be exposed and prepared in horizontal beds for receiving the masonry. Remove all loose and disintegrated rock or thin strata. Have the Engineer inspect and approve all foundation excavations prior to placing masonry.

120-3.4.2 Earth Excavation:

120-3.4.2.1 Foundation Material other than the Rock: When masonry is to rest on an excavated surface other than rock, take special care to avoid disturbing the bottom of the excavation, and do not remove the final foundation material to grade until just before placing the masonry. In case the foundation material is soft or mucky, the Engineer may require excavation to a greater depth and to backfill to grade with approved material.

120-3.4.2.2 Foundation Piles: Where foundation piles are used, complete the excavation of each pit before driving the piles. After the driving is completed, remove all loose and displaced material, leaving a smooth, solid, and level bed to receive the masonry.

120-3.4.2.3 Removal of Obstructions: Remove boulders, logs, or any unforeseen obstacles encountered in excavating.

120-3.4.3 Rock Excavation: Clean all rock and other hard foundation material, remove all loose material, and cut all rock to a firm surface. Either level, step vertically and horizontally, or serrate the rock, as may be directed by the Engineer. Clean out all seams, and fill them with concrete or mortar.

120-3.4.4 Pipe Trench Excavation: Excavate trenches for pipe culverts and storm sewers to the elevation of the bottom of the pipe and to a width sufficient to provide adequate working room. Remove soil not meeting the classification specified as suitable backfill material in 120-8.3.2.2 to a depth of 4 inches below the bottom of the pipe elevation. Remove rock, boulders or other hard lumpy or unyielding material to a depth of 12 inches below the

bottom of the pipe elevation. Remove muck or other soft material to a depth necessary to establish a firm foundation. Where the soils permit, ensure that the trench sides are vertical up to at least the mid-point of the pipe.

For pipe lines placed above the natural ground line, place and compact the embankment, prior to excavation of the trench, to an elevation at least 2 feet above the top of the pipe and to a width equal to four pipe diameters, and then excavate the trench to the required grade.

120-4 Disposal of Surplus and Unsuitable Material.

120-4.1 Ownership of Excavated Materials: Dispose of surplus and excavated materials as shown in the plans or, if the plans do not indicate the method of disposal, take ownership of the materials and dispose of them outside the right-of-way.

120-4.2 Disposal of Muck on Side Slopes: As an exception to the provisions of 120-4.1, when approved by the Engineer, muck (A-8 material) may be placed on the slopes, or stored alongside the roadway, provided there is a clear distance of at least 6 feet between the roadway grading limits and the muck, and the muck is dressed to present a neat appearance. In addition, this material may also be disposed of by placing it on the slopes where, in the opinion of the Engineer, this will result in an aesthetically pleasing appearance and will have no detrimental effect on the adjacent developments. Where the Engineer permits the disposal of muck or other unsuitable material inside the right-of-way limits, do not place such material in a manner which will impede the inflow or outfall of any channel or of side ditches. The Engineer will determine the limits adjacent to channels within which such materials may be disposed.

120-4.3 Disposal of Paving Materials: Unless otherwise noted, take ownership of paving materials, such as paving brick, asphalt block, concrete slab, sidewalk, curb and gutter, etc., excavated in the removal of existing pavements, and dispose of them outside the right-of-way. If the materials are to remain the property of the Agency, place them in neat piles as directed. Existing limerock base that is removed may be incorporated in the stabilized portion of the subgrade. If the construction sequence will allow, incorporate all existing limerock base into the project as allowed by the Contract Documents.

120-4.4 Disposal Areas: Where the Contract Documents require disposal of excavated materials outside the right-of-way, and the disposal area is not indicated in the Contract Documents, furnish the disposal area without additional compensation.

Provide areas for disposal of removed paving materials out of sight of the project and at least 300 feet from the nearest roadway right-of-way line of any road. If the materials are buried, disregard the 300 foot limitation.

120-5 Materials for Embankment.

120-5.1 General Requirements for Embankment Materials: Construct embankments using suitable materials excavated from the roadway or delivered to the jobsite from authorized borrow pits.

Construct the embankment using maximum particle sizes (in any dimension) as follows:

In top 12 inches: 3 1/2 inches (in any dimension).

12 to 24 inches: 6 inches (in any dimension).

In the depth below 24 inches: not to exceed 12 inches (in any dimension)

or the compacted thickness of the layer being placed, whichever is less.

Spread all material so that the larger particles are separated from each other to minimize voids between them during compaction. Compact around these rocks in accordance with 120-7.2.

When and where approved by the Engineer, larger rocks (not to exceed 18 inches in any dimension) may be placed outside the one to two slope and at least 4 feet or more below the bottom of the base. Compact around these rocks to a firmness equal to that of the supporting soil. Where constructing embankments adjacent to bridge end bents or abutments, do not place rock larger than 3 1/2 inches in diameter within 3 feet of the location of any end-bent piling.

120-5.2 Use of Materials Excavated From the Roadway and Appurtenances: Assume responsibility for determining the suitability of excavated material for use on the project in accordance with the applicable Contract Documents. Consider the sequence of work and maintenance of traffic phasing in the determination of the availability of this material.

120-5.3 Authorization for Use of Borrow: Use borrow only when sufficient quantities of suitable material are not available from roadway and drainage excavation, to properly construct the embankment, subgrade, and shoulders, and to complete the backfilling of structures and pipe. Do not use borrow material until so ordered by the Engineer, and then only use material from approved borrow pits.

120-5.3.1 Haul Routes for Borrow Pits: Provide and maintain, at no expense to the Agency, all necessary roads for hauling the borrow material. Where borrow area haul roads or trails are used by others, do not cause such roads or trails to deteriorate in condition.

Arrange for the use of all non-public haul routes crossing the property of any railroad. Incur any expense for the use of such haul routes. Establish haul routes which will direct construction vehicles away from developed areas when feasible, and keep noise from hauling operations to a minimum. Advise the Engineer in writing of all proposed haul routes.

120-5.3.2 Borrow Material for Shoulder Build-up: When so indicated in the plans, furnish borrow material with a specific minimum bearing value, for building up of existing shoulders. Blend materials as necessary to achieve this specified minimum bearing value prior to placing the materials on the shoulders. Take samples of this borrow material at the pit or blended stockpile.

120-5.4 Materials Used at Pipes, Culverts, etc.: Construct embankments over and around pipes, culverts, and bridge foundations with selected materials.

120-6 Embankment Construction.

120-6.1 General: Construct embankments in sections of not less than 300 feet in length or for the full length of the embankment.

120-6.2 Dry Fill Method:

120-6.2.1 General: Construct embankments to meet compaction requirements in Article 120-7 and in accordance with the acceptance program requirements in 120-9. Restrict the compacted thickness of the last embankment lift to 6 inches maximum.

As far as practicable, distribute traffic over the work during the construction of embankments so as to cover the maximum area of the surface of each layer.

Construct embankment in the dry whenever normal dewatering equipment and methods can accomplish the needed dewatering.

120-6.2.1.1 For A-3 and A-2-4 Materials with up to 15% fines:
Construct the embankment in successive layers with lifts up to a maximum compacted thickness

of 12 inches. Ensure the percentage of fines passing the No. 200 US Standard sieve in the A-2-4 material does not exceed 15%.

120-6.2.1.2 For A-1 Plastic materials (As designated in FDOT Design Standard Index 505) and A-2-4 Materials with greater than 15% fines: Construct the embankment in successive layers with lifts up to a maximum compacted thickness of 6 inches.

120-6.2.1.3 Equipment and Methods: Provide normal dewatering equipment including, but not limited to, surface pumps, sump pumps and trenching/digging machinery. Provide normal dewatering methods including, but not limited to, constructing shallow surface drainage trenches/ditches, using sand blankets, sumps and siphons.

When normal dewatering does not adequately remove the water, the Engineer may require the embankment material to be placed in the water or in low swampy ground in accordance with 120-7.2.4.

120-6.2.2 Placing in Unstable Areas: Where depositing the material in water, or in low swampy ground that will not support the weight of hauling equipment, construct the embankment by dumping successive loads in a uniformly distributed layer of a thickness not greater than necessary to support the hauling equipment while placing subsequent layers. Once sufficient material has been placed so that the hauling equipment can be supported, construct the remaining portion of the embankment in layers in accordance with the applicable provisions of 120-7.2.4 and 120-7.2.6.

120-6.2.3 Placing on Steep Slopes: When constructing an embankment on a hillside sloping more than 20 degrees from the horizontal, before starting the fill, deeply plow or cut into steps the surface of the original ground on which the embankment is to be placed.

120-6.2.4 Placing Outside Standard Minimum Slope: Where material that is unsuitable for normal embankment construction is to be used in the embankment outside the standard minimum slope (approximately one to two), place such material in layers of not more than 18 inches in thickness, measured loose. The Contractor may also place material which is suitable for normal embankment, outside such standard minimum slope, in 18 inch layers. Maintain a constant thickness for suitable material placed within and outside the standard minimum slope, unless placing in a separate operation.

120-6.3 Hydraulic Method:

120-6.3.1 Method of Placing: When the hydraulic method is used, as far as practicable, place all dredged material in its final position in the embankment by such method. Place and compact any dredged material that is rehandled, or moved and placed in its final position by any other method, as specified in 120-7.2. The Contractor may use baffles or any form of construction he may select, provided the slopes of the embankments are not steeper than indicated in the plans. Remove all timber used for temporary bulkheads or baffles from the embankment, and fill and thoroughly compact the holes thus formed. When placing fill on submerged land, construct dikes prior to beginning of dredging, and maintain the dikes throughout the dredging operation.

120-6.3.2 Excess Material: Do not use excess material placed outside the prescribed slopes, below the normal high-water level, to raise the fill. Remove only the portion of this material required for dressing the slopes.

120-6.3.3 Protection of Openings in Embankment: Leave openings in the embankments at the bridge sites. Remove any material which invades these openings or existing channels without additional compensation to provide the same depth of channel as existed before

the construction of the embankment. Do not excavate or dredge any material within 200 feet of the toe of the proposed embankment.

120-7 Compaction Requirements.

120-7.1 Moisture Content: Compact the materials at a moisture content such that the specified density can be attained. If necessary to attain the specified density, add water to the material, or lower the moisture content by manipulating the material or allowing it to dry, as is appropriate.

120-7.2 Compaction of Embankments:

120-7.2.1 Earthwork Category 1 and 2 Density Requirements: Reduce the minimum required density from 100% to 95% of AASHTO T99 Method C for all earthwork items requiring densities.

120-7.2.2 Earthwork Category 3 Density Requirements: Except for embankments constructed by the hydraulic method as specified in 120-6.3, and for the material placed outside the standard minimum slope as specified in 120-6.2.4, and for other areas specifically excluded herein, compact each layer of the material used in the formation of embankments to a density of at least 100% of the maximum density as required by AASHTO T 99, Method C. Uniformly compact each layer using equipment that will achieve the required density, and as compaction operations progress, shape and manipulate each layer as necessary to ensure uniform density throughout the embankment.

120-7.2.3 Compaction Over Unstable Foundations: Where the embankment material is deposited in water or on low swampy ground, and in a layer thicker than 12 inches (as provided in 120-6.2.2), compact the top 6 inches (compacted thickness) of such layer to the density as specified in 120-9.5.

120-7.2.4 Compaction Where Plastic Material Has Been Removed: Where unsuitable material is removed and the remaining surface is of the A-4, A-5, A-6, or A-7 Soil Groups, as determined by the Engineer, compact the surface of the excavated area by rolling with a sheepsfoot roller exerting a compression of at least 250 psi on the tamper feet, for the full width of the roadbed (subgrade and shoulders). Perform rolling before beginning any backfill, and continue until the roller feet do not penetrate the surface more than 1 inch. Do not perform such rolling where the remaining surface is below the normal water table and covered with water. Vary the procedure and equipment required for this operation at the discretion of the Engineer.

120-7.2.5 Compaction of Material To Be Used In Base, Pavement, or Stabilized Areas: Do not compact embankment material which will be incorporated into a pavement, base course, or stabilized subgrade, to be constructed as a part of the same Contract.

120-7.2.6 Compaction of Grassed Shoulder Areas: For the upper 6 inch layer of all shoulders which are to be grassed, since no specific density is required, compact only to the extent directed.

120-7.2.7 Compaction of Grassed Embankment Areas: For the outer layer of all embankments where plant growth will be established, do not compact. Leave this layer in a loose condition to a minimum depth of 6 inches for the subsequent seeding or planting operations.

120-7.3 Compaction of Subgrade: If the plans do not provide for stabilizing, compact the subgrade in both cuts and fills to the density specified in 120-9.5. For undisturbed soils, do

not apply density requirements where constructing narrow widening strips or paved shoulders 5 feet or less in width.

Where trenches for widening strips are not of sufficient width to permit the use of standard compaction equipment, perform compaction using vibratory rollers, trench rollers, or other type compaction equipment approved by the Engineer.

Maintain the required density until the base or pavement is placed on the subgrade.

120-8 Backfilling Around Structures and Pipe.

120-8.1 Requirements for all Structures:

120-8.1.1 General: Backfill around structures and pipe in the Dry whenever normal dewatering equipment and methods can accomplish the needed dewatering.

120-8.1.2 Equipment and Methods: Provide normal dewatering equipment including, but not limited to, surface pumps, sump pumps, wellpoints and header pipe and trenching/digging machinery. Provide normal dewatering methods including, but not limited to, constructing shallow surface drainage trenches/ditches, using sand blankets, perforated pipe drains, sumps and siphons.

120-8.1.3 Backfill Materials: Backfill to the original ground surface or subgrade surface of openings made for structures, with a sufficient allowance for settlement. The Engineer may require that the material used for this backfill be obtained from a source entirely apart from the structure.

Do not allow heavy construction equipment to cross over culvert or storm sewer pipes until placing and compacting backfill material to the finished earthwork grade or to an elevation at least 4 feet above the crown of the pipe

120-8.1.4 Use of A-7 Material: In the backfilling of trenches, A-7 material may be used from a point 12 inches above the top of the pipe up to the elevation shown on the FDOT Design Standards as the elevation for undercutting of A-7 material.

120-8.1.5 Time of Placing Backfill: Do not place backfill against any masonry or concrete abutment, wingwall, or culvert until the Engineer has given permission to do so, and in no case until the masonry or concrete has been in place seven days or until the specified 28-day compressive strength occurs.

120-8.1.6 Placement and Compaction: Place the material in horizontal layers not exceeding 6 inches compacted thickness, in depth above water level, behind abutments, wingwalls and end bents or end rest piers, and around box culverts and all structures including pipe culverts. When the backfill material is deposited in water, compact per 120-8.2.5 and 120-8.3.4.

The Contractor may elect to place material in thicker lifts of no more than 12 inches compacted thickness outside the soil envelope if he can demonstrate with a successful test section that density can be achieved. Notify the Engineer prior to beginning construction of a test section. Construct a test section of 500 feet in length. Perform five tests at random locations within the test section. All five tests must meet the density required by 120-7.2. Identify the test section with the compaction effort and soil classification in the Agency Logbook. In case of a change in compaction effort or soil classification, construct a new test section. When a test fails the requirements of 120-7.2, construct a new test section. The Contractor may elect to place material in 6 inches compacted thickness at any time.

120-8.2 Additional Requirements for Structures Other than Pipe:

120-8.2.1 Density: Where the backfill material is deposited in water, obtain a 12 inch layer of comparatively dry material, thoroughly compacted by tamping, before verifying the layer and density requirements. Meet the requirements of the density Acceptance Criteria.

120-8.2.2 Box Culverts: For box culverts over which pavement is to be constructed, compact around the structure to an elevation not less than 12 inches above the top of the structure, using rapid-striking mechanical tampers.

120-8.2.3 Other Limited Areas: Compact in other limited areas using mechanical tampers or approved hand tampers, until the cover over the structure is at least 12 inches thick. When hand tampers are used, deposit the materials in layers not more than 4 inches thick using hand tampers suitable for this purpose with a face area of not more than 100 in². Take special precautions to prevent any wedging action against the masonry, and step or terrace the slope bounding the excavation for abutments and wingwalls if required by the Engineer.

120-8.2.4 Culverts and Piers: Backfill around culverts and piers on both sides simultaneously to approximately the same elevation.

120-8.2.5 Compaction Under Wet Conditions: Where wet conditions do not permit the use of mechanical tampers, compact using hand tampers. Use only A-3 material for the hand tamped portions of the backfill. When the backfill has reached an elevation and condition such as to make the use of the mechanical tampers practical, perform mechanical tamping in such manner and to such extent as to transfer the compaction force into the sections previously tamped by hand.

120-8.3 Additional Requirements for Pipe 15 Inches Inside Diameter or Greater:

120-8.3.1 General: Trenches for pipe may have up to four zones that must be backfilled.

Lowest Zone: The lowest zone is backfilled for deep undercuts up to within 4 inches of the bottom of the pipe.

Bedding Zone: The zone above the Lowest Zone is the Bedding Zone. Usually it will be the backfill which is the 4 inches of soil below the bottom of the pipe. When rock or other hard material has been removed to place the pipe, the Bedding Zone will be the 12 inches of soil below the bottom of the pipe.

Cover Zone: The next zone is backfill that is placed after the pipe has been laid and will be called the Cover Zone. This zone extends to 12 inches above the top of the pipe. The Cover Zone and the Bedding Zone are considered the Soil Envelope for the pipe.

Top Zone: The Top Zone extends from 12 inches above the top of the pipe to the base or final grade.

120-8.3.2 Material:

120-8.3.2.1 Lowest Zone: Backfill areas undercut below the Bedding Zone of a pipe with coarse sand, or other suitable granular material, obtained from the grading operations on the project, or a commercial material if no suitable material is available.

120-8.3.2.2 Soil Envelope: In both the Bedding Zone and the Cover Zone of the pipe, backfill with materials classified as A-1, A-2, or A-3. Material classified as A-4 may be used if the pipe is concrete pipe.

120-8.3.2.3 Top Zone: Backfill the area of the trench above the soil envelope of the pipe with materials allowed on Design Standard, Index No. 505.

120-8.3.3 Compaction:

120-8.3.3.1 Lowest Zone: Compact the soil in the Lowest Zone to approximately match the density of the soil in which the trench was cut.

120-8.3.3.2 Bedding Zone: If the trench was not undercut below the bottom of the pipe, loosen the soil in the bottom of the trench immediately below the approximate middle third of the outside diameter of the pipe.

If the trench was undercut, place the bedding material and leave it in a loose condition below the middle third of the outside diameter of the pipe. Compact the outer portions to meet the density requirements of the Acceptance Criteria. Place the material in lifts no greater than 6 inches (compacted thickness).

120-8.3.3.3 Cover Zone: Place the material in 6 inches layers (compacted thickness), evenly deposited on both sides of the pipe, and compact with mechanical tampers suitable for this purpose. Hand tamp material below the pipe haunch that cannot be reached by mechanical tampers. Meet the requirements of the density Acceptance Criteria.

120-8.3.3.4 Top Zone: Place the material in layers not to exceed 12 inches in compacted thickness. Meet the requirements of the density Acceptance Criteria.

120-8.3.4 Backfill Under Wet Conditions: Where wet conditions are such that dewatering by normal pumping methods would not be effective, the procedure outlined below may be used when specifically authorized by the Engineer in writing.

Granular material may be used below the elevation at which mechanical tampers would be effective, but only material classified as A-3. Place and compact the material using timbers or hand tampers until the backfill reaches an elevation such that it's moisture content will permit the use of mechanical tampers. When the backfill has reached such elevation, use normally acceptable backfill material. Compact the material using mechanical tampers in such manner and to such extent as to transfer the compacting force into the material previously tamped by hand.

120-9 Acceptance Program.

120-9.1 Density over 105%: When a computed dry density results in a value greater than 105% of the applicable Proctor maximum dry density, perform a second density test within 5 feet. If the second density results in a value greater than 105%, investigate the compaction methods, examine the applicable Maximum Density and material description. If necessary, test an additional sample for acceptance in accordance with AASHTO T 99, Method C.

120-9.2 Maximum Density Determination: Determine the maximum density and optimum moisture content by sampling and testing the material in accordance with the specified test method listed in 120-9.3.

120-9.3 Density Testing Requirements: Ensure compliance with the requirements of 120-9.5 by Nuclear Density testing in accordance with FDOT Florida Method FM 1-T 238. Determine the in-place moisture content for each density test. Use Florida Method FM 1-T 238, FM 5-507 (Determination of Moisture Content by Means of a Calcium Carbide Gas Pressure Moisture Tester), or ASTM D 4643 (Laboratory Determination of Moisture Content of Granular Soils By Use of a Microwave Oven) for moisture determination.

120-9.4 Soil Classification: Perform soil classification tests in accordance with AASHTO T-88. Classify soils in accordance with AASHTO M-145 in order to determine compliance with embankment utilization requirements..

120-9.5 Acceptance Criteria: Obtain a minimum density in accordance with 120-7.2 with the following exceptions:

- 1) embankment constructed by the hydraulic method as specified in 120-6.3;
- 2) material placed outside the standard minimum slope as specified in 120-6.2.4;
- 3) other areas specifically excluded herein.

120-9.6 Frequency: Conduct sampling and testing at a minimum frequency listed in the table below.

Test Name	Frequency
Maximum Density	One per soil type
Density	1 per 500' RDWY (Alt Lift)
Soil Classification	One per Maximum Density

120-10 Maintenance and Protection of Work.

While construction is in progress, maintain adequate drainage for the roadbed at all times. Maintain a shoulder at least 3 feet wide adjacent to all pavement or base construction in order to provide support for the edges.

Maintain and protect all earthwork construction throughout the life of the Contract, and take all reasonable precautions to prevent loss of material from the roadway due to the action of wind or water. Repair any slides, washouts, settlement, subsidence, or other mishap which may occur prior to final acceptance of the work. Maintain all channels excavated as a part of the Contract work against natural shoaling or other encroachments to the lines, grades, and cross-sections shown in the plans, until final acceptance of the project.

120-11 Construction.

120-11.1 Construction Tolerances: Shape the surface of the earthwork to conform to the lines, grades, and cross-sections shown in the plans. In final shaping of the surface of earthwork, maintain a tolerance of 0.3 foot above or below the plan cross-section with the following exceptions:

1. Shape the surface of shoulders to within 0.1 foot of the plan cross-section.
2. Shape the earthwork to match adjacent pavement, curb, sidewalk, structures, etc.
3. Shape the bottom of ditches so that the ditch impounds no water.
4. When the work does not include construction of base or pavement, shape the entire roadbed (shoulder point to shoulder point) to within 0.1 foot above or below the plan cross-section.

Ensure that the shoulder lines do not vary horizontally more than 0.3 foot from the true lines shown in the plans.

120-11.2 Operations Adjacent to Pavement: Carefully dress areas adjacent to pavement areas to avoid damage to such pavement. Complete grassing of shoulder areas prior to placing the final wearing course. Do not manipulate any embankment material on a pavement surface.

When shoulder dressing is underway adjacent to a pavement lane being used to maintain traffic, exercise extreme care to avoid interference with the safe movement of traffic.

120-12 Method of Measurement.

120-12.1 Excavation: Excavation will be paid for by volume, in cubic yards, calculated by the method of average end areas, unless the Engineer determines that another method of

calculation will provide a more accurate result. The material will be measured in its original position by field survey or by photogrammetric means as designated by the Engineer. Measurement for payment will include the excavation of unsuitable material, lateral ditch excavation, channel excavation, and excavation for structures and pipe. Payment will not be made for excavation or embankment beyond the limits shown in the plans or authorized by the Engineer.

120-12.2 Embankment: Measurement will be made on a loose volume basis, as measured in trucks or other hauling equipment at the point of dumping on the road. Payment will not be made for embankment beyond the limits shown in the plans or authorized by the Engineer.

120-13 Basis of Payment.

120-13.1 General: Prices and payments for the work items included in this Section will be full compensation for all work described herein, including excavating, dredging, hauling, placing, and compacting; dressing the surface of the earthwork; and maintaining and protecting the complete earthwork.

120-13.2 Excavation: The total quantity of all excavation specified under this Section will be paid for at the Contract unit price for Excavation. No payment will be made for the excavation of any materials which are used for purposes other than those shown in the plans or designated by the Engineer. No payment will be made for materials excavated outside the lines and grades given by the Engineer, unless specifically authorized by the Engineer.

120-13.3 Embankment: The total quantity of embankment specified in this Section will be paid for at the Contract unit price for embankment. No payment will be made for materials which are used for purposes other than those shown in the plans or designated by the Engineer. No payment will be made for materials placed outside the lines and grades given by the Engineer.

**LOCAL AGENCY PROGRAM HOT MIX ASPHALT.
(REV 3-3-06)**

SECTION 334 (Pages 243-266) is deleted and the following substituted:

**SECTION 334
LOCAL AGENCY PROGRAM HOT MIX ASPHALT**

334-1 Description.

334-1.1 General: Construct a Local Agency Program Hot Mix Asphalt (HMA) pavement based on the type of work specified in the Contract and the Asphalt Work Categories as defined below. Meet the applicable requirements for plants, equipment, and construction requirements as defined below. Use a HMA mix that meets the requirements of this specification.

334-1.2 Asphalt Work Mix Categories: Construction of Local Agency Program (LAP) Hot Mix Asphalt Pavement will fall into one of the following work categories:

334-1.2.1 Asphalt Work Category 1: Includes the construction of bike paths.

334-1.2.2 Asphalt Work Category 2: Includes the construction of new HMA turn lanes, paved shoulders and other non-mainline pavement lanes.

334-1.2.3 Asphalt Work Category 3: Includes the construction of new mainline HMA pavement lanes, milling and resurfacing.

334-1.3 Mix Types: Use the appropriate HMA mix as shown in Table 334-1.

Table 334-1 HMA Mix Types		
Asphalt Work Category	Mix Types	Traffic Level
1	Type SP-9.5 , or equivalent as determined by the Engineer	A
2	Type SP-9.5, SP-12.5, or equivalent as determined by the Engineer	B or C
3	Type SP-9.5, SP-12.5	C

A Type SP mix one traffic level higher than the traffic level specified in the Contract may be substituted, at no additional cost (i.e. Traffic Level B may be substituted for Traffic Level A, etc.).

334-1.4 Gradation Classification: HMA mixes are classified as either coarse or fine, depending on the overall gradation of the mixture. Coarse and fine mixes are defined in 334-3.2.2. Use only fine mixes.

The equivalent AASHTO nominal maximum aggregate size Superpave mixes are as follows:

Type SP-9.5..... 9.5 mm

Type SP-12.5..... 12.5 mm

334-1.5 Thickness: The total pavement thickness of the HMA Pavement will be based on a specified spread rate or plan thickness as shown in the Contract Documents. Before paving, propose a spread rate or thickness for each individual layer meeting the requirements of this specification, which when combined with other layers (as applicable) will equal the plan spread rate or thickness. When the total pavement thickness is specified as plan thickness, the plan thickness and individual layer thickness will be converted to spread rate using the following equation:

$$\text{Spread rate (lbs/yd}^2\text{)} = t \times G_{\text{mm}} \times 43.3$$

where: t = Thickness (in.) (Plan thickness or individual layer thickness)

G_{mm} = Maximum specific gravity from the mix design

For target purposes only, spread rate calculations shall be rounded to the nearest whole number.

334-1.5.1 Layer Thicknesses: Unless otherwise called for in the Contract Documents, the allowable layer thicknesses for HMA mixtures are as follows:

Type SP-9.5..... 1 - 1 1/2 inches

Type SP-12.5..... 1 1/2 - 2 1/2 inches

334-1.5.2 Additional Requirements: The following requirements also apply HMA mixtures:

1. When construction includes the paving of adjacent shoulders (≤5 feet wide), the layer thickness for the upper pavement layer and shoulder shall be the same and paved in a single pass, unless otherwise called for in the Contract Documents.
2. For overbuild layers, use the minimum and maximum layer thicknesses as specified above unless called for differently in the Contract Documents. On variable thickness overbuild layers, the minimum allowable thickness may be reduced by 1/2 inch, and the maximum allowable thickness may be increased 1/2 inch, unless called for differently in the Contract Documents.

334-1.6 Weight of Mixture: The weight of the mixture shall be determined as provided in 320-2.2 of the Florida Department of Transportation (FDOT) specifications.

334-2 Materials.

334-2.1 Superpave Asphalt Binder: Unless specified elsewhere in the Contract or in 334-2.4.3, use a PG 67-22 asphalt binder. For Category 2 and 3 projects, require the binder supplier to certify that the material meets the requirements of AASHTO M 320, with the additional requirement that for PG 67-22, an additional high temperature grade of PG 67 is added for which the high test temperature at 10 rad/sec for the Dynamic Shear Rheometer test (AASHTO T 315) shall be 67°C.

334-2.2 Aggregate: Use aggregate capable of producing a quality pavement. For Category 2 and 3 projects, require the aggregate supplier to certify that the material meets FDOT requirements.

334-2.3 Reclaimed Asphalt Pavement (RAP) Material:

334-2.3.1 General requirements: RAP may be used as a component of the asphalt mixture if approved by the Engineer. Usage of RAP is subject to the following requirements:

1. Limit the amount of RAP material used in the mix to a maximum of 50 percent by weight of total aggregate.
2. Do not use RAP material in any friction course mixes.
3. Provide stockpiled RAP material that is reasonably consistent in characteristics and contains no aggregate particles which are soft or conglomerates of fines.

4. Provide RAP material having a minimum average asphalt content of 4.0 percent by weight of total mix. The Engineer may sample the stockpile to verify that this requirement is met.

334-2.3.2 Material Characterization: Assume responsibility for establishing the asphalt binder content, gradation, viscosity and bulk specific gravity (G_{sb}) of the RAP material based on a representative sampling of the material.

334-2.3.3 Asphalt Binder for Mixes with RAP: Select the appropriate asphalt binder grade based on Table 334-2. Maintain the viscosity of the recycled mixture within the range of 4,000 to 12,000 poises.

Percent RAP	Asphalt Binder Grade
<20	PG 67-22
20 – 29	PG 64-22
≥ 30	Recycling Agent

334-3 Composition of Mixture.

334-3.1 General: Compose the asphalt mixture using a combination of aggregates, mineral filler, if required, and asphalt binder material. Size, grade and combine the aggregate fractions to meet the grading and physical properties of the mix design. Aggregates from various sources may be combined.

334-3.2 Mix Design:

334-3.2.1 General: Design the asphalt mixture in accordance with AASHTO R35-04, except as noted herein. Prior to the production of any asphalt mixture, obtain the Engineer's conditional approval of the mix design. Submit the proposed mix design with supporting test data indicating compliance with all mix design criteria to the Engineer. If required by the Engineer, send representative samples of all component materials, including asphalt binder to a laboratory designated by the Engineer for verification. The Engineer will consider any marked variations from original test data for a mix design or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix design have changed, and the Engineer will no longer allow the use of the mix design.

334-3.2.2 Mixture Gradation Requirements: Combine the aggregates in proportions that will produce an asphalt mixture meeting all of the requirements defined

in this specification and conform to the gradation requirements at design as defined in AASHTOM323-04, Table 3. Aggregates from various sources may be combined.

334-3.2.2.1 Mixture Gradation Classification: Plot the combined mixture gradation on an FHWA 0.45 Power Gradation Chart. Include the Control Points from AASHTO M323-04, Table-3, as well as the Primary Control Sieve (PCS) Control Point from AASHTO M323-04, Table 4. Fine mixes are defined as having a gradation that passes above or through the primary control sieve control point. Use only fine mixes

334-3.2.3 Gyrotory Compaction: Compact the design mixture in accordance with AASHTO T312-04. Use the number of gyrations as defined in AASHTO R35-04, Table 1 with the following exceptions: for Traffic Level C mixes, compact the mixture as specified for the Traffic Level of 0.3×10^6 to $< 3 \times 10^6$ ESALs.

334-3.2.4 Design Criteria: Meet the requirements for nominal maximum aggregate size as defined in AASHTO M323-04, as well as for relative density, VMA, VFA, and dust-to-binder ratio as specified in AASHTO M323-04, Table 6.

334-3.2.5 Moisture Susceptibility: Test 4 inch specimens in accordance with FM 1-T 283. Provide a mixture having a retained tensile strength ratio of at least 0.80 and a minimum tensile strength (unconditioned) of 100 psi. If necessary, add a liquid anti-stripping agent, which is listed on the FDOT's Qualified Products List, or hydrated lime in order to meet these criteria.

334-3.2.6 Additional Information: In addition to the requirements listed above, provide the following information on each mix design:

1. The design traffic level and the design number of gyrations (N_{design}).
2. The source and description of the materials to be used.
3. The FDOT source number and the FDOT product code of the aggregate components furnished from an FDOT approved source (if required).
4. The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation caused by handling and processing as necessary.
5. A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly material passing the No. 200 sieve) should be accounted for and identified.
6. The bulk specific gravity (G_{sb}) value for each individual aggregate and RAP component.
7. A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1 percent.
8. A target temperature at which the mixture is to be discharged from the plant and a target roadway temperature. Do not exceed a target temperature of 330°F for modified asphalts and 315°F for unmodified asphalts.
9. Provide the physical properties achieved at four different asphalt binder contents. One shall be at the optimum asphalt content, and must conform to all specified physical requirements.
10. The name of the Mix Designer.
11. The ignition oven calibration factor.

334-4 Contractor Process Control.

Assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are met at all times. Perform any tests necessary at the plant and roadway for process control purposes.

334-5 General Construction Requirements.

334-5.1 Weather Limitations: Do not transport asphalt mix from the plant to the roadway unless all weather conditions are suitable for the laying operations.

334-5.2 Limitations of Laying Operations:

334-5.2.1 General: Spread the mixture only when the surface upon which it is to be laid has been previously prepared, is intact, firm, and properly cured, and is dry. Do not place friction course until the adjacent shoulder area has been dressed and grassed.

334-5.2.2 Air Temperature: Spread the mixture only when the air temperature in the shade and away from artificial heat is at least 40°F for layers greater than 1 inch (100 lb/yd²) in thickness and at least 45°F for layers 1 inch (100 lb/yd²) or less in thickness (this includes leveling courses). The minimum temperature requirement for leveling courses with a spread rate of 50 lb/yd² or less is 50°F.

334-5.3 Mix Temperature: Heat and combine the ingredients of the mix in such a manner as to produce a mixture with a temperature at the plant and at the roadway, within a range of ±30°F from the target temperature as shown on the mix design. Reject all loads outside of this range.

334-5.4 Transportation of the Mixture: Transport the mixture in vehicles previously cleaned of all foreign material. After cleaning, thinly coat the inside surface of the truck bodies with soapy water or an asphalt release agent as needed to prevent the mixture from adhering to the beds. Do not allow excess liquid to pond in the truck body. Do not use diesel fuel or any other hazardous or environmentally detrimental material as a coating for the inside surface of the truck body. Cover each load during cool and cloudy weather and at any time there is a probability of rain.

334-5.5 Preparation of Surfaces Prior to Paving:

334-5.5.1 Cleaning: Clean the surface of all loose and deleterious material by the use of power brooms or blowers, supplemented by hand brooming where necessary.

334-5.5.2 Patching and Leveling Courses: Where the HMA is to be placed on an existing pavement which is irregular, and wherever the plans indicate, bring the existing surface to proper grade and cross-section by the application of patching or leveling courses.

334-5.5.3 Application over Surface Treatment: Where an asphalt mix is to be placed over a surface treatment, sweep and dispose of all loose material from the paving area.

334-5.5.4 Tack Coat: Apply a tack coat on existing pavement structures that are to be overlaid with an asphalt mix and between successive layers of all asphalt mixes, unless directed otherwise by the Engineer. Use either an emulsified asphalt (RS-1 or RS-2), or a straight asphalt (RA-500) material, that has been certified by the Supplier as conforming to FDOT requirements.

334-5.6 Paving:

334-5.6.1 Alignment of Edges: With the exception of pavements placed adjacent to curb and gutter or other true edges, place all pavements by the stringline method to obtain an accurate, uniform alignment of the pavement edge. Control the unsupported pavement edge to ensure that it will not deviate more than ± 1.5 inches from the stringline.

334-5.6.2 Rain and Surface Conditions: Immediately cease transportation of asphalt mixtures from the plant when rain begins at the roadway. Do not place asphalt mixtures while rain is falling, or when there is water on the surface to be covered. Once the rain has stopped and water has been removed from the tacked surface to the satisfaction of the Engineer and the temperature of the mixture caught in transit still meets the requirements as specified in 334-5.3, the Contractor may then place the mixture caught in transit.

334-5.6.3 Checking Depth of Layer: Check the depth of each layer at frequent intervals, and make adjustments when the thickness exceeds the allowable tolerance. When making an adjustment, allow the paving machine to travel a minimum distance of 32 feet to stabilize before the second check is made to determine the effects of the adjustment.

334-5.6.4 Hand Spreading: In limited areas where the use of the spreader is impossible or impracticable, spread and finish the mixture by hand.

334-5.6.5 Spreading and Finishing: Upon arrival, dump the mixture in the approved paver, and immediately spread and strike-off the mixture to the full width required, and to such loose depth for each course that, when the work is completed, the required weight of mixture per square yard, or the specified thickness, is secured. Carry a uniform amount of mixture ahead of the screed at all times.

334-5.6.6 Thickness of Layers: Construct each course of Type SP mixtures in layers of the thickness shown in 334-1.5.1.

334-5.7 Leveling Courses:

334-5.7.1 Patching Depressions: Before spreading any leveling course, fill all depressions in the existing surface more than 1 inch deep by spot patching with leveling course mixture, and compact thoroughly.

334-5.7.2 Spreading Leveling Courses: Place all courses of leveling by the use of two motor graders, with one equipped with a spreader box. Use other types of leveling devices after they have been approved by the Engineer.

334-5.7.3 Rate of Application: When using Type SP-9.5 (fine graded) for leveling, do not allow the average spread of a layer to be less than 50 lb/yd² or more than 75 lb/yd². The quantity of mix for leveling shown in the plans represents the average for the entire project; however, the Contractor may vary the rate of application throughout the project as directed by the Engineer. When leveling in connection with base widening, the Engineer may require placing all the leveling mix prior to the widening operation.

334-5.8 Compaction: For each paving or leveling train in operation, furnish a separate set of rollers, with their operators.

When density testing for acceptance is required, select equipment, sequence, and coverage of rolling to meet the specified density requirement. Regardless of the rolling procedure used, complete the final rolling before the surface temperature of the pavement drops to the extent that effective compaction may not be achieved or the rollers begin to damage the pavement.

When density testing for acceptance is not required, use the following standard rolling procedure:

1. Seal Rolling: Provide two coverages with a tandem steel-wheeled roller (either vibratory or static), weighing 5 to 12 tons, following as close behind the spreader as possible without pick-up, undue displacement, or blistering of the material. Use vibratory rollers in the static mode for layers of 1 inch or less in thickness.
2. Intermediate rolling: Provide five coverages with a self-propelled pneumatic-tired roller, following as close behind the seal rolling operation as the mix will permit.
3. Final rolling: Provide one coverage with a tandem steel-wheeled roller (static mode only), weighing 5 to 12 tons, after completing the seal rolling and intermediate rolling, but before the surface pavement temperature drops to the extent that effective compaction may not be achieved or the rollers begin to damage the pavement.

When using the standard rolling procedure, roll longitudinally along the mat, overlapping the adjacent pass by at least 6 inches. Roll slowly enough to avoid displacement of the mixture, and correct any displacement at once by the use of rakes and the addition of fresh mixture if required. Continue final rolling to eliminate all roller marks. The Contractor may use equipment, sequences, or coverages other than those specified in the standard rolling procedure if so authorized by the Engineer.

Use hand tamps or other satisfactory means to compact areas which are inaccessible to a roller, such as areas adjacent to curbs, headers, gutters, bridges, manholes, etc.

334-5.9 Joints.

334-5.9.1 Transverse Joints: Construct smooth transverse joints, which are within 1/4 inch of a true longitudinal profile when measured with a 15 foot manual straightedge.

334-5.9.2 Longitudinal Joints: For all layers of pavement except the leveling course, place each layer so that longitudinal construction joints are offset 6 to 12 inches laterally between successive layers. The Engineer may waive this requirement where offsetting is not feasible due to the sequence of construction.

334-5.10 Surface Requirements: Construct a smooth pavement with good surface texture and the proper cross-slope.

334-5.10.1 Texture of the Finished Surface of Paving Layers: Produce a finished surface of uniform texture and compaction with no pulled, torn, raveled, crushed or loosened portions and free of segregation, bleeding, flushing, sand streaks, sand spots, or ripples. Correct any area of the surface that does not meet the foregoing requirements in accordance with 334-10.4.

334-5.10.2 Cross Slope: Construct a pavement surface with cross slopes in compliance with the requirements of the Contract Documents.

334-5.10.3 Pavement Smoothness: Construct a smooth pavement meeting the requirements of this Specification. Furnish a 15 foot manual and a 15 foot rolling straightedge meeting the requirements of FM 5-509. Make them available at the job site at all times during paving operations for Asphalt Work Category 3 and make them available upon request of the Engineer for Asphalt Work Category 1 and 2.

334-5.10.3.1 Asphalt Work Category 3:

334-5.10.3.1.1 Acceptance Testing: Straightedge the final Type SP structural layer and friction course layer with a rolling straightedge. Test all pavement lanes and ramps where the width is constant using a rolling straightedge and document all deficiencies on a form approved by the Engineer. Notify the Engineer of the location and time of all straightedge testing a minimum of 48 hours before beginning testing.

334-5.10.3.1.2 Rolling Straightedge Exceptions: Testing with the rolling straightedge will not be required in the following areas: intersections, tapers, crossovers, parking lots and similar areas. In addition, testing with the rolling straightedge will not be performed on the following areas when they are less than 50 feet in length: turn lanes, acceleration/deceleration lanes and side streets. However, correct any individual surface irregularity in these areas that deviates from the plan grade in excess of 3/8 inch as determined by a 15 foot manual straightedge, and that the Engineer deems to be objectionable, in accordance with 334-10.4.

334-5.10.3.1.3 Final Type SP Structural Layer: Straightedge the final Type SP structural layer with a rolling straightedge behind the final roller of the paving train. Correct all deficiencies in excess of 3/16 inch in accordance with 334-10.4.2, and retest the corrected areas prior to placing the friction course.

334-5.10.3.1.4 Friction Course Layer: At the completion of all paving operations, straightedge the friction course. Correct all deficiencies in excess of 3/16 inch in accordance with 334-10.4.3. Retest all corrected areas.

334-5.10.3.2 Asphalt Work Category 1 and 2: If required by the Engineer, straightedge the final structural layer with a rolling straightedge, either behind the final roller of the paving train or as a separate operation. Correct all deficiencies in excess of 5/16 inch in accordance with 334-10.4.2. Retest all corrected areas. If the Engineer determines that the deficiencies on the bicycle path are due to field geometrical conditions, the Engineer will waive corrections with no deduction to the pay item quantity.

334-5.10.4 Correcting Unacceptable Pavement:

334-5.10.4.1 General: Correct all areas of unacceptable pavement at no additional cost.

334-5.10.4.2 Structural Layers: Correct deficiencies in the Type SP structural layer by one of the following methods:

a. Remove and replace the full depth of the layer, extending a minimum of 50 feet on either side of the defective area for the full width of the paving lane.

b. Mill the pavement surface to a depth and width that is adequate to remove the deficiency. (This option only applies if the structural layer is not the final surface layer.)

334-5.10.4.3 Friction Course: Correct deficiencies in the friction course layer by removing and replacing the full depth of the layer, extending a minimum of 50 feet on either side of the defective area for the full width of the paving lane. Corrections may be waived if approved by the Engineer.

334-6 Acceptance of the Mixture.

334-6.1 General: The asphalt mixture will be accepted based on the Asphalt Work Category as defined below:

1) Asphalt Work Category 1 – Certification by the Contractor as defined in 334-6.2.

2) Asphalt Work Category 2 – Certification and quality control testing by the Contractor as defined in 334-6.3

3) Asphalt Work Category 3 – Acceptance testing by the Engineer as defined in 334-6.4.

334-6.2 Certification by the Contractor: On Asphalt Work Category 1 construction, the Engineer will accept the mix on the basis of visual inspection. Submit a Notarized Certification of Specification Compliance letter on company letterhead to the Engineer that all material produced and placed on the project was in substantial compliance with the Specifications. The Engineer may run independent tests to determine the acceptability of the material.

334-6.3 Certification and Quality Control Testing by the Contractor: On Asphalt Work Category 2 construction, submit a Notarized Certification of Specification Compliance letter on company letterhead to the Engineer stating that all material produced and placed on the project complied with the Specifications, along with supporting test data documenting all process control testing as described in 334-6.4.3. If so required by the Contract, utilize an Independent Laboratory as approved by the Engineer for the Process Control testing

334-6.4 Acceptance Testing by the Engineer: On Asphalt Work Category 3, the mixture will be accepted at the plant with respect to gradation ($P_{.8}$ and $P_{.200}$) and asphalt binder content (P_b) based on test results from random samples as obtained by the Engineer. The mixture will be accepted on the roadway with respect to density of roadway cores.

334-6.4.1 Sampling and Testing Requirements: Obtain the samples in accordance with FDOT Method (FM) FM 1-T 168. Obtain samples at the plant of a sufficient quantity to be split into two smaller samples; one for Quality Control testing and one for Acceptance testing by the Engineer, each sample at approximately 35 pounds. Label and safely store the samples for Acceptance testing in a manner agreed upon by the Engineer.

The asphalt content of the mixture will be determined in accordance with FM 5-563. The gradation of the recovered aggregate will be determined in accordance with FM 1-T 030. Roadway density will be determined in accordance with FM 1-T 166. The target density....

334-6.4.2 Acceptance Testing Exceptions: When the total quantity of any mix type in the Project is less than 500 tons, or on Asphalt Work Category 1 construction, the Engineer may accept the mix on the basis of visual inspection. The Engineer may run independent tests to determine the acceptability of the material.

Density testing for acceptance will not be performed on widening strips or shoulders with a width of 5 feet or less, open-graded friction courses, variable thickness overbuild courses, leveling courses, first lift of asphalt base course placed on subgrade, miscellaneous asphalt pavement, or any course with a specified thickness less than 1 inch or a specified spread rate less than 100 lbs/sy. In addition, density testing for acceptance will not be performed on the following areas when they are less than 1,000 feet in length: crossovers, intersections, turning lanes, acceleration lanes,

deceleration lanes, or ramps. Compact these courses (with the exception of open-graded friction courses) in accordance with the standard rolling procedure defined above. In the event that the rolling procedure deviates from the approved procedure, placement of the mix shall be stopped.

334-6 Method of Measurement.

For the work specified under this Section, the quantity to be paid for will be the weight of the mixture, in tons.

The bid price for the asphalt mix will include the cost of the liquid asphalt or the asphalt recycling agent and the tack coat application as specified in 334-5.5.4. There will be no separate payment or unit price adjustment for the asphalt binder material in the asphalt mix.

334-7 Basis of Payment.

334-7.1 General: Price and payment will be full compensation for all the work specified under this Section.

DRAFT

LOCAL AGENCY PROGRAM CONCRETE.

(REV 3-3-06)

SECTION 344 LOCAL AGENCY PROGRAM CONCRETE

344-1 Description.

344-1.1 General: Construct Local Agency Program (LAP) Concrete based on the type of work as described in the Contract and the Concrete Work Categories as defined below.

344-1.2 Work Categories: Construction of LAP concrete elements will fall into one of the following Concrete Work Categories:

344-1.2.1 Concrete Work Category 1: Includes the construction of sidewalks, curb and gutter, ditch and slope pavement, and traffic separators.

344-1.2.2 Concrete Work Category 2: Includes the construction of concrete barriers, traffic railing barriers, parapets, sound barriers, inlets, manholes, junction boxes, pipe culverts, storm sewers, precast drainage products, and noise barrier walls.

344-1.2.3 Concrete Work Category 3: Includes the work associated with the placement and/or construction of precast concrete box culverts, precast concrete poles, concrete used to construct highway signing and lighting systems, retaining wall systems, and drilled shaft construction.

344-2 Materials.

344-2.1 General: Use concrete composed of a mixture of portland cement, aggregates, and water, with or without chemical or mineral admixtures that meet the following requirements:

344-2.1.1 Portland Cement: Cement shall conform to the requirements of the AASHTO or ASTM designations. Different brands of cement, cement of the same brand from different facilities or different types of cement shall be stored separately and shall not be mixed. Portland cements meeting the requirements of AASHTO M-85 or ASTM C-150 are allowed for LAP concrete.

344-2.1.2 Coarse and Fine Aggregates: Aggregates shall meet current FDOT requirements except that source approval by the FDOT is not required.

344-2.1.3 Water: Water shall meet current FDOT requirements.

344-2.1.4 Chemical Admixtures: Chemical admixtures shall meet current FDOT requirements. Admixtures may be added at the dosage rates recommended by the manufacturer.

344-2.1.5 Pozzolans and Slag: Pozzolans and Slag shall meet the current FDOT requirements.

344-2.2 Material Storage: Use a concrete production facility that meets the following requirements:

344-2.2.1 Cementitious Materials Storage: Provide a separate and clearly labeled weatherproof facility to store each brand or type of cementitious material

without mixing or contamination. Provide a suitable, safe and convenient means of collecting cementitious material samples at each storage facility.

344-2.2.2 Aggregate Storage: Provide suitable bins, stockpiles or silos to store and identify aggregates without mixing, segregating or contaminating different grades or types of materials. Identify aggregate type/gradation. Handle the aggregates in a manner to minimize segregation and meet the specification requirements when recovered from storage. Continuously and uniformly sprinkle coarse aggregate with water, for 24 hours preceding introduction into the concrete mix. Timers may be used to facilitate the sprinkling of aggregate stockpiles using an alternating on/off method. However, in no event shall the top surface of the stockpile be permitted to become dry prior to batching of concrete. Moisture probes may be used to determine the moisture content of the aggregate. Ensure that the accuracy of the probe is certified annually. Maintain stored aggregates in a well-drained condition to minimize free water content. Provide access for the Engineer to sample the aggregates from the recovery side of the storage facility.

344-3 Production, Mixing and Delivery of Concrete.

344-3.1 Concrete Production Requirements: Use concrete production facilities certified by the National Ready-Mixed Concrete Association (NRMCA), approved by the FDOT, or approved by PCI, based on the type of concrete for the application. In addition, use batch plants that are on the FDOT's current approved plant list.

Produce concrete utilizing equipment that is in good operating condition and operated in a manner to ensure a consistent product. When moisture probes are not used, ensure that the concrete production facility determines the free moisture for the coarse and fine aggregates within two hours prior to each day's batching. On concrete placements expected to exceed three hours, perform an additional moisture test approximately half way through the batching operations and adjust batch proportions accordingly.

Ensure that the calibration of the measuring devices of the concrete production facilities meets the requirements of Chapter 531 of the Florida Statutes, and are in accordance with Chapter 9.2 of the FDOT State Materials Office Materials Manual. At least quarterly, ensure that all scales, meters and other weighing or measuring devices are checked for accuracy by a qualified representative of a scale company registered with the Bureau of Weights and Measures of the Florida Department of Agriculture. Have the accuracy of admixture measuring dispensers certified annually by the admixture supplier.

When Volumetric Mixers are used for Category 1 applications, deliver concrete in accordance with the requirements of Volumetric Mixer Manufacturers Bureau (VMMB) and ensure that the vehicle has a VMMB registered rating plate.

344-3.2 Classes of Concrete: Classes of concrete to be used on the project will be defined in the Contract Documents.

344-3.3 Contractors Quality Control: The contractor will supply a Quality Control (QC) plan to identify to the Agency how quality will be ensured at the project site. During random inspections the Agency will use this document to verify that the construction of the project is in agreement with his QC plan.

344-3.4 Concrete Mix Design: Before producing any concrete, submit the proposed mix design to the Engineer on a form provided by the Agency. Use only concrete mix designs having prior approval of the Engineer.

Materials may be adjusted provided that the theoretical yield requirement of the approved mix design is met. Show all required original approved design mix data and batch adjustments and substituted material on an Agency approved concrete delivery ticket. The Engineer may disqualify any concrete production facility for non-compliance with specification requirements.

344-3.5 Delivery: For cast-in-place applications, the maximum allowable mixing and agitation time of concrete is 90 minutes.

Furnish an electronic delivery ticket on a form approved by the Agency with each batch of concrete before unloading at the placement site. Record material quantities incorporated into the mix on the delivery ticket. Ensure that the Batcher responsible for producing the concrete certifies that the batch was produced in accordance with these specifications and signs the delivery ticket. The Contractor shall sign the delivery ticket certifying that the concrete was batched, delivered and placed in accordance with these specifications.

The Contractor shall be responsible for rejecting loads of concrete that do not meet the minimum compressive strength requirements.

At the sole option of the Agency, the Engineer may accept concrete at a reduced pay when it is determined that the concrete will serve its intended function.

344-3.6 Placing Concrete:

344-3.6.1 Concreting in Cold Weather: Do not place concrete when the temperature of the concrete at placement is below 45°F.

Meet the air temperature requirements for mixing and placing concrete in cold weather as specified in Section 346. During the curing period, if NOAA predicts the ambient temperature to fall below 35°F for 12 hours or more or to fall below 30°F for more than 4 hours, enclose the structure in such a way that the concrete and air within the enclosure can be kept above 60°F for a period of 3 days after placing the concrete or until the concrete reaches a minimum compressive strength of 1,500 psi.

Assume all risks connected with the placing and curing of concrete. Although the Engineer may give permission to place concrete, the Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the Agency.

344-3.6.2 Concreting in Hot Weather: Meet the temperature requirements and special measures for mixing and placing concrete in hot weather as specified in Section 346.

When the temperature of the concrete as placed exceeds 75°F, incorporate in the concrete mix a water-reducing retarder or water reducer if allowed by Section 346.

Spray reinforcing steel and metal forms with cool fresh water just prior to placing the concrete in a method approved by the Engineer.

Assume all risks connected with the placing and curing of concrete. Although the Engineer may give permission to place concrete, the Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the Agency.

344-3.7 Mixers: Ensure that mixers are capable of combining the components of concrete into a thoroughly mixed and uniform mass, free from balls or lumps of cementitious materials, and capable of discharging the concrete uniformly. Operate concrete mixers at speeds per the manufacturer's design. Do not exceed the manufacturer's rated capacity for the volume of mixed concrete in the mixer, mixing drum, or container.

344-3.8 Small Quantities of Concrete: With approval of the Engineer, small quantities of concrete, less than 3 yd³ placed in one day and less than 0.5 yd³ placed in a single placement may be accepted using a pre-bagged mixture. The Agency may verify that the pre-bagged mixture is prepared in accordance with the manufacturer's recommendations and will meet the requirements of this Specification.

344-3.9 Sampling and Testing: The Agency may sample and test the concrete at its discretion to verify its quality. The minimum 28-day compressive strength requirement for concrete is defined in the plans or in the FDOT Design Standards for that class of concrete or specific element.

344-3.9 Records: Maintain the following records for review for at least three years after final acceptance of the project:

1. Approved concrete mix designs.
2. Materials source (delivery tickets, certifications, certified mill test reports).
3. A copy of the scale company or testing agency report showing the observed deviations from quantities checked during calibration of the scales and meters.
4. A copy of the documentation certifying the admixture weighing/measuring devices.
5. For Non Structural LAP concrete the Agency will accept recent NRMCA, VMMB or Department inspection records certifying the plant or truck can produce concrete and documentation showing that action has been taken to correct deficiencies noted during the inspections.

344-4 Acceptance of the Work.

344-4.1 Category 1 Work: Category 1 work will be accepted based upon compliance with Production, Mixing and Delivery Requirements specified in Section 347 of the current FDOT Specifications, and certifications on the Delivery Ticket as described in 344-3.3.

344-4.2 Category 2 Work:

344-4.2.1 Precast Elements: Precast elements will be accepted based upon certification from the Contractor that the elements were produced by a concrete plant on the FDOT's current approved plant list.

344-4.2.2 Cast-in-place Concrete: Cast-in-Place concrete will be accepted based upon certification on the Delivery Ticket as described in 344-3.3.

344-4.3 Category 3 Work: Category 3 work will be accepted based upon full compliance with this specification, and with current FDOT Specifications Section 346 and associated Contractor Quality Control (CQC) specifications.

344-5 Method of Measurement.

The quantities to be paid for will be the items shown in the plans, completed and accepted.

344-6 Basis of Payment.

Prices and payments will be full compensation for all work and materials specified in this Section.

DRAFT

FACERS Issues



Florida Association of County Engineers and Road Superintendents

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January 27, 2006

Denver Stutler, Jr., Secretary of Transportation
Florida Department of Transportation
605 Suwannee Street
Tallahassee, Florida 32399-0450

Dear Secretary Stutler:

At the request of the Florida city and county public works and transportation personnel, the Florida Department of Transportation (FDOT) agreed to fund the development of Florida-specific curriculum in the instructional areas of traffic signs, roadway markings and traffic signals to fill specific agency needs. The Florida Transportation Technology Transfer (T²) Center, University of Florida is currently under contract to develop the courses.

The Florida Association of County Engineers and Road Superintendents (FACERS) request that, as these courses are completed, they be recognized as accepted alternatives to the currently required training, as specified in city, county and state position descriptions. Currently, only one association's training satisfies the position description requirements: the International Municipal Signal Association (IMSA).

FACERS proposes to provide subject matter experts to review curriculum developed by the Florida T² Center under FDOT grants to attest that said curriculum meets or exceeds the local agency needs. In addition, it is strongly suggested that such courses become part of the Greenbook.

We look forward to discussing the steps necessary to complete this request. Thank you for your assistance with this matter.

Sincerely,

Robert R. Gordon, P.E.
FACERS President
Director, Hillsborough County Public Works Department
P.O. Box 1110
Tampa, FL 33601
gordonr@hillsboroughcounty.org

DEPARTMENT OF
TRANSPORTATION

FEB 9 2006

An Affiliate of the Florida Association of Counties
www.facers.org

CONTRACT NO. _____
FINANCIAL PROJECT NO. _____
F.E.I.D. NO. _____

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC SIGNAL MAINTENANCE AND COMPENSATION AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, _____, by and between the Florida Department of Transportation, an agency of the State of Florida, herein called the "Department", and _____ Florida, herein called the "Maintaining Agency".

WITNESSETH:

WHEREAS, the Maintaining Agency has the authority to enter into this Agreement and to undertake the maintenance and operation of traffic signals or signal systems on the State Highway System, and the Department is authorized under Sections 334.044 and 335.055, Florida Statutes, to enter into this Agreement; and

WHEREAS, the Maintaining Agency has authorized its undersigned representative to enter into and execute this Agreement.

NOW, THEREFORE, in consideration of the premises and the mutual covenants contained herein to be undertaken by the respective parties hereto, and for other good and valuable consideration, the sufficiency of which is hereby acknowledged, the parties mutually agree and covenant as follows:

1. The Maintaining Agency shall be responsible for the maintenance and continuous operation of the traffic signals, traffic signal systems (central computer, cameras, message signs, and communications interconnect), school zone traffic control devices, intersection flashing beacons, illuminated street name signs, and the payment of electricity and electrical charges incurred in connection with operation of such traffic signals and signal systems upon completion of their installation. The Department agrees to pay to the Maintaining Agency, an annual compensation based on Department's fiscal year for the cost of the maintenance and continuous operation of full traffic signal locations as identified in Exhibit A. Flashing beacons, emergency signals, and school zone signals are not included. Payments will be made in accordance with Exhibit B. Should the Maintaining Agency withdraw from the compensation portion of this Agreement, the Maintaining Agency will still be responsible for the maintenance and continuous operation of the above items. In the case of construction contracts, the Maintaining Agency shall be responsible for the payment of electricity and electrical charges incurred in connection with the operation of the traffic signals and signal systems, and shall undertake the maintenance and continuous operation of said traffic signals and signal systems upon final acceptance of the installation by the Department. Repair or replacement and other responsibilities of the installation contractor and the Department, during construction, are contained in the Department's Standard Specifications for Road and Bridge Construction.
2. The Maintaining Agency shall maintain and operate the traffic signals and signal systems in a manner that will ensure safe and efficient movement of highway traffic and that is consistent with maintenance practices prescribed by the International Municipal Signal Association (IMSA) and operational requirements of the Manual on Uniform Traffic Control Devices (MUTCD), as amended. The Maintaining Agency's maintenance responsibilities shall include, but not be limited to, preventive maintenance (periodic inspection, service and routine repairs), and emergency maintenance (trouble shooting in the event of equipment malfunction, failure, or damage). The Maintaining Agency shall record its maintenance activities in a traffic signal maintenance log.
3. The Maintaining Agency may remove any component of the installed equipment for repair; however, it shall not make any permanent modifications and/or equipment replacements unless the equipment provided is capable of performing at minimum the same functions. The Department shall not make any modifications and/or equipment replacements without prior written notice to the Maintaining Agency.
4. The Maintaining Agency shall set and maintain the timing and phasing of the traffic signals in accordance with the Department's timing and phasing plans, specifications, or special provisions. The Maintaining Agency shall obtain prior written approval from the Department for any modification in phasing of signals and signal systems to accommodate changing needs of traffic. The Maintaining Agency may make changes in the signal timing provided these changes are made under the direction of a qualified Professional Engineer and be contingent upon an engineering report or documentation of engineering judgment prepared by, or for, the Maintaining Agency in accordance with Section 1A.09, Engineering Study and Engineering Judgment, of the MUTCD, recommending such changes and signed and sealed by a qualified Professional Engineer registered in the State of Florida. The Maintaining Agency shall send a signed/sealed copy of the timings to the Department immediately after installation. The Department reserves the right to examine equipment, timing and phasing at any time and, after consultation with the Maintaining Agency, may specify modifications. If the Department specifies modification in timing and/or phasing, implementation of such modifications shall be coordinated with, or made by, the Maintaining Agency.
5. The Maintaining Agency shall note in the maintenance log any time/phasing changes and keep a copy of the timings and any approval documentation in a file.

6. The Maintaining Agency and the Department shall develop the Exhibit A which by this reference is made a part of this Agreement as though fully set forth herein. Exhibit A shall contain all existing traffic signals on the State Highway System, applicable to the jurisdiction of the Maintaining Entity, those that are maintained by the Maintaining Agency and those that are not included for compensation. No changes or modifications will be made to Exhibit A during the year for compensation. New signals added by the Department during the fiscal year shall be maintained and operated by the Maintaining Agency upon final acceptance as stated in paragraph 1. The Maintaining Agency and the Department, preceding each fiscal year, shall develop and execute a new Exhibit A, which shall include all new Department signals added during the previous fiscal year and delete those removed. The Maintaining Agency shall begin receiving compensation for new Department's signals in the next fiscal year. In the event that no change has been made to the previous year's Exhibit A, a statement to this effect should be included. The annual compensation will be a lump sum payment detailed in Exhibit B. Future payments will be based on the information provided in Exhibit A, in accordance with the provisions as detailed in Exhibit B, attached and made a part hereof.

- a) Payment shall be made only after receipt and approval of service.
- b) Payment shall be made in accordance with Section 215.422, Florida Statutes.
- c) Bills for fees or other compensation for services or expenses shall be submitted in detail sufficient for a proper pre-audit and post-audit thereof.
- d) Record of costs incurred under terms of this Agreement shall be maintained and made available upon request to the Department at all times during the period of this Agreement and for three (3) years after final payment for the work pursuant to this Agreement is made. Copies of these documents and records shall be furnished to the Department upon request. Record of costs incurred include the Maintaining Agency's general accounting records, together with supporting documents and records of the Maintaining Agency and all subcontractors performing work, and all other records of the Maintaining Agency and subcontractors considered necessary by the Department for proper audit of costs.

7. Maintaining Agency providing goods and services to the Department should be aware of the following time frames. Upon receipt, the Department has five (5) working days to inspect and approve the goods and services, unless the Agreement specifies otherwise. The Department has twenty (20) days to deliver a request for payment (voucher) to the Department of Banking and Finance. The twenty (20) days are measured from the latter of the date the invoice is received or the goods or services are received, inspected and approved.

8. If a payment is not available within forty (40) days, a separate interest penalty at a rate as established pursuant to Section 215.422, Florida Statutes, shall be due and payable, in addition to the invoice amount, to the Maintaining Agency. Interest penalties of less than one (1) dollar shall not be enforced unless the Maintaining Agency requests payment. Invoices returned to a Maintaining Agency because of Maintaining Agency preparation errors shall result in a delay in the payment. The invoice payment requirements do not start until a properly completed invoice is provided to the Department.

9. A Vendor Ombudsman has been established within the Department of Banking and Finance. The duties of this individual include acting as an advocate for contractors/vendors who may be experiencing problems in obtaining timely payment(s) from a state agency. The Vendor Ombudsman may be contacted at (850) 410-9724 or by calling the State Comptroller's Hotline, 1-800-848-3792.

10. An entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity.

11. A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for CATEGORY TWO for a period of thirty-six (36) months from the date of being placed on the convicted vendor list.

12. The Department shall consider the employment by any contractor of unauthorized aliens a violation of Section 274A(e) of the Immigration and Nationality Act. If the contractor knowingly employs unauthorized aliens, such violation shall be cause for unilateral cancellation of this Agreement.

13. The State of Florida's performance and obligation to pay under this Agreement is contingent upon an annual appropriation by the Legislature. In the event this Agreement is in excess of \$25,000 and has a term for a period of more than one year, the provisions of Section 339.135(6)(a), Florida Statutes, are hereby incorporated:

- (a) The Department, during any fiscal year, shall not expend money, incur any liability, or enter into any contract which, by its terms, involves the expenditure of money in excess of the amounts budgeted as available for expenditure during such fiscal year. Any contract, verbal or written, made in violation of this subsection shall be null and void, and no money may be paid on such contract. The Department shall require a statement from the Comptroller of the Department that funds are available prior to entering into any such contract or other binding commitment of funds. Nothing herein contained shall prevent the making of contracts for periods exceeding one year, but any contract so made shall be executory only for the value of the services to be rendered or agreed to be paid for in succeeding fiscal years, and this paragraph shall be incorporated verbatim in all contracts of the Department which are for an amount in excess of \$25,000 and which have a term for a period of more than one year.

14. The Maintaining Agency may be subject to inspections of traffic signals and traffic signal systems by the Department. Such findings will be shared with the Maintaining Agency and shall be the basis of all decisions regarding payment reduction, reworking, Agreement termination, or renewal. If at any time the Maintaining Agency has not performed the maintenance responsibility on the locations specified in the Exhibit A, the Department shall have the option of (a) notifying the Maintaining Agency of the deficiency with a requirement that it be corrected within a specified time, otherwise the Department shall deduct payment for any deficient traffic signal(s) maintenance not corrected at the end of such time, or (b) take whatever action is deemed appropriate by the Department. Any suspension or termination of funds does not relieve any obligation of the Maintaining Agency under the terms and conditions of this Agreement.

15. The Maintaining Agency may enter into agreements with other parties pertaining to traffic signals and signal systems including, but not limited to, agreements relating to costs and expenses incurred in connection with the operation of traffic signals and signal systems on the State Highway System, provided that such Agreements are consistent with the mutual covenants contained in this Agreement. The Maintaining Agency shall furnish a copy of such agreements to the Department.

16. This Agreement may not be assigned or transferred by the Maintaining Agency in whole or in part without consent of the Department.

17. The Maintaining Agency shall allow public access to all documents, papers, letters, or other material subject to provisions of 119, Florida Statutes, and made or received by the Maintaining Agency in conjunction with this Agreement. Failure by the Maintaining Agency to grant such public access shall be grounds for immediate unilateral cancellation of this Agreement by the Department.

18. The Maintaining Agency, to the extent allowed by Section 768.28, Florida Statutes, shall indemnify, defend, save and hold harmless, the State, the Department, any joint pole owner and all of their officers, agents and employees from all suits, actions, claims, demands, and liabilities of any nature whatsoever arising out of, because of, or due to breach of, this Agreement by the Maintaining Agency, its subcontractors, agents or employees or due to any act or occurrence of omission or commission of the Maintaining Agency, its subcontractors, agents or employees. The parties agree that this paragraph shall not waive sovereign immunity of the State of Florida, nor waive the benefits or provisions of Sections 768.28 and 335.055, Florida Statutes, or any similar provision of law.

19. This Agreement shall be governed by and construed in accordance with the laws of the State of Florida. The invalidity or unenforceability of any portion of this Agreement shall not affect the remaining provisions and portions hereof. Any failure to enforce or election on the part of the Department to not enforce any provision of this Agreement shall not constitute a waiver of any rights of the Department to enforce its remedies hereunder or at law or in equity.

20. This Agreement shall remain in force during the life of the original installed equipment and/or the life of any replacement equipment installed with the mutual consent of the parties hereto.

21. Upon execution, this Agreement cancels and supersedes any and all prior Traffic Signal Maintenance Agreement(s) between the parties.

22. This Agreement contains all the terms and conditions agreed upon by the parties.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed, the day and year first above written.

_____, Florida
(Maintaining Agency)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

By: _____
(Authorized Signature)

By: _____
(Authorized Signature)

Print/Type Name: _____

Print/Type Name: _____

Title: _____

Title: _____

Attest: _____
(Seal if Applicable)

Attest: _____

REVIEWED:

Attorney Date

EXHIBIT A

TRAFFIC SIGNAL INTERSECTIONS MAINTAINED AND OPERATED FOR FY

Effective Date: _____ To: _____

Maintaining Agency: _____

Intersection Locations	Compensation (Yes or No)	FDOT FY Unit Rate	Percent of State (Ex. 25, 33, 50, 75, or 100)	Total Amount (Unit Rate x Percent)
			Total Lump Sum	\$

I certify that the above traffic signals were maintained and operated in accordance with the requirements of the Traffic Signal Maintenance and Compensation Agreement.
 For satisfactory completion of all services detailed in this Agreement for this time period, the Department will pay the Maintaining Agency a Total Lump Sum of \$ _____.

 Maintaining Agency Date

 District Traffic Operations Engineer Date

EXHIBIT B

TRAFFIC SIGNAL MAINTENANCE AND COMPENSATION AGREEMENT

1.0 PURPOSE

This exhibit defines the method and limits of compensation to be made to the Maintaining Agency for the services described in this Agreement and in Exhibit A and Method by which payments will be made.

2.0 COMPENSATION

For the satisfactory completion of all services detailed in this Agreement and Exhibit A of this Agreement, the Department will pay the Maintaining Agency the Total Lump Sum in Exhibit A. The Maintaining Agency will receive one lump sum payment at the end of each fiscal year for satisfactory completion of service.

Total Lump Sum Amount for each Fiscal Year is calculated by adding all of the individual intersection amounts. The individual intersection amounts are calculated by taking the FY Unit Rate times the Percent of State Road Approaches to Total Approaches.

Example: For a intersection with 4 approaches with 2 approaches (50%) being state roads, the intersection amount will be: $\$518 \times (2/4) = \259

Unit Rates per 100% State Intersections

FY 02-03	\$ 518
03-04	\$1,599
04-05	\$2,196
05-06	\$2,262
06-07	\$2,330

Beginning FY 07-08, the Unit Rate for each fiscal year will be 3% more than the Unit Rate for the previous fiscal year, unless otherwise specified in an amendment to this Agreement.

3.0 PAYMENT PROCESSING

The Maintaining Agency shall invoice the Department yearly in a format acceptable to the Department.

DRAFT - Chapter 13 Public Transit

CHAPTER 13

PUBLIC TRANSIT

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B	OBJECTIVE.....	13-2
C	TRANSIT COMPONENTS.....	13-3
C.1	Stops and Station Areas	13-3
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CHAPTER 13

PUBLIC TRANSIT

A INTRODUCTION

All usual modes of transportation (autos, trucks, transit vehicles, rails, aircraft, water craft, bikes, pedestrian) should be considered when planning, designing, and constructing the surface transportation system. Where there is a demand for highways to serve vehicles, there could also be a demand for public transit or public transportation. Public transit should be considered in all phases of a project, including planning, preliminary design and engineering, design, construction, etc. Coordination with the FDOT Public Transportation Office, FDOT District Modal Development Office, and/or the local public transit provider(s) will help determine the need for and justification of bus bays on a project by project basis. With the recent passing of various legislation, multimodalism is the ultimate goal. The integration of public transit street side facilities along with pedestrian and bicycle facilities furthers the implementation of this goal.

Planning and designing for public transit is important because it is an integral part of the overall surface transportation system. Public transit is defined as passenger transportation service, local or regional in nature, that is available to any person. It operates on established schedules along designated routes or lines with specific stops and is designed to move relatively large numbers of people at one time. Public transit includes bus, light rail, and rapid transit. Public transportation is similar in definition because it serves the general public, it also includes non-fixed route services that are door-to-door or paratransit services.

With rising levels of congestion resulting in the use of new strategies to effectively and efficiently manage mobility, there is an increased demand for accessible and user friendly public transit. New strategies include increased emphasis on public transit and new emphasis on Transportation System Management (TSM), as well as Transportation Demand Management (TDM). TSM is the use of low cost capital improvements to increase the efficiency of roadways and transit services such as, retiming traffic signals or predesignating traffic flow. TDM focuses on people reducing the number of personal vehicle trips, especially during peak periods. TDM includes the promotion of alternatives to the single occupant vehicle, including public transportation, carpooling, vanpooling, bicycling, walking, and telecommuting, as well as other methods for reducing peak hour travel.

Federal and State legislation provide the stimulus for planning, designing, and constructing a fully integrated transportation system benefiting the traveling public and the environment. Examples of legislation include [the Safe, Accountable, Flexible, and Efficient Transportation Equity Act – A Legacy for Users \(SAFETEA-LU\)](#), [The Federal Transportation Equity Act for the 21st Century \(TEA-21\)](#), The Americans with Disabilities Act of 1990 (ADA), and The Clean Air Act Amendment of 1990 (CAAA). In response to this legislation, the surface transportation system should provide for concurrent use by automobiles, public transit and rail, and, to the extent possible, bicycles and pedestrians.

Throughout the entire process, coordination with transit as if it were a utility is essential.

B OBJECTIVE

There are a number of methods to efficiently develop a coordinated surface transportation system. Coordination among agencies is necessary during the planning and design stages to incorporate transit needs and during the construction phase for re-routing bus (and complementary pedestrian) movements and for actual transit agency specific requirements (e.g., bus stop sign replacement, shelter installations, etc.). For planning purposes, the state and local Transportation Improvement Program (TIP) should be referenced. Additionally, individual transit authorities have five year Transit Development Plans (TDPs) that are updated annually. The TDP can be used as a guide for planned transit needs along existing and new transportation corridors so transit consideration and transit enhancements can be incorporated where appropriate.

C TRANSIT COMPONENTS

C.1 Stops and Station Areas

Where new bus stop pads are constructed at bus stops, bays, or other areas where a lift or ramp is to be deployed, they shall have a firm, stable surface, minimum clear length of 96 inches (measured from the curb or vehicle roadway edge), minimum clear width of 60 inches (measured parallel to the vehicle roadway) to the maximum extent allowed by legal or site restraints, and shall be connected to streets, sidewalks, or pedestrian paths by an accessible route. The slope of the pad parallel to the roadway shall, to the extent practicable, be the same as the roadway. For water drainage, a maximum slope of 1:50 (2%) perpendicular to the roadway is allowed. In cases where there are no sidewalks or curbs, bus stop pads may be necessary to allow the wheelchair passengers to board or alight from a transit vehicle. Coordination with the Public Transportation Office and/or local public transit provider(s) is necessary.

C.2 Shelters

Every public transit system has different needs with regards to shelters and corresponding amenities (e.g., benches, information kiosks, leaning posts, trash receptacles, etc.). Shelter foundation and associated pad size vary from stop to stop based on right of way availability, line of sight, facility usage, etc. New or replaced bus shelters shall be installed or positioned as to permit a wheelchair or mobility aid user to enter from the public way and to reach a location therein having a minimum clear floor area of 30 inches by 48 inches, entirely within the perimeter of the shelter. Such shelters shall be connected by an accessible route to the boarding area provided under C.1 Stops and Station Areas, this Chapter. Coordination with the Public Transportation Office and local transit provider(s) is necessary. All shelters should provide a location for a bicycle rack. Shelters should be installed at locations where demand warrants installation.

C.3 Benches

Bench placement should be in an accessible location (i.e., not on the far side of a drainage ditch from the actual bus stop), but appropriately out of the path of travel on a sidewalk. Connection between the sidewalk and/or bus stop pad should be provided. Coordination with the Public Transportation Office and the local public transit provider(s) is necessary.

C.4 Concrete Bus Stop Pads

Although not always practical, there are situations where concrete bus stop pads should be incorporated into the pavement design of a project. Frequent stopping transit vehicles in a particular location is an example where concrete pads may be warranted.

C.5 Bus Bays (Pullout or Turnout Bays)

In some situations, turnout bays for transit vehicles are appropriate (i.e., consistent slow boarding, layover needs, safety reasons, high speed traffic, etc.). Bus bays can be designed for one or more buses. Coordination with the Public Transportation Office and/or the local public transit provider(s) will help determine the need for and justification of bus bays. When possible, bus bays should be located on the far side of a signalized intersection. The traffic signal will create the critical gap needed for bus re-entry into traffic. There are several publications available which provide additional design information for transit system applications. The Department District Public Transportation Office(s) maintains a library of these publications.

C.6 Promote Public Transit

All citizens and businesses in the State of Florida are encouraged to promote public transit. This can be done in many ways, from providing employees reduced fares to providing route maps and schedules. Work with your local transit agency to provide service to large employment areas and major attractions. Assist local transit agencies in providing such things as bus lanes, park and ride lots and easements for bus shelters and bicycle parking. Encourage businesses or neighborhoods to hold a "Commuter Choices Week" and invite your transit agencies to provide information on the advantages of using transit. "Commuter Choices Week" is a state sponsored event that promotes alternative transportation in the work place (walk, bike, bus, transit, telecommuting).

D PUBLIC TRANSIT FACILITIES

When a project includes a public transit route, curb side and street side transit facilities for bus stops should be considered in the roadway design process.

The “Accessing Transit: Design Handbook for Florida Bus Passenger Facilities” and “Transit Vehicle and Facilities on Streets and Highways” provide guidance relating to provisions for curb side and street side facilities.

D.1. Curb-Side Facilities

Curb-side facilities are the most common, simplest and convenient form of facilities at a bus stop. These include bus stop signs, passenger waiting shelters, bus stop wheelchair access pad, benches, leaning rails, and shelter lighting. Chapter 1 of Accessing Transit provides additional details for each facility. Coordination with the Public Transportation Office, FDOT District Modal Development Office, and/or local public transit provider(s) is necessary in developing the plans.

D.2 Street-Side Facilities

Bus stop locations can be categorized as far side, near side and mid block stops. Bus stops may be designed with a bus bay or pullout to allow buses to pick up and discharge passengers in an area outside of the travel lane. This design feature allows traffic to flow freely without the obstruction of stopped buses. See Figure D.3 for typical detail for the bus stop categories. Chapter 2 of “Accessing Transit” provides additional details for each facility.

The greater distance placed between waiting passengers and the travel lane increases safety at a stop. Bus bays are encouraged on roadways with high operating speeds, such as roads that are part of the Urban Principal Arterial System. For a particular bus stop, a high frequency of crashes involving buses is a good indicator for the need of a bus bay. Bus bays are classified as closed, open or bulbs. See Figure 13-1 for typical detail for the bus bay categories. Detailed Standard drawings for various bus bay configurations are provided in “Transit Facilities Guidelines” on the Public Transportation Office website – <http://www.dot.state.fl.us/transit/>.

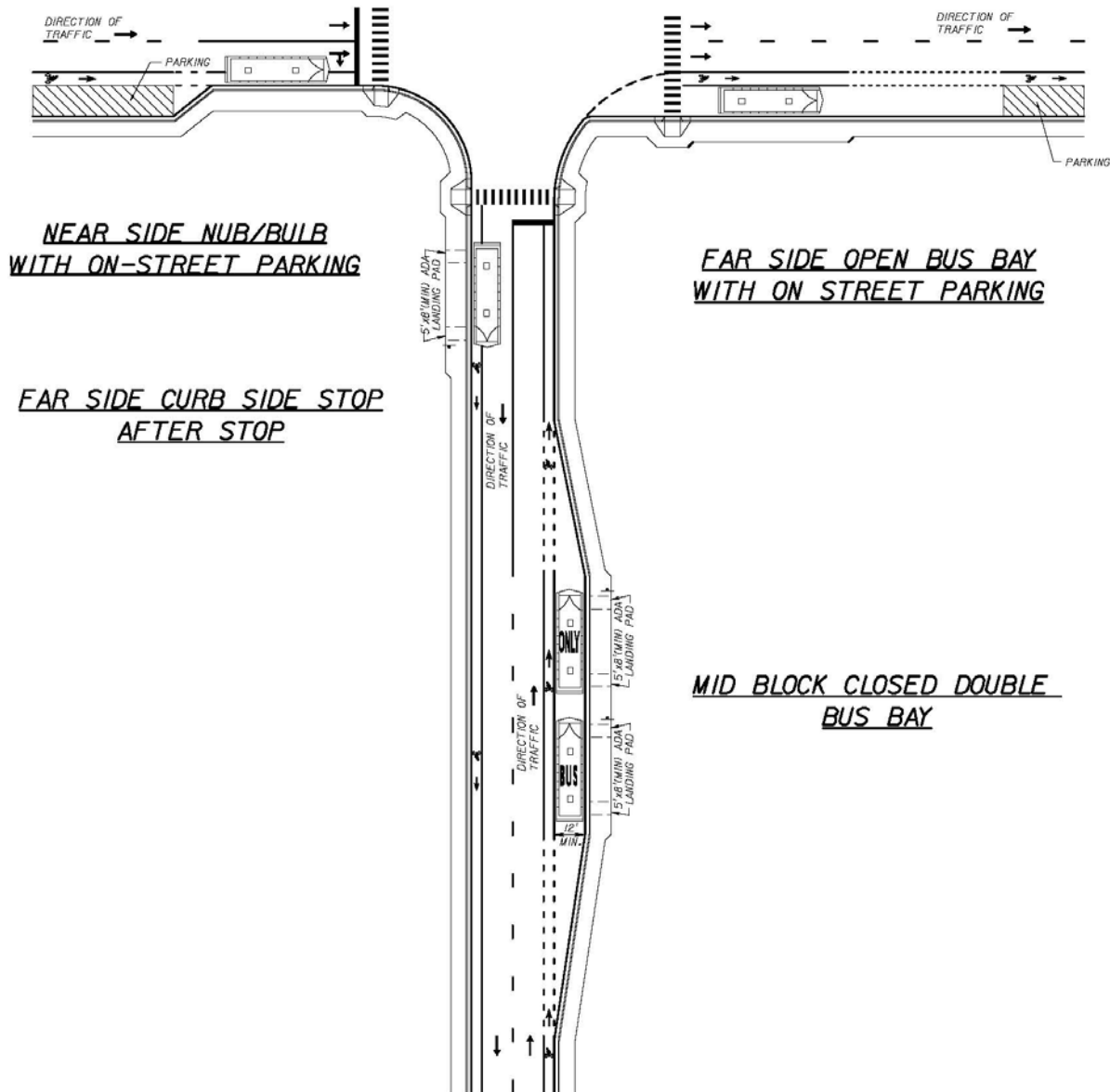
At a specific location, a balance must be obtained based on the designer's judgment and input from the applicable transit agencies. In locations where the traffic volumes exceed 1,000 vehicles per hour per lane, it is difficult to maneuver the bus into the bay and back into the travel lane. Incorporating an acceleration distance, signal priority, or a far side (versus near side or mid-block) placement, are potential solutions when traffic volumes exceed 1,000 vehicles per hour per lane.

The total length of the bus bay should allow room for an entrance taper, a stopping area, and an exit taper as a minimum. However, in some cases it may be appropriate to consider providing acceleration and deceleration lanes depending on the volume and speed of the through traffic. This decision should be based upon site specific conditions. "Accessing Transit" provides detailed bus bay dimensions for consideration when right-of-way is unlimited and access points are limited.

D.3 Bus Bay Lighting

Lighting design for bus bay pavement areas should meet the same criteria for minimum illumination levels, uniformity ratios and max-to-min ratios that are being applied to the adjoining roadway based on FDOT Lighting Design Criteria (5). If lighting is not provided for the adjoining roadway, coordination with the transit agency may be considered to determine if lighting is to be provided for the bus stop area. A decision to install lighting for the adjoining bus stop area may include illumination of the bus bay pavement area. The use of solar panel lighting for bus bays is another option that should be considered.

Figure 13-1 Bus Bay Categories



REFERENCES

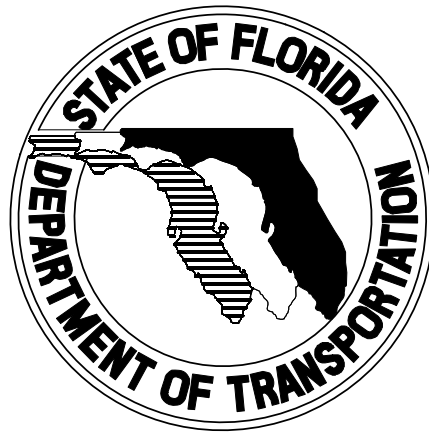
These will be added to Reference page

FDOT Accessing Transit Design Handbook for Florida Bus Passenger Facilities

Transit Facilities Guidelines on the Public Transportation Office web site-
<http://www.dot.state.fl.us/transit/>

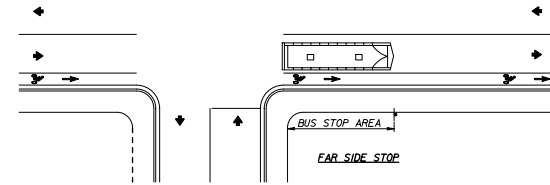
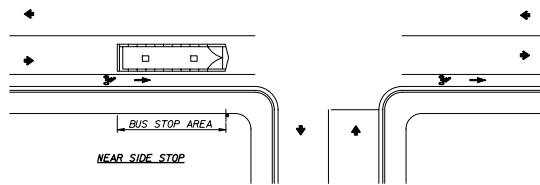
Transit Vehicle and Facilities on Streets and Highways, from Transit Cooperative Research
Program (TCRP) of the Transportation Research Board of the National Research Council
January 2007

State of Florida
 Department of Transportation
 Public Transportation Office



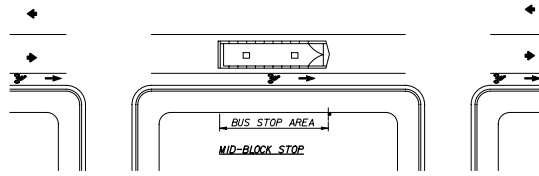
TRANSIT FACILITIES GUIDELINES

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITIES GUIDELINES STREETSIDE BUS STOP LOCATIONS & DESIGN TYPES	FIGURE
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		

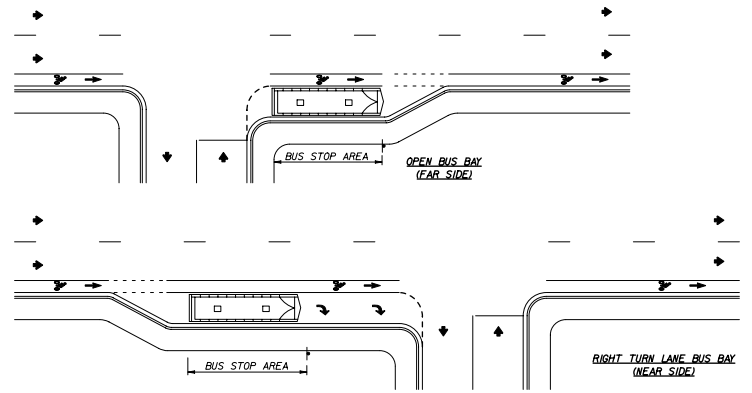
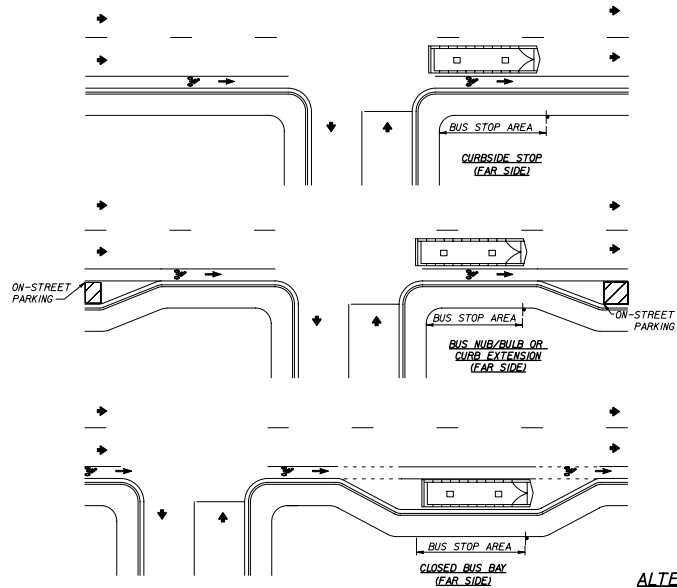


STREETSIDE BUS FACILITY GENERAL GUIDELINES (SEE ACCESSING TRANSIT HANDBOOK FOR ADDITIONAL DETAILS)

- 1) FAR SIDE BUS STOPS AND BAYS ARE GENERALLY PREFERRED OVER NEAR SIDE STOPS AND BAYS
 - EXCEPTION IS AT TWO-LANE ROADWAYS WHERE VEHICLES ARE RESTRICTED FROM GOING AROUND THE BUS STOPPED AT A CURBSIDE STOP
- 2) BUS BAYS ARE GENERALLY PREFERRED OVER CURBSIDE BUS STOPS IN TRAVEL LANES
 - PARTICULARLY FOR ARTERIAL DESIGN SPEEDS GREATER THAN OR EQUAL TO 40 MPH AND
 - WHERE THERE IS SIGNIFICANT BUS AND PASSENGER VOLUMES AND
 - WHERE PLACED DOWNSTREAM FROM A TRAFFIC SIGNAL
- 3) CLOSED BUS BAYS ARE GENERALLY PREFERRED OVER OPEN BUS BAYS
 - EXCEPTION WOULD BE AT A PHYSICALLY CONSTRAINED SITE.



ALTERNATIVE BUS STOP LOCATIONS

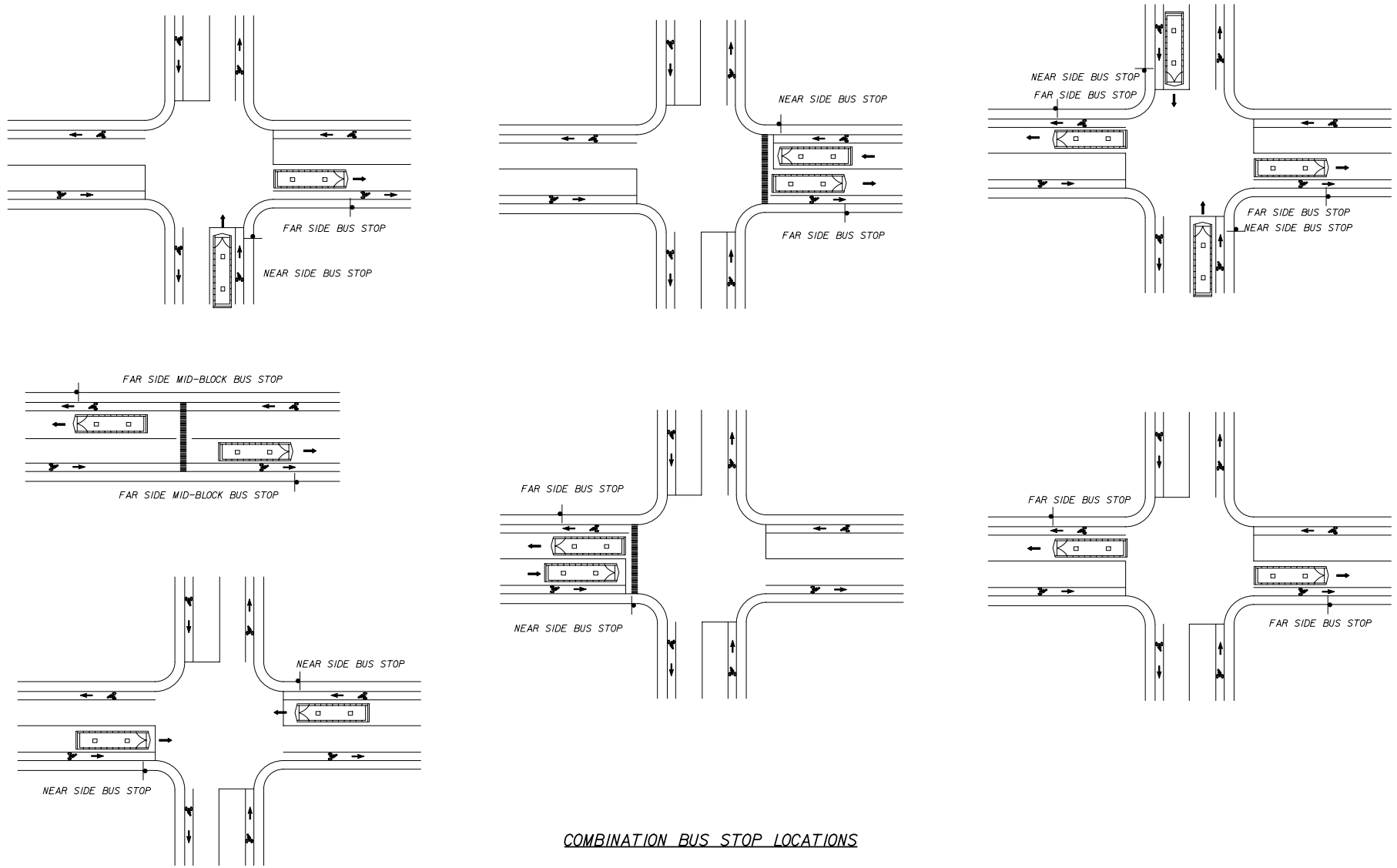


ALTERNATIVE BUS STOP DESIGN TYPES

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITIES GUIDELINES STREETSIDE BUS STOP LOCATIONS & DESIGN TYPES	FIGURE 1-1
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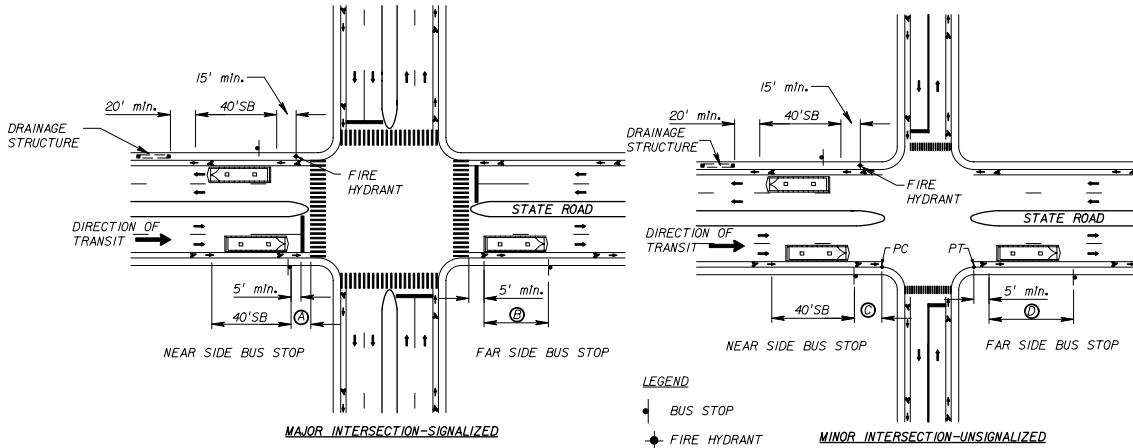
COMBINATION BUS STOP LOCATIONS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITIES GUIDELINES
STREETSIDE COMBINATION
BUS STOP LOCATIONS

FIGURE
 1-2



GENERAL NOTES:

- THESE BUS STOP CONFIGURATIONS ARE PROVIDED AS GUIDELINES. ACTUAL BUS STOP PLACEMENT SHOULD TAKE ALL LOCATION FACTORS INTO ACCOUNT AND BE BASED ON ENGINEERING JUDGEMENT FOR SAFETY.
- ALL BUS STOPS IN URBAN AREAS (CURB & GUTTER AND SIDEWALK) SHALL BE SITUATED SO THAT PASSENGERS BOARD AND ALIGHT AT A LOCATION WHERE FULL HEIGHT CURB & GUTTER IS PRESENT AND NOT IN A SECTION OF DROP CURB.
- ALL BUS STOPS IN URBAN AREAS (CURB & GUTTER AND SIDEWALK) SHALL BE SITUATED TO BE 20' OR MORE AWAY FROM THE EDGE OF A DRAINAGE STRUCTURE, AND 15' OR MORE AWAY FROM A FIRE HYDRANT OR DISABLED PARKING SPACE.
- WHEN POSSIBLE, PROVIDE BUS STOP AT AN EXISTING ROADWAY LIGHT POLE. A 4' CLEAR TRAVEL PATH MUST BE PROVIDED ON SIDEWALKS AT ALL TIMES IN THE VICINITY OF THE BUS STOP. THE RECOMMENDED MINIMUM ILLUMINATION LEVEL IS 1.0 HORIZONTAL FOOT CANDLE FOR THE ENTIRE BUS STOP AREA. (REFERENCE PLANS PREPARATION MANUAL).
- FOR A.D.A. LANDING PAD REQUIREMENTS SEE FIGURE 1-5.
- ALL BUS BAY DRAWINGS REPRESENT A BUS STOP WITH SPACE FOR ONE BUS AT A TIME. IF MORE THAN ONE BUS IS EXPECTED, ADD 40' FOR EACH ADDITIONAL STANDARD BUS AND 60' FOR EACH ADDITIONAL ARTICULATED BUS.
- DECELERATION/ACCELERATION LANE REQUIREMENTS SHOULD BE CONSIDERED FOR BUS BAY TYPE DESIGNS IF RIGHT OF WAY ALLOWS.

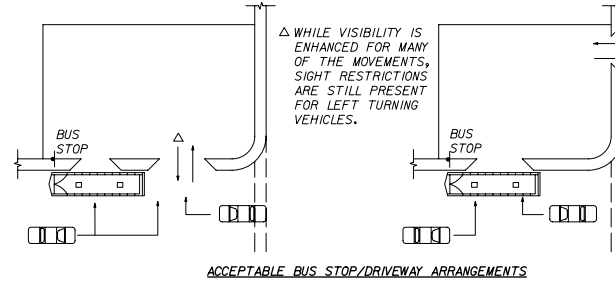
INTERSECTION BUS STOP LOCATION CRITERIA				
BUS STOP VARIABLES	NO TURN LANES IN DIRECTION OF TRANSIT	RIGHT TURN LANE ON NEAR SIDE IN DIRECTION OF TRANSIT	RIGHT TURN LANE ON NEAR SIDE AND AUXILIARY LANE ON FAR SIDE IN DIRECTION OF TRANSIT **	AUXILIARY LANE ON FAR SIDE IN DIRECTION OF TRANSIT ***
DIMENSION A (NEAR SIDE MAJOR INTERSECTION)	NOT RECOMMENDED * UNLESS 2-LANE ROADWAY	NOT RECOMMENDED UNLESS 2-LANE ROADWAY 10' BEFORE ENTRY TAPER FOR TURN BAY 100' IF DROP LANE	NOT RECOMMENDED UNLESS 2-LANE ROADWAY	NOT RECOMMENDED * UNLESS 2-LANE ROADWAY
DIMENSION B (FAR SIDE MAJOR INTERSECTION)	40' FOR A STANDARD BUS (60' FOR AN ARTICULATED BUS)	40' FOR A STANDARD BUS (60' FOR AN ARTICULATED BUS)	110' **	45' FOR A STANDARD BUS (65' FOR AN ARTICULATED BUS) ***
DIMENSION C (NEAR SIDE MINOR INTERSECTION)	12' MIN.	AS CLOSE TO ENTRY TAPER AS FEASIBLE	N/A	N/A
DIMENSION D (FAR SIDE MINOR INTERSECTION)	40' FOR A STANDARD BUS (60' FOR AN ARTICULATED BUS)	40' FOR A STANDARD BUS (60' FOR AN ARTICULATED BUS)	N/A	N/A

- * IF NECESSARY, 12' MINIMUM DIMENSION IS REQUIRED.
- ** THIS COMBINATION OF BUS BAYS IS REFERRED TO AS A QUEUE BYPASS BUS BAY.
- *** THIS ARRANGEMENT IS REFERRED TO AS AN OPEN BUS BAY.

NOTE: THIS TABLE IS PREPARED AS A GUIDELINE FOR THE LOCATION OF BUS STOPS ALONG A STATE ROAD FACILITY WHERE ON-STREET PARKING DOES NOT EXIST.

DRIVEWAY BUS STOP LOCATION GUIDELINES:

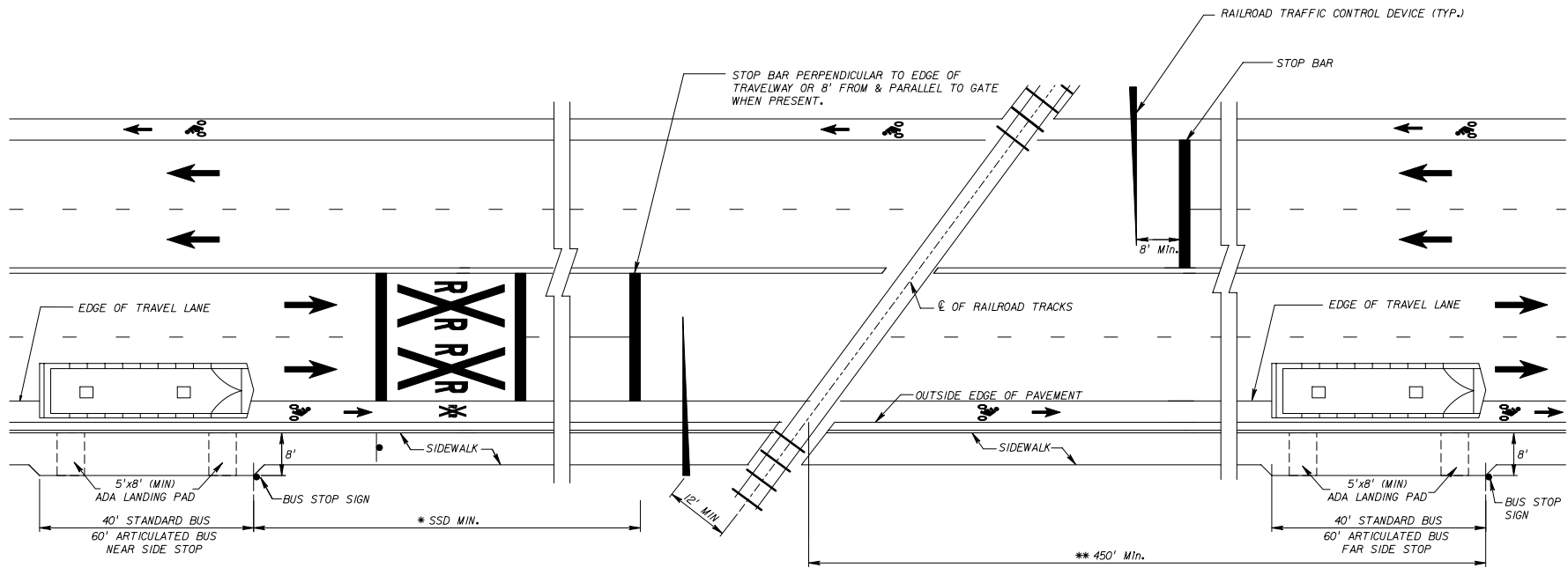
- AVOID BUS STOPS THAT BLOCK THE DRIVEWAY OF A PARCEL WITH A SINGLE DRIVEWAY.
- BUS STOPS SHOULD NOT BE LOCATED WITHIN THE AREA OF INFLUENCE OF A DRIVEWAY TO AVOID SIGHT DISTANCE AND OTHER CONFLICTS. HOWEVER, IF THE SITUATION CANNOT BE AVOIDED:
- LOCATE THE STOP AS FAR DOWNSTREAM (FAR SIDE) FROM THE DRIVEWAY AS FEASIBLE.
- AVOID UPSTREAM (NEAR SIDE) STOPS IN THE TRAVEL LANE. UPSTREAM BAYS ARE ACCEPTABLE.
- LOCATE THE STOP TO ALLOW APPROPRIATE VISIBILITY FOR VEHICLES ENTERING OR LEAVING THE DRIVEWAY AND TO MINIMIZE VEHICLE/BUS CONFLICTS.
- LOCATE THE STOP SO THAT PASSENGERS ARE NOT FORCED TO WAIT FOR A BUS IN THE MIDDLE OF A DRIVEWAY.
- LOCATE THE STOP SO THAT PATRONS BOARD OR ALIGHT DIRECTLY FROM THE CURB RATHER THAN FROM THE DRIVEWAY.
- LOCATE THE STOP SO THAT THE FRONT DOOR ADA LANDING PAD IS LOCATED OUTSIDE THE DRIVEWAY.
- ATTEMPT TO KEEP AT LEAST ONE EXIT AND ENTRANCE LANE OPEN FOR VEHICLES ACCESSING A DRIVEWAY WHILE A BUS IS LOADING OR UNLOADING PASSENGERS.
- EVALUATE RELOCATING A BUS STOP TO A DOWNSTREAM PARCEL SHOULD A CORNER LOCATION PROVE TO BE UNACCEPTABLE.



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITIES GUIDELINES BUS STOP LOCATION RELATIVE TO ACCESS POINTS		FIGURE
		1-3



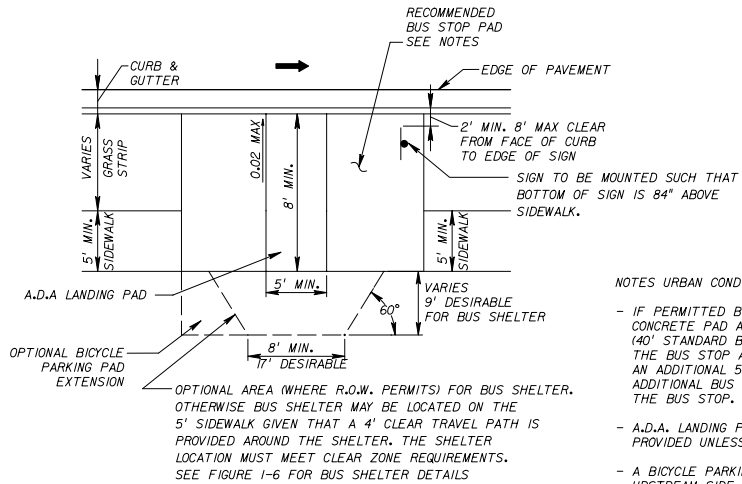
URBAN BUS STOP NEAR AT-GRADE RAILROAD CROSSING

NEAR SIDE BUS STOP PLACEMENT	
DESIGN SPEED (MPH)	* AASHTO STOPPING SIGHT DISTANCE (SSD) (FT)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

NOTES:

- WHEN POSSIBLE IT IS RECOMMENDED TO PLACE BUS STOPS ON THE NEAR SIDE OF A RAILROAD CROSSING TO AVOID CREATING A QUEUE THAT WOULD CONFLICT WITH THE CROSSING.
- NEAR SIDE BUS STOPS SHALL BE LOCATED SO THAT RAILROAD WARNING SIGNS ARE NOT OBSTRUCTED BY A STOPPED BUS.
- SEE FDOT STD INDEX I7346 AND I7882 FOR RAILROAD MARKING AND SIGN DETAILS NOT SHOWN HERE.
- FOR NEAR SIDE OR FAR SIDE BUS BAYS, PROVIDE A MINIMUM OF 50 FT TO THE NEAREST RAIL LINE. (PER FLORIDA STATUTE 316.1945(1))
- FOR ADA LANDING PAD REQUIREMENTS SEE FIGURE 1-5.
- * MIN VALUE CALCULATED BASED ON PROVIDING APPROPRIATE STOPPING SIGHT DISTANCE TO RAILROAD CROSSING. DIMENSION SHOULD BE VERIFIED BASED ON THE SPECIFIC DESIGN CONDITIONS OF EACH CROSSING.
- ** MIN VALUE CALCULATED BASED ON ACCOMMODATING THE QUEUE THAT WOULD DEVELOP DURING A 60 SECOND PERIOD BUS STOP. DIMENSION SHOULD BE VERIFIED BASED ON THE SPECIFIC DESIGN CONDITIONS, TRAFFIC PROJECTIONS, AND EXPECTED BUS STOP DELAYS AT EACH CROSSING.

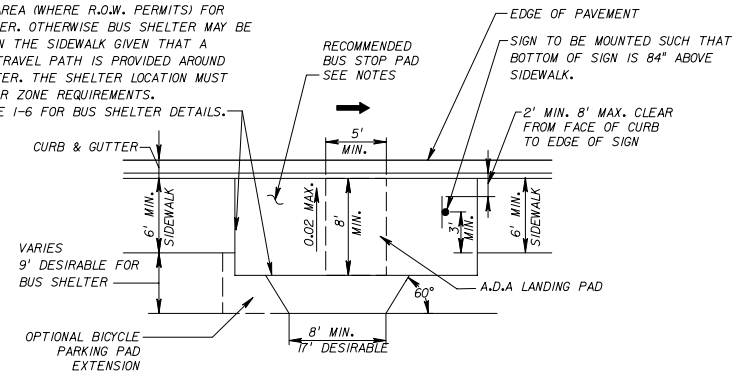
REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITIES GUIDELINES BUS STOP LOCATION RELATIVE TO RAILROAD CROSSING	FIGURE 1-4
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		



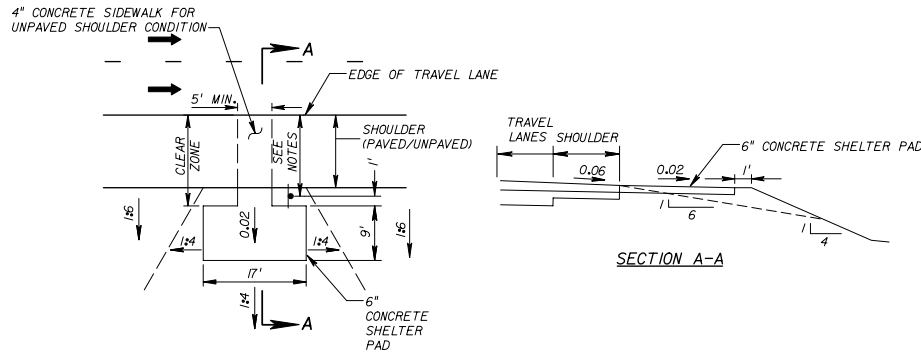
BUS STOP PAD AND SIGNAGE
URBAN/CURB & GUTTER CONDITION WITH GRASS STRIP

- NOTES URBAN CONDITION (WITH / WITHOUT GRASS STRIP):**
- IF PERMITTED BY R.O.W., PROVIDE A CONTINUOUS 8' WIDE CONCRETE PAD ALONG THE ENTIRE LENGTH (40' STANDARD BUS - 60' ARTICULATED BUS) OF THE BUS STOP ADJACENT TO THE CURB & GUTTER. AN ADDITIONAL 50' LENGTH IS RECOMMENDED FOR EACH ADDITIONAL BUS EXPECTED TO SIMULTANEOUSLY STOP AT THE BUS STOP.
 - A.D.A. LANDING PAD MINIMUM DIMENSIONS ARE TO BE PROVIDED UNLESS R.O.W. DOES NOT ALLOW.
 - A BICYCLE PARKING AREA SHOULD BE PROVIDED ON THE UPSTREAM SIDE OF THE BUS SHELTER PAD BASED ON COORDINATION WITH THE LOCAL TRANSIT AGENCY.

OPTIONAL AREA (WHERE R.O.W. PERMITS) FOR BUS SHELTER. OTHERWISE BUS SHELTER MAY BE LOCATED ON THE SIDEWALK GIVEN THAT A 4' CLEAR TRAVEL PATH IS PROVIDED AROUND THE SHELTER. THE SHELTER LOCATION MUST MEET CLEAR ZONE REQUIREMENTS. SEE FIGURE I-6 FOR BUS SHELTER DETAILS.



BUS STOP PAD AND SIGNAGE
URBAN/CURB & GUTTER CONDITION WITHOUT GRASS STRIP

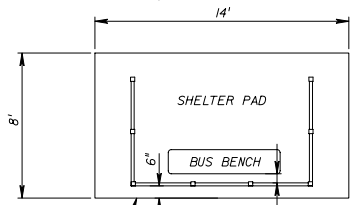
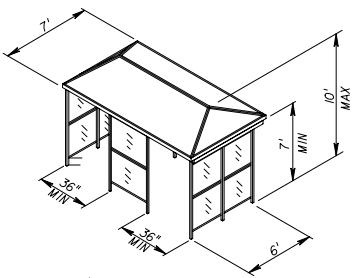
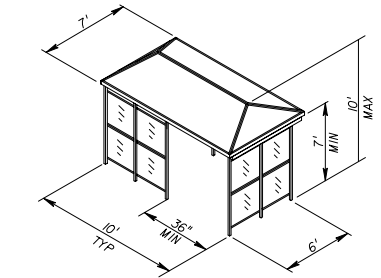


- NOTES RURAL CONDITION:**
- FOR A BUS STOP IN RURAL CONDITIONS, THE BUS STOP SIGN SHOULD BE LOCATED OUTSIDE THE CLEAR ZONE OF THE ROAD; WHERE POSSIBLE IT IS DESIRABLE TO BUILD A CONCRETE PAD FOR A SHELTER.
 - THE CONCRETE PAD SHOULD BE LOCATED OUTSIDE THE CLEAR ZONE. CONCRETE SIDEWALK WITHIN CLEAR ZONE SHOULD MEET ADA CRITERIA.
 - SIZE OF THE BUS SHELTER PAD IS ADJUSTABLE DEPENDING ON LOCAL CONDITIONS. COORDINATE SIZE WITH THE LOCAL TRANSIT AGENCY.
 - SLOPES ARE REPRESENTATIVE AND VARY WITH LOCATION. ADJUST DESIGN TO LOCAL CONDITIONS.

BUS STOP PAD AND SIGNAGE
RURAL/SHOULDER CONDITION

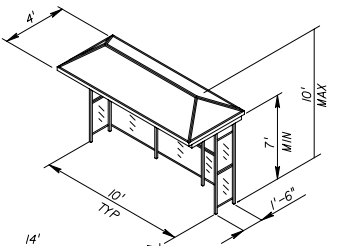
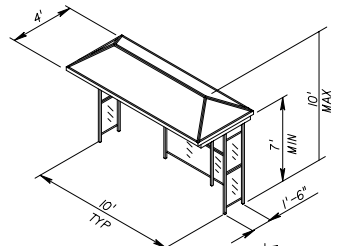
FOR MINIMUM WIDTH OF CLEAR ZONE, REFER TO THE LATEST EDITION OF THE FDOT PLANS PREPARATION MANUAL

REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITIES GUIDELINES CURBSIDE LANDING PADS AND SIGNAGE	FIGURE I-5
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			

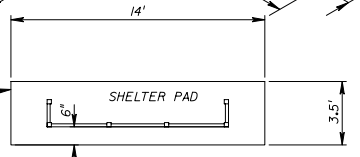


8'x14'x6" CONCRETE SLAB WITH TWO LAYERS OF 6"x6" W.W.M. ON VISQUEEN MEMBRANE AND ON WELL COMPACTED FILL (2500 PSF) TYP.

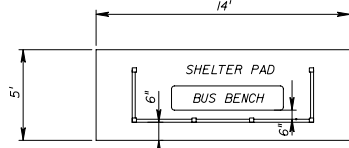
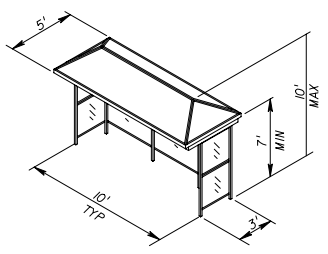
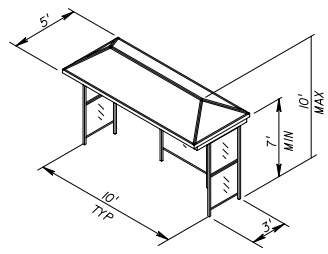
LARGE TYPICAL SHELTERS



3.5'x14'x6" CONCRETE SLAB WITH TWO LAYERS OF 6"x6" W.W.M. ON VISQUEEN MEMBRANE AND ON WELL COMPACTED FILL (2500 PSF) TYP.

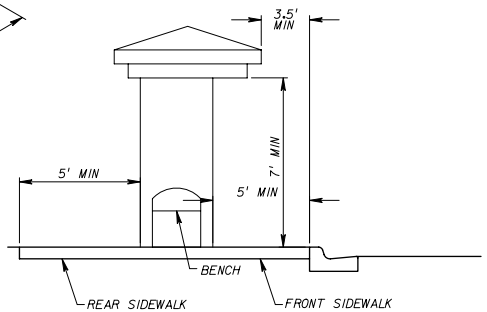


SMALL TYPICAL SHELTERS

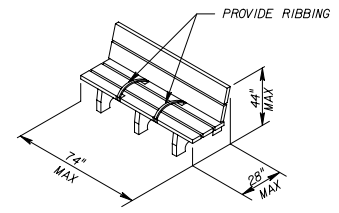


5'x14'x6" CONCRETE SLAB WITH TWO LAYERS OF 6"x6" W.W.M. ON VISQUEEN MEMBRANE AND ON WELL COMPACTED FILL (2500 PSF) TYP.

MEDIUM TYPICAL SHELTERS



MINIMUM CLEARANCES FOR SHELTERS URBAN CONDITION



BENCH DIMENSIONS

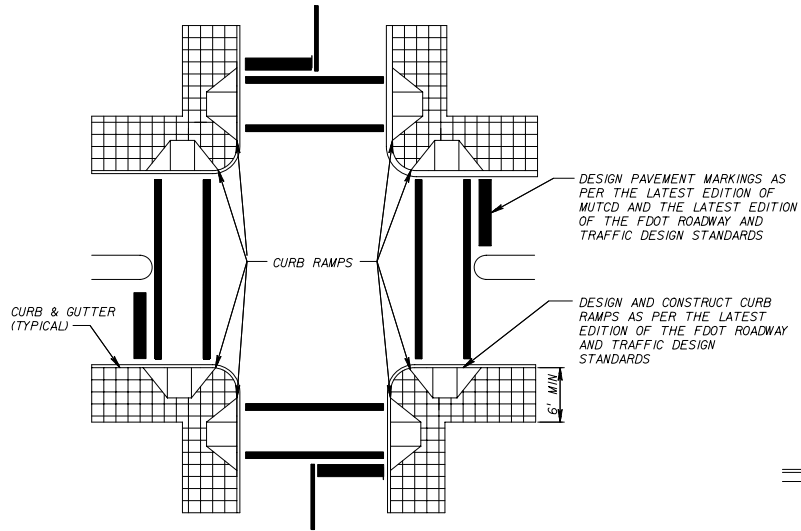
BUS SHELTER NOTES:

- COORDINATE WITH LOCAL TRANSIT AGENCY FOR BUS SHELTER DESIGN
- BUS SHELTERS ARE PROHIBITED IN MEDIANS.
- BUS SHELTERS SHALL BE LOCATED A MINIMUM OF 12 FT FROM THE INTERSECTION POINT OF CURVE/TANGENT.
- BUS SHELTERS SHALL NOT BE LOCATED WITHIN 15 FT OF A FIRE HYDRANT OR DISABLED PARKING SPACE.
- BICYCLE RACKS SHALL BE CONSIDERED AS PART OF THE SHELTER BASED ON COORDINATION WITH THE TRANSIT AGENCY.
- A CLEAR AREA OF 2 FT MINIMUM SHOULD BE PROVIDED BEHIND SHELTER FOR MAINTENANCE.
- BICYCLE RACKS SHALL BE LOCATED SO AS NOT TO BLOCK THE VIEW OF WAITING PASSENGERS.
- BUS SHELTERS SHALL BE LOCATED AT LEAST 15 FT (DESIRABLE) AND 7 FT (MINIMUM) FROM THE NEAREST UTILITY POLE.
- STRUCTURAL DESIGN TO BE PER ALL APPLICABLE LOCAL CODES.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

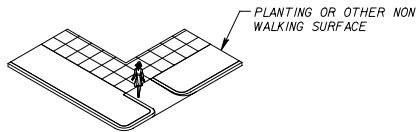
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITIES GUIDELINES CURBSIDE BUS SHELTER DETAILS	FIGURE 1-6
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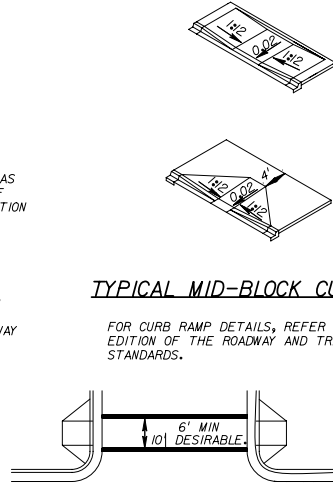
**TYPICAL URBAN INTERSECTION
(DESIRABLE RAMPS)**

NOTE: CURB RAMPS ARE TO BE COMPLETELY CONTAINED INSIDE THE CROSSWALKS.



CURB RAMP / PLANTING STRIP COMBINATION

WHERE THE CURB RAMP IS COMPLETELY CONTAINED WITHIN A PLANTING STRIP OR OTHER NON-WALKING SURFACE, SO THAT PEDESTRIANS WOULD NOT NORMALLY CROSS THE SIDES, THE CURB RAMP SIDES CAN HAVE STEEP SIDES INCLUDING VERTICAL RETURNED CURBS.



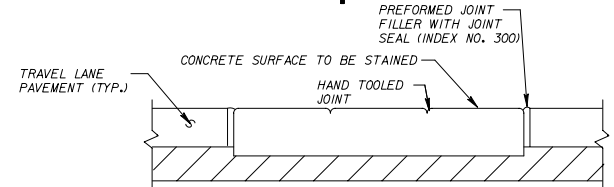
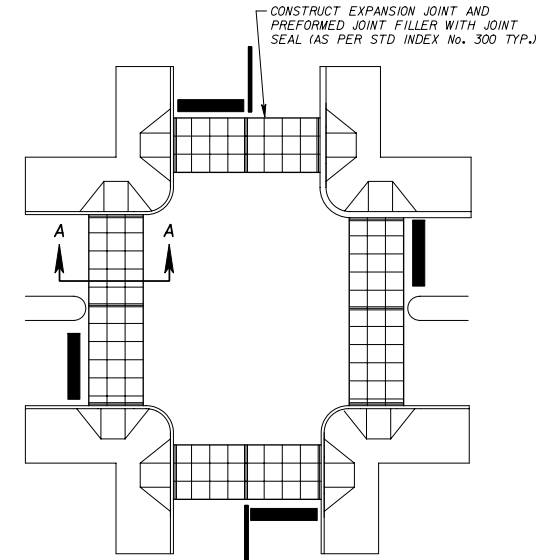
TYPICAL MID-BLOCK CURB RAMPS

FOR CURB RAMP DETAILS, REFER TO THE LATEST EDITION OF THE ROADWAY AND TRAFFIC DESIGN STANDARDS.



**ALTERNATIVE CROSSWALK
PAVEMENT MARKINGS**

- NOTES:
- CURB RAMPS SHOULD BE INSTALLED EVERYWHERE THERE IS A CROSSWALK, MARKED OR UNMARKED.
 - CURB RAMPS MUST NOT INTERFERE WITH THE FREE ACCESS TO THE BUS STOP. CURB RAMPS MAY NOT BE INSTALLED AT BUS STOPPING LOCATIONS. INSTEAD, AN ADA LANDING PAD MUST BE INSTALLED FOLLOWING ALL RELEVANT GUIDELINES, SEE FIGURE 1-5.
 - SIDEWALKS SHOULD BE CONSTRUCTED ALONG BOTH SIDES OF ARTERIAL ROADWAYS THAT ARE NOT PROVIDED WITH SHOULDERS, EVEN THOUGH PEDESTRIAN TRAFFIC MAY BE LIGHT.



SECTION A-A

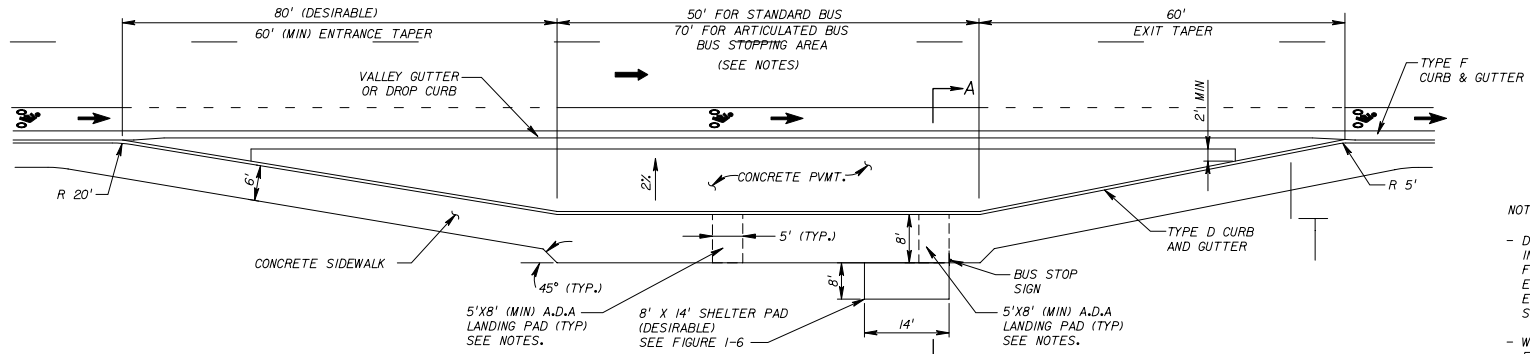
CONST. CONCRETE JOINTS PER INDEX 305

CONCRETE CROSSWALK TYPICAL SECTION

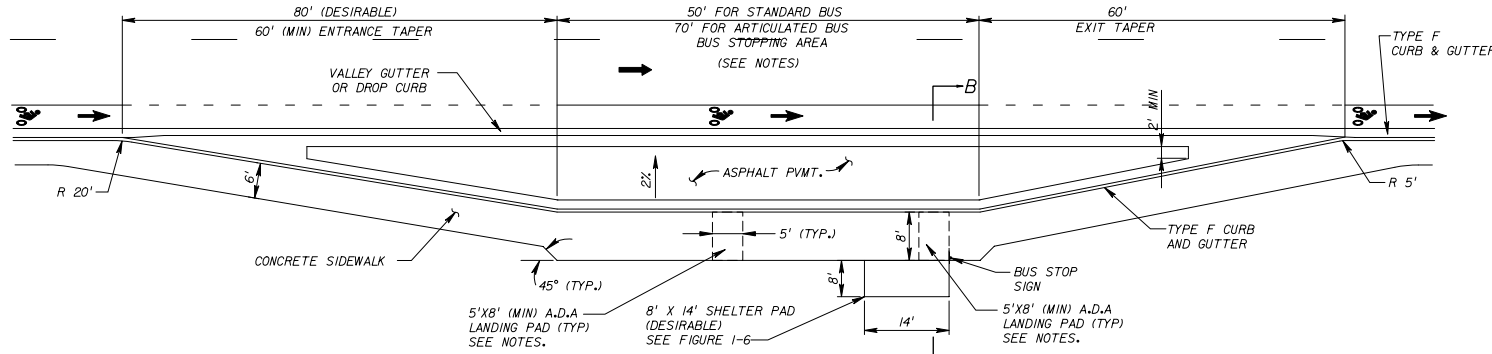
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITIES GUIDELINES CURB RAMPS AND CONCRETE CROSSWALK	FIGURE 1-7
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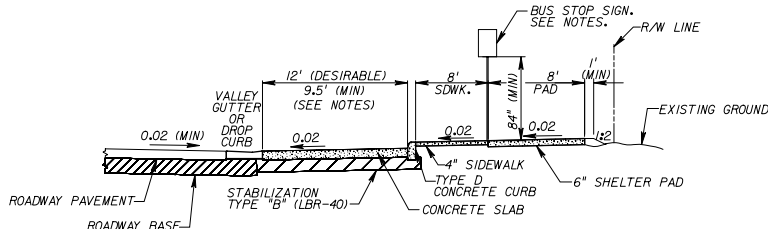


PLAN CONCRETE SLAB OPTION

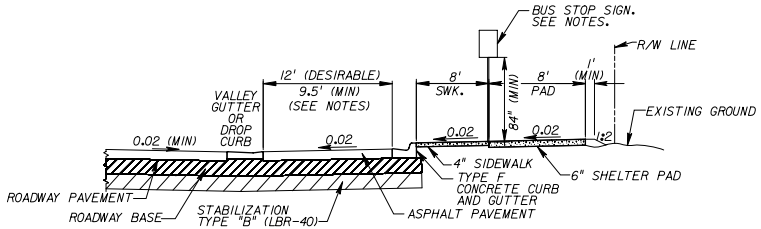


PLAN ASPHALT PAVEMENT OPTION

- NOTES:**
- DIMENSIONS SHOWN ARE FOR ONE BUS. INCREASE LENGTH OF BUS BAY BY 50' FOR EACH 40-FOOT BUS AND 70' FOR EACH 60-FOOT ARTICULATED BUS EXPECTED TO BE AT THE STOP SIMULTANEOUSLY.
 - WHEN NO BUS SHELTER IS USED, EXTEND THE SIDEWALK TO PROVIDE AN A.D.A. LANDING PAD WITH A MINIMUM CLEAR LENGTH OF 8' AND A MINIMUM CLEAR WIDTH OF 5'.
 - FOR CURB & GUTTER TRANSITION DETAILS, REFER TO LATEST VERSION OF FOOT STANDARD INDEXES.
 - FOR SHELTER AND SHELTER PAD DETAILS, REFER TO FIGURE 1-6.
 - ALL CONCRETE JOINTS SHALL BE AS PER THE LATEST VERSION OF THE FOOT ROADWAY AND TRAFFIC DESIGN STANDARDS.
 - A MID-BLOCK CROSSWALK CAN BE USED IN LOCATIONS WHERE THERE IS A MAJOR TRANSIT ORIENTED ACTIVITY CENTER OR THE DISTANCE TO THE NEXT INTERSECTION IS GREATER THAN 300 FEET. SIGNALIZATION MAY BE PROVIDED AS PER THE MUTCD.
 - REFER TO THE "GUIDELINES FOR THE LOCATION AND DESIGN OF BUS STOPS", TRANSIT COOPERATIVE RESEARCH PROGRAM REPORT 19, WASHINGTON D.C. 1996, FOR SPECIAL CONDITIONS AND DIMENSIONS OF BUS BAYS.
 - BUS STOP SIGN PANEL MUST BE LOCATED SUCH THAT A MINIMUM CLEARANCE OF 36" IS PROVIDED ON THE SIDEWALK.
 - DRAINAGE STRUCTURES ARE NOT TO BE LOCATED WITHIN THE BUS BAY.



**SECTION A-A
TYPICAL BUS BAY
URBAN/CURB & GUTTER CONDITION
WITH CONCRETE PAVEMENT**
N.T.S.

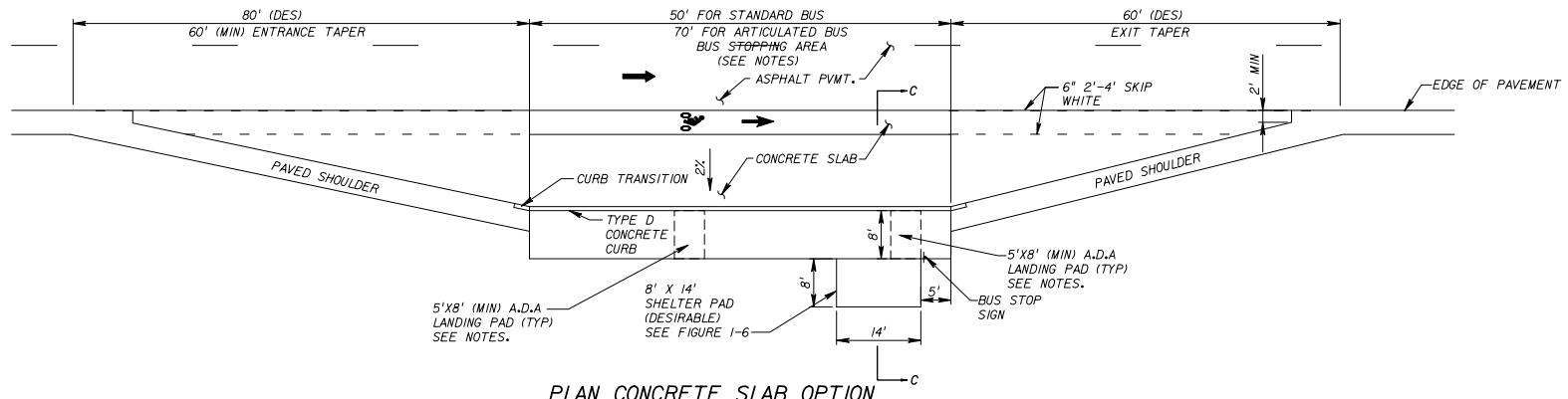


**SECTION B-B
TYPICAL BUS BAY
URBAN/CURB & GUTTER CONDITION
WITH ASPHALT PAVEMENT**
N.T.S.

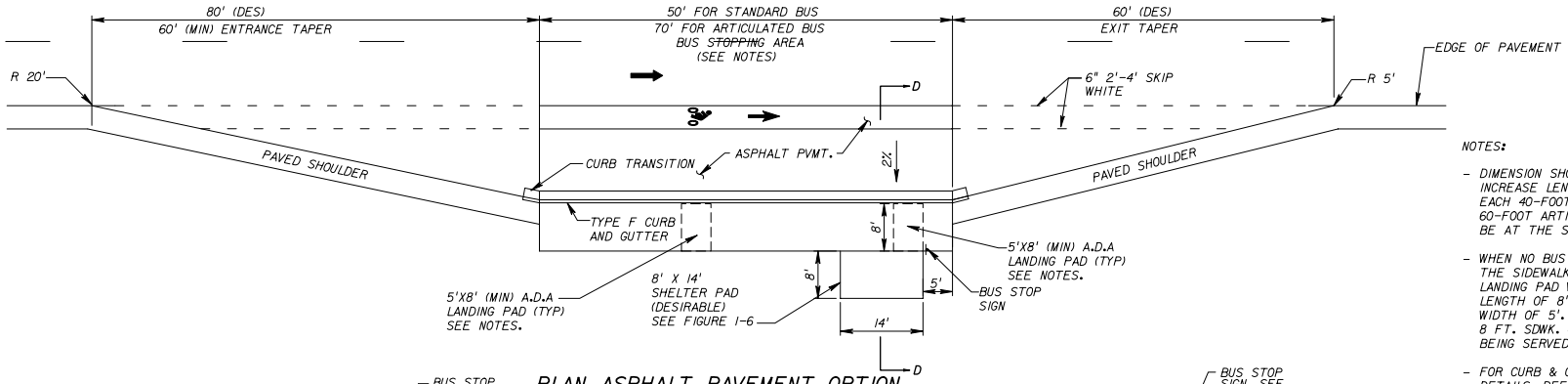
REVISIONS				
DATE	BY	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITIES GUIDELINES CLOSED BUS BAY LAYOUT URBAN/CURB & GUTTER		FIGURE
		1-8

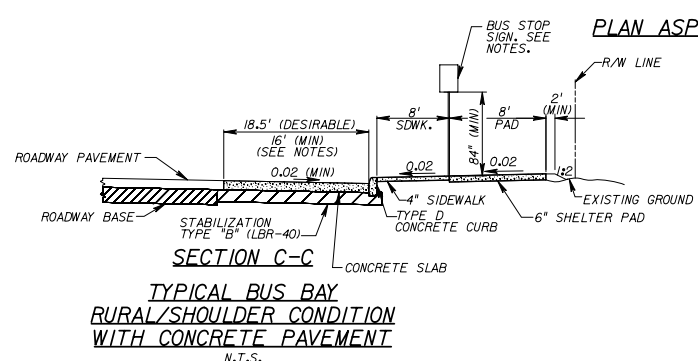


PLAN CONCRETE SLAB OPTION

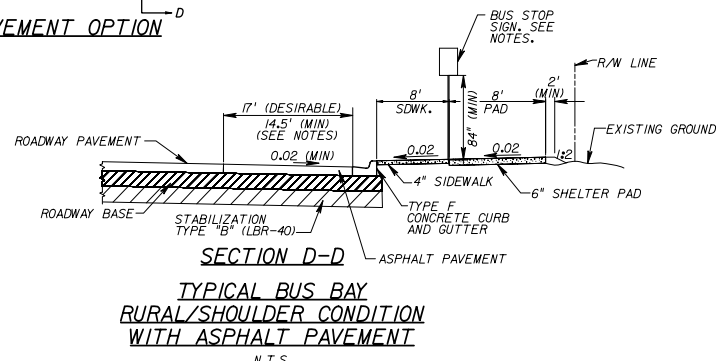


PLAN ASPHALT PAVEMENT OPTION

- NOTES:**
- DIMENSION SHOWN IS FOR ONE BUS. INCREASE LENGTH OF BUS BAY BY 50' FOR EACH 40-FOOT BUS AND 70' FOR EACH 60-FOOT ARTICULATED BUS EXPECTED TO BE AT THE STOP SIMULTANEOUSLY.
 - WHEN NO BUS SHELTER IS USED, EXTEND THE SIDEWALK TO PROVIDE AN A.D.A. LANDING PAD WITH A MINIMUM CLEAR LENGTH OF 8' AND A MINIMUM CLEAR WIDTH OF 5'. IT IS DESIRABLE TO PROVIDE 8 FT. SDWK. CONNECTION TO LOCATION BEING SERVED.
 - FOR CURB & GUTTER TRANSITION DETAILS, REFER TO LATEST VERSION OF FDOT STANDARD INDEX.
 - FOR SHELTER AND SHELTER PAD DETAILS, REFER TO FIGURE 1-6.
 - ALL CONCRETE JOINTS SHALL BE AS PER THE LATEST VERSION OF FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS.
 - BUS STOP SIGN PANEL MUST BE LOCATED SUCH THAT A MINIMUM CLEARANCE OF 36" IS PROVIDED ON THE SIDEWALK.
 - DRAINAGE STRUCTURES SHOULD NOT BE LOCATED WITHIN THE BUS BAY.
 - BUS BAY SIDEWALK SHOULD BE CONNECTED TO EXISTING SDWK. OR ACCESSIBLE TO SHOULDER.



TYPICAL BUS BAY RURAL/SHOULDER CONDITION WITH CONCRETE PAVEMENT
N.T.S.

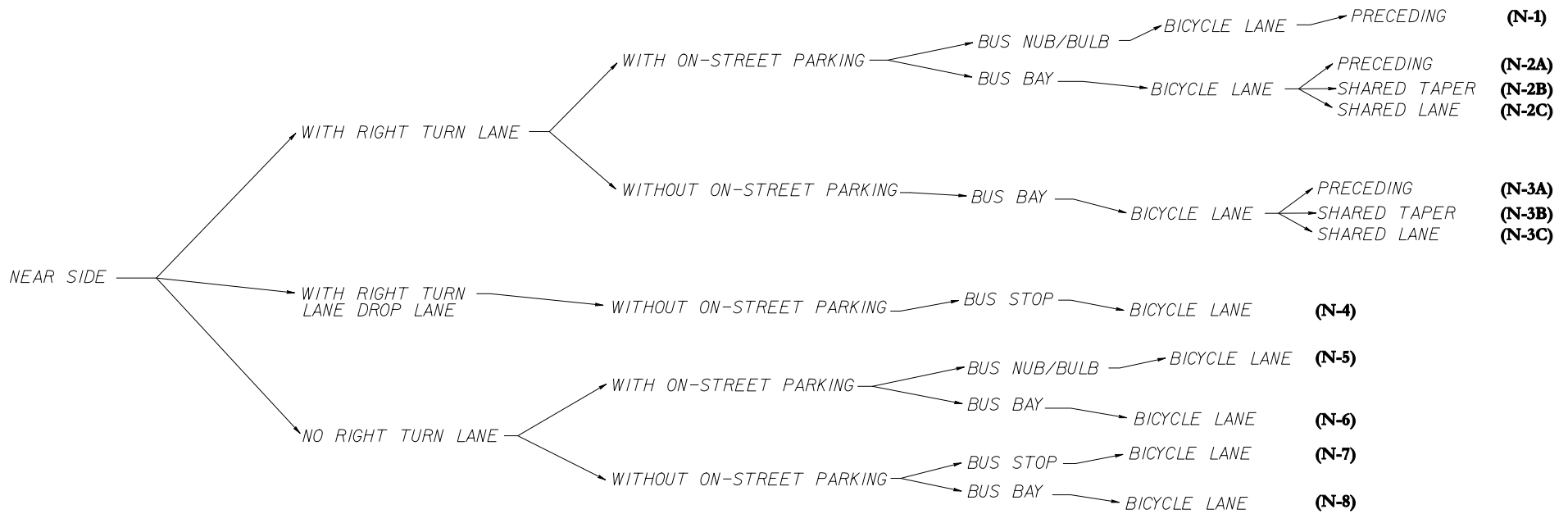


TYPICAL BUS BAY RURAL/SHOULDER CONDITION WITH ASPHALT PAVEMENT
N.T.S.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITIES GUIDELINES CLOSED BUS BAY LAYOUT RURAL/SHOULDER		FIGURE
		1-9



LEGEND

(N-1) - DETAIL DRAWING

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITY GUIDELINES NEAR SIDE BUS FACILITY DECISION TREE		FIGURE 1-10
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID			

URBAN RIGHT TURN LANE DESIGN LENGTH		
DESIGN SPEED (MPH)	* D _i (FT)	
	RIGHT TURN VALUE	THROUGH LANE VALUE
35	95'+QRT	20'+QT
40	105'+QRT	30'+QT
45	135'+QRT	35'+QT
50	190'+QRT	55'+QT

NOTE: THIS TABLE APPLIES TO ALL NEAR SIDE AND FAR SIDE
BUS FACILITIES IN COMBINATION WITH RIGHT TURN LANES.

SOURCE: FDOT STANDARD INDEX 301 $D_i = (L_1 + L_2) - 50$

* D_i = UTILIZE LARGER OF TWO VALUES FOR NEAR SIDE STOPS AND
RIGHT TURN VALUE FOR FAR SIDE STOPS.

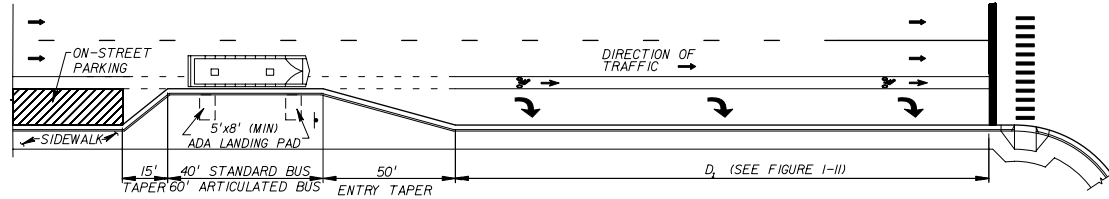
QRT= QUEUE STORAGE VALUE FOR THE RIGHT TURN MOVEMENT (FT).

QT= QUEUE STORAGE VALUE FOR THE THROUGH MOVEMENT (FT).

NOTES FOR QUEUE STORAGE VALUES: (QRT OR QT)

- UTILIZE A 90% SUCCESS RATE VALUE FOR ALL NON-FIHS FACILITIES AND A 95% SUCCESS RATE FOR ALL FIHS FACILITIES. ALL QUEUE VALUES ARE TO BE OBTAINED FROM THE PEAK HOUR FOR THE DESIGN YEAR, AND SHALL BE BASED ON THE ADJUSTED MAXIMUM QUEUE REACH (AMQR).
- WHEN POSSIBLE AND DESIRABLE, PROVIDE MORE STORAGE WHERE THE PROJECTED VALUES APPEAR "LIGHT".
- UTILIZE A VALUE OF 25FT AVERAGE VEHICLE DISTANCE UP TO A VALUE OF 2% TRUCKS. FOR GREATER TRUCK PERCENTAGES, INCREASE THE AVERAGE VEHICLE DISTANCE BY 2 TO 3FT FOR EVERY 5% INCREASE IN TRUCK PERCENTAGE.
- A FORMAL QUEUE STUDY SHOULD BE PERFORMED AT EACH LOCATION. AT LOCATIONS WHERE A SPECIFIC QUEUE STUDY DOES NOT EXIST, UTILIZE A MINIMUM QUEUE STORAGE VALUE OF 100FT IN URBAN/SUBURBAN AREAS AND 50FT IN RURAL AREAS.
- THE QUEUE LENGTH IS TO BE MEASURED FROM THE RADIAL POINT OR, WHEN A STOP BAR IS REQUIRED, FROM THE STOP BAR.

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITIES GUIDELINES TURN LANE REQUIREMENTS	FIGURE I-II
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		



TYPICAL APPLICATION:

- URBAN AREA WHERE PARKING IS CRITICAL.
- AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
- ON STREET PARALLEL PARKING.
- RIGHT TURN LANE REQUIRED.

CONDITIONS:

- ARTERIAL DESIGN SPEED \leq 40 MPH.

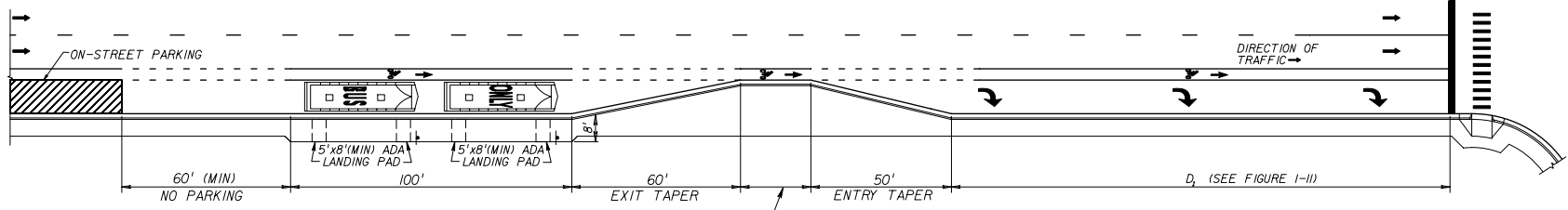
NOTES:

- BUS STOP AREA SHOWN FOR ONE BUS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

N-1

NEAR SIDE NUB/BULB WITH ON STREET PARKING PRECEDING RIGHT TURN LANE

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITY GUIDELINES NEAR SIDE BUS STOPS	FIGURE
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		1-12



TYPICAL APPLICATION:

- AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
- ON STREET PARALLEL PARKING.
- RIGHT TURN LANE REQUIRED.

**25' DESIRABLE.
10' MIN**

N-2A

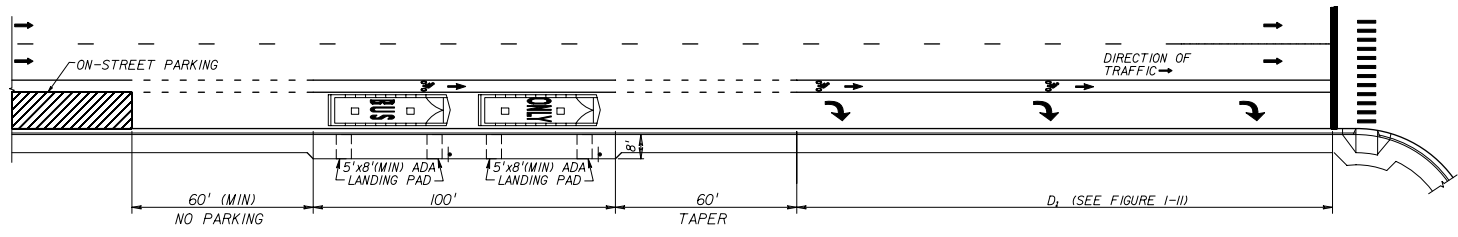
NEAR SIDE BUS BAY WITH ON STREET PARKING PRECEDING RIGHT TURN LANE

CONDITIONS:

- ARTERIAL DESIGN SPEED ≤40 MPH.
- MOST DESIRABLE DESIGN IF VIABLE.

NOTES:

- BUS STOP AREA SHOWN FOR TWO BUSES.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.



TYPICAL APPLICATION:

- AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
- ON STREET PARALLEL PARKING.
- RIGHT TURN LANE REQUIRED.

N-2B

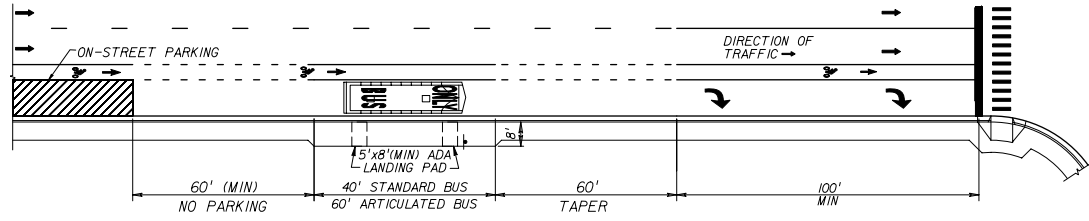
NEAR SIDE BUS BAY WITH ON STREET PARKING PRECEDING RIGHT TURN LANE WITH SHARED TAPER

CONDITIONS:

- ARTERIAL DESIGN SPEED ≤40 MPH.
- SECOND MOST DESIRABLE DESIGN IF VIABLE.

NOTES:

- BUS STOP AREA SHOWN FOR TWO BUSES.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.



TYPICAL APPLICATION:

- AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
- ON STREET PARALLEL PARKING.
- RIGHT TURN LANE REQUIRED.

N-2C

NEAR SIDE BUS BAY WITH ON STREET PARKING SHARED WITH RIGHT TURN LANE

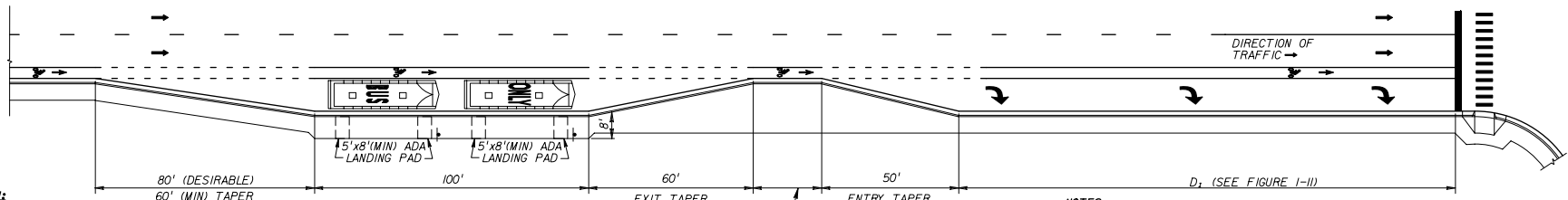
CONDITIONS:

- ARTERIAL DESIGN SPEED ≤40 MPH.
- MINIMUM DESIGN FOR CONSTRAINED SITES.

NOTES:

- BUS STOP AREA SHOWN FOR ONE BUS.
- SUCCEEDING QUEUE BYPASS TO BE CONSIDERED.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITY GUIDELINES NEAR SIDE BUS BAYS	FIGURE 1-13
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		



TYPICAL APPLICATION:

- RIGHT TURN LANE REQUIRED.
- AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.

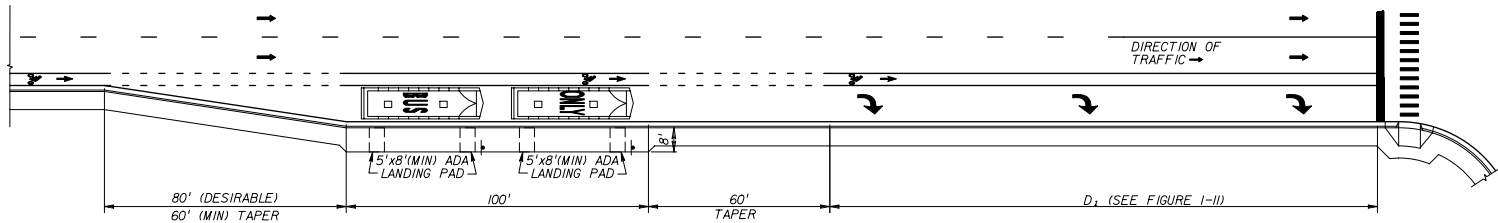
CONDITIONS:

- ARTERIAL DESIGN SPEED ≤ 45 MPH.
- MOST DESIRABLE DESIGN IF VIABLE.

N-3A
NEAR SIDE BUS BAY
PRECEDING RIGHT TURN LANE

NOTES:

- FOR BUS BAY DETAILS SEE FIGURE 1-8 & 1-9.
- BUS STOP AREA SHOWN FOR TWO BUSES.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.



TYPICAL APPLICATION:

- RIGHT TURN LANE REQUIRED.
- AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.

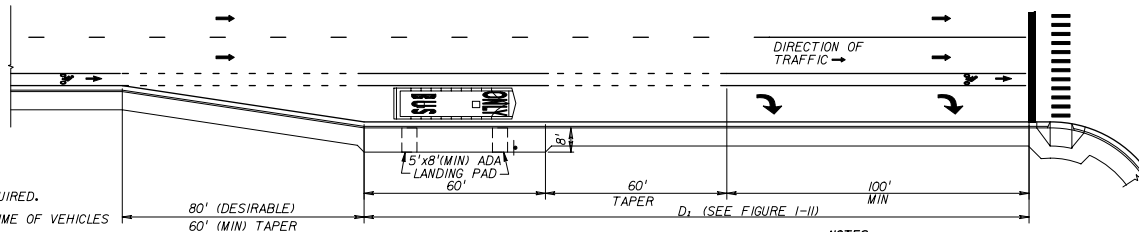
CONDITIONS:

- ARTERIAL DESIGN SPEED ≤ 45 MPH.
- SECOND MOST DESIRABLE DESIGN IF VIABLE.

N-3B
NEAR SIDE BUS BAY PRECEDING
RIGHT TURN LANE WITH SHARED TAPER

NOTES:

- BUS STOP AREA SHOWN FOR TWO BUSES.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.



TYPICAL APPLICATION:

- RIGHT TURN LANE REQUIRED.
- AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.

CONDITIONS:

- ARTERIAL DESIGN SPEED ≤ 45 MPH.
- MINIMUM DESIGN FOR CONSTRAINED SITES.

N-3C
NEAR SIDE BUS BAY
SHARED WITH RIGHT TURN LANE

NOTES:

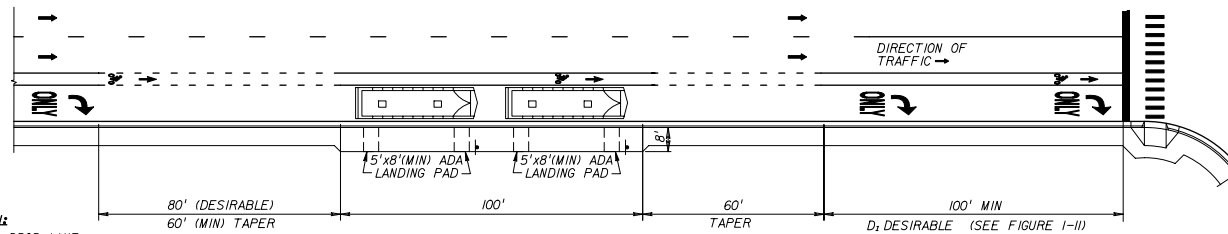
- BUS STOP AREA SHOWN FOR ONE BUS.
- SUCCEEDING QUEUE BYPASS TO BE CONSIDERED.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITY GUIDELINES
NEAR SIDE BUS BAYS

FIGURE
1-14

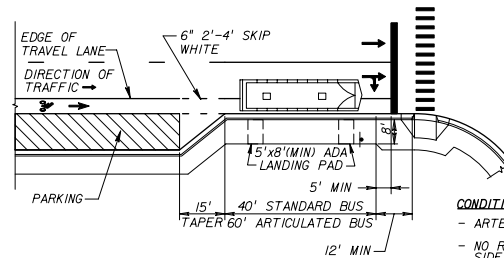


TYPICAL APPLICATION:
- RIGHT TURN LANE DROP LANE.

CONDITIONS:
- ARTERIAL DESIGN SPEED ≤40 MPH.

N-4
NEAR SIDE BUS BAY WITH PRECEDING LANE DROP RIGHT TURN LANE

NOTES:
- BUS STOP AREA SHOWN FOR TWO BUSES.
- SUCCEEDING QUEUE BYPASS TO BE CONSIDERED.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

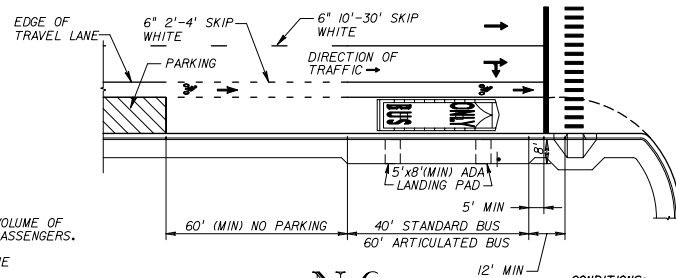


TYPICAL APPLICATION:
- URBAN AREA WHERE PARKING IS CRITICAL.
- AREAS WITH HIGH VOLUME OF PEDESTRIANS ON SIDEWALK SUCH AS CENTRAL BUSINESS DISTRICTS.
- ON STREET PARALLEL PARKING.
- NO RIGHT TURN LANE

N-5
NEAR SIDE BUS BAY WITH ON-STREET PARKING

CONDITIONS:
- ARTERIAL DESIGN SPEED ≤40 MPH.
- NO RIGHT TURN BAY ON NEAR SIDE OF INTERSECTION.

NOTES:
- BUS STOP AREA SHOWN FOR ONE BUS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.



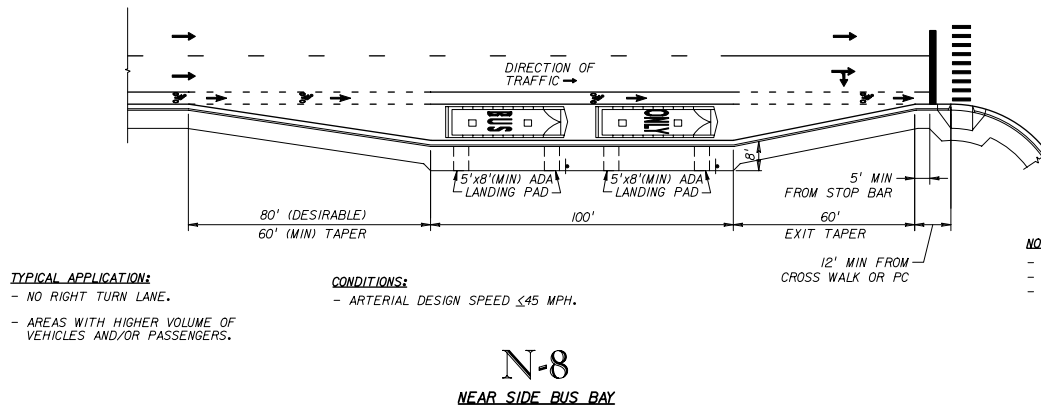
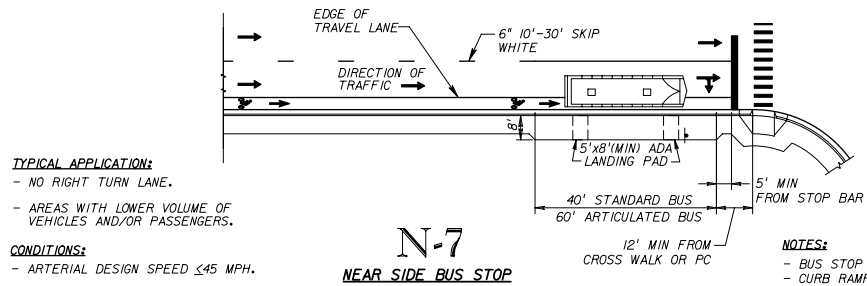
TYPICAL APPLICATION:
- AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
- NO RIGHT TURN LANE
- ON STREET PARALLEL PARKING.

N-6
NEAR SIDE BUS BAY WITH ON-STREET PARKING

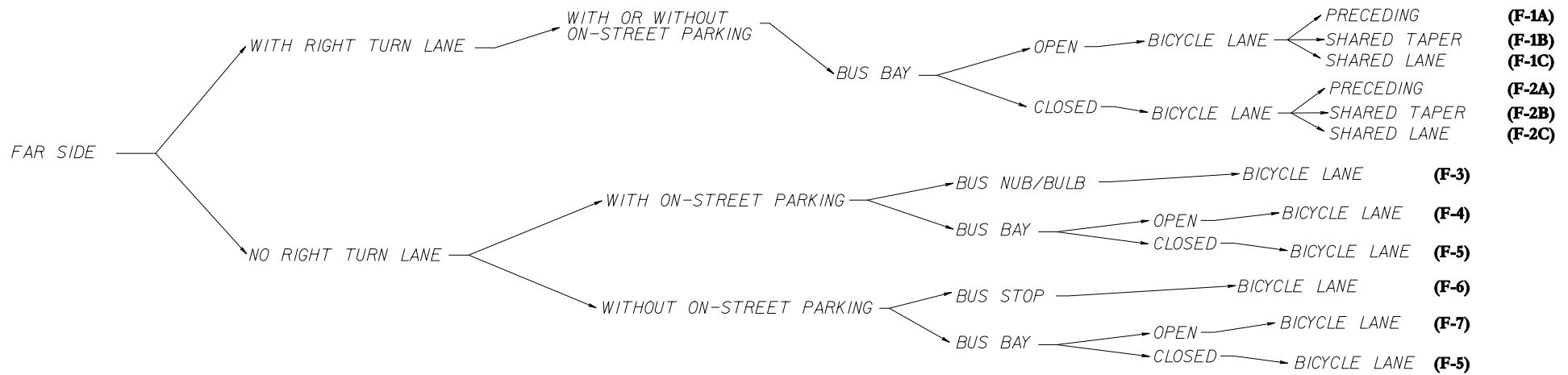
CONDITIONS:
- ARTERIAL DESIGN SPEED ≤40 MPH.

NOTES:
- BUS STOP AREA SHOWN FOR ONE BUS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITY GUIDELINES NEAR SIDE BUS BAYS/STOPS	FIGURE 1-15
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		



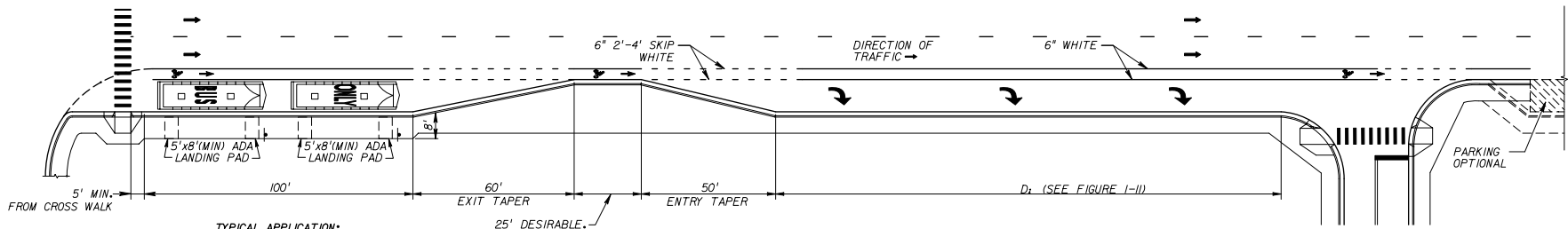
REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITY GUIDELINES NEAR SIDE BUS BAYS/STOPS	FIGURE 1-16
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		



LEGEND

(N-1) - DETAIL DRAWING

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITY GUIDELINES FAR SIDE BUS FACILITY DECISION TREE	FIGURE 1-17
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		

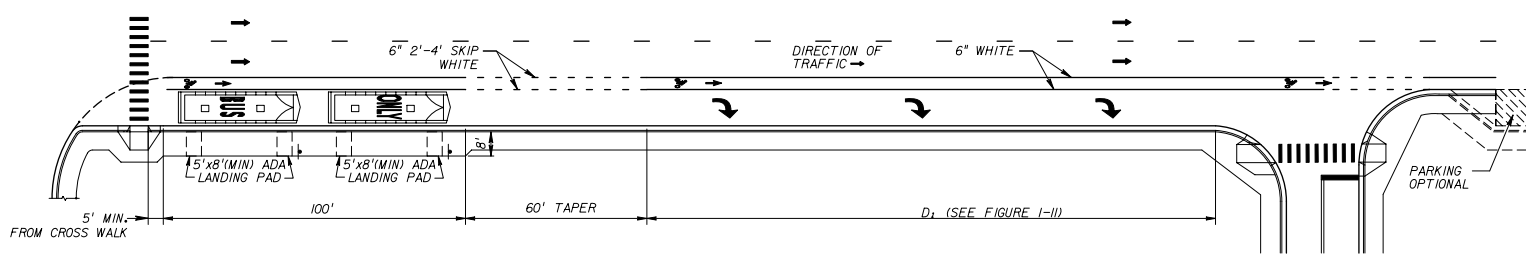


TYPICAL APPLICATION:
 - AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
 - RIGHT TURN BAY AT NEAR SIDE AND FAR SIDE OF INTERSECTION.

F-1A
FAR SIDE OPEN BUS BAY PRECEDING RIGHT TURN LANE

CONDITIONS:
 - ARTERIAL DESIGN SPEED ≤ 45 MPH.
 - OPEN BUS BAY DESIGN RECOMMENDED FOR 4 LANE OR LESS ROADWAY.
 - MOST DESIRABLE DESIGN IF VIABLE.

NOTES:
 - BUS STOP AREA SHOWN FOR TWO BUSES.
 - CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

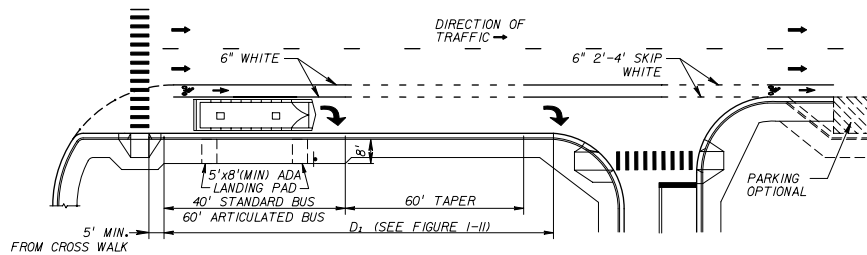


TYPICAL APPLICATION:
 - AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
 - RIGHT TURN BAY AT NEAR SIDE AND FAR SIDE OF INTERSECTION.

F-1B
FAR SIDE OPEN BUS BAY PRECEDING RIGHT TURN LANE WITH SHARED TAPER

CONDITIONS:
 - ARTERIAL DESIGN SPEED ≤ 45 MPH.
 - OPEN BUS BAY DESIGN RECOMMENDED FOR 4 LANE OR LESS ROADWAY.
 - SECOND MOST DESIRABLE DESIGN IF VIABLE.

NOTES:
 - BUS STOP AREA SHOWN FOR ONE BUS.
 - CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.



TYPICAL APPLICATION:
 - AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
 - RIGHT TURN BAY AT NEAR SIDE AND FAR SIDE OF INTERSECTION.

F-1C
FAR SIDE OPEN BUS BAY SHARED WITH RIGHT TURN LANE

CONDITIONS:
 - ARTERIAL DESIGN SPEED ≤ 45 MPH.
 - OPEN BUS BAY DESIGN RECOMMENDED FOR 4 LANE OR LESS ROADWAY.
 - MINIMUM DESIGN FOR CONSTRAINED SITES.

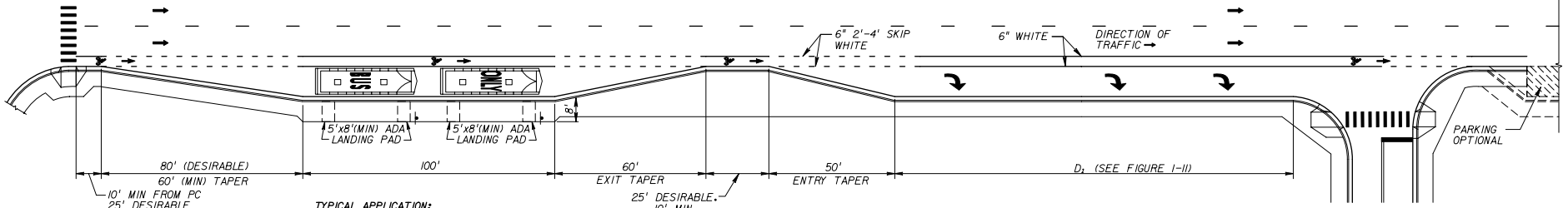
NOTES:
 - BUS STOP AREA SHOWN FOR ONE BUS.
 - CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITY GUIDELINES
FAR SIDE BUS BAYS

FIGURE
 1-18

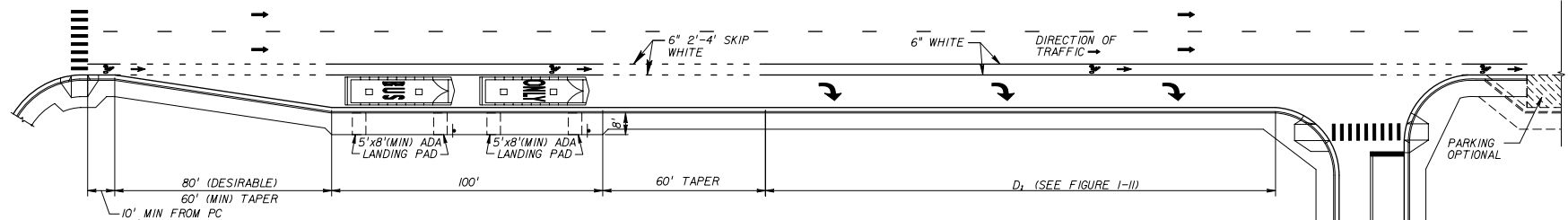


TYPICAL APPLICATION:
 - AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
 - RIGHT TURN BAY AT FAR SIDE OF INTERSECTION.

F-2A
FAR SIDE CLOSED BUS BAY PRECEDING RIGHT TURN LANE

CONDITIONS:
 - ARTERIAL DESIGN SPEED ≤ 45 MPH.
 - MOST DESIRABLE DESIGN IF VIABLE.

NOTES:
 - FOR BUS BAY DETAILS SEE FIGURE I-8 & I-9.
 - BUS STOP AREA SHOWN FOR TWO BUSES.
 - CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

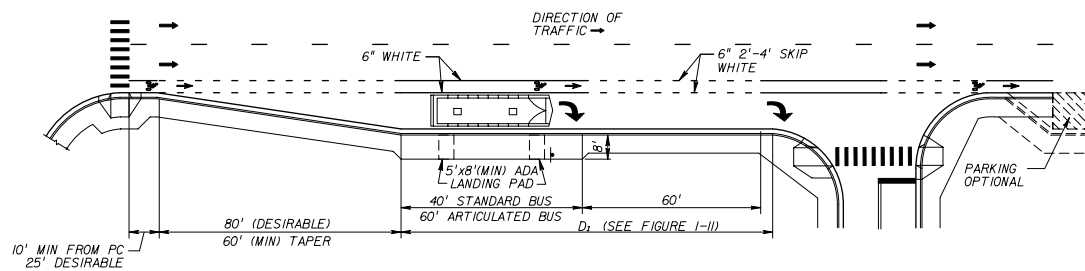


TYPICAL APPLICATION:
 - AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
 - RIGHT TURN BAY AT FAR SIDE OF INTERSECTION.

F-2B
FAR SIDE CLOSED BUS BAY PRECEDING RIGHT TURN LANE WITH SHARED TAPER

CONDITIONS:
 - ARTERIAL DESIGN SPEED ≤ 45 MPH.
 - SECOND MOST DESIRABLE DESIGN IF VIABLE.

NOTES:
 - BUS STOP AREA SHOWN FOR TWO BUSES.
 - CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.



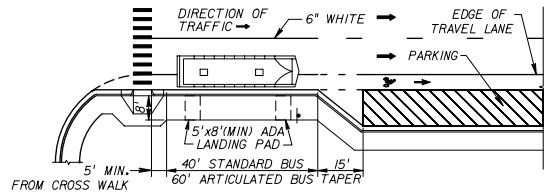
TYPICAL APPLICATION:
 - AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
 - RIGHT TURN BAY AT FAR SIDE OF INTERSECTION.

F-2C
FAR SIDE CLOSED BUS BAY SHARED WITH RIGHT TURN LANE

CONDITIONS:
 - ARTERIAL DESIGN SPEED ≤ 45 MPH.
 - MINIMUM DESIGN FOR CONSTRAINED SITES.

NOTES:
 - BUS STOP AREA SHOWN FOR ONE BUS.
 - CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITY GUIDELINES FAR SIDE BUS BAYS	FIGURE I-19
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		



- TYPICAL APPLICATION:**
- URBAN AREA WHERE PARKING IS CRITICAL.
 - AREAS WITH HIGH VOLUME OF PEDESTRIANS ON SIDEWALK.
 - ON-STREET PARALLEL PARKING.

F-3
EAR SIDE NUB/BULB
WITH ON-STREET PARKING

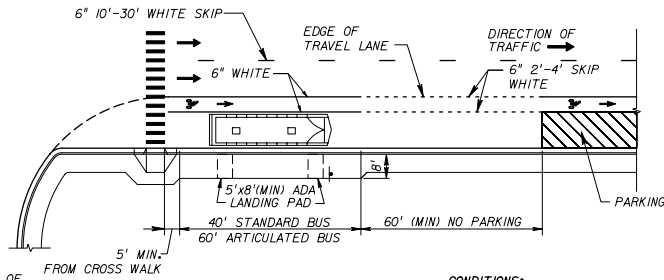
- CONDITIONS:**
- ARTERIAL DESIGN SPEED ≤40 MPH.
- NOTES:**
- BUS STOP AREA SHOWN FOR ONE BUS.
 - CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITY GUIDELINES
FAR SIDE BUS STOPS

FIGURE
 1-20



TYPICAL APPLICATION:

- AREAS WITH HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.
- RIGHT TURN BAY AT NEAR SIDE OF INTERSECTION, AND NO FAR SIDE RIGHT TURN LANE.
- ON STREET PARALLEL PARKING.

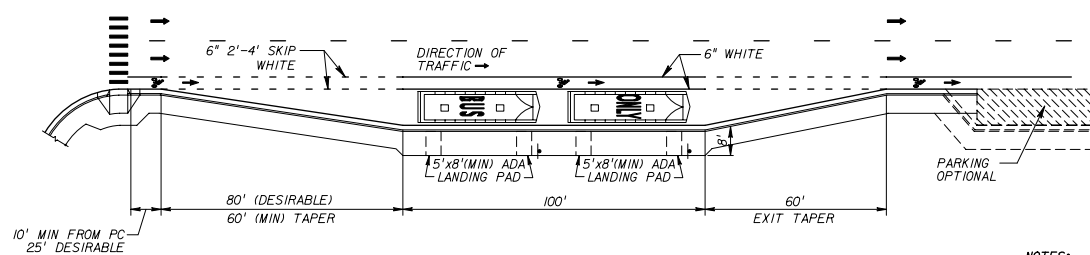
CONDITIONS:

- ARTERIAL DESIGN SPEED ≤ 40 MPH.
- OPEN BUS BAY DESIGN RECOMMENDED FOR 4 LANE OR LESS DIVIDED ROADWAYS.

NOTES:

- BUS STOP AREA SHOWN FOR ONE BUS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

F-4
FAR SIDE OPEN BUS BAY
WITH ON STREET PARKING



TYPICAL APPLICATION:

- NO FAR SIDE RIGHT TURN LANE.
- AREAS WITH HIGHER VOLUME OF VEHICLES AND/OR PASSENGERS.

CONDITIONS:

- ARTERIAL DESIGN SPEED ≤ 45 MPH.

NOTES:

- FOR BUS BAY DETAILS SEE FIGURE 1-8 & 1-9.
- BUS STOP AREA SHOWN FOR TWO BUSES.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

F-5
FAR SIDE CLOSED BUS BAY

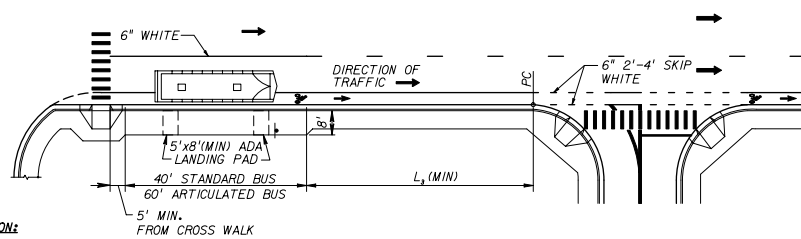
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITY GUIDELINES FAR SIDE BUS BAYS
--

FIGURE
1-21

FAR SIDE BUS STOP PLACEMENT	
DESIGN SPEED (MPH)	L ₃
35	75'
40	75'
45	100'
50	135'



TYPICAL APPLICATION:

- NO FAR SIDE RIGHT TURN LANE.
- AREAS WITH LOWER VOLUME OF VEHICLES AND/OR PASSENGERS.

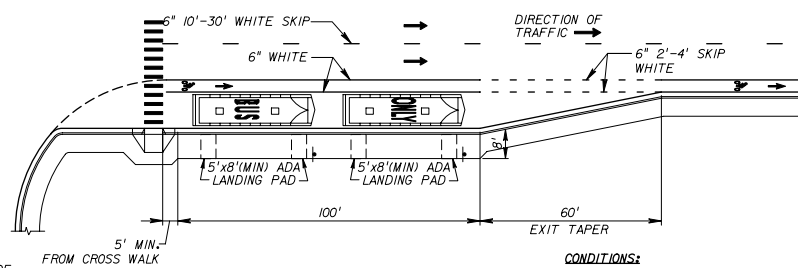
CONDITIONS:

- ARTERIAL DESIGN SPEED ≤ 45 MPH.

NOTES:

- BUS STOP AREA SHOWN FOR ONE BUS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

F-6
FAR SIDE BUS STOP
WITHOUT RIGHT TURN LANE



TYPICAL APPLICATION:

- RIGHT TURN BAY AT NEAR SIDE OF INTERSECTION AND NO RIGHT TURN LANE AT FAR SIDE OF INTERSECTION.
- AREAS WITH HIGHER VOLUME OF VEHICLES AND/OR PASSENGERS.

CONDITIONS:

- ARTERIAL DESIGN SPEED ≤ 45 MPH.
- OPEN BUS BAY DESIGN RECOMMENDED FOR 4 LANE OR LESS DIVIDED ROADWAYS.

NOTES:

- BUS STOP AREA SHOWN FOR TWO BUSES.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

F-7
FAR SIDE OPEN BUS BAY

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

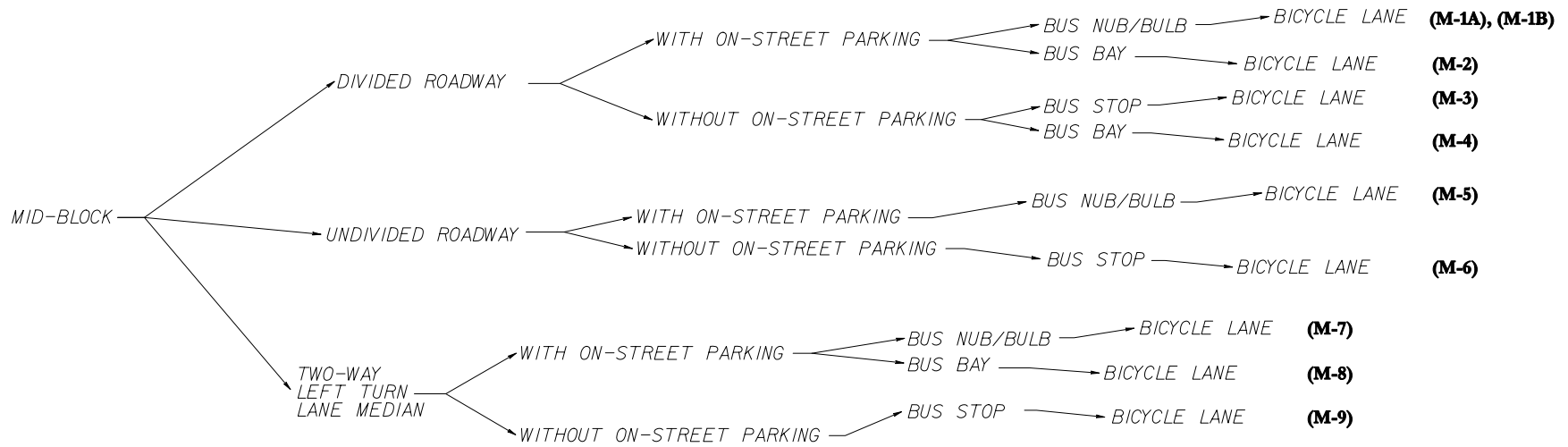
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITY GUIDELINES
FAR SIDE BUS BAYS/STOPS

FIGURE

1-22



LEGEND

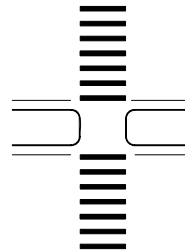
(M-1) - DETAIL DRAWING

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITY GUIDELINES
MID-BLOCK BUS FACILITY
DECISION TREE

FIGURE
1-23



MEDIAN OPTION 1
(STRAIGHT MEDIAN WITH
STRAIGHT CROSSWALK)

NOTE: FOR 3 OR MORE LANE ROADWAY SECTIONS MIDBLOCK CROSSINGS MUST BE SIGNALIZED AND APPROVED BY FDOT'S TRAFFIC OPERATIONS DEPARTMENT.

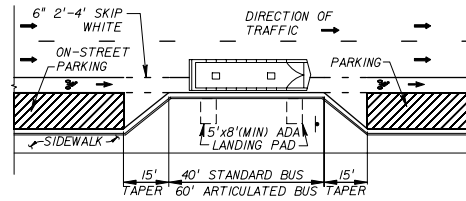
CROSSWALK CLEAR ZONE REQUIREMENTS							
DESIGN SPEED (MPH)	**S.S.D. (FT)	DIMENSION DL (FT)					
		MEDIAN/SIDEWALK WIDTH					
		2'	4'	6'	8'	10'	≥ 12'
30	200	100	135	150	160	165	170
35	250	125	165	190	200	210	215
40	300	150	200	225	240	250	260
45	350	175	235	265	280	290	300

** S.S.D. - STOPPING SIGHT DISTANCE

MID-BLOCK CROSSING NOTES:

- USE THE SAME PARAMETERS FOR ROADWAYS WITH MORE THAN FOUR LANES.
- INSTALL ADVANCE WARNING SIGNS AS PER THE MUTCD AND FDOT STANDARDS TO WARN MOTORISTS OF ONCOMING CROSSWALK.
- CLEAR AREA SHOULD BE FREE OF ALL FIXED OBJECTS SUCH AS LIGHT/UTILITY POLES, SIGNAL EQUIPMENT, TREES, VEGETATION, STREET FURNITURE, ETC. THAT WOULD OBSTRUCT THE VIEW OF PEDESTRIANS. CROSSING WARNING SIGNS ARE EXCLUDED FROM THE CLEAR AREA REQUIREMENTS.
- REFER TO FDOT INDEX 17346 OF THE LATEST EDITION OF THE FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS FOR TRAFFIC SIGN AND CROSSING SIGNAL LOCATION.
- PARKING IS PROHIBITED FOR 100' IN ADVANCE OF THE CROSSWALK.
- PROVIDE AN EVEN WALKING SURFACE ACROSS THE THE MEDIAN BY DEPRESSING THE CURBING AT THE CROSSING LOCATION. CURB RAMPS SHOULD NOT BE USED.

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			FIGURE
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
									1-24



TYPICAL APPLICATION:

- AREAS WITH HIGH VOLUME OF PEDESTRIANS ON SIDEWALK SUCH AS CENTRAL BUSINESS DISTRICTS.
- MID-BLOCK BUS STOP NEEDED TO ACCESS A TRANSIT DEMAND GENERATOR.
- ON-STREET PARALLEL PARKING.

CONDITIONS:

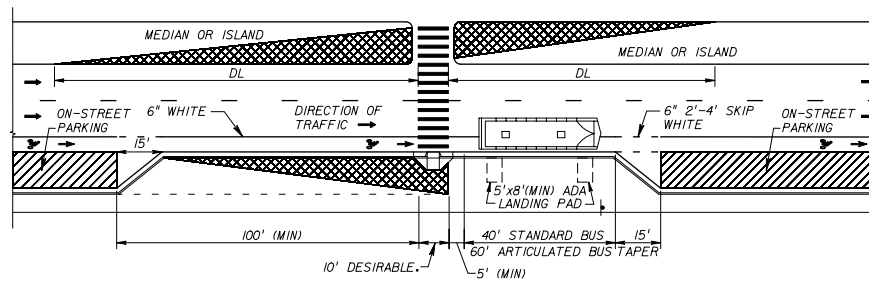
- ARTERIAL DESIGN SPEED ≤ 40 MPH.
- ON STREET PARKING PROVIDED.

NOTES:

- PEDESTRIAN RAMP AND CROSSWALK (WITH OPTIONAL PEDESTRIAN SIGNAL) CAN BE PROVIDED IF NO CONFLICT IS CREATED WITH A.D.A. LANDING PADS.
- BUS STOP AREA SHOWN FOR ONE BUS.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.

M-1A

**MID-BLOCK NUB/BULB WITH ON-STREET PARKING
(NO MID-BLOCK CROSSWALK)**



TYPICAL APPLICATION:

- AREAS WITH HIGH VOLUME OF PEDESTRIANS ON SIDEWALK SUCH AS CENTRAL BUSINESS DISTRICTS.
- MID-BLOCK BUS STOP NEEDED TO ACCESS A TRANSIT DEMAND GENERATOR.
- ON-STREET PARALLEL PARKING.

CONDITIONS:

- ARTERIAL DESIGN SPEED ≤ 40 MPH.
- ON STREET PARKING PROVIDED.

NOTES:

- BUS STOP AREA SHOWN FOR ONE BUS.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.
- DIMENSION "DL" CAN BE FOUND ON FIGURE 1-24.

M-1B

**MID-BLOCK NUB/BULB ON A
DIVIDED ROADWAY WITH ON-STREET PARKING**

- PARKING AREA
- CLEAR AREA (SEE FIGURE 1-24 FOR DETAILS)

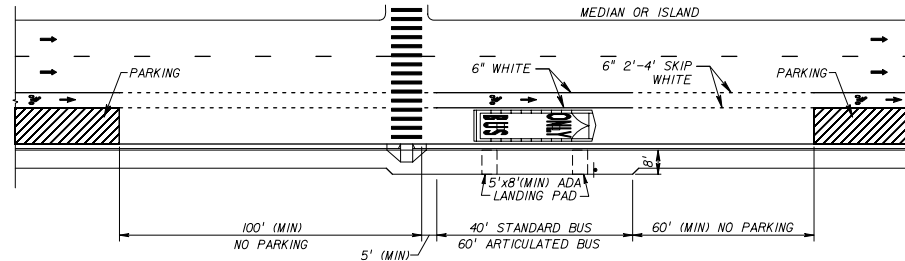
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

**TRANSIT FACILITY GUIDELINES
MID-BLOCK BUS STOPS**

FIGURE

1-25



TYPICAL APPLICATION:

- RIGHT TURN BAY EXISTS ON NEAR SIDE OF INTERSECTION AND FAR SIDE BUS STOP CAN NOT BE PROVIDED.
- MID-BLOCK CROSSING NEEDED TO ACCESS A TRANSIT DEMAND GENERATOR.
- LOW VOLUME OF PEDESTRIANS ON SIDEWALK AND STREET PARKING EXISTS. WHEN PEDESTRIAN VOLUME IS HIGH, NUB ALTERNATIVE IS PREFERABLE.

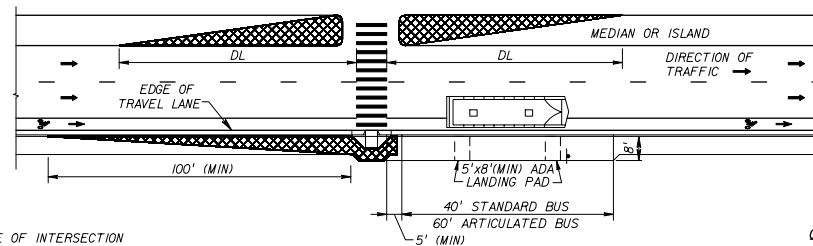
CONDITIONS:

- ARTERIAL DESIGN SPEED \leq 45 MPH.

NOTES:

- BUS STOP AREA SHOWN FOR ONE BUS.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

M-2
MID-BLOCK BUS BAY ON A DIVIDED ROADWAY WITH ON-STREET PARKING (NO NUB ALTERNATIVE)



TYPICAL APPLICATION:

- RIGHT TURN BAY EXISTS ON NEAR SIDE OF INTERSECTION AND FAR SIDE BUS STOP CAN NOT BE PROVIDED.
- MID-BLOCK CROSSING NEEDED TO ACCESS A TRANSIT DEMAND GENERATOR.
- LOW VOLUME OF PEDESTRIANS ON SIDEWALK AND LOW VOLUME OF VEHICLES.

CONDITIONS:

- ARTERIAL DESIGN SPEED \leq 45 MPH.

NOTES:

- BUS STOP AREA SHOWN FOR ONE BUS.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.
- DIMENSION "DL" CAN BE FOUND ON FIGURE 1-24.

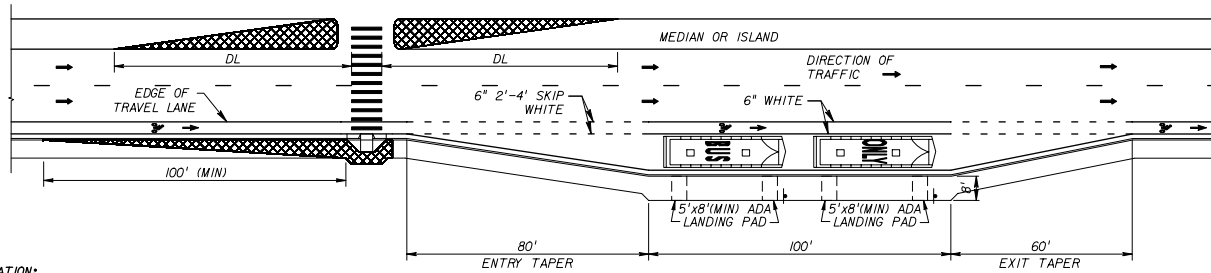
☒ CLEAR AREA (SEE FIGURE 1-24 FOR DETAILS)

M-3
MID-BLOCK BUS STOP ON A DIVIDED ROADWAY WITHOUT ON-STREET PARKING

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITY GUIDELINES MID-BLOCK BUS BAYS/STOPS	FIGURE 1-26
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TYPICAL APPLICATION:

- RIGHT TURN BAY EXISTS ON NEAR SIDE OF INTERSECTION AND FAR SIDE BUS STOP CAN NOT BE PROVIDED.
- MID-BLOCK CROSSING NEEDED TO ACCESS A TRANSIT DEMAND GENERATOR.
- AREA OF HIGH VOLUME OF VEHICLES AND/OR PASSENGERS.

CONDITIONS:

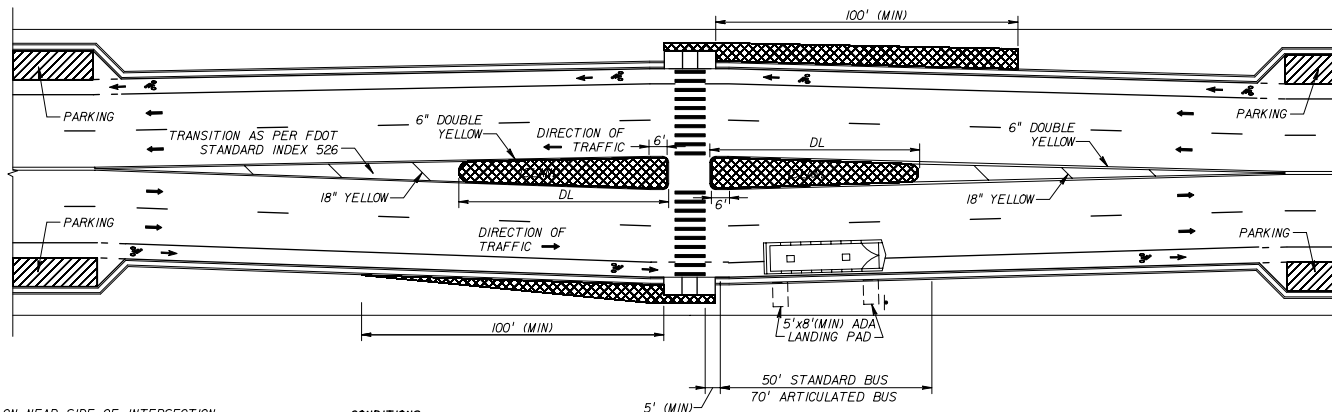
- ARTERIAL DESIGN SPEED ≤ 45 MPH.

M-4

MID-BLOCK BUS BAY ON A DIVIDED ROADWAY WITHOUT ON-STREET PARKING

NOTES:

- FOR BUS BAY DETAILS SEE FIGURE 1-8 & 1-9.
- BUS STOP AREA SHOWN FOR TWO BUSES.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.
- DIMENSION "DL" CAN BE FOUND ON FIGURE 1-24.



TYPICAL APPLICATION:

- RIGHT TURN BAY EXISTS ON NEAR SIDE OF INTERSECTION AND FAR SIDE BUS STOP CAN NOT BE PROVIDED.
- MID-BLOCK CROSSING NEEDED TO ACCESS A TRANSIT DEMAND GENERATOR.
- LOW VOLUME OF PEDESTRIANS ON SIDEWALK, LOW VOLUME OF VEHICLES AND STREET PARKING EXISTS.

CONDITIONS:

- ARTERIAL DESIGN SPEED ≤ 45 MPH.

M-5

MID-BLOCK BUS STOP ON AN UNDIVIDED ROADWAY WITH ON-STREET PARKING

NOTES:

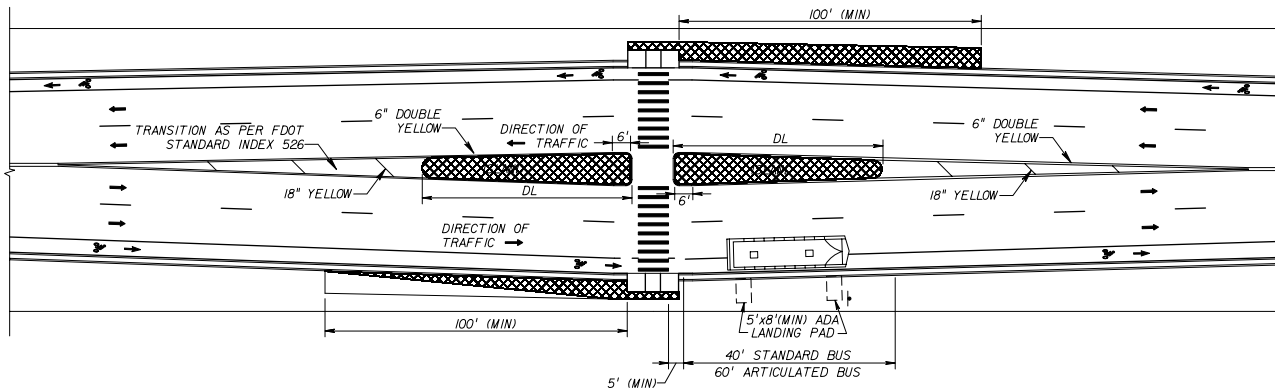
- INSTALLATION OF MEDIAN ISLAND TO BE PROPERLY COORDINATED WITH ADJACENT PROPERTY ACCESS REQUIREMENTS (DRIVEWAYS AND SIDE STREETS).
- BUS STOP AREA SHOWN FOR ONE BUS.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.
- DIMENSION "DL" CAN BE FOUND ON FIGURE 1-24.

- PARKING AREA
- CLEAR AREA (SEE FIGURE 1-24 FOR DETAILS)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA		
DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TRANSIT FACILITY GUIDELINES	FIGURE
MID-BLOCK BUS BAYS/STOPS	1-27



TYPICAL APPLICATION:

- RIGHT TURN BAY EXISTS ON NEAR SIDE OF INTERSECTION AND FAR SIDE BUS STOP CAN NOT BE PROVIDED.
- MID-BLOCK CROSSING NEEDED TO ACCESS A TRANSIT DEMAND GENERATOR.
- LOW VOLUME OF PEDESTRIANS ON SIDEWALK AND LOW VOLUME OF VEHICLES.

CONDITIONS:

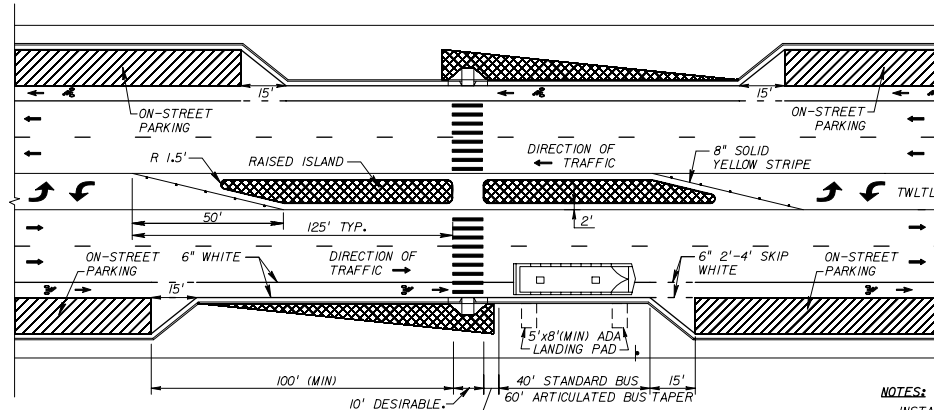
- ARTERIAL DESIGN SPEED ≤ 45 MPH.

M-6

MID-BLOCK BUS STOP ON AN UNDIVIDED ROADWAY WITHOUT ON-STREET PARKING

NOTES:

- INSTALLATION OF MEDIAN ISLAND TO BE PROPERLY COORDINATED WITH ADJACENT PROPERTY ACCESS REQUIREMENTS (DRIVEWAYS AND SIDE STREETS).
- BUS STOP AREA SHOWN FOR ONE BUS.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.



TYPICAL APPLICATION:

- AREAS WITH HIGH VOLUME OF PEDESTRIANS ON SIDEWALK SUCH AS CENTRAL BUSINESS DISTRICTS.
- MID-BLOCK CROSSING NEEDED TO ACCESS A TRANSIT DEMAND GENERATOR.
- ON-STREET PARALLEL PARKING.

CONDITIONS:

- ARTERIAL DESIGN SPEED ≤ 45 MPH.

M-7

MID-BLOCK BULB/BULB WITH TWO-WAY-LEFT-TURN-LANE MEDIAN AND ON-STREET PARKING

NOTES:

- INSTALLATION OF MEDIAN ISLAND TO BE PROPERLY COORDINATED WITH ADJACENT PROPERTY ACCESS REQUIREMENTS (DRIVEWAYS AND SIDE STREETS).
- BUS STOP AREA SHOWN FOR ONE BUS.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.
- DIMENSION "DL" CAN BE FOUND ON FIGURE 1-24.

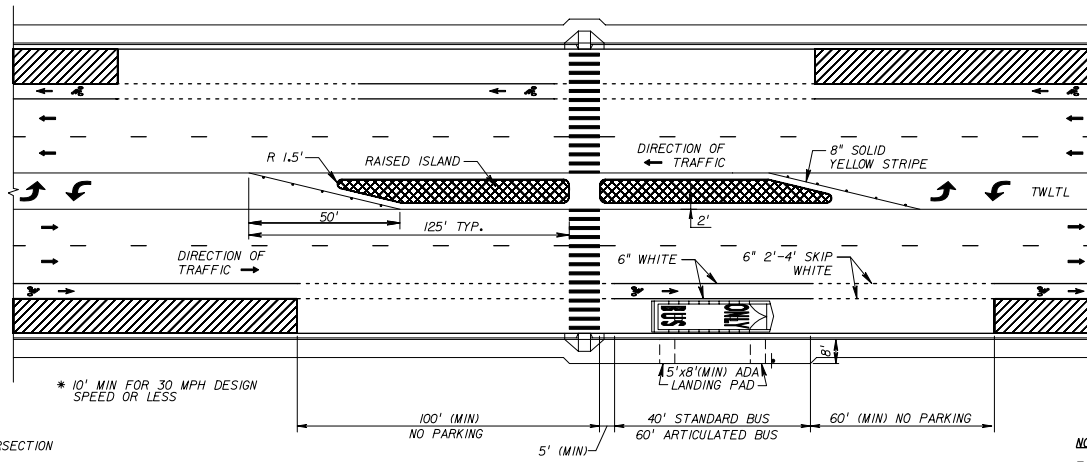
- ▨ PARKING AREA
 - ▩ CLEAR AREA (SEE FIGURE 1-24 FOR DETAILS)
- TWTL TWO WAY LEFT TURN LANE

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

**TRANSIT FACILITY GUIDELINES
MID-BLOCK BUS STOPS**

FIGURE
1-28



TYPICAL APPLICATION:

- RIGHT TURN BAY EXISTS ON NEAR SIDE OF INTERSECTION AND FAR SIDE BUS STOP CAN NOT BE PROVIDED.
- MID-BLOCK CROSSING NEEDED TO ACCESS A TRANSIT DEMAND GENERATOR.
- LOW VOLUME OF PEDESTRIANS ON SIDEWALK AND STREET PARKING EXISTS. WHEN PEDESTRIAN VOLUME IS HIGH, NUB ALTERNATIVE IS PREFERABLE.
- ON STREET PARALLEL PARKING.

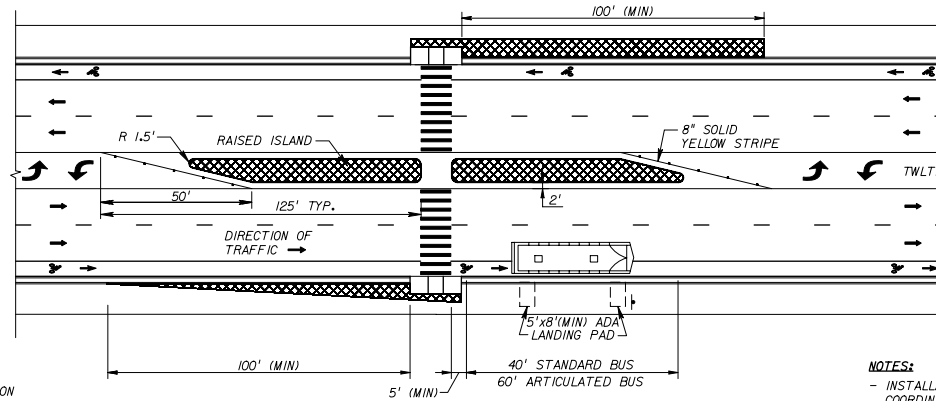
CONDITIONS:

- ARTERIAL DESIGN SPEED ≤ 45 MPH.

NOTES:

- INSTALLATION OF MEDIAN ISLAND TO BE PROPERLY COORDINATED WITH ADJACENT PROPERTY ACCESS REQUIREMENTS (DRIVEWAYS AND SIDE STREETS).
- BUS STOP AREA SHOWN FOR ONE BUS.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

M-8
MID-BLOCK BUS BAY WITH TWO-WAY-LEFT-TURN-LANE
MEDIAN AND ON-STREET PARKING



PARKING AREA
 CLEAR AREA (SEE FIGURE I-24 FOR DETAILS)
 TWLTL TWO WAY LEFT TURN LANE

NOTES:

- INSTALLATION OF MEDIAN ISLAND TO BE PROPERLY COORDINATED WITH ADJACENT PROPERTY ACCESS REQUIREMENTS (DRIVEWAYS AND SIDE STREETS).
- BUS STOP AREA SHOWN FOR ONE BUS.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

TYPICAL APPLICATION:

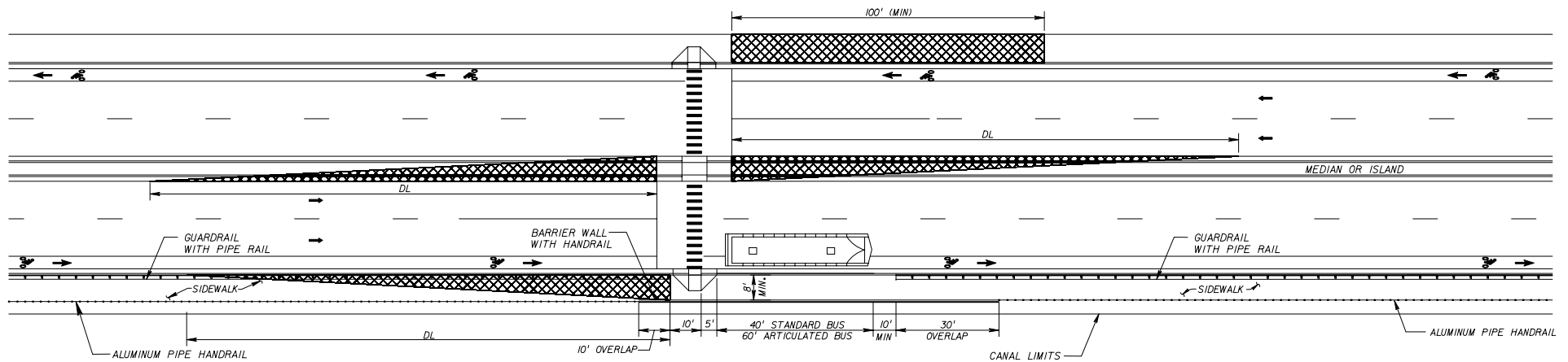
- RIGHT TURN BAY EXISTS ON NEAR SIDE OF INTERSECTION AND FAR SIDE BUS STOP CAN NOT BE PROVIDED.
- MID-BLOCK CROSSING NEEDED TO ACCESS A TRANSIT DEMAND GENERATOR.
- LOW VOLUME OF PEDESTRIANS ON SIDEWALK AND LOW VOLUME OF VEHICLES.

CONDITIONS:

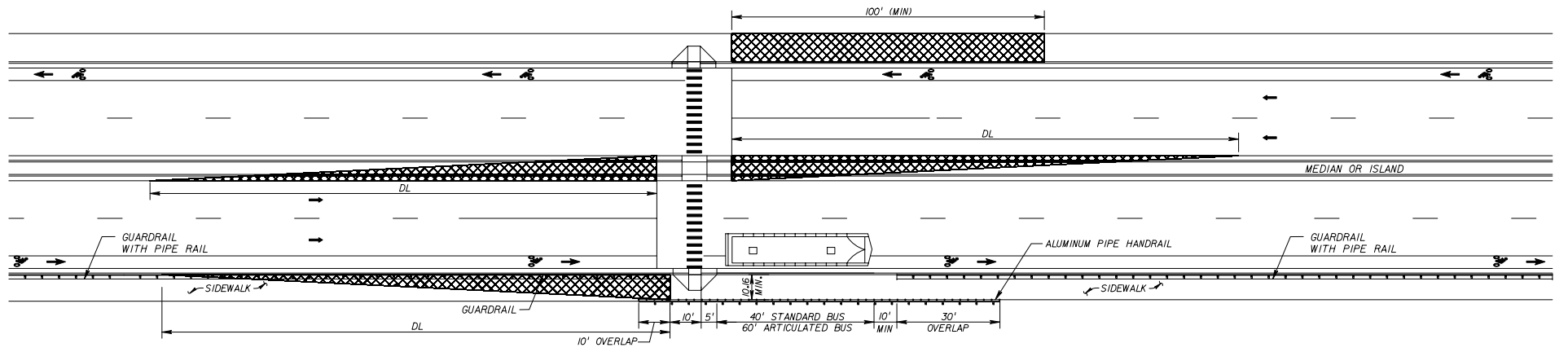
- ARTERIAL DESIGN SPEED ≤ 45 MPH.

M-9
MID-BLOCK BUS STOP WITH TWO-WAY-LEFT-TURN-LANE
MEDIAN WITHOUT ON-STREET PARKING

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITY GUIDELINES MID-BLOCK BUS BAYS/STOPS	FIGURE 1-29
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		



MID-BLOCK BUS STOP ADJACENT TO CANAL BARRIER WALL OPTION



MID-BLOCK BUS STOP ADJACENT TO CANAL GUARDRAIL OPTION

NOTES:

- SEE FDOT STANDARD INDEX 17346 FOR TRAFFIC CONTROL DEVICE DETAILS.
- SEE FDOT STANDARD INDEXES FOR DETAILS ON GUARDRAIL AND BARRIER WALL.
- BUS STOP AREA SHOWN FOR ONE BUS.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.
- DIMENSION "DL" CAN BE FOUND ON FIGURE 1-24.

☒ CLEAR AREA (SEE FIGURE 1-24 FOR DETAILS)

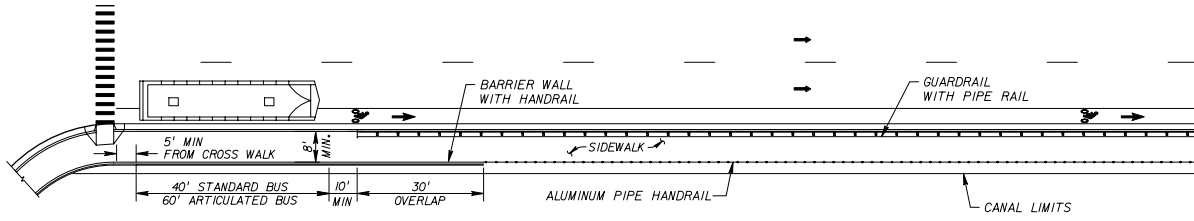
FDOT PREFERRED

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

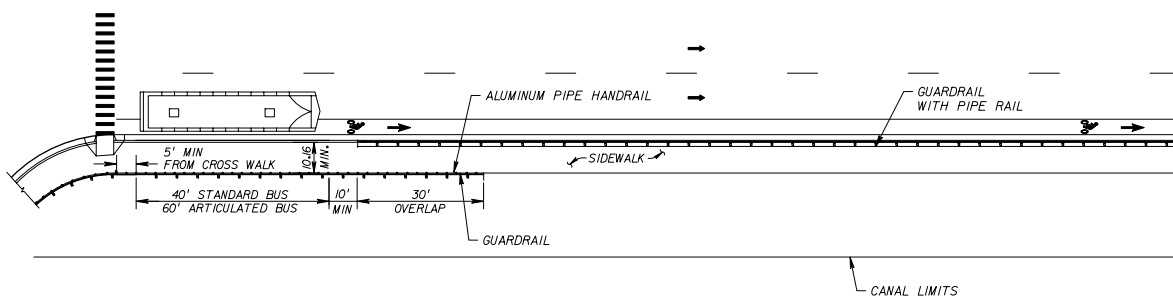
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

**TRANSIT FACILITIES GUIDELINES
BUS STOP LOCATION
ADJACENT TO CANAL**

FIGURE
1-30



EAR SIDE BUS STOP ADJACENT TO CANAL BARRIER WALL OPTION

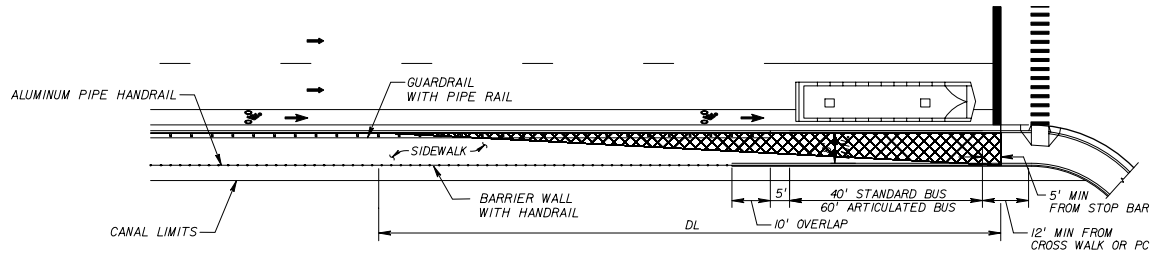


EAR SIDE BUS STOP ADJACENT TO CANAL GUARDRAIL OPTION

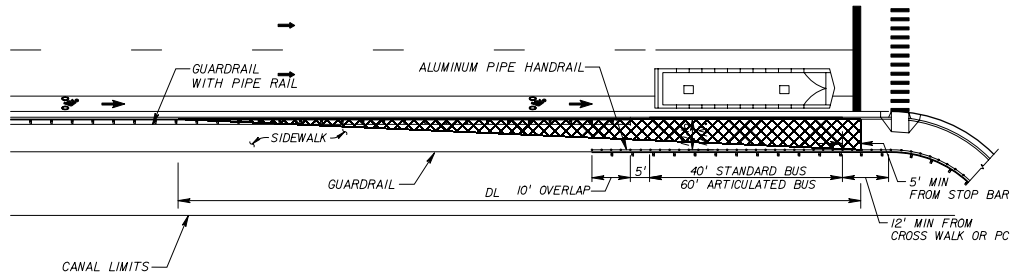
- NOTES:
- SEE FDOT STANDARD INDEX I7346 FOR TRAFFIC CONTROL DEVICE DETAILS.
 - SEE FDOT STANDARD INDEXES FOR DETAILS ON GUARDRAIL AND BARRIER WALL.
 - BUS STOP AREA SHOWN FOR ONE BUS.
 - CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

FDOT PREFERRED

REVISIONS					STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITIES GUIDELINES BUS STOP LOCATION ADJACENT TO CANAL	FIGURE 1-31
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY		



NEAR SIDE BUS STOP ADJACENT TO CANAL BARRIER WALL OPTION



NEAR SIDE BUS STOP ADJACENT TO CANAL GUARDRAIL OPTION

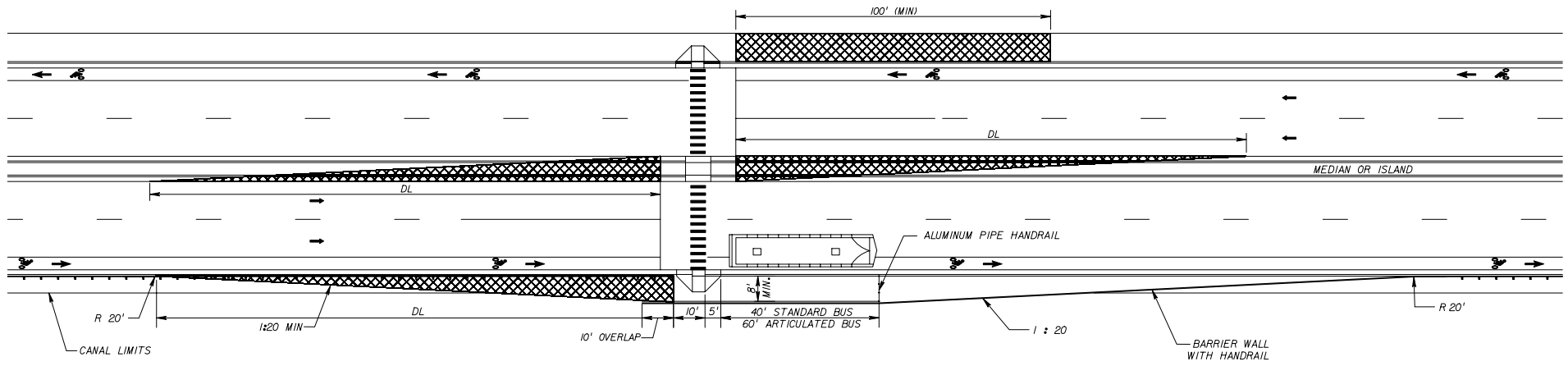
☒ CLEAR AREA
(SEE FIGURE I-24 FOR DETAILS)

NOTES:

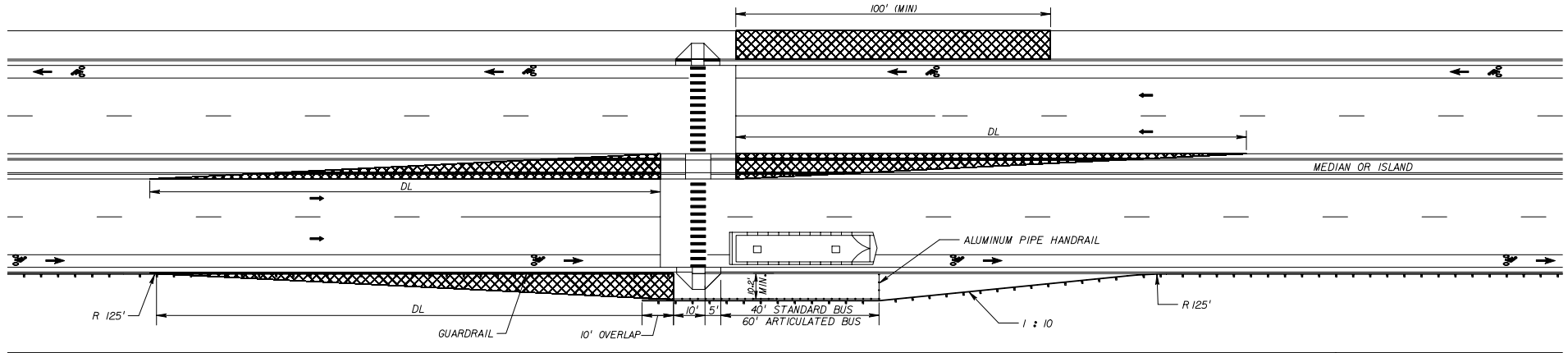
- SEE FDOT STANDARD INDEX I7346 FOR TRAFFIC CONTROL DEVICE DETAILS.
- SEE FDOT STANDARD INDEXES FOR DETAILS ON GUARDRAIL AND BARRIER WALL.
- BUS STOP AREA SHOWN FOR ONE BUS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.
- DIMENSION "DL" CAN BE FOUND ON FIGURE I-24.

FDOT PREFERRED

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITIES GUIDELINES BUS STOP LOCATION ADJACENT TO CANAL	FIGURE I-32
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		



**MID-BLOCK ISOLATED BUS STOP
ADJACENT TO CANAL BARRIER WALL OPTION**



**MID-BLOCK ISOLATED BUS STOP
ADJACENT TO CANAL GUARDRAIL OPTION**

NOTES:

- SEE FDOT STANDARD INDEX 17346 FOR TRAFFIC CONTROL DEVICE DETAILS.
- SEE FDOT STANDARD INDEXES FOR DETAILS ON GUARDRAIL AND BARRIER WALL.
- BUS STOP AREA SHOWN FOR ONE BUS.
- SEE "MID-BLOCK CROSSING" SECTION OF THE GUIDELINES FOR FURTHER DETAILS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.
- DIMENSION "DL" CAN BE FOUND ON FIGURE 1-24.

CLEAR AREA
(SEE FIGURE 1-24 FOR DETAILS)

FDOT PREFERRED

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

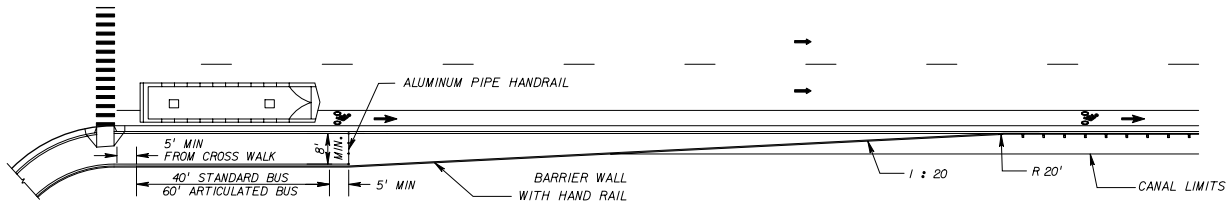
**STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION**

ROAD NO.	COUNTY	FINANCIAL PROJECT ID

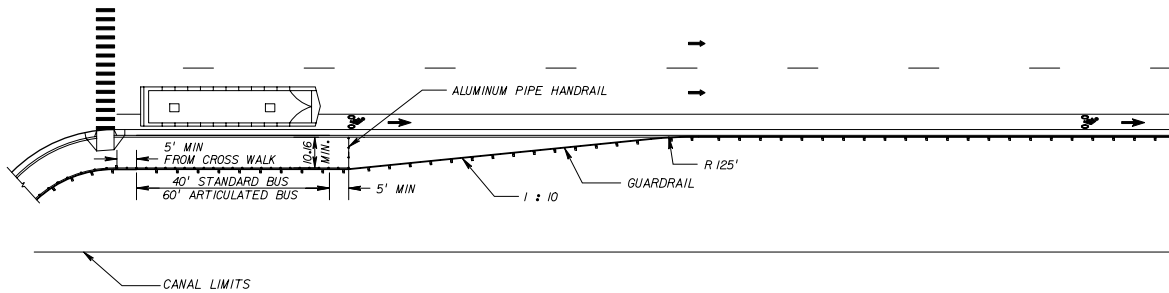
**TRANSIT FACILITIES GUIDELINES
BUS STOP LOCATION
ADJACENT TO CANAL**

FIGURE

1-33



FAR SIDE ISOLATED BUS STOP
ADJACENT TO CANAL BARRIER WALL OPTION



FAR SIDE ISOLATED BUS STOP
ADJACENT TO CANAL GUARDRAIL OPTION

NOTES:

- SEE FDOT STANDARD INDEX IT346 FOR TRAFFIC CONTROL DEVICE DETAILS.
- SEE FDOT STANDARD INDEXES FOR DETAILS ON GUARDRAIL AND BARRIER WALL.
- BUS STOP AREA SHOWN FOR ONE BUS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.

FDOT PREFERRED

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

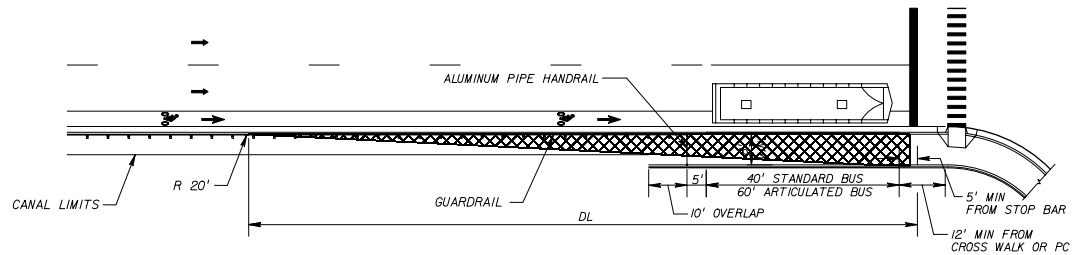
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID

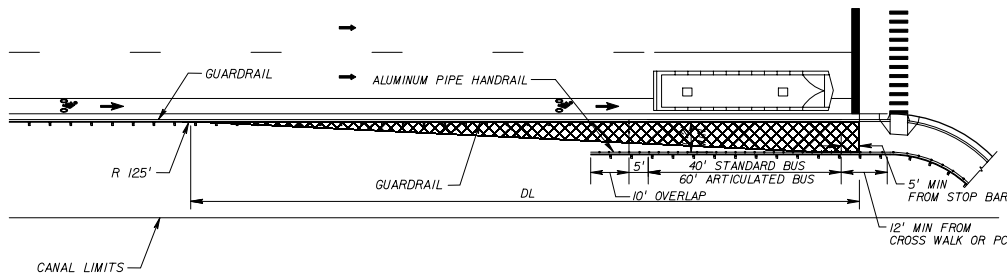
TRANSIT FACILITIES GUIDELINES
BUS STOP LOCATION
ADJACENT TO CANAL

FIGURE

1-34



**NEAR SIDE ISOLATED BUS STOP
ADJACENT TO CANAL BARRIER WALL OPTION**



**NEAR SIDE ISOLATED BUS STOP
ADJACENT TO CANAL GUARDRAIL OPTION**

☒ CLEAR AREA
(SEE FIGURE 1-24 FOR DETAILS)

NOTES:

- SEE FDOT STANDARD INDEX IT346 FOR TRAFFIC CONTROL DEVICE DETAILS.
- SEE FDOT STANDARD INDEXES FOR DETAILS ON GUARDRAIL AND BARRIER WALL.
- BUS STOP AREA SHOWN FOR ONE BUS.
- CURB RAMP TYPE IS SHOWN ONLY AS AN ILLUSTRATION.
- DIMENSION "DL" CAN BE FOUND ON FIGURE 1-24.

FDOT PREFERRED

REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TRANSIT FACILITIES GUIDELINES BUS STOP LOCATION ADJACENT TO CANAL	FIGURE 1-35
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		

Current FDOT Issues

PATTERNED/TEXTURED PAVEMENT.

(REV 6-25-05) (1-06)

PAGE 593. The following new Section is added after Section 522:

SECTION 523

PATTERNED/TEXTURED PAVEMENT

523-1 Description.

Apply a patterned and/or textured treatment to asphalt or concrete, in accordance with manufacturer's recommendations. Applications include the following:

1. Imprinting patterns into existing or new pavement and covering with a surface coating(s) of paint or thermoplastic.
2. Imprinting patterns into existing or new pavement and inlaying the imprint with preformed thermoplastic material.
3. Colored, preprinted, preformed texturized thermoplastic material that is applied over existing pavement.
4. Colored thermoplastic material that can be imprinted and texturized during or after application to existing pavement.

For applications requiring removal and replacement of existing pavement, meet the requirements of Section 350 for cement concrete pavement; the requirements of Section 334 for Superpave asphalt or Section 337 for FC 9.5 and FC 12.5 asphalt.

For the purpose of this Specification, patterns are defined as visible surface markings; imprinted textures are defined as palpable surface markings.

Use the location, pattern/texture type (brick, stone, etc.), and coating color as specified in the plans. Joint openings shall not exceed 1/2 inch [13 mm] in width.

523-2 Materials.

523-2.1 Qualified Products List: Use only patterned/textured pavement products listed on the Qualified Products List. Meet manufacturer's specifications for all pattern/texture templates, coating and coloring materials. Use only material that is delivered to the job site in sealed containers bearing the manufacturer's original labels.

Material coatings used to achieve the pattern/texture and/or color shall produce an adherent, weather resistant, skid resistant surface capable of resisting deformation to traffic. Paint and thermoplastic materials must meet the requirements of this Specification and Section 971, except that the requirements for Color and Retroreflectivity do not apply.

Manufacturers seeking approval for inclusion on the QPL must submit application and certifications in accordance with Section 6 along with the following documentation:

1. Manufacturer's specifications and procedures for materials and installation.
2. Manufacturer's certification with supporting test data and results that the patterned/textured pavement installed in accordance with the manufacturer's specifications and procedures has been tested in accordance with the ASTM E-274, Skid Resistance of Paved Surfaces using a standard ribbed full Scale Tire at a speed of 40 mph (FN40R), and has a minimum FN40R value of 35.

523-2.2 Performance Requirements: QPL approval will be contingent on a field service test demonstrating that the imprinted texture and coating materials meet the following performance measures at the end of three years from opening to traffic:

1. The imprint must maintain a depth of 50% of the original installed depth and width.

2. Wearing of the material coating shall not expose more than 15% of the underlying surface area.

3. Friction performance of patterned/textured pavement materials must meet or exceed a British Pendulum Number (BPN) of 40 in accordance with ASTM E-303, measuring surface frictional properties using the British Pendulum Tester, or an FN40R value of 35 in accordance with ASTM E-274 FN40R value of 35.

The field service test installation shall be within a marked crosswalk on a roadway with an ADT of 8,000 to 12,000 vehicles per day per lane, approved by the State Materials Office. The test installation shall be a minimum six feet wide and extend from pavement edge to pavement edge across all traffic lanes and shoulder pavement at the crosswalk location. The test installation will be tested for skid resistance and wear in accordance with the specifications.

523-3 Construction.

523-3.1 Surface Protection: Protect treated surfaces from traffic and environmental effects until the area is completely coated/imprinted, and any coatings have dried or cured according to the manufacturer's instructions.

523-3.2 Pavement Cuts: Complete all utility, traffic loop detector, and other items requiring a cut and installation under the finished surface, prior to pattern installation.

523-3.3 Installation Acceptance: For asphalt roadways, apply patterned/textured pavement a minimum of 14 days after placement of the adjacent pavement. Upon completion of the installation, the Engineer will check the area at random locations for geometric accuracy, as specified in the plans. If any of the chosen areas have an imprint width and depth that is less than the manufacturer's specifications, correct the entire textured area, at no additional cost to the Department.

Supply the specified pattern and color samples for the Engineer's use to visually determine that the material matches the color specified in the plans. For any continuous or abutting areas, i.e. all treated areas of an intersection, color materials must be from the same lot/batch.

Provide certification that the textured pavement was installed in accordance with the manufacturer's requirements.

523-4 Method of Measurement.

The quantity to be paid will be the plan quantity in square yards [square meters] of patterned/textured pavement, completed and accepted. No deduction will be made for the area(s) occupied by ornamental trees within the asphalt area, or any other areas occupied by manholes, inlets, drainage structures, or by any public utility appurtenances within the area. Asphalt or concrete materials placed prior to treatment will be paid separately under the appropriate pay items. Milling required for the placement of patterned/textured pavement will be included in the cost of the patterned/textured pavement.

523-5 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section. Surface materials, including colors, sealers, and/or resins, shall be included for payment under this Section.

Payment will be made under:

- 523- 1- Patterned/Textured Pavement-per square yard.
- 2523- 1- Patterned/Textured Pavement-per square meter.

7.4.11 Foundation Criteria

Refer to **Section 7.5, Foundation Design**, for geotechnical requirements.

7.4.12 Mast Arm and Monotube Supports

7.4.12.1 Mast Arm Supports

All new signals installed on the State Highway System that meet any of the following criteria (considered the mast arm policy area):

1. along designated coastal evacuation routes;
2. along the Strategic Intermodal System routes; or
3. along corridors within the approximate ten mile coastline boundary defined by the State Traffic Engineering Office Implementation Guidelines

shall be supported by mast arms with the signal head(s) rigidly attached to the mast arm. A span wire assembly may be used within this mast arm policy area only when it is impractical to use a mast arm or overhead rigid structure and a Design Variation has been approved in accordance with **Chapter 23** of this volume.

Mast arm signal supports or other types of rigid supports outside the mast arm policy area must be carefully considered before inclusion in a project. The districts have the flexibility to provide the total funding if funding is available. If funding is not sufficient, mast arm signal supports or other types of rigid supports outside the mast arm policy area can be installed by the Department with Maintaining Agency providing the funding for the cost difference between the proposed supports and strain pole supports typically installed by the Department.

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

The signal support system used for signals located outside the mast arm policy area shall be selected after consideration of appropriate site conditions, design requirements and cost.

The Structures Design Office has developed a Traffic Signal Mast Arm Standard. The

standard includes single arm designs, with and without luminaires and double arm designs without luminaires. The standard designs include both 90 and 110 mph design wind speeds. A foundation and base plate design has been developed for each pole type.

The manufacturer of the standard mast arms will be pre-approved by the Department and added to the Qualified Products List (QPL). When the standard assemblies are used, design details in the plans or shop drawing submittals will not be required. Special designs, for those locations where the standard design is not appropriate, will require complete design details for the pole, arm and foundation to be included in the plans, and will require shop drawings.

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

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

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

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

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

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



Presentations

Contact Us

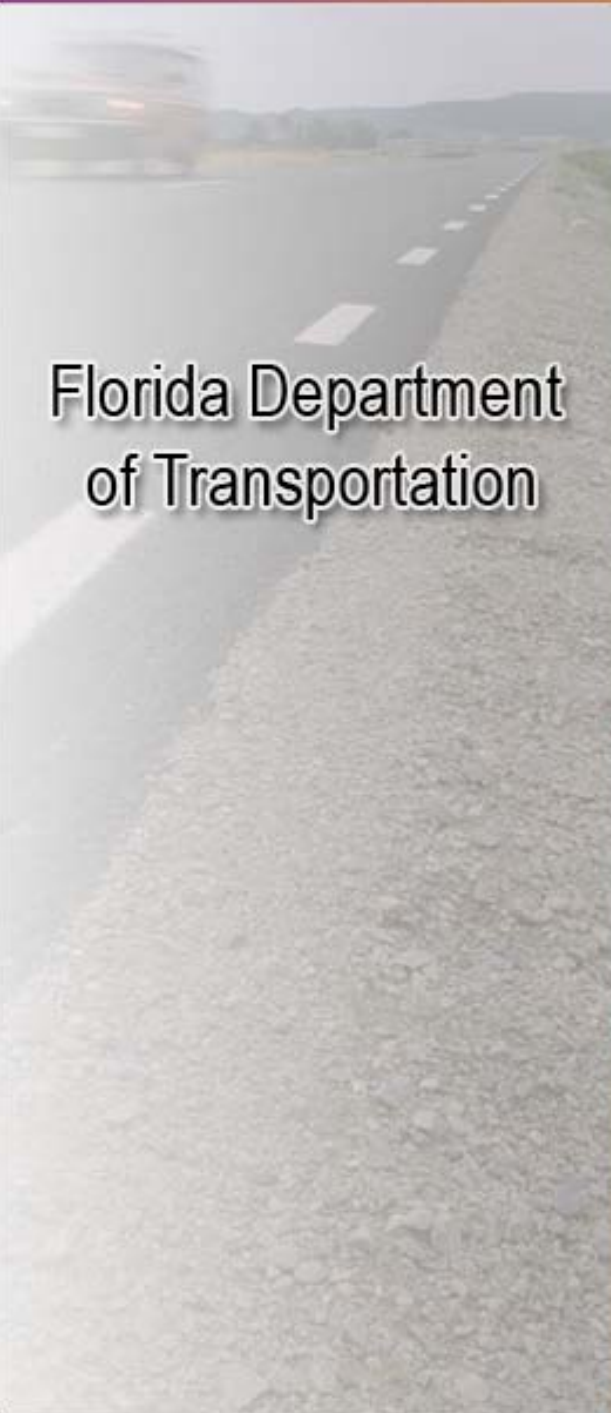
FAQ

Updated Manuals on the Web:

- Roadway Design
- Design Standards
- Plans Preparation Manual
- Sample Plans
- Florida Greenbook
- Utility Accommodation Manual
- Drainage Manuals and Handbooks
- Pavement Design Manuals
- Structure Manuals and Handbooks
- Basis of Estimates
- FDOT CADD Publications
- FDOT Specifications



Quit



Florida Department of Transportation



Design Update Training 2006

A New Direction in Design



Instructions

Please click the links below to access the training on the latest changes to the Plan's Preparation Manual, Design Standards, Utility Accommodation Manual, Florida Greenbook, Drainage Manuals, Pavement Design Manuals, Basis of Estimates, and Sample Plans.

BT-05-0113 (2 PDH Credits)
2006 Design Update Training- Structures
Structures Design

Charles Boyd (18:35)
 Type K Temporary Barrier Transitions and
 Existing Bridge Traffic Railing Retrofits

Steve Nolan (4:21)
 2006 Interim Design Standards-
 Changes to Gravity Wall Index No. 520

Steve Nolan (16:32)
 2006 Design Standards- Changes to
 Drainage Inlets and Manholes

Charlie Harvey (8:17)
 Structures Standards Migration and
 Software Updates

Andre Pavlov (12:52)
 New FDOT Retaining Wall Policies and
 Future Direction of FDOT Lighting,
 Traffic Signal, and Sign Structures

David O'Hagan (21:40)
 Products to be Produced in 2006

BT-05-0114 (2.5 PDH Credits)
2006 Design Update Training- Roadway, Estimates and Drainage
Roadway Design
Criteria and Standards

Rob Quigley 28:58
 Plans Preparation Manual Updates

Andy Keel (18:30)
 Design Standards- Roadway

Cheryl Adams (35:54)
 2006 Design Standards-
 600 Series (MOT)

Chester Henson (24:29)
 Signing and Pavement Marking,
 Signalization, and Lighting

Estimates

Melissa Hollis (11:46)
 Basis of Estimates Updates

Drainage

Rick Renna and Linda Seigle (17:57)
 News from the Drainage Section

Steve Nolan (16:32)
 2006 Design Standards- Changes to
 Drainage Inlets and Manholes

BT-05-0115 (1 PDH Credit)
2006 Design Update Training- Utilities
Utilities

Ken Weldon (01:11:37)
 UAM Changes that Impact the FDOT
 Designer

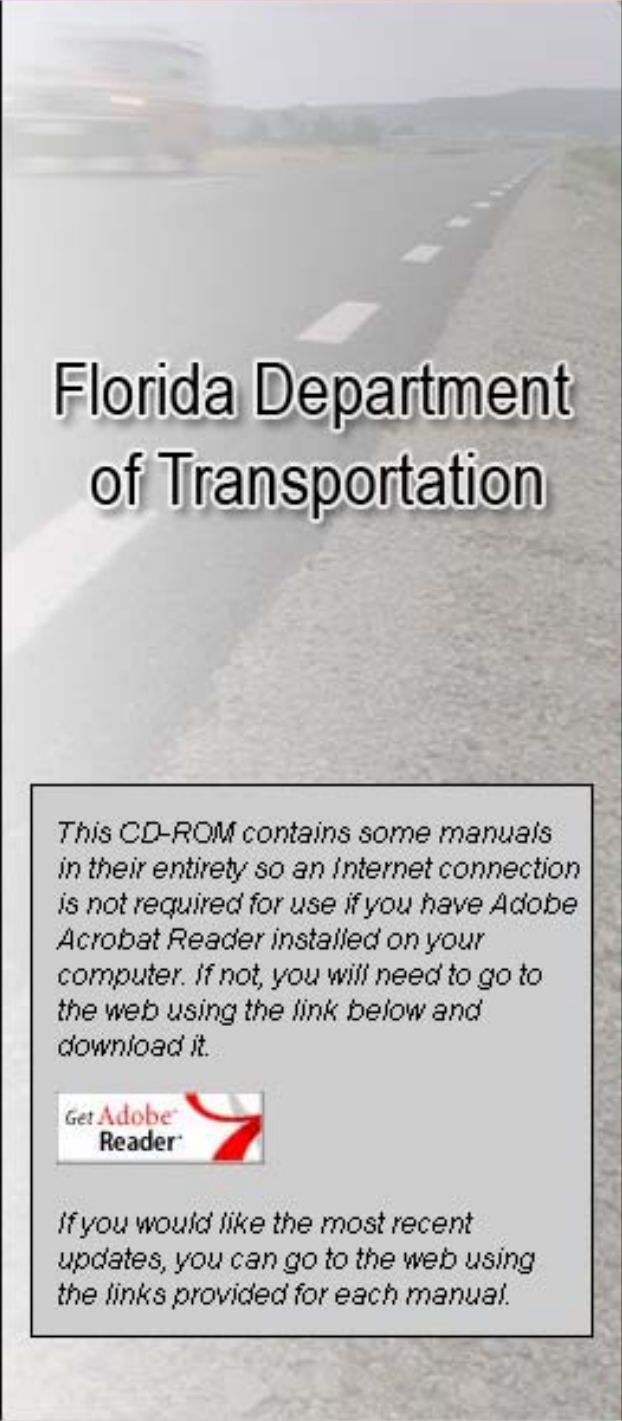
Audio Script Text

CADD

Esther Barwick and Bruce
 Dana (19:07)
 FDOT CADD Updates

More videos on the CADD Website

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[Survey](#)
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Florida Department of Transportation

Manuals on CD:


- Design Standards
- Plans Preparation Manual
- Florida Greenbook
- Utility Accommodation Manual
- Drainage Manuals and Handbooks
- Pavement Design Manuals

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- Pavement Design Manuals
- Structure Manuals and Handbooks
- Basis of Estimates
- FDOT CADD Publications
- FDOT Specifications

Quit

This CD-ROM contains some manuals in their entirety so an Internet connection is not required for use if you have Adobe Acrobat Reader installed on your computer. If not, you will need to go to the web using the link below and download it.



If you would like the most recent updates, you can go to the web using the links provided for each manual.

Design Manuals/Handbooks 2006

A New Direction in Design



Livable Communities



Livable Communities & Transportation Design Issues

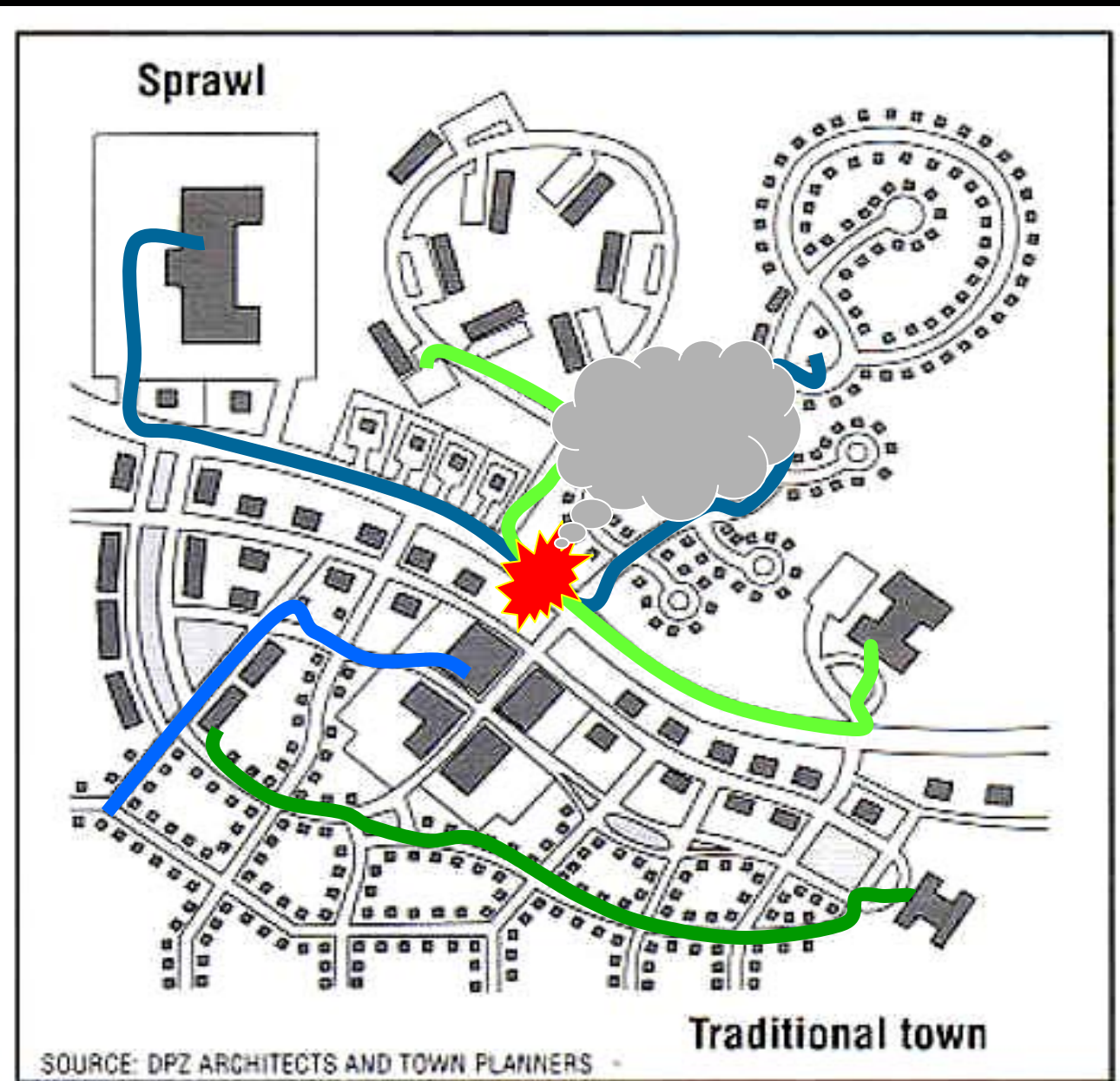
Florida Green Book
Committee Meeting

Billy Hattaway, P.E.

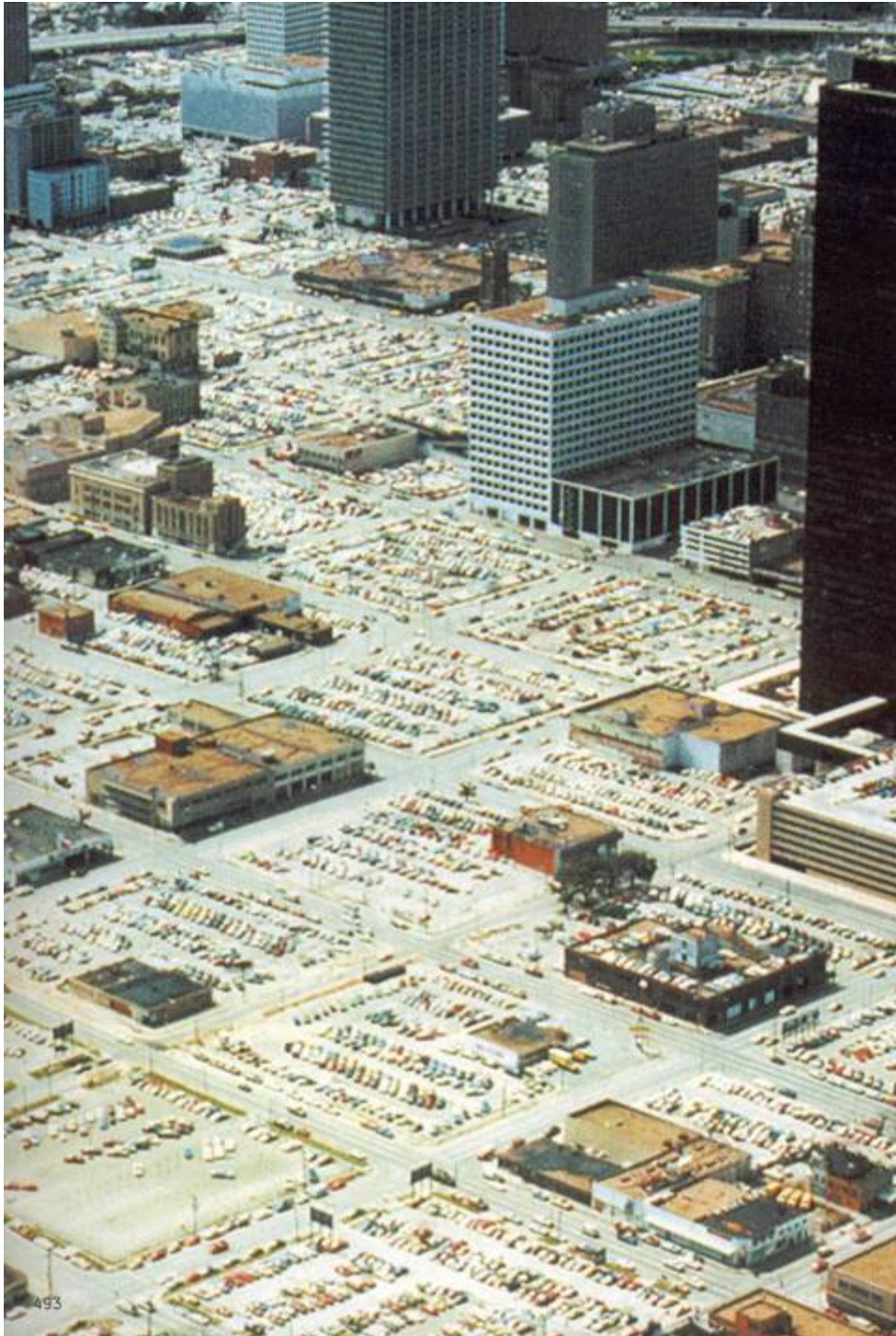


- **Conventional Suburban**
 - Separated use
 - Single use
 - Auto dominant
 - Low Density

- **New Urbanism**
 - Focus on Pedestrian
 - Mixed Use
 - Multi-modal
 - Compact







America's high level of dependence upon the automobile has lowered the standard of living, snarled traffic and lowered air quality.



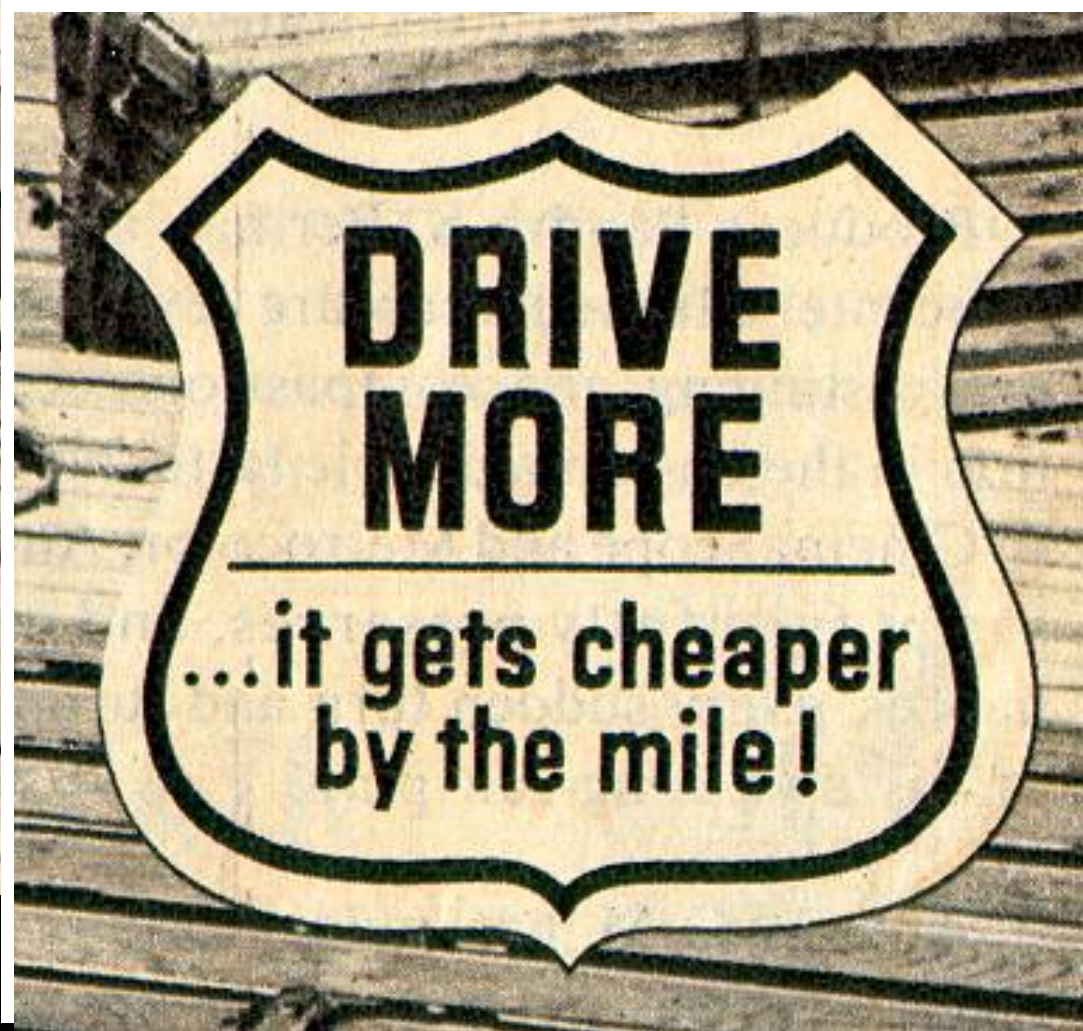


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Colliers, 1955

Self
Unleaded

● **Cash**
Per Gallon

Regular

3 2 9 $\frac{9}{10}$

Plus

3 3 9 $\frac{9}{10}$

Supreme

3 4 9 $\frac{9}{10}$

EX

On

Je
Sub

**It took us 125 years to use the first trillion barrels of oil.
We'll use the next trillion in 30.**

So why should you care? willyoujoinus.com



Human energy™

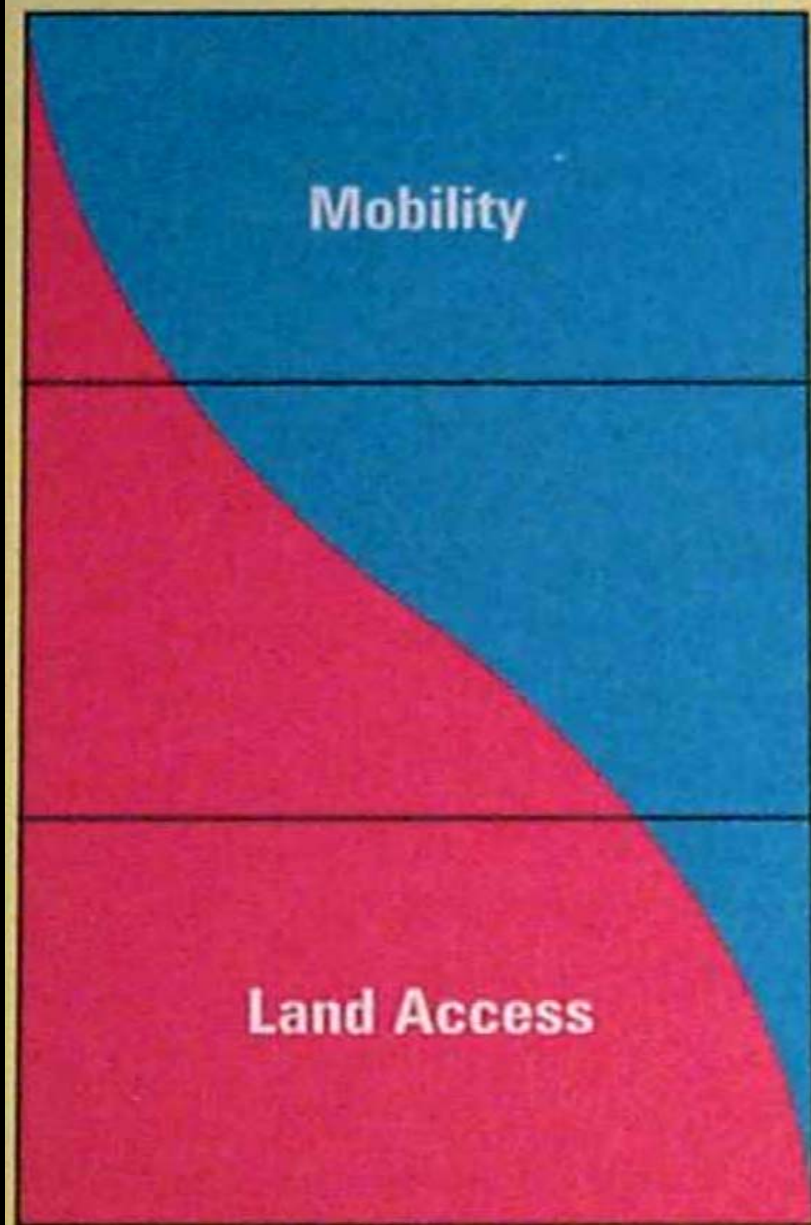
Over half the world's oil lies in five countries.

So where do you live? willyoujoinus.com



Human energy™

- Political instability – Iran/Venezuela
- Growing middle class – India/China
- Production capacity



Arterials

- higher mobility
- low degree of access

Collectors

- balance between mobility and access

Locals

- lower mobility
- high degree of access

1968 Federal Highway Act

Three Functional Classifications

- Arterials – (State) Connect major areas, long trips (50-100 miles), high speed (60-70 mph)
- Collectors – (County) Intermediate trips (5-15 miles), high speed (50 mph)
- Locals – (City) Local access, short trips (5 miles <), lower speeds (30-45)
- All trips are by auto or truck, no pedestrians in the critical functional definition

Flexibility in Highway Design - FHWA

- “... a determination of functional classification establishes the basic roadway cross section in terms of lane width, shoulder width, type and width of median area, and other major design features...”
- *“The flexibility available to a highway designer is **considerably limited** once a particular functional classification has been established.”*

“The solution of the traffic problem is to be sought not so much by wider streets as by proper plan of the town.”

John Nolen, 1926

**Albert Einstein.... “The definition of
Insanity....doing the same thing
over and over again and expecting
different results.”**

Dr. Phil...”Is it working for you?”



Embarcadero
San Francisco









The Only Constant is CHANGE

In the past fifty years transportation planners/engineers have:

Removed parking for safety

Removed trees for safety

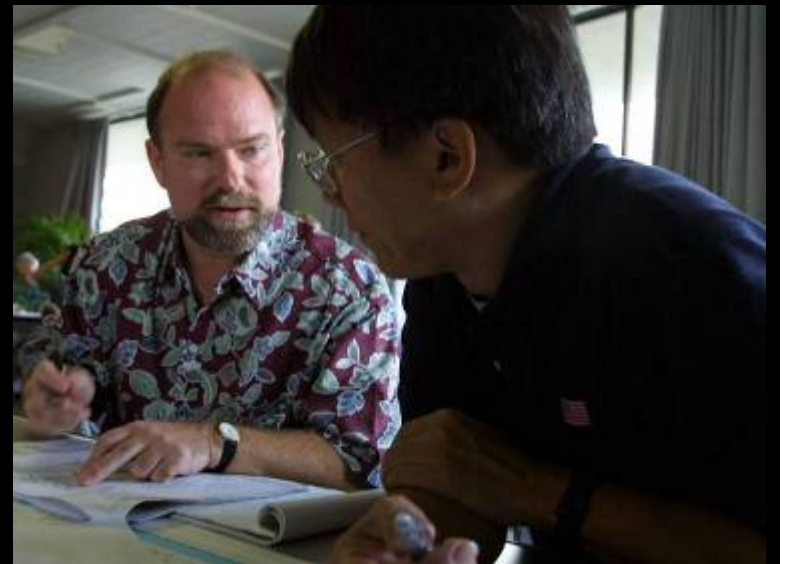
Added lanes for safety

Widened lanes for safety

Widened Intersections for safety the

Taken out sidewalks for added capacity

In the past traffic planners and engineers have been seen as villains leading to the decline of cities and quality of life.



The Only Constant is CHANGE

In the **next** fifty years transportation planners/engineers **will**:

Add parking for safety

Add trees for safety

Remove lanes for safety

Narrow lanes for safety

Narrow Intersections for safety

Add sidewalks for added capacity

*In the **future** traffic planners and engineers will be seen as **heroes** and **heroines** leading to the **rise** of cities and quality of life.*



What influences a driver's selected speed?

- Driver

- **Balance of expedience/safety**
- Familiarity with the road
- Emotional condition
- Personality
- Skill
- Late or on time
- Urgency of trip
- **Presence and/or history of enforcement**



What influences a driver's selected speed?

- Form (cont'd)
 - Adjacent land use/development
 - Length of Trip
 - Pavement type
 - Shoulder width



What influences a driver's selected speed?

- **Form**

- **Road geometrics**
 - Road width
 - Lane width
- **Vehicle parking**
- **Traffic volume (Including presence of Pedestrians & Bicycles)**



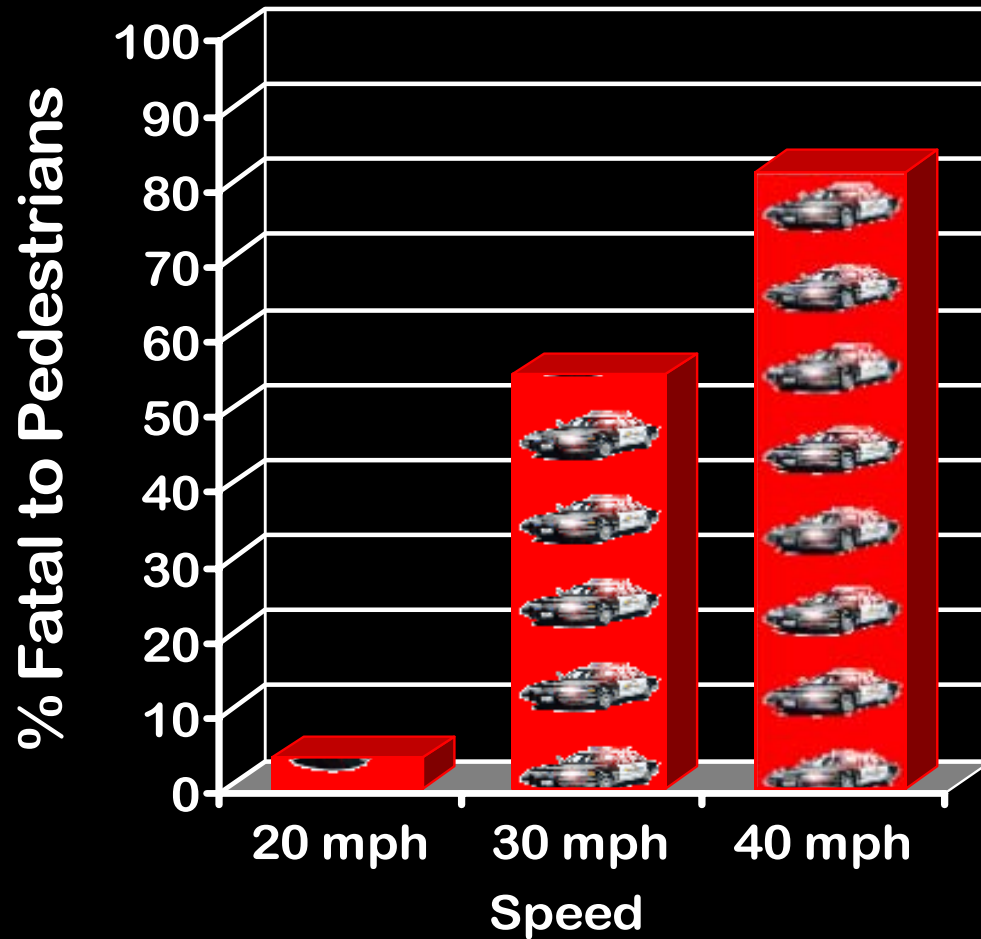
Driver Expectation



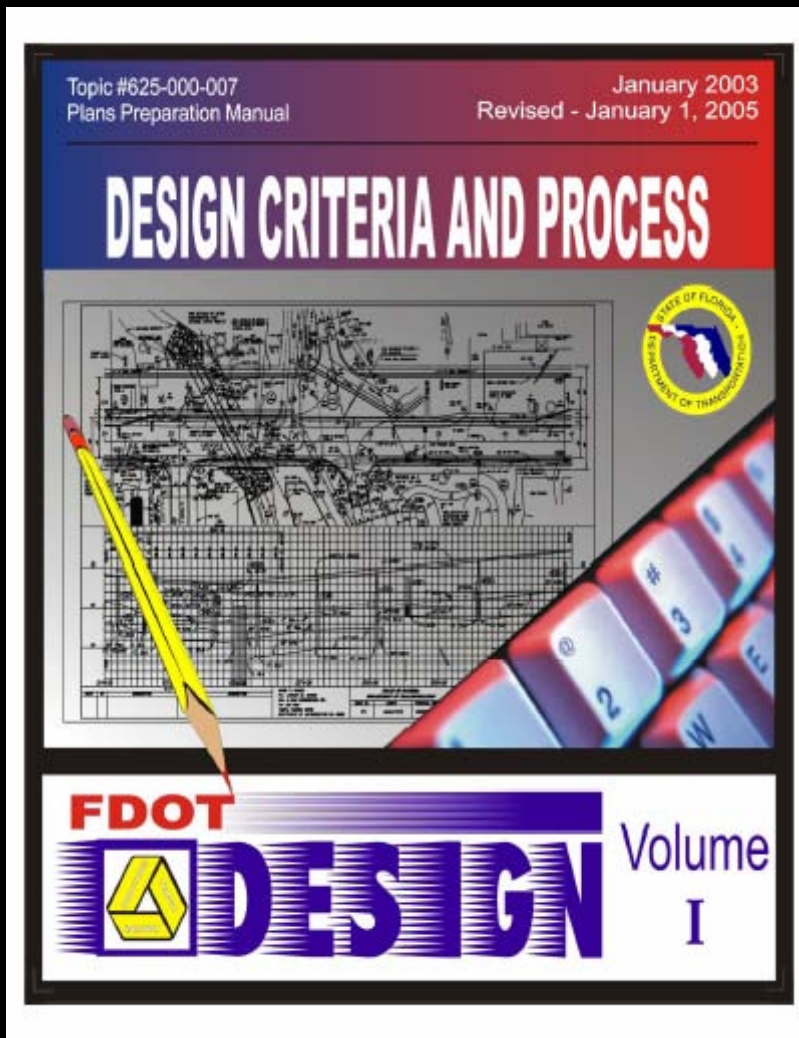
Speed (averages 42 mph in 30 mph zones)



Pedestrian Fatalities & Speed



FDOT Plans Preparation Manual



Chapter 21 – Transportation Design for Livable Communities

21.5.3 Lane Widths

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

Table 21.1 Lane Widths

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

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

FDOT “Green Book”

*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
TALLAHASSEE, FLORIDA*

*MAY 2002
EDITION*

- Residential Street Design
- Traffic Calming



A POLICY ON GEOMETRIC DESIGN OF



HIGHWAYS AND STREETS

2001



FOURTH EDITION

AMERICAN ASSOCIATION OF STATE HIGHWAY
AND TRANSPORTATION OFFICIALS

Transportation Design

Real Comments

- DOT Agency staff:
“The Department will not compromise vehicle capacity to accommodate pedestrians”
- County staff:
“Our policy does not allow roundabouts on arterials”
- City staff:
“I won’t reduce lane widths and get someone killed”

Tools to Design for New Urbanism

- SmartCode
- ITE/FHWA/EPA/CNU Design of Major Urban Thoroughfares

SMARTCODE & MANUAL

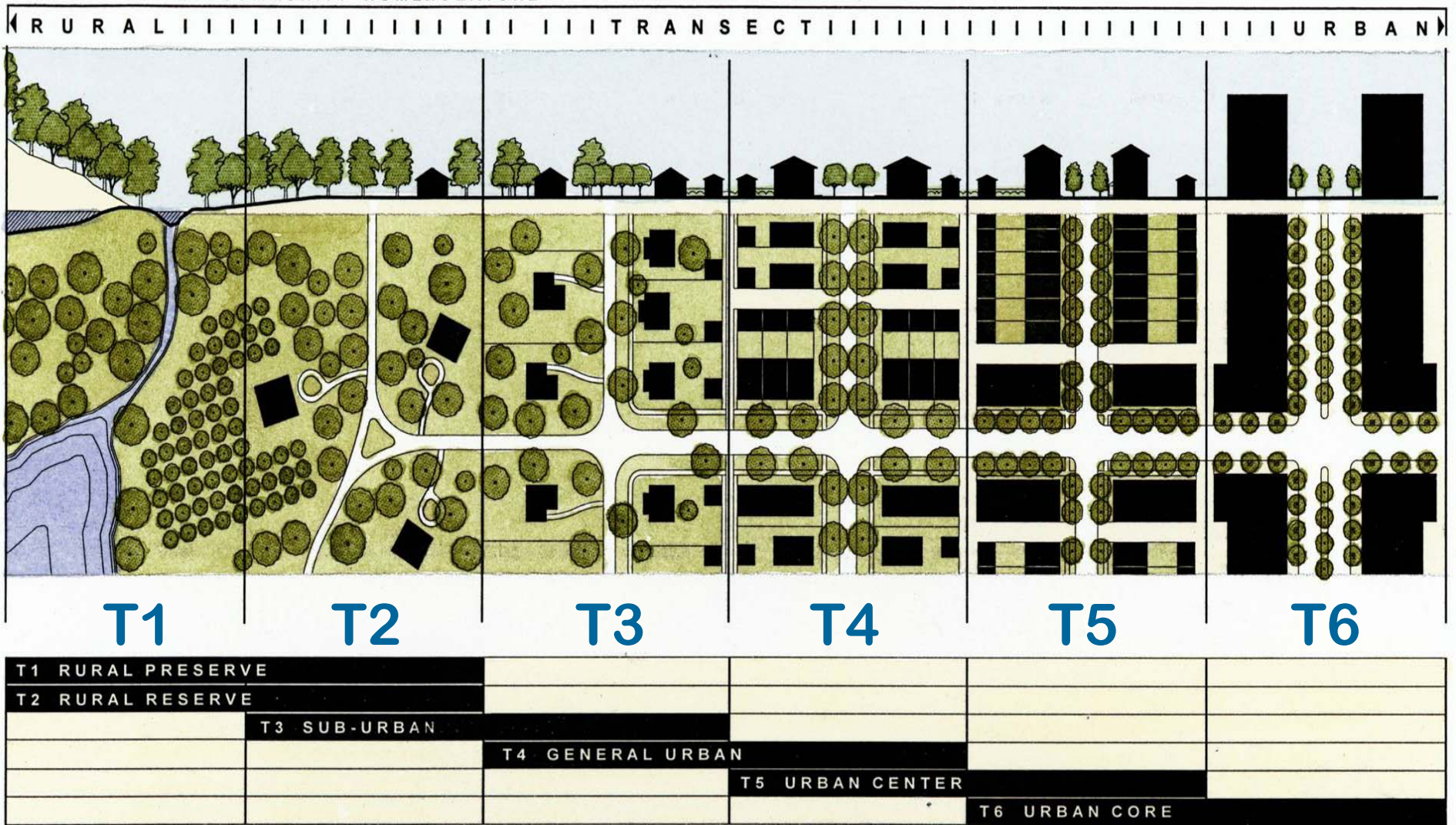


Includes the complete SmartCode v8.0

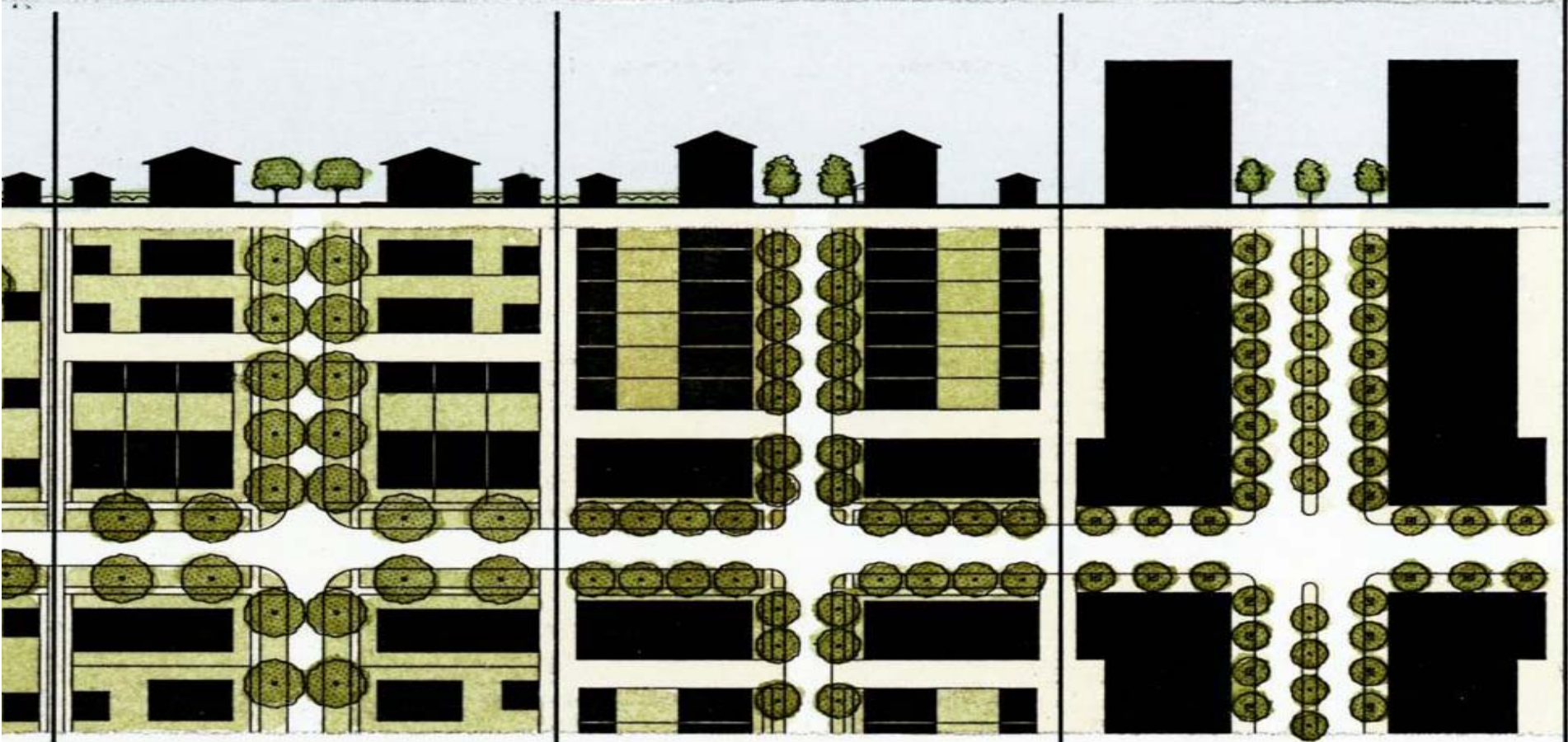
<http://www.placemakers.com/info/SCdownloads.html>

- **Conventional zoning codes are based primarily on use and density.**
- **The SmartCode is considered a "form-based code"**
 - **Addresses the physical form of building and development.**
- **The SmartCode is a unified land development ordinance**
 - **Combines zoning, subdivision regulations, urban design (including street design), and architectural standards**

The Transect – A Classification System



S E C T I O N I U R B A N



T4

T5

T6

T-4 General Urban

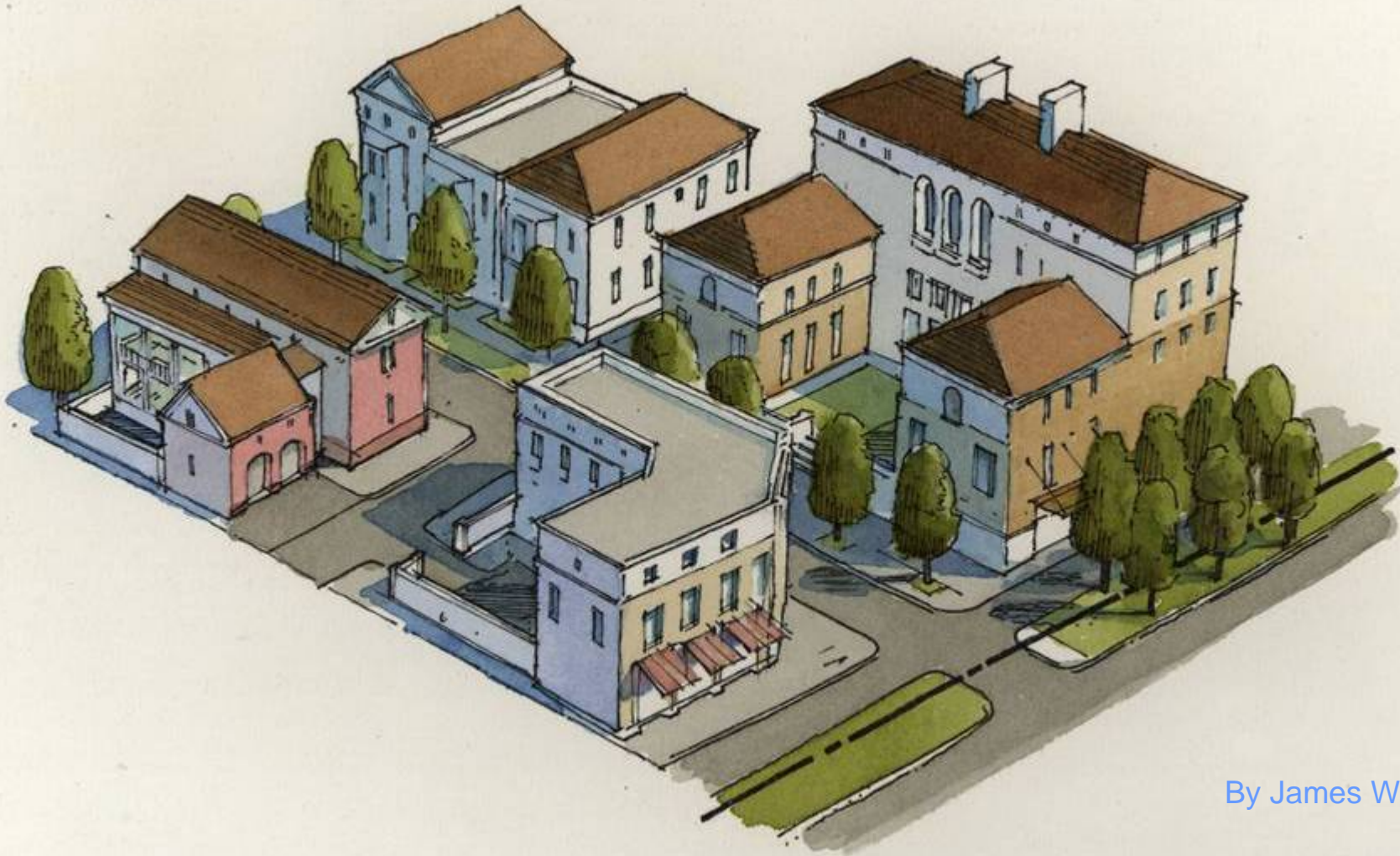


By James Wassell

T-4 General Urban



Urban Center

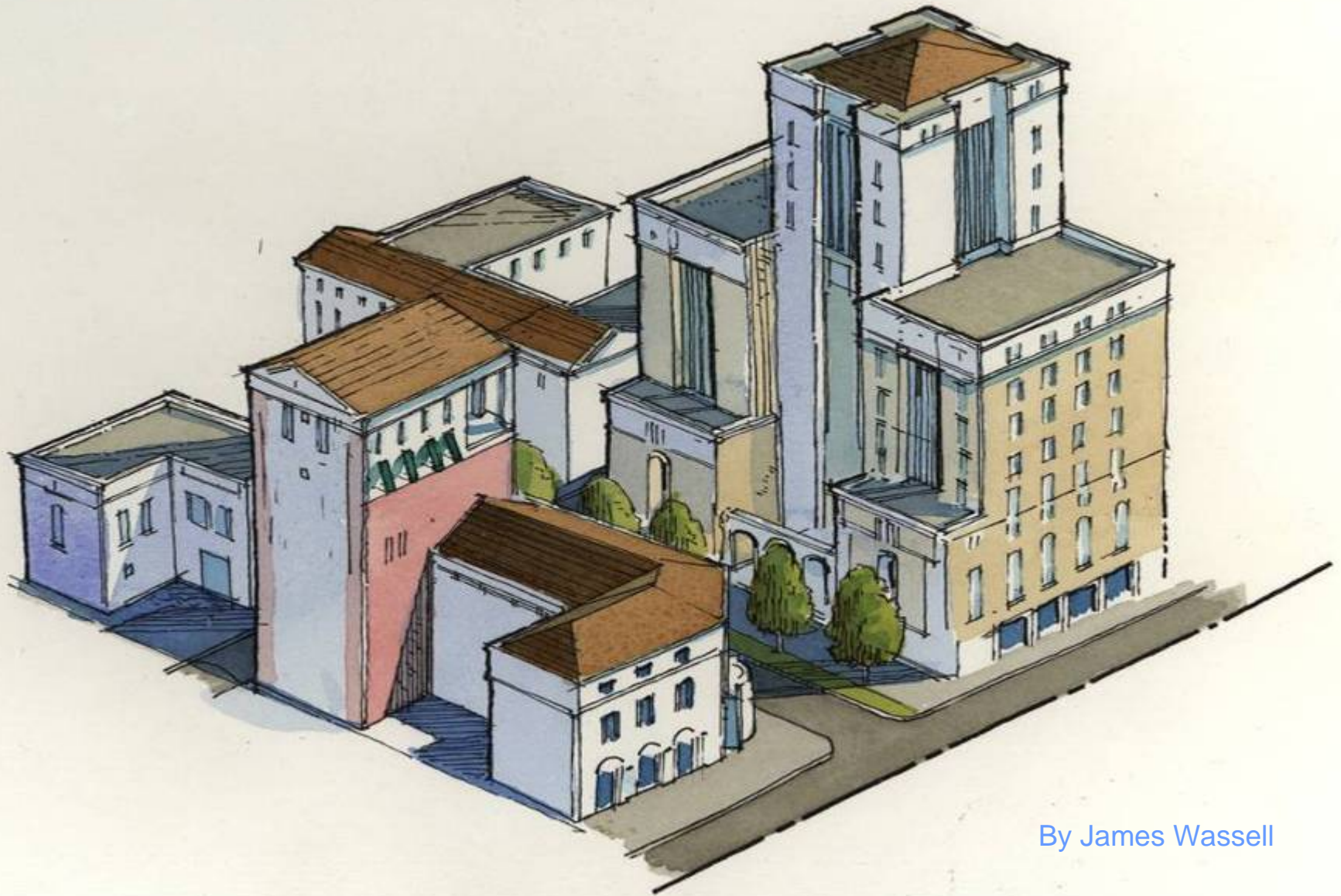


By James Wassell

Urban Center



Urban Core



By James Wassell

Urban Core



Vehicular Lane Standards

6.7.1 Travel Lane Width		Design Speed	T1	T2	T3	T4	T5	T6
8 feet	Very Low	▪	▪	▪	•			
9 feet	Low	▪	▪	▪	▪	•	•	
10 feet	Moderate	▪	▪	▪	▪	▪	▪	
11 feet	Moderate	▪	▪			▪	▪	
12 feet	High	▪	▪			•	•	

6.7.2 Parking Lane Width		Design Speed	T1	T2	T3	T4	T5	T6
(Angle) 18 feet	Varies						▪	▪
(Parallel) 7 feet	Very Low / Low			▪	▪			
(Parallel) 8 feet	Moderate			▪	▪	▪	▪	
(Parallel) 9 feet	High							▪

6.7.3 Inside Turning Radius		Design Speed	T1	T2	T3	T4	T5	T6
5-10 feet	Very Low				▪	▪	▪	▪
10-15 feet	Low	▪	▪	▪	▪	▪	▪	▪
15-20 feet	Moderate	▪	▪	▪	▪	▪	▪	▪
20-30 feet	High	▪	▪			•	•	•

By Exception

Creating a True Multi-Way Boulevard



Steve Price – Urban Advantage













Creating a True Multi-Way Boulevard





Creating a True Multi-Way Boulevard



Livable Communities Workshops

Learn about transportation & safety & their role in achieving sustainable, livable, active communities.



Hosted by:

Florida Department of Transportation
FSU's Department of Urban and Regional Planning

FREE REGISTRATION

CONTINUING EDUCATION CREDITS ARE AVAILABLE

Workshops open to transportation & other professionals, elected and appointed officials, and the general public

Trainers:

Dan Burden, Senior Urban Designer, Glatting-Jackson, and
Executive Director of Walkable Communities, Inc.
Billy Hattaway, P.E., Vice President, Hall Planning & Engineering
Former FDOT State Design Engineer

Registration: 8:00 (4:30 end)

Fort Walton Beach	January 20
Sarasota	February 3
Orlando	February 10
Marco Island	June 26
Ft. Myers	June 27
Tampa	June 28
Jacksonville	August 8
Milton	August 10

Register On-Line today at www.fsu.edu/~durp/
Register early!!! All courses have capacity limits.

Contact:

Stephanie Striefel at sstriefel38@yahoo.com for more information.

Marco Island	June 26
Ft. Myers	June 27
Tampa	June 28
Jacksonville	August 8
Milton	August 10

<http://www.fsu.edu/~durp/>

Tort Liability

- "The intent of the policy in the "Green Book" is to provide guidance to the designer by referencing a recommended range of values – not a single value
- Our main concern as designerslies with the end product: auto accidents, pedestrian and bicyclist safety,...

Tort Liability

- Agency has a duty to the motorist, the pedestrian, and the bicyclist.
- Plaintiff has to prove that the agency violated that duty through negligence.

Tort Liability

- **Exceptions –**
 - You have considered issues raised by the public.
 - Your decision doesn't have to be the correct one
 - It has to be based upon some logic.
 - Decision has got to be documented and included in your files.

Tort Liability

- **Documentation - the court will not substitute its judgment for that of a transportation agency**
- **The court will not second-guess your decision to design a roadway or an element of a roadway in a certain manner, unless....**
- **that decision is simply outrageous and not based on any conceivable factual scenario or guidelines.**

Tort Liability

In conclusion:

- In terms of liability.....transportation professionals are given much more discretion
- Use logic and stay generally within the guidelines of your own standards, but don't hesitate to use innovative thinking

Tort Liability

In conclusion: (cont'd)

- Documentation of your decisions is going to help keep you out of trouble
- Adopt a recognized practice such as Smart Code, ITE Guidelines, etc.

Planning Issues

Establishing Guidelines for Mid-block Crosswalks at Uncontrolled Locations



Martin Guttenplan, AICP
Florida Department of
Transportation

Florida Greenbook
Committee Meeting

Xuehao Chu
Center for Urban
Transportation Research

Motivation for Research

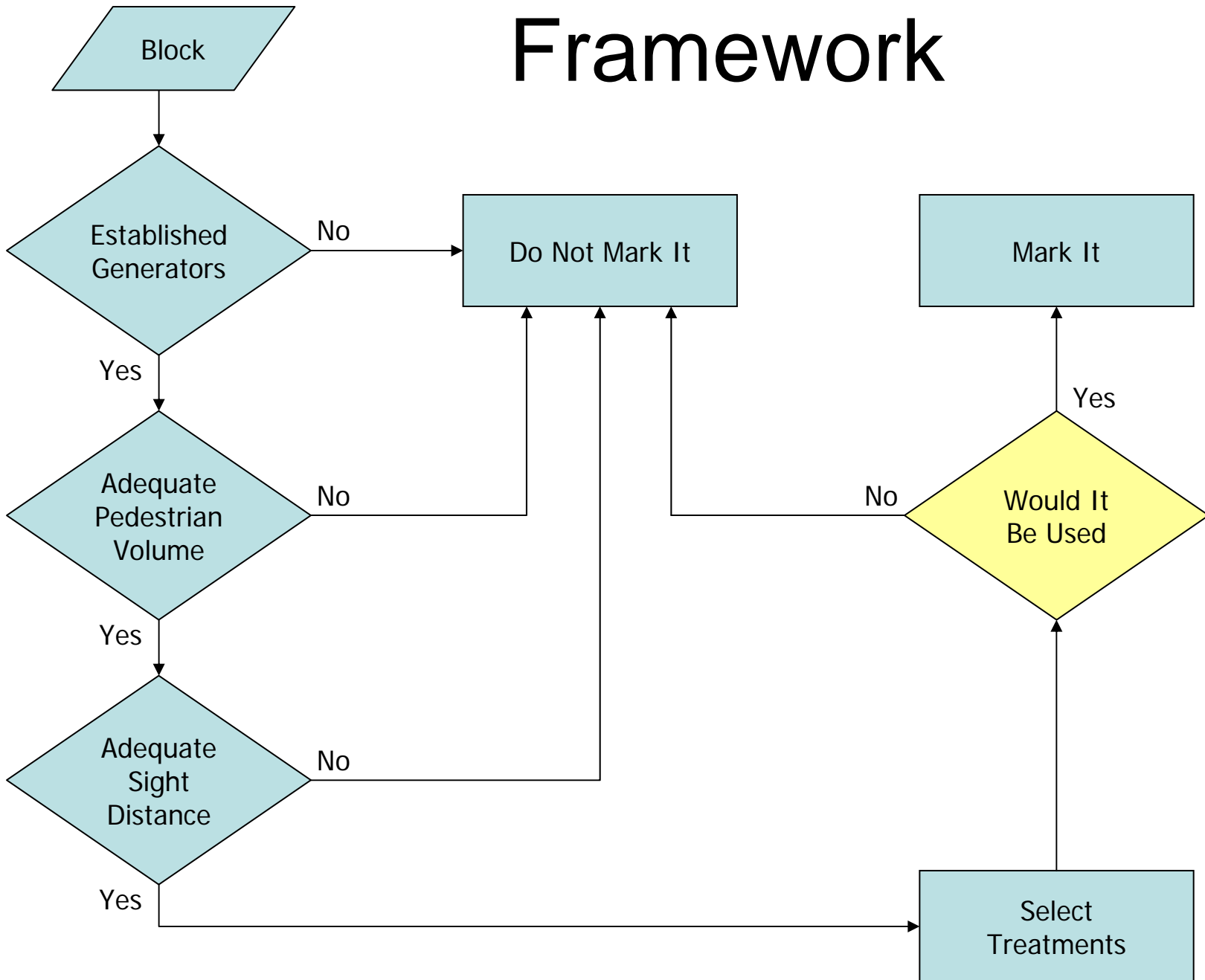


- Mid-blocks represent 70% of ped injuries from road crossing
- Mid-block injuries more severe
- Mid-block share of injuries increasing over time
- Mid-block fatality risk increasing over time relative to fatality risk at intersections

Objectives

- Develop a set of guidelines for placing mid-block crosswalks at uncontrolled locations on the State Highway System
- Develop a spreadsheet template for estimating the likelihood of a mid-block crosswalk being used by pedestrians

Framework



Would
It Be
Used?

Block Characteristics	
Block Length : <input type="text" value="1000"/> ft	Traffic Volume : <input type="text" value="800"/> vph
Roadside Characteristics	
<u>Nearside</u>	<u>Farside</u>
Nearside Shoulder Width : <input type="text" value="0"/> ft	Farside Shoulder Width : <input type="text" value="0"/> ft
Nearside Sidewalk Width : <input type="text" value="5"/> ft	Farside Sidewalk Width : <input type="text" value="5"/> ft
Intersection Characteristics	
<u>Upstream (Left)</u>	<u>Downstream (Right)</u>
Traffic Signal : <input type="text" value="1"/>	Traffic Signal : <input type="text" value="1"/>
Pedestrian Signal : <input type="text" value="1"/>	Pedestrian Signal : <input type="text" value="1"/>
Crosswalk Marking : <input type="text" value="1"/>	Crosswalk Marking : <input type="text" value="1"/>
Pedestrian Crossing Pattern and Midblock Crosswalk Location	
Start Point (distance from left int.) : <input type="text" value="250"/> ft	End Point (distance from left int.) : <input type="text" value="750"/> ft
Midblock Crosswalk (Distance from Upstream Intersection): <input type="text" value="500"/> ft	
Cross-sectional Characteristics	
<u>Median Type</u>	<u>Road Width</u>
Upstream Intersection : <input type="text" value="No Median"/>	Upstream Intersection : <input type="text" value="62"/> ft
Downstream Intersection : <input type="text" value="No Median"/>	Downstream Intersection : <input type="text" value="62"/> ft
Origin Point : <input type="text" value="No Median"/>	Origin Point : <input type="text" value="62"/> ft
Destination Point : <input type="text" value="No Median"/>	Destination Point : <input type="text" value="62"/> ft
Midblock Crosswalk : <input type="text" value="Concrete"/>	Midblock Crosswalk : <input type="text" value="62"/> ft
% pedestrians crossing from the Start Point to the End Point expected to use the midblock crosswalk : 45.63%	

Why People Cross Where They Do Research

- How and when might a pedestrian go to a crosswalk at mid-block locations?
- How and when might a pedestrian go to an intersection?
- Where should bus stops be located so that riders are more likely to choose safe crossing options to access them?

Crossing Scenario

- Street environment
- Origin and destination of the crossing
- Crossing options available



Logistics

- 48 sites, representative of all public roads classified as collector or above
- 86 participants
- 4 survey days with variation by
 - Day of week
 - Hour of day (am peak, mid-day, pm peak)
- On each survey day
 - 20 participants
 - 10 sites
 - 2 buses, each carrying 10 participants
 - Each bus visiting 6 sites
 - Each participant spending 5-6 hours

Conclusions: *Intersections*

- People more likely to cross at intersection with traffic or pedestrian signal
- Most influential factors:
 1. Pedestrian signals
 2. Marked crosswalks
 3. Traffic signals
- Crossing at an intersection is highly responsive to increases in roadside walking distance.
 - 1% increase in distance reduces probability of that intersection being chosen by 1.5 -1.9%
- Crossing distance has little influence on the decision to cross at an intersection

Conclusions: *Mid-Block*

Crossing at mid-block marginally responsive to:
roadside walking distance,
followed by traffic volume and
increases in crossing distance.

Increases in crossing distance have the largest impact
on jaywalking followed by intersection crossing and
then mid-block crossing

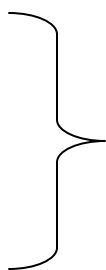
Increases in crossing distance are twice as likely to
reduce jaywalking as increases in traffic volume

Increases in crossing distance have greatest impact on
jaywalking and least on mid-block

Conclusions: *Mid-Block and Intersections*

- People are more likely to cross at a location if it has a marked crosswalk
- Presence of a marked crosswalk is more influential at an intersection than mid-block
- Increases in roadside walking distance impacts crossing at an intersection many times more than mid-block

Process for Developing Guidelines

- CUTR & FDOT Established Steering Committee
 - CUTR Review of Existing Guidelines
 - CUTR Recommendation of Criteria & Thresholds
 - Steering Committee Discussion and Recommendation
 - *CUTR Draft Guidelines*
 - *Steering Committee Feedback*
 - *CUTR Revise Guidelines*
- 
- To be done.*

Steering Committee

- **FDOT Central Office – Planning**
- **FDOT Central Office – Safety**
- **FDOT Central Office – Design**
- **FDOT District 7 – Pedestrian Coordinator**
- **FDOT District 7 – Project Development**
- **City of St Petersburg**
- **HARTline**
- **Alachua County**

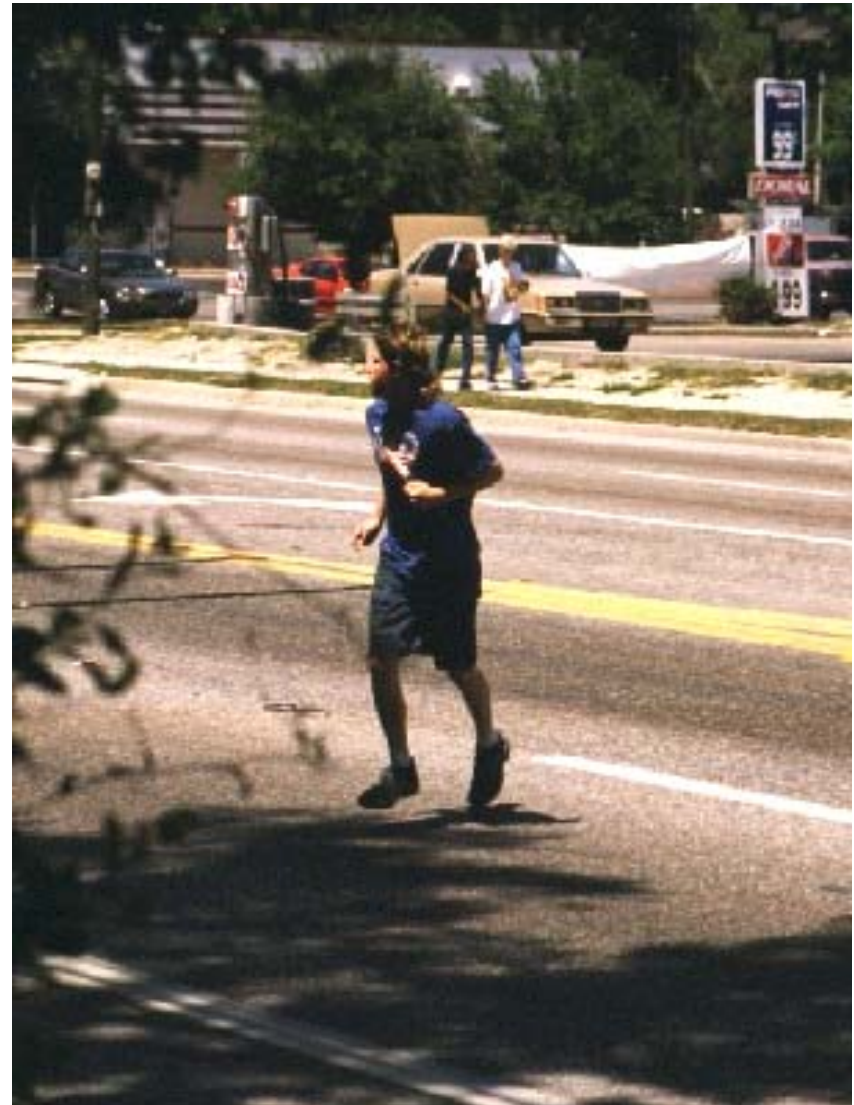


Existing Guidelines

- *Florida Greenbook* – Chapter 9, little on mid-block crosswalks
- *Plan Preparation Manual* – Newly added section 8.3.3.1 on mid-block crosswalks at uncontrolled locations
- *Florida Traffic Engineering Manual* – section 4.1
- *Florida Pedestrian Planning and Design Handbook* – Chapters 9, 12
- 10 other states
- 12 cities

Components of Guidelines

- Philosophy
- Demand
- Safety
- Treatments
- Linking Safety and Treatments
- Responsibilities



Philosophy

Existing Guidelines

- **Exclusion**—Crosswalks shall only be placed at intersections (Edina, Minnesota)
- **Discouragement**—Installations of mid-block crosswalks are discouraged (Oregon)
- **Encouragement**—It encourages pedestrian travel by providing safe and efficient roadway crossing opportunities (Boulder, Colorado).
- **Inclusion**—Do not exclude any conditions for mid-block crosswalks (San Jose, California)

Philosophy

Committee Recommendation: **Inclusive**

For locations with adequate sight distance & established crossing demand, select treatments (including ped signal) to ensure reasonable safety even with high speed and volume locations.



Demand

Existing Guidelines

Level of Demand		Distance to Alternatives		Crossing Opportunities	
Pedestrian Volume	Generators	Block Length (feet)	Distance to Nearest Alternative (feet)	Min Traffic Volume (ADT)	Max Gaps
<ul style="list-style-type: none"> ◆ 10-40/h ◆ 60-100/4h 	<ul style="list-style-type: none"> ◆ No for Most ◆ Alternative ◆ Required 	500-660	100-300	1500-3000	Rarely used

Demand

Committee Recommendation

Level of Demand		Distance to Alternatives		Crossing Opportunities	
Pedestrian Volume	Generators	Block Length (feet)	Distance to Nearest Alternative (feet)	Min Traffic Volume (ADT)	Max Gaps
<ul style="list-style-type: none"> ♦ 25/h ♦ 75/4h 	Required	600	300		
<ul style="list-style-type: none"> ♦ Measure volume between generators; ♦ Waived if part of a multi-use path 			Any protected crossing: stop signs, signals, etc.	Consider for county/municipal roads	Difficult to measure

Note: Pedestrian volume is measured for all crossing locations along a block, including intersections.

Safety

Existing Guidelines

Sight Distance	Lighting	Traffic Speed (mph)		Roadway Width	Traffic Volume
		85 th Percentile	Speed Limit		
<ul style="list-style-type: none"> ◆ Adequate ◆ 200-250ft ◆ 8-10* Limit ◆ Table 	<ul style="list-style-type: none"> ◆ None ◆ Adequate ◆ Streetlight 	≤35-45	≤35-45		
Used as disqualifying factors		<p>Two alternative approaches to using these criteria:</p> <ol style="list-style-type: none"> 1. Disqualifying factors; 2. Defining safety conditions for selecting treatments 			

Safety

Committee Recommendation

Sight Distance	Lighting	Traffic Speed (mph)		Roadway Width	Traffic Volume
		85 th Percentile	Speed Limit		
PPM Table with 10-mph shift	<ul style="list-style-type: none"> ♦ 2.5 hfc; ♦ Solar-based if infeasible 	Defining safety conditions for selecting treatments			
<ol style="list-style-type: none"> 1. Disqualifying factors; 2. When street parking present, use a bulbout or restrict parking 		These safety conditions are defined through a Table that was recently developed from a national study			

Stopping Sight Distance (Grades 2% or Less)

Design Speed (mph)	Speed Limit (mph)	Stopping Sight Distance (feet)
25	15	155
30	20	200
35	25	250
40	30	305
45	35	360
50	40	425
55	45	495
60	50	570
65	55	645

Safety

Committee Recommendation

Sight Distance	Lighting	Traffic Speed (mph)		Roadway Width	Traffic Volume
		85 th Percentile	Speed Limit		
PPM Table with 10-mph shift	<ul style="list-style-type: none"> ♦ 2.5 hfc; ♦ Solar-based if infeasible 	Defining safety conditions for selecting treatments			
<ol style="list-style-type: none"> 1. Disqualifying factors; 2. When street parking present, use a bulbout or restrict parking 		These safety conditions are defined through a Table that was recently developed from a national study			

Table of Safety Conditions

Traffic Volume	Speed Limit (mph)	2-Lanes	3-Lanes	4+ Lanes With Raised Median	4+ Lanes Without Raised Median
ADT ≤ 9,000	≤30				
	35				
	≥40				
9000 < ADT ≤ 12,000	≤30				
	35				
	≥40				
12,000 < ADT ≤ 15,000	≤30				
	35				
	≥40				
ADT > 15,000	≤30				
	35				
	≥40				

Treatments

Existing Guidelines

Basic Treatments	Enhancements
<ul style="list-style-type: none">• Standard marking• High visibility marking• Advance pedestrian crossing sign• Street lighting	<ul style="list-style-type: none">• High visibility marking• Advance pedestrian crossing sign• Overhead signs• Electronic signs• Flash beacons• In-roadway warning lights• Automated detection• Crosswalk lighting• Yield lines/safety zones• Refuge islands• Raised medians• Pedestrian signals• Pedestrian bridges/tunnels

Treatments

Committee Recommendation

Basic Treatments	Enhancements
<p data-bbox="199 695 651 743">All of These Five:</p> <ol data-bbox="199 824 1024 1255" style="list-style-type: none"><li data-bbox="199 824 861 873">1. High visibility marking<li data-bbox="199 881 877 930">2. Street lighting ≥ 2.5 hfc<li data-bbox="199 946 1024 1060">3. Advance pedestrian crossing sign<li data-bbox="199 1076 756 1190">4. Sidewalks to/from generators<li data-bbox="199 1206 898 1255">5. Yield lines/safety zones	<ul data-bbox="1071 613 1843 1344" style="list-style-type: none"><li data-bbox="1071 613 1522 662">• Overhead signs<li data-bbox="1071 686 1528 735">• Electronic signs<li data-bbox="1071 760 1486 808">• Flash beacons<li data-bbox="1071 833 1822 881">• In-roadway warning lights<li data-bbox="1071 906 1675 954">• Automated detection<li data-bbox="1071 979 1602 1027">• Crosswalk lighting<li data-bbox="1071 1052 1501 1101">• Refuge islands<li data-bbox="1071 1125 1528 1174">• Raised medians<li data-bbox="1071 1198 1596 1247">• Pedestrian signals<li data-bbox="1071 1271 1843 1320">• Pedestrian bridges/tunnels



DEC 7 2005

Link Safety and Treatments

No Link: City of Palo Alto, CA

1. **Traffic Volumes** - No more than 12,000 vehicles per day.
2. **Speed** - 85th percentile speed no greater than 40 mph.
3. **Pedestrian Volume** - Minimum of 40 pedestrians per hour or 25 pedestrians per hour for each of 4 hours.
4. **Location** - Midway between stop or signal controlled intersections.
5. **Types of Treatment** - Special enhanced treatments include one or more of the following will be implemented at all qualifying mid-block crosswalks: raised crosswalks, bulbouts, median refuges, and actuated warning systems.

Link Safety and Treatments

Partial Link: Oregon

Mid-block crosswalks often do not get good compliance from motorists. Only consider mid block crosswalks when an engineering study demonstrates their need and the location meets the following criteria:

1. There is good visibility of the crosswalk. Stopping sight distance is a minimum.
2. Posted speed 35 mph or less.
3. No reasonable alternative at a stop-controlled intersection.
4. There is established pedestrian usage, (see ITE suggested pedestrian volume thresholds), Lower pedestrian volumes acceptable for less experienced and less agile pedestrians
5. Locations more than 300 feet to nearest crossing or marked crosswalk.
6. Volumes less than 10,000 ADT or if above 10,000 ADT raised median islands should be included.
7. Pedestrian crossing enhancements (curb extensions and/or pedestrian refuges) should be considered.

Link Safety and Treatments

Full Link: example of min enhancements

Traffic Volume	Speed Limit (mph)	Roadway With			
		2-Lanes	3-Lanes	4+ Lanes With Raised Median	4+ Lanes Without Raised Median
ADT ≤ 9,000	≤30		RI		RM,RI,CL
	35	RI	RI		RM,RI,CL
	≥40	RI,FB,CL	RI,CL	CL	RM,RI,CL
9000 < ADT ≤12,000	≤30		RI	OS	RM,RI,OS,CL
	35	RI	RI	OS	RM,RI,OS,CL
	≥40	RI,CL,FB	RI,CL,FB,ES	OS,CL,FB,ES	RM,RI,OS,CL,FB

- OS=Overhead signs
- ES=Electronic signs
- FB=Flash beacons
- IL=In-roadway warning lights
- AD=Automated detection

- CL=Crosswalk lighting
- RI=Refuge islands
- RM=Raised medians
- PS=Pedestrian signals
- BT=Pedestrian bridges/tunnels

Link Safety and Treatments

Full Link: example of min enhancements

Traffic Volume	Speed Limit (mph)	Roadway With			
		2-Lanes	3-Lanes	4+ Lanes With Raised Median	4+ Lanes Without Raised Median
12,000 < ADT ≤ 15,000	≤30	RI,IR	RI,IR	OS,IR	RM,RI,OS
	35	RI,RI	RI,IR	OS,CL,ES	RM,RI,OS,CL,ES
	≥40	RI,OS,CL,FB	RI,OS,CL,FB,ES	OS,CL,FB,ES	RM,RI,OS,FB,ES
ADT > 15,000	≤30	RI,IR,CL	RI,IR,CL	OS,CL	RM,RI,OS,CL
	35	RI,OS,IR,CL,FB	RI,OS,IR,CL,FB	OS,CL,FB,ES	RM,RI,OS,CL,FB,ES
	≥40	RI,OS,CL,FB	RI,OS,CL,FB,ES	OS,CL,FB,ES	RM,OS,CL,FB,ES

- OS=Overhead signs
- ES=Electronic signs
- FB=Flash beacons
- IL=In-roadway warning lights
- AD=Automated detection

- CL=Crosswalk lighting
- RI=Refuge islands
- RM=Raised medians
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Responsibilities

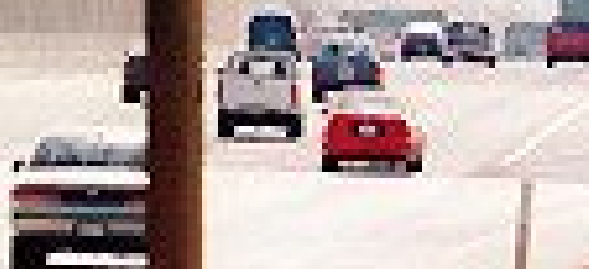
Committee Recommendation

- **The requester is responsible for having a mid-block crosswalk study arranged and completed according to FDOT standards**
- **FDOT would determine if the study met its standards**
- **Using the new guidelines, FDOT would:**
 - **decide if the location has established demand,**
 - **adequate sight distance and if so,**
 - **what treatments should be made.**

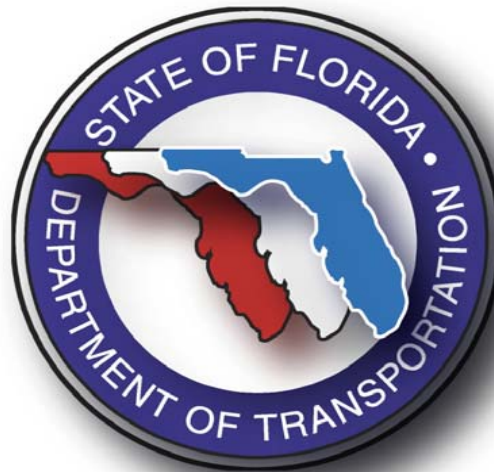
CAUTION



International Border
Frontera Internacional
1 1/2 mi / 2 km



2025 Florida Transportation Plan: Moving Together



***Florida Greenbook Advisory
Committee Meeting***

March 7, 2006

What is the Florida Transportation Plan?

- ◆ Policy framework for the expenditure of State and Federal transportation funds (over \$150 billion)
- ◆ Long range goals and objectives for the State Transportation System
 - ✓ Policy, not project plan
- ◆ Statewide in scope, not just FDOT
- ◆ Defines the roles and responsibilities of the various agencies that implement these decisions

2020 FTP

- ◆ 2020 FTP adopted in December 2000
- ◆ The FTP was updated in 2005 to reflect and respond to:
 - ✓ Changes affecting transportation system and travel needs
 - ✓ Changes in social, economic, and environmental factors
 - ✓ New trends and technologies

Public and Partner Outreach

- ◆ FTP Steering Committee
 - ✓ Six meetings between January and September 2005
- ◆ Two Statewide Summits
 - ✓ February and August 2005
- ◆ Fourteen Regional Forums
 - ✓ May 2005
- ◆ Focus Groups
- ◆ Partner Briefings
 - ✓ Continuous during 2005
- ◆ Website

Steering Committee: Local Officials

- ◆ Susan Haynie, Boca Raton Council Member
- ◆ Teresa Jacobs, Orange County Commissioner
- ◆ Richard Kaplan, Mayor of Lauderhill
- ◆ Walter Kelley, Mayor of Lynn Haven
- ◆ Bruce Maguire, St. Johns County Commissioner
- ◆ Deborah Martohue, St. Pete Beach Commissioner
- ◆ Linda Myers, Putnum County Commissioner
- ◆ Bob Rackleff, Leon County Commissioner
- ◆ Lilly Rooks, Levy County Commissioner
- ◆ Beverly Zimmern, Gulf Breeze City Commissioner

2025 Florida Transportation Plan

- ◆ Includes five goals:
 - ✓ Safety/Security
 - ✓ Quality of Life and Environmental Stewardship
 - ✓ System Maintenance and Preservation
 - ✓ Mobility
 - ✓ Sustainable Funding for the Future
- ◆ Plan available at <http://www.ftp2025.com>

Implementing 2025 FTP

- ◆ FTP Steering Committee identified:
 - ✓ Long range goals/objectives
 - ✓ Implementation responsibility
 - ✓ Key implementation strategies
 - General, not prescriptive (not experts)
- ◆ Over next years Department will be working with partners to:
 - ✓ Develop more specific strategies for implementing the 2025 FTP
 - ✓ Monitor/measure performance

Implementing 2025 FTP: FDOT

- ◆ Drafted FDOT Implementation Action Plan:
 - ✓ Lead role
 - ✓ Shared/supportive role
- ◆ Will update Short Range Component
 - ✓ Objectives, strategies, performance measures
- ◆ Address Key New Areas:
 - ✓ Statewide criteria for identifying and developing new SIS facilities (e.g., corridors)
 - Governor/Secretary priority area
 - ✓ Gap between funding and needs documented in a consistent and compatible format

Implementing 2025 FTP: FDOT

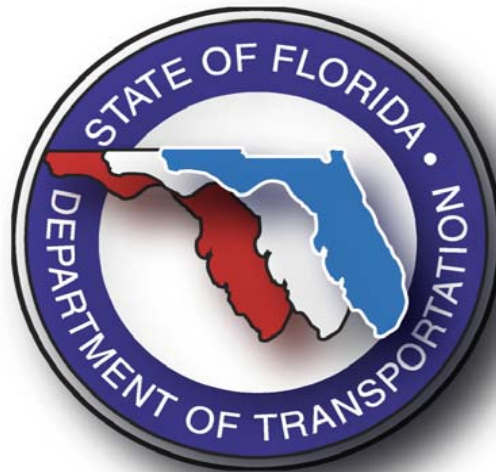
- ◆ Address Key New Areas (continued):
 - ✓ Regional visions and action plans to guide transportation investments and decision making
 - Central FL regional growth vision initiative
 - Partnership with DCA, FDOT, MPO Alliance, RPC
 - FDOT: develop prototype applying regional visioning and coordination re: 2025 FTP, Growth Mgt bill, etc.

Implementing 2025 FTP: Partners

- ◆ MPOAC Committee of Board Members:
 - ✓ Develop 2025 FTP implementation action plan
- ◆ Enterprise Florida – Strategic Plan for Economic Development
 - ✓ Strategies to support 2025 FTP
 - Facilitate economic development in economically distressed areas
 - Regional visions and action plans
 - Criteria for new transportation corridors to support economic growth, environmental stewardship

Implementing 2025 FTP: Partners

- ◆ Outreach to Other Partners :
 - ✓ Modal organizations
 - ✓ Local organizations (e.g., League of Cities, Association of Counties)
 - ✓ Etc.
- ◆ All Partners - convene periodically to:
 - ✓ Coordinate implementation
 - ✓ Review progress in implementing the Plan
 - ✓ Address emerging or other issues



2025 FTP: Safety and Security

- ◆ Goal: A safer and more secure transportation system for residents, businesses and visitors

- ◆ Four long range objectives:
 - ✓ ***Improve safety*** -- Improve the safety of all modes of transportation comprising Florida's transportation system, for all users, including roadway intersections and locations where modes intersect.

 - ✓ ***Reduce fatalities/injuries*** -- Reduce the rates of motor vehicle, bicycle and pedestrian fatalities and serious injuries through design techniques and the application of the "4 E's" -- engineering, education, enforcement and emergency response strategies

2025 FTP: Safety and Security

- ◆ Four long range objectives (cont.):
 - ✓ ***Make strategic safety investments*** -- Focus resources proactively where opportunities for safety improvements are greatest, as identified by best available data and trends.
 - ✓ ***Improve security*** -- Improve the security of Florida's transportation system to deter and respond to attacks on transportation facilities or domestic targets, while ensuring mobility for all users.

2025 FTP: Quality of Life

- ◆ Goal: Enriched quality of life and responsible environmental stewardship

- ◆ Seven long range objectives:
 - ✓ ***Enhance community livability*** -- Plan, develop and implement transportation facilities and services with communities and agencies to enhance the livability of communities. If enhancement is not possible, avoid or minimize adverse impacts to communities.

 - ✓ ***Conserve non-renewable resources*** -- Make transportation decisions that conserve and optimize non-renewable resources and promote the use of renewable resources (material, facilities, and sources of energy) and include strategies to decrease greenhouse gases and other pollutants.

2025 FTP: Quality of Life

- ◆ Seven long range objectives (cont.):
 - ✓ **Accommodate human scale** -- Plan, develop, implement, and fund the transportation system to accommodate the human scale, including pedestrian, bicycle, transit-oriented and other community-enhancing features unless inappropriate.
 - ✓ **Improve land use coordination** -- Improve coordination of land use and transportation decisions among state government, local governments, and MPOs to ensure that future growth is sustainable.
 - ✓ **Maximize use of existing infrastructure** -- Optimize the efficiency of Florida's transportation system by implementing operational, management, access, and land use strategies that support the intended use of each element of the system identified as part of evolving statewide, regional, or community visions

2025 FTP: Quality of Life

- ◆ Seven long range objectives (cont.):
 - ✓ **Use effective public involvement** -- Provide opportunities for early and continuing proactive public involvement in the transportation decision-making process, including easily understood and complete information, timely public notice, and full public access to key decisions.
 - ✓ **Preserve natural environment** -- Plan, design, and construct transportation facilities in a manner that preserves and, where feasible, restores the function and character of the natural environment and that avoids or minimizes and mitigates adverse impacts.

2025 FTP: System Maintenance and Preservation

- ◆ Goal: Adequate and cost-efficient maintenance and preservation of Florida's transportation assets
- ◆ Three long range objectives:
 - ✓ ***Maintain transportation system*** -- Maintain all elements of the transportation system to protect the public's investment for the future.
 - ✓ ***Eliminate illegal, overweight vehicles*** -- Eliminate the illegal operation of commercial vehicles that exceed weight limits on Florida's public roads and bridges
 - ✓ ***Use alternative modes*** -- Maximize the use of alternative, non-roadway modes to transport overweight and oversize loads.

2025 FTP: Mobility

- ◆ Goal: A stronger economy through enhanced mobility for people and freight
- ◆ Total 12 long range objectives organized by type of trip:
 - ✓ Mobility between Regions, States and Nations
 - ✓ Mobility within Regions
 - ✓ Mobility within Communities
- ◆ Five objectives: regions, states and nations -- SIS
 - ✓ ***Improve transfers between modes and facilities*** -- Provide for smooth and efficient transfers for both people and freight between transportation modes and between the SIS and other transportation facilities.

2025 FTP: Mobility

- ◆ Five objectives: regions, states and nations (cont.):
 - ✓ ***Reduce delay and improve reliability*** -- Reduce delay on and improve the reliability of SIS facilities.
 - ✓ ***Preserve new capacity for growth*** -- Preserve new capacity on the SIS for projected growth in trips between regions, states, and nations, especially for trips associated with economic competitiveness.
 - ✓ ***Provide modal alternatives*** -- Expand the use of modal alternatives to SIS highways for travel and transport trips between regions, states, and nations.
 - ✓ ***Set criteria for new hubs & corridors*** -- Establish statewide criteria for identifying and developing new SIS facilities where such facilities are needed to connect the economic regions of the state, especially economically distressed areas, coordinated with regional and community visions

2025 FTP: Mobility

- ◆ Two objectives: Mobility within Regions
 - ✓ ***Enhance regional coordination*** -- Develop regional visions and action plans that integrate transportation, land use, economic, community and environmental systems to guide transportation investments. Focus attention on meeting mobility needs within regions that transcend traditional jurisdictional boundaries, and ensuring connectivity between SIS, regional, and local facilities.
 - ✓ ***Facilitate economic development*** -- Facilitate economic development opportunities in Florida's economically distressed areas by improving transportation access from these regions to markets in a manner that reflects regional and community visions.

2025 FTP: Mobility

- ◆ Four objectives: Mobility within Communities
 - ✓ **Develop multimodal systems** -- Develop multimodal transportation systems that support community visions.
 - ✓ **Expand transportation choices** -- Expand transportation choices to enhance local mobility and to maintain the performance of the SIS and regionally significant corridors.
 - ✓ **Reduce travel by single-occupant vehicles** -- Reduce per capita vehicle-miles traveled by single occupant vehicles, especially during peak hours of highway use.
 - ✓ **Ensure accessibility for all** -- Ensure that the transportation system is accessible to all users, including young, elderly, disabled and economically disadvantaged persons.

2025 FTP: Sustainable Funding

- ◆ Goal: Sustainable transportation investments for Florida's future

- ◆ Four long range objectives:
 - ✓ **Reduce backlog & meet future needs** -- Provide sufficient resources to reduce the identified backlog in transportation needs and meet growth needs at the state, regional, and local levels.

 - ✓ ***Set transportation investment priorities*** -- Establish transportation investment priorities recognizing that the Strategic Intermodal System meets a strategic and essential state interest, and that regional and local systems must be adequately funded.

2025 FTP: Sustainable Funding

- ◆ Four long range objectives (cont.):
 - ✓ ***Reduce costs*** -- Reduce the cost of providing and operating transportation facilities.
 - ✓ ***Identify gap between funding and needs*** -- Document the gap between funding resources (local, regional, state, and federal) and needs across all levels and all modes in a consistent and compatible format.

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. Stemberge*, 278 So. 2d 288 (Fla. 3d DCA 1973). Meetings in defiance of the Sunshine Law are those that are “violative of the statute’s spirit, intent and purpose.” *Id.*

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

3. Individuals/Organizations Subject to the Sunshine Law

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

3(a). Advisory Boards or Committees

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

3(b). Staff Members

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

3(c). Purchasing or Bid Evaluation Committees

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

4. Notice Requirements

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

5. Consequences for Failure to Comply

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

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

6. Conclusion

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

**FLORIDA DEPARTMENT OF TRANSPORTATION
GOVERNMENT IN THE SUNSHINE
September 2005**

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

OPEN MEETINGS

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

YOU CANNOT:

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

YOU CAN:

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

A continuing concern is the sending of e-mail by a member to other members. An e-mail that states factual background material is permissible² so long as there is no interaction between or among members. E-mails that solicit comments from other members or that circulate responses from members are prohibited.³

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

PUBLIC RECORDS

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

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

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

ETHICS

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

- Prohibited actions or conduct:⁹ Solicitation or acceptance of gifts or unlawful compensation to influence official action; misuse of public position; or use of information not available to the public generally for personal pecuniary gain for themselves or anyone else. Note: For the gifts that are allowed by the statute,¹⁰ the Governor's Code of Ethics places further restrictions.¹¹
- Restricted business and contractual relationships:¹² Certain restrictions and prohibitions apply to members or their relatives.
- Voting Conflicts of Interest:¹³ Persons present at a meeting are required to vote, unless the member has a voting conflict of interest, in which case the member may abstain from voting.¹⁴ A voting conflict occurs when the measure being voted on inures to the private gain or loss of the member, a relative, the member's employer, or a client of the member. The member must disclose the conflict prior to participating in discussion or voting on the matter, or if unknown at the time, as soon as possible. The member must file Commission on Ethics Form 8A¹⁵ with the recording secretary within fifteen days of the vote.

Reference Materials:

Attorney General's Website: <http://myfloridalegal.com/sunshine>

Government-in-the-Sunshine Manual, First Amendment Foundation, Tallahassee, FL

First Amendment's Website: <http://www.floridafaf.org/>

ENDNOTES:

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

² Attorney General Opinion 2001-20, March 20, 2001.

³ Attorney General Informal Opinion, October 31, 2000.

⁴ Sections 286.011(2) and 286.012, Florida Statutes.

⁵ Article I, Section 24(a), Florida Constitution; Section 119.07, Florida Statutes.

⁶ Section 119.011(1), Florida Statutes; Orange County v. Florida Land Co., 450 So. 2d 341 (Fla. 5th DCA 1984).

⁷ Shevin v. Byron, Harless, Schaffer, Reid & Assoc., Inc., 379 So. 2d 633 (Fla. 1980).

⁸ Times Publishing Co. v. City of St. Petersburg, 558 So. 2d 487 (Fla. 2d DCA 1990).

⁹ Section 112.313(7), Florida Statutes.

¹⁰ Sections 112.312(12) and 112.313(2), Florida Statutes.

¹¹ Governor Bush's Code of Ethics, available at:

<http://www.myflorida.com/myflorida/government/policies/ethicscode.html>

¹² Sections 112.313(3), (7), and (12), Florida Statutes.

¹³ Section 112.3143, Florida Statutes.

¹⁴ Section 286.012, Florida Statutes.

¹⁵ http://www.ethics.state.fl.us/forms/Form8a_2000.PDF.

Chapter Subcommittee Assignments

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3. Geometric Design	Chuck Meister
4. Roadside Design	James Harrison
5. Pavement Design and Construction	Dwayne Kile
6. Roadway Lighting.....	Bernie Masing
7. Rail-Highway Grade Crossings	Jimmy Pitman
8. Pedestrian Facilities	Joy Puerta
9. Bicycle Facilities.....	Joy Puerta
10. Maintenance.....	VACANT
11. Work Zone Safety	Frederick Schneider
12. Construction.....	Tanzer Kalayci
13. Public Transit.....	Annette Brennan
14. Design Exceptions	Ramon Gavarrete
15. Traffic Calming.....	Henry Cook
16. Residential Street Design.....	James Harrison
17. Bridges and Other Structures.....	David O'Hagan

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Tentative Key Dates – 2007 Florida Greenbook

Tentative Key Dates for 2007 Florida Greenbook

2005

November 24, 2005 Effective date of 2005 Florida Greenbook

2006

March 7, 2006 Florida Greenbook Advisory Committee Meeting

April 14 2006 Deadline for addressing comments from Committee meeting and submitting corrections for 2007 Greenbook. Any new proposed changes are due to subcommittees for review.

May 1, 2006 Deadline for changes by chapter subcommittees submitted for distribution to committee for review.

June 1, 2006 Comments due from committee review of proposed changes.

June 21, 2006 Deadline for addressing committee comments.

June 28, 2006 Deadline for compiling 2007 Draft for FDOT Legal office review

July 19, 2006 Deadline for addressing comments made by FDOT Legal office

August 2, 2006 Deadline for compiling the 2007 Draft Greenbook

August 16, 2006 Deadline for publishing a Change Notice/Addendum/Rulemaking for the changes

September 7, 2006 Deadline for submitting comments on the change notice (21 days)

October 29, 2006 Deadline for addressing comments due to original change notice

November 15, 2006 Deadline for publishing new Change Notice in response to comments

December 10, 2006 File rule amendment (Rule 14-15.002) 2007 Greenbook

2007

January 1, 2007 Tentative effective date of the 2007 Florida Greenbook / Post on website

January 3, 2007 **Notification** sent to registered holders that 2007 Greenbook has been posted on FDOT website

All dates subject to change

