



TRAFFIC ENGINEERING MANUAL



January 2019



Florida Department of Transportation
TRAFFIC ENGINEERING MANUAL

2018

Chapter 1 PROCEDURE

Traffic Engineering Manual Adoption Procedure	1-1-1
---	-------

Chapter 2 SIGNS

2.1 Use of Slippery When Wet Signs	2-1-1
2.1.1 Conditions for Use	2-1-1
2.1.2 Location and Placement	2-1-1
2.1.3 Enhancement	2-1-2
2.1.4 Notification.....	2-1-2
2.2 Overhead Street Name Signs	2-2-1
2.2.1 Purpose	2-2-1
2.2.2 Standards	2-2-1
2.2.3 Installation	2-2-2
2.2.4 Sign Design	2-2-2
2.3 Signs and Markings at Divided Highways and Crossroads.....	2-3-1
2.4 Symbol Signs on the State Highway System.....	2-4-1
2.4.1 Definitions.....	2-4-1
2.4.2 Conditions for Use	2-4-1
2.5 Destination-Distance Signs at Rural Interstate and Freeway Exit Ramp Terminals.....	2-5-1
2.6 Bridge Signs and Markings	2-6-1
2.6.1 Bridge and Sign Structure Low Clearance Signs.....	2-6-1
2.6.2 Bridge Pier Marking	2-6-1
2.6.3 Cross Road Name Signs on Overpasses	2-6-1
2.6.4 Narrow Bridge Treatment	2-6-2
2.6.5 Guide Signs On Overpasses	2-6-2
2.7 Place Name Signs on the State Highway System.....	2-7-1
2.8 Move Vehicles from Travel Lane Sign	2-8-1
2.8.1 Sign Design	2-8-1
2.8.2 Location and Placement	2-8-1
2.9 No Passing Zone Signs.....	2-9-1
2.10 Vending Machine Signs	2-10-1
2.10.1 Physical Characteristics	2-10-1
2.10.2 Location and Placement.....	2-10-1
2.11 Guidelines for Bicycle Warning Signs.....	2-11-1

2.11.1	Definitions.....	2-11-1
2.11.2	General Instructions	2-11-1
2.11.3	When Sign Requests May Be Approved	2-11-2
2.11.4	Sign Design	2-11-2
2.11.5	Sign Placement	2-11-3
2.12	Recycling Collection Center Signs	2-12-1
2.12.1	Definition	2-12-1
2.12.2	Sign Design	2-12-1
2.12.3	Sign Installation	2-12-1
2.13	Signing for Safety Belt Use and Child Restraint Laws	2-13-1
2.13.1	Purpose	2-13-1
2.13.2	Background	2-13-1
2.13.3	State Highway System Points of Entry	2-13-1
2.13.4	Rest Areas and Interstate Welcome Centers	2-13-1
2.13.5	Other Locations	2-13-2
2.13.6	Standard Safety Belt Sign (FTP-46-06 and FTP 47 06)	2-13-3
2.13.7	Sign Design	2-13-3
2.13.8	Sign Availability	2-13-3
2.14	Signing for Emergency Management	2-14-1
2.14.1	Purpose	2-14-1
2.14.2	Background	2-14-1
2.14.3	Procedure	2-14-1
2.14.4	Sign Design	2-14-1
2.14.5	Evacuation Route Sign Use.....	2-14-2
2.14.6	Evacuation Route Sign Placement	2-14-2
2.14.7	Sign Installation	2-14-2
2.14.8	Shelter and Traveler Information Signing	2-14-3
2.14.9	Shelter Sign Design and Use	2-14-3
2.14.10	Traveler Information Signing Design and Use	2-14-4
2.14.11	Continuous Hinge Requirements.....	2-14-5
2.14.12	Radio Frequency Information Signs	2-14-5
2.14.12.1	Radio Frequency Information Sign Design.....	2-14-5
2.14.12.2	Radio Frequency Information Sign Placement	2-14-5
2.14.12.3	Radio Frequency Information Sign Installation	2-14-7
2.15	Smoke on Highway Signs	2-15-1
2.15.1	General.....	2-15-1
2.15.2	Temporary Smoke on the Highway Sign	2-15-1
2.15.3	Prescribed Burn Sign.....	2-15-2

2.15.4	Sign Installation And Removal.....	2-15-3
2.16	Supplemental Guide and Motorist Services Signs on Limited and Non-Limited Access Highways	2-16-1
2.17	Emergency Highway Traffic Plan	2-17-1
2.18	*FHP Highway Assistance Program.....	2-18-1
2.18.1	Purpose	2-18-1
2.18.2	Sign Location.....	2-18-1
2.18.3	Sign Design and Installation	2-18-1
	2.18.13.1 Interstate and Other Limited Access Routes	2-18-1
	2.18.13.2 Major Arterial Routes.....	2-18-2
2.18.4	Sign Availability	2-18-2
2.20	Call Box/Mile Marker Signs.....	2-20-1
2.21	Florida Litter Law Signs	2-21-1
2.21.1	Purpose	2-21-1
2.21.2	Sign Design and Placement	2-21-1
2.21.3	Sign Installation	2-21-1
2.22	Traffic Control for Toll Collection Facilities	2-22-1
2.23	Florida’s Turnpike and Toll Road Numbering and Signing Program.....	2-23-1
2.23.1	Purpose	2-23-1
2.23.2	Background	2-23-1
2.23.3	Road Numbering Program.....	2-23-1
2.23.4	Signing Program.....	2-23-2
2.23.5	Recommended Maximum Trailblaze Distance	2-23-3
2.23.6	Limited Access Sign Designs	2-23-3
2.24	Placement of Crime Watch Signs on the State Highway System.....	2-24-1
2.24.1	Purpose	2-24-1
2.24.2	Definitions.....	2-24-1
2.24.3	Background	2-24-1
2.24.4	Requests for Signing	2-24-1
2.24.5	Sign Locations	2-24-2
2.24.6	Sign Design and Placement	2-24-2
2.24.7	Installation and Maintenance	2-24-3
2.24.8	Special Considerations.....	2-24-3
2.25	Distance Signing for Non-Limited Access Highways.....	2-25-1
2.25.1	Purpose	2-25-1
2.25.2	Background	2-25-1
2.25.3	Procedure	2-25-1

2.26	Advance Guide Signs on Limited Access Highways	2-26-1
2.26.1	Purpose	2-26-1
2.26.2	Background	2-26-1
2.26.3	Definitions.....	2-26-1
2.26.4	Procedure	2-26-1
2.27	Commuter Assistance Signs	2-27-1
2.27.1	Purpose	2-27-1
2.27.2	Background	2-27-1
2.27.3	Sign Design and Installation.....	2-27-1
2.28	Reference Location Signs (Mile-Markers)	2-28-1
2.28.1	Purpose	2-28-1
2.28.2	Standards	2-28-1
2.28.3	Criteria for Limited Access Roadways	2-28-1
2.28.4	Criteria for Non-Limited Access Roadways	2-28-1
2.29	Use of Fluorescent Yellow-Green Sign Sheeting (Section Rescinded)	
2.30	Signing for One-Stop Career Centers	2-30-1
2.30.1	Purpose	2-30-1
2.30.2	Background	2-30-1
2.30.3	Definitions.....	2-30-1
2.30.4	Sign Design and Installation.....	2-30-1
2.31	Unique Transportation Symbol Signs	2-31-1
2.31.1	Purpose	2-31-1
2.31.2	Background	2-31-1
2.31.3	Scope	2-31-1
2.31.4	Passenger Ship Sign	2-31-1
2.31.5	Amtrak Sign.....	2-31-2
2.31.6	Greyhound Signing.....	2-31-2
2.31.7	Installation and Placement	2-31-3
2.32	511 Telephone Service Sign	2-32-1
2.32.1	Purpose	2-32-1
2.32.2	Sign Design and Placement	2-32-1
	2.32.2.1 Interstate and Other Limited Access Routes	2-32-2
	2.32.2.2 Major Arterial Routes.....	2-32-2
2.33	Signing for Nature-Based Tourism and Heritage Tourism Trails	2-33-1
2.33.1	Purpose	2-33-1
2.33.2	Background	2-33-1
2.33.3	Pilot Program.....	2-33-1
2.33.4	Criteria for Signing Program	2-33-2

2.33.5	DOT Participation	2-33-2
2.33.6	Sign Approval and Design	2-33-2
2.33.7	Sign Maintenance.....	2-33-3
2.34	Signing for the Florida Scenic Highways Program and the National Scenic Byways Program.....	2-34-1
2.34.1	Purpose	2-34-1
2.34.2	Background	2-34-1
2.34.3	Program Coordination	2-34-2
2.34.4	Sign Criteria.....	2-34-2
2.34.5	Florida Scenic Highway Signs	2-34-3
2.34.5.1	Coordination.....	2-34-3
2.34.5.2	Sign Detail.....	2-34-3
2.34.5.3	Sign Installation.....	2-34-3
2.34.5.4	Maintenance.....	2-34-5
2.34.6	National Scenic Byway Signs	2-34-5
2.34.6.1	Coordination.....	2-34-5
2.34.6.2	Sign Detail.....	2-34-6
2.34.6.3	Installation.....	2-34-6
2.34.6.4	Maintenance.....	2-34-7
2.35	Signing for Memorial Roadway Designations.....	2-35-1
2.35.1	Purpose	2-35-1
2.35.2	Background	2-35-1
2.35.3	Signing Process	2-35-1
2.35.4	Sign Installation and Maintenance.....	2-35-2
2.35.5	Sign Design.....	2-35-2
2.36	Community Wayfinding Guide Signs.....	2-36-1
2.36.1	Purpose	2-36-1
2.36.2	Background	2-36-1
2.36.3	Standards	2-36-1
2.36.4	Review Process.....	2-36-1
2.37	Advance Street Name Signs	2-37-1
2.37.1	Purpose	2-37-1
2.37.2	Background	2-37-1
2.37.3	Definitions.....	2-37-1
2.37.4	Standards	2-37-1
2.37.5	Advance Street Name Signs at Signalized Intersections.....	2-37-2
2.37.6	Advance Street Name Signs at Non-Signalized Intersections	2-37-6

2.37.7	Advance Street Name Plaques on Intersection Warning and Advance Traffic Control Signs	2-37-7
2.38	Use of Generators and Portable Stop Signs at Non-Functioning Signalized Intersections	2-38-1
2.38.1	Purpose	2-38-1
2.38.2	Conditions for Use	2-38-1
2.38.3	Location and Placement	2-38-1
2.38.4	Storage and Distribution	2-38-2
2.38.5	Removal and Recovery	2-38-2
2.39	Warning, Stop, and Yield Sign Sizes	2-39-1
2.39.1	Background	2-39-1
2.39.2	Recommended Warning Sign Sizes	2-39-1
2.39.3	Recommended Stop Sign Sizes	2-39-3
2.39.4	Recommended Yield Sign Sizes	2-39-5
2.40	Displaying Messages on Dynamic Message Signs Permanently Mounted on the State Highway System.....	2-40-1
2.40.1	Purpose	2-40-1
2.40.2	Definitions.....	2-40-1
2.40.3	Approved Standard Safety Messages for Display on Permanently Mounted DMS	2-40-1
2.41	Guidelines for Use of Retroreflective Strips	2-41-1
2.41.1	Purpose	2-41-1
2.41.2	Definitions.....	2-41-1
2.41.3	Conditions for Use	2-41-1
2.41.4	Sign Design	2-41-2
2.42	Express Lanes Signing	2-42-1
2.42.1	Purpose	2-42-1
2.42.2	Background	2-42-1
2.42.3	Criteria.....	2-42-1
2.42.4	Sign Placement	2-42-7
2.42.5	Sign Installation	2-42-8
2.42.6	Special Consideration For Arterial Entrance/Ingress Connections With Express Lanes.....	2-42-8

Chapter 3 SIGNALS

3.1	Signalized Intersection Flashing Mode Operation and Flashing Beacons	3-1-1
3.1.1	Definitions.....	3-1-1

3.1.2	Recommendations for Signalized Intersections.....	3-1-1
3.1.2.1	Programmed Flashing Mode Operation	3-1-1
3.1.2.2	Non-Programmed Flashing Mode Operation.....	3-1-2
3.1.3	Application Requirements for Signalized Intersection.....	3-1-2
3.1.3.1	Yellow-Red Flashing Mode	3-1-2
3.1.3.2	Red-Red Flashing Mode	3-1-2
3.1.4	Heads To Be Flashed.....	3-1-3
3.1.5	Flashing Indication Colors	3-1-3
3.1.6	Application Requirements for Flashing Beacons	3-1-4
3.1.7	Operation of Flashing Beacons	3-1-4
3.2	Guidelines for Left Turn Treatment.....	3-2-1
3.2.1	Purpose	3-2-1
3.2.2	Left Turn Signal Phasing	3-2-1
3.2.3	Left Turn Signal Displays.....	3-2-3
3.2.4	Signal Display for Exclusive Left Turn Lane	3-2-3
3.2.5	Left Turn Phases for Separated Left and Thru Lanes.....	3-2-3
3.2.6	Permissive Only Mode in Multi- Left Turn Lane Approaches.....	3-2-6
3.3	Scheduling Traffic Signal Studies and Funding Arrangements	3-3-1
3.3.1	Purpose	3-3-1
3.3.2	General.....	3-3-1
3.3.3	Response to Signal Requests and Scheduling Traffic Signal Studies	3-3-1
3.3.4	Traffic Signal Studies and Engineering.....	3-3-2
3.3.5	Funding Arrangements for Warranted New Signal Installations	3-3-3
3.3.6	Other Considerations.....	3-3-3
3.4	Emergency Traffic Control Signals.....	3-4-1
3.4.1	Purpose	3-4-1
3.4.2	Background	3-4-1
3.4.3	Procedure.....	3-4-1
3.4.4	Configuration and Operation of Emergency Traffic Control Signals.....	3-4-2
3.4.5	Emergency Signal Sign (R10-13).....	3-4-3
3.4.6	Other Requirements	3-4-3
3.5	Traffic Signal Mast Arm Support Boundaries	3-5-1
3.5.1	General.....	3-5-1
3.5.2	Implementation	3-5-1
3.5.2.1	Mast Arm Structures Boundary Maps.....	3-5-1

3.6	Standardization of Yellow Change and Red Clearance Intervals for Signalized Intersections	3-6-1
3.6.1	Purpose	3-6-1
3.6.2	Standard.....	3-6-1
3.6.2.1	Yellow Change Interval	3-6-2
3.6.2.2	Red Clearance Interval.....	3-6-3
3.7	Accessible Pedestrian Signals	3-7-1
3.7.1	Purpose	3-7-1
3.7.2	General.....	3-7-1
3.7.3	Procedure.....	3-7-1
3.7.4	Approval/Denial Process	3-7-2
3.8	Marked Pedestrian Crosswalks at Midblock and Uncontrolled Approach Locations	3-8-1
3.8.1	Purpose	3-8-1
3.8.2	General.....	3-8-1
3.8.3	Definitions.....	3-8-1
3.8.4	Procedure.....	3-8-2
3.8.5	Installation Criteria and Considerations	3-8-3
3.8.6	Pedestrian Crossing Treatments	3-8-6
3.8.7	Selection Guidance for Pedestrian Treatments	3-8-12
3.9	Countdown Pedestrian Signal Head Applications (Section Rescinded)	
3.10	Flashing Yellow Arrow Signal Application	3-10-1
3.10.1	Purpose	3-10-1
3.10.2	Background	3-10-1
3.10.3	Operational Requirements.....	3-10-2
3.10.4	Installation Guide.....	3-10-5
3.10.5	Installation Criteria.....	3-10-6
3.10.6	Variable Mode Of Operation.....	3-10-8
3.10.7	Public Notification.....	3-10-8
3.10.8	Education	3-10-8
3.10.9	Signal Retrofit Checklist	3-10-9

Chapter 4 MARKINGS

4.1	Crosswalks in Heavy Pedestrian Concentration Areas	4-1-1
4.1.1	General.....	4-1-1
4.1.2	Markings.....	4-1-1

4.1.3	Signing	4-1-1
4.2	Pavement Word, Symbol, and Arrow Markings	4-2-1
4.2.1	General.....	4-2-1
4.2.2	Lane Use Arrow and “Only” Pavement Markings on Intersection Approaches	4-2-2
4.2.3	Route Shield Pavement Markings	4-2-3
4.2.4	Route Shields for Wrong Way Treatment.....	4-2-5
4.3	Use of Blue Raised Pavement Markers to Identify Fire Hydrants	4-3-1
4.3.1	Purpose	4-3-1
4.3.2	Background	4-3-1
4.3.3	Procedure.....	4-3-1
4.3.4	Guidelines	4-3-2
4.4	Roundabout Markings.....	4-4-1
4.5	Express Lanes Markings	4-5-1
4.5.1	Purpose	4-5-1
4.5.2	Definitions.....	4-5-1
4.5.3	The Words ‘Express’ and ‘Only’ Pavement Markings In Express Lanes.....	4-5-1
4.5.4	Chevrons and Markers in Buffer Area	4-5-2
4.5.5	Special Pavement Markings Within the Tolling Area	4-5-2
4.6	Internally Illuminated Raised Pavement Markers	4-6-1
4.6.1	Purpose	4-6-1
4.6.2	Definitions.....	4-6-1
4.6.3	Application.....	4-6-1
4.6.4	Procedure	4-6-1

Chapter 5 SPECIALIZED OPERATIONAL TOPICS

5.1	Golf Cart Crossing and Operation on the State Highway System.....	5-1-1
5.1.1	Purpose	5-1-1
5.1.2	General.....	5-1-1
5.1.3	Definitions.....	5-1-1
5.1.4	Procedure.....	5-1-2
5.1.5	Criteria for Approval of Crossing.....	5-1-5
5.1.6	Operation of Golf Carts on Sidewalks.....	5-1-8

Appendices

History	A-1
Index	B-1

