TRAFFIC ENGINEERING MANUAL

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Florida Department of Transportation

TRAFFIC ENGINEERING MANUAL

2019

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Chapter 1

ADOPTION PROCEDURE

TRAFFIC ENGINEERING MANUAL ADOPTION PROCEDURE

PURPOSE:

To provide traffic engineering standards and guidelines to be used on the State Highway System by the Department's District Traffic Operations Offices.

AUTHORITY:

Sections 20.23(4)(a) and 334.048(3), Florida Statutes (F.S.)

SCOPE:

The ***Traffic Engineering Manual (TEM)*** affects the State Traffic Engineering and Operations Office and the District Traffic Operations Offices.

REFERENCES:

Chapter 316, F.S.

Rule 14-15.010, F.A.C., Manual on Uniform Traffic Control Devices (MUTCD)

Topic No. 025-020-002, Standard Operating System

1. DISTRIBUTION

The official recipient of this manual will be the District Traffic Operations Engineers and their staff, and the State Traffic Engineering and Operations Office managers and staff.

2. AVAILABILITY

The ***TEM*** is available free of charge at the Department's ***State Traffic Engineering and Operations Office website***.

3. REGISTRATION

Users of the ***TEM*** interested in receiving automatic notifications of revisions to the manual by e-mail may subscribe from the Department's website. As required by Section 283.55, F.S., by March 1 of each odd-numbered year, we will survey e-mail addresses from our current registration list and purge any outdated registrations.

4. REVISIONS AND ADDITIONS

(1) The District Traffic Operations Engineers (DTOE) and the State Traffic Operations Engineer (STOE) will constitute the Manual Review Committee.

(2) Items warranting immediate change will be made with the approval of the STOE (after a majority vote of the Manual Review Committee and consultation with any other affected parties). Statewide meetings of DTOEs will be held every six months, and a major agenda item will be any additions/changes either necessary or recommended to the ***TEM***.

(3) All revisions will be coordinated through the Forms and Procedures Office prior to implementation.

(4) Substantive revisions or policy-related issues, as determined by the Manual Review Committee, will be approved by the Secretary following the process established in the ***Standard Operating System, Topic No. 025-020-002***.

(5) Once revisions and/or additions have been approved by the Secretary theywill be posted on the State Traffic Engineering and Operations Office website.

(6) An e-mail notification will be made to all registered holders of the ***TEM*** that the revisions have been posted on thewebsite.

5. TRAFFIC ENGINEERING VARIATIONS

(1) The Department's traffic engineering criteria and standards contained in this manual are established by recommended practice of the ***Manual on Uniform Traffic Control Devices (MUTCD)*** or the ***American Association of State Highway and Transportation Officials (AASHTO)*** guidelines and/or by specific research conducted for the Department. There may be site specific conditions or certain circumstances that may warrant a variation from the criteria or standards referenced herein. A variation shall be a one-time event on a case-by-case basis or it may be that the ***TEM*** will be revised to incorporate avariation.

(2) A request for and subsequent approval of any variation from the criteria and/or standards contained in the ***TEM*** shall be subject to the procedure established below in ***Section 6.***

6. TRAFFIC ENGINEERING VARIATION PROCESS

(1) A formal written request from a local governmental agency, engineering consultant, or other interested party may be submitted to the appropriate DTOE and should include the following:

(a) Proposed location (State Road ID, Mile Post).

(b) Applicable standard or criterion (Chapter & Section Number).

(c) Statement of the reasons why the required criteria or standards are not applicable to the site specific conditions.

(d) Statement of the proposed variation.

(e) Statement of how the proposal can be as safe by not following the criteria or standard.

(f) Description of other impacts (operations, environmental and community needs).

(2) The District Traffic Operations Staff will review and evaluate the proposed variation request according to the following guidelines:

(a) Whether the variation is absolutely necessary for completing a project.

(b) Whether other alternatives have been considered that would meet current

(c) TEM criteria or standards.

(d) Whether the proposed variation has been used in other areas – local, state or national. Provide examples, including before and after data, if available.

(e) Whether the proposed variation will require Federal Highway Administration approval or coordination.

(3) If the District Staff believes a variation may be warranted, the DTOE shall forward the request for variation to the State Traffic Engineering and Operations Office for review.

(4) If the District Staff believes a variation is not warranted, the DTOE shall document the reasons and advise the requestor of the findings.

(5) Upon review by the State Traffic Engineering and Operations Office Staff, the STOE shall submit a memorandum concerning the decision for

requested variation, including any special conditions or requirement to the appropriate DTOE. The STOE may consult with the DTOEs to obtain statewide consensus prior to approving and authorizing the requested variation.

(6) The STOE memorandum will serve as the formal document authorizing or denying the requested variation from the applicable TEM criteria or standard and shall be filed electronically on the State Traffic Engineering and Operations Office SharePoint site for future reference.

7. TRAINING

None required.

8. FORMS

None required.

Chapter 2

SIGNS

Section 2.1

USE OF SLIPPERY WHEN WET SIGNS

2.1.1 CONDITIONS FOR USE

The District Traffic Operations Engineer shall request the District Maintenance Engineer to erect SLIPPERY WHEN WET (W8-5) signs at locations where it has been determined there is a slippery pavement condition. A slippery pavement is defined when a standard friction test at 40 mph has determined the skid numbers are less than 25.

When the posted highway speed is above 45 mph, SLIPPERY WHEN WET signs should be installed when the skid numbers are less than 30, and also one of the following conditions is met:

- When the Safety Ratio (Actual Crash Rate divided by the Critical Crash Rate) is greater than or equal to one.
- Any downgrade greater than 3 percent.
- At intersections with traffic signals.

2.1.2 LOCATION AND PLACEMENT

Additional signs may be needed at locations with the following conditions:

(1) **Horizontal Curves**. SLIPPERY WHEN WET signs are to be placed prior to the CURVE sign with an advisory speed plate. The ball-bank indicator provides a reasonable speed through the curve; however, a lower speed may be desired if there are known extraordinary hazards such as hydroplaning.

(2) **Hydroplaning.** Generally, hydroplaning only occurs at speeds above 47 mph; however, excessive runoff across travel lanes may produce hydroplaning at lower speeds. Multi-lane facilities, rutted lanes, built-up shoulders, and downgrades are candidate locations. If excessive water buildup cannot be corrected, then SLIPPERY WHEN WET signs may be appropriate even when skid numbers are greater than 30.

(3) **Ramp and Bridge Decks.** Interchange exit or entrance ramps on sharp curves and on a downgrade may present a hazardous condition if the pavement is also slippery. Special attention should be given to ramps with compound curves. A pavement friction inventory is normally maintained for interchange ramps; however, special tests, at speeds less than 40 mph can be requested.

SLIPPERY WHEN WET signs should be used with an advisory exit speed sign, RAMP XX MPH (W13-2).

SLIPPERY WHEN WET signs shall be placed in advance of all moveable and non-moveable steel deck bridges. These signs should be placed in accordance with ***Table 2C-4. Guidelines for Advance Placement of Warning Signs in the MUTCD***.

2.1.3 ENHANCEMENT

When roadway surface conditions exist that might adversely affect a motorcyclists' ability to maintain control of their motorcycle under wet conditions, a MOTORCYCLE ***(W8-15P)*** plaque as shown in ***Figure 2.1-1*** may be mounted below the warning sign. Additional warnings should be placed at appropriate intervals where the condition exists.

Figure 2.1-1. Motorcycle Plaque

2.1.4 NOTIFICATION

(1) The District Maintenance Engineers will promptly notify in writing the District Traffic Operations Engineer when SLIPPERY WHEN WET signs have been erected.

(2) The District Traffic Operations Engineer shall request the District Maintenance Engineer to remove SLIPPERY WHEN WET signs that are no longer warranted under the above provisions.

Section 2.2

OVERHEAD STREET NAME SIGNS

2.2.1 PURPOSE

Street name guide signs for most streets that intersect with a road on the state highway system are normally furnished, installed, and maintained by the appropriate local government. However, at signalized intersections on the state highway system, larger overhead street name signs should be used. These signs may be furnished and installed, by the Department.

2.2.2 STANDARDS

(1) Street name signs shall only be used to identify cross streets. They are not intended to identify destinations such as cities or facilities.

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

(3) When a cross street is known by both route number and a local name, use of the local name is preferred on the overhead street name signs since the route number is identified on route markers along the route.

(4) When a cross street has dual local street name designations, for example N.W. 31 Avenue and Martin Luther King Jr. Boulevard, both names may be used on the overhead street name signs. However, the Department is responsible for the primary designation (i.e., name shown on the Official Florida Transportation Map). If a secondary designation is approved by local resolution, the local government shall be responsible for the installation of this secondary designation.

(5) When a cross street has a different name on each side of the intersection, both names shall be shown on the overhead street name sign, two signs should be used with one on the left and one on the right side of the intersection. In some instances, the type of signal span design may dictate the need for the use of a single sign with both names. When used, the names should be separated and accompanied by directional arrows, with the left name displayed over the right.

(6) The display of block numbers is not required when two street names with arrows are provided on a single panel.

2.2.3 INSTALLATION

(1) The location of the overhead street name sign on a signal strain pole and/or mast arm may vary. However, it shall not interfere in any way with the motorist view of the signal heads.

(a) For static signs, the preferred installation is shown in the ***Department's Standard Plans, Index No. 659-010***.

(b) For internally illuminated signs, the preferred installation is shown in the ***Department's Standard Plans, Index No. 700-050***.

(2) In the case of separate street names on each side of the street, one sign should be placed to the right of the centerline and signal heads and the other to the left side of the centerline and signal heads.

2.2.4 SIGN DESIGN

(1) Overhead street name signs shall be designed in accordance with ***Section 2D.43 of the MUTCD***.

(2) The sign panel used for overhead street name signs shall be 24 inches in height with length determined by legend.

(3) At a minimum, 8-inch upper and 6-inch lower case lettering for the street name and 6-inch all upper case lettering for the block numbering text on the second line shall be used. The preferred font is Series E-Modified; however, Series E may be used to accommodate the amount of legend. An example of this design is shown in ***Figure 2.2-1***.

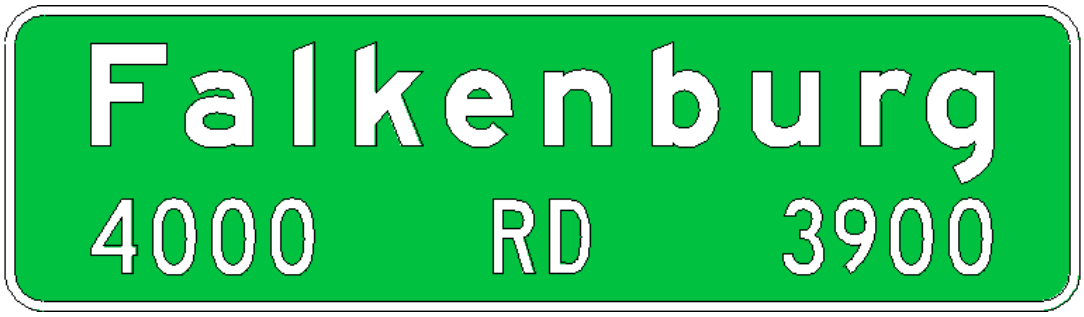
(4) When structurally possible, overhead street name signs should be designed in compliance with FHWA recommendations for older drivers (***Section 2D.43 of the MUTCD*** and ***Recommendation I-J-2 of the FHWA Design Handbook for Older Drivers and Pedestrians***). When used, the minimum lettering size should be 12-inch upper case with 9-inch lower case.

(5) Internally-illuminated signs should be used whenever possible to provide better night-time visibility, and to benefit older drivers. When used, the devices shall be on the ***Approved Products List (APL).*** They shall be designed using a white message on a green background, and if a border is used it shall be white.

(6) Overhead street name signs using standard panels shall have a white message and border on a green background. If internally illuminated overhead street name signs are not installed, high intensity sheeting should be used for added visibility at night.

(7) Sign panels should be two-sided in order to provide for a sign display on both the right and left side of each intersection approach.

Figure 2.2-1. Overhead Street Name Sign



Section 2.3

SIGNS AND MARKINGS AT DIVIDED HIGHWAYS AND CROSSROADS

The Department's standards for this section are shown in the current edition of the ***Department's Standard Plans, Index No. 711-001, Sheet 5 of 14*** and ***Index No. 700-109***.

Section 2.4

SYMBOL SIGNS ON THE STATE HIGHWAY SYSTEM

2.4.1 DEFINITIONS

Symbol Sign. Sign used to inform, advise, regulate, or warn of an impending situation where a symbol depicts the approaching situation or information desired.

Word Message Sign. Sign used as an alternate to a symbol sign describing by word message an approaching situation or information desired.

Educational Plaque. A word message sign used jointly with a new symbol sign to familiarize the motoring public with the meaning of the symbol displayed.

Symbol signs are more easily recognized and better understood by the motoring public. The ***MUTCD*** encourages their use as the primary advisory or warning sign.

With Florida's large tourist population, a broader use of symbol signs is a desirable and important step toward the greater safety and facilitation of traffic. Accordingly, it is appropriate to *require* the use of symbol signs over word message signs.

2.4.2 CONDITIONS FOR USE

(1) A symbol sign, if available, shall be used where an advisory, regulatory, or warning sign is warranted to depict an approaching situation or provide information. Word message signs as alternates to symbol signs and educational plaques are generally less effective. However, there may be circumstances where a word message sign is more appropriate. In these cases, the District Traffic Operations Engineer should maintain documentation of the exception in district files.

(2) Any proposed new symbol will require approval as provided in ***Section 1A.10 of the MUTCD***. All requests for a new symbol shall be sent to the State Traffic Operations Engineer for review and processing with the Federal Highway Administration.

(3) When a new symbol sign is utilized, an educational plaque may be used to explain the new symbol by word message as provided in ***Section 2A.12 of the MUTCD.***

Section 2.5

DESTINATION-DISTANCE SIGNS AT RURAL INTERSTATE AND FREEWAY EXIT RAMP TERMINALS

(1) Combined DESTINATION-DISTANCE (***D1-1a, D1-2a, and D1-3a***) signs should be used at exit ramp terminals on rural interstates and freeways in lieu of DESTINATION (***D1-1***) signs.

(2) The combined DESTINATION-DISTANCE sign shall only be used facing exiting traffic from rural interstate and freeway ramps.

(3) Existing DESTINATION signs at exit ramp terminals should be replaced with the combination DESTINATION-DISTANCE signs during the course of routine sign replacement activities.

(4) Distances should be determined from the best information available and reflect the distance from the ramp terminal to a control point in the named destination. Control points for all Florida cities that are listed on the official ***Florida Distance Chart*** are maintained by the Transportation Data and Analytics Office.

(5) In the case of places not on the chart, a control point may be defined by the district, usually as the junction of two main routes within the urban area.

(6) Distance figures shall be shown just after the destination name. When a sign must accommodate destinations in different directions, a line should divide the destinations as shown in ***Figure 2D-7 of the MUTCD***.

(7) Signs shall have a white legend on green background. The signs shall be individually detailed in plans and use as a minimum 8-inch numerals and 8/6 upper/lower case lettering.

Section 2.6

BRIDGE SIGNS AND MARKINGS

2.6.1 BRIDGE AND SIGN STRUCTURE LOW CLEARANCE SIGNS

(1) A LOW CLEARANCE (W12-2) sign shall be placed at the Stopping Sight Distance of every bridge or structure having a minimum vertical clearance of 14 feet 6 inches or less except as noted below.

(2) In urban areas, where advance signs could be blocked by traffic or where competition with advertising signs make advance signs ineffective, the LOW CLEARANCE sign or marking should be placed on the bridge beam or equivalent.

(3) A LOW CLEARANCE sign or marking shall also be placed on the bridge beam or equivalent of every bridge or structure having a minimum vertical clearance of 13 feet 6 inches or less.

(4) LOW CLEARANCE signing and marking shall conform to additional criteria outlined in ***Section 2C.27 of the MUTCD***.

2.6.2 BRIDGE PIER MARKING

(1) Bridge piers shall be marked only when they are not protected by a guardrail or a barrier and are less than 30 feet from the near edge of pavement.

(2) The marking used shall be a Type 3 object marker 12 x 36-inch panel with alternating black and yellow stripes sloped down at an angle of 45 degrees toward the side of the pier which traffic is to pass.

(3) For additional emphasis, a large surface bridge pier may be treated with sheeting having diagonal stripes at least 12 inches wide and similar in design and application to the Type 3 object marker.

2.6.3 CROSS ROAD NAME SIGNS ON OVERPASSES

These signs will no longer be installed, except as requested by law enforcement agencies or emergency rescue organizations. This includes signs mounted on the bridge beam or on posts. When this request is approved, the signs should use 10.67-inch Series E Modified lettering.

2.6.4 NARROW BRIDGE TREATMENT

Signs and markings on narrow bridge approaches shall be as shown in the current edition of the ***Department's Standard Plans, Index No. 700-106***.

2.6.5 GUIDE SIGNS ON OVERPASSES

See ***FDOT Modifications To LRFD Specifications For Structural Supports For Highway Signs, Luminaires And Traffic Signals (LRFDLTS-1), Structures Manual Volume 3,*** Section 2.6 for limitations on the use of bridge mounted signs.

Section 2.7

PLACE NAME SIGNS ON THE STATE HIGHWAY SYSTEM

This section has been rescinded since it is now included in ***Rule Chapter 14-51, Part IV of the Florida Administrative Code***.

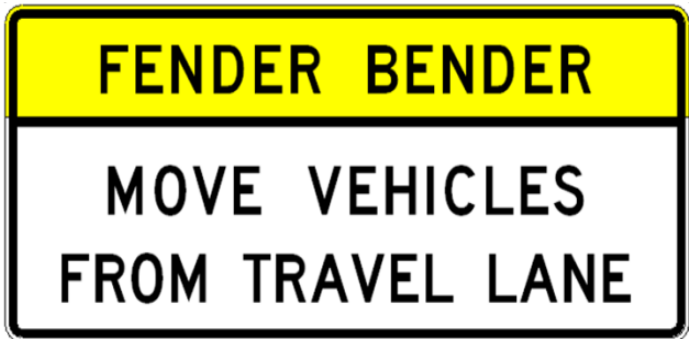
Section 2.8

MOVE VEHICLES FROM TRAVEL LANE SIGN

2.8.1 SIGN DESIGN

MOVE VEHICLES FROM TRAVEL LANE ***(R16-4)*** signs are found in ***Section 2B.65 of the MUTCD***. These signs are used in support of ***Section 316.061(2), F.S.*** and replaces the experimental MOVE ACCIDENT VEHICLES FROM TRAVEL LANE sign (formerly ***FTP 27-06 and FTP-28-06.***)

Figure 2.8-1. Move Vehicles from Travel Lane Sign



2.8.2 LOCATION AND PLACEMENT

(1) On non-limited access highways a MOVE VEHICLES FROM TRAVEL LANE ***(R16-4)*** sign may be used in urban areas when their use will reduce queue lengths and delays, remove interference with traffic signal vehicle detectors, or enhance intersectional capacity. The 42 x 84 inch standard panel uses 6-inch Series C lettering. The 24 x 52 inch standard sign panel has 4-inch Series C letters.

(2) On limited access highways, a 54 x 120 inch MOVE VEHICLES FROM TRAVEL LANE ***(R16-4)*** sign using 8-inch Series D lettering may be placed on the right side of urban freeways downstream from entrance ramps when their use will improve driver behavior concerning unnecessary and unlawful constriction of freeway travel lanes due to traffic crashes.

(3) The MOVE VEHICLES FROM TRAVEL LANE ***(R16-4)*** sign details are available in the ***Standard Highway Signs and Markings Book – Interim Releases for New and Revised Signs***.

(4) For permanent installations, specify yellow retroreflective background for the FENDER BENDER enhancement.

(5) Mounting heights and lateral clearances should adhere to those specified in the ***Department's Standard Plans, Index No. 700-101*** and support systems shall meet or exceed Department standards of frangibility.

Section 2.9

NO PASSING ZONE SIGNS

(1) The NO PASSING ZONE ***(W14-3)*** pennant sign, as shown in ***Figure 2.9-1*** shall **not** be used routinely at the beginning of all no passing zones.

(2) The NO PASSING ZONE pennant sign may be installed as a supplement to pavement markings that establish a no passing zone under the following circumstances:

(a) At locations where pavement markings indicating no passing zones are not visible sufficiently in advance to give the driver adequate warning such as on vertical or horizontal curves.

(b) Other locations where such signs are determined desirable for safety as a result of an engineering study.

(3) Proposed use of NO PASSING ZONE pennant signs at locations meeting the above criteria shall be reviewed and approved by the District Traffic Operations Engineer prior to installation.

Figure 2.9-1. No Passing Zone Pennant Sign.

W14-3

NO PASSING ZONE

*Reduce spacing 20% for 48" size.
**Reduce spacing 35% for 48" size.
***Use Series 2000 Alphabets for 36" size.

A	B	C	D	E	F	G	H	J	K	L	M	N
36	24	.5	.75	5.75	3 D	3 C	1.75	2.375	1.875	4	15.75	8.313
40	30	.5	.75	7.25	4 D	4 C	1.75	2.5	1.875	6.5	22.563	11.063
48	36	.625	.875	8.5	5 D	5 C	2	3	2.25	8	268.13	12.75
64	48	.75	1.25	12	6 D	6 C	3	4	3	10.75	33.688	16.563

WARNING SIGN COLORS:

LEGEND – BLACK
BACKGROUND – YELLOW (RETROREFLECTIVE)

TTC SIGN COLORS:

LEGEND – BLACK
BACKGROUND – ORANGE (RETROREFLECTIVE)

Section 2.10

VENDING MACHINE SIGNS

2.10.1 PHYSICAL CHARACTERISTICS

(1) The VENDING MACHINES sign ***(FTP-73-06)*** shall be 66 x 30 inches with two lines of legend in 8-inch Series D lettering. The legend and border shall be white on blue background.

(2) Sign details are available in the ***Department's Standard Plans, Index No. 700-102***.

2.10.2 LOCATION AND PLACEMENT

(1) VENDING MACHINES signs will be appended at the bottom and between the supports of REST AREA 1 MILE ***(D5-1)*** signs. Such placement will not impair the breakaway characteristics of the sign.

(2) At some rest areas, the VENDING MACHINE message is designed into a sign with flip-up panel which reveals the message SAFETY BREAK / FREE COFFEE ***(FTP-74-06, FTP75-06, and FTP-76-06)***.

(3) Normally, the VENDING MACHINES message will be displayed. However, when the safety break is in effect, the sign is to be folded up to read SAFETY BREAK FREE COFFEE.

(4) The SAFETY BREAK / FREE COFFEE sign detail is available in the ***Department's Standard Plans, Index No. 700-102***.

Section 2.11

GUIDELINES FOR USE OF BICYCLE SIGNS

2.11.1 PURPOSE

To provide guidance on the use of bicycle signs when a documented need exists. The objective of using bicycle signs is to improve motorist awareness of people biking on State roadways.

2.11.2 GENERAL

(1) ***Chapter 9B*** and ***Section 2C.49 of the MUTCD*** establish the standards for bicycle signs installed on public roadways. The MUTCD must be reviewed and considered with bicycle sign requests.

(2) The use of bicycle signs as a warning is shown in ***Section 9B.18*** and ***Section 2C.49 of the MUTCD***. The use of bicycle signs as regulatory is shown in ***Section 9B.06 of the MUTCD***.

(3) Bicycle signs shall be installed only at locations reviewed and approved by the District Traffic Operations Engineer.

(4) The District Bicycle/Pedestrian Coordinator and District Bicycle/Pedestrian Safety Specialist will provide recommendations for all bicycle sign requests and should consider the following conditions when reviewing requests for bicycle signs:

- **(a)** Context classification
- **(b)** Land use
- **(c)** Volumes
- **(d)** Crash data
- **(e)** Geometric criteria

(5) Bicycle signs shall be mounted in accordance with existing Department standards.

2.11.3 CONDITIONS FOR USE

(1) Bicycle signs should be used only at locations where a documented need exists to enhance the awareness of bicycles on a facility or where required by a Standard.

(2) The BICYCLES MAY USE FULL LANE ***(R4-11)*** sign is used when it is important to inform road users that bicyclists might occupy the travel lane such as where commuter bicyclists are common users of the facility. The BICYCLES MAY USE

FULL LANE ***(R4-11)*** sign may be installed on roadways when a shared lane marking (***Department's Standard Plans, Index 711-002***) is present or when all of the following conditions exist:

(a) where travel lanes are less than 14' wide
(b) no bicycle lane is present
(c) no rideable paved shoulder of 4' width or greater is present

(3) A shared lane marking is not required for use of the BICYCLES MAY USE FULL LANE ***(R4-11)*** sign.

(4) Requests to install BICYCLES MAY USE FULL LANE ***(R4-11)*** signs on multilane roadways must be submitted by the District Traffic Operations Engineer and shall be sent to the State Traffic Operations Engineer for review and approval.

Section 2.12

RECYCLING COLLECTION CENTER SIGNS

2.12.1 DEFINITION

Recycling Collection Center. A facility open full time to the general public for the purpose of collecting items to be recycled, e.g., oil, aluminum, batteries, etc. The facility may operate as part of a recycling plant or may be a collection center for the distribution of these items to a recycling center elsewhere.

2.12.2 SIGN DESIGN

(1) The RECYCLING COLLECTION CENTER (FTP-48-06) sign shall be 42 x 60 inches. Lettering shall be 4-inch, Series C. The legend and border shall be white on green.

(2) The RECYCLING COLLECTION CENTER W/OPTIONAL MUNICIPALITY NAME (FTP-49-06) sign shall be 42 x 66 inches. Lettering shall be 4-inch, Series C. The legend and border shall be white on green.

(3) A Directional Arrow (M-Series) may be attached below the sign panel if desired.

(4) Exact sign details for both the FTP-48-06 and the FTP-49-06 can be found in the ***Department's Standard Plans, Index No. 700-102***, and in the ***Department's Sign Library***.

2.12.3 SIGN INSTALLATION

(1) Sign requests must be submitted by local government to the appropriate District Traffic Operations Office for review and approval.

(2) RECYCLING COLLECTION CENTER signs placed on the State Highway System should adhere to the mounting heights and lateral clearances specified in the ***Department's Standard Plans, Index No. 700-101.*** Support systems shall meet or exceed the standards shown in ***Section 700 of the Department's Standard Specifications***.

(3) RECYCLING COLLECTION CENTER signs shall not be permitted in a location where the view of existing traffic control devices may be obscured or where they might otherwise compete for the motorist's attention, for example, next to a stop sign.

Section 2.13

SIGNING FOR SAFETY BELT USE AND CHILD RESTRAINT LAWS

2.13.1 PURPOSE

To help reduce the number of highway deaths and injuries; to encourage compliance of motorists with the state's safety belt use and child restraint laws; and to establish uniform criteria for district implementation of signing for safety belt use and child restraint laws.

2.13.2 BACKGROUND

The Florida Safety Belt Law (***Section 316.614, F.S.***), mandates state agencies conduct a continuing safety and public awareness campaign and adopt programs designed to encourage compliance with usage requirements of the safety belt law. It is the intent of this procedure to support the actions of this statute and provide appropriate signing.

2.13.3 STATE HIGHWAY SYSTEM POINTS OF ENTRY

(1) Districts Two and Three shall install and maintain signing at all State Highway System points of entry, informing motorists of the statutory requirement for safety belt use in the State of Florida.

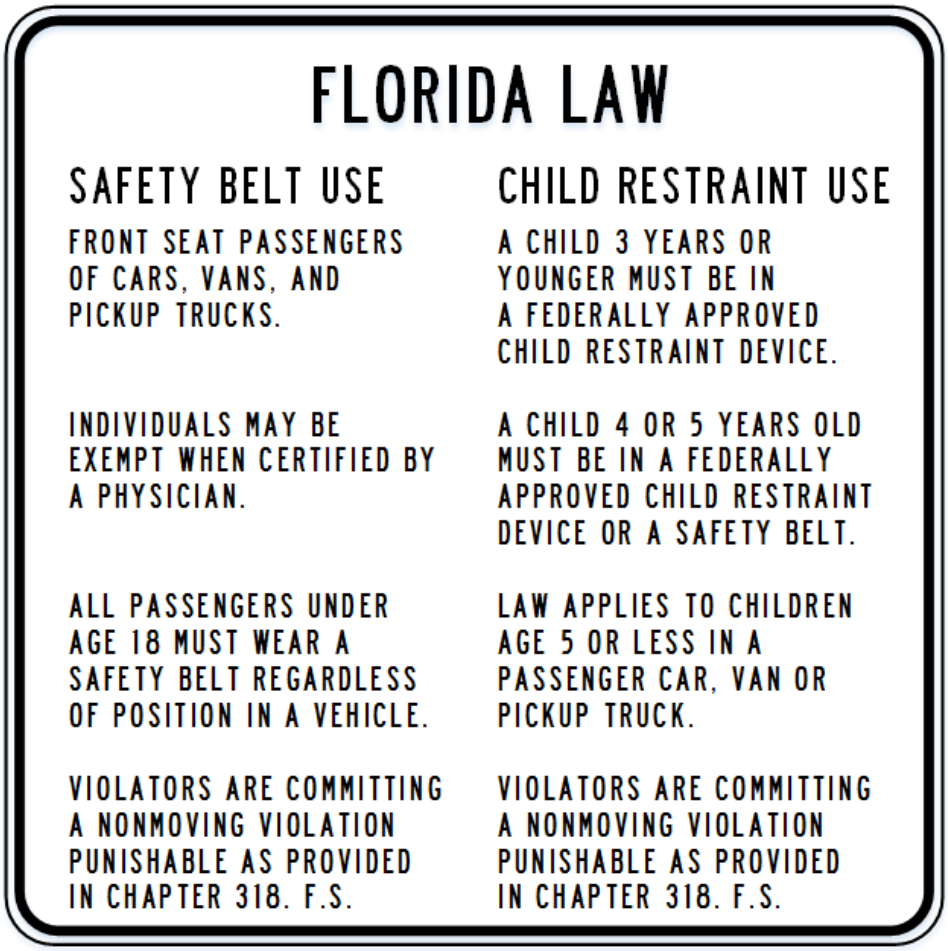
(2) On limited access highways, a FLORIDA SAFETY BELT AND CHILD RESTRAINT LAW sign ***(FTP-44-06)*** shall be installed downstream of existing "Welcome to Florida" and speed limit signs.

(3) On non-limited access highways, a FLORIDA SAFETY BELT AND CHILD RESTRAINT LAW sign ***(FTP-45-06)*** shall be installed downstream of existing "Welcome to Florida" and speed limit signs.

2.13.4 REST AREAS AND INTERSTATE WELCOME CENTERS

(1) A Rest Area Safety Belt Law sign ***(Figure 2.13-1)*** shall be installed and maintained in all rest areas and Interstate Welcome Centers informing motorists of the specific requirements of Florida's safety belt and child restraint laws. This sign shall be placed in a prominent location for easy viewing by pedestrians using the facilities.

Figure 2.13-1. Florida Safety Belt Law



(2) On the exit from these rest areas and Welcome Centers, the existing “Buckle Up” sign shall be replaced with the FLORIDA SAFETY BELT AND CHILD RESTRAINT LAW sign (***FTP-45-06)***, as signs need to be replaced.

2.13.5 OTHER LOCATIONS

The FLORIDA SAFETY BELT AND CHILD RESTRAINT LAW sign **(*FTP-44-06*** and ***FTP-45-06)*** may be used at other locations on the State Highway System at the discretion of the District Traffic Operations Engineer but should be limited to locations where:

(1) There is documented evidence of a high crash location; or

(2) A high percentage of the traffic is composed of tourists or visitors; and

(3) The sign will not interfere or detract from existing regulatory, guide, or warning signs or other traffic control devices.

2.13.6 STANDARD SAFETY BELT SIGN (FTP-46-06 AND FTP-47-06)

(1) This sign is to be used for general education purposes.

(2) The 36 x 48 inch sign ***(FTP-46-06)*** should be installed on limited access facilities at county lines, based on space available. The District Traffic Operations Engineers may also install this sign where there is a documented need.

(3) The 24 x 30 inch sign ***(FTP-47-06)*** is to be installed on non-limited access highways and urban areas, based on space available and where there is a documented need.

2.13.7 SIGN DESIGN

(1) Specific sign details for all signs referenced in this section are shown in the ***Department's Standard Plans, Index Number 700-102***.

(2) Electronic details for all the signs in this section are available from the ***Department's Sign Library***.

2.13.8 SIGN AVAILABILITY

Maintenance may obtain new or replacement signs by requisition from the Lake City Sign Shop.

Section 2.14

SIGNING FOR EMERGENCY MANAGEMENT

2.14.1 PURPOSE

To establish a uniform basis for installing and maintaining emergency management signs on the State Highway System.

2.14.2 BACKGROUND

(1) The Florida Division of Emergency Management (DEM) plans for both natural and man-made disasters, as well as, prepares and implements a statewide Comprehensive Emergency Management Plan (CEMP). The DEM is the state's liaison with federal and local agencies on emergencies of all kinds and works with local governments to provide technical assistance, as they prepare emergency plans and procedures.

(2) The DEM requested the Department to install and maintain evacuation route signs on those portions of the State Highway System that comprise official evacuation routes to educate motorists as to the available routes and to ensure that signs are in place well in advance of the actual need to guide motorists away from high-risk areas. Evacuation Route and Zone Maps are located on the DEM website.

2.14.3 PROCEDURE

(1) The District Traffic Operations Engineer shall initiate the actions necessary at the district level to implement these guidelines and to ensure that evacuation routes are properly and promptly signed upon request of the County Emergency Management Director. District Maintenance will ensure that the signs are installed and maintained in the field.

(2) Information on subsequent signing changes and/or additions shall be provided to the DEM for their records and shall be handled by the District Traffic Operations Engineer upon request of the regional counties and coordinated through the Department's Emergency Coordination Officer.

2.14.4 EVACUATION ROUTE SIGN DESIGN

(1) The EVACUATION ROUTE sign shall conform to the ***Department's Standard Plans, Index No. 700-102 Sheet 9***.

(2) A 24-inch diameter Evacuation Route sign ***(FTP-78-06)*** should be used by local governments to indicate roads or streets under local jurisdiction as official evacuation routes.

(3) The 36-inch diameter Evacuation Route sign (FTP-77-06) shall be used on limited access highways and the 24-inch diameter Evacuation Route sign (FTP-78-06) shall be used on non-limited access highways.

(4) The arrow designs on the FTP-77-06 or FTP-78-07 sign shall include a straight, vertical arrow pointing upward, a straight horizontal arrow pointing to the left or right, or a bent arrow pointing to the left or right for advance warning of a turn.

(5) Sign details are available at the Department's ***Sign Library***.

2.14.5 EVACUATION ROUTE SIGN USE

(1) The EVACUATION ROUTE sign shall be used exclusively to sign along regional evacuation routes that have been so designated on the approved statewide regional evacuation route plans recorded by the Florida Division of Emergency Management.

(2) The EVACUATION ROUTE sign shall be used to guide motorists along the regional evacuation routes and away from potential high-risk areas.

(3) The sign shall comply with applicable provisions of the ***Section 2N.03 of the MUTCD***.

2.14.6 EVACUATION ROUTE SIGN PLACEMENT

(1) Signs shall be placed in accordance with existing Department standards and be consistent with the ***Section 2N.03 of the MUTCD***.

(2) The EVACUATION ROUTE sign shall be erected 150 to 300 feet in advance of, and at, any turn in an approved evacuation route and elsewhere for straight-ahead confirmation, if needed. The signs shall be mounted according to height and lateral clearances specified in the ***Department's Standard Plans, Index No. 700-101***.

2.14.7 SIGN INSTALLATION

(1) Signs shall be furnished, installed, and maintained by the Department on official evacuation routes that are on the State Highway System.

(2) Signs shall be installed only at locations reviewed and approved by the District Traffic Operations Engineer to ensure that such signs do not interfere with existing traffic control devices.

2.14.8 SHELTER AND TRAVELER INFORMATION SIGNING

(1) The State Traffic Operations Engineer will coordinate, address, and implement operational concerns on evacuation route signing and related operational needs within the Department and with the Florida Division of Emergency Management.

(2) The District Traffic Operations Engineers will coordinate evacuation shelter signing efforts on a districtwide basis. If signing for shelters or evacuation traveler information is required, the use of the signs must be included in the CEMP area/regional evacuation plan.

(3) Shelter signing will be installed on highways at key locations. The location determination shall be a joint effort between the District Traffic Operations Engineer and the local agencies.

(4) Signs will be installed under the following conditions:

(a) the shelter location is part of the regional plan;

(b) the local agency shall purchase the signs;

(c) the local agency shall be responsible to "flip-up" or "flip-down" the signs.

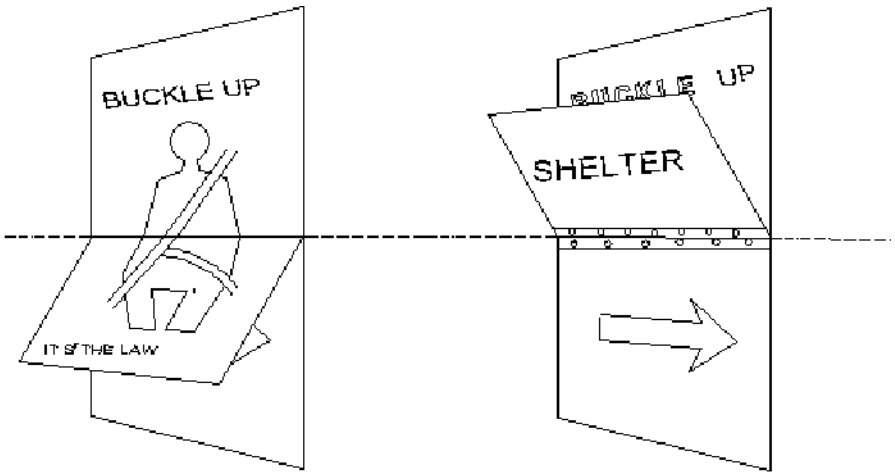
2.14.9 SHELTER SIGN DESIGN AND USE

(1) Shelter signs shall have a with a white background in accordance with ***Section 2N.09 of the MUTCD*.**

(2) The type of shelter signing support used on the State Highway System, portable (temporary), or permanent, will be determined by the District Traffic Operations Engineer.

(3) The sign designs for shelters may be permanent or temporary. The permanent design will use a “flip up” design as shown in ***Figure 2.14-1***. This means that the bottom panel will be flipped up to reveal the shelter message. The Safety Belt Symbol Sign shall be used as the default message for shelter signs. The CEMP should assign responsibility for turning up the “flip up” signs (***Figure 2.14-1***) during emergency conditions, and back down when conditions return to normal.

Figure 2.14-1. Flip Up Sign



2.14.10 TRAVELER INFORMATION SIGNING DESIGN AND USE

(1) The Traveler Information sign shall have a blue background with a white legend in accordance with the MUTCD Standard Signs D12 series and MUTCD Section 2I.09. An example is shown in ***Figure 2.14-2***.

(2) When the local/regional CEMP plan includes the use of traveler information on local shelters and other evacuation information, and a local radio station has a written agreement to be the official traveler information station, the frequency of the station may be signed for on the interstate system. This can be done with Changeable Message Signs, or with permanent flip up signs as shown in ***Figure 2.14-1***. A default message for the “flip up” sign shall be the Safety Belt Symbol sign.

Figure 2.14-2. Traveler Information Sign

2.14.11 CONTINUOUS HINGE REQUIREMENTS

The continuous hinge shall be of stainless steel, with minimum .060-inch leaf thickness, 2-inch open width and .120-inch pin diameter. The hinge shall be attached to the aluminum sign panels with 1/8-inch stainless steel pop rivets installed on 4-inch centers for the width of the sign. The pin must be permanently located in place by shortening the pin at each end of the hinge and staking the ends of the two outboard knuckles.

2.14.12 RADIO FREQUENCY INFORMATION SIGNS

The addition of radio frequency information signs along evacuation routes on the State Highway System has been approved by the Department as an important communication link for public safety during evacuation periods. The addition of these signs was made possible when Florida Public Radio Stations volunteered to partner with other state and local agencies in the state's evacuation efforts.

2.14.12.1 Radio Frequency Information Sign Design

The Radio Frequency Information sign shall have a blue background with a white legend in accordance with the MUTCD Standard Signs D12 series and MUTCD Section 2I.09.

2.14.12.2 Radio Frequency Information Sign Placement

(1) The Radio Frequency Information Sign ***(Figure 2.14-3)*** will be placed at the following locations:

(a) All limited access highways classified as evacuation routes.

(b) Principal non-limited access highways in areas where limited access highways are not the main evacuation routes.

(c) Principal non-limited access highways that are critical links leading to limited access highways.

(2) Limited access highways will consist of an Evacuation Route sign (***FTP-77-06)*** sign and a 36 x 24-inch Radio Frequency Information sign ***(FTP-70-06)***. Exact sign details can be found in the ***Department's Standard Plans, Index 700-102***.

(3) This sign assembly will be positioned near county lines (where radio coverage is present) and where radio frequency coverage changes. When overlap occurs, the frequency motorists would be driving into is the correct frequency to sign.

(4) Evacuation routes on the State Highway System non-limited access highways are signed with the Evacuation Route sign ***(FTP-78-06)***. A 24 x 18-inch Radio Frequency Information sign ***(Figure 2.14-3)*** will be attached to the existing sign assembly in the above mentioned locations erected close to the county lines or

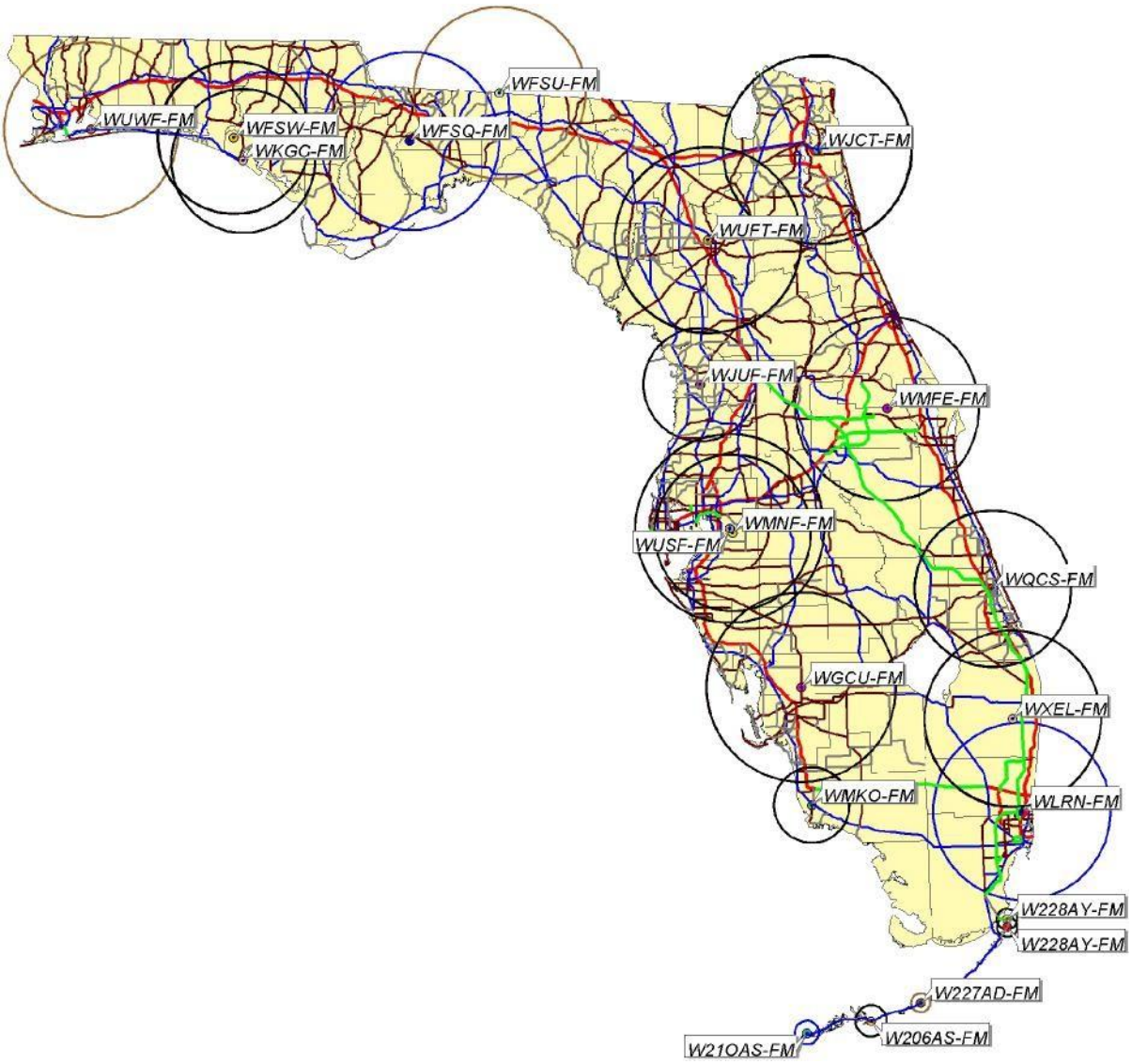
coverage area. Changes are to be modified with the addition of the radio frequency panel. Additional locations to be modified are the beginning and termination points of qualifying links.

(5) When long segments occur on both limited access and non-limited access highways, confirmation Radio Frequency Information signs should be installed at 10-mile increments.

(6) ***Figure 2.14-4*** represents the general statewide radio coverage area for this program.

Figure 2.14-3. Radio Frequency Information Sign

Figure 2.14-4. Radio Coverage Area



Note: WXEL-FM call letters have changed to WPBI-FM
WFIT-FM has been added to the Florida Public Broadcast membership.

2.14.12.3 Radio Frequency Information Sign Installation

(1) Exact sign locations are to be determined by the ***District Traffic Operations Engineer***. Work orders should be prepared using the usual procedures for installation by Department Maintenance forces.

(2) The signs shall be mounted according to height and lateral clearances specified in the ***Department's Standard Plans, Index No. 700-101***.

(3) In some cases, the mounting height resulting from attaching an additional panel to an existing sign may be less than the required 7 feet. In rural roadside areas, this situation still meets requirements; however, in urban areas where pedestrians are present, the support must be modified to maintain the required height.

Section 2.15

SMOKE ON HIGHWAY SIGNS

2.15.1 GENERAL

(1) Fires in proximity to highways in Florida can be wildfires or controlled burns under prescribed conditions. In either case, the Florida Department of Agriculture and Consumer Services (FDACS) Florida Forest Service (FFS) is most knowledgeable about smoke conditions.

(2) A Cooperative Agreement For Response To and Management of Smoke Intrusion On Florida Highways has been developed to provide a cooperative policy and process to warn and advise travelers about roadway visibility conditions resulting from wildfires and prescribed burns. This agreement is between the FFS, FDOT and the Florida Highway Patrol (FHP).

(3) The use of signs for controlled burns is shown in ***Part 5 of the MUTCD***. The use of signs for incident management is shown in ***Chapter 6I of the MUTCD***.

2.15.2 TEMPORARY SMOKE ON THE HIGHWAY SIGN

(1) FDOT will supply as needed, temporary incident management signs for use during smoke emergencies.

(2) FDOT has the authority to place the signs. FFS is authorized, but has no duty, to place the signs to warn motorists of an existing smoke hazard.

(3) FFS will notify FHP whenever FFS has knowledge that smoke may impact traffic on the state highway system. FDOT and FFS will assist when requested by FHP.

(4) FFS will coordinate the removal of such signs with FHP or FDOT.

(5) The signs and support hardware must comply with the Department standards.

(6) The sign detail is available in the ***Department's Sign Library*** under Temporary Smoke on Highway and reads: REDUCE SPEED SMOKE AHEAD.

2.15.3 PRESCRIBED BURN SIGN

(1) Prescribed burns are pre-planned and approved through the FFS authorization process. Precautionary warning signs on non-limited access roadways may be supplied, erected, and removed by the prescribed fire practitioner planning and executing the burn. The use of temporary precautionary warning signs for prescribed burns is optional.

(2) Prescribed fire practitioners shall not place precautionary warning signs on limited access public roadways without written approval by FDOT.

(3) The sign detail is available in the ***Department's Sign Library*** under Prescribed Burn and temporary precautionary warning signs will read as follows: PRESCRIBED BURN AHEAD.

(4) Sign materials shall comply with the current edition of the ***Section 994 of the Department's Standard Specifications***.

(5) Signs shall be mounted in accordance with the current edition of the ***Department's Standard Plans, Index No. 102-600***.

(6) Mounting heights and lateral clearances should adhere to those specified in the current edition of the ***Department's Standard Plans, Index No. 700-101***:

Case II (rural locations)	Sign edge 12' minimum from driving lane edge
Case V (urban locations)	Sign edge 2' minimum from face of curb

Section 2.16

SUPPLEMENTAL GUIDE AND MOTORIST SERVICES SIGNS ON LIMITED AND NON-LIMITED ACCESS HIGHWAYS

This section has been rescinded since it is now adopted as Florida's Highway Guide Sign Program in ***Rule Chapter 14-51, F.A.C.***

Section 2.17

EMERGENCY HIGHWAY TRAFFIC PLAN

This section of the TEM has been rescinded and replaced with the Emergency Management Program (Topic Number 956-030-001), which is sponsored by the Emergency Management Office.

Section 2.18

*FHP HIGHWAY ASSISTANCE PROGRAM

2.18.1 PURPOSE

(1) The *FHP (347) Highway Assistance Program is a statewide program where motorists wishing to report highway related information to the Florida Highway Patrol, or summon roadside assistance in a Road Ranger service area, can do so by using their cellular phone. Signs will be erected to inform motorists of the cellular phone number.

(2) The signing program will extend to all Interstate, Toll, U.S. Routes, and other major State Highway System roadways throughout the state.

2.18.2 SIGN LOCATION

The location of these signs should correspond to areas where cellular service is available. The service is available in all counties of the state; however, there are areas in some counties which are not covered.

2.18.3 SIGN DESIGN AND INSTALLATION

(1) The *FHP sign ***(FTP-43-06)*** is 48 x 48 inches, has a white legend on blue background, and the exact sign detail is shown in the ***Department's Standard Plans Index No. 700-102***.

(2) The electronic detail for this sign is available from the ***Department's Sign Library***.

(3) The *FHP sign has been revised to provide motorists the number interpretation of FHP (347), in order to quicken the calling process. This new sign design will be used on all new projects and as signs need to be replaced.

(4) Mounting heights and lateral clearances should adhere to those specified in the ***Department's Standard Plans, Index No. 700-101*** and support systems shall meet or exceed Department standards of frangibility.

(5) Specific sign placement details should be developed by District Traffic Operations Offices using the following guidelines.

2.18.13.1 Interstate and Other Limited Access Routes

(1) At state and county lines

(2) At approximately 30 mile intervals

(3) Following major freeway to freeway interchanges

2.18.13.2 Major Arterial Routes

(1) At state and county lines

(2) At approximately 30 mile intervals

(3) Downstream from intersections formed by junctions of U.S./Major State Highway System roadways

2.18.4 SIGN AVAILABILITY

Maintenance may obtain new or replacement signs by requisition from the Lake City Sign Shop.

Section 2.20

CALL BOX/MILE MARKER SIGNS

This section has been rescinded in accordance with the ***Department's DME Memo 13-05, Call Box Removal Plan***. Information on the use of reference markers can be found in ***Section 2.28 of the TEM***.

Section 2.21

FLORIDA LITTER LAW SIGNS

2.21.1 PURPOSE

In 1988, the Legislature enacted the ***Solid Waste Act*** which provided for a comprehensive solution to Florida's solid waste problems by involving state and local governmental entities and the private sector. ***Section 55 of the Solid Waste Act*** provided that there must be a coordinated effort to a cleaner environment through sustained programs of litter prevention. Subsection 5 provided that the Department of Transportation must place signs discouraging litter at all off-ramps on the interstate highway system.

2.21.2 SIGN DESIGN AND PLACEMENT

(1) The FLORIDA LITTER LAW sign is to be installed in compliance with ***Section 403.413(4), F.S.***

(2) The Department shall install the FLORIDA LITTER LAW sign ***(FTP-41-06)*** on interstate off-ramps as required by statute. They should be installed a minimum of 100 feet in advance of the first motorist services sign, or a minimum of 100 feet in advance of directional signs on the off-ramps without motorist service signs.

(3) The off-ramp sign shall be 30 x 36 inches with a white background and black legend ***(FTP-41-06)***. The specific sign detail is shown in the ***Department's Standard Plans, Index 700-102***.

(4) The Department may also install the FLORIDA LITTER LAW sign ***(FTP-40-06)*** on the interstate where there is excessive littering. This sign shall be 42 x 48 inches with a white background and black legend. The specific sign detail is shown in ***Department's Standard Plans, Index 700-102***.

(5) Electronic sign details are available at the ***Department's Sign Library***.

2.21.3 SIGN INSTALLATION

(1) Installation of these signs should be completed through the normal methods of locating the sign positions and notifying District Maintenance. Maintenance will order the signs from the Sign Shop and install them.

(2) The FLORIDA LITTER LAW sign ***(FTP-41-04)*** may also be installed on the State Highway System either by the ***District Traffic Operations Engineer*** or by local government through the Department's permit process.

(3) Mounting heights and lateral clearances should adhere to those specified in the ***Department's Standard Plans, Index No. 700-101*** and support systems shall meet or exceed Department standards of frangibility.

Section 2.22

TRAFFIC CONTROL FOR TOLL COLLECTION FACILITIES

The Department's standards for this section are now referenced in the ***Turnpike Plans Preparation and Practices Handbook (TPPPH)***.

Section 2.23

FLORIDA'S TURNPIKE AND TOLL ROAD NUMBERING AND SIGNING PROGRAM

2.23.1 PURPOSE

To establish standards for systematic numbering and signing of Florida's emerging toll road system.

2.23.2 BACKGROUND

(1) Florida's toll road system was originally made up of a complex network of locally developed expressways and the Florida Turnpike. The toll roads were developed largely through the efforts of local expressway authorities to serve regional transportation needs, seldom extending into adjacent counties. As locally funded and developed projects, the expressway's authorities developed a sense of community ownership for the toll road and gave it a locally pleasing name. These names have traditionally been used when referring to the roadway even though state road numbers were assigned to each facility.

(2) ***Section 338.01, F.S.***, which has created an intrastate highway system, changed the local flavor of the toll roads. Now considered a major component of the intrastate system, the toll roads perform a necessary function in transporting the motorist through urban areas in the shortest possible time. Consequently, the Turnpike District of the Department is responsible for the administration and expansion of many of the toll roads. Some of these are already open, others are in the planning stages.

(3) As toll roads have expanded and developed over time into a statewide toll network, a systems approach has been adopted to include connections to other systems. This includes accessibility to local streets, county roads, state system routes, and connections between other limited access systems. An integral part of this interconnected system is the road numbering and signing program.

2.23.3 ROAD NUMBERING PROGRAM

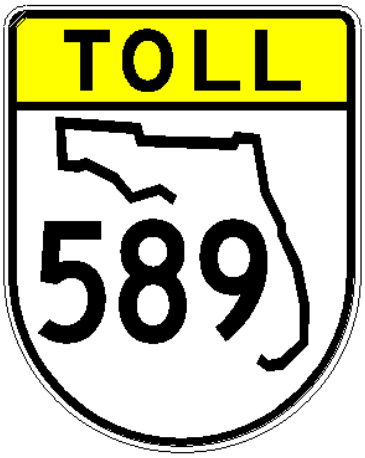
(1) Because of the expanding size of the toll system, the convention of identifying toll roads only by local names is not acceptable. The high number of toll roads and their interconnected nature causes navigation problems for tourists and other non-familiar motorists. A worst case can develop where one expressway joins another and the route name suddenly changes without changing roadways. The solution is to use a route numbering system, similar to that used on interstate routes, U.S. routes, and other state highways.

(2) Local names or logos will be retained for identification and a local sense of ownership only. Local names or logos will continue to be used by resident motorists, but those not familiar with the local system will rely on the numbering system to navigate the statewide system of toll facilities.

(3) The numbering system will be consistent with the statewide numbering systems for all state and county roads. In most cases the existing state road numbers will be used to refer to the toll roads. For new tollways, a number will be assigned by the Transportation Data and Analytics Office, consistent with the official numbering program. In cases where future facilities will result in the completion of a loop or beltway, connecting a series of shorter toll road segments, a single road number will be retained, often requiring a change of road numbers on older links.

(4) To express membership in the statewide toll system, and provide a consistent method of identification throughout the State, a sign has been developed ***(Figure 2.23-1)*** which depicts the toll road number on a unique sign shape. This sign is similar to an interstate shield and is used as a route marker and as part of the trailblaze assembly.

Figure 2.23-1. Toll Route Marker



2.23.4 SIGNING PROGRAM

(1) The toll route marker ***(Figure 2.23-1)*** is available in three sizes, depending on application. To identify the facility along the mainline a 48 x 60-inch toll route marker may be used. This sign may be used when leaving the toll plaza to confirm the route and also erected periodically along the mainline.

(2) To maintain the local identity of the toll road, and provide for local area motorists, the toll road name or logo may be erected on a confirmation guide sign downstream from the mainline toll plazas. If used, the logo panel shall be

furnished by the local expressway authority. These local name or logo signs are for identification purposes only. No attempt shall be made to use only the local toll road name or logo in guide signing, direction signing or trailblazing to the facility. A combination of route number signs and expressway names or logos may be necessary to accommodate local concerns, but the principal identification is the toll route marker.

(3) To identify a toll facility at a freeway to freeway interchange, both the advance guide sign and exit direction guide sign shall use the 36 x 48-inch toll route shield. This size is available as an overlay, and should also be used in other freeway type guide signs and overhead direction sign applications. The local toll road name or 36-inch logo panel may be used in a guide sign or direction sign application. If used, this logo panel shall be furnished by the local expressway authority.

(4) To identify a toll facility from a conventional road, (state, county, or local systems), or to provide trailblazing to a toll facility a 24 x 30-inch toll route marker shield shall be used in conjunction with the appropriate cardinal direction information, arrows, junctions, etc. The local toll road name or a 24-inch logo panel may be used in conjunction with the toll route marker. If used, this logo panel shall be furnished by the local expressway authority. Confirmation assemblies should be used in trailblazing beyond intersections of numbered routes.

Electronic sign details for these signs can be found at the ***Department's Sign Library***.

(5) Although trailblazing to toll facilities is an effective method of advertising for the facility, the intent of signing is to guide the motorist. The ***MUTCD*** is very specific on this issue. General limits on the maximum distance from a toll facility to parallel routes are recommended for rural and urban density development as follows.

2.23.5 RECOMMENDED MAXIMUM TRAILBLAZE DISTANCE

Rural density	5 miles
Urban density	2 miles

Due to the cost of signing and the possibility of overloading the motorist with information, the engineer must use care in locating these signs. Acceptable locations are along major parallel routes, and at the junction of roadways which have exits on the toll road.

2.23.6 LIMITED ACCESS SIGN DESIGNS

(1) For general issues relating to guide signs and the use of regulatory and warning signs, the toll system shall be interpreted as functioning as a fully access

controlled roadway with corresponding criteria such as clear zone requirements, letter height, sign placement, etc. (See ***Section 2E.02 of the MUTCD***). The engineer must keep in mind that this level of signing is purposefully kept simple and dignified, using large lettering, and concise messages that can be read, comprehended, and acted upon while traveling at a high rate of speed.

(2) The procedures used for guide sign sequences shall be as for other limited access facilities. The use of supplemental guide signs for traffic generators shall follow ***Rule 14-51.020, F.A.C***.

Section 2.24

PLACEMENT OF CRIME WATCH SIGNS ON THE STATE HIGHWAY SYSTEM

2.24.1 PURPOSE

To aid districts in evaluating and responding to requests for erecting Crime Watch Signs within the State Highway System rights-of-way.

2.24.2 DEFINITIONS

Crime Watch Sign. A sign used to identify a neighborhood, community, or other geographical area within which there exists a Crime Watch Program.

2.24.3 BACKGROUND

(1) Crime prevention is an issue of critical concern to both government and its citizens. With the assistance of law enforcement agencies, local citizens have organized Crime Watch Programs to enhance the safety and security of persons and property within their communities. According to law enforcement officials, the erection of Crime Watch Signs indicative of the adoption of a Crime Watch Program can be a deterrent to crime. Generally, local governments erect these signs along residential streets and in business districts.

(2) Crime Watch Signs shall not be considered official traffic control devices and accordingly are not governed by the ***MUTCD***. However, they do aid in law enforcement and contribute to public safety.

2.24.4 REQUESTS FOR SIGNING

(1) Requests for permitting the erection of Crime Watch Signs within State Highway System rights-of-way should be reviewed by the District Traffic Operations Engineer.

(2) Only requests submitted by local government traffic engineering or law enforcement agencies should be considered. Others should be referred to their local governmental agencies.

2.24.5 SIGN LOCATIONS

(1) Crime Watch Signs may be permitted along a state highway only in the vicinity of strip residential or commercial development which is directly accessed from the state highway.

(2) Crime Watch Signs should not be permitted on state highway right-of-way when the area of concern is adequately served by side streets connecting to the state highway. In such cases, the signs should be placed on the side street right-of-way and be readily visible to someone entering the side street from the state highway.

(3) Excessive posting of Crime Watch Signs along a state highway should not be permitted. Prudent judgment must be exercised in reviewing signing strategies with respect to the spacing of successive signs. For example, on highways passing through isolated small rural or suburban communities, single signs at the limits of the communities may be appropriate. In heavily developed areas, additional signs at moderate spacing may be needed.

(4) Crime Watch Signs shall not be permitted in a location where the view of existing traffic control devices may be obscured or where they might otherwise compete for the motorists' attention (e.g., next to a STOP Sign).

2.24.6 SIGN DESIGN AND PLACEMENT

(1) Since Crime Watch Signs are not official traffic control devices, requests for the Department to design or establish standards for these signs should be declined. However, the District Traffic Operations Engineer should review sign designs proposed for use on the State Highway System. Designs which resemble an official traffic control device or which may be confusing to or misconstrued by the motorists should be rejected.

(2) Sign designs should be simple and dignified, devoid of any advertising. Panel design and quality should be adequate to maintain a high level of appearance and legibility under anticipated environmental conditions, both day and night.

(3) Mounting heights and lateral clearances should adhere to those specified in the ***Department's Standard Plans, Index No. 700-101*** and support systems shall meet or exceed Department standards of frangibility.

(4) Crime Watch Signs shall not be affixed to any sign support maintained by the Department.

2.24.7 INSTALLATION AND MAINTENANCE

(1) A local governmental agency must agree to assume full responsibility for the installation and maintenance of any Crime Watch Signs permitted by the Department for installation on the State Highway System.

(2) The installing agency should be advised that the Department reserves the right to remove any Crime Watch Signs not in conformance with these instructions or which are not properly installed or maintained.

2.24.8 SPECIAL CONSIDERATIONS

Unusual requests or designs, or problems associated with Crime Watch Signs on the State Highway System should be discussed with the State Traffic Operations Engineer prior to permitting.

Section 2.25

DISTANCE SIGNING FOR NON-LIMITED ACCESS HIGHWAYS

2.25.1 PURPOSE

To establish a consistent distance signage system for all non-limited access state roads in conformance with ***Sections 2D.41*** and ***2D.42 of the MUTCD***.

2.25.2 BACKGROUND

(1) ***Section 2D.37 of the MUTCD*** does address the application of distance signage. However, there is no statewide procedure for distance signage on non-limited access roads. This perpetuates the situation of signing for a destination on a non-limited access state road that may be several hundred miles away. Also, the current distance signage practice does not take into consideration the use of Interstate and Florida's Turnpike System for long distance driving by motorists.

(2) The Department's current non-limited access distance signs do not provide adequate destination information for motorists who are looking for the variety of tourist attractions which are accessible from non-limited access highways in addition to destinations accessible from the Interstate and Florida's Turnpike System.

2.25.3 PROCEDURE

(1) Distance signs should have the names of three cities, towns, significant geographical identity, route, or community, and the distance (to the nearest mile) to those places.

(2) The top name should be the next place on the route having a post office, railroad station, route number (name) of an intersecting highway, or other significant geographical identity.

(3) The middle name should be used to indicate communities along the route or important route junctions. This name may be varied on successive distance signs to give motorists maximum information concerning communities along the route to the next control city.

(4) The bottom name must a major destination control city. The control city should remain the same on all successive distance signs throughout the length of the route until that destination qualifies to be the top or middle name on the distance

sign. Once the control city moves up, the next control city must be shown as the bottom name. There should always be a control city shown as the bottom name.

(5) ***Figure 2.25-1, Figure 2.25-2, Figure 2.25-3***, and ***Figure 2.25-4*** are examples of distance signs for non-limited access highways.

(6) Placement of distance signs are specified in ***Section 2D.42 of the MUTCD.***

(7) Control cities have populations of 10,000 or more and include countyseats. A matrix that includes the centroid defined for each municipality on the list can be found on the ***Intercity Mileage Spreadsheet***, maintained by the Transportation Data and Analytics Office.

(8) The implementation of this distance signing program should be through normal construction projects. The District Traffic Operations Engineer must develop corridor distance signage plans for inclusion into existing work program projects. Stand-alone distance signage projects are not required or desired.

Figure 2.25-1

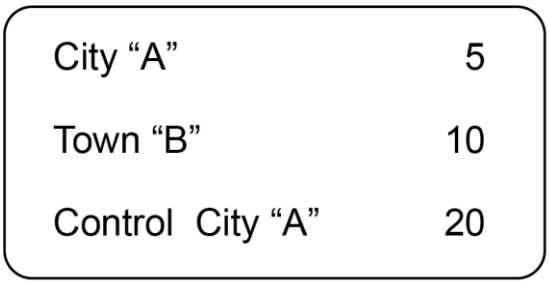


Figure 2.25-2

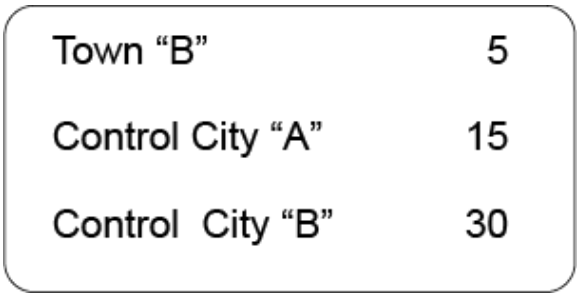


Figure 2.25-3

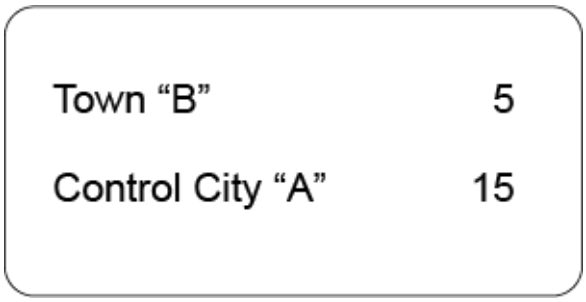
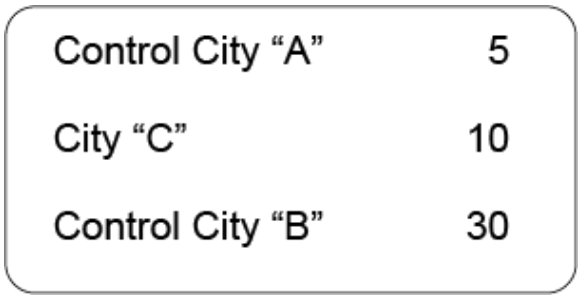


Figure 2.25-4



Section 2.26

ADVANCE GUIDE SIGNS ON LIMITED ACCESS HIGHWAYS

2.26.1 PURPOSE

To provide uniform statewide advance guide sign applications that ensure motorists are provided advance notification of interchange exits on limited access highways.

2.26.2 BACKGROUND

The Department's ***International Signing Practices Study*** recognized the need of the international tourist for advance notification of exit direction information. The most frequently cited problem of international visitors navigating in Florida was the lack of information about exits. Since this need is not limited to the international tourist, but to every unfamiliar motorist and also older drivers from both in and out-of-state this section was developed. The application for interchange guide signs is currently addressed in ***Section 2E.30 of the MUTCD***.

2.26.3 DEFINITIONS

The following definitions apply to this section and are in accordance with ***Section 2E.32 of the MUTCD***:

Intermediate Interchange. An interchange with urban and rural routes not in the category of major or minor interchanges.

Major Interchange. Subdivided into two categories: (a) interchanges with other expressways or freeways, or (b) interchanges with high-volume multi-lane highways, principal urban arterials, or major rural routes where the volume of interchanging traffic is heavy or includes many road users unfamiliar with the area

Minor Interchange. An interchange where traffic is local and very light, such as interchanges with land service access roads. Where the sum of the exit volumes is estimated to be lower than 100 vehicles per day in the design year.

2.26.4 PROCEDURE

(1) For urban areas, two advanced guide signs are required for every major and intermediate interchange on the Interstate, Florida's Turnpike System, and other limited access roadways.

(2) The two advance guide signs should be placed 1/2 mile and 1 mile upstream of the exit. If interchange spacing prohibits the placement of these two advanced

guide signs, then the interchange sequential series signs ***(Section 2E.40 of the MUTCD)*** should be used. Left hand exit interchanges should utilize diagrammatic signs.

(3) For major and intermediate interchanges, the two advance guide signs must be mounted overhead in urban areas. For rural interchanges either cantilever or ground mounted signs are adequate.

(4) For major interchanges in the rural area and freeway-to-freeway interchanges, three (3) advance guide signs must be provided and located approximately 1/2 mile, 1 mile, and 2 miles upstream from the exit. For rural intermediate interchanges, two advance guide signs are to be installed.

(5) Implementation of this advance guide sign program should be through construction projects scheduled in the work program. The ***District Traffic Operations Engineer*** must develop a list of interchanges for inclusion into the work program projects. Stand-alone advance guide sign projects are not required to comply with this standard.

Section 2.27

COMMUTER ASSISTANCE SIGNS

2.27.1 PURPOSE

To provide statewide sign design consistency for the Department's Commuter Assistance Program, ***Topic Number 725-030-008***.

2.27.2 BACKGROUND

Coordinated use of existing transportation resources can provide a responsive, low cost alternative for alleviating urban highway congestion and improving air quality, thereby reducing the need for costly highway improvements. The Commuter Assistance Program focuses on the single occupant commuter trip which is the greatest cause of peak hour highway congestion. A coordinated effort to provide alternatives to these commuters, using existing or low cost resources, can be beneficial to the development of a transportation demand management program and public transit statewide. The State's Commuter Assistance Program encourages a public/private partnership to provide services to employers and individuals for: carpools, vanpools, express bus service, subscription transit service, group taxi services, heavy and light rail, and other systems which are designed to increase vehicle occupancy.

2.27.3 SIGN DESIGN AND INSTALLATION

(1) ***Section 2I.11of the MUTCD*** provides guidance for the installation of a carpool information sign.

(2) Signing requests received from the Department's Public Transit Office or local transit agencies must be approved by ***District Traffic Operations Engineers***.

(3) Sign placement will be determined by District Traffic Operations based on field review and space availability.

(4) The Department's Commuter Assistance Program also includes two additional modes of services (vanpooling and transit) and there are different signs for each of these services.

(5) There are two different sizes for each sign design. The arterial sign shall be 36 x 24 inches. The interstate sign shall be 78 x 48 inches. All signs shall be blue reflective background with white lettering.

(6) Exact sign details for the TRY CARPOOLING ***(FTP-56-06 and FTP-56A-06)*** TRY TRANSIT ***(FTP-59-06 and FTP-60-06)*** and TRY VANPOOLING ***(FTP-57-06 and FTP-58-06)*** are available in the ***Department's Standard Plans, Index 700-102***.

(7) Electronic sign details for the all the signs in this section are available in the ***Department's Sign Library***.

(8) Mounting heights and lateral clearances should adhere to those specified in the ***Department's Standard Plans, Index No. 700-101*** and support systems shall meet or exceed Department standards of frangibility.

Section 2.28

REFERENCE LOCATION SIGNS (MILE-MARKERS)

2.28.1 PURPOSE

To establish consistent criteria and signing methods for reference location signs (mile markers) on both limited and non-limited access roadways.

2.28.2 STANDARDS

(1) Reference location signs shall be as described in ***Section 2H.05 and Section 2H.06 of the Manual of Uniform Traffic Control Devices (MUTCD)***. These signs consist of a vertical panel containing the mile-marker number. The sign shall have 6-inch white letters on a green reflective background and be placed on the right side of the roadway at 1-mile or 1/2-mile increments as detailed in ***Sections 2.28.3 and2.28.4***.

(2) The zero distance shall be established at the southern or western state line or at junctions where the route begins. ***MUTCD*** standards shall be followed for overlap routes.

2.28.3 CRITERIA FOR LIMITED ACCESS ROADWAYS

Reference Location Signs and Enhanced Reference Location Signs shall be used on limited access facilities. The following criteria shall be used when selecting reference location signs along limited access facilities:

(1) Reference location signs (***Section 2H.05 of the MUTCD***) shall be used every 1.0 mile outside urban boundary facilities.

(2) Enhanced reference location signs (***Section 2H.06 of the MUTCD***) shall be used every half mile inside urban boundary facilities.

2.28.4 CRITERIA FOR NON-LIMITED ACCESS ROADWAYS

(1) While reference location signs will be helpful on many roadways, those with existing positioning systems, i.e., good building numbers, adequate landmarks, and signed cross streets will not benefit significantly. In addition, there may be many requests from municipalities to provide these signs on qualifying roadways. The following criteria shall be used when selecting roadways to use reference location signs:

(a) Cross at least two municipalities or two county jurisdictions within three miles.

(b) Relatively devoid of named landmarks, cross streets, or building addresses that would serve as navigation aids for motorists in the area.

(c) Can be identified by local Emergency Medical Services (911) program to assist in address location.

(d) The proposed reference location sign should not interfere in any manner with other traffic control devices.

(2) Requests for the reference location signing must be initiated by local jurisdictions. In all cases, requests shall be directed to the District Traffic Operations Engineer and must meet all the criteria listed above.

(3) The local jurisdiction must, through the permit process, erect and maintain reference location signs on state system roadways, but the District Traffic Operations Engineer is responsible for the route signing plan.

Section 2.29

USE OF FLUORESCENT YELLOW-GREEN SIGN SHEETING

This section was rescinded on 11/1/18 and is now included in ***Section 700 of the Department's Standard Specifications***.

Section 2.30

SIGNING FOR ONE-STOP CAREER CENTERS

2.30.1 PURPOSE

The intent of this sign is to assist Floridians locate full-service One-Stop Career Centers located statewide. These centers provide a customer service network that offer every Floridian access to re-employment information, job search consulting, training and education referrals, and temporary financial assistance.

2.30.2 BACKGROUND

In 1995, the State of Florida began taking steps toward a new future for workforce development. Florida has committed significant resources to the development and integration of its workforce development system, perhaps most significant is the development of the One-Stop Career Centers. These centers offer universal services to all Floridians, not just those eligible for specific programs.

2.30.3 DEFINITIONS

Full-Service One-Stop Career Center. A physical location designated by the Regional Workforce Development Board which provides access to legislatively mandated partner agencies, and on-site delivery of core services, i.e., job search, placement assistance, skills assessment, and information on supportive services.

2.30.4 SIGN DESIGN AND INSTALLATION

(1) The One-Stop Career Center sign ***(FTP-36-06)*** shall be 36 x 36 inches and is white on green in color. The exact detail is shown in the ***Department's Standard Plans Index 700-102***.

(2) An electronic sign detail can be found at the ***Department's Sign Library***.

(3) Sign requests must be submitted by a local representative of the ***Workforce Regional Development Boards*** to the appropriate ***District Traffic O***perations Engineer. The Department will only sign for full-service One-Stop Career Centers as defined above.

(3) One-Stop Career Center signs will only be installed and maintained by the Department on Non-Limited Access Highways.

(4) Signs will be placed, based on availability of suitable space, at the nearest intersection along the State Highway System to the One-Stop Career Center.

(5) Mounting heights and lateral clearances shall adhere to those specified in the ***Department's Standard Plans, Index No. 700-101*** and support systems shall meet or exceed Department standards for frangibility.

Section 2.31

UNIQUE TRANSPORTATION SYMBOL SIGNS

2.31.1 PURPOSE

To provide standards for the use of FHWA approved transportation symbol signs on the State Highway System.

2.31.2 BACKGROUND

(1) Florida has a unique traveler composition compared to other states, in that a significant proportion of motorists are not familiar with our roadways. This is mainly due to the very large number of tourists, both domestic and international.

(2) We have found through research in our International Signing Study thatnon-familiar motorists respond very well to symbol signs.

(3) We have enhanced our signing program by implementing the followinginnovative symbol signs that describe transportation related services or destinations.

2.31.3 SCOPE

The use of the symbol signs in this section must meet the criteria for motorist services signing established in ***Rule Chapter 14-51, F.A.C., Florida's Highway Guide Sign Program.*** More specifically, ***Rule 14-51.021(1)(f), F.A.C.*** for Limited Access Highways and ***Rule 14-51.031(1)(f), F.A.C.*** for Non-Limited Access Highways.

2.31.4 PASSENGER SHIP SIGN

(1) The passenger ship transportation mode forms an important destination for both Florida residents and visitors to the state. This symbol sign will be used throughout the state to trailblaze the routes to passenger seaports and cruise ship ports that meet criteria specified in ***Section 2.31.3***.

(2) The PASSENGER SHIP sign ***(Figure 2.31-1)*** is a white symbol on green background.

(3) A 30-inch sign panel should be used on limited access highways and a 24-inch panel on non-limited access highways.

(4) Electronic sign details are available in the ***Department's Sign Library***.

Figure 2.31-1. Passenger Ship Sign

2.31.5 AMTRAK SIGN

(1) This AMTRAK symbol sign is currently approved for use on guide signs and trailblazing to Amtrak stations.

(2) Approval to place the AMTRAK sign shall be in accordance with criteria specified in ***Section 2.31.3***.

(3) The AMTRAK sign ***(Figure 2.31-2)*** is a white symbol on green background.

(4) A 30-inch sign panel should be used on limited access highways and a 24-inch panel on non-limited access highways.

(5) Electronic sign details are available in the ***Department's Sign Library***.

Figure 2.31-2. Amtrak Sign

2.31.6 GREYHOUND SIGNING

(1) This 3-color sign will be used as a motorist service sign and also to trailblaze to intra-city bus stations. Currently, there is no good way to sign for small bus

stations that may be located within a building used for other businesses. The use of this symbol sign will make it easier to trailblaze to these locations.

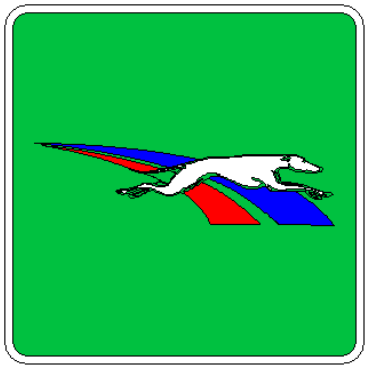
(2) Approval to place the GREYHOUND sign shall be in accordance with criteria specified in ***Section 2.31.3***.

(3) The GREYHOUND sign is ***(Figure 2.31-3)*** a 3-color symbol with a white border on a green background

(4) A 30-inch panel should be used on limited access highways and a 24-inch panel on non-limited access highways.

(5) Electronic sign details are available in the ***Department's Sign Library***.

Figure 2.31-3. Greyhound Sign



2.31.7 INSTALLATION AND PLACEMENT

(1) Where these signs are approved for use as trailblazer signs they shall be installed in accordance with height and lateral clearance requirements shown in the ***Department's Standard Plans, Index 700-101***.

(2) Where these signs are approved for use as general service signs appended to freeway guide signs, they must conform to the ***Department's Standard Plans, Index 700-104*** except for color scheme.

Section 2.32

511 TELEPHONE SERVICE SIGN

2.32.1 PURPOSE

The 511 Telephone Service is part of a nationwide program where motorists who wish to obtain traffic and transportation information can do so by dialing 511 from either their cell or regular phones in areas where the service is available. Signs will be erected to inform motorists of the phone number for this service.

The signing will extend to all Interstate and major State Highway System roadways throughout the state that have the 511 Telephone Service.

2.32.2 SIGN DESIGN AND PLACEMENT

(1) The CALL 511 sign ***(Figure 2.32-1)***, as found in ***Section 2I.10 of the MUTCD***, has two standard sizes. Signs installed on limited access highways shall be 48 x 60 inches ***(FTP-66-06)*** while signs installed on non-limited access highways shall be 36 x 48 inches ***(FTP-67-06)***.

Figure 2.32-1. TRAVEL INFO CALL 511 Sign

(2) The CALL 511 signs ***(FTP-66-06 and FTP 67-06)*** shall have a white legend on blue background and the exact sign details are shown in the ***Department's Standard Plans, Index No. 700-102***.

(3) Electronic sign details can be found in the ***Department's Sign Library***.

(4) When the 511 Telephone Service becomes available, specific sign placement details shall be reviewed by the appropriate ***District Traffic Operations*** office using the guidelines shown in ***Sections 2.32.2.1 and 2.32.2.2.***

2.32.2.1 Interstate and Other Limited Access Routes

(1) At state and county lines
(2) At approximately 10 mile intervals in urban/metro areas
(3) At approximately 30 mile intervals in rural areas
(4) Preceding major freeway to freeway interchanges

2.32.2.2 Major Arterial Routes

(1) At state and county lines
(2) At approximately 10 mile intervals in urban/metro areas
(3) At approximately 30 mile intervals in rural areas
(4) Recommended locations should be upstream from intersections formed by junctions of U.S./Major State Highway System Roadways at the discretion of the District Traffic Operations Engineer.

Section 2.33

SIGNING FOR NATURE-BASED TOURISM AND HERITAGE TOURISM TRAILS

2.33.1 PURPOSE

The purpose of this section is to identify for prospective sponsors of nature-based and/or heritage trails the type of support the Department can offer and the signs that are appropriate for installing along public roadways.

2.33.2 BACKGROUND

(1) The concept of nature-based and heritage tourism is best explained as a statewide effort to promote the natural and historic resources of our state. These resources include natural spaces of our State Parks, lakes, rivers, beaches, and woodlands, as well as the rich historical and cultural sites across Florida.

(2) The Department is an active participant in the effort to promote Florida's natural assets through nature-based tourism and heritage tourism programs. The Department's role is to provide a mechanism for using public right of way for the needed signs and provide engineering guidance to ensure that effective signing plans are developed.

(3) Some examples of approved trails are the Historic Heritage Trail sponsored by the Department of State, the Birding Trail sponsored by the Fish and Wildlife Conservation Commission, and the Gulf Coast Heritage Trail sponsored by the Sarasota Bay National Estuary Program.

2.33.3 PILOT PROGRAM

(1) The Gulf Coast Heritage Trail was the first regional nature-based tourism trail program within the state and the Department approved the signing plan as a pilot program. It is a true trail system in that trail-blaze signs identify the route to follow to access the sites, which are also described in the auto tour map and brochure. The program was pioneered and coordinated by the Sarasota Bay National Estuary Program in Sarasota and Manatee Counties.

(2) The success of this pilot is such that the Department is using the Gulf Coast Heritage Trail as a model for other regional plans to follow.

2.33.4 CRITERIA FOR SIGNING PROGRAM

In developing a trail system, several criteria must be followed by the sponsor of the proposed nature-based or heritage tourism trail.

(1) The sponsor must develop grassroots support including local input into establishing routes.

(2) The program must include use of a land-based brochure with auto tour map - the signs are not the primary guidance method.

(3) Attraction selection should be restricted to public ownership, non-profit, or for those charging admission, a primary educational purpose (this includes museums and art galleries).

(4) Promotional posters and an Internet website are strongly suggested.

2.33.5 DOT PARTICIPATION

(1) The Department will participate in the development of nature-based and heritage tourism programs by providing advisory services as the programs are proposed, offer preliminary route recommendations, and approve routes upon which signs may be erected.

(2) The Department's State Traffic Engineering and Operations Office (850-410-5600) must be contacted early in the process to assure proper coordination with all districts affected by the proposed trail.

(3) Upon selection of the final route, District Traffic Operations personnel will determine appropriate locations for trail-blaze signs and mark the locations so that a sign contractor can erect the signs. It is the sponsor's responsibility to have the signs manufactured and erected through the Department's general use permitting process. Department staff can provide the names of sign manufacturers and contractors who are experienced in providing theseservices.

2.33.6 SIGN APPROVAL AND DESIGN

(1) The State Traffic Operations Engineer in Tallahassee must approve the sign design to be used for this program.

(2) Logo signs are encouraged for this program, and several criteriaapply:

(a) Signs installed on non-limited access highways shall be 24-inch panels. The name of the trail should be in white highway sign type, upper case lettering (Helvetica). A sample logo is shown in ***Figure 2.33-1***.

(b) Signs shall be devoid of advertising.

(c) Signs logos may use colors, but must contain a brown background of Type III retro-reflective sheeting, per ***Section 994 of the Department's Standard Specifications***. Inks must be transparent highway sign types.

(d) Signs should be installed along the State Highway System route with an arrow pointing in the appropriate direction where cross streets must be used to access the attraction. Confirmation signs, with straight-ahead arrows, are used at appropriate intervals to let motorists know they are on the right path (usually 3-5 miles depending upon length of the route segments).

Figure 2.33-1. Logo for Gulf Heritage Trail

2.33.7 SIGN MAINTENANCE

(1) The sponsors of the proposed nature-based and/or heritage trails are responsible for the maintenance of the signs used throughout the trail.

(2) A contract with a private sign installation contractor should be executed or a maintenance agreement with local government secured for signs on the State Highway System.

(3) Evidence of the contract or agreement must be presented to the appropriate ***District Traffic Operations*** office prior to installation of the signing program.

Section 2.34

SIGNING FOR THE FLORIDA SCENIC HIGHWAYS PROGRAM AND THE NATIONAL SCENIC BYWAYS PROGRAM

2.34.1 PURPOSE

To establish statewide signing standards for designated Florida Scenic Highways and/or National Scenic Byways.

2.34.2 BACKGROUND

(1) The intent of both the Florida Scenic Highways Program (FSHP) and the National Scenic Byways Program (NSBP) is to designate paved public roads as scenic corridors to preserve, enhance, and maintain the intrinsic resources for the enjoyment of the traveling public.

(2) For a roadway to be designated under either or both these programs, the roadway must possess at least one of the following six intrinsic resources:

(a) **Cultural Resources.** Include the traditions, values, customs and arts of social groups.

(b) **Historical Resources.** Reflect human actions evident in past events, sites or structures.

(c) **Archaeological Resources.** Embody the physical evidence or remains of human life, activities, or cultures.

(d) **Recreational Resources.** Highlight activities dependent upon the natural elements of the landscape.

(e) **Natural Resources.** The natural landscapes showing little or nodisruption by humans.

(f) **Scenic Resources.** Combinations of natural and manmade features that give the visual landscape remarkable character and significance.

(3) Benefits of designation as a Florida Scenic Highway and/or a National Scenic Byway include:

(a) **Resource Protection.** FSHP/NSBP designation provides the opportunity to preserve and enhance the significant intrinsic resources along public roads.

(b) **Community Recognition.** The posting of the FSHP/NSBP logo signage along the designated highways will identify the corridors as "special places" with important resources worth noting.

(c) **Economic Development/Tourism.** Designation provides an opportunity for the millions of tourists traveling by car in Florida to visit these communities along a designated highway corridor.

(d) **Community Visioning.** The FSHP/NSBP designation can complement and support a community's vision thereby instilling a sense of pride.

(e) **Partnering.** This concept comes from public and private cooperation of agencies and corporate sponsorships, which provide support to the community and the overall corridor's focus.

2.34.3 PROGRAM COORDINATION

(1) FDOT's ***Environmental Management Office (EMO)*** oversees the Statewide Florida Scenic Highways Program.

(2) Each FDOT District Office has a designated District Scenic Highways Coordinator that represents the district in all matters pertaining to the FSHP or NSBP. The District Scenic Highways Coordinators are the initial point of contact for questions about the Program and provide the link between the Department and the community.

2.34.4 SIGN CRITERIA

(1) In signing a designated Florida Scenic Highway (FSH) or National Scenic Byway (NSB), the following criteria must be followed:

(a) Signing shall not interfere with or distract from adjacent traffic control devices or from the resources of the area.

(b) Signing shall conform to the ***MUTCD***, which is incorporated by reference in ***Rule 14-15.010, F.A.C.***

(c) Highways that lose designation under the FSHP or the NSBP shall have all FSH and NSB signs removed.

(2) Designated FSH, and NSB (as applicable), shall be signed at entrance points to a route. Signing along a designated highway will be installed approximately every five-miles in both directions. However, during the review by District Traffic Operations, exceptions can be made based on frequency of intersections and/or directional needs.

(3) Signs shall be installed for both FHS and NSB in accordance with the approved sign standards shown in Sections 2.34.5 ***and*** 2.34.6.

2.34.5 FLORIDA SCENIC HIGHWAY SIGNS

2.34.5.1 COORDINATION

(1) The Department of Transportation provides advisory services when highway corridors are proposed for eligibility or designation to the FSHP. Once the highway corridor is designated, the District Scenic Highway Coordinator(s) facilitates the coordination of the sign implementation process.

(2) The proper sign coordination process for a FSH is detailed below:

(a) The District Coordinator(s) will coordinate the preferred location(s) for the FSHP signs with the District Traffic Operations Office, along with the Corridor Management Entity (CME).

(b) The District Traffic Operations Office will finalize the location(s) of the signs and send a work request to the appropriate District Maintenance Yard for installation.

(c) One additional sign will be ordered along with all the other signs. This sign is to be used as a display at the ceremony and is not to be placed along the corridor.

(d) The CME and its partners may host a dedication ceremony to celebrate the designation of the particular corridor as a Florida Scenic Highway.

2.34.5.2 SIGN DETAIL

(1) The standard sign design to be used to designate a Florida Scenic Highway is shown in Figure 2.34-1. There are two sign sizes available, and they are to be used in the specific applications shown in ***Section 2.34.5.3***.

(2) Exact sign details are shown in the ***Department's Sign Library***.

2.34.5.3 SIGN INSTALLATION

(1) The 24 x 36 FSH sign (***Figure 2.34-1***) shall be installed at the entrance points to a designated Florida Scenic Highway route along with a supplemental panel with the scenic highway's name.

Figure 2.34-1. Florida Scenic Highway Sign Design

(2) When appropriate, the Florida Scenic Highway Sign shall be co-located with existing route confirmation signs. The 16 x 24 sign panel should be installed on top of this sign. The exact application is shown in ***Figure 2.34-2***.

Figure 2.34-2. Co-Location on Route Confirmation Marker

(3) When the designated scenic highway intersects with another state road, the 16 x 24 sign panel should be installed on existing route directional signs. The exact application is shown in ***Figure 2.34-3***.

(4) The Department is responsible for the installation of the FSH signs on the State Highway System.

(5) The local government is responsible for the installation of the FSH signs on their system.

2.34.5.4 MAINTENANCE

(1) The maintenance of the FSH signs used throughout the scenic highway corridor depends on the government entity that is responsible for the roadway.

(a) The Department is responsible for the maintenance of FSH signs on the State Highway System.

(b) Local government is responsible for the maintenance of FSH signs on their roads.

Figure 2.34-3. Co-Location on Route Direction Marker

2.34.6 NATIONAL SCENIC BYWAY SIGNS

2.34.6.1 COORDINATION

(1) The Department provides advisory services when highway corridors are proposed for eligibility or designation to the NSBP. Once the highway corridor is designated, the District Scenic Highway Coordinator(s) facilitates the coordination of the sign implementation process similar to the FSH process outlined in Section 2.34.5.1**.** The only difference will be no need for an extra NSB sign panel for the dedication ceremony.

(2) The District Scenic Highways Coordinator(s) will work with the Statewide Scenic Highways Coordinator to submit applications for National Scenic Byway or All-American Road designation to the Federal Highway Administration.

(3) Once designated as National Scenic Byway or All-American Road, the District Scenic Highway Coordinator(s) will facilitate the following process.

(a) The District Scenic Highway Coordinator(s) will coordinate the location of the NSBP signs with the District Traffic Operations Office.

(b) District Traffic Operations will locate the signs and send a work request to the appropriate District Maintenance Yard for installation.

(c) The District Scenic Highway Coordinator(s) will contact the respective District Maintenance Office or local government to coordinate the installation of the signs along the corridor.

2.34.6.2 SIGN DETAIL

(1) The FHWA developed and approved the ***America's Byways (D6-4 and D6-4a)*** sign shown in ***Section 2D.55 of the MUTCD***. This sign is approved for use on National Scenic Byways.

(2) The exact sign details for the National Scenic Byways Sign can be found in the *FHWA's Standard Highway Signs Manual*.

2.34.6.3 INSTALLATION

(1) The NSB sign shall be installed at the entrance points to a designated byway. When possible, this sign shall be mounted below the FSH sign on a standard sign pole.

(2) When an existing designated Florida Scenic Highway becomes a National Scenic Byway, District Traffic Operations will review the existing signing on the designated roadway for possible ways to accommodate both designations on the corridor. If unable, to place both, then the FSH will have the priority on the roadway.

(3) The Department is responsible for the installation of the NSB signs on the State Highway System.

(4) The local government is responsible for the installation of the NSB signs on their system.

2.34.6.4 MAINTENANCE

(1) The maintenance of the NSB signs used throughout the National Scenic Byway corridor depends on the government entity that is responsible for the roadway.

(a) The Department is responsible for the maintenance of the NSB sign on the State Highway System.

(b) Local government is responsible for the maintenance of the NSB sign on their roads.

Section 2.35

SIGNING FOR MEMORIAL ROADWAY DESIGNATIONS

2.35.1 PURPOSE

The purpose of this section is to provide guidance to the districts on the installation of signs when a roadway has been given a memorial designation by the Florida Legislature.

2.35.2 BACKGROUND

(1) Over the years, the Florida Legislature has dedicated, named, and otherwise titled roadways in Florida. The designated roads can be under the jurisdiction of either the Department or local government.

(2) Records kept in the Department's Systems Implementation Office identify the earliest dedicated roadway as the W.W. Clark Memorial Bridge on State Road 580 between Safety Harbor and Oldsmar. This was dedicated by the State Road Board on July 6, 1922. Since that time, every county and most cities have participated in officially naming some roadway feature.

2.35.3 SIGNING PROCESS

(1) The Florida Legislature designates the roadways based on recommendations from a city or county commission, individual state agencies, or civic groups.

(2) Upon official designation by the Florida Legislature, it is the responsibility of the legislative sponsors of the designation to obtain local resolutions in accordance with ***Section 334.071(3), F.S.***

(3) After receiving a copy of the local resolution, the Department shall begin the process to have the signs installed on the State Highway System.

(4) Within the Department, the process for the installation of these signs involves the following offices:

- **(a)** District Public Information Office
- **(b)** District Traffic Operations Office
- **(c)** District Maintenance Office
- **(d)** State Traffic Engineering and Operations Office
- **(e)** Transportation Data and Analytics Office

(5) Each district has their own signing process in place, and it varies as to which of the above district offices initiates the process. However, it is important that all the above district offices are notified and kept informed as to the status of roadway designations within their district after each legislative session.

(6) Each district will coordinate the installation of the signs with the legislative sponsor of the designation.

(7) Memorial names may not appear on guide signs or on any other than the standard sign, in accordance with ***Section 2M.10 of the MUTCD***

2.35.4 SIGN INSTALLATION AND MAINTENANCE

(1) Signs shall be installed and maintained by the Department on the State Highway System.

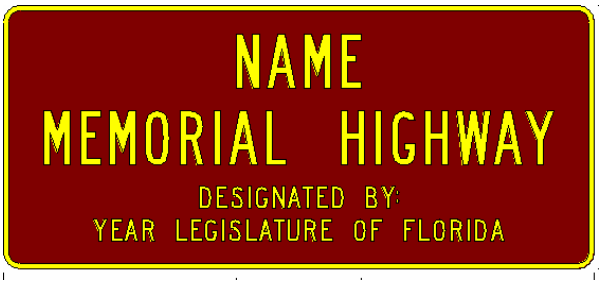
(2) On non-limited access facilities, one sign per direction shall be installed in accordance with ***Section 2M.10 of the MUTCD***.

(3) On limited access facilities, one sign per direction shall be installed in accordance with ***Section 2M.10 of the MUTCD.***

2.35.5 SIGN DESIGN

(1) The signs used for Memorial Roadway Designations shall be a brown panel with yellow lettering. An example of this sign is shown in ***Figure 2.35-1***.

Figure 2.35-1. Memorial Roadway Designation Sign



(2) The exact sign detail for this sign can be found at the ***Department's Sign Library***.

Section 2.36

COMMUNITY WAYFINDING GUIDE SIGNS

2.36.1 PURPOSE

The purpose of this section is to provide guidance to the districts on the process for approving Community Wayfinding Guide Signs on the State Highway System.

2.36.2 BACKGROUND

(1) The Department, in cooperation with the Florida League of Cities, has developed statewide criteria for Community Wayfinding Guide Signs on our State Highway System. These standards as shown in ***Rule 14-51, Part V, F.A.C.,*** (Florida's Highway Guide Sign Program) provide local governments the flexibility to design their own Community Wayfinding Guide Sign System while still maintaining federal and state sign standards to safely guide motorists to their destinations.

(2) The standards shown in ***Rule 14-51, Part V, F.A.C.*** allow local governments to have a better understanding of what can and cannot be approved for use on the State Highway System based on the requirements of the MUTCD.

2.36.3 STANDARDS

(1) All Community Wayfinding Guide Signs on the State Highway System must be in conformance with ***Rule 14-51, Part V, F.A.C.*** prior to any installation.

(2) In conformance with ***Rule 14.51.051(8), F.A.C.,*** the design, installation, and maintenance of Community Wayfinding Guide Signs on the State Highway System are the responsibility of local government.

2.36.4 REVIEW PROCESS

(1) A pre-planning meeting between District Traffic Operations and local government is recommended to assist in compliance with ***Rule 14-51, Part V, F.A.C.***

(2) After a Community Wayfinding Guide Sign System Plan has been developed, local governments or their representative must provide one set of the Community Wayfinding Guide Sign System Plans to the appropriate ***District Traffic Operations Office***.

(3) Once received, the Community Wayfinding Guide Sign System Plan shall be reviewed by the District Traffic Operations Office for compliance with ***Rule 14-51, F.A.C.***

(4) If compliance is not met, District Traffic Operations staff will contact local government with the changes that need to be made to their Community Wayfinding Guide Sign System Plan in order to meet the criteria shown in the ***Rule 14-51, F.A.C.***

(5) Once the Community Wayfinding Guide Sign System Plan is approved, the District Traffic Operations Office shall issue a letter of compliance signed by the District Traffic Operations Engineer to the local government.

Section 2.37

ADVANCE STREET NAME SIGNS

2.37.1 PURPOSE

To provide guidance on the design, placement, and installation criteria for advance street name signs on the State Highway System.

2.37.2 BACKGROUND

(1) The use of advance street name signs is one of the recommended roadway improvements and safety countermeasures in the Department's Safe Mobility for Life Program. This recommended improvement is based on the ***FHWA's Handbook for Designing Roadways for the Aging Population*** to provide advance notification to drivers to help them in making safer roadway decisions.

(2) In 2002, FDOT conducted an effectiveness study on the roadway improvements that were implemented in our aging road user program, including advance street name signs. Data from that study showed that advance street name signs with larger lettering were read at a greater distance from the intersection being announced which led to significantly more decision time. The research supports our decision to continue to use advance street name signs as an effective safety countermeasure for FDOT's ***Safe Mobility for Life Program***.

2.37.3 DEFINITIONS

Critical or Significant Cross Street. A signalized or unsignalized intersection or cross street classified as a minor arterial or higher, that provides access to a traffic generator or possesses other comparable physical or traffic characteristics deemed to be critical or significant and having an AADT greater than 2000.

2.37.4 STANDARDS

The standards shown in this section apply to each of the three different types of advance street name sign applications. Specific criteria for the installation of advance street name signs at signalized intersections (NEXT SIGNAL) is shown in ***Section 2.37.5,*** for non-signalized intersections (NEXT INTERSECTION) in ***Section 2.37.6*** and for advance street name plaques on intersection warning signs in ***Section 2.37.7***.

(1) Advance street name signs and Advance Street Name plaques shall only be used to identify critical or significant cross streets. They are not intended to identify destinations such as cities, facilities, or residential neighborhoods.

(2) Whenever possible the word Street, Boulevard, Avenue, etc., should be abbreviated (St, Blvd, Ave) or letter height reduced to conserve sign panel length. In special cases it may be deleted; however, if confusion would result due to similar street names in the area, for example Orange Street and Orange Avenue, this deletion should not be made.

When a subdivision or community in the area also goes by that name these words (Street, Boulevard, Avenue, etc.) or their abbreviations should not be deleted.

(3) When a cross street is known by both route number and a local name, use of the local name is preferred on the advance street name sign since the route number is identified on route markers along the route.

(4) When minor cross streets intersect the State Highway between the advance street name and the intersection, additional legend such as NEXT SIGNAL or XX FEET may be added to the advance street name sign.

(5) The legend used on the advance street name sign or plaque shall be consistent with the legend on either the overhead street name or post mounted street name sign.

(6) Sign sheeting materials shall comply with the current edition of the ***Department's Standard Specifications for Highway and Bridge Construction, Section 994***.

(7) Mounting heights and lateral clearances should adhere to those specified in the ***Department's Standard Plans, Index No. 700-101*** and support systems shall meet or exceed Department standards of frangibility.

(8) Signs should be installed in advance of the intersection in accordance with the distances shown in ***"Condition A" of Table 2C-4 of the MUTCD***. These distances are to be considered the minimum for a single lane change maneuver and should be measured from the begin taper point for the longest auxiliary lane designed for the intersection. The degree of traffic congestion and the potential number of lane change maneuvers that may be required should also be considered when determining the advance placement distance.

2.37.5 ADVANCE STREET NAME SIGNS AT SIGNALIZED INTERSECTIONS

(1) Requests to install advance street name signs ***(Figure 2.37-1)*** must be initiated by District Traffic Operations or based on a request received from the local agency having jurisdiction over the approaching cross street. The District Traffic Operations Engineer is responsible for the review and approval of these signs.

(2) Advance street name signs shall be white lettering on green background and designed in accordance with ***Sections 2D.05 and 2D.39 of the MUTCD***.

Figure 2.37-1. Advance Street Name Sign at Signalized Locations

(3) The use of advance street name signs at signalized intersections as a safety countermeasure are recommended and should be installed if any of the following conditions occur:

(a) There is a documented history of side-swipe or rear-end crashes or;
(b) There are high volume approaches.
(c) There is a high 65 and older population.
(d) Roadway with 4 lanes or greater.
(e) Rural high speed roadways (50 mph or greater).
(f) The intersection is located in a ***Safe Mobility for Life Coalition Priority County.***

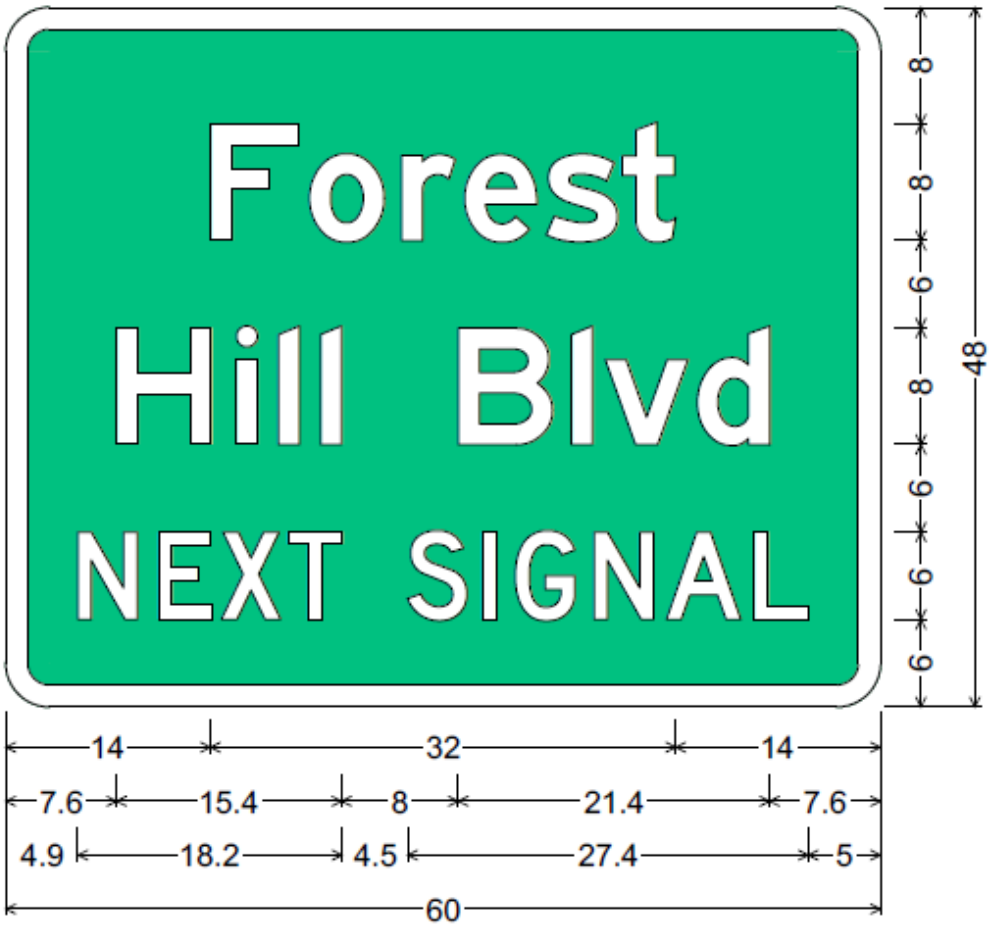
(4) At a minimum, letter height (legend) shall conform to ***Table 2.37-1, Design Guidelines for Advance Street Name Signs.*** When street name legends are lengthy, or there is limited right-of-way the sign font shall be modified from ***Table 2.37-2*** using the standard font sizes shown in ***Figure 2.37-4.***

Table 2.37-1. Design Guidelines for Advance Street Name Signs

Posted Speed Limit	STREET NAME LEGEND Letter Size (inches) Upper/Lower Case Letters	NEXT SIGNAL or NEXT INTERSECTION Letter Size (inches) Upper Case Letters
35 mph or less	8EM	6D
40 mph or greater	10.67EM	8E

(5) Roadways posted at 35 mph or less, or when limited right of way is available a single post sign design ***(Figure 2.37-2)*** shall be installed.

Figure 2.37-2. Advance Street Name Sign Design (Single Post)



3.0" Radius, 1.5" Border, White on Green;
"Forest" E 2K; "Hill Blvd" E 2K; "NEXT SIGNAL" D 2K;
Table of distances between letter and object lefts.

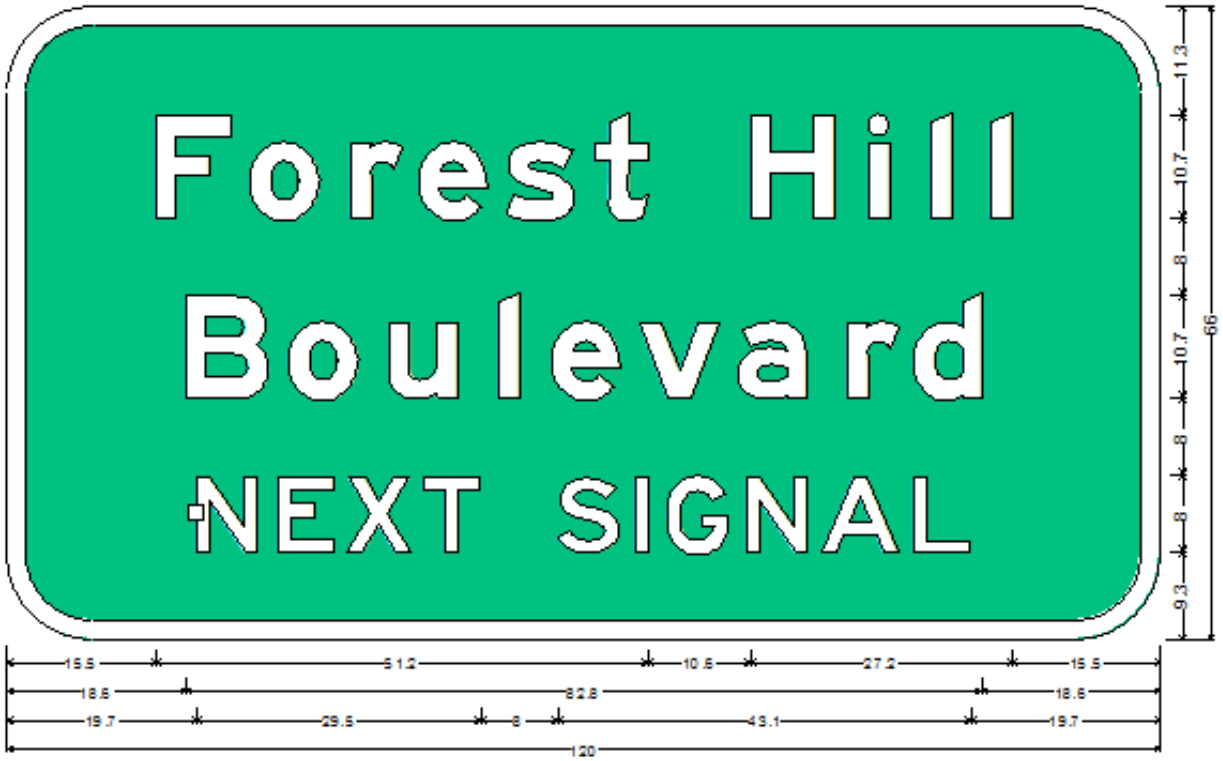
	F	o	r	e	s	t	
14.0	6.8	6.4	4.3	5.6	5.2	3.7	14.0

	H	l	l	l	B	l	v	d	
7.6	8.2	2.9	2.9	9.4	7.8	2.3	6.3	5.0	7.6

	N	E	X	T	S	I	G	N	A	L	
4.9	5.6	4.3	4.5	8.3	5.1	2.2	5.4	5.0	6.0	3.7	5.0

(6) Roadways posted at 40 mph or greater and have no limited right of way, a double post design (***Figure 2.37-3)*** shall be installed.

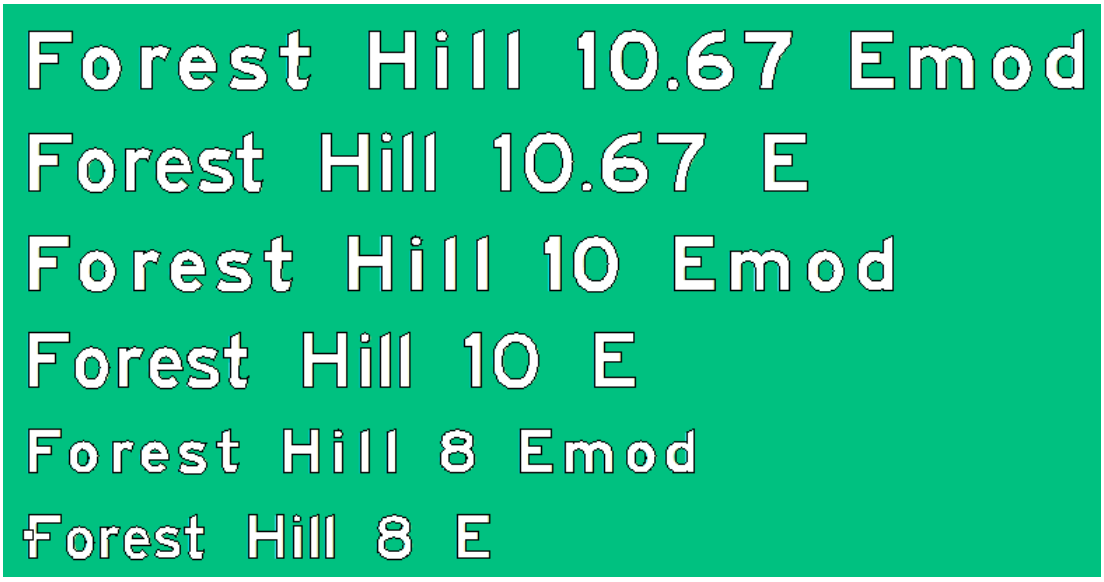
Figure 2.37-3. Advance Street Name Sign Design (Double Post)



9.0" Radius, 2.0" Border, White on Green;
"Forest Hill" E Mod 2K; "Boulevard" E Mod 2K; "NEXT SIGNAL" E 2K;
Table of letter and object leftx.

F 15.5	o 25.3	r 35.8	e 42.8	s 51.9	t 61.1	H 77.3	i 89.6	l 96.0	l 102.4
B 18.6	o 29.3	u 39.8	l 51.1	e 58.6	v 65.8	a 76.1	r 87.4	d 94.3	
N 19.7	E 28.3	X 35.4	T 43.2	S 57.2	I 65.3	G 68.6	N 76.9	A 84.8	L 94.3

Figure 2.37-4. Standard Font Sizes for Advance Street Name Sign Legends



(7) When a cross street has a different name on each side of the intersection, both names shall be shown on the advance sign with an arrow beside each name to designate direction ***(Figure 2.37-5)***.

Figure 2.37-5. Advance Street Name Sign Using Different Names

2.37.6 ADVANCE STREET NAME SIGNS AT NON-SIGNALIZED INTERSECTIONS

(1) Requests to install advance street name signs ***(Figure 2.37-6)*** at non-signalized intersections must be initiated by District Traffic Operations or based on a request received from the local agency having jurisdiction over the approaching cross

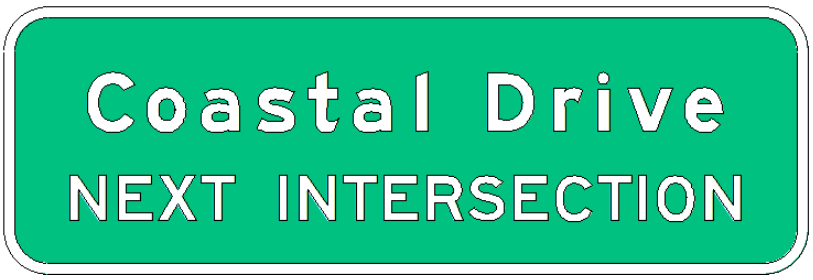
street. The District Traffic Operations Engineer is responsible for the review and approval of these signs.

(2) These signs may be installed on multi-lane divided highways that have a dedicated left turn lane, not just a median opening for the approaching critical or significant cross street. The posted speed of the roadway shall not be lower than 45 mph.

(3) Advance street name signs shall be designed in accordance with ***Sections 2D.05 and 2D.39 of the MUTCD*** and the ***Standard Highway Signs Manual***.

(4) At a minimum, letter height (legend) shall conform to ***Table 2.37-1, Design Guidelines for Advance Street Name Signs***.

Figure 2.37-6. Advance Street Name Signs at Non-Signalized Locations



2.37.7 ADVANCE STREET NAME PLAQUES ON INTERSECTION WARNING AND ADVANCE TRAFFIC CONTROL SIGNS

(1) Intersection Warning Signs (W2 series) ***(Figure 2.37-7)*** and Advance Traffic Control Signs (W3 series) ***(Figure 2.37-8)*** should be installed when there is a documented need based on sight restriction, crash history, or engineering judgment.

(2) Advance street name plaques ***(Section 2C.49 of the MUTCD)*** should be installed on these warning signs when there is:

- **(a)** Minimum of 2000 AADT
- **(b)** No street lighting along main arterial
- **(c)** Documented history of turning, entering, or side-swipe crashes
- **(d)** Limited sight distance due to horizontal or vertical curves
- **(e)** A high 65 and older population
- **(f)** The intersection is located in a ***Safe Mobility for Life Coalition Priority County***.

(3) It is recommended that wherever a new or replacement Intersection Warning Sign (W2 series) is installed on a rural roadway it is accompanied by an advance street name plaque designed in accordance with this section.

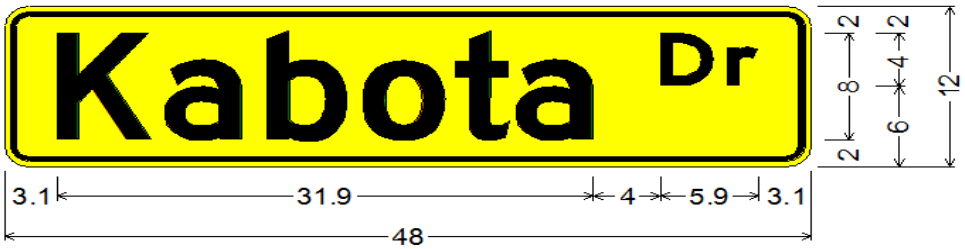
(4) Requests must be initiated by District Traffic Operations or may also be received from the local agency having jurisdiction over the approaching cross street.

(5) Advance street name plaques shall be black lettering on yellow background using an 8-inch D series lettering size mounted below a 48-inch warning sign panel, with upper/lower case lettering in accordance with the ***FHWA's Handbook for Designing Roadways for the Aging Population.*** If not structurally possible, lettering size may be decreased to a minimum of 5-inch D series.

(6) Roads not currently signed with an advance route marker may be considered for an Intersection Warning Sign (W2 series) with an advance street name plaque when they meet the criteria referenced in ***Section 2.37.7(1)***.

(7) Roads with an advanced route marker (JCT shield) ***(Figure 2.37-9)*** may have the street name plaque placed below to better identify the roadway to unfamiliar travelers. The panel color should match the route marker. If used, the lettering on the street name plaque shall be no less than 4-inch C series.

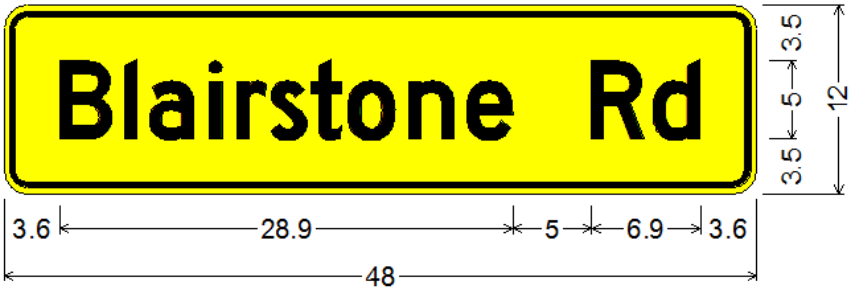
Figure 2.37-7. Advance Street Name Plaque on Intersection Warning Sign



1.5" Radius, 0.4" Border, 0.4" Indent, Black on Yellow;
"Kabota" D 2K " Dr" E 2K;
Table of letter and object lefts.

K	a	b	o	t	a	D	r
3.1	9.5	15.6	21.4	26.8	30.5	39.0	43.0

Figure 2.37-8. Advance Street Name Plaque on Advance Traffic Control Warning Sign



1.5" Radius, 0.4" Border, 0.4" Indent, Black on Yellow;
"Blairstone Rd" D 2K;
Table of letter and object lefts.

B	l	a	i	r	s	t	o	n	e
3.6	7.7	9.3	13.1	14.9	17.1	19.6	22.0	25.8	29.5

R	d
37.5	41.4

Figure 2.37-9. Advance Street Name Plaque on Advanced Route Marker

3 PANEL ROUTE MARKER;
M2-1_21x15;
1.5" Radius, 0.6" Border, 0.4" Indent, Yellow on Blue;
"JCT" C 2K specified length;
30" COUNTY SHIELD;
1.5" Radius, 0.6" Border, 0.4" Indent, Yellow on Blue;
"Sweetwater" C 2K; "Road" C 2K;
Table of widths and spaces.

9.4	J 4.6	1.9	C 5.0	1.1	T 4.6	9.4

2.5	S 2.8	0.4	w 4.7	0.4	e 2.6	0.5	e 2.5	0.3	t 1.8	0.1	w 4.7	0.3	a 2.4	0.5	t 1.8	0.3	e 2.6	0.6	r 1.7	2.5

11.9	R 2.8	0.6	o 2.6	0.5	a 2.4	0.7	d 2.5	12.0

Section 2.38

USE OF GENERATORS AND PORTABLE STOP SIGNS AT NON-FUNCTIONING SIGNALIZED INTERSECTIONS

2.38.1 PURPOSE

The purpose of this section is to provide guidance on deploying generators and portable stops signs at non-functioning signalized intersections after an emergency event. The Department's guiding principles on deploying generators and portable or part-time (folding) stop signs shall conform to Section 316.1235, F.S. and to the MUTCD.

2.38.2 CONDITIONS FOR USE

(1) The District Traffic Operations Engineer shall request the installation of generators or the placement of portable stop signs after an emergency event at locations where a signalized intersection is not functioning. A non-functioning signalized intersection is defined herein as an intersection that is equipped with traffic signals which are damaged and/or without power after an emergency event.

(2) When the signalized intersection is without power and restoration of power using a generator is not possible, portable stop signs should be placed as directed by the District Traffic Operations Engineer.

(3) When portable stop signs are utilized at a signalized intersection that is not functioning due to a power outage, the power shall be disconnected to avoid traffic control conflicts when power is restored.

(4) When generators are used at a signalized intersection due to a power outage and power is restored, the traffic signals shall continue to function in the same operation. If the traffic signals were in flashing operation, the traffic signals shall continue in flashing operation. If the traffic signals were in normal cycle and phasing operations, the traffic signals shall continue in the normal operation.

2.38.3 LOCATION AND PLACEMENT

(1) The locations for placement of generators or portable stop signs shall be at the discretion of the District Traffic Operations Engineer. They shall, in coordination with local agencies, develop and maintain a list of critical signalized intersections to establish a priority for generator or portable stop sign installation.

(2) The placement of the portable stop signs shall be in accordance with Figures 2.38-1 through 2.38-6 of this section. Placement of the portable stop signs for any intersection design not represented in Figures 2.38-1 through 2.38-6 shall be done in accordance with the direction of the District Traffic Operations Engineer, the Department's Standard Plans, and the MUTCD.

(3) Each critical signalized intersection control cabinet shall be wired with a transfer switch and capable of switching to an alternate generated power source in the event of a power outage and shall conform to Section 676 of the Department's Standard Specifications.

2.38.4 STORAGE AND DISTRIBUTION

(1) Each District shall have access to and be capable of deploying portable generators to provide an alternate power source to 12 percent of the signalized intersections on the State Highway System in the District. The District Maintenance Office shall determine the deployment locations.

(2) The District Maintenance Office shall be responsible for maintenance and storage of the generators.

(3) Each District shall have access to and be capable of deploying portable stop signs to non-functioning signalized intersections on the State Highway System in the District that are not equipped with a generator.

2.38.5 REMOVAL AND RECOVERY

(1) The generators should be removed upon restoration of power and proper signals operation. The portable stop signs should be removed prior to normal operations of the traffic control signal. The recovery of the generators and portable stop signs should be accomplished using District emergency response teams or emergency contractors by either of the following:

(a) Complete removal from each intersection.

(b) Stockpiling the portable stop signs in one corner of the intersection for removal later.

(2) The Districts shall determine the method of recovery and develop a recovery plan for their intersections.

Figure 2.38-1. Temporary Signing for Power Outage – Major Dual Left Intersection

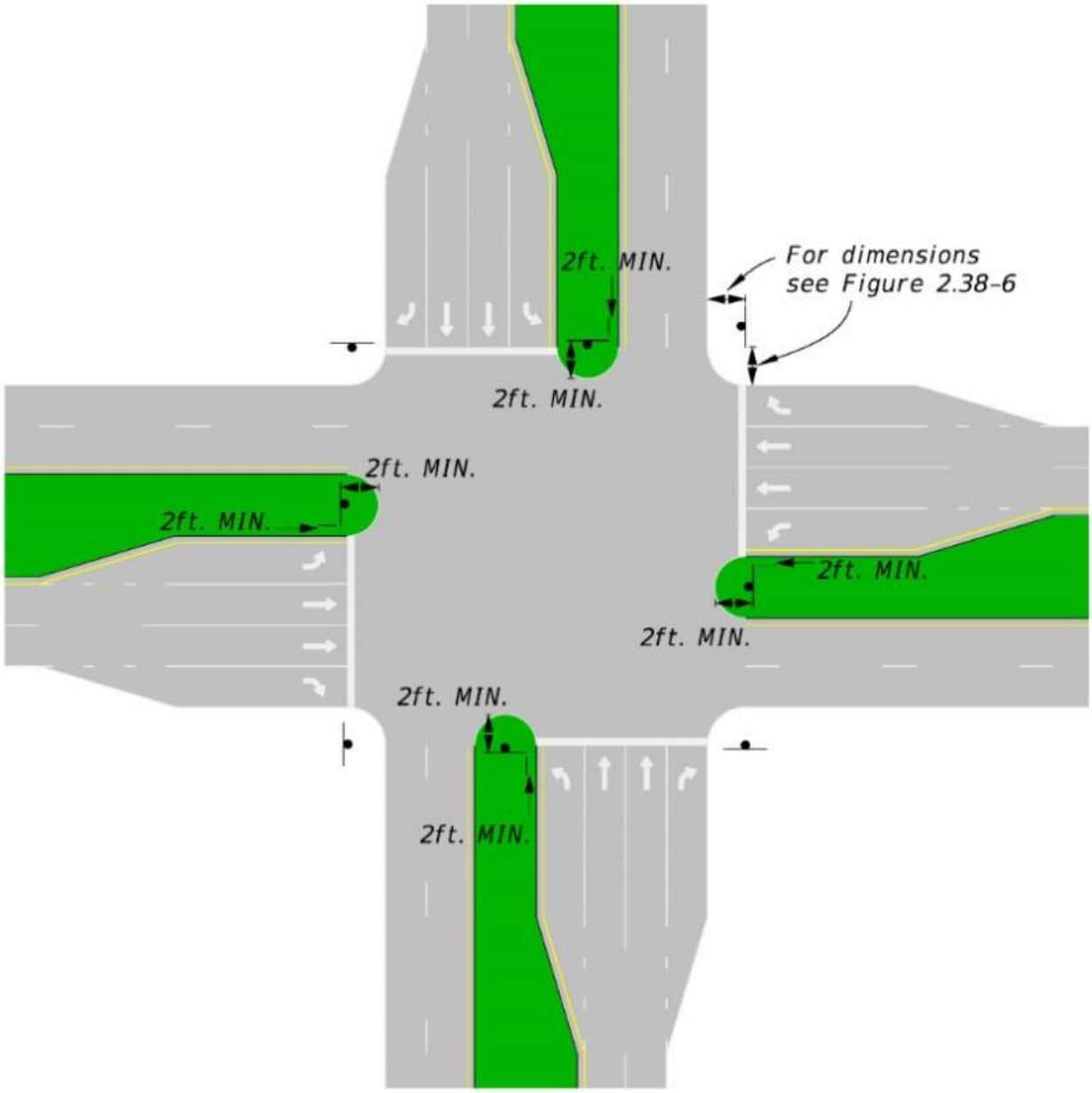


Figure 2.38-2. Temporary Signing for Power Outage – Major Single Left Intersection

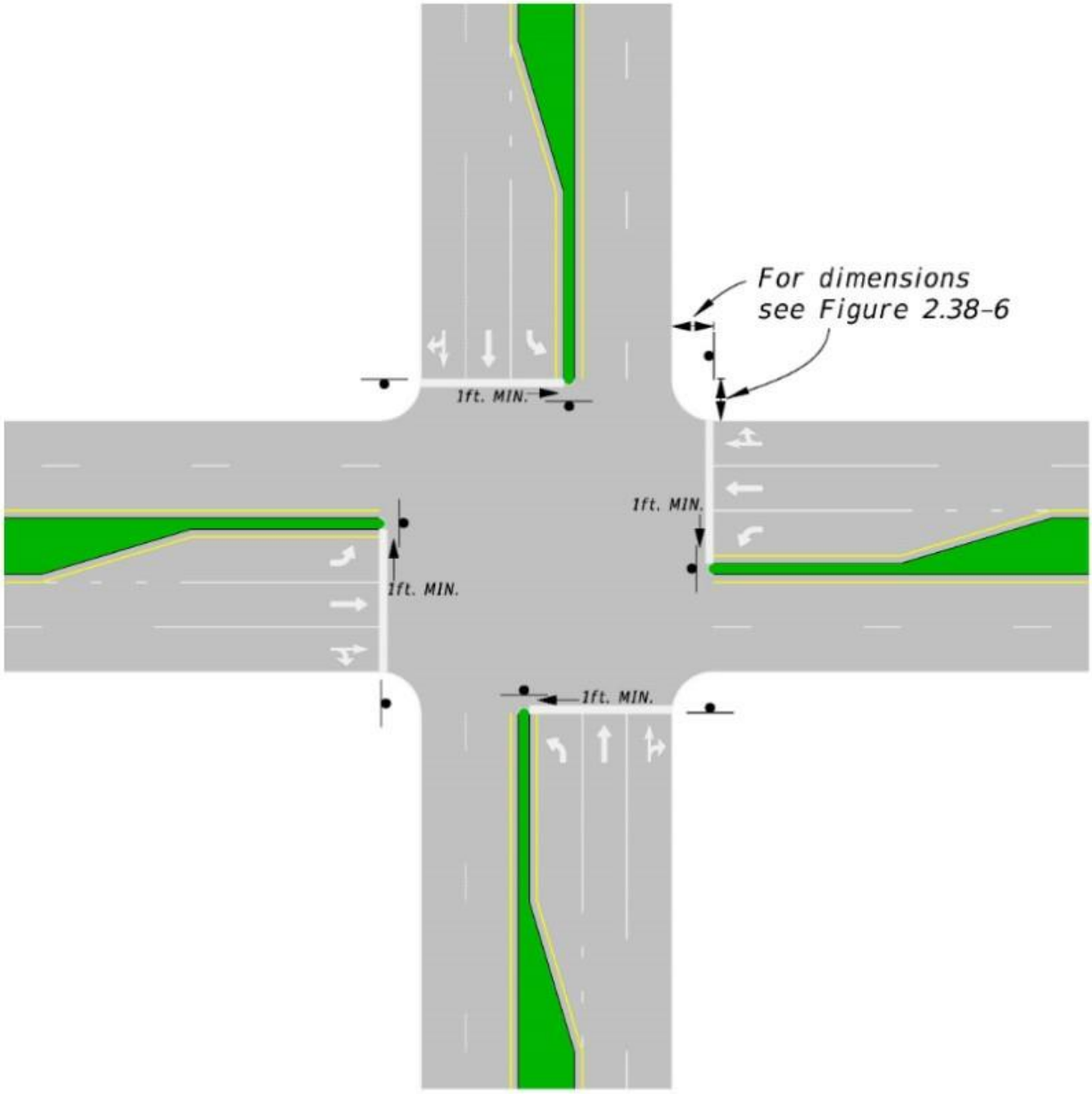


Figure 2.38-3. Temporary Signing for Power Outage – Major Thru Intersection

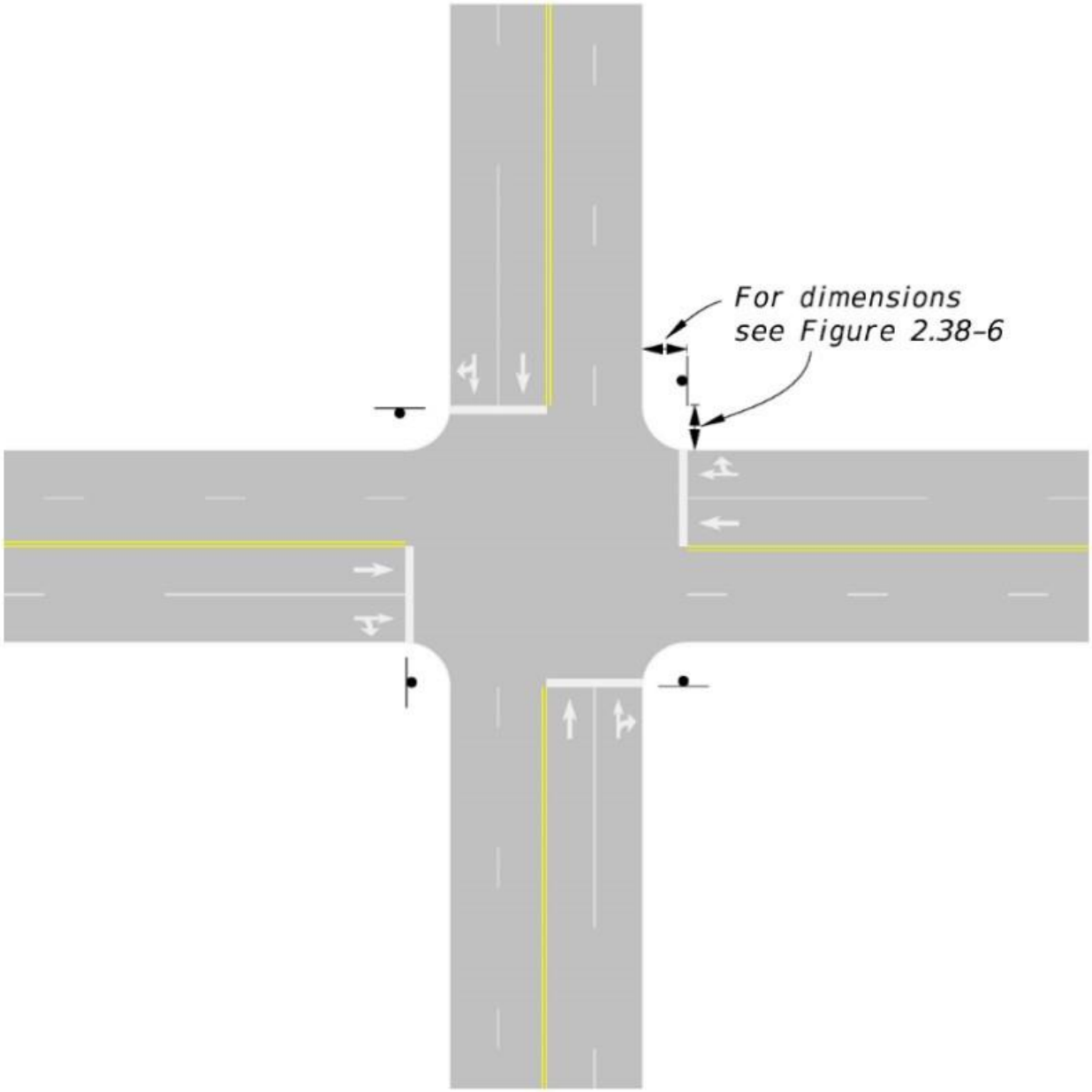


Figure 2.38-4. Temporary Signing for Power Outage – Major to Minor Intersection

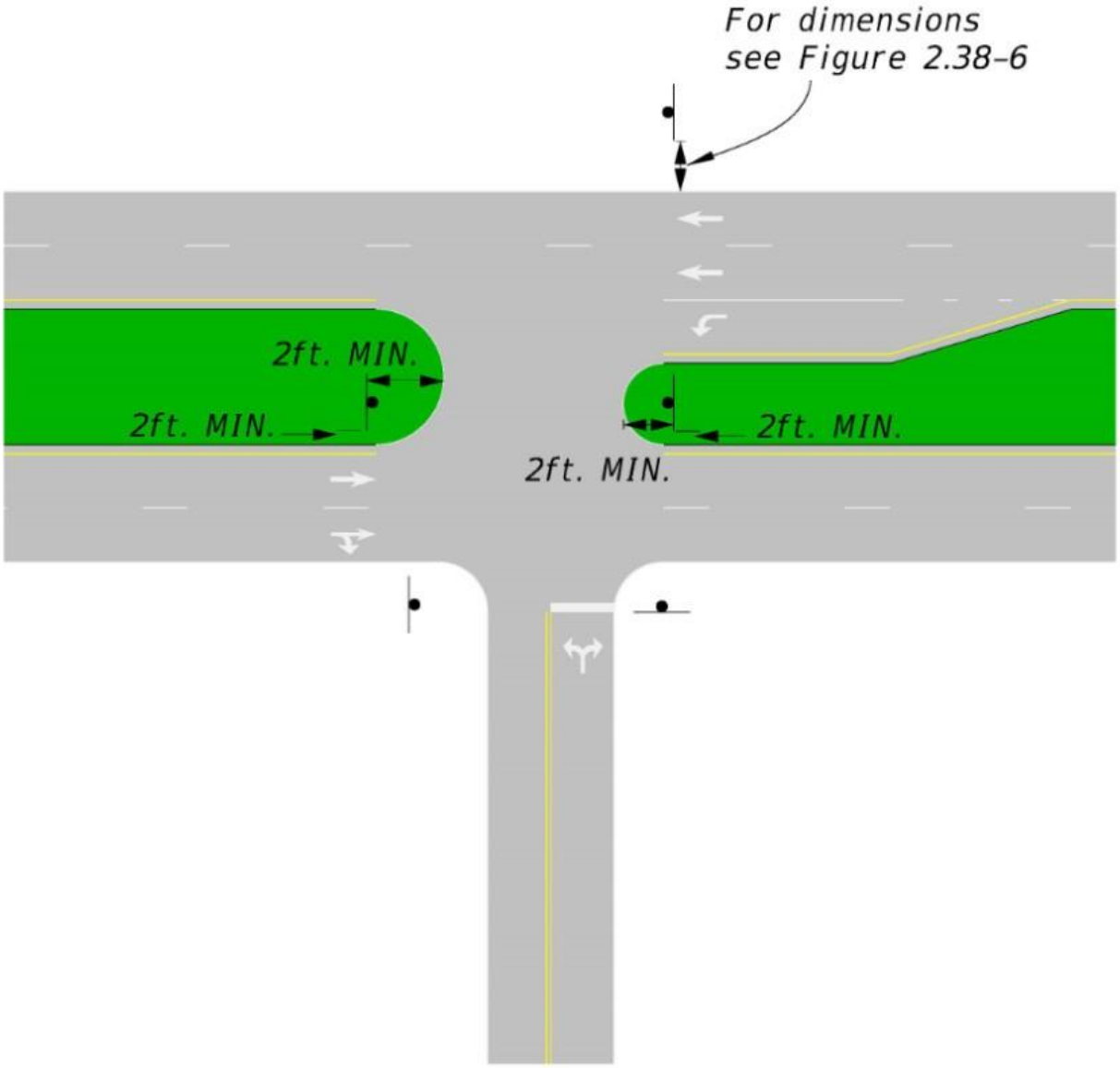


Figure 2.38-5. Temporary Signing for Power Outage – Minor Intersection

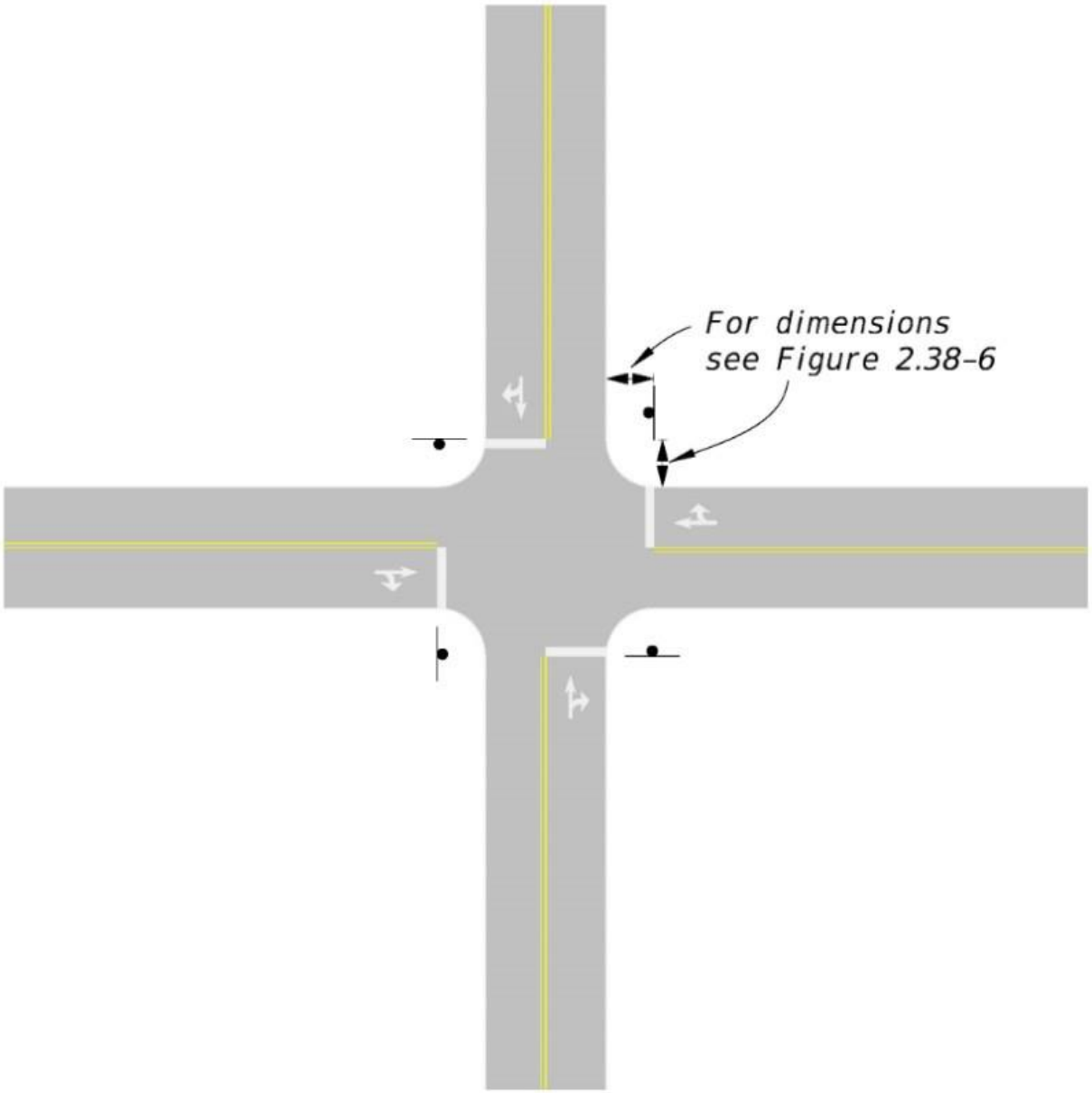
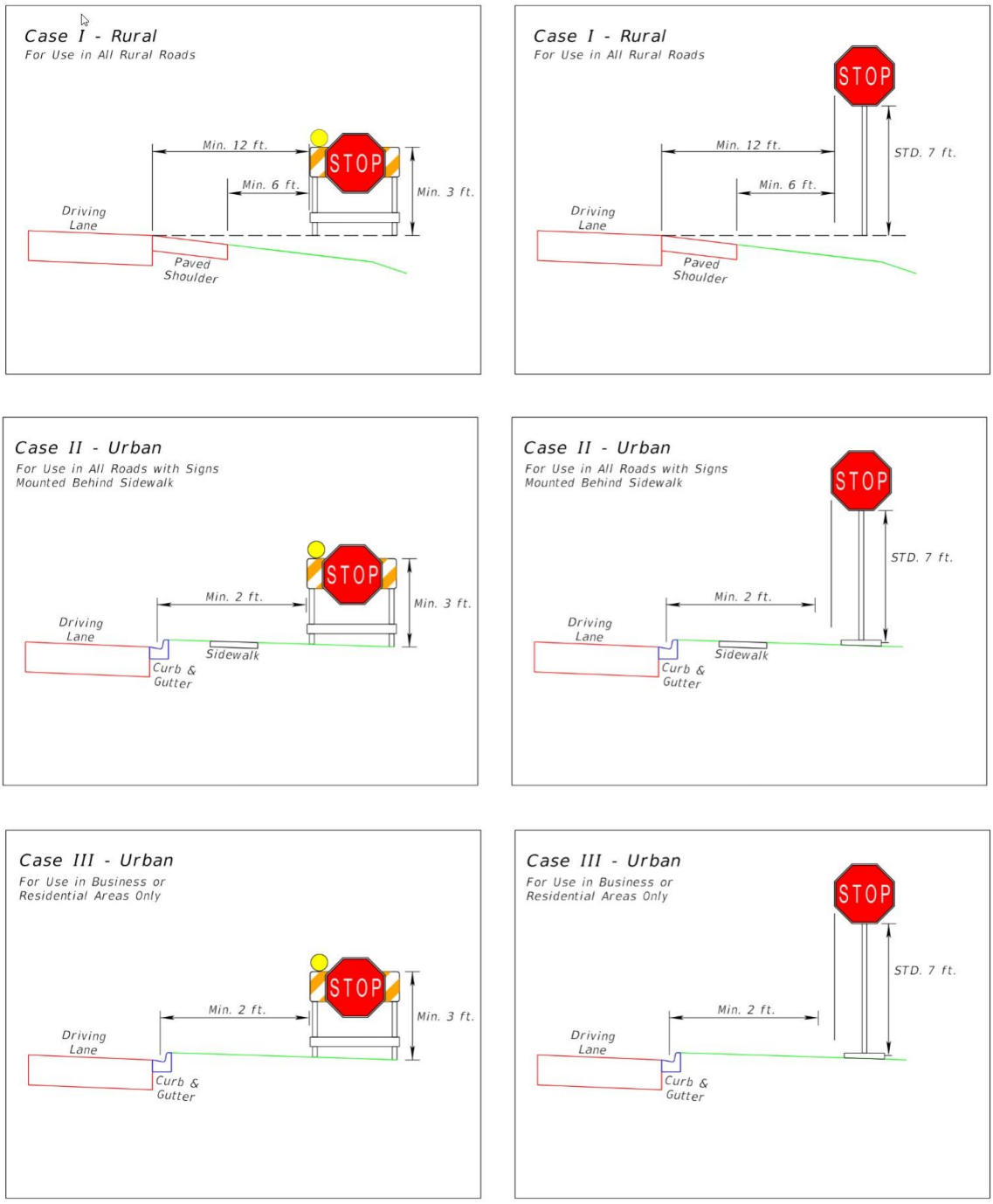


Figure 2.38-6. Temporary Signing for Power Outage – Sign Dimensions



The above sign offset distances and height measurements are from the MUTCD. During a Governor's emergency declaration, these distances may vary at the discretion of the District Traffic Operations Engineer.

Section 2.39

WARNING, STOP, AND YIELD SIGN SIZES

2.39.1 BACKGROUND

(1) Drivers (65 years and older) experience visual decline and slower reaction time and reduced visual acuity is associated with crash rates. Warning, STOP, and YIELD signs are critical to the safe operation of motor vehicles by all drivers. In order to determine the appropriate sizes that should be used for these critical signs, the State Traffic Engineering and Operations Office conducted a study.

(2) The minimum required corrected visual acuity to obtain a driver's license in the State of Florida is 20/70. Therefore, this value was selected as the design visual acuity goal for these critical signs. Based on this design goal, the required sizes of Warning, STOP, and YIELD signs were determined and are presented in this section.

(3) The minimum sign sizes referenced in this section shall be used on all future projects and as replacements when necessary due to sign damage or expiration of useful sign life.

2.39.2 RECOMMENDED WARNING SIGN SIZES

(1) The recommended symbol warning sign sizes in ***Table 2.39-1, Recommended Symbol Warning Sign Sizes*** meet the design goal for 20/70 visual acuity.

Table 2.39-1. Recommended Symbol Warning Sign Sizes

SIGN CODE	SIGN SIZE (Inches)	SIGN SYMBOL
W3-1	36	Stop Ahead
W3-2	36	Yield Ahead
W3-3	36	Signal Ahead
W3-5	36	Speed Reduction
W11-10	36	Truck Crossing

(2) The recommended word message warning sign sizes in ***Table 2.39-2, Recommended Word Message Warning Sign Sizes*** meet either the minimum design goal of 20/70 visual acuity or the most acuity available by using a 48-inch diamond shape sign.

Table 2.39-2. Recommended Word Message Warning Sign Sizes

SIGN CODE	SIGN SIZE (Inches)	LETTER SERIES	PRIMARY LETTER HEIGHT (Inches)	MINIMUM REQUIRED ACUITY 20/x	SIGN MESSAGE
W5-1	48	D	8	64	Road Narrows
W5-2	48	D	8	64	Narrow Bridge
W5-3	48	C	8	54	One Lane Bridge
W8-1	36	D	10	80	Bump
W8-2	36	E	10	88	Dip
W8-3	48	C	8	54	Pavement Ends
W8-4	48	C	8	54	Soft Shoulder
W8-6	48	C	8	54	Truck Crossing
W8-7	48	D	8	64	Loose Gravel
W8-8	48	D	8	64	Rough Road
W8-9	48	C	8	54	Low Shoulder
W9-1	48	D	8	64	Right Lane Ends
W9-2	48	D	8	64	Lane Ends Merge Left
W13-1	24	E	10	88	35 MPH
W13-2	36 x 48	E	12	106	Exit 25 MPH
W13-3	36 x 48	E	12	106	Ramp 30 MPH
W14-1	48	D	9	72	Dead End

(3) A No Passing Zone sign ***(W14-3)*** shall be 36 x 48 inches with 5-inch Series D lettering on the words NO and PASSING and 5-inch Series C lettering on the word ZONE.

(4) Right-of-way constraints may sometimes limit the size of warning signs. When this occurs, the largest sign that will fit shall be used.

(5) For any sign that isn't designed for 20/70 visual acuity there will be less legibility distance and therefore less time to perceive and understand the message before passing the sign. However, by adding the following additional distances to the sign placement distances shown in ***Table 2C-4, Guidelines for Advance Placement of Warning Signs*** and referenced in ***Section 2C.05 of the MUTCD***, the same total distance from the point where the sign is just legible to the condition must be maintained. Add 25 feet for 8-inch Series C and 8-inch Series

D letters; 50 feet for 5-inch Series D, 6-inch Series C, and 6-inch Series D letters; and 75 feet for 5-inch Series C letters.

2.39.3 RECOMMENDED STOP SIGN SIZES

(1) The 48-inch STOP sign provides a minimum required acuity of 20/45. In addition, use of the larger STOP signs, in areas with restricted right-of-way, may present problems. Installation of the STOP AHEAD symbol warning sign will alleviate both of these problems.

(2) ***Table 2.39 3, Stop and Stop Ahead Sign Sizes and Placement*** was produced to determine the required size for the STOP and STOP AHEAD sign, and the sign placement distance for the STOP AHEADsign.

Table 2.39-3. Stop and Stop Ahead Sign Sizes and Placement

POSTED SPEED (mph)	STOPPING SIGHT DISTANCE (feet)	STOP SIGN SIZE[1] (inches)	STOP SIGN RECOGNITION DISTANCE (20/70) (feet)	STOP AHEAD SYMBOL SIGNS [2] (inches)	STOP AHEAD SIGN PLACEMENT DISTANCE (feet)
20	150	24	178	–	–
25	200	30	222	–	–
30	250	36	267	36*	125*
35	300	36	267	36*	175*
45	450	36	267	36	325
50	550	48	356	36	425
55	625	48	356	36	500
*If needed for restricted sight distance locations in urban areas.					
[1]On state highways, the 48-inch STOP sign should be considered for 45 mph or greater. STOP signs on roads intersecting the state highway are usually replaced in FDOT construction projects. The sizes in this section are recommended for the replacement signs. Motorists traveling on local roads, in urban areas, expect to encounter STOP signs. STOP signs larger than 36-inches should be used when greater emphasis or visibility is needed.					
[2] On state highways, in rural areas, motorists may not expect to encounter a STOP sign. As an enhancement, the STOP AHEAD sign should be used for speeds equal to or greater than 45 mph. On local roads, in rural areas, motorists usually expect to stop as they cross a state highway. Where sight distance restrictions exist, a STOP AHEAD sign should be used.					

(3) The stopping sight distance shown in the table above were calculated using the equation on ***Page 113 of AASHTO's A Policy on Geometric Design for***

Highways and Streets (Green Book, 2004 edition), and is for level, wet pavement. The brake reaction time was increased from 2.5 to 3.5 seconds to accommodate drivers aged 65 years and older.

(4) Both the stopping sight distance and the STOP AHEAD sign placement distance should be increased to compensate for longer stopping sight distance on downgrades.

(5) The increase due to downgrades as steep as 6 percent does not change the results in ***Table 2.39-3*** for speeds up to and including 35 mph. ***Table 2.39-4*** gives the required additional distance due to downgrade. This increase should be added to both the stopping sight distance and the STOP AHEAD sign placement distance in ***Table 2.39-3***.

(6) The STOP AHEAD symbol sign should be placed according to ***Table 2.39-3***, rather than ***Table 2C-4. Guidelines for Advance Placement of Warning Signs***, referenced in ***Section 2C.05 of the MUTCD*** for Condition B (Stop). The 36-inch size sign has 141 foot legibility for 20/70 visual acuity, which is greater than the required 125 feet.

(7) If restricted right-of-way requires a STOP sign smaller than shown in this table, the largest possible size should be used and a 36-inch STOP AHEAD symbol sign should be placed according to ***Table 2.39-3*** and ***Table 2.39-4***.

(8) If restricted right-of-way demands a STOP AHEAD symbol sign smaller than 36-inch, the 30-inch sign will provide approximately 117 foot legibility. This sign should be placed 10 feet further from the STOP sign than the distance shown in ***Table 2.39-3*** and ***Table 2.39-4***.

Table 2.39-4. Additional Stopping Sight Distance and Stop Ahead Sign Placement Distance Due to Downgrade

POSTED SPEED (mph)	ADDITIONAL DISTANCE (3% GRADE) (feet)	ADDITIONAL DISTANCE (6% GRADE) (feet)
45	25	50
50	50	75
55	50	100

(9) When flashing beacons are used on the STOP sign, the STOP AHEAD sign is optional unless required because of restricted sight distance.

2.39.4 RECOMMENDED YIELD SIGN SIZES

The sizes for YIELD signs shall be as shown in ***Table 2B-1 of the MUTCD*** with a target compliance date of December 22, 2013.

Section 2.40

APPROVED SAFETY MESSAGES FOR PERMANENTLY MOUNTED DYNAMIC MESSAGE SIGNS

2.40.1 PURPOSE

To provide a listing of approved standard safety messages that can be displayed on permanently mounted Dynamic Message Signs.

2.40.2 DEFINITIONS

DMS — Dynamic Message Sign(s); refers to dynamic, changeable or variable message signs defined as programmable traffic control devices that display messages composed of letters, symbols/graphics or both. DMS are used to convey timely and important en route and roadside information to motorists and travelers about changing highway conditions to improve operations and reduce crashes. DMS may inform drivers to change travel speed, change lanes, divert to a different route, or to be aware of a change in current or future traffic conditions.

2.40.3 APPROVED STANDARD SAFETY MESSAGES FOR DISPLAY ON PERMANENTLY MOUNTED DMS

Approved standard safety messages for display on a permanently mounted DMS can be found on the ***Department's Highway Signing Program website***.

Section 2.41

GUIDELINES FOR USE OF RETROREFLECTIVE STRIPS

2.41.1 PURPOSE

To provide guidance on the use of retroreflective strips on sign posts when the material is required or a documented need exists to draw attention to the sign, especially at night-time. The objective of providing the retroreflective strips is to improve the conspicuity and presence of the signs.

2.41.2 DEFINITIONS

Conspicuity. Easily seen or noticed; readily visible or observable.

2.41.3 CONDITIONS FOR USE

(6) Retroreflective strips should be used where a documented need exists to enhance sign visibility. The requirement for enhanced conspicuity as referenced in ***Section 2A.15 of the MUTCD***, for standard signs is generally based on the need to make a sign more visible. Retroreflective strips should only be used when there is a need for extra emphasis.

(7) The following sign types require the use of retroreflective strips:

- **(a)** WRONG WAY sign posts
- **(b)** Crossbuck sign blades at all rail crossings and posts at all passive rail crossings

(8) Use retroreflective strips on sign posts where a documented need exists or application has been proven to significantly reduce crashes for a given condition. The following sign types are appropriate based upon engineering judgment:

- **(a)** Curve Warning Signs (***Section 2C.06 of the MUTCD***)
- **(b)** Do Not Enter Signs (***Section 2B.37 of the MUTCD***)
- **(c)** Stop, Yield or Other Regulatory Signs (***Section 2B.05 of the MUTCD***)

(9) For the more critical signs that happen to be placed in a less desirable location (in curves where headlamps don't align optimally, etc.), engineering evaluations may lead to a sign being upgraded with retroreflective strips. Engineering judgment includes considering high crash locations where the use of retroreflective strips on sign supports could improve sign visibility and provide better guidance to motorists.

2.41.4 SIGN DESIGN

The specifications for retroreflective requirements are referenced in ***Section 700 of the Department's Standard Specifications***.

Section 2.42

EXPRESS LANES SIGNING

2.42.1 PURPOSE

This section establishes a uniform basis for the design of express lanes signing.

2.42.2 BACKGROUND

(1) Express lanes design criteria are found in the ***FDOT Design Manual (FDM)***.

(2) Express lanes signs shall comply with applicable provisions of ***Section 2G of the MUTCD***. Express lanes are referred to as Priced Managed Lanes in the MUTCD.

2.42.3 CRITERIA

Express lanes signs include the following sign types:

(1) Regulatory Signs:

- **(a)** Vehicle Eligibility Sign
- **(b)** Express Lanes Termination Sign
- **(c)** Toll Amount Sign

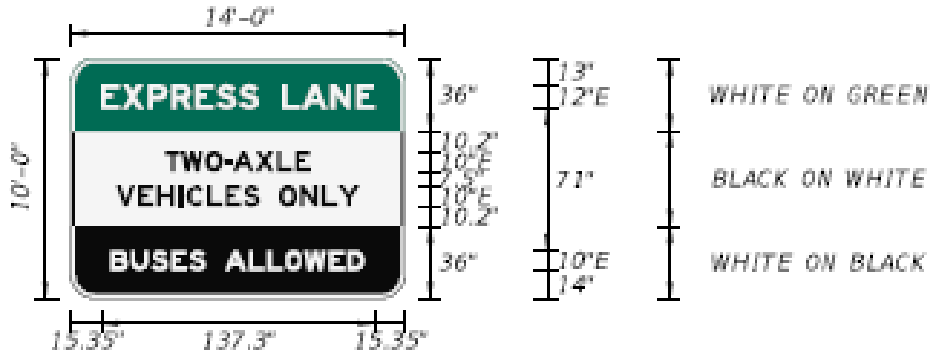
(2) Advanced Guide Signs:

- **(a)** Point of Entry/ Ingress signing
- **(b)** Point of Exit/ Egress signing

2.42.3.1 VEHICLE ELIGIBILITY SIGN

The purpose of this sign is to convey the vehicle eligibility criteria established in ***Rule 14-100.003, F.A.C.*** regarding the number of axles and vehicle types permitted to use the express lanes. This sign shall be mounted overhead and over the lane to which it applies. An example of the Vehicle Eligibility Sign is shown in ***Figure 2.42-1***.

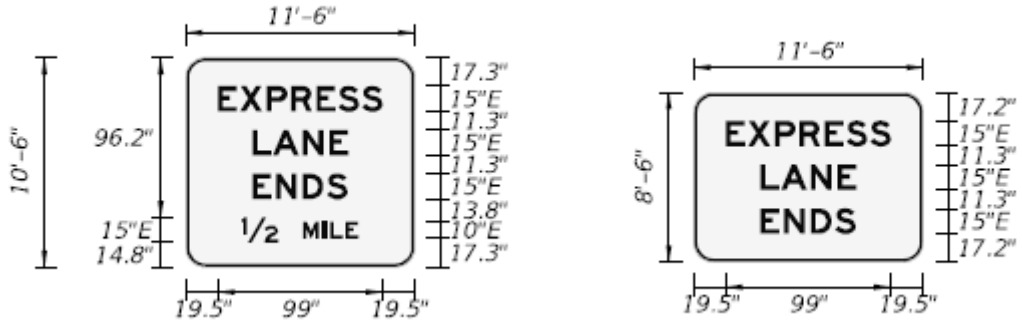
Figure 2.42-1. Vehicle Eligibility Sign



2.42.3.2 EXPRESS LANES TERMINATION SIGN

The purpose of this sign is to inform motorists that the express lanes are ending. This sign shall be mounted overhead and over the express lanes to which it applies. If space permits, three signs are preferred, at sequential spacing. Due to the large number of drivers over the age of 65 in Florida, increased letter height of 15 inches shall be used. Examples of the Express Lanes Termination Sign are shown in ***Figure 2.42-2***.

Figure 2.42-2. Express Lane Termination Signs



2.42.3.3 TOLL AMOUNT SIGN (TAS)

(1) As required by ***Rule 14-100.003, F.A.C.*** the TAS is used to display real-time toll amount information to users by identifying the cost of using the express lanes to a specific destination and the fee for toll violations. Since the TAS posts information that influences driver decisions to use the express lanes, it is important that the sign be clear, legible, and straightforward. Examples of the TAS are shown in Figure 2.42-3 and Figure 2.42-4. Note: the legend “TOLL” is to be used on signs that are for tolled facilities.

(2) No more than three destinations shall be displayed on the TAS.

(3) The toll violation message shall be black on white and displayed on the TAS.

(4) The TAS shall be mounted overhead and over the lane to which it applies. See ***Section 2.42.4*** for TAS sign placement and sequencing.

(5) Destinations and toll amounts shall not be repeated on the TAS for users within the express lanes.

(6) Two TASs, indicating the toll amounts for the next set of toll destinations, shall be installed (space permitting) over the express lanes prior to the last point of egress to the general use or general toll lanes before beginning the new sequence of tolling trips.

Figure 2.42-3. Toll Amount Sign for Non-Tolled Facilities

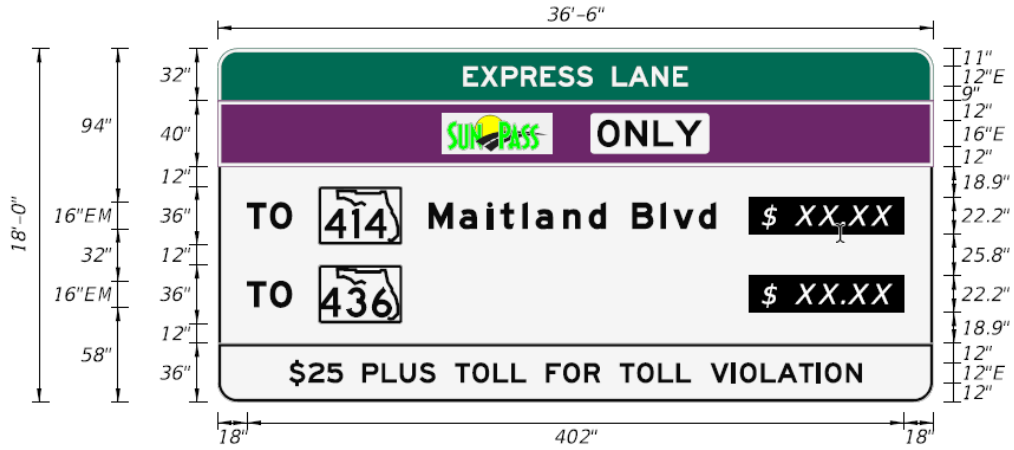
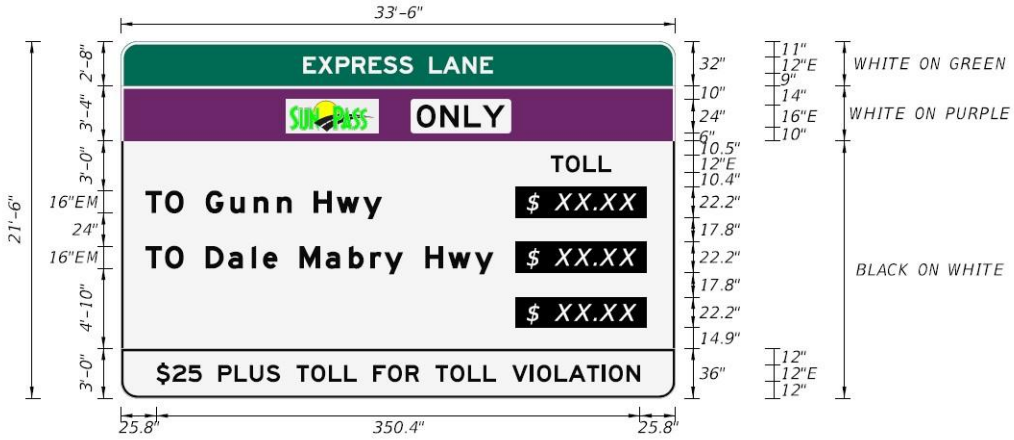


Figure 2.42-4. Toll Amount Sign for Tolled Facilities



2.42.3.4 ADVANCED GUIDE SIGNS

(1) Per ***Section 2G.10 of the MUTCD***, if the Entry/Ingress or Exit/Egress is on the left side of the roadway, a LEFT plaque shall be added to the top left edge of the Advance Guide Signs. If the Entry/Ingress or Exit/Egress is a lane drop situation, the ONLY panel with down arrow shall be installed.

(2) A “NO TRUCKS”, black on white, panel shall be added to the top of the advanced guide signs as shown in ***Figure 2.42-5***.

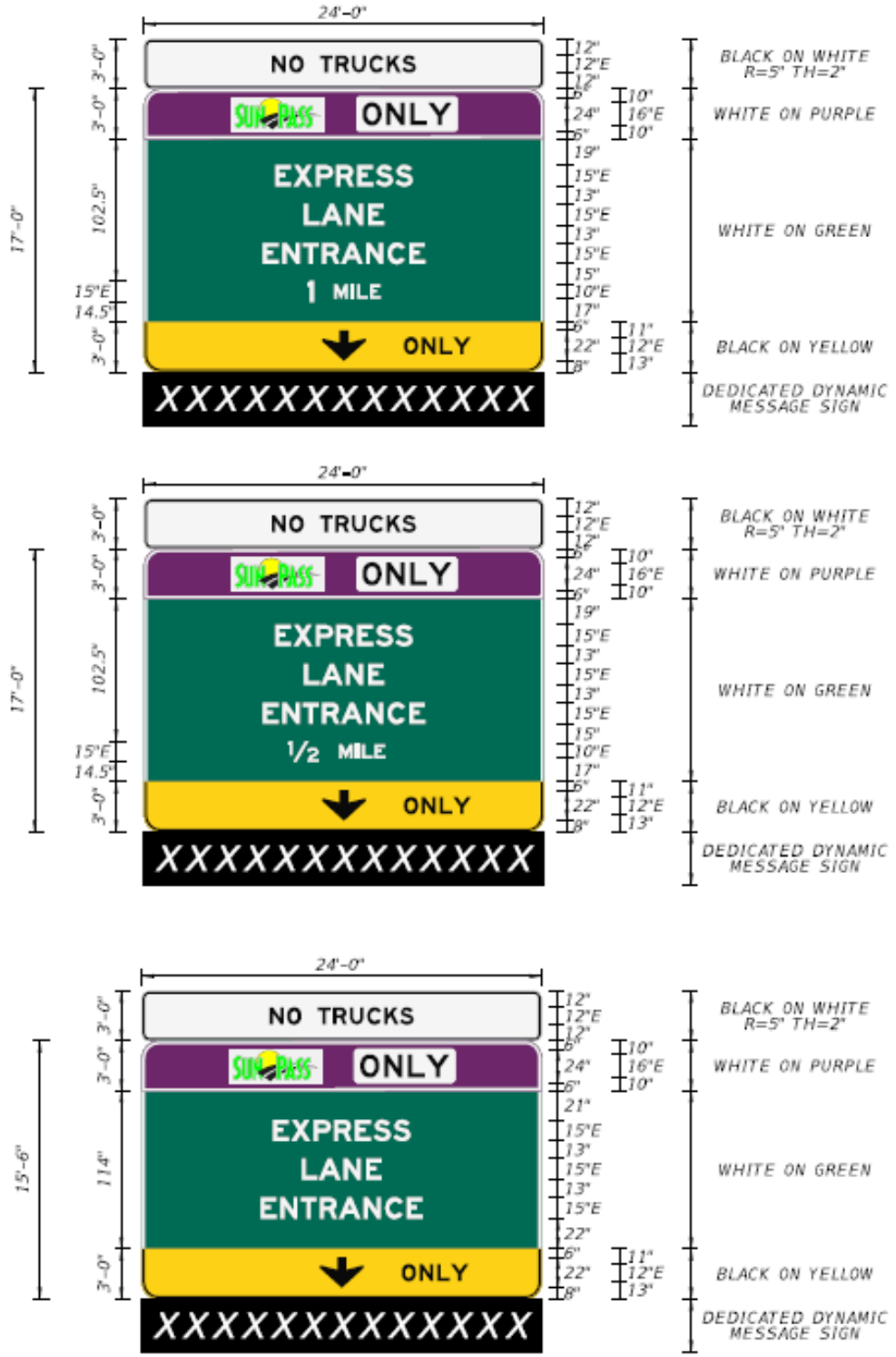
(3) SunPass, or other interoperable transponders, is the only form of payment for the express lanes. The “SUNPASS ONLY” panel with purple background shall be included on the Advanced Guide Signs.

2.42.3.5 POINT OF ENTRY/ INGRESS SIGNS

(1) There are three types of access points for express lanes as defined in the ***FDM 211.14***. The Point of Entry/Ingress Signs shall be installed at each access point. Examples of the Point of Entry/Ingress Signs are shown in ***Figure 2.42-5***.

(2) When the point of entry is the initial entrance to the express lanes network, the advance overhead signing shall begin two miles prior to the express lanes entrance, space permitting. In addition to the initial entry/ingress express lanes signing, sequential overhead guide signs shall be located at one mile, ½ mile, and at the express lanes point of entry. For intermediate express lanes entry/ingress points the advance signing shall begin one mile prior to the express lanes ingress location and continue with the remaining sequence of signs.

Figure 2.42-5. Ingress Signing (TYP)



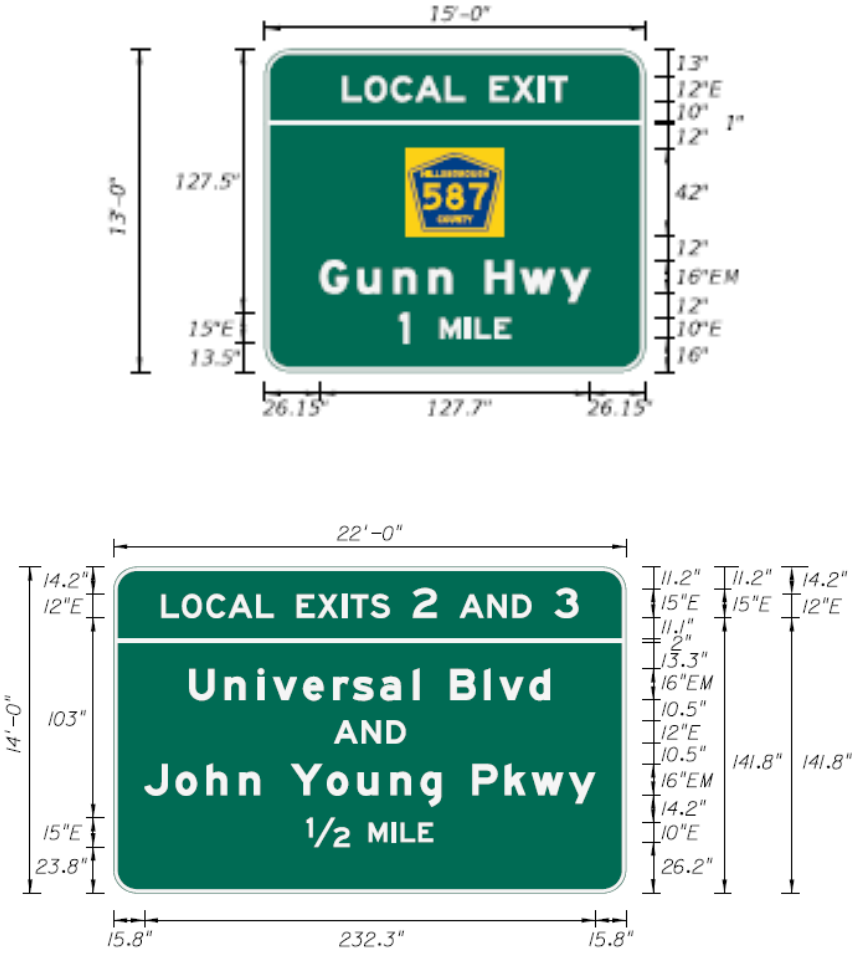
2.42.3.6 POINT OF EXIT/ EGRESS SIGNS

(1) Intermediate point of exit/egress guide signs, or local exit signs, inform express lanes users which express lanes egress ramp serves their destination. Local exit signs shall be mounted overhead and over the lane to which it applies.

(2) The destinations on the TASs shall be displayed the same way on the corresponding general use or general toll lane exit sign.

(3) If three or more general use or general toll lane exits occur before the next opportunity to exit the express lanes, the egress signing should reflect this ***(Figure 2.42-6)***.

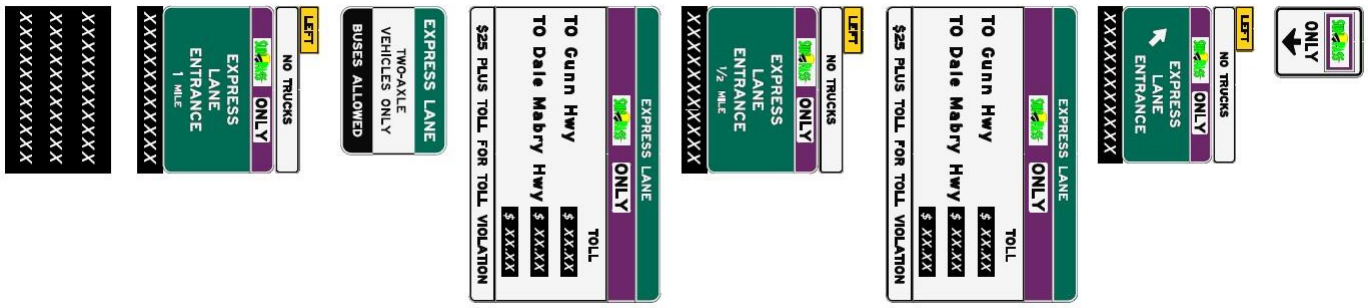
Figure 2.42-6. Egress Signing (TYP)



2.42.4 SIGN PLACEMENT

(1) There shall be seven signs installed for an express lane entrance, as follows: three advanced guide signs, two TASs, one vehicle eligibility sign, and one regulatory ***R3-44*** (***Section 2G.17 of the MUTCD***). One 3-line full-matrix Dynamic Message Sign (DMS) shall also be included, if space is available. The order in which the signs should be installed is shown in ***Figure 2.42-7***. ***Note: The R3-44 sign shall be the last sign in the sequence. The DMS shall be the first sign in the sequence, if installed***.

Figure 2.42-7. Express Lanes Entrance Sign Sequence



(2) A minimum of two TASs shall be installed with the legend showing destination and price, prior to the entrance to the express lanes. The ***MUTCD*** provides minimum spacing requirements for express lanes signs including TASs.

(3) If the information on the sign is intended for the general use or general toll lanes, the sign shall be installed over the general use or general toll lanes. If the information on the sign is intended for the express lanes, the sign shall be installed over the express lanes.

2.42.5 SIGN INSTALLATION

(1) The TAS sign structures shall be designed to hold the maximum size panel of three destinations.

(2) The TAS sign closest to an express lanes ingress shall be installed on a span structure.

2.42.6 SPECIAL CONSIDERATION FOR ARTERIAL ENTRANCE/INGRESS CONNECTIONS WITH EXPRESS LANES

(1) For direct entrance/ingress access into the express lanes from an arterial road, one (1) TAS for each travel direction is acceptable, provided the sign includes a 1-Line DMS to serve as a backup, with separate power and separate communication.

(2) The letter height for arterial signs may be reduced per ***MUTCD***.

(3) If there are Right-Of-Way constraints and the Vehicle Eligibility Sign is unable to be placed on multi-post supports, a single post version of the sign is acceptable.

Section 2.43

RAMP ONLY SIGN PANEL

2.43.1 PURPOSE

To establish a uniform basis for incorporating the 'RAMP ONLY' sign panel.

2.43.2 BACKGROUND

Section 2E.24 of the MUTCD provides signing guidance for expressway and freeway lane drops at interchange exits. However, the ***MUTCD*** only provides limited guidance for signing a lane drop for a conventional road approach to interchanges onto a limited access facility. ***Section 2D.45 of the MUTCD*** states that "consistently applied signing for conventional road approaches to freeway or expressway interchanges is highly desirable." The use of the 'RAMP ONLY' sign panel supports consistency for drivers on roadways with a through lane drop that carries an interchange entrance ramp.

2.43.3 CONDITIONS FOR USE

(1) The 'RAMP ONLY' sign panel (***Figure 2.43-1)*** is used when it is important to inform motorists on low volume conventional crossroads that the through lane is being terminated (dropped) at the interchange entrance ramp. When used, this sign shall be mounted overhead and over the lane to which it applies.

(2) The sign details for the 'RAMP ONLY' sign panel can be found in the ***FHWA's Standard Highway Signs Manual 2012 Supplement*** for the 'EXIT ONLY' (down arrow) (E11-1) sign. The number of arrows displayed on the sign panel shall correspond to the number of terminated lanes at the location of each sign. Placement of the down arrow shall comply with the provisions shown in ***Section 2E.19 of the MUTCD***.

(3) The use of the 'RAMP ONLY' sign panel shall be coordinated with the District Traffic Operations Engineer.

Figure 2.43-1 RAMP ONLY SIGN PANEL

Chapter 3

SIGNALS

Section 3.1

SIGNALIZED INTERSECTION FLASHING MODE OPERATION AND FLASHING BEACONS

3.1.1 DEFINITIONS

(1) **Flashing Beacon:** A Flashing Beacon is a highway traffic signal with one or more signal sections that operates in a flashing mode. It can provide traffic control when used as an intersection control beacon or as a warning beacon in alternative uses.

(2) **Flashing Operation of Traffic Control Signals:**

(a) **Non-Programmed Flashing Mode Operation.** The automatic transfer from a signalized intersection's normal mode operation (stop and go, steady red-yellow-green displays) to flashing mode operation (stop or caution, flashing red-yellow, or red indications) caused by a malfunction of the signal controller, a conflict in signal displays or manual selection of the flashing mode operation by maintenance or police personnel.

(b) **Programmed Flashing Mode Operation.** The automatic transfer from a signalized intersection's normal mode operation (stop and go, steady red- yellow-green displays) to flashing mode operation (stop or caution, flashing red-yellow or red indications) during set times during the day.

3.1.2 RECOMMENDATIONS FOR SIGNALIZED INTERSECTIONS

3.1.2.1 Programmed Flashing Mode Operation

Flashing operation is both energy and operationally efficient and is encouraged when consistent with the following recommendations:

(1) Flashing yellow/red operation may be used when two-way traffic volumes on the main street are below 200 vehicles per hour.

(2) Flashing yellow/red operation may be used during any hours of the day or night when ***MUTCD Signal Warrants #1 and #2*** are not met and where the two-way main street volume is greater than 200 vehicles per hour, provided the ratio of main street to side street volume is greater than 4:1.

(3) Signal operation should be changed to regular operation if crash pattern or severity increases or there is an increase in conflicts.

(4) A speedway effect can be avoided and uniform speeds obtained by maintaining sufficient signals cycling through steady red, green and yellow at proper spacing so as to provide signal progression at an appropriate speed.

(5) Traffic signals should be put on flashing operation primarily at simple traffic signal controlled intersections where the side street drivers have an unrestricted view of approaching main street traffic. Intersections with more than four legs, skewed intersections (greater than 15 degrees), or railroad preempted signals should not be considered for flash.

(6) Flashing should be restricted to no more than 3 separate periods in a 24-hour period.

3.1.2.2 Non-Programmed Flashing Mode Operation

All signalized intersections shall automatically transfer to flashing mode immediately (no clearance interval) whenever a malfunction occurs during the normal mode operation of the signalized intersection.

3.1.3 APPLICATION REQUIREMENTS FOR SIGNALIZED INTERSECTION

The signal flashing mode and start-up sequence shall be as follows for:

3.1.3.1 Yellow-Red Flashing Mode:

(1) **Main Street.** Flashing yellow during flashing mode, then steady green on start-up sequence.

(2) **Protected Left Turns.** Flashing red during flashing mode, then steady red on start-up sequence. Protected left turn signals should carry all arrow indications.

(3) **Side Street.** Flashing red during flashing mode, then steady red on start-up sequence.

3.1.3.2 Red-Red Flashing Mode:

(1) **Main Street.** Flashing red during flashing mode, then steady green on start-up sequence.

(2) **Protected Left Turns.** Flashing red during flashing mode, then steady red on start-up sequence. Protected left turn signals should contain all arrow indications.

(3) **Side Street.** Flashing red during flashing mode, then steady red on start-up sequence.

3.1.4 HEADS TO BE FLASHED

Section 4D.30 of the MUTCD requires all signal faces on an approach to be flashed when the signal is in flashing mode operation. Therefore, a left or right turn signal not illuminated during flashing mode operation is unacceptable. ***Section 4D.30 of the MUTCD*** requires the flashing of red or yellow arrow indications.

Pedestrian signal indications (WALK and DON'T WALK) shall not be illuminated during flashing mode operation at signalized intersections.

3.1.5 FLASHING INDICATION COLORS

(1) The color to be flashed, red or yellow circular indication, or arrow indications shall be determined as follows:

(a) Each approach or separately-controlled turn movement that is controlled during normal stop-and-go operation shall be provided with a flashing display.

(b) All signal faces on an approach shall flash the same color, either yellow or red circular or arrow. However, separate signal faces for separately-controlled turn movements may be flashed as described in ***Section 4D.30 of the MUTCD***. Flashing yellow indications for through traffic do not have to be shielded or positioned to prevent visual conflict for drivers in separately-controlled turn lanes; however, shielding for separate protected turn movements shall be in accordance with Sections ***4D.22***, ***4D.23***, and ***4D.24*** of the MUTCD.

(c) When a signal face consisting entirely of arrow indications is to be put on flashing operation, or when a signal face contains no circular indication of the color that is to be flashed, the appropriate red or yellow arrow indication shall be flashed.

(d) When a signal face includes both circular and arrow indications of the color that is to be flashed, only the circular indication of that color shall be flashed. A 5-section head cluster shall be flashed the same color as the approach through lanes. Only circular red or circular yellow indications shall be flashed in a flashing mode operation.

(e) No steady green indication or flashing yellow indication shall be terminated and immediately followed by a steady red or flashing red indication without the display of the steady yellow change indication; however, transition may be made directly from a steady green indication to a flashing yellow indication. This applies to both the circular and arrow indications. The transition from stop-and-go to flashing operation, when the transition is initiated by a signal conflict monitor or by a manual switch, may be made at any time.

(2) **Main Street, Through Traffic.** From flashing yellow to steady green.

(3) **Main Street, Separate Left Turn.** From flashing red to steady red.

(4) **Side Street, Through Traffic.** From flashing red to steady red.

(5) Green arrow indications which are continuously illuminated during normal operations should be continually illuminated during flashing mode operation.

3.1.6 APPLICATION REQUIREMENTS FOR FLASHING BEACONS

(1) All existing flashing beacons are considered to meet the ***MUTCD*** requirements whether they are single or dual indicated.

(2) However, all new or replacement intersection control beacon installations shall be designed and installed with dual indications. Wherever practical, the dual indications shall both be positioned laterally within each approach width to the intersection. For example, a four-way beacon assembly over each side of a divided four-lane highway does not meet this requirement. In no instance shall intersection control beacon indications on an approach be closer than 8 feet apart measured horizontally.

3.1.7 OPERATION OF FLASHING BEACONS

(1) Intersection Control Beacons. Dual indications for intersection control beacons displaying horizontally aligned red indications shall be flashed simultaneously. Alternate flashing of dual horizontally aligned red indications is reserved for highway approaches to a railroad. Two vertically aligned red signal indications shall be flashed alternately. Refer to ***Section 4L.02 of the MUTCD***.

(2) Warning Beacons. Warning beacons typically are installed at obstructions or to emphasize warning signs. These may be singular or dual indications and may be flashed alternately or simultaneously. Refer to ***Section 4L.03 of the MUTCD***.

Section 3.2

GUIDELINES FOR LEFT TURN TREATMENT

3.2.1 PURPOSE

This guideline can be used to determine the selection of the following types of left turn treatments, as defined in ***Section 4D.17 of the MUTCD***:

- Permissive Only Mode
- Protected/Permissive Mode
- Protected Only Mode
- Split Phasing (each direction alternatively has both left turn green arrow and circular green)

Option:

(1) A flashing YELLOW ARROW signal indication may be displayed to indicate a permissive left-turn movement in either a protected/permissive mode or a permissive only mode of operation.

(2) It is not necessary that the left-turn mode for an approach always be the same throughout the day. Varying the left-turn mode on an approach among the permissive only and/or the protected/permissive and/or the protected only left-turn modes, during different periods of the day is acceptable.

3.2.2 LEFT TURN SIGNAL PHASING

(1) If the need for left turn phasing on an intersection approach has been firmly established, the following guidelines should be used to select the type of left turn phasing to provide. Sound traffic engineering judgment should be exercised in applying these guidelines.

(2) A protected/permissive mode should be provided for all intersection approaches that require a left turn phase unless there is a compelling reason for using another type of left turn phasing. If the decision between providing protected/permissive or protected only mode is not obvious, the traffic engineer should initially operate the left turn phase as protected/permissive mode on a trial basis. If satisfactory operations result, the protected/permissive mode should be retained. If unsatisfactory operations result, the protected/permissive mode should be converted to protected only mode.

(3) A protected only mode shall be provided for an intersection approach if any of the following conditions exist:

(a) Two or more left turn only lanes are provided.

(b) Geometric conditions and resulting sight distance necessitate protected only mode.

(c) The approach is the lead portion of a lead/lag intersection phasing sequence.

(d) The use of offset left turn lanes to the degree that the cone of vision requirements in Section 4D.13 of the MUTCD for the shared signal display cannot be met.

(4) A protected only mode may be considered if any of the following conditions exist:

(a) Speed limit of opposing traffic is higher than 45 mph.

(b) Left turn traffic must cross three or more lanes of opposing through traffic.

(c) A protected/permissive mode is currently in use and the number of left turn angle crashes caused by left turn drivers on this approach exceeds six per year.

(d) Unusual intersection geometrics exist that will make permissive left turning particularly confusing or hazardous, such as restricted sight distance.

(5) A permissive/protected mode can be used effectively for some intersection approaches if the traffic engineer feels that the advantage to be gained in better progression, as demonstrated in a traffic signal analysis computer program, is worth the violation of driver expectancy. However, use of this type of left turn phasing should be limited and should be restricted to only the following situations which will not create a left-turn trap:

(a) T-intersections where opposing U-turns are prohibited.

(b) Four-way intersections where the opposing approach has prohibited left turns or protected left turn phasing.

(c) Four-way intersections where the left turn volumes from opposing approaches do not substantially differ throughout the various time periods of a normal day, so that overlap phasing is not beneficial or required.

(6) Split phasing can be used effectively if any of the following conditions apply:

(a) Opposing approaches are offset to an extent that simultaneous left turns from opposing directions would be impossible or hazardous.

(b) Left turn volumes are extremely heavy on opposing approaches and both are nearly equal to the adjacent through movement critical lane volume.

(c) Left turn volume is extremely heavy on an approach that does not include a separate left turn lane.

(d) Drivers are permitted to turn left from more than one lane, but drivers are also permitted to use the right-most left turn lane as a through lane.

3.2.3 LEFT TURN SIGNAL DISPLAYS

The following are the left turn signal displays as referenced in ***Section 4D.17 of the MUTCD*** to be used with the various types of left turn phasing.

(1) **Protected/Permissive Mode.** A 5-section signal display centered over the lane line between the left turn lane and the left-most through lane should be used. The 5-section signal display could serve as one of the two required through traffic signal heads. No supplemental signing should be provided.

(2) **Protected Only Mode with a single left turn lane.** A 3-section vertical signal head from top to bottom -- (or left to right in a horizontally-aligned face) left turn red arrow, left turn yellow arrow, left turn green arrow) should be centered over the left turn lane.

(3) **Protected Only Mode with two or more left turn lanes.** At least two 3-section vertical signal heads (or left to right in a horizontally-aligned face) as described in the paragraph above should be used with one centered over each left turn lane.

(4) **Split phasing.** A 5-section signal display centered over the lane line between the left turn lane and the left-most through lane should be used. The 5-section signal display could serve as one of the two required through traffic signal heads. No supplemental signing should be provided.

3.2.4 SIGNAL DISPLAY FOR EXCLUSIVE LEFT TURN LANE

A 3-section (red, yellow, and green) signal face shall not be placed over, and/or devoted to, an exclusive left turn lane, unless the signal phasing sequence provides a protected left turn movement during the cycle.

3.2.5 LEFT TURN PHASES FOR SEPARATED LEFT AND THRU LANES

(1) Left turn lanes at signalized intersections that are separated from through lanes by raised or painted islands may be operated as protected only mode, as protected/permissive or permissive only mode. If protected/permissive mode is used, the 5-section signal display should be placed overhead on the lane line between the adjacent through lane and the island so as to be obvious that the signal display is shared. In all cases, the cone of vision requirements in ***Section 4D.13 of the MUTCD*** shall be met. Below is an illustrative example using standard lane widths on a 4-lane divided highway. A corresponding table for maximum allowable island width (without shifting the signal head) for the indicated signal head distance from stop line is given.

Figure 3.2-1. Signal Head/Left-Turn Treatment

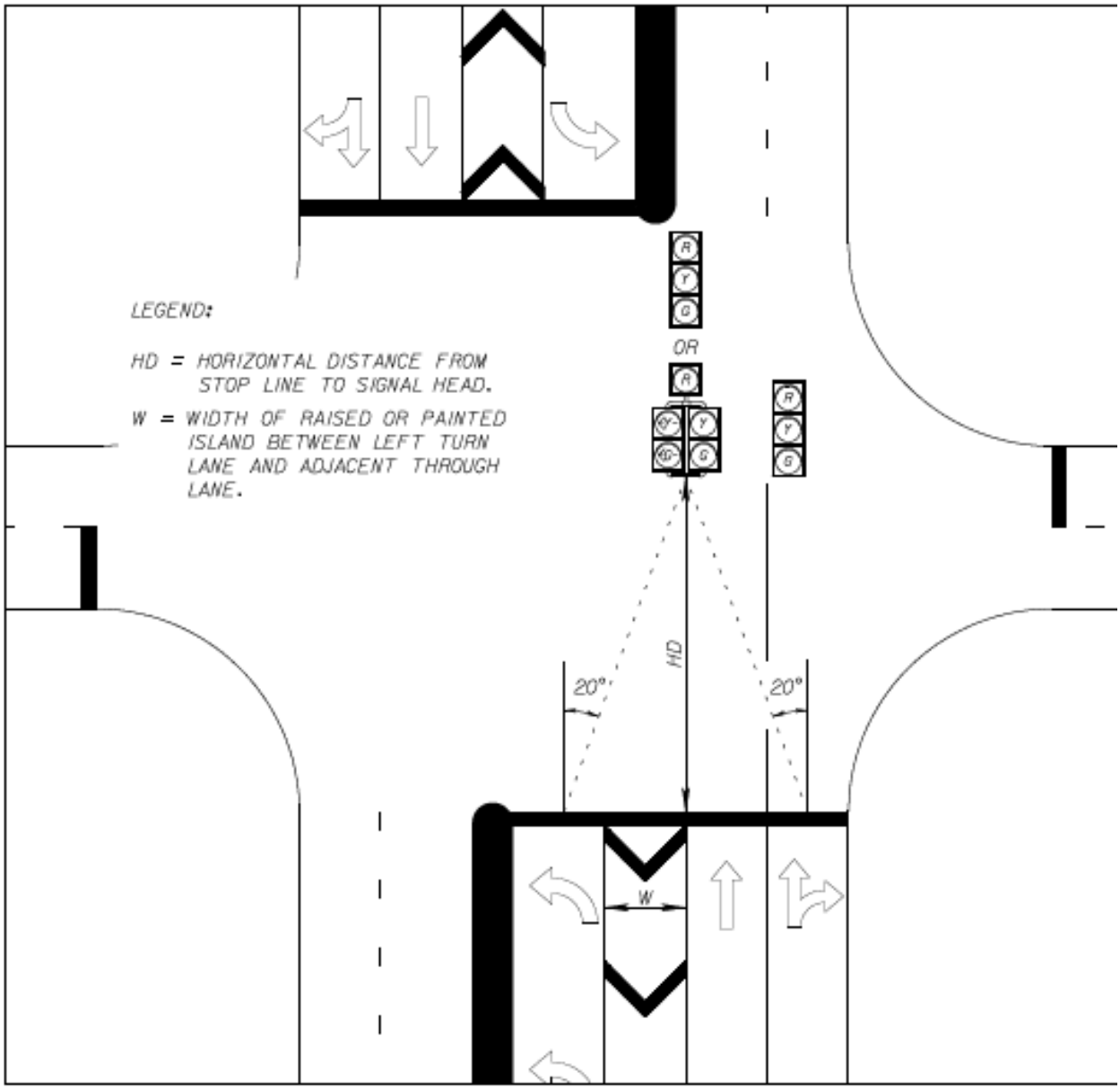


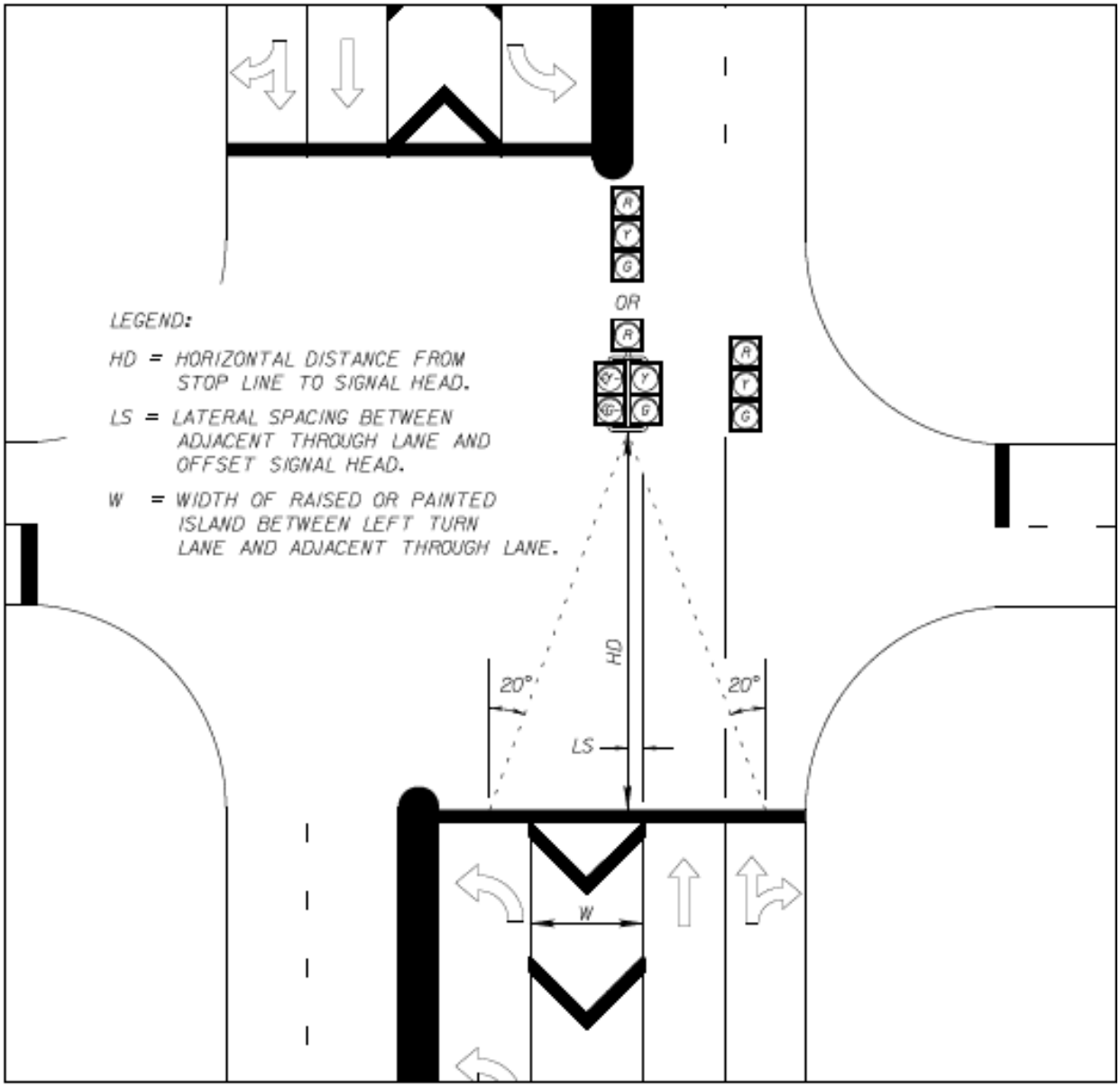
Table 3.2-1. Maximum Width of Hatched-Out Area Without Shifting Signal Head

Horizontal Distance	Width
40	8
50	12
60	15
70	19
80	23
90	26
100	30
110	34
120	37
130	41
140	44
150	48

(2) Signal faces containing circular green signal indication for a permissive only left-turn should not be located above an exclusive left-turn lane or the extension of the lane, nor should they be post-mounted on the far side median in front of the left-turn lane. Permissive only left turn signal displays shall not be provided in an exclusive left turn signal face. If the separation or geometric conditions of the offset left turn lane is such that the cone of vision would not be met with a shared signal head positioned on the lane line adjacent to the nearest through lane, the shared signal face may be offset to the left from the adjacent through lane line such that the required cone of vision is still met for the right most through lane and for the left turn lane. This lateral offset spacing should be used only after other options such as increasing the horizontal distance to the signals heads has been considered and placed so as to be obvious that the signal display is shared. The lateral offset spacing of the shared signal head from the adjacent through lane generally should not be greater than one half the width of the island (½W).

(3) If the lateral shift is too great, the cone of vision may not be adequate for the driver in the right most through lane. Where the cone of vision cannot be met, protected only mode must be used. This may be due to a large parallel offset left turn lane or due to a tapered or curved offset left turn lane.

Figure 3.2-2. Left Turn Lane Signal Head Shift



3.2.6 PERMISSIVE ONLY MODE IN MULTI- LEFT TURN LANE APPROACHES

A permissive green interval for two or more left turn lane approaches shall not be used.

Section 3.3

SCHEDULING INTERSECTION CONTROL EVALUATIONS AND FUNDING ARRANGEMENTS

3.3.1 PURPOSE

To establish criteria for responding to requests for traffic signal installations, for funding and implementation arrangements for warranted signals, and for conducting related studies such as the Intersection Control Evaluation (ICE) to determine the need and type of improvement.

3.3.2 GENERAL

Since the Department is charged with the responsibility to erect and maintain a uniform system of traffic signals and other traffic control devices for regulation, control, guidance, and protection of traffic on the State Highway System, there is need to provide uniformity in responding to requests for signals and in the scheduling and conducting of traffic studies to determine signal needs. If an intersection is determined to meet signal warrants, the procedure as described in the Department's ***Topic No. 750-010-003, Manual on Intersection Control Evaluations*** must be conducted to determine the appropriate intersection control strategy.

3.3.3 RESPONSE TO SIGNAL REQUESTS AND SCHEDULING TRAFFIC SIGNAL STUDIES

(1) The District Traffic Operations Office shall objectively review all requests for traffic signal installations received by the Department against existing information and local knowledge of the intersection before agreeing to commit resources for a detailed traffic study. This initial screening may require a brief site visit to view the field conditions. During the initial screening, all data shall be recorded in writing and kept on file. An attempt shall be made to relate all data and analysis to standards set forth in the ***MUTCD***. If the initial screening results in a decision to conduct a signal warrant study, the appropriate ***District Traffic Operations Office*** should contact the local government traffic engineering agency, advise them of the Department's decision, and obtain their views and input. Also, the appropriate ***District Traffic Operations Office*** should advise the local government traffic engineering agency that should signal warrants be met, an ICE analysis will be required to determine the appropriate intersection control strategy.

(2) If the initial screening results in a decision to not consider signalization or further study, the ***District Traffic Operations Office*** shall document the reasons and advise the requestor of the findings with a copy to the local government traffic

engineering agency. Although local government concurrence is desirable, it is not a prerequisite for committing Department resources to a full signal warrant study and subsequent ICE analysis if the signal is warranted.

(3) The ***District Traffic Operations Office*** shall normally conduct signal warrant studies for proposed signal installations on the State Highway System. However, a local government traffic engineering agency may conduct such studies and submit them to the ***District Traffic Operations Office*** for review. All studies shall be conducted in accordance with the procedure and standards prescribed in this document and shall be signed and sealed by a professional engineer.

(4) If the signal warrant study shows the installation of a new traffic signal is warranted, the ***District Traffic Operations Office*** or local government traffic engineering agency will conduct an ICE analysis to determine the appropriate intersection form.

(5) Formal legal resolutions from local agencies may form the basis of their concurrence in the need for a traffic signal study. However, such documents should not be required by the Department as a prerequisite to scheduling the study. Additionally, the availability of implementation funds should not be a prerequisite to assessing traffic signalization needs (conducting a study).

(6) The ***District Traffic Operations Office*** shall keep a log of requests for traffic signal studies and their disposition. To the extent practical, a priority system utilizing the request date, traffic volumes, accident experience, and the level of local government interest should be used to schedule traffic signal studies.

3.3.4 TRAFFIC SIGNAL STUDIES AND ENGINEERING

(1) Department of Transportation staff, local agency engineers, or qualified consulting engineers may perform traffic signal studies, ICE analyses, and provide any required engineering services for the preparation of implementation plans and specifications for proposed traffic signals and/or alternative intersections on the State Highway System. However, the Department is responsible for requiring and overseeing such work.

(2) Traffic signal studies shall be made in accordance with ***Topic No. 750-020-007, Manual on Uniform Traffic Engineering Studies (MUTS)***, particularly, ***Chapter 2 of the MUTS Manual***, referred therein. ICE analyses shall be made in accordance with ***Topic No. 750-010-003, Manual on Intersection Control Evaluations***. Plans and specifications, if required, shall be prepared in accordance with established Department procedures.

(3) Traffic signal studies, ICE analyses or engineering analyses conducted for new, or proposals to significantly revised, private access points to major traffic generators shall be conducted by qualified traffic engineers at no cost to the Department. Except under unusual circumstances, these studies and/or analyses shall be part of the Driveway Permit Application as per the requirements of ***Rule 14-96***. In accordance with ***Section 2.3(1)(d) in Topic No. 750-010-003, Manual***

on Intersection Control Evaluations, a Driveway Permit Application for Category E, F, and G standard connection categories are required to conduct ICE analysis and have the analysis approved by both the District Design Engineer and the District Traffic Operations Engineer. These studies shall, in addition to evaluating the need for signal control at unsignalized intersections and alternative intersections forms from the ICE analyses, also consider enhanced features at existing upstream and downstream signalized intersections, as appropriate. Such study and report shall be signed and sealed by a Florida registered professional engineer. Likewise, engineering costs associated with the preparation of implementation plans and specifications should also normally be borne by the developer. There may be instances where the Department determines that specific critical design requirements make it essential that the engineering work be performed by Department forces. In such instances, the District Secretary may direct that the engineering work be done by the Department at no cost to the developer.

(4) Studies and engineering at existing private access points which may be required as a result of normal traffic growth are usually made by qualified traffic engineers by the requestor. In extraordinary situations the Department may elect to do so.

3.3.5 FUNDING ARRANGEMENTS FOR WARRANTED NEW SIGNAL INSTALLATIONS

(1) New traffic signal installations and/or alternative intersections from the ICE analysis on the State Highway System may be funded from private, local, state, or federal funds, or any combination of such funds.

(2) The developers shall totally fund the installation of any new traffic signal, any alternative intersection construction, and/or the enhancements of any existing traffic signals when these improvements are requirements specified in a new or revised Driveway Permit or local government Development Order. If proposals to provide signalization or alternative intersection or modify existing signalization is above the minimum required by Permit or Development Order and provides a betterment to the State Highway System substantially beyond mitigation for development impacts, the Department's District Secretary may determine an appropriate financial participation formula and assign percentages of participation to the developer in consideration of the specific conditions at each site.

(3) Although signal installation and/or alternative intersection construction on the State Highway System is the responsibility of the Department, local governments may contribute, on a voluntary basis, a portion, or all of the cost of signal installation and/or alternative intersection construction depending upon specific cooperative arrangements worked out between the Department's District Offices and the local agency. Local funds are most often utilized in these cooperative efforts to advance the implementation schedule of a warranted traffic signal and/or alternative intersection. When local funds are accepted by the Department, a formal joint project agreement executed by both parties is necessary.

(4) Most local governments in Florida's urban areas have qualified traffic engineering organizations with experienced traffic signal field crews and many new signals have been installed on the State Highway System using local agency installation crews with control hardware supplied by the Department. Where the local agency is agreeable to this procedure (most are because of their maintenance and operational involvement in these sites), this technique should be encouraged. No formal agreement is necessary since no money is changing hands; however, a letter from the local agency agreeing to install Department supplied hardware should be obtained.

3.3.6 OTHER CONSIDERATIONS

(1) Prior to purchase, use, or installation, traffic signals must comply with provisions of the ***FDOT Approved Product List Submittal Process***.

(2) Prior to finalizing the agreement of intersection improvement, the study must comply with ***Topic No. 750-010-003, Manual on Intersection Control Evaluations***.

(3) Prior to installation of traffic signals, compliance with ***Topic No. 750-010-022, Traffic Signal Maintenance Agreements***, is necessary.

Section 3.4

EMERGENCY TRAFFIC CONTROL SIGNALS

3.4.1 PURPOSE

To provide guidance for warranting, designing, and operating emergency traffic control signals at locations where emergency vehicles, most commonly fire trucks, need special traffic signal assistance to egress onto the street system.

3.4.2 BACKGROUND

The Department's district offices often receive local public agency requests for traffic signal control for the departure of emergency vehicles. This section was developed to give comprehensive guidance to determine if the signals are warranted.

3.4.3 PROCEDURE

The need for an Emergency Traffic Control Signal shall be considered if an engineering study finds that one of the following warrants are met:

(1) Minimum Traffic Volumes (Both directions of travel, based on signal warrant #2), as shown in Table 3.4-1.

Table 3.4-1. Minimum Traffic Volumes

Roadway	Peak Hour	or	24 Hours
2-Lane	750 VPH		7500 ADT
4-Lane	900* VPH		9000* ADT
6-Lane or more	1200* VPH		12000* ADT
*Values shall be increased by 1/3 when arterial has traffic signal system coordination with signals located within 1000 feet in both directions from the emergency signal location.			

(2) When the geometric design of the arterial and emergency vehicle facility is such that the vehicle when returning must *back in*, and to do so must block traffic when performing this maneuver and the traffic volume and speeds are such that the use of emergency vehicle lights and flaggers have been ineffective in controlling traffic.

(3) When the location of the emergency vehicle driveway consistently conflicts with the normal traffic queue from an adjacent signalized intersection. The use of DO NOT BLOCK INTERSECTION (R10-7) sign should be considered in conjunction with the emergency signal installation.

(4) On all approaches when vertical or horizontal curvature or other obstructions do not provide adequate stopping sight distance for traffic approaching an emergency vehicle driveway.

3.4.4 CONFIGURATION AND OPERATION OF EMERGENCY TRAFFIC CONTROL SIGNALS

(1) ***Section 4G.03 of the MUTCD*** defines the operational requirements for a *mid-block* location of an emergency signal. The MUTCD allows either a steady green or flashing yellow operation of signal heads between emergency vehicle actuations. These choices of operation, combined with limited details for signal configuration requirements have resulted in a lack of uniformity of emergency signal design and operation within the State.

(2) Based on requirements contained in ***Chapter 4G.04 of the MUTCD***, the following criteria for emergency traffic control signals shall be followed for new or reconstructed installations.

(a) Dual indications shall be provided for each roadway approach. A minimum of one signal face shall be installed for the emergency vehicle driveway but two indications are preferable.

(b) If the emergency service is located off the main roadway and emergency vehicles access the main roadway via a public access street, emergency signals may be erected at the intersection of these roadways. If this practice is followed, dual indication shall be used on the public access street, with the signals resting on the flashing red indication.

(c) Mid-block emergency signals shall be operated as flashing yellow between emergency vehicle actuations. Roadway signal head configuration shall consist of three sections and shall be operated as shown in ***Figure 3.4-1***. (The use of special technological signal devices may be selected, i.e., strobe signals, LED, or solar power. These devices may require temporary permitting prior to installation.)

(d) Signal operation at intersections which are pre-empted by emergency vehicles entering the roadway near or at the intersection should be designed on an individual basis.

(3) It is not practical to outline all possible situations which may be encountered in the field. Such factors as emergency vehicle route distance between the

intersection and emergency vehicle driveway, intersection geometrics, number of lanes, normal queue length, traffic volumes, etc., should be considered.

3.4.5 EMERGENCY SIGNAL SIGN (R10-13)

(1) As emergency signals are installed at locations along major arterials where emergency vehicles enter the roadway, the EMERGENCY SIGNAL sign (R10-13), shall be placed on the span wire or mast arm to identify the purpose of the signal to the driver.

(2) The EMERGENCY SIGNAL sign (R10-13) shall always be legible, shall be mounted adjacent to each signal face, and shall be located between the dual signal indications on each roadway approach.

(3) No sign is required for the emergency vehicle driveway approach.

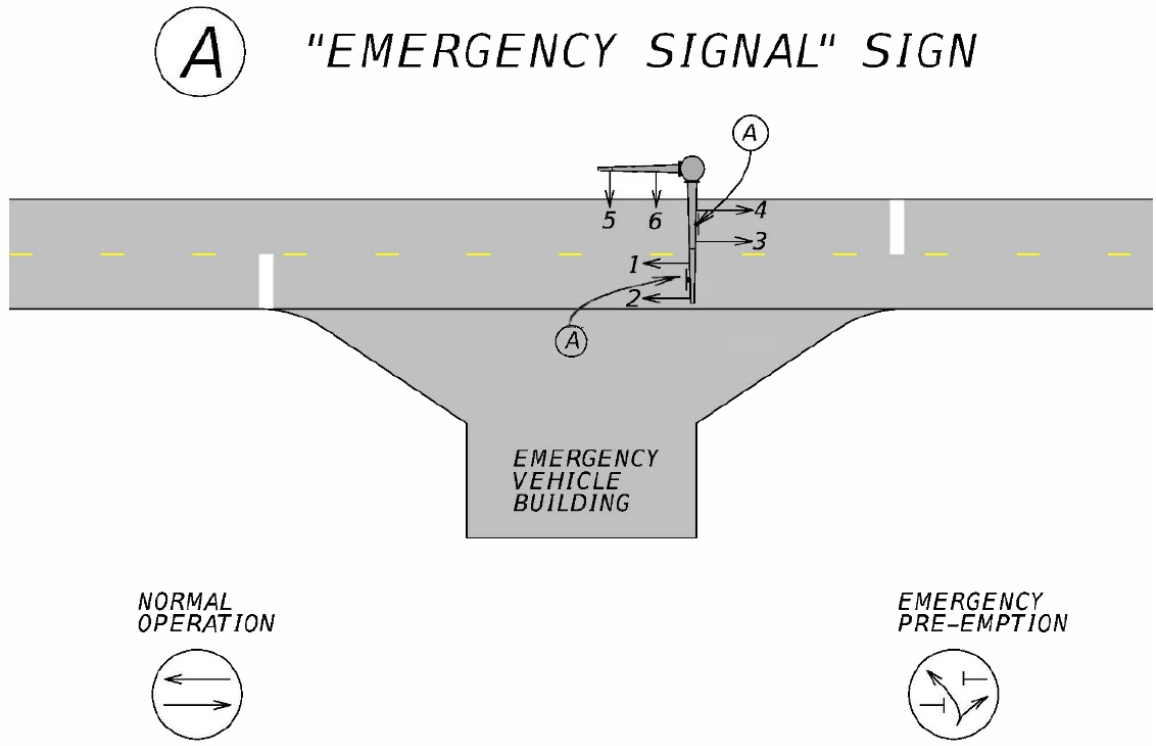
3.4.6 OTHER REQUIREMENTS

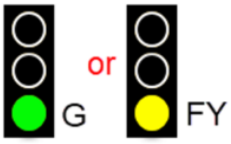
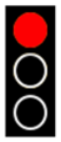
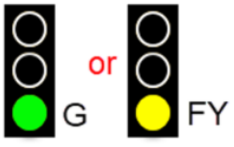
(1) A controller timing chart shall be a part of the contract plans.

(2) A Maintenance Agreement shall be required for all Emergency Signals on the State Highway System.

(3) A signal timing study is required to determine proper clearance intervals.

Figure 3.4-1. Mid-Block Emergency Signal Operation



NORMAL OPERATION	CHANGE TO EMERGENCY PREEMPTION	EMERGENCY PREEMPTION	CHANGE FROM EMERGENCY PREEMPTION	RELEASE
Signal 1,2,3,4 	Signal 1,2,3,4	Signal 1,2,3,4 	Signal 1,2,3,4	Signal 1,2,3,4 
Signal 5,6	Signal 5,6	Signal 5,6	Signal 5,6	Signal 5,6

Section 3.5

TRAFFIC SIGNAL MAST ARM SUPPORT BOUNDARIES

3.5.1 GENERAL

The ***Department's Plans Preparation Manual, Topic No. 625-000-007, Volume 1 – Chapter 7*** requires that all traffic signals installed on the State Highway System that are within the Mast Arm Structures Boundary shall be supported by mast arms.

3.5.2 IMPLEMENTATION

3.5.2.1 Mast Arm Structures Boundary Maps

The mast arm structures boundary map follows an alignment of state roads that are parallel to an approximate ten mile distance to the coastline. Official mapping of this boundary is maintained on a Map Info-Base by the State Traffic Engineering and Operations Office. Current district maps are provided at this location: ***https://www.fdot.gov/traffic/trafficservices/pdfs/districts***.

Section 3.6

STANDARDIZATION OF YELLOW CHANGE AND RED CLEARANCE INTERVALS FOR SIGNALIZED INTERSECTIONS

3.6.1 PURPOSE

The purpose of the yellow change and red clearance intervals is to provide a safe transition between two conflicting traffic signal phases. The function of yellow change interval is to warn traffic of an impending change in the right-of-way assignment and the function of the red clearance interval is to provide additional time following the yellow change interval to clear the intersection before conflicting traffic is released. The Manual on Uniform Traffic Control Devices (***MUTCD***) states that a yellow change interval should have a minimum duration of 3 seconds and a maximum duration of 6 seconds and a red clearance interval should have duration not exceeding 6 seconds. The intent of this section is to provide a standard for uniform application of yellow and red intervals.

All new signal installations, intersections that have a Traffic Infraction Detectors installed, any signal that has signal phasing changes, geometric changes affecting the timing or phasing, or corridor re-timing projects must comply with these standards immediately upon implementing timing changes. All other existing signalized intersections on the State Highway System must be in compliance with standards of this section by June 30, 2015.

3.6.2 STANDARD

(1) ***Section 316.075(3)(a), F.S.*** states that no traffic control signal device shall be used which does not exhibit a yellow or "caution" light between the green or "go" signal and the red or "stop" signal. The Statute is silent on the yellow clearance interval duration and does not mention nor mandates the use of a red clearance interval.

(2) The Institute of Transportation Engineers (ITE) formula shall be used to calculate yellow change interval. Yellow change intervals shall not be lower than the values shown in Table 3.6-1 for a given posted speed limit (PSL) even if the ITE formula produces a lower value. Yellow change intervals calculated to be lower than 3.4 seconds shall be set at no less than 3.4 seconds. The yellow interval shall not exceed 6 seconds. Any yellow change intervals that are greater than the standard yellow change intervals presented in Table 3.6-1 of this section, for a given PSL, are allowed, but they shall be based on ***MUTCD's Section 4D.26***, engineering practice and the ITE formula. However, for a given PSL, the yellow change intervals shall not be less than the standard values presented in ***Table 3.6-1***.

(3) A Perception Reaction Time (PRT) of 1.4 seconds shall be used. Yellow change and red clearance interval times shall be rounded up to the nearest 0.1 second.

(4) Approach speed used in this section is the PSL for the approach being analyzed.

3.6.2.1 Yellow Change Interval

(1) Recent research has found that the 85th percentile PRT value was 1.33 seconds. Based on the research results, a PRT of 1.4 seconds shall be used.

(2) The Florida yellow change intervals shown in ***Table 3.6-1*** are computed using ***Formula 3.6-1*** (found in ITE's Traffic Engineering Handbook) with a PRT of 1.4 seconds and a grade of 0%. These intervals are the required standard minimum values.

Table 3.6-1. Florida Yellow Change Interval (0.0 % Grade) Standards*

APPROACH SPEED (MPH)	YELLOW INTERVAL (SECONDS)
25	3.4
30	3.7
35	4.0
40	4.4
45	4.8
50	5.1
55	5.5
60	5.9
65	6.0
* For approach grades other than 0%, use ITE Formula.	

Formula 3.6-1

$$Y = t + \frac{1.47v}{2(a + Gg)}$$

Where:

Y = length of yellow interval, sec.
t = perception-reaction time (use 1.4 sec.)
v = speed of approaching vehicles, in mph.
a = deceleration rate in response to the onset of a yellow indication (use 10 ft/sec2)

g = acceleration due to gravity (use 32.2 ft/sec2)
G = grade, with uphill positive and downhill negative (percent grade /100)

3.6.2.2 Red Clearance Interval

A red clearance interval must be used. Providing adequate red clearance intervals can significantly impact intersection safety by reducing the probability of occurrence of right angle crashes, even if drivers run the red signal indication. The red clearance interval shall be determined using engineering practices. The values are typically computed using ***Formula 3.6-2,*** found in ***ITE's Traffic Engineering Handbook***.

Formula 3.6-2

$$RR = \frac{WW + LL}{1.47vv}$$

Where:

R = length of red interval, sec.
W = width of the intersection, in feet, measured from the near-side stop line to the far edge of the conflicting traffic lane along the actual vehicle path.
L = Length of vehicle (Use 20 ft.)
v = speed of approaching vehicles, in mph.

The minimum red clearance interval shall be 2.0 seconds and the maximum red clearance interval should normally not exceed 6.0 seconds. Longer red intervals than the minimum 2.0 seconds can be used at the engineer's discretion where width of intersection, sight distance, complex intersections, crash history and any unique conditions exist that may warrant longer red times. The determination shall be based on engineering judgment. The National Cooperative Highway Research Program (NCHRP) Report 731 recommends using a modified ITE formula that allows for 1.0 second reduction due to reaction time delay from the conflicting movement. Therefore, a 1.0 second reduction may be made in the values computed from ***Formula 3.6-2*** and applying engineering judgment. However, the red clearance interval shall be no less than 2.0 seconds.

Section 3.7

ACCESSIBLE PEDESTRIAN SIGNALS

3.7.1 PURPOSE

To establish criteria for the installation and operation of accessible pedestrian signals on the State Highway System that provide information in non-visual formats, such as audible tones, speech messages, and/or vibrating surfaces.

3.7.2 GENERAL

Sections 4E.09 to 4E.13 of the MUTCD establish the standards for accessible pedestrian signals installed on public roadways. ***Section 4E.06 of the MUTCD*** also contains guidance for accessible pedestrian signal installations. The MUTCD must be reviewed and considered with accessible signal installation requests.

3.7.3 PROCEDURE

(1) Accessible pedestrian signals installed on the State Highway System shall be reviewed and approved by the District Traffic Operations Engineer (DTOE) prior to installation.

(2) Requests for accessible pedestrian signal installations received from the public, maintaining agencies, public agencies or support groups for people with visual impairments will be reviewed by the DTOE. The DTOE may request input from public agencies and organizations that support people with visual impairments to determine if accessible pedestrian signals would be effective and safe for users.

(3) An engineering study shall be conducted if the initial DTOE's review supports the installation of the accessible pedestrian signal. The engineering study should consider the needs of all pedestrians and not just those with visual impairments.

(4) The following criteria should be considered when reviewing requests for accessible pedestrian signals:

- **(a)** potential demand for accessible pedestrian signals
- **(b)** right on red movements
- **(c)** free-flow right turn movements
- **(d)** complexity of signal phasing
- **(e)** complexity of intersection geometry
- **(f)** traffic volumes during times when pedestrians might be present
- **(g)** audible tones or sounds that may cause confusion
- **(h)** verbal messages instead of tones or sounds
- **(i)** vibrotactile pedestrian devices

(j) pushbutton or passive pedestrian detectors

(k) sufficient automatic volume adjustment in response to ambient traffic sound level, 100dBa (decibels) maximum

(l) locations with more than four lanes and/or greater than 35 MPH posted speed limit shall be given additional considerations for geometrics, operations, and pedestrian safety

3.7.4 APPROVAL/DENIAL PROCESS

(1) The DTOE shall review all requests for accessible pedestrian signals received by the Department from an engineering study and/or local request before agreeing to approve the installation. The review should consider the needs of all pedestrians and not just those with visual impairments.

(2) The initial review may require site visits to view the field conditions. During the initial screening, all data shall be recorded and maintained. An attempt shall be made to relate all data and analysis to standards set forth in ***Sections 4E.09 to 4E.13 of the MUTCD***.

(3) If the initial review results in a decision not to install accessible pedestrian signals, the DTOE shall document the reasons and advise the requestor of the findings with a copy provided to the local government. Although local government concurrence is desirable, it is not a prerequisite for committing Department resources for an accessible pedestrian signal installation.

Section 3.8

MARKED PEDESTRIAN CROSSWALKS AT MIDBLOCK AND UNCONTROLLED APPROACH LOCATIONS

3.8.1 PURPOSE

To establish criteria for the consistent installation and operation of marked pedestrian crosswalks at midblock and unsignalized intersections on the State Highway System.

3.8.2 GENERAL

(1) Marked crosswalks and pedestrian treatments at uncontrolled approaches are intended to improve pedestrian connectivity and reduce instances of pedestrians crossing at random and unpredictable locations which can create confusion and add risk to themselves and other road users. Crosswalks may be used to facilitate pedestrian access and to concentrate pedestrian crossing activity to a safe and predictable location. Pedestrian crosswalks at uncontrolled approaches may be an appropriate tool where there is a documented pedestrian demand and the distance to the nearest controlled intersection crossing location would result in significant out-of-direction travel for pedestrians. In some locations having Context Classifications C2T, C4, C5 and C6 documented pedestrian demand is not required to install a pedestrian crosswalk.

(2) Marked crosswalks and pedestrian treatments that are well located and thoughtfully designed can serve as a mechanism for improving pedestrian connections, community walkability, and pedestrian safety. However, they are not suitable for all locations. Careful evaluation must be undertaken regarding expected levels of pedestrian crossing demand, safety characteristics of the crossing location, and design considerations for the crossing control type.

3.8.3 DEFINITIONS

(1) **Context Classification** – Description of the land use and transportation context where a roadway is found. Roadways are designed to match the characteristics and demands defined by the appropriate Context Classification. See ***FDOT Design Manual (FDM), Chapter 200*** for additional information.

(2) **In-Roadway Warning Lights** – Special types of highway traffic control devices installed in the roadway surface to warn road users that they are approaching a condition on or adjacent to the roadway that might not be readily apparent and might require the road users to slow down and/or come to a stop.

(3) **Marked Crosswalk** – Any portion of a roadway at an intersection or elsewhere distinctly indicated as a pedestrian crossing by pavement marking lines on the surface which might be supplemented by contrasting pavement structure, style or color. Marked crosswalks serve to provide guidance, define and delineate crossing paths, define intersections, and designate a stopping location when motorists are required to stop in the absence of a stop line.

(4) **Midblock Crossing** – Any location proposed for a marked crosswalk (signalized or unsignalized) between intersections.

(5) **Passive Pedestrian Detection** – Automated pedestrian detection systems that can detect the presence and direction of pedestrians and activate the traffic control device without any required action by the pedestrian.

(6) **Pedestrian Attractor** – A residential, commercial, office, recreational, or other land use that is expected to be an end destination for pedestrian trips.

(7) **Pedestrian Generator** – A residential, commercial, office, recreational or any other land use that serves as the starting point for a pedestrian trip.

(8) **Pedestrian Hybrid Beacon (PHB)** – A special type of hybrid beacon used to warn and control traffic at an unsignalized location to assist pedestrians in crossing a street or highway at a marked crosswalk. It is also known as high-intensity activated crosswalk (HAWK).

(9) **Rectangular Rapid Flashing Beacon (RRFB)** – A traffic control device consisting of two rapidly and alternately flashing rectangular yellow indications having LED-array based pulsing light sources that function as a warning beacon.

(10) **Two-Stage Marked Crosswalk** – A marked crosswalk that is designed to allow pedestrians to cross each half of the roadway independently, using a median refuge island for pedestrians to wait before completing the crossing.

(11) **Uncontrolled Approach** – A portion of the roadway approaching a crosswalk without stop or signal control, including midblock and unsignalized intersections.

(12) **Unmarked Crosswalk** – The legal crossing area at an intersection connecting the lateral lines of the sidewalks on opposite sides of the roadway.

3.8.4 PROCEDURE

(1) Any marked crosswalk proposed for an uncontrolled approach on the State Highway System shall be reviewed and approved by the appropriate District Traffic Operations Engineer prior to installation.

(2) A request from a state agency or local government for a marked crosswalk on an uncontrolled approach shall be submitted to the appropriate District Traffic Operations Engineer. Non-governmental entities wishing to obtain

authorization for a crosswalk at an uncontrolled approach location should do so through the local government.

(3) If the District Traffic Operations Engineer's review of available information supports the installation of a marked crosswalk at an uncontrolled approach location based upon the criteria outlined in ***Section 3.8.5***, then the justification for the marked crosswalk must be documented.

(4) The criteria referenced in ***Section 3.8.5***, as documented in an engineering study, shall be met as a condition for approval of a proposed marked crosswalk at an uncontrolled location. The engineering study must include the following information:

(a) Field data to demonstrate the need for a marked crosswalk based upon minimum pedestrian volumes (except as described in ***Section 3.8.5(2)*** and availability of any alternative crossing locations that satisfy the criteria described in ***Section 3.8.5***.) The ***Department's Manual on Uniform Traffic Studies (MUTS)*** provides additional information on obtaining pedestrian group size and vehicle gap size field data for use in making assessments of opportunities for safe crossings at uncontrolled locations.

(b) Potential links between pedestrian generators and attractors. This information is required for establishing the proposed crossing location or to confirm existing pedestrian crossing patterns.

(c) All safety considerations as described in ***Section 3.8.5(5)*** with respect to stopping sight distances, illumination levels, and proximity to intersection conflict areas.

(d) The proposed crossing location and corresponding signing, marking, and signal treatments (if applicable). A schematic layout should be provided over aerial photography or survey to show locations of signs, markings, and other treatments in proximity to existing traffic control devices. Treatments are dependent upon the site context, vehicle operating speeds, roadway cross-section, pedestrian volumes, and other variables. Treatments may include consideration of traffic signals or other warning devices to support pedestrian visibility and driver yielding. Other treatments such as median refuge areas, curb extensions, raised crosswalks, and supplemental signing and markings may also be applicable at some locations to support reduced crossing distance and enhanced pedestrian safety. See ***Section 3.8.6*** and ***3.8.7*** for discussion of treatment options and guidance on treatment selection.

(e) Any pedestrian-vehicle crash history within the vicinity of the proposed crosswalk that has occurred based upon a minimum of three years of

data. Also, from field observation, document the number and nature of any pedestrian-vehicle conflicts.

(f) Transit stop activity data and the location of transit stops within the vicinity of the proposed crosswalk, as applicable.

(5) If the evaluation results in a decision not to install a requested marked crosswalk or other pedestrian treatment, the District Traffic Operations Engineer shall document the reasons and advise the requestor of the findings. Meeting the minimum criteria outlined in this section does not guarantee approval of a request.

(6) Prior to the approval of a marked pedestrian crossing or other treatment at an uncontrolled approach location, coordination is necessary between the appropriate District Traffic Operations Office and local agencies to determine and document responsibilities for maintenance of any proposed traffic control devices.

3.8.5 INSTALLATION CRITERIA AND CONSIDERATIONS

(1) Placement of marked crosswalks should be based upon an identified need and not used indiscriminately. Important factors that should be considered when evaluating the need for a marked crosswalk include:

(a) Proximity to significant generators and attractors

(b) Pedestrian demand

(c) Pedestrian-vehicle crash history

(d) Distance between crossing locations

(2) To be considered for a marked pedestrian crosswalk, an uncontrolled approach location shall meet all the criteria in ***Sections 3.8.5(3) and 3.8.5(4)***. See ***Section 3.8.5(3)*** for exceptions to the pedestrian volume criteria.

(3) Minimum Levels of Pedestrian Demand

(a) Any uncontrolled location under consideration for a marked crosswalk should exhibit (1) a well-defined spatial pattern of pedestrian generators, attractors, and flow (across a roadway) between them or (2) a well-defined pattern of existing pedestrian crossings. Generators and attractors should be identified over an aerial photograph to illustrate potential pedestrian routes in relation to any proposed marked crosswalk location.

(b) Sufficient demand should exist that meets or exceeds the thresholds for an average day. An average day is generally considered a non-holiday weekday without a special event, or weekend day including Saturday or Sunday. Data collection should be based upon pedestrian volumes observed crossing the roadway outside a crosswalk at or in the vicinity of

the proposed location, or at an adjacent (nearby) intersection. A bicyclist can be counted as a pedestrian if appropriate for the crossing.

The following minimum thresholds should be met when considering a new marked crosswalk at an uncontrolled approach:

- 20 or more pedestrians during a single hour (any four consecutive 15-minute periods) of an average day, or
- 18 or more pedestrians during each of any two hours of an average day, or
- 15 or more pedestrians during each of any three hours of an average day.

The following are exceptions to the minimum pedestrian volume demand criteria:

- Within a school zone there is no minimum pedestrian volume for a school crossing.
- For the following combinations of context class and vehicle speeds, a marked crosswalk may be installed without meeting the minimum pedestrian volume thresholds. Supplemental crossing treatments (See ***Section 3.8.7***) may still be applicable and should be evaluated as part of the engineering study.
    - The roadway falls within a C2T Rural Town Context Classification and the speed limit is 35 MPH or less.
    - The roadway falls within a C4 Urban General Context Classification zone and the speed limit is 35 MPH or less.
    - The roadway falls within a C5 Urban Center Context Classification zone and the speed limit is 35 MPH or less.
    - The roadway falls within a C6 Urban Core Context Classification.

Even when applying pedestrian volume criteria exceptions, a signed and sealed engineering study will still be required to document the crossing need, location, and proposed treatments.

(c) Shared Use Path Crossings

In order to promote the use of shared use paths and reduce the impacts roadway crossings can create for pedestrians and bicyclists, crossing

locations connecting a shared use path on each side of a roadway are not subject to minimum pedestrian volume criteria listed above.

Proposed locations where a trail or shared use path ends on one side of a roadway and a sidewalk or similar facility exists on the other side of the roadway must meet 50 percent of the minimum pedestrian volume threshold for installation. Such crosswalks are subject to removal if pedestrian volumes fall below half of this reduced threshold.

Care should be given to selecting the appropriate location and crossing treatments for shared use paths. The inside dimension for crosswalks on shared use paths need to be at least as wide as that for the shared use paths.

(4) Minimum Location Characteristics

(a) A minimum vehicular volume of 2,000 Average Daily Traffic (ADT) along the roadway segment.

(b) Minimum distance to nearest alternative crossing location is 300 feet per the ***FDOT Design Manual (FDM), Chapter 222 Pedestrian Facility***. An alternative pedestrian crossing location may be considered to be any controlled location with a STOP sign, traffic signal, or a grade-separated pedestrian bridge or tunnel that accommodates pedestrian movement across the subject roadway. A proposed crossing location that falls between 100 and 300 feet from an alternative existing crossing may be considered if more practical for pedestrian use; this justification must be documented in an engineering report.

(c) The proposed location must be outside the influence area of adjacent signalized intersections, including the limits of the auxiliary turn lanes. Where an adjacent intersection is signalized, the design must ensure that the ends of standing queues do not extend to the proposed marked crosswalk location.

(5) Safety Considerations

For any proposed marked crosswalk, the location should be conducive to providing a sufficient level of pedestrian safety. The following conditions should be satisfied for existing crosswalks or, if not, should be achieved in conjunction with any implementation of the proposed marked crosswalk:

(a) The location for a marked crosswalk must provide adequate stopping sight distance. The ***FDOT Design Manual (FDM), Chapter 222 Pedestrian Facility*** provides additional information for identifying appropriate stopping sight distance. Parking restrictions in the vicinity of the marked crosswalk may be necessary to meet required sight distance. Other optional treatments, including curb extensions, may also be considered for improving sight distance and reducing pedestrian crossing distance.

(b) If sidewalks connecting the crosswalk to established pedestrian generators and attractors are not already present, they should be provided. The ***FDOT Design Manual (FDM), Chapter 222 Pedestrian Facility*** provides additional sidewalk design considerations.

(c) Crosswalk illumination shall be provided at all newly constructed uncontrolled approach crosswalks in accordance with ***FDOT Design Manual (FDM), Chapter 231 Table 231.2.1***. However, there may be locations such as environmentally-sensitive areas or crosswalks serving facilities that are open only during daylight hours, where lighting may be omitted.

(d) At uncontrolled approach locations with vehicular volumes greater than 12,000 ADT or where crossing distances exceed 60 feet, a refuge island or raised median should be considered to facilitate a two-stage crossing. Provide documentation where physical constraints prevent the accommodation of a median refuge. Roadway and safety conditions shall be taken into consideration in identifying whether the location is appropriate for a marked crosswalk. Median refuge areas shall meet Americans with Disabilities Act (ADA) requirements and the ***Department's Standard Plans, Index No. 522-002***.

(e) Consideration should be given to the location of nearby bus stops when locating a proposed pedestrian crossing. Marked crosswalk placement should seek to minimize conflicts with transit vehicles. Bus stops on the far side of a marked crossing are preferred. If feasible, bus stops can be relocated to better align with a proposed pedestrian crossing.

3.8.6 SELECTION GUIDANCE FOR PEDESTRIAN TREATMENTS

(1) An engineering study should be performed before a marked crosswalk is installed at a location away from a traffic control signal or an approach controlled by a STOP or YIELD sign. The treatment to be provided at a particular location should be selected in consideration of pedestrian volumes and crossing difficulty:

(a) For high volume pedestrian crossings, traffic signal control may be appropriate provided that ***Signal Warrant 4 of the MUTCD*** is satisfied. Alternatively, a PHB may be utilized if the applicable ***MUTCD*** warrants are satisfied and requirements for a traffic signal are not met. For additional guidance on these control options see ***Section 3.8.6(3)***.

(b) For locations meeting the criteria under ***Section 3.8.5***, but do not have sufficient pedestrian volume to meet ***Signal Warrant 4 of the MUTCD*** or PHB volume requirements, other pedestrian-actuated warning device options are available including RRFB, flashing beacons, and in-roadway warning lights. Decisions about which additional treatment elements to include (if any) should be made with sound engineering judgment. For guidance on supplemental warning device options that are exempt from warrants, see ***Section 3.8.7(3)*** for details.

(c) ***Section 3.8.7(4)*** provides additional guidance regarding other crosswalk design treatments that could be considered to support pedestrian visibility and safety. Examples include supplemental signing, refuge islands, curb extensions, lighting, and raised crosswalks. Some treatments may be used in combination with implementation of a traffic control signal or other warning beacon devices.

(2) The charts shown in ***Figure 3.8-1*** and ***Figure 3.8-2*** were developed using information from ***Figure 4C-7***, ***Figure 4F-1,*** and ***Figure 4F-2 of the MUTCD***. The charts herein are intended for use as a quick-check guidance for selecting the appropriate pedestrian traffic control device for a particular set of hourly vehicular and pedestrian volumes for low and high-speed roadways.

(3) Selection Guidance for Warranted Signals

For a location with high pedestrian demand, signal control may be appropriate provided an ***MUTCD*** signal warrant is satisfied and a new pedestrian signal is compatible with the remaining signal system along the arterial. For a mid-block crossing within a coordinated signal system, if the ***Signal Warrant 4*** criteria is not met but PHB criteria is met, a PHB installation could be upgraded to a pedestrian traffic signal. Consideration should be given to cycle length, signal spacing, and available gaps to reduce pedestrian delay and promote signal compliance.

Figure 3.8-1. Guidelines for the Installation of Pedestrian Treatments on Low-Speed Roadways

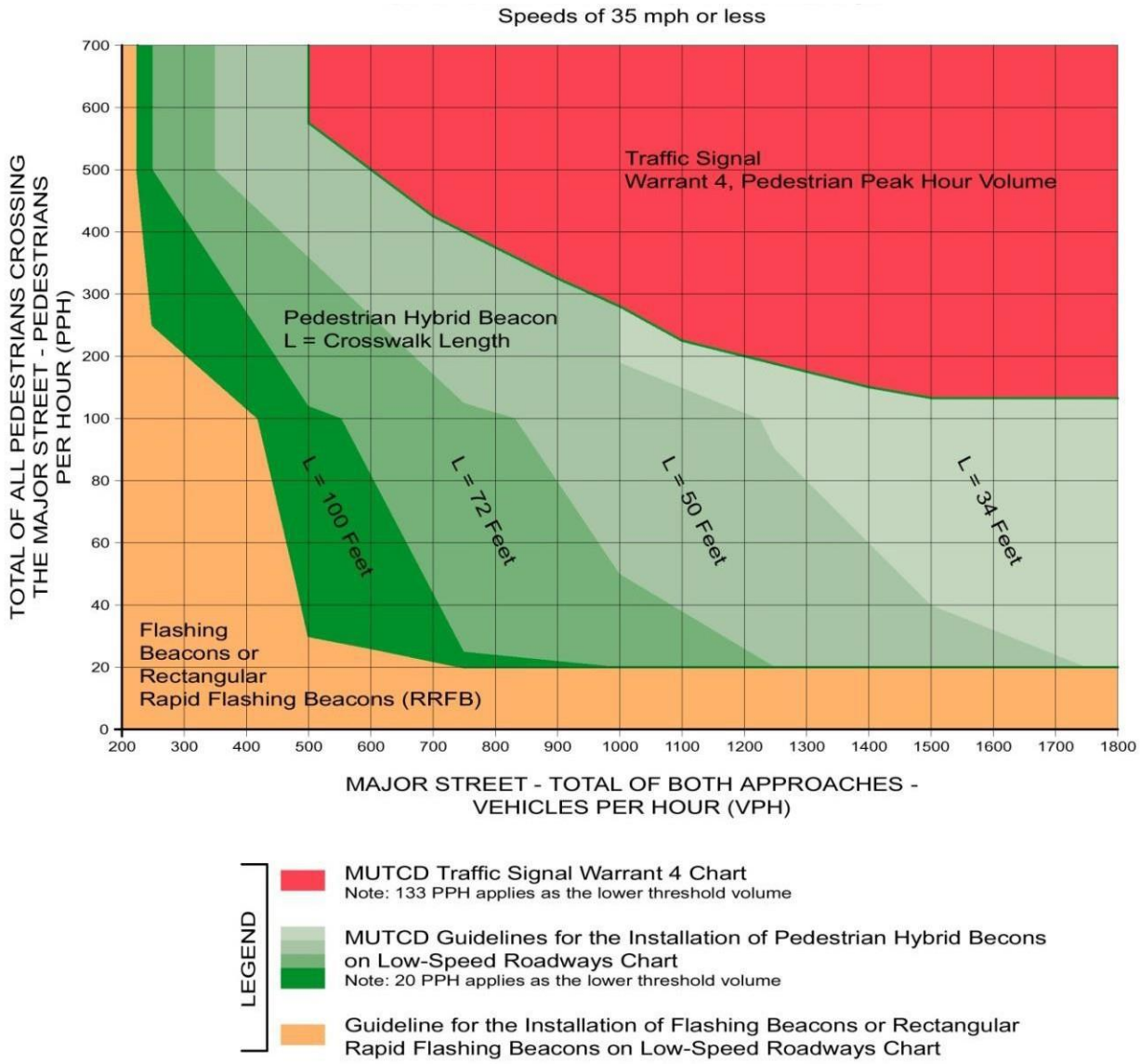
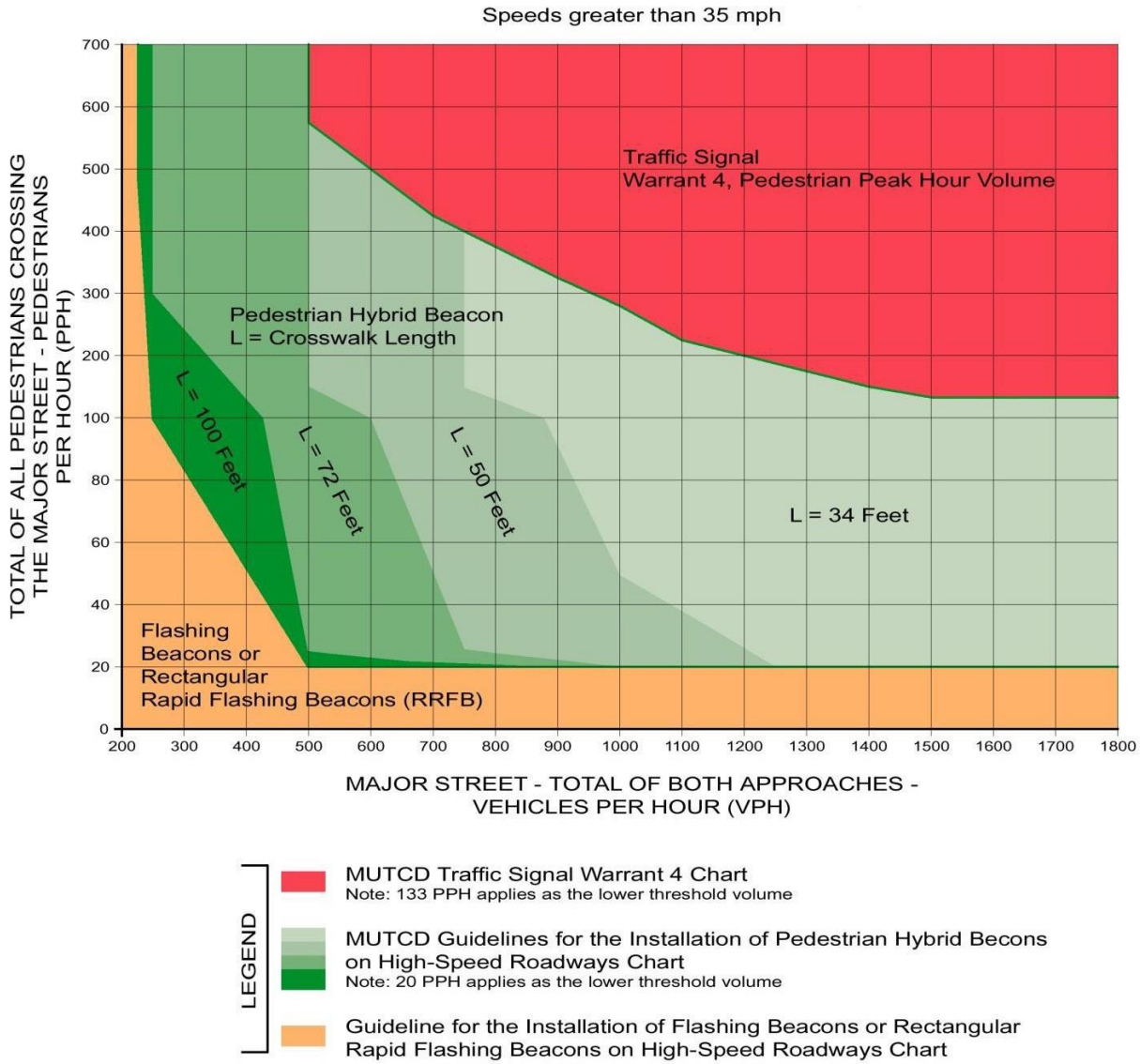


Figure 3.8-2. Guidelines for the Installation of Pedestrian Treatments on High-Speed Roadways



3.8.7 PEDESTRIAN CROSSING TREATMENTS

(1) The minimum requirement for a pedestrian crossing treatment is the following:

(a) Ten-foot wide minimum Special Emphasis Crosswalk markings shall be used for all marked crosswalks at uncontrolled approaches, as shown in the ***FDOT Design Manual (FDM), Chapter 230 Signing and Pavement Marking.*** The design of marked crosswalks at uncontrolled approaches should follow the ***FDOT Design Manual (FDM), Chapter 222 Pedestrian Facility***. The ***FDOT Design Manual (FDM)*** provides three possible configurations for a midblock crossing.

(2) Signal Treatments (Requiring Warrant Analysis)

(a) Traffic Control Signal

- When pedestrian volumes are of a sufficient level to meet the ***Signal Warrant 4 of the MUTCD***, a traffic control signal may be installed to serve this demand. Applicable pedestrian signal warrants and installation guidelines are identified in ***Section 4C.05 of the MUTCD***. For mid-block crosswalks that are greater than 300 feet from the nearest signalized intersection, considerations for a traffic control signal at a new location should include distance to adjacent signals and availability of adequate gaps for pedestrians to cross the roadway. In some cases, a pedestrian signal may not be needed at the study location if adjacent coordinated traffic control signals consistently provide gaps of adequate length for pedestrians to cross the roadway. The ***Department's Manual on Uniform Traffic Studies (MUTS)*** provides additional guidance on conducting Pedestrian Group Size and Vehicle Gap Size studies.

- Some locations experience challenges related to pedestrians with slower crossing speeds. In those cases, ***Chapter 4C.05 of the MUTCD*** allows the pedestrian volume crossing the major street to be reduced as much as 50 percent if the 15th percentile crossing speed is less than 3.5 feet per second.

- For locations where signalized control is selected for the pedestrian crossing, additional coordination for the crossing location is recommended with the District Access Management Review Committee and the District Traffic Operations Engineer.

- For six-lane divided roadways or crossing distances exceeding 80 feet, a two-stage pedestrian crossing with median refuge island should be considered where a warranted pedestrian signal will control the proposed crossing. A two-stage pedestrian crossing may have a lesser impact to vehicle delay (compared to a single crossing) since the signal serves each direction independently while the median serves as a refuge area for pedestrians to wait prior to completing their crossing.

- At locations where pedestrian compliance is of concern, feedback devices may be installed with the pedestrian signal button to provide pedestrians with confirmation of the call.

(b) Pedestrian Hybrid Beacon (aka HAWK)

- A possible alternative to the traffic signal is the Pedestrian Hybrid Beacon. ***Chapter 4F of the MUTCD*** provides volume guidance (this guidance is treated as warrants in Florida) on the use of Pedestrian Hybrid Beacons where pedestrian volumes do not meet the pedestrian warrants for a traffic signal under ***Section 4C.05 of the MUTCD***. This device is not intended for use at intersections or driveways, as ***MUTCD*** recommends maintaining a distance of 100 feet from side streets or driveways controlled by stop or yield signs. An example of the pedestrian hybrid beacon treatment is shown in ***Figure 3.8-3***.

- For six-lane roadways or crossing distances exceeding 80 feet, a two-stage pedestrian crossing with a median refuge island should be considered where a warranted pedestrian hybrid beacon will control the proposed marked crossing. A two-stage pedestrian crossing may have a lesser impact to vehicle delay (compared to a single crossing) since the beacon serves each direction independently while the median island serves as a refuge area for pedestrians to wait prior to completing their crossing.

- In an urban corridor, a location featuring a coordinated signal system and meeting the PHB warrants, a PHB installation could be upgraded to a pedestrian traffic signal. In such cases, consideration should be given to cycle length, signal spacing, and available gaps to reduce pedestrian delay and promote signal compliance.

Figure 3.8-3. Pedestrian Hybrid Beacons

(c) For locations where signal warrants are met, consideration may be given to providing a pedestrian bridge or tunnel in lieu of an at-grade marked crossing.

(3) Pedestrian-Actuated Warning Treatments (Not Requiring Warrant Analysis)

For locations where pedestrian traffic signals or PHBs are not warranted, alternative pedestrian- actuated warning devices presented in this section may be considered to provide additional emphasis of the marked crosswalk and the presence of pedestrians.
Additional treatments, not included in this section, may also be appropriate depending upon the individual site characteristics.

Each of the treatments presented in this section must be pedestrian actuated using approved detectors. This must include a pedestrian pushbutton with the option of adding a passive pedestrian detector to enhance the activation of the ped phase within the traffic control device cycle.

(a) Rectangular Rapid Flashing Beacons (RRFB)

- FHWA issued ***Interim Approval 21, Rectangular Rapid-Flashing Beacons at Crosswalks (IA-21)*** on March 20, 2018 which specifies the intended use and design requirements for RRFB devices. FDOT has received FHWA approval to install RRFBs on the State Highway System. Local agencies must receive FHWA approval to install RRFBs on their local roads.

- The rectangular beacons are provided in pairs below the PEDESTRIAN CROSSING warning sign (***W11-2***) and operate in a flash pattern in accordance with ***IA-21*** upon activation by the pedestrian. When used, the beacons must be pedestrian activated, using approved detectors (such as pushbuttons or passive detection devices) that meet ADA requirements for accessibility. An example of the rectangular rapid flashing beacon treatment is shown in ***Figure 3.8-4***. Detailed conditions of use, including sign/beacon assembly, dimensions and placement, and flashing rates are provided in ***IA-21***.

- ***Department's Standard Plans, Index No. 654-001*** provides design details for the installation of post mounted RRFBs.

- Use of RRFBs should be limited to roadways with four or fewer through lanes.

- Any new RRFB on a multilane undivided roadway should be installed overhead unless design constraints or engineering documentation preclude overhead installation. Overhead RRFBs improve visibility for approaching drivers and are consistent with the installation of overhead school zone warning signs on multilane roadways. Consideration should be given to installing advanced warning signs with RRFBs on multilane approaches, especially those with higher traffic volumes and speeds.

- When overhead RRFBs are used, they should be combined with ground mounted devices. Overhead RRFBs should feature an internally illuminated pedestrian crossing sign which is continuously lit at night.

Figure 3.8-4. Rectangular Rapid Flashing Beacons

(b) Flashing Yellow Warning Sign Beacons

- The use of flashing yellow warning beacons may provide additional emphasis of the crossing location by supplementing the appropriate marked crossing warning or regulatory signs where pedestrian signals are not warranted. These devices are still allowable in the ***MUTCD***, although newer devices such as RRFBs have increased in popularity. When used, beacons shall meet the requirements of ***Chapter 4L of the MUTCD***. Any flashing yellow warning beacons installed at a new crosswalk at an uncontrolled location must use pedestrian actuation, as to elicit a more effective response from motorists than continuously flashing beacons.

- Beacons may be configured either overhead or side mounted; however, the preferred configuration is a side, post-mounting to avoid drivers confusing the beacons for a flashing traffic signal.

- When post mounted, a configuration of two vertically aligned warning beacons is recommended. These beacons should be operated in an alternating flash pattern.

- When beacons are overhead mounted, an internally illuminated pedestrian crossing sign should be used in conjunction with the beacons. This sign should be continuously lit at night.

(c) In-Roadway Warning Lights

- ***Section 4N.02 of the MUTCD, In-Roadway Warning Lights at Crosswalks*** establishes federal standards by which lighted (illuminated) pedestrian crosswalk edge lines can be installed and operated. Additional guidance and support are provided in ***Section 4N.02 of the MUTCD*** which may be used for the installation and operation of lighted in-roadway pedestrian crosswalks. These additional provisions may be reviewed and considered on a lighted pedestrian walkway.

- In-roadway warning lights shall not be used where YIELD or STOP signs, or traffic signals are present.

- In-roadway warning lights may be installed in conjunction with overhead or LED roadside highlighted signs or Flashing Yellow Beacons as long as the flashing rates are identical and flash in unison. Engineering judgment should be exercised.

(4) Additional Treatment Options for Midblock and Uncontrolled Intersections

(a) STOP HERE FOR PEDESTRIANS sign ***(R1-5 series)***

- To provide additional emphasis of the requirement to stop for pedestrians in the marked crosswalk, a stop line and associated STOP HERE FOR PEDESTRIANS sign ***(R1-5 series)*** may be used. The R1-5 sign is not to be used in combination with the pedestrian traffic signal or the Pedestrian Hybrid Beacon.

- If used, the stop line should be placed 40 feet in advance of the marked crosswalk. See the ***FDOT Design Manual (FDM), Chapter 230 Signing and Pavement Marking***. Where a stop line is used, parking should be prohibited in the area between the stop line and the marked crosswalk. Use a solid lane line between the stop line and crosswalk.

- If a stop line is provided, the corresponding STOP HERE FOR PEDESTRIANS (R1-5 series) sign shall be provided. ***The FDOT Design Manual (FDM), Chapter 230 Signing and Pavement Marking*** illustrates the placement of these signs. ***Section 2B.11 of the MUTCD*** provides additional guidance on the placement of the R1-5 series sign.

- An ADVANCE PEDESTRIAN CROSSING warning sign ***(W11-2)*** with supplemental AHEAD plaque shall be used in combination with the R1-5 series sign. ***The FDOT Design Manual (FDM), Chapter 230 Signing and Pavement Marking*** shall be used for mounting locations of advance W11-2 signs as related to approach speeds.

(b) IN-STREET PEDESTRIAN CROSSING sign ***(R1-6 or R1-6a)***

- IN-STREET PEDESTRIAN CROSSING sign ***(R1-6 or R1-6a)*** may be used on low speed roadways to remind road users of laws regarding right-of-way at an unsignalized pedestrian crosswalk. An IN-STREET PEDESTRIAN CROSSING sign should not be placed in advance of a marked crosswalk to educate road users about the State law prior to reaching the marked crosswalk, nor should it be installed as an educational display along the highway that is not near any crosswalk. Additional information is provided in ***Section 2B.12 of the MUTCD***.

- If used, the IN-STREET PEDESTRIAN CROSSING signs shall be placed in the roadway at the marked crosswalk location on the center line, on a lane line, or on a median island. The IN-STREET PEDESTRIAN CROSSING sign shall not be post-mounted on the left-hand or right-hand side of the roadway.

(c) Other treatments

To improve visibility, support pedestrian travel and increase awareness the following treatments can be incorporated for pedestrian crossings. Further information on design criteria of these treatments can be found in the ***FDOT Design Manual (FDM), Chapter 222 Pedestrian Facility***.

- Pedestrian Refuge Islands or raised median
- Curb extensions
- Raised crosswalks
- Speed reduction treatments (See ***FDOT Design Manual (FDM), Chapter 202 Speed Management***)
- Overhead lighting (See ***FDOT Design Manual (FDM), Chapter 231 Lighting***)

Section 3.9

COUNTDOWN PEDESTRIAN SIGNAL APPLICATIONS

This section was rescinded on 11/1/17.

Section 3.10

FLASHING YELLOW ARROW SIGNAL APPLICATION

3.10.1 PURPOSE

To establish criteria for the installation and operation of left and right turn flashing yellow arrow (FYA) signals. Also, to provide guidelines and best practices for installation of FYA signals at new and existing intersections consistent with ***Section 4D.20 of the MUTCD***.

3.10.2 BACKGROUND

(1) For many years, some engineers have had concerns that drivers turning left on a permissive circular green signal indication might inadvertently mistake that indication as implying the left turn has the right of way over opposing traffic, especially under some geometric conditions.

(2) To date, research studies and guidelines have only been conducted for left turning FYA treatments. However, the use of right turn FYA treatments is permissible in accordance with the MUTCD and this section. Further guidance for right turn FYA treatments will be included upon research findings, implementation, and case studies.

(3) In 2003, National Cooperative Highway Research Program (NCHRP) completed research for the “Evaluation of Traffic Signal Displays for Protected/Permissive Left-Turn Control” and published the ***NCHRP Report 493***. The key findings of the research are as follows:

(a) The FYA was found to be a good overall alternative to the circular green as the permissive signal display for a left-turn movement.

(b) The FYA was found to have a high level of understanding and correct response by left-turn drivers, and a lower fail-critical rate than the circular green.

(c) The FYA display in a separate signal face for the left-turn movement offers more versatility in field application. It is capable of being operated in any of the various modes of left-turn operation by time of day, and is easily programmed to avoid the "yellow trap" associated with some permissive turns at the end of the circular green display.

(4) The FHWA crash modification factor (CMF) Clearinghouse is reporting a CMF of 0.857 for installation of left turn flashing yellow arrow signals and supplemental traffic signs.

3.10.3 OPERATIONAL REQUIREMENTS

In accordance with ***Section 4D.20 of the MUTCD***, the following design and operational requirements shall apply when a separate left-turn signal face is being operated in a protected/permissive left-turn mode and a flashing left-turn yellow arrow signal indication is provided.

(1) Mode(s) of Left-Turn Operation:

(a) The flashing YELLOW ARROW signal indication may be displayed to indicate a permissive left-turn movement in either a protected/permissive mode or a permissive only mode of operation.

(b) Varying the left-turn mode of operation from the permissive only and/or the protected/permissive and/or the protected only left-turns during different periods of the day is allowed when:

- The Critical Gap is calculated to be 7 seconds at minimum during non-peak hours. Refer to ***Section 8.3, Vehicular Critical Gap of the Manual on Uniform Traffic Studies***.
- The Left-turn volume routinely is less than 240 vehicles per hour on average or the product of opposing through and left-turn hourly volumes is less than 50,000 (one opposing through lane), or 100,000 (two opposing through lanes).
- There are no fatalities and less than three left turn crashes per year that are attributed to permissive left turning movements.

(2) **Signal Face Arrangement**: At least one separate four-section signal face, in addition to the minimum of two signal faces for other traffic on the approach, shall be provided for the left-turn movement. The separate left-turn signal face shall be capable of displaying, from top to bottom (or left to right in a horizontally-aligned face), the following set of signal indications: Steady left-turn RED ARROW, steady left-turn YELLOW ARROW, flashing left-turn YELLOW ARROW, and steady left-turn GREEN ARROW.

(3) **Signal Face Location**: Within an exclusive left-turn lane that has a left-turn signal face mounted over the roadway, that left-turn signal face should be centered over the left-turn lane or the extension thereof. If centering of the overhead left-turn signal face is not practical, it shall not be positioned any further to the right than the lane line (or the extension of the lane line) between the left-

turn lane and the adjacent through lane, nor shall it be positioned any further to the left than the left edge of the left-turn lane (or extension thereof.)

(4) Signal Displays: Signal head displays shall meet the following requirements:

(a) Must be capable of displaying the following signal indications: steady left-turn RED ARROW, steady left-turn YELLOW ARROW, flashing left-turn YELLOW ARROW, and left-turn GREEN ARROW. Only one of the four indications shall be displayed at any given time.

(b) During the protected left-turn movement, a left-turn GREEN ARROW signal indication shall be displayed.

(c) A steady left-turn YELLOW ARROW signal indication shall be displayed following the left-turn GREEN ARROW signal indication.

(d) During the permissive left-turn movement, a flashing left-turn YELLOW ARROW signal indication shall be displayed.

(e) A steady left-turn YELLOW ARROW signal indication shall be displayed following the flashing left-turn YELLOW ARROW signal indication if the permissive left-turn movement is being terminated and the separate left-turn signal face will subsequently display a steady left-turn RED ARROW indication. The flashing left-turn YELLOW ARROW signal indication (i.e. permissive phase) may be omitted when the pedestrian phase is activated. This is a strategy to address either a documented conflict or history of left turn vehicles not yielding to pedestrians.

(f) A flashing left-turn YELLOW ARROW signal indication shall be permitted to display for a permissive left-turn movement while the signal faces for the adjacent through movement display steady CIRCULAR RED signal indications and the opposing left-turn signal faces display left-turn GREEN ARROW signal indications for a protected left-turn movement.

(g) Before the FYA begins, provide a start-up delay (2 seconds) for all opposing through movements to establish position in the intersection.

(h) When changing phase from permissive left-turn movement to a protected left-turn movement, a left-turn GREEN ARROW signal indication shall be displayed immediately upon the termination of the flashing left-turn YELLOW ARROW signal indication. A steady left-turn YELLOW ARROW signal indication shall not be displayed between the display of the flashing left-turn YELLOW signal indication and the display of the steady left-turn GREEN ARROW signal indication. See ***Section 3.10.4*** for further guidance.

(i) The display shall be a four-section signal face except that a three-section signal face containing a dual-arrow signal section shall be permitted where signal head height limitations (or lateral positioning limitations for a horizontally-mounted signal face) will not permit the use of a four-section signal face. The dual-arrow signal section, where used, shall display a GREEN ARROW for the protected left-turn movement and a flashing YELLOW ARROW for the permissive left-turn movement. Prior to the use of three section signal face, where space limits a four-section signal face, concurrence and approval from the District Traffic Operations Engineer will be required.

(j) During steady mode (stop-and-go) operation, the signal section that displays the steady left-turn YELLOW ARROW signal indication during change intervals shall not be used to display the flashing left-turn YELLOW ARROW signal indication for permissive left turns.

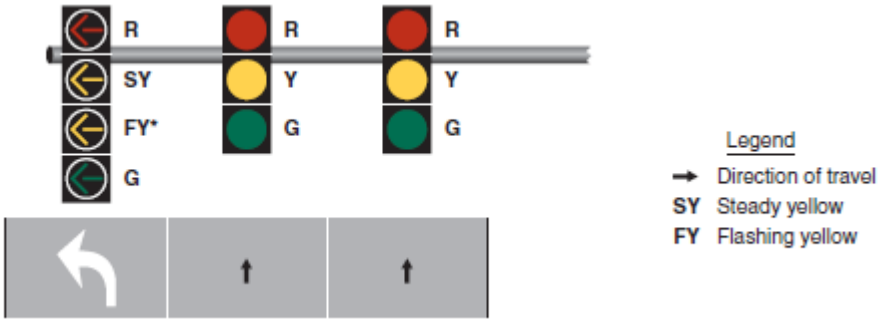
(k) During flashing mode operation (see ***Section 4D.30 of the MUTCD***), the display of a flashing left-turn YELLOW ARROW signal indication shall be only from the signal section that displays a steady left-turn YELLOW ARROW signal indication during steady mode (stop-and-go) operation.

(5) **Yellow Trap**: FYA can be used to reduce the risk of a left turn yellow trap condition. Signal timing sequence must allow the permissive left-turn phase (FYA) to continue until the opposing traffic's through phase terminates, even if the adjacent through phase has already terminated. When implementing FYA designers and engineers should review all potential sequencing combinations, including when phases are skipped due to lack of demand and special patterns such as preemption, to determine if a yellow trap situation could occur. If there is a possibility of a yellow trap, modifications to sequencing and controller programming parameters should be incorporated into design as necessary to eliminate the yellow trap. Primary responsibility lies with the design engineer to include adequate information in design plans for others who may be establishing sequences and controller programming.

(6) The Four-Section Signal Protected-Permissive Left Turn Mode (***Figure 3.10-1***), is illustrated in ***Figure 4D-12 of the MUTCD***.

Figure 3.10-1. Four-Section Signal Protected-Permissive Left Turn Mode

A – Typical Position



B – Typical Arrangements

* Shall not be displayed when operating in the protected only mode

3.10.4 INSTALLATION GUIDE

(1) The FYA is an option for permissive/protected left turn phasing. However, as with protected/permissive operation in general, careful consideration is needed when deciding where to install the FYA.

(2) Prior to implementing FYA at signalized intersections, it is recommended that the Districts obtain concurrence from the Local Agencies and provide them with information on where the FYA(s) are being proposed.

(3) The following guidelines are provided to ensure statewide consistency during the installation of the FYA:

(a) Four-section FYA signal displays for new signal installations and candidate retrofit locations that meet the criteria below should be considered and prioritized based on the following:

- Corridors where changing to lead/lag rather than lead/lead left-turn phasing would improve progression.

- Locations where left-turn demand is low during off-peak periods and variable modes of left-turn phasing will improve safety and operations.

- Locations where crash patterns involve left-turning vehicles and could be attributed to driver misunderstanding of shared signal indications.

- Locations with frequent railroad or emergency vehicle preemption activations which result in higher risk of a left-turn trap condition.

- Locations undergoing signal upgrades.

(b) For new and retrofit FYA installation, the signal display for the left-turn movement should be centered over the corresponding exclusive left-turn lane.

(c) For locations with a high 65 years and older population or intersections located in a ***Safe Mobility for Life Coalition Priority County***, careful and comprehensive intersection operations and crash history evaluation shall be conducted prior to implementation.

(d) It is optional use of the supplemental LEFT TURN YIELD ON FLASHING YELLOW ARROW sign during the initial implementation of FYA across the state to educate motorists on FYA operations.

The ability to install the supplemental LEFT TURN YIELD ON FLASHING YELLOW ARROW sign depends on whether the structural loading capacity meets the minimum requirements to withstand the wind loading under the Department's established design event. Please see Section 3.10.4 (f) for further guidance on loading.

(e) FYA use for permissive-only, protected/permissive, permissive/prohibited phasing should consider time-of-day applications.

(f) Phasing out the existing 5-section head by adding a separate 4-section FYA indication for the left-turn lane and 3-section indication for the inside through-lane. The Department will follow the ***Traffic Operations Bulletin 01-12, Adding Signal Heads and/or Backplates to Existing Traffic Signals*** to address reduced wind load requirements to facilitate the installation of the FYA signals in the most expedient manner.

3.10.5 INSTALLATION CRITERIA

(1) Typically, isolated locations or sections of corridors with signalized intersections that have the following characteristics may be considered for installation of protected/permissive left turn operation FYA:

(a) Opposing left turn paths do not conflict.

(b) Existing intersection geometry and traffic operations characteristics facilitate the installation of the FYA including:

- Left turn crossing distance.
- Available sight distance must be greater than required site distance based on approach speeds and left turn lane offset conditions.
- Use when the approach has only one left turn bay.
- Use when there are two opposing through lanes. Three opposing through lanes may be considered on a case-by-case basis.

(c) There is already an existing protective/permissive operation in place and less than three left turn related collisions per year recorded over a three-year period susceptible to correction by protected-only phasing.

(d) Use the FYA when the left-turn volume is less than 240 vehicles per hour on average or the product of opposing through and left-turn hourly volumes is less than 50,000 (one opposing through lane), or 100,000 (two opposing through lanes).

(e) Signal coordination plans indicate operational improvement with the installation of FYA permissive-protected operation based on volume criteria and crash pattern during peak periods.

(2) While it is desirable to be consistent in the application of left turn treatment along a corridor for driver expectation, it may not be practical to install FYA left turn protected/permissive mode in a consistent manner along a corridor. For example, FYA left turn operation requires a separate left turn signal face. Signalized intersections along a corridor equipped with shared signal faces that would require installation of new signal poles with longer mast-arms may be cost prohibitive to convert to FYA left turn operation.

(3) There are existing implementations of FYA that have resulted in a mix of FYA and 5-section green ball protected/permissive operation. However, it would be appropriate to install the FYA at a new signalized intersection meeting the criteria for protected/permissive left turn mode operation on the corridor without

immediately modifying the other existing intersections along the corridor. Preferably, the intersection should not be within view of other intersections with the 5-section green ball.

(4) Consider using a FYA protected/permissive mode at a location that previously operated in protected mode only after careful study of the intersection. Do not remove protected-only left turn phasing if opposing sight distance is inadequate for permissive left turns, operating speed is too great, roadway geometry is complicated or there are too many opposing through lanes. For more information on sight distance refer to the ***Department's Design Manual - 212 Intersections***.

3.10.6 VARIABLE MODE OF OPERATION

(1) Variable mode operation, changing between protected only to protected/permissive mode, or between protected/permissive to permissive only operation by time of day is possible with the 4-section FYA signal face where an engineering study shows this type of operation will improve safety and operations. However, it is important to ensure that the traffic signal controller is capable of switching between modes in a manner such that the flashing yellow arrow indication and the opposing through movement indication terminate together.

(2) When switching between protected/permissive to permissive only, ensure that the controller is capable of reassigning the left turn detectors to call the associated through phases by time of day.

3.10.7 PUBLIC NOTIFICATION

Installation of a FYA left turn operation should be coordinated with the District Public Information Office. Consider providing press releases with specific details on when the public can expect to see the new indications. Press releases should be prepared and sent out (approximately two weeks or more in advance of conversion).

3.10.8 EDUCATION

(1) The Department has developed a FYA tip card (Figure 3.10-2) to inform and educate the public about this new traffic control device. The tip card was developed using human factors studies to help the public simply understand what to do when encountering a FYA on the roadway system. This FYA tip card can be used by the District staff for public outreach where these traffic control devices will be installed. To obtain electronic and/or print copies of the current version of the Flashing Yellow Arrow tip card, visit ***SafeMobilityFL.com***.

(2) Location-specific education with Portable Changeable Message Signs (PCMS). This should be done for a short duration prior to implementation and a longer

duration after implementation (ex. 1 week/6 weeks) to display the following alternating messages:

(a) Phase 1: NEW SIGNAL DISPLAY

(b) Phase 2: YIELD ON FLASHING ARROW

Figure 3.10-2. Flashing Yellow Arrow Tip Card

3.10.9 SIGNAL RETROFIT CHECKLIST

Before FYA signal is set up in the field, the following checklist can be used to examine the existing hardware conditions at the intersections. Full awareness of the existing hardware conditions can facilitate a smooth implementation of FYA PPLT.

(1) Check replacement head size/mounting. Sometimes, installation of four-section vertical signal head (to replace five-section doghouse) may need to raise wire spans.

(2) Check if the number of available cables is sufficient to enable FYA signals. A common installation of PPLT phasing using a green ball for the permissive interval makes use of the green through phase to illuminate the green ball. Due to the flashing indication, additional cabling may be necessary in order for the flashing display to be controlled by its own circuit.

(3) Check if the mast arm is long enough to center the FYA signal head over the exclusive left-turn lane.

(4) Check status of signal equipment. Before implementing FYA signals, the equipment to be used should be checked, e.g., a malfunctioned load switch or a bad load switch socket may lead to problems during the implementation of FYA.

(5) Confirm with signal equipment manufacturers about the applicability and programming method of the controller and management malfunction unit (MMU). Most leading signal equipment manufacturers have developed new models of controllers and MMUs that support FYA signal operations. Controllers must have the correct firmware to enable FYA operations.

(6) Check if cabinet modification is required. Controller manufacturers have not standardized on FYA operation. Cabinet modification will depend on controller make and model. An MMU capable of FYA operation is required. Install a new MMU recommended by the controller manufacturer. A modification to the cabinet flash programming is required. Contact the manufacturer representative.

(7) The MUTCD does not include a standard sign for FYA installation since it considers that FYA display is intuitively obvious in meaning to drivers and that an explanatory sign was unnecessary. However, the Department has designed a 36 x 30 inch white background and black lettering LEFT TURN SIGNAL – YIELD ON FLASHING ARROW (***FTP-85-13***) sign as shown in ***Figure 3.10-3***. The specific sign detail is shown in the ***Department's Standard Plans, Index 700-102*** and can be installed adjacent to the new head for additional clarification. If the FYA face is to be installed at an existing location with a 5-section face, verify the sign can be installed and ensure any conflicting signs such as the LEFT TURN YIELD ON GREEN (R10-12) sign is removed if in place.

Figure 3.10-3. Flashing Yellow Arrow Sign

Section 3.11

LEADING PEDESTRIAN INTERVAL SIGNAL APPLICATION

3.11.1 PURPOSE

To establish criteria for implementing leading pedestrian interval (LPI) signal applications at new and existing signalized intersections.

3.11.2 BACKGROUND

(1) LPI is a low-cost countermeasure for pedestrian and vehicular traffic control at signalized intersections. LPI is also known as “pedestrian head start” or “delayed vehicle green” that gives pedestrians an advance “Walk” signal indication before a concurrent green signal is provided to vehicles. This will allow pedestrians to establish a presence in the crosswalk, thereby increasing the visibility of pedestrians to drivers and potentially reducing conflicts with turning vehicles.

(2) LPI has been recommended as a countermeasure to reduce pedestrian–vehicle crashes at signalized intersections. Research has shown a 59% reduction in pedestrian–vehicle crashes at treated intersections.

3.11.3 LPI IMPLEMENTATION

(1) LPI signal applications shall comply with ***Section 4E.06 of the MUTCD***.

(2) The following criteria shall be used for LPI signal applications on the State Highway System:

(a) LPI signal application is allowed in the following FDOT Context Classifications, in accordance with ***FDOT Design Manual (FDM), Chapter 200, Context Classifications, Table 200.4.1*** without the need for a traffic engineering study:

- C4- General Urban
- C5- Urban Center
- C6- Urban Core

(b) An engineering study shall be required for LPI signal application in the following FDOT Context Classifications:

- C1- Natural
- C2- Rural
- C2T- Rural Town
- C3R – Suburban Residential
- C3C – Suburban Commercial

(3) When required, the engineering study shall include the following conditions:

(a) Failure to Yield Study: A vehicular yielding compliance condition is intended for applications at an approach to a signalized intersection where vehicular compliance yielding-to-pedestrian is the principal reason to consider LPI.

(4) LPI timing should allow pedestrians to clear the width of one lane in the direction of moving traffic, including the width of a parking and/or bicycle lane, to increase the visibility of pedestrians to turning traffic. A minimum of 3-second LPI duration is required by the ***MUTCD***. The ***Formula 3.11.3-1*** may be used to design LPI duration:

Formula 3.11.3-1

LPI= ML/W

Where:

LPI = number of seconds (rounded value) between onset of "Walk" signal for pedestrians and green indication for vehicles

ML = distance on crosswalk to clear width of one through lane from the edge of curb, in feet. (Should consider distance for large corner radius as per ***Section 4E.06.22 of the MUTCD***)

W = walking speed (3.5 ft/s for pedestrian clearance calculation suggested by the ***MUTCD***, or 3.0 ft/s)

3.11.4 CONSIDERATIONS

(1) An electronic blank-out "NO TURN ON RED" sign should be considered to enhance LPI implementation.

(2) Extended LPI should be considered at approaches with large portions of users with slower crossing speeds (children, older adults, persons with physical disabilities), or at approaches where the pedestrian detector location is not immediately adjacent to the curb (or, if no pedestrian detector is present, a location 6-feet from the face of the curb or from the edge of the pavement may be considered for calculating extended LPI).

(3) The use of an Accessible Pedestrian Signal (APS) (***Sections 4E.09–4E.13 of the MUTCD***) should be considered if an LPI is used, as vision-impaired pedestrians use the sound of moving traffic to start crossing.

(4) Education about LPI operation should be considered—for example, using a different background color (other than white) for a pushbutton sign plate with a short message such as “Ped Head Start” for crosswalks with the LPI feature.

(5) Conducting field observations and safety improvement evaluations after LPI implementation should be considered, and potential further adjustments in signal timing and coordination could be applied based on engineering judgment.

(6) Lengthy traffic signal cycles should be avoided to reduce pedestrian wait time and increase pedestrian compliance behavior with pedestrian signals.

Chapter 4

MARKINGS

Section 4.1

CROSSWALKS IN HEAVY PEDESTRIAN CONCENTRATION AREAS

4.1.1 GENERAL

Heavy pedestrian generators such as beaches or hotels may create a need for channeling pedestrians across a State Highway at locations other than intersections.

To help ensure the use of marked crosswalks in heavy pedestrian concentration areas, special consideration should be given to their location relative to construction or proximity of sidewalks, paths, guardrails, retaining walls, or shrubbery as a means for controlling existing pedestrian crossing movements within a defined path.

4.1.2 MARKINGS

(1) A marked crosswalk shall consist of 2 parallel white lines 1-foot wide. Lines should be placed not less than 6 feet apart and located to provide the least amount of walk time, whenever practical (see the ***Department's Standard Plans Index Nos. 522-002 and 711-001***).

(2) For added visibility, special emphasis markings may be used as shown in the ***Department's Standard Plans, Index No. 711-001***.

4.1.3 SIGNING

(1) A PEDESTRIAN CROSSING (***W11-2***) sign, along with an arrow panel ***(W16-7p)*** shall be installed immediately adjacent to each marked pedestrian crossing location. This installation can be either ground-mounted or overhead on the mast arm or span wire.

(2) A PEDESTRIAN CROSSING (***W11-2***) sign along with an AHEAD ***(W16-9P)*** supplemental panel shall be installed in advance of a series of marked crosswalks and may be installed in advance of each crosswalk location within a heavy pedestrian concentration area.

(3) The need for advance crossing signs shall be based on engineering judgment considering relative spacing of crosswalks, roadside development, and other factors. The ***Department's Standard Plans, Index No. 711-001*** shall be used for mounting locations as related to approach speeds.

(4) An END PEDESTRIAN CROSSING sign may be installed to notify motorists that the pedestrian zone has ended. The sign should be 3 x 8 feet with 8-inch letters if mounted overhead. The size of a ground-mounted sign shall be 24 x 30 inches. Sign format shall be similar to that used for the END SCHOOL ZONE (***FTP-32-04 or FTP-34-04***) sign as shown in the ***Department's Speed Zoning Manual***. The sign should be installed approximately 200 to 300 feet beyond the last marked crosswalk.

Section 4.2

PAVEMENT WORD, SYMBOL, AND ARROW MARKINGS

4.2.1 GENERAL

(1) Pavement word, symbol, and arrows markings ***(Figure 4.2-1*** through ***Figure 4.2-2*** may be used to supplement existing highway signing and/or to provide additional emphasis for regulatory, warning, or guidance messages as determined by engineering judgment.

Figure 4.2-1. Pavement Word Markings

(2) The minimum requirements for word, symbol, and arrow markings are provided in ***Section 3B.20 of the MUTCD.*** Additional requirements are provided in the Department's Speed Zoning Manual***,*** the FDOT Standard Plans, Index No. 711-001 and Index No. 711-002. Design of elongated shields are contained in ***FDOT Standard Plans, Index 711-001.***

(3) Pavement word, symbol, and arrow markings shall not be used as a substitute for vertical sign installation unless overhead signing is impractical or impossible to install, such as when imposing on navigable airspace.

(4) To recommend non-standard word or symbol pavement markings, an engineering study indicating how the application can be expected to optimize operations efficiency and/or safety is required to be forwarded through the District Traffic Operations Engineer to the State Traffic Operations Engineer in support of a FHWA Request for Experiment. If the request is accepted and approved by the FHWA, the District Traffic Operations office recommending the design will be responsible for submission of the required interim and final reports to Central Office for review and submission to the FHWA.

Figure 4.2-2. Pavement Symbol and Arrow Markings

4.2.2 LANE USE ARROW AND "ONLY" PAVEMENT MARKINGS ON INTERSECTION APPROACHES

(1) Lane-use arrow symbols should not be routinely applied in through lanes at intersections except with overhead lane-use control signs. However, where unusual geometrics or alignment of through lanes may result in driver confusion, a straight arrow symbol may be used to provide additional guidance for drivers in the through lanes.

(2) The word "ONLY" is not required if the arrow symbol for an exclusive turn lane is used under the following conditions:

(a) Lane is developed at a mid-block location.

(b) Lane is clearly delineated by appropriate channelization.

(c) Lane requires lateral vehicle movement from an established lane for proper positioning to execute the turn.

(3) However, the word "ONLY" shall be used with the arrow symbol where unusual geometrics or alignment of an exclusive turn lane may result in driver confusion or misunderstanding.

(4) Where an established through lane becomes an exclusive turn lane, the word "ONLY" shall be used with the arrow symbol indicating the allowed turning movement.

(5) Whenever the word “ONLY” is used with an arrow symbol, these markings shall be accompanied by the appropriate signs as specified in ***Sections 2B-18, 2B-19 2B-20***, and ***3B-20 of the MUTCD***.

(6) Design and placement details for pavement arrows and the ONLY message are found in the ***FDOT Standard Plans, Index No. 711-001***.

4.2.3 ROUTE SHIELD PAVEMENT MARKINGS

(1) Route Shield Pavement Markings (Figure 4.2-3) shall be justified for use due to cost. Public feedback about a specific location should be considered. Route shield pavement markings are justified for each of the following conditions:

(a) Increased crash history where high traffic volumes worsen complex lane assignments such as lane drops, double lane exits with optional lanes, gores where crash cushions are hit frequently, and unusual geometries.

(b) Underutilization of the optional lane or excess lane where changing maneuvers could cause congestion in an area not expected from volume/capacity analyses.

(c) Complicated lane assignments and alignment shifts.

(d) Where an overhead sign structure is not practical and the turn-lane from an arterial to the on-ramp of a limited access facility may appear to provide access to establishments in the vicinity.

Figure 4.2-3. Route Shield Pavement Markings

(2) Route shield pavement markings are to be installed for optimum visibility.

(a) Place after at least one overhead guide sign for interchange.

(b) Place far enough upstream of the decision point to allow motorist to safely change lanes.

(c) Do not install under or immediately adjacent to overpasses as they can cast shadows on the shields. Note that placement on downhill slopes may reduce their effectiveness.

(d) Place no more than two sets of markings (shield, with arrow or message) before the gore or decision point.

(e) Install them within 1 mile in advance, taking into consideration existing signs and other traffic control devices.

(3) Route shield pavement markings shall be installed as follows:

(a) All Route shields shall be pre-formed thermoplastic.

(b) All Route shield pavement markings shall be 15 feet in length.

(c) US Route shields shall have contrast for both asphalt and concrete pavement.

(d) Align the symbol in the center of the lane.

(e) Install the route shields in a single line across the roadway. Do not stagger.

(f) Arrows or messages (TO, LEFT, RIGHT, NORTH, SOUTH), may be used to supplement route shields and shall follow the route shield.

(g) Use an 80-foot gap between markings. However, cardinal directions (if used) may be 40 foot from a route shield marking.

Figure 4.2-4. Cardinal Direction Markings

4.2.4 ROUTE SHIELDS FOR WRONG WAY TREATMENT

(1) Route Shield Pavement Markings provide proper guidance to motorists on arterials adjoining limited access facilities. ***Figure 4.2-5*** and ***Figure 4.2-6*** show the plan view of the E Bearss Avenue interchange with Interstate-275 in Tampa. ***Figure 4.2-6*** shows the left turn arrow marking in the westbound dual left turn lanes east of the off-ramp intersection. These figures illustrate the possible existing typical treatments and, if present, will need modifications as noted in this section. Such treatments shall not be used on future projects.

Figure 4.2-5. Plan View of an I-275 Interchange

Figure 4.2-6. Dual Left Turn Lanes with Left Turn Arrows

(2) At interchanges with a break in the arterial left turn lane(s) serving a ramp, the pavement markings preceding the break shall include the interstate shield, cardinal direction, and straight arrow. An example is shown in ***Figure 4.2-7***.

Figure 4.2-7. Pavement Markings for Wrong Way Treatment

(3) There shall be one combination of the interstate shield, cardinal direction and straight arrow per lane and preceding the break in the turn lane which then serves the entry ramp.

(4) The lane designation at all newly designed interchanges shall follow this scheme.

Section 4.3

USE OF BLUE RAISED PAVEMENT MARKERS TO IDENTIFY FIRE HYDRANTS

Section rescinded. Requirements can now be found in ***FDOT Standard Plans Index 706-001, Sheet 6.***

Section 4.4

ROUNDABOUT MARKINGS

The Department's standards for this section are shown in ***Chapter 3C of the MUTCD***.

Section 4.5

EXPRESS LANES MARKINGS

4.5.1 PURPOSE

Express lanes markings shall conform to the ***Department's Design Manual*** and to the ***MUTCD***. This section is intended only as a supplement to these documents to provide guidance on pavement markings for express lanes markings.

4.5.2 DEFINITIONS

Buffer Area. The pavement space between the express lane(s) and general use or general toll lanes that is designated by a pattern of standard longitudinal pavement markings that are wider than a normal or wide line marking.

Slip Ramp Access Type. Provides connections between the express lanes and general use or general toll lanes using breaks in the separation type and are typically facilitated by an exclusive lane.

Toll Gantry. Truss structure supporting toll equipment over the roadway.

Tolling Area. Section of roadway underneath the toll gantry.

Weave Lane Access Type. Provides interim access to express lanes using a break in the separation type that has an additional lane to accommodate weaving movements. Weaving and speed changes required for merging between the general use or general toll lanes and the express lanes occurs in a separate weave lane.

Weave Zone Access Type. Provides interim access to express lanes using a break in the separation type allowing for simultaneous ingress and egress.

4.5.3 THE WORDS 'EXPRESS' and 'ONLY' PAVEMENT MARKINGS IN EXPRESS LANES

(1) The words 'EXPRESS' and 'ONLY' shall be placed in advance of express lanes access points and co-located with overhead advance guide signs under the following condition:

(a) When the general use or general toll lane transitions directly into an express lane.

(b) When the general use or general toll lane directly connects from a surface street (see ***Figure 2G-26 of the MUTCD***).

(2) The word 'EXPRESS' shall be placed at the immediate point of entry under the following conditions:

(a) When the slip ramp transitions directly into the express lanes.

(b) When the slip ramp from the general use lanes or general toll lanes merges directly into the express lanes.

(3) The word 'ONLY' shall NOT be used under the following conditions:

(a) Weave zone access type.

(b) Weave lane access type.

(c) At any point beyond the entry gore where there is no legal option to exit or enter the express lanes.

4.5.4 CHEVRONS AND MARKERS IN BUFFER AREA

Chevrons crosshatch markings in buffer areas (***Figure 4.5-1***) with express lanes markers shall be installed as follows:

(1) Buffer widths of 2' shall not have chevrons.

(2) Buffer widths 2' to 12':

(a) For slip ramp access type, add 18" white chevrons spaced at 100' within the slip ramp transition.

(b) For weave lane access type, add 18" white chevrons spaced at 100' within the weave lane transition.

(c) For weave zone access type, add 18" white chevrons spaced at 100' for 1000' on both sides of the weave area.

(d) Buffer widths greater than 12' shall have 18" white chevrons spaced at 100'.

4.5.5 SPECIAL PAVEMENT MARKINGS WITHIN THE TOLLING AREA

(1) When there is more than one express lane, a solid 8" white stripe shall separate the lanes for 300' prior to the toll gantry and 50' past the toll gantry as shown in ***Figure 4.5-2***.

(2) Express Lanes Marker Placement Within the Tolling Area:

(a) Buffer widths between 8’ and 12’ shall have two (2) express lane markers evenly spaced transversely.

(b) Buffer widths 12’ and greater shall have three (3) express lane markers evenly spaced transversely.

(c) Express lane markers or raised pavement markings shall not be installed on top of the loop or lead-in saw cut or sealant.

Figure 4.5-1. Buffer Area Detail

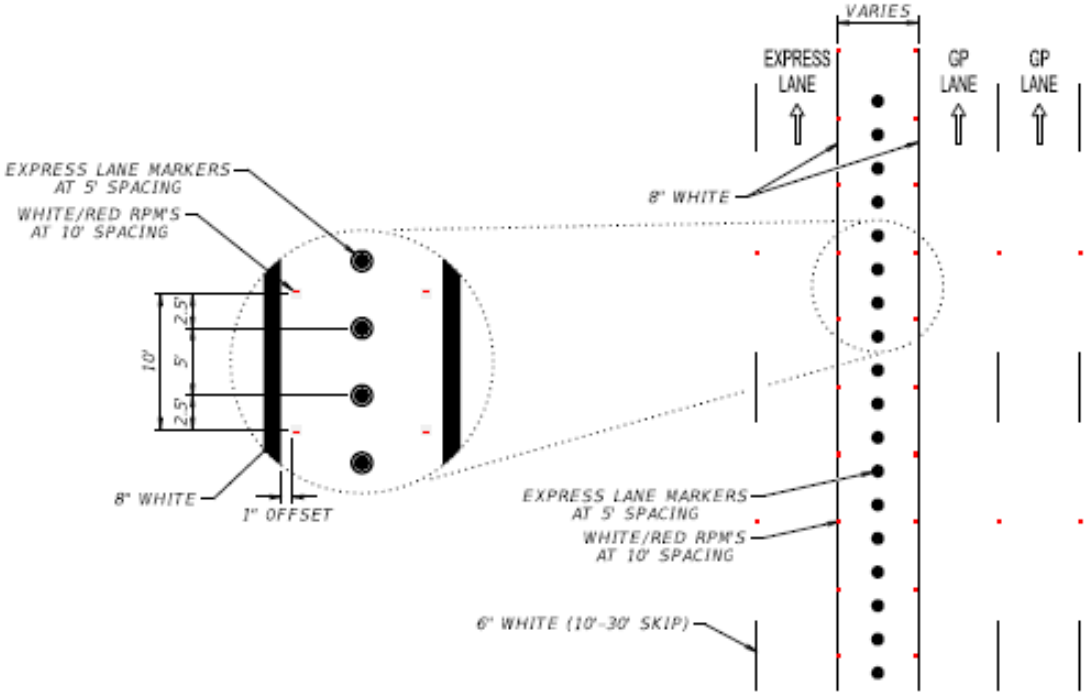
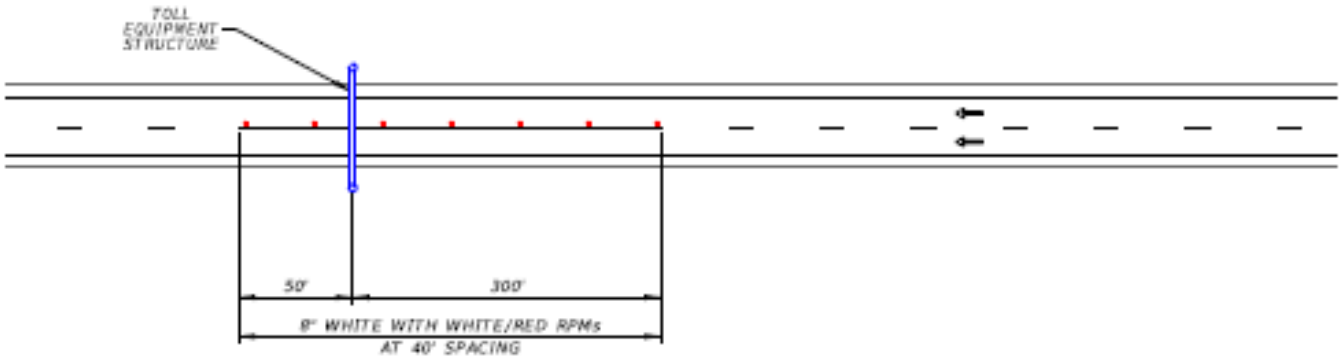


Figure 4.5-2. Striping Under Toll Gantry



Mainline Toll Pavement Marking
N.T.S.

Section 4.6

USE OF INTERNALLY ILLUMINATED RAISED PAVEMENT MARKERS

4.6.1 PURPOSE

To provide guidance for the uniform application of Internally Illuminated Raised Pavement Markers (IIRPMs) on the State Highway System.

4.6.2 DEFINITIONS

Raised pavement markers are traffic control devices used as a positioning guide to supplement longitudinal pavement markings for enhanced nighttime and wet weather visibility. IIRPMs are permitted for use by ***Chapter 3B of the MUTCD*** as an equivalent alternative to Retroreflective Raised Pavement Markers (RRPMs). IIRPMs are steady-burn internally illuminated raised pavement markers installed in the roadway surface.

4.6.3 APPLICATION

RRPMs are the Department's standard type of raised pavement marker. The use of IIRPMs should be limited to mitigation strategies for curves with any of the following:

- Substandard horizontal alignment or super-elevation
- Substandard lane widths
- Substandard shoulder widths

4.6.4 PROCEDURE

(1) For supplementing or substituting longitudinal line markings, IIRPM spacing must comply with ***Sections 3B.12 through 3B.14 of the MUTCD***.

(2) For all IIRPM applications on the State Highway System, a signed and sealed Traffic Engineering and Safety Study must be conducted to justify the use. District Traffic Operations Engineers will coordinate with the District Maintenance Engineer to consult the location of these installations.

Chapter 5

SPECIALIZED OPERATIONAL TOPICS

Section 5.1

GOLF CART CROSSING AND OPERATION ON THE STATE HIGHWAY SYSTEM

5.1.1 PURPOSE

The purpose of this section is to establish criteria and guidelines for safe operation of golf carts on authorized portions of the State Highway System.

5.1.2 GENERAL

(1) The Department has developed this section in response to a growing public interest in using golf carts. Golf carts are increasingly used to make short trips for shopping, social and recreational purposes from nearby residential neighborhoods such as planned unit communities with golf courses. These passenger-carrying vehicles, although low-speed, offer a variety of advantages, including comparatively low-cost and energy-efficient mobility.

(2) Golf cart use and operation on public roads is authorized only under certain circumstances as provided in ***Section 316.212, F.S.*** The intent of this section is to provide criteria and guidelines for authorizing golf cart crossings at designated locations along State Highway System and promote uniformity within the State. This section also provides safety recommendations to counties and municipalities wishing to enact ordinances authorizing the use of golf carts on sidewalks adjacent to or on the State Highway System within their corresponding jurisdictions.

5.1.3 DEFINITIONS

(1) Golf Cart: A motor vehicle designed and manufactured for operation on a golf course for sporting or recreational purposes and that attain speeds of less than 20 miles per hour.

(2) Grade Separated Crossing: A tunnel or overpass designed and constructed for the purpose of crossing a street or highway.

(3) Local Government: A City or County as defined in ***Section 11.45 (e), F.S.***

(4) State Roadway: Any roadway of the State Highway System under jurisdiction of the State except limited access facilities.

5.1.4 PROCEDURE

(1) Any golf cart crossing proposed for a location on the State Highway System shall be reviewed and approved by the appropriate District Traffic Operations Engineer prior to installation. The Department's preferred design for golf cart crossing of any state road shall be via grade separated facility.

(2) A request from a local government shall be submitted to the appropriate District Traffic Operations Engineer. Non governmental entities wishing to obtain authorization for a golf cart crossings shall do so through the local government with jurisdictional authority.

(3) If the District Traffic Operations Engineer's review of available information supports the installation of a golf cart crossing based upon the criteria outlined in Section 5.1.5, then a full engineering study prepared by a State of Florida licensed engineer representing the requester may be conducted.

(4) The criteria referenced in ***Section 5.1.5***, as documented in an engineering study, shall be met as a condition for approval of a golf cart crossing. The engineering study shall also contain the following information:

(a) Document the need for a golf cart crossing based on conditions set forth in ***Section 316.212, F.S.***, i.e., verify the following:

- The intersecting county or municipal road has been designated for use by golf carts.
- A golf course or single mobile home park is constructed on both sides of a state road.

(b) Document all safety considerations with respect to intersecting sight distances, proximity to intersection and driveway conflict areas, number and configuration of approach lanes to signalized intersections and roadway speed and volume thresholds as described in ***Section 5.1.***5 that can be satisfied at the proposed location.

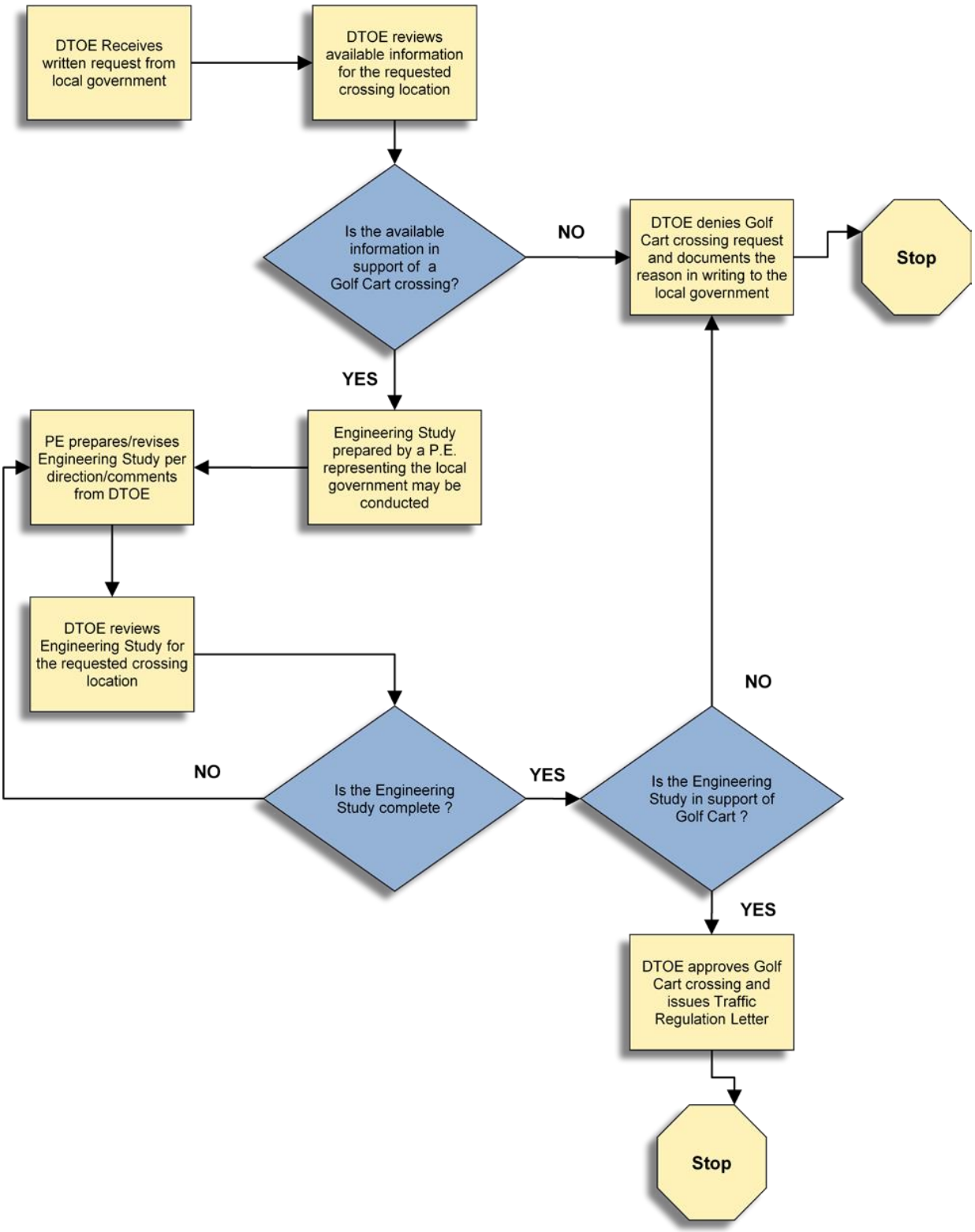
(c) Document the proposed golf cart crossing and/or roadway segment location (Roadway ID and Mile Post) and corresponding signing, marking, and signal treatments (if applicable). A schematic layout should be provided over aerial photography or survey to show locations of signs, markings, and other treatments in proximity to existing traffic control devices.

(d) Document all crash history within the vicinity of the proposed golf cart crossing based upon a minimum three years of data.

(5) If the evaluation results in a decision not to authorize the installation of a golf cart crossing, the District Traffic Operations Engineer shall document the reasons and advise the local government of the findings. Meeting the minimum criteria outlined in this section does not guarantee approval of a request for a golf cart crossing.

(6) Prior to the approval of a golf cart crossing, coordination is necessary between the appropriate District Traffic Operations Office, District Maintenance Office and local governments to determine any permitting requirements or responsibilities for maintenance.

Figure 5.1-1. Procedure Flowchart

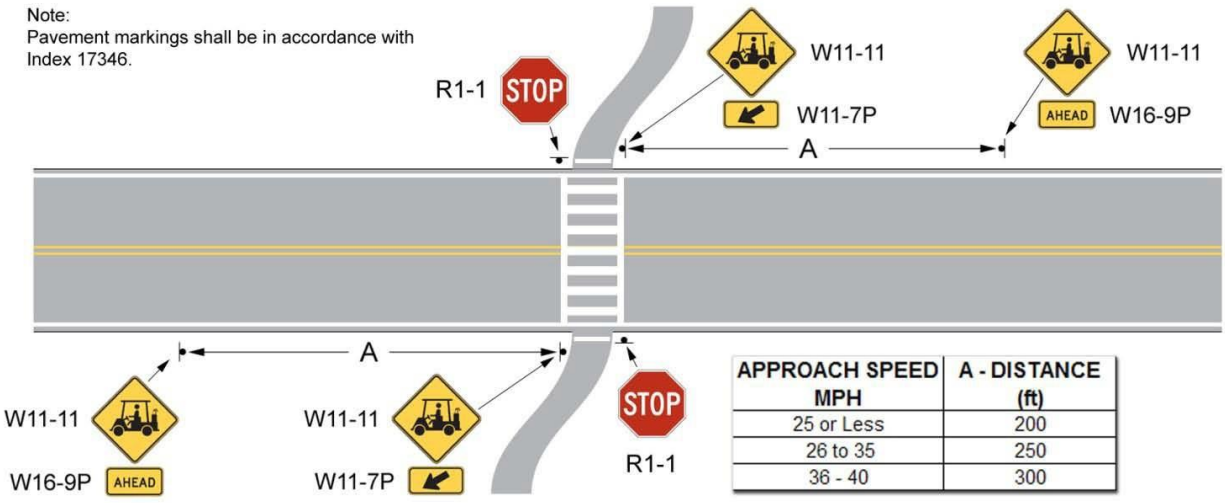


5.1.5 CRITERIA FOR APPROVAL OF CROSSING

(1) Mid-Block Crossing: To be considered for a golf cart crossing at a mid-block location along any state road where a golf course or a single mobile home park is constructed or located on both sides of the roadway, the proposed location and roadway characteristics shall meet the following criteria:

- **(a)** Maximum vehicular volume of 15,000 Average Daily Traffic (ADT) or less along the roadway segment.
- **(b)** Maximum Posted Speed Limit of 40 miles per hour or less.
- **(c)** Maximum number of lanes is three (3) with or without bike lanes.
- **(d)** Maximum allowable median width is 15 feet or less.
- **(e)** Minimum distance to the nearest driveway, access point or pedestrian crosswalk is 350 feet in each direction.
- **(f)** Crossing along roadway tangents only with the nearest point of curvature at least 350 feet in each direction.
- **(g)** A clear and unobstructed view of the roadside on the approach to the crossing.
- **(h)** Mid-block crossing signing and pavement markings should be installed as shown in ***Figure 5.1-2***.
- **(i)** Golf carts are the only vehicle permitted to use the designated crossing or to traverse State right-of-way. Other vehicles such as Low Speed Vehicles are strictly prohibited. See 320.01(42) F.S.

Figure 5.1-2. Mid-Block Crossing



APPROACH SPEED MPH	A - DISTANCE (ft)
25 or Less	200
26 to 35	250
36 - 40	300

(2) Side Street Stop Controlled Intersections: To be considered for a golf cart crossing at a roadway intersection with side street stop control, the location along any state road shall meet the following criteria:

(a) Side street maximum vehicular volume 1,200 ADT and AM/PM Peak Hour not to exceed 110 vehicles per hour single direction.

(b) Main street posted speed limit or 85th percentile intersection approach speed is 35 miles per hour or less.

(c) Maximum crossing distance for undivided roadways shall be equal to three (3) lanes or less not including any right turn lanes, bike lanes and crosswalks. For divided roadways of four (4) lanes or less, a minimum of twenty two (22) feet median width is required. See ***Figure 5.1-4***.

(d) Side street approaches should have an exclusive left turn lane and a shared through-right turn lane. Other lane approach configurations will be considered on case-by-case basis.

(e) Side street intersection alignment shall be a 90 degrees (not more than 105 degrees) angle to the mainline tangent. Skewed or offset intersections are not recommended for golf cart crossings.

(f) Approach stop signs and pavement markings shall be in accordance with ***MUTCD*** and ***Department's Standard Plans, Index No.711-001***.

(g) Golf Cart signs (W11-11) should be placed on the mainline approach as shown in ***Figure 5.1-3*** and ***Figure 5.1-4***.

Figure 5.1-3. Stop-Controlled Crossing

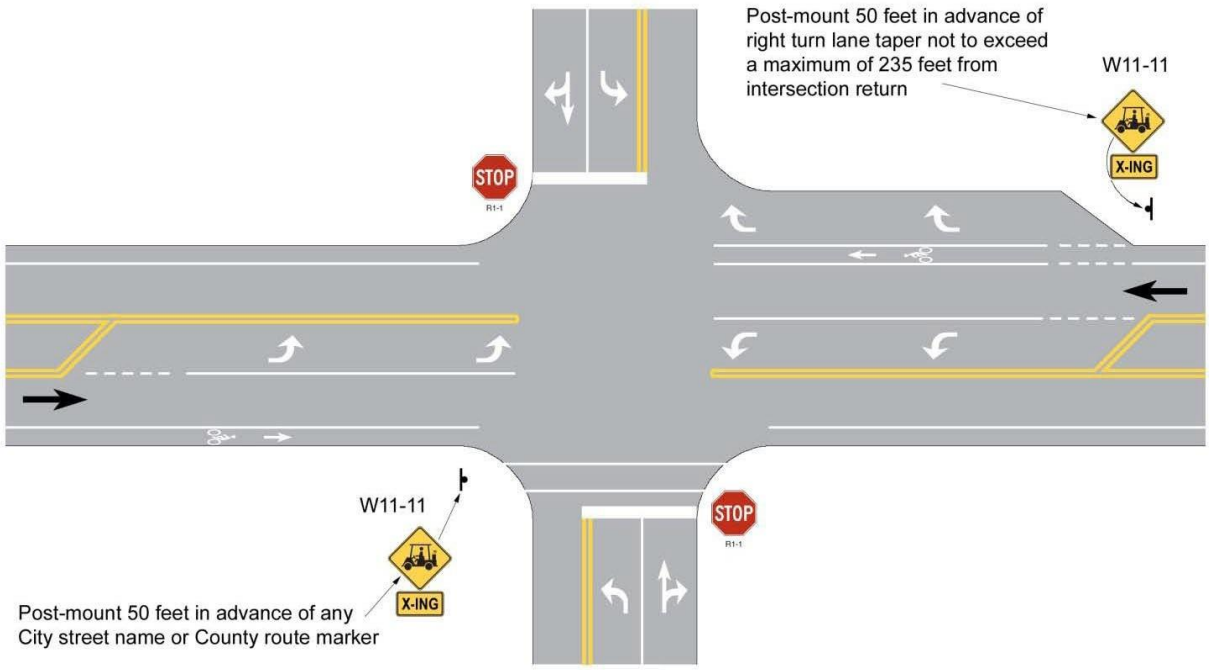
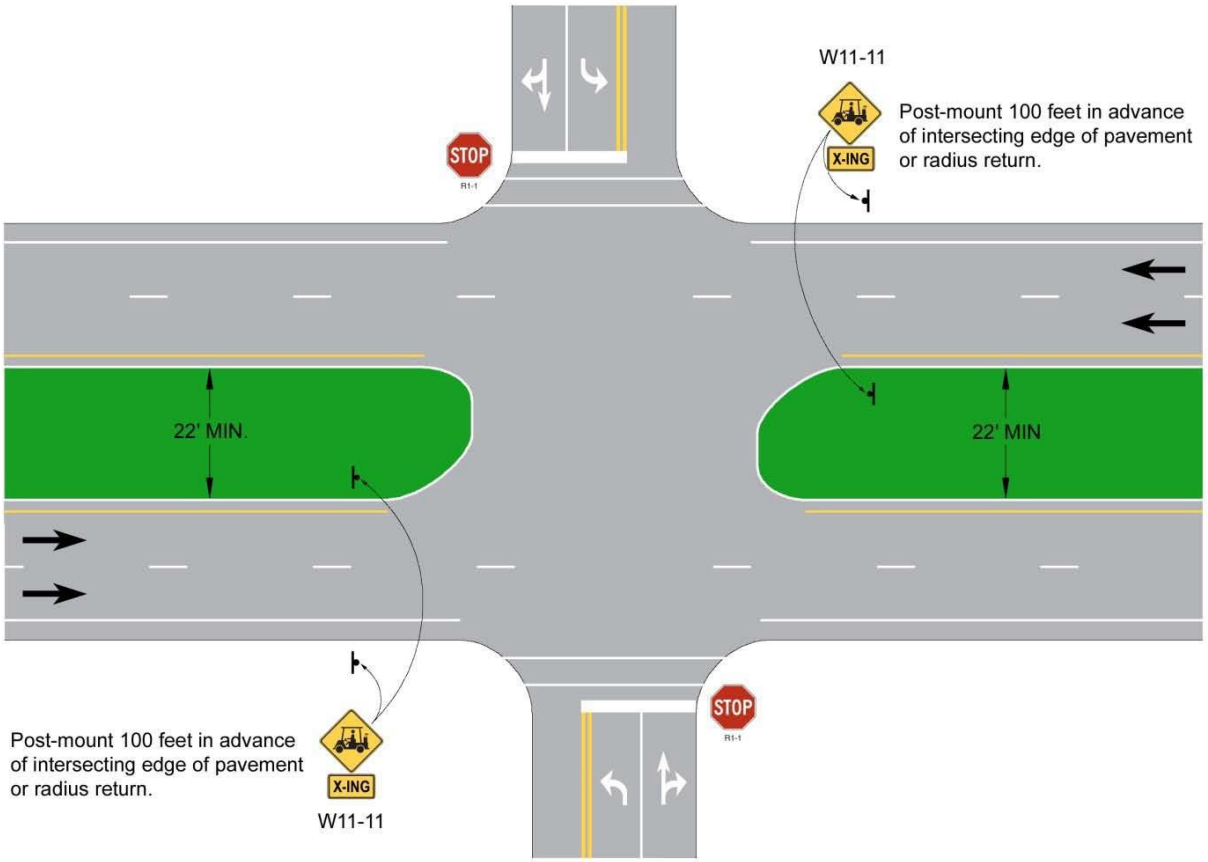


Figure 5.1-4. Four-Lane Stop-Controlled Crossing



(3) Full Signalized Intersections: To be considered for a golf cart crossing at a roadway intersection with full signal control, the location along any state road shall meet the following criteria:

(a) Side street maximum vehicular volume 1,500 ADT and AM/PM Peak Hour not to exceed 200 vehicles per hour single direction.

(b) Side street posted speed limit or 85th percentile intersection approach speed is 35 miles per hour or less.

(c) Maximum crossing distance equal to five (5) lanes or less not including any right turn lanes, bike lanes and crosswalks.

(d) Side street approaches should have at least one (1) exclusive left turn lane and at least one (1) exclusive through or shared through-right turn lane. Other lane approach configurations will be considered on case-by-case basis.

(e) Side street intersection alignment shall be a 90 degrees (not more than 105 degrees) angle to the mainline tangent.

Skewed or offset intersections are not recommended for golf cart crossings.

(f) Golf carts shall not use pedestrian crosswalks or sidewalk ramps for the purpose of crossing the mainline state road.

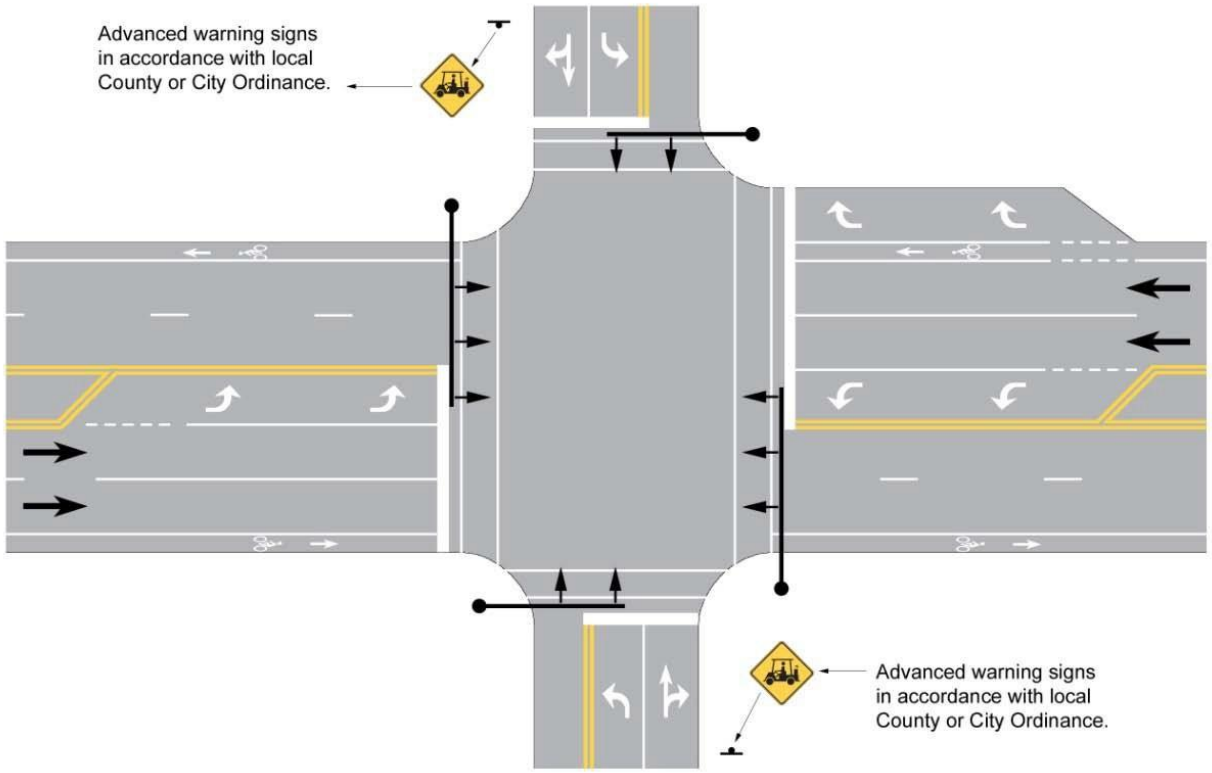
(g) Golf cart crossings are not permitted at "T" intersections.

(h) For existing signalized "T" intersections, a proposed forth leg approach and receiving lane for the exclusive use of golf cart crossing shall not be permitted.

(i) Approach traffic control signs and pavement markings shall be in accordance to ***MUTCD*** and ***Department's Standard Plans, Index No. 711-001***.

(j) Golf Cart signs (**W11-11**) should be placed on the side street approach as shown in ***Figure 5.1-5***.

Figure 5.1-5. Traffic Signal Controlled Crossing



5.1.6 OPERATION OF GOLF CARTS ON SIDEWALKS

(1) Under ***Title 23 of United States Code, Section 217***, existing and proposed non-motorized trails and pedestrian walkways using Federal transportation funds do not permit motorized use including golf cars or golf carts. However, the legislation

authorizes exceptions and the Federal Highway Administration (FHWA) has developed framework for an exception process.

(2) Safety and Operational Recommendations: The following recommendations for the operation of golf carts on pedestrian sidewalks adjacent to a state road should be considered when authorizing such use by local government ordinance:

(a) Access to State maintained sidewalks should be from county or city maintained sidewalks adjacent to side streets intersecting with a state road. In-street golf cart operation onto State operated sidewalks via ADA curb ramps is not permitted.

(b) Crossing a state road from county or city maintained streets or sidewalks to access State operated adjacent sidewalks is not recommended. If a local government submits a request for golf cart crossing and seeks consultation for golf cart operation on a State operated sidewalk at the same location, the golf cart crossing will not be allowed.

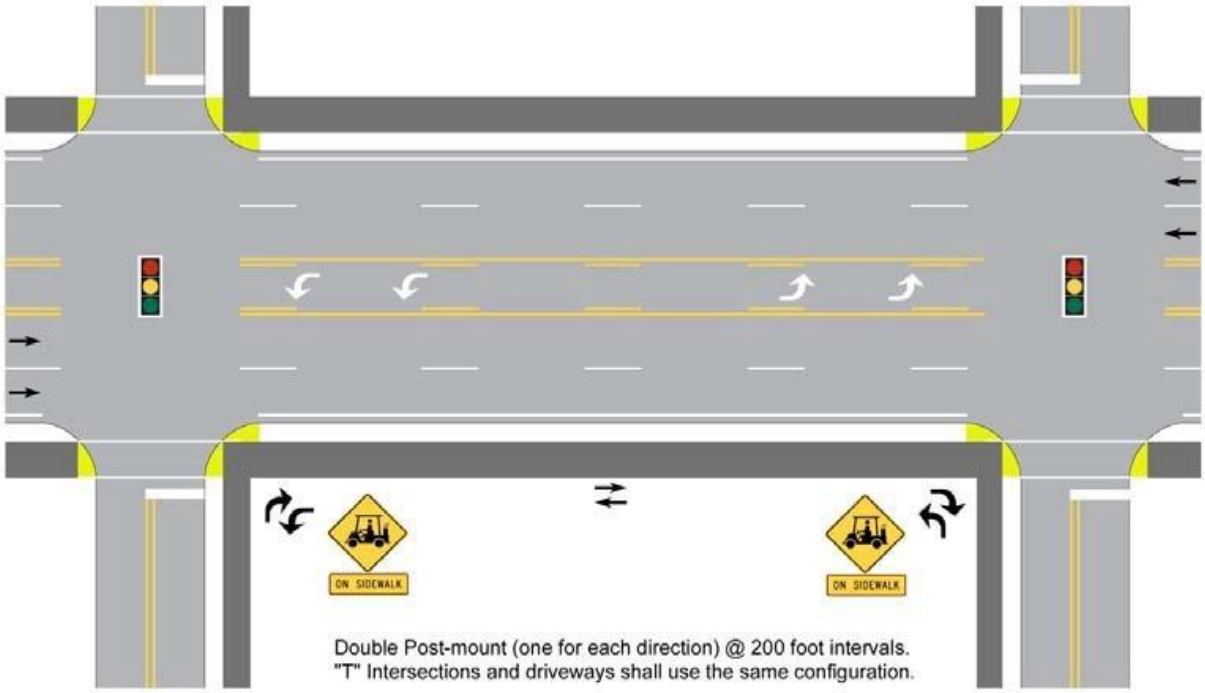
(c) A minimum un-obstructed sidewalk width of 8 feet is required and separated from back of curb or edge of shoulder by at least 5 feet is recommended.

(d) A minimum width of 4 foot grassed or stabilized, relatively flat area should be provided beyond the outside edge of sidewalks for recovery or stalled golf carts. Sidewalks with existing adjacent drainage features or fencing should not be considered.

(e) Golf cart operation on State operated sidewalks should terminate at a connecting county or city maintained sidewalk.

(f) State approved, Golf Cart On Sidewalk signs should be installed along State operated sidewalks as shown in ***Figure 5.1-6***.

Figure 5.1-6. Golf Cart Operation on Sidewalks



APPENDICES

HISTORY

Entire Manual	**FDOT Traffic Engineering Manual (TEM)**
11/17	Changed name of Department's Design Standards to Department's Standard Plans and updated associated references.
11/17	Updated reference to Transportation Statistics Office to reflect name change to Transportation Data and Analytics Office.
11/16	Updated hyperlinks to reflect change in office section name from Operations to Traffic Services.
01/12	Mandatory changes to incorporate adoption of MUTCD 2009.
12/06	Pen and Ink changes (updated references and/or links).
Chapter 1	**Traffic Engineering Manual Adoption Procedure**
10/11	Added Section 5 (Traffic Engineering Variations) and Section 6 (Traffic Engineering Variation Process)
03/09	Pen and ink changes.
04/05	Changed office name. Removed rule reference for Section 2.16.
08/03	Changed website address.
03/03	Changed rule incorporation reference to 14-15.015. Updated website address.
03/02	Changed website address. Also created links to references and changed office name to Traffic Operations.
10/01	Approved to have TEM available electronically on the internet/infonet only.
Chapter 2	**Signs**
11/16	Simplified language.
Section 2.1	**Use of Slippery When Wet Signs**
03/02	Updated references to Millennium MUTCD and included links to all references.
10/99	Section 2.1.2(3), 2nd paragraph. Added, "These signs should be placed in accordance with MUTCD Table II-1 using a 10 mph deceleration factor."

06/91 Former FDOT Topic Number 750-010-018 incorporated into TEM.

Section 2.2 Overhead Street Name Signs

06/09 Clarified sign design requirements for internally illuminated overhead signs versus standard static panel signs.

04/07 Removed references to Advance Street Name Signs (new Section 2.37). Standardized sign sizes for overhead street name signs on State Highway System.

03/02 Updated references to Millennium MUTCD and included links to all references.

05/00 Section 2.2.4(1) and (2) changed to conform with letter height requirements shown in Table 6.3-1 in the Elder Roadway User Program Section of the TEM.

Section 2.3 Signs and Markings at Non-Signalized Intersections of Divided Highways and Crossroads

03/02 All references in this document are now in the 2002 edition of the Design Standards.

07/00 This section updated to include the mandatory implementation plan for Divided Highways and Crossroads issued by the State Highway Engineer.

06/91 Former FDOT Topic Number 750-010-035 incorporated into TEM.

Section 2.4 Symbol Signs on the State Highway System

03/02 Updated references to Millennium MUTCD and included links to all references.

06/91 Former FDOT Topic Number 750-010-026 incorporated into TEM.

Section 2.5 Destination Distance Signs at Rural Interstate and Freeway Exit Ramp Terminals

06/91 Former FDOT Topic Number 750-010-024 incorporated into TEM.

Section 2.6 Bridge Signs and Markings

11/18 Added clarification that placement of W12-2 sign should be at the Stopping Sight Distance

06/18 Added new subsection 2.6.5 Guide Signs on Overpasses

11/12 Mandatory changes to incorporate maximum vehicle height according to Section 316.515, F.S.

04/02 Updated references to Millennium MUTCD and included links to all references. We also standardized lettering size for the cross road signs on overpasses.

07/93 Cross Road Name Signs on Overpasses, added that signs can be installed if requested by law enforcement or emergency rescue organizations.

06/91 Former FDOT Topic Number 750-010-034 incorporated into TEM.

Section 2.7 Place Name Signs on the State Highway System

04/05 Rescinded. Now Part IV of Rule 14-51, F.A.C., Florida's Highway Guide Sign Program.

05/02 Minor editorial changes to make current.

05/00 Editorial comments. Section 2.7.6(2) revised to add that place name signs located off state right-of-way must conform to statute.

06/91 Former FDOT Topic Number 750-010-036 incorporated into TEM.

Section 2.8 Move Accident Vehicles from Travel Lanes Signs

06/04 Updated sign references to the 2004 Design Standards. Added optional graphic panel to limited access sign.

05/02 Updated references to Millennium MUTCD and included links to all references.

06/91 Incorporated into TEM.

Section 2.9 No Passing Zone Signs

07/12 Mandatory changes to incorporate MUTCD references.

05/02 Created a link to the W14-3 sign in the new federal Standard Highway Signs.

06/91 Incorporated into TEM.

Section 2.10 Vending Machine Signs

06/04 Added sign details.

06/91 Incorporated into TEM.

Section 2.11 Guidelines for Bicycle Warning Signs

05/19 Eliminated references to the “Share the Road” sign and updated the section to include references to the “Bicycle May Use Full Lane” sign.

09/02 Updated references to the Millennium MUTCD and the 2002 Standard Highway Signs Manual.

07/00 Editorial comments. Added Section 2.11.4 to include sign design and instructions for Bicycle Sharing Road Sign. Change initiated due to Revision 5 of the MUTCD.

06/91 Incorporated into TEM.

Section 2.12 Recycling Collection Center Signs

09/04 Updated sign references to the 2004 Design Standards.

09/02 Updated sign references to the 2002 Design Standards.

06/91 Incorporated into TEM.

Section 2.13 Signing for Safety Belt Use and Child Restraint Laws

11/04 Updated sign references to the 2004 Design Standards and Sign Library.

01/03 Updated sign references to the 2002 Design Standards. Updated references to Millennium MUTCD.

07/00 Editorial Comments. Added sign details for all signs. Section 2.13.6 changed to add new design for Standard Safety Belt Sign.

03/93 Former FDOT Topic Number 750-010-014 incorporated into TEM.

Section 2.14 Signing for Evacuation Routes

06/18 Section renamed to **Signing for Emergency Management**.

06/18 Section updated to reflect most current practices.

11/16 Section rewritten to simplify language.

11/16 Corrected sign numbers.

11/16 Removed Department of Community Affairs, which has been dissolved into Florida Division of Emergency Management.

11/16 Added the word inch to clarify measurement.

11/16 Corrected phone number.

08/01 Changes were made to incorporate the process for signing for one-way operations and also radio frequency information signs during an evacuation. Also, the "hurricane" reference was removed from the title and throughout the document as this section is applicable to all types of evacuations.

09/99 Changes were made based on new direction of regional evacuation and sheltering plan. The Department's Emergency Coordination Office initiated changes.

08/93 Former Topic Number 750-020-006 incorporated into TEM.

Section 2.15 Smoke on Highway Signs

11/18 Section updated to reflect modified smoke management agreement

03/02 Changes necessary following the Highway Safety Smoke Management Interagency Agreement. Included sign details for Temporary and Prescribed Burn Signs and requirements for the installation and removal of these signs. Also included links to all references.

04/96 Incorporated into TEM.

Section 2.16 Signing for Supplemental Guide Signs and Motorist Services on Limited and Non-Limited Access Highways

04/05 Rescinded. Now Rule 14-51, F.A.C., Florida's Highway Guide Sign Program.

09/99 Formatting changes and converted back to English.

Section 2.17 Emergency Highway Traffic Plan

04/09 Rescinded. Now covered under Topic No. 500-000-104, Emergency Management Program.

06/93 Incorporated into TEM.

Section 2.18 *FHP Highway Assistance Program

11/04 Updated sign references to the 2004 Design Standards and Sign Library.

01/03 Changed sign detail references to their FTP number in the Design Standards.

04/96 Incorporated into TEM.

Section 2.20 Call Box/Mile Marker Signs

04/14 Rescinded. Call boxes removed from State Highway System.

09/04 Updated sign references to the 2004 Design Standards and Sign Library.

03/99 Section 2.20.2(1) and (2) increased measurement for installation. Also added sign design to include tenth of a mile measurement.

07/97 Incorporated into TEM.

Section 2.21 Florida Litter Law Signs

06/04 Updated sign references to 2004 Design Standards. Minor revisions recommended by Signing Team.

07/97 Incorporated into TEM.

Section 2.22 Traffic Control for Toll Collection Facilities

04/09 Rescinded. Now included in Turnpike’s Plans Preparation and Practices Handbook.

07/98 Former FDOT Topic Number 750-010-010 incorporated into TEM.

Section 2.23 Florida's Turnpike and Toll Road Numbering and Signing Program

11/01 Changes made were initiated by Management to include the use of the local road name or logo (to be provided by the local expressway authority) on the toll facility along with our Toll Route Marker. Updated references to Millennium MUTCD and the sign detail for the Toll Route Marker.

04/01 Section 2.23.4(3), last sentence. Allowed possibility of local road names to be used in a guide sign or directional sign. Change initiated by management.

07/98 Incorporated into the TEM.

Section 2.24 Placement of Crime Watch Signs on the State Highway System

05/04 Pen and Ink changes.

07/98 Former FDOT Instructional Memo Number 750-005 incorporated into TEM.

Section 2.25 Distance Signing for Non-Limited Access Highways

09/99 Incorporated into TEM. Implements Action Plan 006 from our Evaluation of International Signing Practices Study (1994).

Section 2.26 Advance Guide Signs on Limited Access Highways

09/99 Incorporated into TEM. Implements Action Plan 007 of our Evaluation of International Signing Practices Study (1994).

Section 2.27 Commuter Assistance Signs

09/99 Incorporated into TEM. Developed from discussions with Public Transportation Office.

Section 2.28 Reference Location Signs (Mile-Markers)

09/14 Criteria established for both limited and non-limited access roadways.

04/00 Incorporated into TEM. Recommended by DTOE's during statewide meeting.

Section 2.29 Use of Fluorescent Yellow-Green Sign Sheeting

11/18 Section rescinded and the language is now included in the FDOT Standard Specifications for Road and Bridge Construction Section 700.

07/00 Incorporated into TEM. Developed to establish guidelines for the use of this innovative sheeting that was approved by the FHWA.

Section 2.30 Signing for One-Stop Career Centers

08/04 Updated sign references to 2004 Design Standards.

07/00 Incorporated into TEM. Developed from sign request in District Four.

Section 2.31 Unique Transportation Symbol Signs

08/02 Incorporated into TEM.

Section 2.32 511 Telephone Service Sign

06/04 Incorporated new FTP references.

06/02 Incorporated into TEM.

Section 2.33 Signing for Nature-based Tourism and Heritage Tourism Trails

09/02 Incorporated into TEM.

Section 2.34 Signing for Florida Scenic Highways Program and the National Scenic Byways Program

10/04 Incorporated into TEM.

Section 2.35 Signing for Memorial Roadway Designations

07/06 Web address for Sign Library changed.

10/04 Incorporated into TEM.

Section 2.36 Wayfinding Signs

04/07 Incorporated into TEM.

Section 2.37 Advance Street Name Signs

11/16 Added clarification that conditions are recommended and not mandatory.

11/16 Added language addressing lengthy street name legends and limited right-of-way.

11/16 Added language for font size.

06/09 In order to provide consistency with the MUTCD, incorporated standards for advance street name signs not only for signalized intersections but non-signalized and the use of advance street name sign plaques for advance warning and intersection control signs.

04/07 Incorporated into TEM.

Section 2.38 Use of Temporary Stop Signs at Non-Functioning Signalized Intersections

06/18 Section renamed to **Use of Generators and Portable Stop Signs at Non-Functioning Signalized Intersections**

06/18 Section updated to reflect most current practices.

01/16 Editorial change to apply to any emergency event.

05/07 Incorporated into TEM.

Section 2.39 Warning, Stop, and Yield Sign Sizes

10/07 Pen and ink changes made to table for consistency with final research report.

08/07 Incorporated into TEM.

Section 2.40 Displaying Messages on Dynamic Message Signs Permanently Mounted on the State Highway System

11/17 Section modified.

08/15 New approved messages added.

08/08 Incorporated into TEM.

Section 2.41 Guidelines for Use of Retroreflective Strips

10/15 Incorporated into TEM.

Section 2.42 Express Lanes Signing

05/19 Modified 2.42.4 paragraph (1) to allow more flexibility with the signing order.

06/18 Incorporated into TEM.

Section 2.43 Ramp Only Signal Panel

10/19 Incorporated into TEM.

Chapter 3 Signals

Section 3.1 Signalized Intersections Flashing Mode Operation and Flashing Beacons

12/09 Changes made consistent with MUTCD 2003.

10/93 Page III-1 removed provision that accident patterns need to be monitored at flashing yellow/red locations. Page III-2 removed option for flashing signal operations in relation to closing times.

06/91 Former FDOT Topic Number 750-010-023 incorporated into TEM.

Section 3.2 Guidelines for Left Turn Treatment

12/09 Changes made as recommended by DTOEs, figures added.

08/93 Under Left Turn Signal Phasing, changed left turn separation from 10 to 12 feet.

06/91 Incorporated into TEM.

Section 3.3 Scheduling Intersection Control and Funding Arrangements

10/19 Section name changed to “Scheduling Intersection Control Evaluations and Funding Arrangements.

10/19 Hyperlink added for Manual on Intersection Control Evaluations and FDOT Approved Product List Submittal Process.

10/93 Former FDOT Topic Number 750-010-001 incorporated into TEM.

Section 3.4 Emergency Traffic Control Signals

11/18 Updated figure 3.4-1 and eliminated figure 3.4-2 by incorporation to improve legibility.

06/18 Section updated to reflect most current practices.

11/12 Mandatory changes to provide clarity and revise MUTCD reference.

02/10 Added appropriate MUTCD 2003 signs and references.

04/96 Former FDOT Topic Number 750-020-004 incorporated into TEM.

Section 3.5 Traffic Signal Mast Arm Support Boundaries

02/10 Section title change, references to PPM added, direct links to pdf versions of District Boundary Maps included.

10/98 Incorporated into TEM.

Section 3.6 Standardization of Yellow Change and Red Clearance Intervals for Signalized Intersections

10/13 Changes to yellow change and red clearance intervals: (a) Increased perception reaction time to 1.4 seconds; (b) Round up Yellow Change Intervals to the next 0.1 sec; (c) Increased the minimum Yellow Change Interval to 3.4 seconds; (d) Increased the minimum Red Clearance Interval to 2.0 seconds and the maximum Red Clearance Interval to 6.0 seconds.

09/12 New language added to clarify and give guidance for determining the all-red clearance interval.

07/11 Editorial changes made to clarity the method of determining yellow clearance time.

06/10 Changes necessary to have yellow and all-red intervals consist with ITE's Traffic Engineering Handbook.

07/05 These are guidelines so we changed title to reflect it. Changed from "Standardization of Yellow and All-Red Intervals for Signalized Intersections."

06/02 Incorporated into TEM.

Section 3.7 Accessible Pedestrian Signals

11/18 Entire section updated. "Audible" changed to "accessible".

02/03 Incorporated into TEM.

Section 3.8 Marked Pedestrian Crosswalks at Midblock and Uncontrolled Approach Locations

10/19 Updated hyperlinks for FDOT Standard Plans.

05/19 Section modified to include provisions for pedestrian crosswalk treatments that are based on context classifications.

11/18 Updated section to reflect MUTCD language consistency and to clarify the 'average day' language in section 3.8.5(3)(b).

01/16 Modified to address pedestrian crosswalks at both midblock and uncontrolled approach locations. Added definitions to key terms, revised minimum pedestrian activity thresholds, updated photos, clarified guidance on Pedestrian Hybrid Beacons, and modified guidance on the use of Rectangular Rapid Flashing Beacons on multilane roadways.

10/14 Modified to reflect the language for crosswalk illumination to help implement safe crossing of pedestrians at midblock locations.

06/13 Changes necessary to refine the criteria for installing and operating mid-block pedestrian crosswalks.

01/10 Substantive changes necessary to expand crossing treatments available with appropriate criteria and selection guidance included.

06/03 Changes necessary to conform to the MUTCD 2000 standards.

02/03 Incorporated into TEM.

Section 3.9 Countdown Pedestrian Signal Applications

11/17 Section rescinded.

03/07 Changes necessary to incorporate Department's policy on this device.

07/06 Changes necessary to give direction to districts on implementation.

04/03 Incorporated into TEM.

Section 3.10 Left Turn FYA Signal Application

11/18 New section

Section 3.11 Leading Pedestrian Interval Signal Application

05/19 New section

Chapter 4 Markings

Section 4.1 Crosswalks in Heavy Pedestrian Concentration Areas

11/17 Changed reference to Design Standard to Speed Zone Manual.

08/04 Incorporated latest MUTCD 2003 changes.

06/91 Former FDOT Topic Number 750-020-008 incorporated into TEM.

Section 4.2 Pavement Word, Symbol, and Arrow Markings

10/19 Changed reference to design of elongated shields.

11/18 Updated figure 4.2-3 to improve legibility.

11/17 Changed reference to Design Standard to Speed Zone Manual.

02/15 Added new subsection for Route Shields for Wrong Way Treatment.

05/14 Pen and ink changes to update figures.

10/13 Changes necessary to bring the proper clarification for pavement markings and route shields into the TEM.

06/91 Former FDOT Topic Number 750-010-020 incorporated into TEM.

Section 4.3 Use of Blue Raised Pavement Markers to Identify Fire Hydrants

10/19 Rescinded.

07/98 Former FDOT Instructional Memorandum Number 750-004 incorporated into TEM.

Section 4.4 Roundabout Markings

07/07 Incorporated into TEM.

Section 4.5 Express Lanes Markings

11/18 Added new definitions.

06/18 Incorporated into TEM.

Section 4.6 Use of Internally Illuminated Raised Pavement Markers

11/18 New section.

Chapter 5 Specialized Operational Topics

Section 5.1 Golf Cart Crossings and Operation on the State Highway System

10/11 New section in new “Specialized Operational Topics” chapter.

Section 5.1 Computer Models for Traffic Engineering and ITS Analysis and Design

11/10 Rescinded.

06/91 Former FDOT Topic Number 750-030-005 incorporated into TEM.

Chapter 6

11/16 Removed.

Section 6.1 Elder Road User Program

04/07 Rescinded. Information contained in section provided on Safe Mobility for Life Program (Topic No. 000-750-001) website.

06/98 Incorporated into TEM. Initiated by Elder Road User Program FDOT Topic Number 000-750-001.

Section 6.2 Warning, Stop, and Yield Sign Sizes to Accommodate the Elder Roadway User in Florida

08/07 Rescinded. Information contained in Section 2.39 (Warning, Stop, and Yield Sign Sizes).

06/98 Incorporated into TEM. Based on research developed from Elder Road User Program.

Section 6.3 Intersection Guide Signs

04/07 Rescinded. Information contained in Section 2.37 (Advance Street Name Signs).

06/98 Incorporated into TEM. Based on research developed from Elder Road User Program.

Chapter 7 Approved Product List Certification and Approval Process

11/16 Removed.

Section 7.1 Approved Product List Certification and Approval Process

07/12 Rescinded. Changed into a local procedure and link shown in section.

03/11 Title changed and APL Vendor Qualification Program was added. Changes made to the Product Approval Process, Temporary Permit Process and APL Review Process. Moved remaining APL procedures from MSTCSD specifications to this section.

03/99 Former FDOT Topic Number 750-010-013 incorporated into TEM.

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