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1 Introduction

1.1 Background and Purpose

Managed lane projects are gaining popularity as congestion management tools in urban areas across the United States because they are cost-effective facilities that provide active management of transportation demand. With demand for transportation services in and around Florida’s metropolitan areas continually rising, and with fewer funds available to build a way out of the resulting congestion, the Florida Department of Transportation (FDOT) has established the implementation of managed lanes as a priority congestion mitigation strategy in transportation planning. Managed Lanes are defined by FDOT as “highway facilities or sets of lanes within an existing highway facility where operational strategies are proactively implemented and managed in response to changing conditions with a combination of tools.” These tools include access control, vehicle eligibility, variable pricing, or a combination thereof. Managed lanes can include express lanes, high occupancy vehicle (HOV) lanes, reversible lanes, truck-only toll lanes, and vehicle-restricted lanes.

On August 30, 2013 the statewide directive 525-030-020a: Tolling for New and Existing Facilities on the State Highway System was published, outlining FDOT’s direction on the State Highway System (SHS). The directive established where and how tolls may be implemented along the SHS. It states that all additional capacity on interstate highways within Florida shall be express lanes. It also states that all additional capacity on non-interstate limited access facilities in Florida shall be express lanes, where deemed appropriate through the transportation planning process. While not required or defined in the directive, Express Lanes are also being considered and deployed on tolled facilities in the state where deemed necessary and appropriate.

The statewide directive defines express lanes as “a type of managed travel lane physically separated from a general use lane or general toll lane within a roadway corridor. Express lanes use dynamic pricing through electronic tolling in which toll amounts are set based on traffic conditions.” Express lanes can provide a high degree of operational flexibility, which enables them to be actively managed to respond to changing traffic demands. Express lanes can be located within tolled or non-tolled facilities, include congestion pricing, have vehicle restrictions, and may be operated as reversible flow or bi-directional facilities to best meet peak demands. Express lane facilities can be adjusted at any time to better match local and regional objectives. These adjustments allow FDOT to offer Florida drivers new and reliable mobility choices.

Florida is one of the few states in the country that has multiple urban areas planning express lane projects. With different districts planning different projects across the state, statewide consistency is critical. A summary map for each region of the state has been developed showing the current status and location of each planned express lane project within the state. The objective of this handbook is to provide guidelines for FDOT to plan, design, and operate express lane projects that are consistent, predictable, and repeatable throughout the state for the traveling public.

1.2 Handbook Format

Each chapter of this handbook provides information on a different aspect of express lane facility planning and implementation. The chapters and their descriptions are as follows:

- **Authoritative References** contains references governing design criteria, references prescribing design and analysis procedures, and statewide rules and regulations.
Policies and Requirements lists the policies and codes relating to the implementation of express lanes and provides a brief description of each.

Agency Responsibilities discusses the process for identifying the stakeholders of a project and the assignment of responsibility for each element of an express lane facility.

Traffic and Revenue Studies provides guidelines on how to estimate the demand for express lanes and evaluate their feasibility.

Design discusses the principles of design unique to express lane projects.

Toll Collection discusses the toll collection process and systems required for collecting tolls.

Operations discusses the principles of safe and efficient operation of express lane facilities.

Express Lanes Maintenance outlines the maintenance responsibilities for express lane facilities.

Public Communication provides guidance on proper communication and public involvement for successful express lane project coordination.

Reporting provides minimum standards on reporting information and data for use in evaluating the express lanes.

For the purpose of this document, the term “General Use Lane” shall refer to all lanes which are not express lanes, inclusive of both limited access facilities and toll facilities. When policy, design, or operations are different for express lanes on limited access facilities as opposed to tolled roadways, a note is made to distinguish the difference. When references are made to outside documents, a link will be provided to the document and the text will be blue, italicized, bold, and underlined.

The handbook is a “living” document and will be updated as the statewide express lane network develops and evolves. FDOT will use statewide procedures, outlined in this document, to collect data, perform research, and measure performance to more efficiently manage and operate express lane facilities. FDOT will continue to monitor existing policies, standards, and guidelines and update them as needed.
2 Authoritative References

The following publications are authoritative references that provide criteria, guidelines, and computational procedures for express lane facilities.

2.1 References Governing Design Criteria

The FDOT Plans Preparation Manual (PPM) is the principal governing document for plans preparation on the Florida SHS. The PPM describes the design criteria, process, plans preparation, and assembly details for plans.

The FDOT Design Standards publication contains a series of index sheets with drawings that prescribe detailed requirements for construction and maintenance of highway facilities in Florida.

The FDOT Standard Specifications provide instructions and guidelines for construction methods and materials.

FDOT publishes the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, also known as the “Florida Green Book”, which establishes design criteria for new transportation construction projects off the state highway and federal aid systems.

The FDOT Traffic Engineering Manual provides traffic engineering standards to be used on the SHS.

FDOT publishes the Florida Intersection Design Guide identifying the requirements for intersection design and providing guidelines for intersection alternatives analysis.

FDOT Structures Design Office publishes the FDOT Structures Manual which provides engineering and detailing standards, criteria, and guidelines for designing structures on FDOT facilities.

Florida’s Turnpike Enterprise (Turnpike) publishes the General Tolling Requirements (GTR) which serves as the main source of open road tolling requirements for the State of Florida.

The Turnpike publishes the Turnpike Plans Preparation and Practice Handbook (TPPPH) which includes requirements specific to Turnpike facilities that modify or add to the normal requirements included in the FDOT PPM.

The Manual of Uniform Traffic Control Devices (MUTCD) contains the standards for traffic control devices that regulate, warn, and guide road users throughout the United States. FDOT has adopted the MUTCD as a standard that applies to all roads in the State.

The American Association of State Highway and Transportation Officials (AASHTO) publishes A Policy on Geometric Design of Highways and Streets, also known as the “Green Book”, which is a comprehensive compilation of criteria used in the geometric design of all roadway facilities.

AASHTO publishes the Guide for Geometric Design of Transit Facilities on Highways and Streets that provides a comprehensive reference of current practice in the geometric design of transit facilities on streets and highways.
2.2 References Prescribing Design and Analysis Procedures

The Transportation Research Board publishes the *Highway Capacity Manual* (HCM) to establish the methodologies that engineers and planners use to assess the traffic and environmental effects of highway projects.

AASHTO publishes the *Highway Safety Manual* (HSM) which quantifies and evaluates highway safety performance.

The FDOT *Manual on Uniform Traffic Studies* establishes the minimum standards for conducting traffic engineering studies on roads along the SHS.

FDOT has developed the *2040 Revenue Forecast Handbook* which includes program estimates for the expenditure of state and federal funds expected from current revenue sources. The handbook provides guidance for Metropolitan Planning Organizations (MPOs) when updating their plans for transportation facilities and services in Florida.

*Florida Standard Urban Transportation Model Structure (FSUTMS) Standards* contain information on the background and development of the traffic demand models used for Traffic and Revenue studies.

2.3 Rules and Regulations

Florida Administrative Code (FAC) *Chapter 14-100, Toll Enforcement* sets forth the rules for minimum training and qualifications for toll enforcement officers, provides guidance to toll enforcement officers for issuance of a Uniform Traffic Citation (UTC), establishes the criteria for express lane tolling, sets exemptions for tolls for 95 Express, and establishes video billing procedures for toll facilities.

Florida Statute *(FS) 316.0741* allows registered carpools, hybrid vehicles, and Inherently Low Emissions Vehicles (ILEV) to be exempt from express lane tolls in the case of High Occupancy Vehicle (HOV) lanes being re-designated as express lanes.

*FS 338.151* outlines where tolls may be implemented. Except where otherwise authorized by law, the Department may not establish tolls on lanes of limited access roadways on the state highway system that existed on July 1, 2012, unless tolls were already established by that date. However, the Department may establish tolls on new limited access facilities, lanes added to existing limited access facilities, and on new or replacement major bridges on the SHS constructed after that date.

*FS 338.166* concerns bonding secured by tolls collected from use of high occupancy toll (HOT) lanes, or Express Lanes, and how toll collections may be used.
3 Policies and Requirements

The development of express lane facilities, as well as a statewide express lane network, requires special consideration of a variety of planning and policy issues. The planning and implementation processes of express lane projects are similar to those of more typical roadway improvement projects, but can be more extensive due to their unique nature. Express lane projects introduce additional technical, organizational, financial, and outreach requirements which require FDOT and its partners to work together to refine and implement these strategies throughout the lifecycle of the facility.

FDOT has implemented policies and supporting legislation specifically for express lanes. FDOT policy requires that all new capacity improvements on limited access highways on the SHS in Florida must be express lanes. Florida legislation establishes the vehicle eligibility in the express lanes.

3.1 FDOT Express Lanes Vision

The FDOT Express Lanes Vision is to make all additional capacity for limited access facilities on the SHS express lanes. The purpose of this vision is to better manage congestion and to provide choices to drivers. The vision also establishes that express lanes are a required Transportation Systems Management and Operations (TSM&O) solution for all additional capacity on the SHS. Express lanes help to satisfy long-term mobility needs by providing:

- Travel time reliability
- Travel options for drivers
- Enhanced transit operations

Additional TSM&O strategies are available with express lane projects, which can yield long-term benefits, while allowing Florida to more quickly provide additional capacity and a broader selection of transportation facilities. Express lane facilities offer a balanced congestion mitigation strategy and more reliable mobility choices to drivers in Florida.

3.2 Legislation and Directives

Existing statutes, administrative codes, and directives must be followed when planning express lane projects. These rules dictate how funds can be used, which vehicles are eligible to use express lanes, where tolls can be implemented, and how tolls are to be collected and spent. National guidance which outlines the planning process to develop express lane facilities can also be found in the published documents referenced at the end of this section.

3.2.1 Existing Florida Statutes

There are currently three Florida Statutes that relate to express lanes:

- **FS 338.166**. This statute allows FDOT to request the Division of Bond Finance to issue bonds secured by toll collections from the express lane facilities owned by FDOT. It allows FDOT to continue to collect the toll on the express lane after the discharge of any bond obligation related to the project. It assigns the order in which collected tolls may be used and gives direction on how funds can be used once financial obligations have been met. The remaining funds can be used to support improvements on other SHS facilities in the county or counties where the tolls were collected or support express bus service on the express lane facility. Per this statute, FDOT can implement variable toll rates. With the exception of HOV lanes or express lane facilities, tolls
may not be charged for the usage of an Interstate highway where they were not charged as of July 1, 1997.

For Turnpike Express Lane Facilities:

| Remaining funds after financial obligations have been satisfied must be used on the Turnpike system as defined by the Florida Turnpike Enterprise Law. |

→ **FS 316.0741.** This statute states that vehicles having exemption decals, by virtue of compliance with the minimum fuel economy standards and being registered for use in HOV toll lanes or Express Lanes in accordance with FDOT rules, shall be allowed to use any HOV lanes that are re-designated as express lanes without payment of a toll.

→ **FS 338.151.** This statute outlines where tolls may be implemented on the SHS such as on new limited access facilities, lanes added to existing limited access facilities, new major bridges over waterways, and replacements of existing major bridges over waterways. However, FDOT may not establish tolls on lanes of limited access roadways that existed on July 1, 2012, with the exception of HOV lanes, express lanes, and the Turnpike system, unless tolls were already established by that date. The authority of this statute is provided in addition to that provided under the Florida Turnpike Enterprise Law and **FS 338.166.**

### 3.2.2 Florida Administrative Code

**Florida Administrative Code (FAC) Rule 14-100.003** establishes criteria for Express lane tolling, including toll amounts, pricing criteria, tolling methods, vehicle eligibility, toll displays, and toll violation procedures.

Express lane criteria is also established in **FAC Rule 14-100.004**, which makes special exemptions for the 95Express Lanes projects in Miami-Dade and Broward Counties.

### 3.2.3 Directives

To clarify the Express Lanes Vision, FDOT Central Office (CO) released the statewide **Directive 525-030-020-a: Tolling for New and Existing Facilities on the State Highway System**, referred to as the Express Lanes Directive, on August 30, 2013. This directive was valid for one year, during which time, additional feedback and input from FDOT District Offices was requested. This directive was extended for one more year to collect additional feedback and input. The directive currently outlines the policies specific to tolling on the SHS.

The Express Lanes Directive states that tolling strategies shall be implemented for all new limited access facilities on the SHS and lanes added to existing limited access facilities on the SHS. All new major bridges on the SHS over waterways and replacements of existing major bridges on the SHS over waterways must consider tolling. The Express Lanes Directive suggests the tolling strategies to be considered for these facilities should include congestion pricing or toll road financing with the toll paying either partially or fully for the cost of the facilities.

For express lane projects, each region must develop a Regional Concept of Transportation Operations (RCTO). The RCTO outlines the agreements between the different stakeholders of the region on how to operate the express lane network. The RCTO is a planning tool which aids in understanding and documenting the responsibilities of each party involved in the planning and operation of the express lane network. The RCTO provides the specific operational details of each express lanes project. The RCTO will be refined as the network is implemented and matures. The
Express Lanes Directive requires the development of a Concept of Operations for any TSM&O project. Each individual express lanes project shall develop a project specific Concept of Operations.

### 3.3 Lane Management Policy

The three main policy elements that can be used to manage express lanes are eligibility, access, and pricing. These elements are defined as follows:

- **Vehicle Eligibility** controls the types of vehicles permitted in the express lanes. Limiting the use of the express lanes to particular vehicle types can significantly increase overall throughput.
- **Access** controls the number and spacing of entry and exit points along an express lane facility and the type of separation between the express lanes and general use lanes.
- **Pricing** uses the toll amount on the express lane facility to manage the number of vehicles in the express lanes in order to maintain a predetermined performance threshold and provide a reliable trip time.

Express lanes in Florida will use a combination of all three lane management strategies. Only certain vehicle types are permitted to use the express lanes, points of entry and exit for the express lanes are limited, and the express lanes are dynamically priced to maximize vehicle throughput on the facility.

#### 3.3.1 Vehicle Eligibility and Toll Exemption

Vehicle eligibility is an important policy element used to manage the performance of express lane facilities in Florida. Two axle vehicles and buses are the only acceptable vehicle types allowed to utilize express lane facilities statewide. All buses, including three axle buses and articulated buses, are allowed to use the express lanes. Emergency response vehicles with more than two axles are permitted to use the express lanes when responding to an incident in the express lanes. Maintenance vehicles with more than two axles are permitted in the express lanes when performing maintenance work within the express lanes. Vehicles with three or more axles authorized for emergency evacuation by the FDOT Secretary are allowed to use the express lanes.

Figure 3-1 displays the vehicle classification scheme that was developed for Florida express lanes and is based on FHWA’s vehicle classifications. The vehicle classification scheme breaks down all motor vehicles into 13 categories. Figure 3-1 shows which vehicles are eligible to utilize express lanes in Florida and which vehicles are not. FDOT’s eligibility policy allows vehicles that fall into Class 1 through Class 5 to use express lane facilities. For safety and operational purposes, two axle vehicles towing a trailer will not be allowed. Class 6 through Class 13 vehicles will not be permitted to use express lane facilities in Florida.

Registered public transit and registered public school buses are exempt from paying tolls on express lanes. Public transit and public school buses will be required to have a SunPass® sticker tag associated with a valid license plate for the vehicle on file with the Turnpike back office. The cost of the SunPass® sticker tag will be paid for by the owner. Except where toll exemptions are granted in accordance with [FS 338.155](#), [FAC Rule 14-100.004](#), and [FS 316.0741](#) there are no other toll exemptions allowed on express lane facilities.

#### 3.3.2 Access

Vehicle access will be limited to certain locations for all express lane facilities in Florida. Continuous access to the express lanes is prohibited. Vehicle ingress and egress points will be determined based upon considerations for traffic safety, traffic volumes, the surrounding roadway network, areas
of congestion, and interchange spacing. Further details on vehicle access can be found in Section 6.4.

### 3.3.3 Pricing

Express lanes will be priced by individual segments. When express lane systems consist of more than one segment, the segments will be grouped into tolling trips containing no more than three segments. Express lane segments and tolling trips are discussed in further detail in Section 7.4. Express lane segments will be dynamically priced with the intent to promote free-flow traffic and maximize throughput of the express lanes. Dynamic pricing consists of varying the toll in the express lanes based on localized traffic density information. The optimum volume of traffic in the express lanes will be determined for each facility depending on the local conditions. The toll amounts will be set by the districts, based on traffic density, using dynamic pricing software. The toll amount information is then sent to the Turnpike for processing. This coordination is discussed in further detail in Section 7.2.

### 3.4 Policy Exemptions

The express lane policy and guidelines outlined in this Handbook shall be implemented consistently to the maximum, practical extent. When project specific situations arise that call for an action that deviates from the policy, a Policy Exemption is required. The request for a Policy Exemption must be approved by the FDOT Secretary for the project to proceed to the next phase of project development.
The Policy Exemption process (Figure 3-2) is a bottom-up process that begins at the District staff level. When all project-level leads agree there is a justified need to deviate from the policy, a request is prepared and submitted to the FDOT CO Systems Planning Office Manager of Florida Highway Systems Management section. The CO Florida Highway Systems Management section evaluates the request for statewide impacts, weighs the implications outlined in the proposed action, and furnishes a recommendation to the FDOT Secretary. Finally, the FDOT Secretary reviews the Policy Exemption request and the recommendation and then makes a decision to approve or deny the proposed Policy Exemption request.

![Figure 3-2: Policy Deviation Process](image)

If a potential capacity expansion project is identified as not meeting the recommended financial internal rate of return (IRR) for express lanes as defined in Section 5.5, a written Policy Exemption, approved by the FDOT Secretary, will be required in order for the project to proceed further in the planning phase. Any proposal to build a new non-tolled facility or capacity improvement on limited access facilities on the SHS without express lanes will require a Policy Exemption.

### 3.5 Toll Revenue Allocation

Toll revenue must be used in accordance with [FS 338.166](https://example.com/fs338166). The statute states that after the discharge of any bond indebtedness related to the project, toll revenues are to be applied as follows:

- Annual O&M cost of the express lanes
- Improvement to the express lanes or associated system
- Construction, maintenance, or improvement of any road on the SHS within the county or counties in which the toll revenues were collected
- To support express bus service on the facility where the toll revenues were collected

The policy when there are bonds issued, or when the State Transportation Trust Fund (STTF) loans funds for the construction of the express lanes or O&M costs associated with the express lanes, revenues are to be applied as follows:

- Annual O&M cost of the express lanes
Debt service to bonds/ repayment to the STTF
Improvement to the express lanes or associated system
Construction, maintenance, or improvement of any road on the SHS within the county or counties in which the toll revenues were collected
To support express bus service on the facility where the toll revenues were collected

Programming guidelines for O&M and capital costs once the express lanes are in operation are provided in the *FDOT Work Program Instructions* Chapter 41.

For Turnpike Express Lane Facilities:

<table>
<thead>
<tr>
<th>Remaining funds after financial obligations have been satisfied must be used on the Turnpike system as defined by the <em>Florida Turnpike Enterprise Law</em>.</th>
</tr>
</thead>
</table>

*FDOT Work Program Instructions* Chapter 41.
4 Agency Responsibilities

FDOT Central Office, FDOT Districts, Federal Highway Administration (FHWA), and the Turnpike are all involved in the planning and implementation of express lane projects. It is important to clearly define the roles and responsibilities of all the entities in the early phases of the projects. Completion of a Regional Concept of Transportation Operations (RCTO), Express Lane Project Matrix, and a project specific Concept of Operations (ConOps) will define the local agreements established for operating the regional express lane network, the responsibilities of each party involved in planning and operation, and the specific operational details of each express lanes project. The decisions made for each project and express lane network must remain consistent with FDOT policies and design guidelines.

4.1 FDOT Central Office

FDOT Central Office provides express lane guidance, design standards, and general oversight. FDOT Central Office will provide a liaison for each feasibility assessment to ensure continuous communication between Central Office and the owner of the project. To ensure consistent express lane evaluation across the statewide network, FDOT Systems Planning Office, in conjunction with the Project Finance Office and the Turnpike, will ensure that consistent travel demand and financial models, processes, and methods are used by the District offices and by the Turnpike for every project. This ensures consistent evaluation for operational improvements and financial feasibility.

4.2 Federal Highway Administration

For projects on the Interstate System, FHWA will be an integral and necessary part of the development, review, and approval processes. The role of FHWA is the same for express lane projects as it is on conventional projects. FHWA is responsible for approval of all plans for express lanes on Interstates as well as approval of all environmental documents associated with Interstate projects. FHWA must approve the operational strategies contained within the ConOps for each express lane project on the Interstate. FHWA may have special rules for previous commitments in a project area such as HOV to HOT conversion. Projects that use federal funds will be subject to the rules and requirements of the National Environmental Policy Act (NEPA).

4.3 FDOT Districts

In project planning, the District Offices will be able to make informed decisions that best serve the specific project and the particular needs of the area. At project inception, there shall be coordination between the District project management team and the Turnpike project management team. The District traffic operations team and the District design team must coordinate with the Turnpike tolling systems team beginning in the planning phase of the express lanes project and continue coordination until the project is constructed and operational. District Offices will coordinate with Central Office and local transportation agencies to develop an RCTO that specifically outlines the agency responsibilities for planned express lane networks in the region.

The District offices will determine the method of separating the express lanes from the general use lanes as well as ingress and egress locations in coordination with the Turnpike. FDOT District Offices are also responsible for funding and leading all feasibility assessments for candidate projects and Traffic and Revenue Studies within their district, with the exception of Turnpike facilities. This includes the responsibility of coordinating with MPOs, local governments, the Turnpike, transit agencies, and local expressway authorities participating in the express lane project. The District is
also responsible for operating the Express Lanes and coordinating with other external entities, such as emergency service providers and other transportation agencies within the District.

4.4 Florida’s Turnpike Enterprise

The Turnpike will lead all Traffic and Revenue Studies and feasibility assessments for Turnpike facilities. The Turnpike will provide support staff to the Districts for developing Traffic and Revenue Studies and feasibility assessments during the development of express lane projects. The Turnpike will determine the toll technology, toll equipment, toll operations, and toll maintenance for express lane facilities throughout the state. A Turnpike Project Manager (PM) will be assigned to each express lanes project to coordinate design reviews, shop drawing reviews, and perform general coordination between the District PM and the Turnpike for the design and construction of the tolling sites.

4.5 Regional Concept of Transportation Operations

Each region of the state shall develop an RCTO, which documents how the system will operate, stakeholder responsibilities, project scope, goals, objectives, and expectations, based on the region’s long term express lane network vision. A region usually consists of one metropolitan area but could encompass a larger area depending on the express lane network that is planned. An express lane network consists of one or more express lane projects. The RCTO is a planning document that helps internal and external partners understand the overall vision of the network and how the systems will operate.

The RCTO will include the policies, operational guidelines, and goals for how the express lane network will operate regionally. The RCTO document will also outline the agreements, roles, phase implementation, and responsibilities between different stakeholders of the region on how to operate the express lane network. When two or more agencies are operating contiguous express lane facilities, the operation and maintenance of ITS devices at the point(s) where they interface will be addressed in the RCTO and the project ConOps. The RCTO should also address how transit authorities plan to use the express lanes. The Regional ITS Architecture will need to be updated as the RCTO is developed.

4.6 Express Lane Project Matrix

Because toll collection activities will be administered by the Turnpike, a Memorandum of Agreement (MOA) shall be developed by the responsible District Office and the Turnpike, initiated during planning and being completed before the design begins. The purpose of the MOA is to identify areas of responsibility regarding roadway and associated infrastructure, tolling infrastructure, operations, maintenance, ownership, and any financial obligations. The MOA should identify the pre-scoping questions, include a summary of the coordination requirements between the District Office and Turnpike, and include an Express Lane Project Matrix that identifies the entity responsible for each project element. The responsible District Office and Turnpike should complete the MOA prior to the initiation of the design phase.

The completion of an Express Lane Project Matrix, using the responsibility matrix template, shall be initiated by the Turnpike and completed in coordination with the responsible FDOT District(s). The responsibility matrix template contains elements of express lane design, operation, and maintenance and has been developed for use on FDOT District Express Lane Projects. The responsibility matrix identifies which entity is responsible for each element of the express lane facilities from planning through operations and maintenance.
4.7 Concept of Operations

A project specific ConOps document must be developed for each express lanes project following the FDOT ITS ConOps Outline. The ConOps document should serve as a formal Memorandum of Understanding (MOU) or interagency agreement for operating defined transit, arterial, and highway systems involving express lanes. The ConOps shall be developed in the planning phase and updated at least annually or as needed throughout the life of the project (including once the facility is in operation). The ConOps shall identify the responsible parties for contiguous express lane facility operations and maintenance. The project specific ConOps is a subset of the RCTO and must be updated as the project and network evolve. The project ConOps is defined in further detail in Section 8.3.2.
5 Traffic and Revenue Studies

The overall planning process for express lanes is a multi-phased approach that includes initially identifying potential projects in coordination with the local MPOs, identifying design options and ROW needs through a PD&E Study, construction of the project, and conducting the day to day operations of the express lane facility. A Traffic and Revenue (T&R) study occurs as part of the initial planning process. A T&R study includes having an understanding of the factors that influence traffic demand in the express lanes. These factors include market share, access point locations and segment lengths, tolling points, pricing policy, and the locations of direct connections to adjacent roadways. Other factors to be considered in the planning process are congestion levels in the corridor, trip purposes, and the traffic mix. Once the necessary information about these factors is collected, a T&R study is conducted using these factors as inputs.

A T&R study evaluates the projected traffic demand on the express lanes and estimates the amount of toll revenues that would be generated. Most T&R studies take between nine and eighteen months to complete, depending on the desired level of detail and the corresponding precision desired of the forecasts. These studies apply to Turnpike and District projects for new toll facilities as well as widening projects that include express lanes. Each study will adhere to the pricing policy guidelines described in Section 3.3.3 of the handbook.

The results of the T&R study are used to assess the financial feasibility of the project utilizing the financial Internal Rate of Return (IRR) and Net Present Value (NPV). An assessment of the Return on Investment (ROI) may also be conducted by Central Office using a Benefit-Cost analysis to determine the economic benefits of each express lane project.

5.1 Planning Considerations

The following factors should be considered in the planning process and then used later in the T&R study:

- **Market Share:** The potential market share of an express lane project is the percentage of traffic that will likely use the express lanes. Origin/destination data is needed early in the planning process to estimate eligible trips and later determine market share using an express lane model. Origin/destination data can be extracted from the demand model or through field observation. If geometric conditions warrant, two express lanes should be provided in each direction to enhance market share.

- **Access Points:** Since express lanes are designed to mainly serve commuters, the initial length of express lane segments should be at least five miles long and bypass at least two interchanges. This distance was developed based on research of average trip lengths in Florida. Final locations of access points should be based on site specific operational analysis and is detailed in Section 6.4.

- **Tolling Points:** Toll and data gantries should be located as close to the express lane entry point as possible. The tolling points are selected based on the definition of a segment and are covered in more detail in Chapter 7.

- **Pricing Policy:** Dynamic pricing and vehicle eligibility influence the demand for the express lanes. The overall pricing objective is to manage traffic demand.

- **Direct Connections:** Direct connections to major adjacent roadways increase the ability of drivers to use the express lanes, and improve market share. Direct connections to Park and Ride and transit facilities should also be considered for operational purposes. Direct connection locations and feasibility are evaluated during initial planning, but also must be evaluated in more detail during design, which is discussed in Section 6.4.2.
5.2 Levels of T&R Studies

FDOT’s Traffic and Revenue Studies Program typically prepares two levels of studies. Each of these levels requires the use of a travel demand model and an express lane model to determine the share of traffic using the express lanes. The preferred express lane model for the State of Florida is called ELTOD (express lanes time of day). Depending on the project circumstances, it may not be necessary to examine both levels of study for the same project. The levels of T&R needed will be evaluated on a project by project basis. All express lanes projects that will do a T&R study will conduct at least a Planning Level Plus study with a 75% confidence level.

A Planning-Level Plus study provides a detailed assessment of the project and creates a preliminary estimate of traffic and revenue forecasts. These forecasts rely on existing travel demand models but use additional input data such as updated traffic counts, socioeconomic data, origin-destination traffic data, travel surveys, speed and delay studies, model calibration, and value of time calculations. Risk-based analysis can also be included in this stage. This type of study is most appropriate after the Project Development and Environment (PD&E) phase has established many of the project features, and it usually takes between nine and twelve months to complete.

An investment-grade study serves as the basis for the financing of a project by allowing the FDOT Central Office to evaluate the opportunities and risks associated with the toll traffic forecasts and the corresponding revenues. It is best suited for projects that will be funded using bond proceeds. Additional refinements to the travel demand model used in the planning-level study are beneficial. Operational analysis using microsimulation models, as well as toll sensitivity and risk-based analyses are part of these refinements. This type of study is likely to occur during the design phase of the project with a single alternative being evaluated. It usually follows the planning-level study and takes an additional four to six months of work.

5.3 T&R Studies for Turnpike Projects

The Turnpike will lead and manage all T&R studies on express lane projects owned by the Turnpike. The Turnpike Finance Office will use the results from these T&R studies to evaluate the feasibility of each express lane project.

5.4 T&R Studies for District Projects

The Turnpike will manage all T&R Studies in coordination with the District(s) requesting the study. In addition, the District(s) requesting the study will provide the funding to complete it. The primary work tasks will be completed by a Traffic and Revenue General Consultant under contract with the Turnpike.

The Turnpike Project Manager will be responsible for leading the project coordination efforts and for working closely with the appointed Project Manager(s) from the requesting District(s), Central Office, and any consultant staff.

5.4.1 Initiation Process for T&R Studies

In order to begin an FDOT District T&R Study, the District(s) and the T&R Consultant are both requested to participate in the project initiation process outlined below. In addition, the Methodology Letter of Understanding (MLOU) must be signed before the T&R Consultant is assigned to the project. Table 5-1 summarizes the major responsibilities outlined below by entity and order during the project initiation process.
Request Project: The first step in the study initiation is for the District to request the project by completing a District Traffic and Revenue Study Project Request Form and submitting it to the Turnpike. The District will then assign a project manager to the project. If a proposed study

<table>
<thead>
<tr>
<th>Project Step</th>
<th>Responsible Entity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>FTE</strong></td>
</tr>
<tr>
<td><strong>STEP 1:</strong> Request Project</td>
<td>2 - FTE reviews the project request form and identifies the T&amp;R Consultant to perform the study.</td>
</tr>
<tr>
<td><strong>STEP 2:</strong> Conduct Scope Meeting</td>
<td>1 - FTE schedules and hosts the project scope meeting. 2 - FTE assists in the development of the study parameters.</td>
</tr>
<tr>
<td><strong>STEP 3:</strong> Prepare Scope of Services</td>
<td>2 - FTE reviews and modifies, if needed, the scope of services, schedule, and staff hour estimate. 3 - FTE finalizes the scope of services and schedule, and sends them to the Consultant.</td>
</tr>
<tr>
<td><strong>STEP 4:</strong> Negotiate Staff Hours and Prepare Automated Fee Proposal (AFP)</td>
<td>1 - FTE schedules a meeting to negotiate the staff hour estimate proposed by the T&amp;R Consultant, if needed.</td>
</tr>
<tr>
<td><strong>STEP 5:</strong> Program Funding and Issue Letter of Authorization</td>
<td>2 - FTE encumbers the funding programmed by the district and issues the letter of authorization to the T&amp;R Consultant.</td>
</tr>
</tbody>
</table>

Table 5-1: Summary of District Traffic and Revenue Study Responsibilities for Project Initiation
includes more than one District in its limits, then each District participating in the study must complete a separate form in coordination with each partnering district.

- **Conduct Project Scope Meeting:** Once received, the Turnpike will review the completed project request form, and will schedule a scope meeting. The purpose of the meeting is to discuss and identify the pertinent tasks involved in the project and their level of effort, and to determine the overall study parameters. The meeting will include representatives from the Turnpike, the District(s), Central Office, FHWA Transportation, and the T&R Consultants.

- **Prepare Scope of Services:** Based on the level of study and the parameters discussed in the scope meeting, the Turnpike T&R Project Manager will request a project scope of services to be prepared by the T&R Consultant. The scope will identify all project tasks and include a schedule and a staff hour estimate. The Turnpike T&R Project Manager will coordinate the review of the scope of services with the District to ensure that any necessary revisions are included, and the scope of services is finalized.

- **Negotiate Staff Hours:** Once the scope of services is finalized, the Turnpike Project Manager will schedule a meeting with the District(s) and the T&R Consultant to negotiate the proposed staff hour estimate.

- **Program Funding and Issue Letter of Authorization:** The District will program the funding for the project in the Work Program which may require a work program amendment. The Turnpike will encumber the funds and issue the letter of authorization to the T&R Consultant to begin the work.

### 5.4.2 Traffic and Revenue Study Development

The primary work tasks to be completed by the T&R Consultant include the following:

- Perform project data collection and assembly
- Review, modify, test, and run travel demand model and time of day express lane model
- Prepare future year data and develop traffic forecasts
- Develop toll revenue assumptions and forecasts
- Perform project coordination activities
- Prepare and transmit project documentation

Other project tasks in addition to (or instead of) the primary work tasks, which are consistent with the General Consultant Scope of Services, may be included depending on the study parameters. Each T&R Consultant will adhere to a quality control and quality assurance plan that has been pre-approved by the Turnpike T&R Project Manager. All T&R consultant activities shall be reviewed for technical accuracy, grammatical correctness, adherence to standards in form, and completeness.

### 5.5 Financial Feasibility Assessment

Once the results of the Planning-Level Plus or Investment-Grade T&R study are available, the Department will initiate a more in-depth financial feasibility analysis to be performed by the Project Finance Office. The financial analysis will determine the financial IRR and NPV to aid in selecting feasible projects.

The financial IRR is the discount rate at which the net present value of all future cash flow (both inflows and outflows) is equal to zero. The financial IRR will include gross toll revenue, toll transaction fees (cost to collect), construction costs (cash flowed), operation and maintenance costs, renewal and replacement costs, express bus service costs (if applicable) and debt service costs (if applicable). The Financial IRR calculations typically cover a 50 year timeframe. The Department’s goal for the financial IRR should be equal to or greater than 5% and a 5% discount rate is used when calculating the NPV. If the financial IRR is below 5% then alternatives will be considered to reduce
costs. If express bus service is to be included in the project, those costs will be used as a sensitivity test to the financial IRR.
6 Design

Consistency in the design of express lanes is essential to their success from operational, safety, and customer perspectives. The FDOT Plans Preparation Manual (PPM) states that “Design consistency is achieved when the geometric features of the roadway are consistent with the operational characteristics expected by the driver.” Until statewide Express Lane criteria is published in the PPM, the Central Office Roadway Design and Traffic Engineering and Operations Offices will be involved in establishing criteria during the planning and design of Express Lane projects. The involvement of these two offices will promote consistency in the design and operation of Express Lane facilities throughout the state.

The administration, design, and operation of express lanes will be consistent, yet flexible, across Districts and should be consistent with other agencies within the project region. Whereas the goal of this chapter is to ensure design consistency, when designing for express lanes there is no single design solution for all express lane projects. To support statewide goals, every project should be customized for site specific constraints while ensuring that customers will have a consistent experience when using all express lane facilities throughout Florida. Design guidance has been established for the following design elements:

- Geometry
- Lane Separation
- Access
- Signing and Pavement Markings
- Incident Management & Enforcement
- ITS
- Tolling Infrastructure

The purpose of the design chapter of this handbook is to provide recommendations and guidance for the above design elements, where not covered in the PPM or Design Standards, specific to express lanes. Other design criteria and standards, not specific to express lanes, are contained in the PPM and Design Standards. Design Exceptions and Design Variations from Federal and State adopted design criteria will be required to go through the existing statewide process (see Chapter 23 of the PPM).

The design requirements for tolling infrastructure are detailed in the Florida’s Turnpike Enterprise General Tolling Requirements. The Turnpike should be consulted as the Districts develop concept plans to ensure consistency in tolling infrastructure design.

6.1 Background

Each of the design documents listed below provides some information that can be related to express lanes, but no one document offers comprehensive guidance for roadway designs specific to express lanes. The concepts provided in this handbook provide additional express lane design guidance to be followed in conjunction with the requirements included in the PPM and other applicable design references.

The following is a list of several design references applicable to express lane design:

- AASHTO A Policy on Geometric Design of Highway and Streets
- AASHTO A Policy on Design Standards – Interstate System
- AASHTO Highway Safety Manual (HSM)
6.2 Roadway Geometric Design Elements

The physical configuration and operation of express lane installations varies greatly and is driven by travel demand and physical constraints. The design may involve one or more directional lanes operated on a concurrent (with the flow of traffic) or reversible-flow (one direction in the AM, another direction in the PM) basis.

Geometric elements of express lanes in Florida must comply with all existing State and Federal design criteria. The governing document for highway design elements in Florida is the PPM. The PPM does not currently provide design criteria specific to Express Lane facilities. The roadway design office is in the process of developing criteria governing express lane design for inclusion in a future release of the PPM.

6.3 Separation

Express lanes are limited-access facilities that typically operate adjacent to general use lanes. The separation technique is one of the critical design decisions that influence the feasibility, operations, and constructability of an express lane project. Other major design elements discussed in this chapter, such as geometry, access, and ITS design elements, are also dependent on the type of separation chosen for a project. Project implementation costs, operation and maintenance costs, safety and operational characteristics, type of enforcement, and traffic incident management are greatly influenced by the type of separation treatment. All express lane facilities should be constructed to the inside (median side) of the general use lanes to reduce costs and maintain general use lane access to cross streets.

There are four separation treatments that can be used for express lanes: barrier separation, grade separation, buffer separation, and wide buffer separation. When considering separation treatments, the greater the physical and/or spatial separation, the better the operating and safety performance of both the express lanes and the general use lanes. In urban areas where right of way (ROW) is severely constricted, consideration may be given to grade separation. However, if project costs or corridor limitations do not allow for barrier, median, or grade separation, then buffer separation with express lane markers must be used.

Project goals, design specifications, safety characteristics, implementation and maintenance costs, access considerations, tolling operations, incident response, and enforcement are key factors for consideration when selecting the separation technique to be used for each project. Therefore, the separation technique must be determined on a project by project basis, with consideration of its impacts to all of these factors.
6.3.1 Barrier Separation

In this lane separation technique, continuous concrete barrier walls or movable barrier walls are used as separators between the express lanes and the general use lanes. Some of the key benefits of this type of separation include elimination of access violations, improved traffic management, improved safety, and better access control. However, the use of continuous barriers is likely to increase project construction costs, may increase response time for incident management and emergency vehicles, reduce access to transit stations, and could require additional ROW to accommodate the required shoulders on both the express lanes and general use lanes. In addition, concrete barrier separation may limit future expansion.

6.3.2 Grade Separation

Grade separation of express lanes separates the express lanes from the general use lanes by placing them at different elevations. This is generally accomplished by placing the express lanes on a bridge over the general use lanes. Some of the key benefits of this type of separation include the elimination of access violations, improved traffic management, improved safety, and better access control. However, similar to barrier separation, grade separation is likely to increase project construction costs, may increase response time for incident management and emergency vehicles, reduce access to transit stations, and could require additional ROW. Future expansion of the elevated system or modification of access points may be cost prohibitive with grade separation.

6.3.3 Buffer Separation

This separation technique uses a combination of pavement markings with a series of orange tubular pylons, called express lane markers, to separate the express lanes from the general use lanes. Express lane markers are more effective than pavement markings alone to provide visual separation, maintain lane positions, and discourage crossover access movements. FDOT’s preferred buffer separation distance is four feet. Express lane markers must conform to the guidelines published in FDOT Development Specification 993. This separation technique cannot be used for reversible lane operations.

Buffer separation requires less ROW than other separation options. This technique provides convenient access for emergency responders to the express lanes. Although access may be improved for emergency response, narrower buffers do not provide sufficient area for emergency vehicles to park during recovery operations. Buffer separation is a simpler option for the operating/maintenance agencies to retrofit and expand in the future. Buffer separation can also provide a lower construction costs compared to barrier or grade separation and simpler incident clearance procedures. Due to the ease of retrofitting existing limited access facilities, this option provides a relatively inexpensive and expedient implementation. Future expansion is accomplished by relocating the pavement markings and express lane markers.

The cost of recurring maintenance of express lane markers is high when compared to other separation options due to frequent replacement of damaged express lane markers. Buffer separation also includes high rates of access violations compared to barrier separation options, and greater friction between faster moving express lane traffic versus slower moving traffic in the adjacent general use lanes. This option requires enforcement strategies which incur additional cost.

6.3.4 Wide Buffer Separation

Where ROW is available, wide buffers can be used to separate the express lanes from the general use lanes. Wide buffers can be grassed median islands or pavement markings that are more than one-lane wide and require full width shoulders on both sides. Longer transition distances will be required to traverse wide buffers and the required shoulders, but a wide buffer can offer a higher
level of safety than at-grade concrete barriers or narrow buffers. Further advantages of median separation include better access control, additional room for ramps, improved incident management options, and space for signs, lighting, and ITS equipment. Drainage can be improved using grassed median islands by increasing pervious area and providing better storm water collection in the case of depressed median islands. Drainage must be provided in depressed medians to ensure that no water stages in the vehicle recovery area. Future expansion is facilitated wherein wide buffers can be converted to additional lanes using either barrier or buffer separation. Wide buffers may have higher construction costs for retrofit projects and additional ROW requirements.

6.3.5 Considerations When Determining the Type of Separation

Safety, operations, and cost are key considerations when determining the type of separation to be used for an express lane facility. Depending on specific project objectives, additional considerations may include flexibility associated with accommodating future corridor growth.

If the project has adequate ROW and a need to accommodate future corridor growth or future phasing, express lane configurations using a wide buffer separated system can provide room for future pavement when the additional lane is needed. The roadway can be milled, resurfaced, re-stripped, and the express lane markers shifted once additional capacity is needed. This approach also minimizes future relocation of ramp terminals and bridges.

When designing barrier separated express lane facilities, designers will often break the cross slope of the roadway at the barrier in superelevated regions to minimize embankment requirements. This technique is called non-coplanar construction because each portion of the roadway traveling in the same direction is not aligned with the other portions of the roadway traveling in the same direction. An example of this non-coplanar roadway configuration, with express lanes and general use lanes, is shown in Figure 6-1.

![Figure 6-1: Non-Coplanar, Barrier Separated, Cross Section](image)

Although the non-coplanar approach is an economical solution in the short term, it may require major reconstruction for future expansion. As can be seen by comparing the two cross sections in Figure 6-1, widening the non-coplanar express lanes by one lane in each direction requires complete reconstruction of the general use lane facility as well. It may also require the replacement of bridges within the corridor.

A coplanar design, where the adjacent lanes in the same direction are vertically aligned with each other, has lower long term expansion costs. An example of a coplanar system is shown in Figure 6-2.
6.4 Access

Access points should be located and designed in a way that will not produce adverse impacts to the express lanes and the parallel general use lanes. Access is a key element in managing the traffic flow in express lanes. Allowing vehicles to enter (ingress) and exit (egress) at limited locations enhances the operations of express lanes by encouraging longer distance trips and reducing potential congestion from friction. It is critical to select the location of the access points early in the planning phase based on operational analysis to minimize weaving and provide safe travel for users entering and exiting the express lanes system.

There are three types of access points between general use lanes and express lanes:

- **Point of Entry**: This access point is located at the beginning of the express lane corridor.
- **Intermediate Point of Ingress or Egress**: This access point occurs within the express lane corridor where traffic enters the express lane from the general use lanes or exits the express lane to the general use lanes. Intermediate ingress and egress points may also include access to the surrounding roadway network directly to or from the express lane.
- **Termination Point of Exit**: This access point occurs at the end of the express lane facility where all express lanes merge back into the general use lanes with a standard highway cross section.

Operational and safety studies will be needed in conjunction with the Regional Concept of Traffic Operations (RCTO), project specific Concept of Operations (ConOps), T&R studies, and local master plans to identify the most appropriate access locations and types. Consideration of park and ride locations and transit facilities should also be considered when determining ingress and egress locations. These decisions can be made at the planning level and must be supported with detailed design level analyses. Access locations and types should be finalized in the project ConOps. Slip ramp, weave zone, and weave lane access locations should be supported by the operational analysis and designed in a way that will not produce adverse impacts to the operation of the express lanes or the adjacent general use lanes. The locations of slip ramp access points needs to be closely coordinated with general use lane entrance and exit ramps to allow adequate distance for motorists to complete weaving movements when moving between the express lanes and general use lanes. Operational analyses must demonstrate that queuing from vehicles exiting the express lanes to the general use lanes will not encroach on the express lanes.

Express lanes in Florida may provide the following types of access: direct connect ramps, slip ramps, weave zones, and weave lanes. Key design factors that influence the selection of an access treatment are safety, traffic volumes, interchange spacing, areas of congestion, the surrounding roadway network, and separation techniques. Detailed operational and safety studies are needed to identify the most appropriate access locations. In addition, long-range plans, ROW constraints,
environmental issues, and project costs are other factors that need to be considered prior to selecting the access locations and treatments.

6.4.1 Slip Ramp Access
Slip ramps provide connections between the express lanes and general use lanes using breaks in the separation techniques (e.g.; barrier or buffer). Slip ramp access allows for either ingress or egress typically facilitated by an exclusive lane. The proper design of a slip ramp reduces the potential for unstable flow created by the speed differential between the express lanes and general use lanes at the access points. Special consideration must be given to operations during peak congestion times to prevent spillback of the egress traffic into the express lanes. Design considerations should also be made to minimize the potential of unintended movements in a slip ramp. Slip ramps do not require an interchange access request.

6.4.2 Direct Connect Ramps
Direct connect ramps provide access to and from the express lanes using dedicated grade separated ramps. These types of ramps are best used when they are not the last exit in a tolling trip as defined in Section 7.4.1, where sufficient ROW is available, the surrounding roadway network will support it, and high traffic volumes or operations dictate the need for the exclusive connections. Direct connect ramps are also the preferred access type for system-to-system connections between express lane facilities, toll facilities, major arterials, park-and-ride facilities, and for transit facilities. Direct connect ramps on an Interstate Highway will require an interchange access request.

Advantages of using direct connect ramps include reduced or eliminated weaving conditions with corresponding safety benefits, improved travel times, and improved transition areas, which allow high-speed merges and diverges.

Disadvantages for direct connect ramps are higher construction costs, longer construction schedules, complex design, a larger construction footprint, and the potential need for additional ROW. Another disadvantage is a violation of driver expectancy with left-side ramps and a stop condition at the ramp terminal. The design of direct connect ramps should provide adequate stopping sight distance. Careful attention to geometric design, signing, and pavement markings is essential to mitigate potential wrong way entries. When combining general use lane exits and express lane exits in a “braided ramp” configuration, the express lanes exits should merge on the right side of the general use lanes.

When connecting two express lane facilities, direct connect ramps provide the express lane users a seamless travel option to continue using the express lanes on another facility without having to enter and weave across the general use lanes. However, there are roadway geometric challenges associated with making system-to-system express lane direct connections. Primarily, the number of connections that must be made when connecting express lane facilities. Including all of the possible general use lane and express lane connections using traditional interchange designs is complex, costly, and may require long ramps with three or four levels.

6.4.3 Weave Zone Access
A weave zone access consists of a short break in the buffer striping and express lane markers at strategically chosen locations allowing for simultaneous ingress and egress. Weave zone access is generally used on facilities that have buffer separation. The weave zone requires no extra roadway width and is easier to retrofit on existing freeways. However, weaving movements have safety and operational issues and are not desirable for barrier separated facilities. When designing the length of
weave required for safe and effective operations, transit vehicle operating characteristics should be considered in locations where transit operations are planned or anticipated.

6.4.4 Weave Lane Access

A weave lane is similar to a weave zone in that it allows for simultaneous ingress and egress of the express lanes; however, an additional lane is provided to accommodate the weaving movements. This type of access allows the weaving and speed changes required for merging to and from the general use lanes and the express lanes to occur in a separate location that has less impact on traffic than a weave zone. A weave lane may require additional roadway width and ROW due to the additional lane that is required to allow weaving.

6.5 Signing and Pavement Markings

Express lane signing communicates information regarding access locations and toll amounts to specific destinations in a clear, concise, and timely manner without overloading the user with information. Consistency of signing across the express lane network and the state is important for express lane usage and public acceptance. The signing recommendations in this handbook are intended to provide consistency across the state, similar to what is expected on signing for toll plazas. This handbook is intended to provide recommended guidelines for sign messages, layouts, and relative locations.

Express lane signs must comply with the MUTCD, the PPM, FDOT Design Standards, and the TPPPH. Within the MUTCD, express lanes are referred to as priced managed lanes and sign guidelines are categorized under “Chapter 2G – Preferential and Managed Lane Signs.” Express lane signs are detailed in the TPPPH guide drawings and cover the following:

- **Regulatory Signs**
  - Vehicle eligibility signs
  - Express lane termination signs
  - Toll amount signs
- **Advance Guide Signs**
  - Point of entry
  - Point of exit

6.5.1 Regulatory Signs

Vehicle Eligibility Signs convey restrictions on the number of axles and allow bus axle exceptions within the express lanes. Per the express lane Directive, vehicles with more than two axles are not allowed to operate in express lanes unless otherwise approved and indicated by regulatory signs.

Locations, messages, and layout of the express lane termination point signs will follow the regulations in the MUTCD. The express lanes termination point signing is classified as regulatory signage because in addition to indicating the end of the express lane tolling, the point of exit also indicates the end of vehicle eligibility restrictions. The termination point of exit signs and messages are particularly important when vehicle eligibility or occupancy requirements change downstream of the express lane designation.

As required by FAC Rule 14-100.003 the toll amount sign and toll amount dynamic message sign (DMS) are used to display real-time toll amount information to users identifying the cost of using the express lanes to a specific destination. Since the toll amount sign is used to influence driver decisions to make use of the express lane or not, it is important that the sign be clear, legible, and straightforward. The toll amount sign also includes information on the fee for toll violations.
The toll amount signs will be placed at locations as specified in the TPPPH guide drawings. FDOT requires a minimum of two toll amount signs, showing destination and price, prior to the entrance to the express lanes. The MUTCD provides minimum spacing requirements for express lane signs including toll amount signs.

Express lane facilities will be governed by the following rules for toll amount sign location and design:

- A toll amount sign sequence is required before each ingress point.
- A maximum of three destinations and toll amounts are allowed per toll amount sign.
- The last destination on the toll amount sign must be the end of the tolling trip.
- Destinations and toll amounts shall not be repeated on toll amount signs for users within the express lanes.
- Prices must be displayed for each egress from the express lanes of the current tolling trip.
- An egress to the general use lanes must be provided within each tolling trip for users in the express lanes before a new trip begins so that users can choose to remain in the express lanes or exit.
- The final egress of each tolling trip should include access to the general use lanes.
- A toll amount sign indicating the toll amounts for the next tolling trip must be provided prior to the last point of egress to the general use lanes before beginning a new tolling trip.

### 6.5.2 Guide Signs

Express lane specific guide signs will follow guidance provided in the MUTCD and in the TPPPH guide drawings. In cases where the MUTCD and TPPPH differ, the TPPPH should be used as the standard. The three major transition points between general use lanes and express lanes, defined in Section 6.4, require signing.

When the point of entry represents the initial entrance to the express lane network, the advance overhead signing is to begin two miles prior to the express lane entrance. In addition to the initial express lane signing, sequential overhead guide signs will be located at one mile, ½ mile, and at the express lane point of entry. For intermediate express lane entry points the advance signing is to begin one mile prior to the express lane access location and continue with the remaining sequence of signs at the same spacing as the initial express lane signing.

DMS indicating the comparative travel times or congestion levels between the express lanes and general use lanes are not recommended for use in Florida. These signs may be interpreted as a guarantee of travel times and may cause customer complaints when incidents that affect travel times occur.

Each advanced entry guide sign must have a DMS supplemental sign that displays the operational status of the express lanes. A traffic incident management DMS is required prior to each ingress point to the express lanes from the general use lanes. The incident management DMS location and configuration can be found in the TPPPH guide drawings. In order for the operational status DMS to be considered a regulatory sign, the message must be posted in white or black text on a white or black background.

**For Turnpike Express Lane Facilities:**

The legend “ADDITIONAL TOLL” should be used above the toll amounts on existing toll facilities with express lanes.
Intermediate point of exit guide signs, or local exit signs, are intended to inform express lane users which exits are served by exiting the express lane at the next point of express lane exit. Local exit signs are located above the express lanes and should include a list of exits immediately downstream of an intermediate express lane exit. The exits referenced on the toll amount signs should be displayed on the corresponding exit sign. The layout and design of the intermediate exit signs can be found in the TPPPH guide drawings. While the intermediate point of exit signs are considered guide signs, the termination point is considered a regulatory sign and guidelines for its use can be found in the regulatory signs Section 6.5.1.

6.5.3 Pavement Markings

The purpose of express lane pavement markings is to provide guidance and information for the road user. The references available to assist in the design of express lane pavement markings are the MUTCD, the FDOT Traffic Engineering Manual, TPPPH guide drawings, and FDOT’s Design Standards. Within the MUTCD, express lanes are referred to as priced managed lanes and pavement marking guidelines are categorized under “Chapter 3D – Markings for Preferential Lanes.”

When a general use lane transitions directly into an express lane, it is recommended that pavement messages reading “EXPRESS” and “ONLY” be placed in advance of express lanes access points. These messages should be co-located with overhead advance guide signs. At intermediate points of entry the pavement messages can be used when slip ramps or merge lanes transition directly into the express lane. The pavement messages should not be used in weave zones or weave lane access treatments. For font, sizing, spacing, and color guidelines refer to the MUTCD.

The TPPPH guide drawings shall be referenced for express lane longitudinal pavement marking and buffer zone details. For areas not addressed in the guide drawings, reference the MUTCD “Chapter 3D.02, Preferential Lane Longitudinal Markings for Motor Vehicles.”

6.6 Incident Management and Enforcement Design Considerations

Incident management and enforcement are two critical operational needs of express lanes and require coordination between Design staff and Operations staff to ensure the preferred geometric design concept supports operations and vice versa. The anticipated operations for incident management and enforcement of the express lanes is examined on a project-specific basis to identify and incorporate required design elements. How incident management is performed under existing conditions and how it will be performed under future conditions are both design inputs for the express lanes project. Design elements such as roadside toll equipment, emergency turn-around areas, access to the express lanes, staging areas, and incident investigation areas may be necessary to support the operational needs of an express lane project. Design considerations may include the following:

» How will access to the express lanes be accommodated for first responders?
  ▪ Are emergency turnaround areas required?
  ▪ Are staging areas required?
  ▪ Are accident investigation areas necessary?
  ▪ Are existing facilities available for accident investigation?
  ▪ Are emergency access locations needed?

» How will the express lane roadside traffic enforcement be conducted?
  ▪ Are shoulders adequate for enforcement?
  ▪ Is an enforcement area necessary?

» How will towing be addressed?
  ▪ Are quick clearance policies in place?
  ▪ Are special incident management vehicles needed?
Do special areas need to be provided for incident investigation?

As discussed in Chapter 8, it is critical for early coordination during the project concept development phase to identify any design needs resulting from the envisioned project.

### 6.7 ITS Design for Express Lanes

At a minimum, the following ITS components should be incorporated into express lane projects:

- DMS
- CCTV cameras
- Vehicle detection systems (VDS)
- Power systems
- Communication systems
- Transportation Management Centers (TMC)

The FDOT [PPM](#), FDOT [Design Standards](#), FDOT [Standard Specifications](#), [MUTCD](#), and other ITS design guidelines from FDOT provide general ITS design standards which are also applicable to express lanes. Additionally, the designer should be aware of the Federal Communications Commission (FCC) regulations and will coordinate with the [FDOT ITS Telecommunications Office](#) for information on licensing, frequency allocation, and other specifics.

It is recommended that a [Systems Engineering Management Plan](#) (SEMP) be conducted prior to developing the system requirements for the express lane network. ITS equipment critical to the operation of express lanes are a priority maintenance item. The ITS equipment that is used in support of the express lanes should be located to ensure ease of access and maintainability, minimizing the need to require any facility or lane closures.

Communication network needs related to toll collection shall be coordinated directly with the Turnpike and be incorporated into the ITS design. The [GTR](#) provides information on the tolling communication network requirements.

#### 6.7.1 Dynamic Message Signs

Express lane DMSs are used to disseminate real-time traveler information relevant to toll amounts, lane status information, incident management information, and special events information. All DMSs implemented for the express lanes should be full matrix and full color to provide the greatest flexibility.

The three types of DMSs required for express lane operations are:

- **Lane Status DMS**: Provides real-time express lane status updates. This includes notifying the user whether the facility is open or closed as well as any other warning that may be relevant prior to entering the express lane.
- **Toll Amount DMS**: Displays real-time toll amount information to users about the cost of using the express lanes to a specific destination.
- **Incident Management DMS**: Provides real-time traffic and event management information.

DMSs should be placed in accordance with the TPPPH guide drawings. The lane status and toll amount DMSs should be placed in advance of express lanes entry points so they can be observed by users before entering the express lanes.
6.7.2 Closed Circuit Television Cameras

There are typically two types of CCTV cameras needed to support the express lane operations:

- **Surveillance Cameras.** Used for incident management to help detect, monitor, and manage events on the express lane facility
- **Confirmation Cameras.** Used to monitor the toll amounts and DMS signs from the TMC

The surveillance cameras should be located to provide 100 percent coverage of the express lane facility so there are no blind spots. This includes the express lanes, under overpasses, shoulders, entry and exit points, and all ramps. For new express lane projects on facilities with existing ITS infrastructure, CCTV camera coverage should be reviewed and supplemented as needed to obtain full coverage of the entire facility.

The confirmation cameras are typically deployed at upstream locations of express lane DMSs to verify the operation and messages posted on toll amount DMSs, lane status DMSs, or incident management DMSs. Each DMS sign should have a confirmation camera to allow for DMS message verification.

6.7.3 Vehicle Detection Systems

VDS is primarily used on the express lane facility for obtaining real-time traffic data such as volume and speed. The VDS should provide traffic data for each lane of the express lane facility. The traffic information collected through the VDS is used by the operators for incident detection and by the toll setting software to determine toll amounts.

VDS location guidelines for express lanes include the need for a VDS site at every 1/4 mile to 1/3 mile, providing coverage of express all lanes. For new express lane projects on facilities with existing ITS infrastructure a review of existing VDS coverage will determine any supplemental VDSs needed for full coverage of the entire facility. Consideration should be given to the data accuracy of the VDS based on local conditions. The accuracy of the existing or proposed VDS should be reviewed to ensure that the devices that are proposed for the facility can provide adequate information for the purpose of tolling the facility.

The spacing of the VDS sites impacts the granularity of the data collected (i.e. more granularity when the sites are closer). An advantage of higher granularity is ensuring the redundancy of data on a segment, even when some of the VDS sites do not produce accurate data at a given time. Some of the disadvantages of closely spaced VDSs are higher recurring maintenance costs (due to more devices along a segment), and increased data storage and processing needs.

6.7.4 Power Systems

Providing reliable power services to the express lane facilities is critical to ensure there is minimal downtime of the ITS infrastructure, and thereby more reliable express lane operations. In addition to the main power distribution, a backup power system consisting of generators, uninterruptible power supplies (UPSs), and other associated components need to be planned and designed to support power requirements for all ITS and toll components.

UPS systems and power generators provide a continuous power supply in the event of a power outage, thus minimizing potential revenue loss. Vandal resistant hardening needs to be incorporated into the power system design.
6.7.5 Communications System
The majority of Florida’s ITS infrastructure uses fiber optic cable and Ethernet based communications systems to provide communications from the TMC to field devices, such as DMS, CCTV, VDS, and ramp meters. As express lane projects are implemented, the existing communications system may need to be supplemented or upgraded to support the project needs. The ITS communications system also supports the tolling components of the express lanes. Any modification to the communications system must be coordinated with toll operations. Redundancy across the communications network is required to ensure the express lane facilities are reliable and operate with minimal downtime.

6.7.6 Transportation Management Centers
The TMC is an around-the-clock operation that requires continuous staffing every day of the year. The TMC provides real-time traffic management that is critical to successful express lane operations. The express lane software will also be operated from the TMC. An early design consideration during the express lane implementation should include planning for any expansions as related to the TMC building infrastructure to handle these new operations.

6.8 Tolling Infrastructure
The GTR provides information on tolling points including toll gantries, toll equipment, gantry building details, communications systems, and power systems. The TPPPH contains details on the signing, pavement marking, and roadway design within the tolling point. The design staff should coordinate with the Turnpike Project manager when designing the location of the tolling infrastructure.
7 Toll Collection

The tolling of express lanes is established by FAC Rule 14-100.003 with the ultimate goal of managing traffic demand through the use of dynamic pricing in order to promote free-flow traffic and maximize throughput of the express lanes. For express lanes in Florida, Florida’s Turnpike Enterprise (Turnpike) will be responsible for the collection of tolls and all tolls will be collected via SunPass® or an interoperable transponder. Toll-by-Plate will not be a valid toll collection option for express lanes. All express lane facilities will use dynamic pricing to manage demand in the express lanes. Enforcement of a toll violation on the express lanes is the responsibility of the Turnpike and will be handled by the Turnpike Back Office. Enforcement of all other express lane policies is discussed in Section 8.6.

7.1 Florida Express Lane Toll Collection System

The toll collection system has six primary functions:

- Detect vehicles traveling in the express lane
- Identify the transponder ID, license plate, and vehicle classification (number of axles)
- Create the toll transactions
- Build trips and assign toll amounts
- Collect revenue, process violators, and issue statements
- Provide customer service and account management

The major components of the toll collection system, as shown in Figure 7-1, include roadside toll equipment, the transaction host, and the tolls back office, all connected by a system of telecommunications.

7.1.1 Roadside Toll Equipment

The primary function of the roadside toll collection equipment is to reliably create accurate toll transactions. There are several technologies deployed at the roadside as part of the toll collection
Vehicle detection is performed by a series of inductive loops installed in the roadway. The loops are specifically designed and located through the tolling point and they detect and record vehicles’ exact locations when their axles pass over. This location information is used for triggering violation cameras. The loops are also used to determine vehicle separation distance, which aids in correlation of images, transponder reads, and classification and ensures that each vehicle generates only a single transaction. Special loops, such as gradient loops, perform vehicle classification by detecting the number of vehicle axles.

Automatic vehicle identification is performed when the RF reader and antenna send a signal out to the roadway in front of the gantry. As a vehicle approaches the gantry, the SunPass® transponder receives the incoming signal, and a signal is reflected back to the reader with the transponder's information.

Proprietary algorithms within the toll system use the loop and transponder data as a trigger for the violation cameras. The violation cameras capture front and rear license plate images of vehicles in the express lane. Images are taken for every vehicle that passes under the toll gantry and the license plate information is matched to a customer’s account. A violation and a fine is issued if a customer violates the express lane SunPass® policies. A violation of express lane SunPass® policies would occur if a vehicle is not a registered SunPass® holder or if they are not a vehicle that is exempt from the toll as established in Section 3.3.1.

The toll equipment, including the equipment on the gantry and the loops in the pavement, send the information collected to a climate controlled, roadside shelter that contains servers, network switches, and uninterruptable power supplies. The servers process the data and develop the transactions. Transactions are then transmitted to the transaction host via fiber optic network and/or high-speed leased circuit telecommunication lines. The transactions are also stored temporarily at the roadside equipment building as a back-up in the event of a communications failure or other system failure events. The servers also send system health information to the host and back office and receive data from the host (such as the positive list of active, valid transponders).
7.1.2 Transaction Host

All express lanes in Florida that are operated by the Turnpike send their transactions to the transaction host. The host serves as the clearinghouse between the express lanes and the back office, where customer accounts are maintained. The transaction host also serves as the repository for toll transactions and is the system of record. As transactions are processed through the back office, the back office system creates amendments for associated transactions, and returns and stores the amendments in the host.

7.1.3 Toll System Back Office

The Tolls System Back Office supports both express lane tolling as well as traditional tolling across the state for facilities owned or operated by the Turnpike. The back office consists of computers and servers, for the automated processing of transactions, and staff to complete manual processes that require human intervention, such as, manual image review of license plates, violator processing, reporting, monitoring, and customer service elements. The toll system back office performs several express lane functions, including:

- Receiving the toll amount data from the various Traffic Management Centers (TMCs) around the state. The District TMCs will determine the toll amounts using dynamic pricing algorithms and send the toll amounts to the Turnpike for processing
- Processing the toll amounts received from the Districts and determining the appropriate charges for customers
- Providing customer service and account management for all SunPass® customers
- Processing toll violations
- Processing transactions for toll-exempt vehicles

Toll violations are handled by the Turnpike’s back office and are discussed in detail in Section 8.6.2.

7.2 Toll System Interfaces

Express lane systems in Florida consist of two systems running in parallel, with key interfaces between them. These two systems and the interfaces needed to support express lane operations are the Turnpike toll collection system and the District ITS and pricing system. The interaction between the two systems is shown in Figure 7-3. The Turnpike operates the toll collection system and is responsible for processing toll transactions through roadside toll equipment and back office systems. The District is responsible for the management of the express lane traffic operations through the TMC.

The toll lane equipment is connected to the Turnpike Back Office through the Turnpike transaction host, while the ITS roadside equipment connects to the TMC. The ITS roadside components include traffic sensors deployed along the express lanes, dynamic message signs (DMS) displaying express lane status and toll amounts, traffic control devices (such as gates), and closed-circuit television (CCTV) cameras for incident management.

The three key interfaces between the toll collection system and the ITS/pricing system are:

- **Toll Amount Interface.** This interface is used by the Turnpike to receive the final toll amount information from the TMC / Pricing System. This interface will be used for all express lanes throughout the state.

- **Customer Service Interface.** This interface allows the Turnpike Customer Service Representatives to look at information that was posted on the toll amount DMS when customers have questions
regarding transactions. The Turnpike also has an Interface Control Document that describes this interface.

\[\text{Reversibility Interface.}\] This interface is used by the TMC to send a signal to the toll system to change the direction in which the toll point operates. This interface is only needed if the express lane is a reversible system.

### 7.3 Toll Amounts and Pricing

Dynamic pricing is the primary operating mode that shall be implemented on all express lanes in Florida. Dynamic pricing adjusts the toll amount based on traffic conditions in the express lanes. Operating modes other than dynamic pricing are to be used only on a temporary basis for operational purposes as defined in project specific operating guidelines.

The Districts are responsible for determining the toll amount for the express lanes using dynamic pricing under normal operating conditions. The toll amounts shall be determined by toll setting software. The goal of the toll setting software’s algorithm shall be to promote free-flow traffic and maximize throughput. The pricing goal is discussed in further detail in Section 3.3.3. The toll amounts should be updated in 15-minute intervals by the toll setting software for normal operating conditions. The toll setting software will be operated by the District TMC. Toll setting software is currently being evaluated for use on all express lane facilities. All FDOT Districts shall use the same toll setting software to operate each of the express lane facilities once the evaluation is complete.

The toll setting software shall have the ability to run an automated pricing schedule and support manual override of posted toll amounts for exception cases such as a significant equipment problems or a major traffic incident. If there is a traffic incident, the TMC shall have the ability to manually control the toll amounts posted on the toll amount DMSs. The TMC shall also have the ability to retroactively modify the toll amount created by the pricing system prior to sending the final toll amounts to the Turnpike back office. These retroactive adjustments will never be more than the original toll amount. The Turnpike receives only the final toll amounts from the TMC within 48 hours.
7.4 Express Lane Segment

An express lane segment is the distance between an entry point to the express lanes and the next point of exit (Figure 7-4, Example A). If there are multiple entry points before an exit point, the segment is defined to be the distance between the first entry point and the exit point (Figure 7-4, Example B). If there are multiple exit points following an entry point, the segment represents the distance between two successive exit points (Figure 7-4, Example C).

Gantries shall be placed between successive entries, between an entry point and an exit point, and between successive exits, unless the entry or exit points are spaced less than one mile apart or physical constraints prevent the placement of such structures.

Gantries placed between successive entry points (i.e., data gantries) do not charge a toll but rather collect data to accurately account for the time to travel from the toll amount DMS to the tolling point. All other gantries will charge the toll in effect at the time of entry. Every segment has only one toll gantry that charges a toll. The minimum toll is $0.50 at each gantry where a toll is charged. **FAC Rule 14-100.003** contains additional information on toll rates. Any exception to this tolling plan must be

<table>
<thead>
<tr>
<th>For Turnpike Express Lane Facilities:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The minimum additional toll is $0.25 for tolled facilities.</td>
</tr>
</tbody>
</table>

initiated by the District in coordination with the Turnpike and approved by the Secretary.
7.4.1 Trip Building

A tolling trip is comprised of one or more contiguous segments. Figure 7-5 illustrates the six tolling trip possibilities of an example express lane system, for a single direction of travel, which is composed of three segments. For longer express lane systems that have more than three segments, trip building systems, consisting of no more than three segments, can be established in series with a decision point for the customer to stay in or get out of the express lanes within the tolling trip. The linking of trip building systems together is shown in Figure 7-6.

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**Figure 7-5: Trip Possibilities for a Three Segment Express Lane System**

**Figure 7-6: Linked Trip Building Systems**
A customer in the general use lanes will see a toll amount DMS which displays the toll amount that will be charged to the customer for traveling to one or more destinations in the express lanes. Each possible express lane exit in the current tolling trip, and the associated destination, is provided with the associated toll amount. The toll amount seen by the customer on the toll amount DMS is locked in upon entry to the express lanes for travel to the destinations shown on the sign. Therefore, the customer will be charged no more than what is posted on the toll amount DMS for traveling to the destinations shown even if the toll amounts change after customers enter. If the toll amount is reduced after a customer has entered the express lanes and while the customer is still in the express lanes, the reduced toll amount will be charged.

Each of the express lane segments within a tolling trip may have different toll amounts, which when added together, form the total trip toll amount. Even though the toll amounts will be charged on a segment-by-segment basis, and reported as such on the customer’s statement, trip building is necessary to ensure that drivers who get into the express lanes and travel through multiple segments pay the lower toll between what they see on the toll amount DMS and what is actually charged at the successive toll gantries within the tolling trip.
8 Operations

Consistency in express lane operations is important from the customer’s perspective to establish a consistent experience throughout the statewide network. Customer expectations need to be met and confusion minimized. Different characteristics of express lane facilities may lead to operational differences as a result of physical constraints such as, the need for reversibility of the express lane segment, ingress and egress point design, and location or the use of other technologies along the corridor (e.g., ramp metering, changeable lane assignments, etc.). Express lane facilities may also use multiple augmenting operational strategies, such as, traditional traffic management and active traffic management.

Express lane system operations need to be determined early in the planning process. Operations staff should be involved in the developmental process of the express lanes during the planning, PD&E, design, construction, and implementation phases of the project.

Coordination should occur between the Turnpike, District, and Central office as well as with other regional operations partners. Regional operations partners may include county and municipal public sector agencies, transit agencies, law enforcement, first responders, and towing companies. These entities should be engaged early in the development of a Regional Concept of Transportation Operations (RCTO) document, which will address how express lane corridors within the region work within the framework of an interconnected express lanes network. The RCTO describes how the system will work from the stakeholders’ perspective and outlines their roles and involvement in operations. In addition to the RCTO each project develops a Project Concept of Operations (ConOps) document which builds on the RCTO and outlines on a project level how the express lane project will operate within the context of the larger network.

8.1 Operations Involvement

Traffic Operations, ITS, Tolls, Roadway Planning and Design, Traffic and Revenue Finance, Project Finance, and Maintenance must be involved at the beginning of the express lane project with ongoing involvement through the project development and lifecycle. How express lane projects are operated directly influences the way they are designed.

8.2 The Need for Consistency

There are multiple operational considerations on express lane projects that require statewide consistency, including customer communications, customer service, tolling approach, and incident management coordination.

8.2.1 Customer Communications

The primary questions asked by express lanes customers include:

- How can the facility legally be used?
- When/where can it be accessed?
- How much will it cost?

From the customer’s perspective, the rules of use and access locations are communicated by information provided to customers before they use the express lanes and while they are on the roadway. Project specific information should be provided on project-specific web pages and with consistency in public communications throughout the state. Roadside signage and pavement markings provide a consistent message for operations, such as access restrictions, vehicle eligibility,
and toll amounts. Additional details for signage and pavement marking design are discussed later in this chapter, as well as in Section 6.5.

The cost of using the express lanes must be clearly displayed and easy to understand. Toll prices and messages must be presented in a consistent manner throughout the state and SunPass® statements need to be consistent so customers understand how they are being charged after using an express lane facility. The primary communication of the toll amount to the customer is through the toll amount DMS. The message placed on the toll amount DMS should be easy to comprehend and consistent across the statewide network. The customer SunPass® statement provides the customer with a summary of the toll amount(s) they were charged each time they used the express lanes in addition to any other toll facilities they may have used.

8.2.2 Customer Service

Florida’s Turnpike Enterprise operates the SunPass® call centers which provide the primary point of contact and customer interface for customer service questions. Calls on the operational performance of the express lanes are received by the District Traffic Management Center representative. Therefore, consistency in the operations of the express lanes throughout the state ensures that customer service personnel at the call centers can effectively communicate with customers and respond to questions on the express lanes and on the customer’s SunPass® account statements.

SunPass Call Center Representatives utilize a single set of tools to answer customer inquiries related to their SunPass® accounts. The Turnpike has established an interface to access the District data on the dynamic pricing for each of the express lane facilities. The interface allows Call Center Representatives to access the express lane toll amount information and events associated with closures in a consistent manner.

Coordination of answers to Frequently Asked Questions and establishment of procedures for addressing inquiries in a consistent manner are essential to maintaining quality customer service throughout the state.

8.2.3 Incident Management

It is necessary to have consistent planning for various first responders including fire, rescue, city, county, tow trucks, etc. These responders need to know what is expected of them during incident management operation of an express lane facility. Differing procedures can lead to confusion and mistakes when responding to an incident. Standard Operating Procedures (SOP) established by the TMC operations team, outline predefined response scenarios for establishing a consistent incident management operation.

8.3 Concept of Operations

Each region in the state, which may include a single District or multiple Districts, will develop a Regional Concept of Transportation Operations, or RCTO. In addition, a project specific Concept of Operations (ConOps) document will be developed for each express lane project and used to communicate the corridor characteristics to all stakeholders. Identification of what the system will look like, how it will be operated, and the roles of stakeholders are all key components of the ConOps.

8.3.1 Regional Concept of Transportation Operations

Each region of the state shall develop an RCTO based on the area’s express lane network long-term vision per the express lane directive discussed in Section 4.5. The RCTO document will outline the
agreements among the different stakeholders of the region on how to operate the express lane network. The RCTO will also establish an express lane Network Executive Oversight Committee, appointed by the District Secretary, which will continue to guide the development process for its particular region.

8.3.2 Project Concept of Operations

A Project ConOps is a project-specific document which focuses on the operational concepts for each specific express lane project. Each express lane project shall develop a project ConOps during the planning phase which will build off the RCTO. The ConOps should be updated at least annually or as needed during each phase of the project development and throughout the life of the project as the system and operational roles and procedures mature. The ConOps is a critical component to the systems engineering process that provides the framework for the future development of operational and design requirements. The ConOps should follow the FDOT ITS ConOps outline, which was derived from the Society of Automotive Engineers (SAE) and the Institute of Electrical and Electronics Engineers (IEEE) national standards for a ConOps.

The project ConOps will:

- Identify the stakeholders and define how the system will be used with stakeholder agreement on how the system will operate
- Identify who is responsible for various aspects of the express lane operations and maintenance, documented through a responsibility matrix
- Establish lines of communication to each of the stakeholders and public information
- Define the project system concept including the identification of anticipated costs
- Identify any needs of phased implementation and how it will be coordinated
- Define the ITS support environment in which the system will operate
- Establish project operational requirements
- Identify specific design needs based upon any unique typical section constraints
- Identify the responsibilities of the District TMC, the Turnpike TMC, and the Turnpike back office
- Define the operating modes for the software
- Outline the dynamic pricing algorithm
- Contain a signing concept plan including ingress and egress locations and toll gantry locations
- Detail incident management and enforcement strategies
- Identify space, staffing, and change management requirements
- Identify any SunGuide® or toll setting software requirements for operation

8.4 Signing for Communication

Express lane signage needs to communicate information regarding points of entry, points of exit, and toll amounts to specific destinations in a clear, concise, and timely manner without creating an information overload to motorists. Section 6.5 of this handbook provides specific guidelines for sign messages, sign layouts, and relative sign locations. While sign messages and communications should be consistent from region to region, toll amounts are driven by demand and are the responsibility of the Districts.

8.5 Transportation Management Centers

Transportation Management Centers (TMCs) are central to the daily operations and overall success of an express lane project. The TMC uses data collected from the roadside detection equipment and processed through a statewide express lanes algorithm to set the toll amount for each segment of the express lanes. Additionally, operators within the TMC monitor the express lanes to ensure that they are operating effectively and to respond to incidents within the express lanes and the general
use lanes. Operators may also override the express lane toll pricing algorithm as a result of incidents within the express lanes and other prevailing traffic conditions.

The TMC is the center of operations for managing traffic incidents. It is critical that incident detection, verification, and clearance happen as quickly as possible in order to ensure that the efficient operation of both the express lanes and the general use lanes is maintained. Incidents are to be communicated to motorists through dynamic message signs (DMSs) that will provide customers with updates. Incidents in the express lanes will affect user expectations for reliable travel times. All incidents should be cleared as quickly as possible using established quick clearance policies for incidents in the express lanes and in the general use lanes, to minimize their effect on the operation of the express lanes.

Toll amount signs and express lane status signs are critical to operations and tolling and shall be monitored to ensure the correct toll price and the correct express lane status messages are being displayed. Traffic detection devices and equipment used to control dynamic pricing and tolling messages also need to be monitored to ensure that they are operating as expected. Because the operations of the equipment associated with monitoring and conveying information about the express lanes has a direct effect on what customers are charged, Districts must establish policies and procedures for monitoring and responding to problems with ITS technologies used for express lanes. Performance measures for devices will need to be established to repair or replace the equipment in an expedited manner.

For reversible express lane facilities, the TMC is responsible for opening and closing the facility, as well as to monitoring the gates and access points. TMC operators utilize cameras to confirm the reversible lanes are clear of stalled vehicles and opposing traffic before switch of direction is initiated. A physical drive through of the facility before it is opened to opposing traffic shall be required by the SOP for reversible facilities that do not have complete camera coverage of the facility. Before the facility is reopened, a towing vehicle will be required to remove any vehicles that would be facing the wrong direction after the facility is reversed.

The TMC will need trained operators who can assist with express lane operations, such as manually adjusting the toll amounts and accepting toll amounts that are generated by the software. The enhanced role of operations will also include an understanding of notification guidelines and design strategies. Express lanes are a premium service and TMCs may need to adapt to all day monitoring if this is not part of the current operations. The level of monitoring would be most intense during the peak periods of operation and may only require minor monitoring during the off-peak periods.

8.6 Enforcement

Express lane enforcement falls into two categories: enforcement of traffic infractions and toll violation enforcement. Traffic infraction enforcement of express lanes is the responsibility of the District through coordination with Florida Highway Patrol (FHP) or local law enforcement. All toll violation enforcement is handled by the Turnpike back office.

For Turnpike Express Lane Facilities:

Enforcement of express lane policy and traffic enforcement is the responsibility of the Turnpike through coordination with FHP.
8.6.1 Traffic Infractions
Traffic infractions in the express lanes are handled by state or local law enforcement officers. Typical traffic infractions related to express lanes operations include:

- Illegal lane changes (Crossing the buffer zone to access or exit express lane)
- Entering the express lanes when they are closed
- Speeding in express lanes
- HOV violations
- Restricted vehicle presence

How the traffic enforcement of an express lane facility will be accommodated is determined on a project level and documented in the project ConOps. Design coordination needs to occur in order to ensure enforcement strategy consistency across the regional express lane network; however, a project’s specific typical section may require design considerations such as enforcement areas or pull-offs for law enforcement.

8.6.2 Toll Violations
Toll violations, which consist of driving in the express lanes without being an authorized user, are handled by the Turnpike’s back office. FAC Rule 14-100.003 defines an authorized user as any person operating a motor vehicle in an express lane with an active SunPass® transponder or interoperable transponder based on a pre-paid account having sufficient funds to pay the applicable toll. Additionally, the Rule identifies the policy for motor vehicles which are exempt from payment of applicable toll on 95 Express. The Turnpike will issue an Unpaid Toll Violation (UTV) notice to the registered owner of the vehicle. Violators shall be charged in accordance to FAC Rule 14-100.003.

8.7 Standard Operating Procedures
Express lanes have multifaceted aspects of operations that require well-defined procedures and policies in order to meet operational expectations. Organization is vital to the decision-making process so that people know their roles in the chain-of-command and so that the proper personnel are authorized and available to make important operations decisions. In determining the organizational structure and roles several key questions need to be answered, including:

- Who has the authority to override the toll amounts?
- Who has the authority to close the express lanes?
- For various events, who is notified?
- When is the system maintained and who needs to be involved in the coordination?

These questions should be answered on a project specific basis and should be addressed in the SOP. The SOP should not be part of the project ConOps and should be developed as a separate procedural document for express lanes. However, the ConOps should identify the performance requirements that will guide the SOP.

Prior to going live with an express lane facility, the SOP needs to be developed and agreed upon by all entities involved in operating the facility. Scenarios and appropriate responses to those scenarios can be developed for different instances and geographic locations across the express lane network. The SOP should be coordinated and communicated with all parties in advance of system deployment. The SOP should be reviewed soon after the facility opening to determine if revisions are necessary and should then be reviewed and updated annually thereafter or sooner if necessary. In general, SOPs are needed for the following:
Incident management with detailed procedures for:

- Specific geographic locations
- Levels of incident severity and extent of impact
  - Incident type (e.g., fatality)
  - The presence of hazardous materials
  - Incident location (e.g., within the express lanes or general use lanes)
- Emergency events (e.g., evacuation)
- Planned special events (e.g., Presidential convoy)
- Use of the express lanes for specific activities surrounding an event (e.g., access for first responders, possibly in the opposite direction of travel)
- Disabled vehicle and debris removal

Maintenance

- Planned
- Unplanned

Reversible operations (if applicable)

- Lane opening
- Lane closing
- Lane directional change/reversing

Degraded operations such as equipment or communications failure
9 Express Lanes Maintenance

Express Lanes Maintenance consists of maintaining tolling equipment, ITS equipment, and the portion of the roadway that is operating as express lanes. Funding for operations and maintenance costs for express lane maintenance items shall be covered by the tolls collected on state owned and operated express lane facilities as prescribed by FS 338.166 and Section 3.5. This ensures adequate levels of funding for express lanes maintenance over the life of the facility. The infrastructure design life is assumed to be 40 to 50 years. The technology aspects of, including the ITS, tolling, and telecommunications equipment, have a shorter useful lifecycle and may vary by device type but is typically assumed to be 8 years.

If the express lanes project is procured with a design-bid-build or design-build contract, then a reserve fund shall be established to adequately fund operations and maintenance over the life of the facility for all equipment types and components in the system. Maintenance programming instructions are provided in Chapter 41 of the FDOT Work Program Instructions.

9.1 Tolls

The responsibility of maintaining the express lane tolling system and infrastructure is shared between the Turnpike and the project’s District Office(s). In general, the Turnpike is responsible for maintaining the tolling system and the District Office is responsible for maintaining the infrastructure items that support the tolling system. An Express Lane Project Responsibility Matrix and subsequent Memorandum of Agreement (MOA) shall be developed by the responsible District(s) and the Turnpike to specifically identify areas of responsibility regarding the roadway and associated infrastructure, tolling infrastructure, operations, maintenance, and ownership. Chapter 4 contains further information on each agency’s responsibilities regarding express lane facilities.

The tolling system includes the electronic devices, cabling on the gantry and in the toll equipment building, and the in-pavement inductive loops. The supporting infrastructure includes the electrical power system, the HVAC system, the generator, the fuel tank and fuel, and the facility communications. Some elements, such as the uninterruptible power supply (UPS) units and wide-area network (WAN) switches, may be the responsibility of the Turnpike or the District. The Turnpike is traditionally responsible for maintaining the physical toll equipment building.

The ability to maintain and repair the toll system equipment directly affects the ability of the facility to manage demand so it is important to respond to maintenance and repair issues promptly. Maintenance of the tolling system equipment mounted on the gantry is performed using a bucket truck from below. This requires either a full or partial closure of the express lane during the maintenance activity. If an accessible gantry is utilized, maintenance can be performed from the walkway of the accessible gantry above live traffic. Proper coordination between the Turnpike and the District Office for both regular preventive maintenance, and unplanned maintenance will result in minimal loss of demand management. Traditionally, preventative maintenance activities are performed during non-peak, low traffic periods. Additionally, unplanned maintenance that has only minimal impacts to demand management can also be performed during the low-traffic periods.

9.2 ITS

ITS maintenance falls into two categories: preventive and corrective. Preventive maintenance consists of scheduled maintenance with the intent of preventing or minimizing a future equipment failure. Corrective maintenance, or general response maintenance, is maintenance that occurs in response to an equipment failure. ITS maintenance is important to express lane system operations
because an interruption of ITS services may result in a loss of demand management or operational failures. Without network communications connectivity, toll transactions cannot be transmitted from the equipment building to the Turnpike’s back office for final processing. Malfunctioning toll amount signs could inhibit the ability to charge tolls, and malfunctioning detectors could affect the ability to assess traffic conditions and accurately calculate the appropriate toll amount. ITS equipment maintenance policies that support effective operations of the express lanes need to be established in the MOA between the District and the Turnpike.

ITS maintenance work can be performed in-house or by contractors, and must be defined in the responsibility matrix developed for each express lane project. When a contractor is used, the contractor should report to the District project manager and be held responsible for the administration of the maintenance activities, including any unscheduled requests for maintenance, record keeping, field maintenance technicians, preventive maintenance, and special engineering services, as needed.

Maintenance work on express lane ITS equipment should be done in accordance with the Standard Operating Guidelines, as well as with the manufacturer’s recommendations and industry best practices. If using a maintenance contract, the contract should include stipulations for response times for various activity types as well as penalties associated with each to ensure adherence.

9.2.1 General Response Maintenance

When problems arise with any portion of the ITS system for any reason, the problem is typically defined as a repair of a failed component, and general response maintenance is performed. The priority of the maintenance response is dependent on the severity of the component failure and its effect on other ITS subsystems. Typical causes of component malfunctions requiring immediate attention include, but are not limited to, life expectancy failures, vehicle crashes, theft, vandalism, weather, and unknown component failures. Each District should evaluate existing protocols for responding to critical and non-critical failures and adjust them as necessary for the express lane ITS infrastructure. Critical failures would include problems that affect the demand management capabilities of the express lanes and non-critical failures would not immediately affect the demand management of the express lanes.

9.2.2 Preventive Maintenance

Periodic preventive maintenance has been shown to reduce equipment failures and to extend the life of the ITS system. Preventive maintenance activities entail daily, weekly, monthly, and/or semi-annual inspections of the systems. Preventive maintenance should include detailed procedures, including field checklists for all of the ITS components. Maintenance contracts should be reviewed and updated as necessary to accommodate the maintenance needs of express lane ITS equipment. Maintenance intervals may need to be adjusted based on location, equipment type, and the criticality of the device to express lane operation.

9.2.3 Activities by ITS Type

The responsibility matrix defines the responsible party for each element of the express lane ITS system. ITS maintenance along the express lane facility includes the following activities:

- **DMS Signs**: Maintenance of displays, battery backup, AC power, trimming of any trees obstructing views, and checking of all connections.
- **CCTV Cameras**: Lens and dome cleaning, Pan/Tilt/Zoom (PTZ) assembly maintenance, communications checks, power checks, clearance of any trees obstructing views, and camera alignment corrections for maximum visibility.
Sensors: Calibration, communications checks, power checks

Communications Equipment: Field-to-center and center-to-center component checking and repair of the fiber backbone.

TMC: Maintenance of all equipment within the TMC, including the video wall and backup power. Districts are also responsible for the recurring facility costs and general building maintenance.

Software: Updates and patches to the SunGuide® software and the dynamic pricing system software. Maintenance of the hardware for database and system management. Hardware additions for any new or expanded software patches or capabilities.

Access Gates (if applicable): Power system, communication system, access control unit, and mechanical system maintenance.

ITS Cabinets: Power system, backup power system, communication system, equipment, and air conditioning unit maintenance. Cabinet security checks and vandalism protection or abatement.

9.3 Roadway

Roadway maintenance activities may need to be adjusted for express lane projects. New procedures may need to be established for maintenance of any additional items that did not previously exist such as express lane markers and existing maintenance techniques may need to be adjusted based on the new geometry. Considerations for roadway maintenance in the operating lifecycle of an express lane facility are:

- Identification of any additional short and long-term roadway maintenance activities
- The cost of each maintenance activity
- The duration required to address each activity

These considerations are used to calculate the average cost per mile for roadway maintenance for the express lane facility. The cost allocation for different components of the express lanes, such as pavement, ITS, and tolling equipment should be based on historical information for similar types of systems and assigned to the specific equipment/cost type.


## 10 Public Communication

Communication is a critical aspect in all phases of an express lane project in order to educate the customer and gain project support. The goal of public communications is to use a variety of messaging approaches to improve the safety and operations of the roadway and to gain support for the express lane project.

To facilitate an efficient communications and outreach effort, a plan must be established early to define how, when, and who will develop and deliver the messages. It is important that communications messaging considers who the audience is, what information needs to be communicated, what are the most effective means of communication available, as well as who will be responsible for each aspect of communication.

Communication efforts for express lane projects are multifaceted, ranging from educational outreach during the early planning of express lane facilities, to public involvement during the PD&E, design, or construction phases, to real-time communications about the express lane facility during operations. Unlike conventional roadway projects, the public may not readily understand how to use the facility or realize the benefits of express lanes. The critical role of communications is to help the public understand how express lane facilities operate, evaluate and understand the advantages that express lanes can offer, and accept the express lane facility as a new option for travel. The outreach effort required for express lane projects exceeds the public involvement efforts required for more traditional projects, and the success of an express lane project is highly dependent upon timely communication of information to the consumer. Customers must be made aware of the costs, benefits, and operating rules associated with the express lane facility. Additionally, transit agency routes, schedules, and stops must be conveyed on the project website as well as the transit website to illustrate access locations to the express lane transit services.

When working with the media, District PIOs in conjunction with the CO PIO will take the lead on operational issues. When issues involve tolling and toll policy, District PIOs will need to work with the Turnpike.

A consolidated website with information concerning all express lanes in Florida has been established at [floridaexpresslanes.com](http://floridaexpresslanes.com). Individual express lanes may also have a dedicated website and, in those instances, there will be a two-way linkage between the facility specific express lanes website and the statewide website.

This chapter discusses the target audiences, target messages, outreach efforts, and best practices in communicating with the public. The topics discussed within this chapter are scalable and can be applied to an individual project, regional network, or statewide program.

### 10.1 Target Audiences

In developing a communications plan, it is important to consider what audiences will be addressed. There are both internal and external audiences, and these audiences will require different types of communications due to the separate interests, questions, and intentions of each group, as well as their role in express lane implementation and operation. Individuals and groups will have disparate levels of understanding concerning express lanes and may have different responses to alternative types of messaging. This section identifies potential audiences and their communication needs and/or responsibilities. In several instances these target audiences overlap with the non-FDOT Project Champions, discussed later in this chapter in Section 10.3.3, who are a specific intended audience that will also need targeted communications.
While addressing external audiences and answering questions, it is important to promote the project and emphasize express lanes as an efficient answer to managing congestion. External communication may also emphasize the need for a specific project or the statewide network, and explain how the aspects of express lanes help target congestion problems at their source. Potential external audiences include:

- Customers
  - Automobile Commuters
  - Transit Customers
- Non-customers
- Tourists
- Infrequent Customers
- Experienced Express Lane Users
- Transit Agencies
- Trucking Community
- Elected Officials
- Partner Agencies
- Business Owners

In order to be more prepared to address the concerns of the public, communications efforts should anticipate the range of public concerns and questions that may arise concerning the express lane project. Some of the questions and concerns external audiences will have include:

- How to use the system
- Enforcement policies
- Project travel benefits and impacts
- Project costs
- Funding sources
- Anticipated effect on traffic due to construction
- How to pay for tolls
- Anticipated toll revenues
- How much will it cost to use the express lanes
- Why the toll amount changes
- How they will know what the toll is when it is changing
- How these tolls affect supply and demand
- Toll revenue use
- What vehicles exempt

Technology-related concerns may include questions about how electronic toll collection (ETC) works, general questions about ETC equipment and transponders, and privacy concerns related to ETC. External audiences will also be interested in the environmental advantages of express lanes due to the decrease in stop-and-go traffic.

Internal audiences include the various agencies that will be involved with each express lane facility in the statewide network. Due to the complex planning and implementation nature of express lane projects, it is important to clearly define which agency will be in charge of each communication task and to identify an agency lead from the very beginning of the project. The responsible agency should be stated in the project Responsibility Matrix defined in Section 4.6. Interagency coordination should be planned in order to reduce internal and external frustration, and it can be helpful to have planned meetings or teleconferences to facilitate open communication among participating agencies. Participating agencies will have the responsibility of using internal staff communications (meetings, newsletters, trainings, etc.) to educate staff on the implementation, operations, costs, benefits, and
common questions about the facility. It is also necessary to use these internal staff communications to keep staff updated on any changes or current issues concerning the express lane facility.

In addition to communicating internally, these agencies share the responsibility of communicating with the various external audiences. It is important to have a coordinated communications plan with clearly defined roles. During the development of the RCTO or the ConOps (see Section 8.3), specific communication roles and responsibilities will be identified.

10.2 Target Messages

Due to the unique and dynamic nature of express lanes, there is an assortment of information that needs to be communicated to the various audiences. The target message must identify with the audience, anticipate their questions, and alleviate their confusion. The target messages need to provide the target audiences with answers to many questions:

- Why the express lane facilities are being provided (i.e. project need)
- How they will operate
- Who can use them (i.e. are there any restrictions or exemptions)
- The advantages to having an express lane facility
- Anticipated toll amounts
- How and where will the revenue be used
- SunPass® will be used to pay for tolls exclusively

It is important to provide information on system level improvements and how individual corridors fit into the regional vision and messaging. In addition, the impacts of numerous policy decisions, as well as the benefits and costs of an express lane project, need to be included in communications messaging.

The target message should always emphasize that express lanes are a choice that provides a reliable travel time and an efficient solution to congestion management. Express lane projects incorporate tolling, transit, technology, instant messaging, and incentives that, in combination with dynamic pricing, increase the overall operational efficiency and improve speeds for the entire corridor. The target messages must be consistent and continuous, especially with toll amounts.

10.2.1 Benefits and Costs

To achieve the goals of express lane communications, customers, the public, and stakeholders need to be aware of the benefits and costs of using an express lane facility. Using statistics and actual cost information along with clearly stating facts can be an effective tool in communicating benefits and costs. Express lane costs should include construction costs, signage and equipment costs, and operation and maintenance costs. Costs should also include any additional burdens that the population may have. For example, is a part of the population receiving disproportionate impacts? Customer cost questions typically include:

- What are the costs to use the facility
- Is the trip worth the cost
- Why do tolls increase during certain times of the day

Express lanes can have benefits beyond the specific lanes in which they are implemented. Benefits to include in communications messaging include, reduced travel times, increased travel speeds, reduced weaving, reduced queuing, improved trip reliability, improved operations in the general use lanes, reduced pollution from vehicular emissions (i.e. sustainability), and enhancements to the movement of regional transit. Cost savings can be achieved by using express lanes as they can be
more cost effective than building new roadway facilities or widening existing facilities that may be quickly overloaded with latent demand. For both customers and non-customers it is important to communicate that benefits extend beyond the individual customer to general use lane users, transit users, and nearby communities and businesses.

Financial benefit messages to consider include: toll revenue amounts, toll revenue assignment, and whether or not toll revenues will be used to offset construction costs. For facility owners, it is important to instill an understanding that revenues can be used to offset the costs of operations, maintenance, and capital expenditures of the express lanes. Details on how the revenue can be used are addressed in FS 338.166 and in Section 3.5.

10.2.2 Policy Decision Impacts

There are numerous policy decisions that happen in the planning stages of an express lane project. Each express lane policy has key considerations that must be communicated to different users with different travel needs. These decisions directly affect the target audiences and need to be included in communications strategy. Once a policy decision is made, it needs to be clearly defined, and it is necessary to develop standard messaging that explains the policy and the benefits. It is necessary to address the following policy decision impacts:

- **Dynamic and Static Pricing**: Outreach messaging needs to define dynamic and static pricing and explain that dynamic tolling will be used and how dynamic pricing works. It should also be explained how this is a market-based approach to allocating roadway space. It is important to convey how the express lane system is managed, how pricing is determined, why pricing varies throughout the day, and what are the advantages and disadvantages of dynamic tolling. Real-time facilities messaging should communicate what the current toll amount is, and it is very important that customers know where to locate this information.

- **Toll Collection**: It is important to promote the adoption of SunPass® to Florida residents and to explain that SunPass® transponders or interoperable transponders from other states are required to access an express lane facility in Florida. Information on where and how to obtain SunPass® transponders and on which out-of-state transponders are interoperable can be found on the website SunPass® (sunpass.com).

- **Transit Service**: It is important to communicate to transit riders how transit services utilize the express lane. Outreach efforts to transit system riders should include express bus services, park-and-ride lots, costs, and travel times; and include explanation on how these transit services relate to the express lane. This type of communication is also a good opportunity to engage with the community to promote transit and build ridership.

- **Vehicle Eligibility**: It should be communicated before operations have begun, which vehicles are eligible to use the express lane and which vehicles are restricted. This information may differ between express lane facilities in the statewide network. As such, it is important that this information is available to customers, both beforehand and in real-time at the facility.

- **Occupancy Requirements**: It is important to clearly communicate any vehicle occupancy requirements for an express lane facility to customers. Part of this communication includes education to customers on why the occupancy requirements may differ among express lane facilities throughout the state. It is also important to communicate to customers who utilize carpooling, vanpooling, and HOV programs what these occupancy requirements are and how they affect their carpooling situation. Occupancy requirements should also be communicated real-time at the facility.

- **Emergency Response**: It is necessary to collaborate with emergency responders to create a plan for communicating information concerning emergency situations on the roadway to customers. In the event of an emergency situation, real-time messaging approaching the facility needs to relay key information to concerned motorists to show a seamless emergency response.
**Enforcement:** Communications concerning enforcement policies should be coordinated with local and state law enforcement and respective PIOs to create an enforcement guide and a protocol for interagency communication that is consistent, predictable, and repeatable. Once a communications protocol is established, it is important to communicate these policies to the public, agency team members, and local law enforcement to ensure cohesive plans and actions.

**Toll Violation:** It is important to educate both customers and customer service representatives on toll violation penalties. Messaging should include information on toll collection, transponders, how toll violations will be reported, and what to do in a toll violation situation. Clearly defining rules and penalties will help avert customer and internal confusion, frustration, and dissatisfaction.

Once policies are established, standard communications messaging must be developed to speak to both external and internal audiences. When communicating policy decisions and impacts, it is important to establish a cohesive communications plan.

### 10.2.3 Pre-Implementation Messages
Target messages that should be used prior to the opening of an express lane facility should include:

- Information about how to use the express lanes
- Entry and exit locations
- The length of the facility
- What to expect during construction
- How long construction will take
- When toll collection will begin
- How tolling works
- How to understand how much the toll will be
- How toll revenues can be used

It should be strongly emphasized that using the express lanes is a choice that can provide the user with a more reliable travel time compared to the general use lanes. Additional messaging should focus on the successes of previous express lanes projects, including increased speeds in the general use lanes, reduced delays for all motorists on the roadway, and the average tolls charged during peak hour. Districts should develop a project specific go-live plan before opening the express lanes to the public.

### 10.2.4 Post-Implementation Messages
Once the express lane facility has opened, public communication should continue with a focus on:

- the average toll amounts being charged during the day
- the travel time savings of the express lanes
- the number of vehicles using the express lanes
- how the toll revenue is being used

These messages should always reinforce that using the express lanes is a choice that can provide the user with a more reliable travel time compared to the general use lanes.

### 10.3 Outreach Efforts
Early communication is essential to gain support for individual express lane projects, regional networks, and the statewide network. It is necessary to have a strategy that utilizes branding efforts, multiple means of communication, and project champions for a successful project outreach effort.
10.3.1 Branding

Branding is an important communication tool for establishing a sense of consistency and reliability for customers who will use the various express lane facilities statewide. The Flying “e” logo, illustrated in Figure 10-1, will be used for each express lane facility on any accompanying information messaging or educational outreach material. The logo is an effective branding tool used to provide a consistent and established look for network facilities and materials. The flying “e” provides to customers a sense of connectivity, and helps reduce customer confusion.

Figure 10-1: Flying “e” Logo

10.3.2 Means of Communication

Because each target audience group will have its own specific questions and interests, it is most effective to use different means of communication targeted to the specific needs of each audience. Early, audience-tailored communication is essential for effective communications messaging. Effective means of communication with target audiences include:

- Public Meetings
- Interviews
- Focus Groups
- Newsletters
- Websites/Social Media
- Fact Sheets/Frequently Asked Questions Sheets
- Email Blasts
- Educational Videos and Webinars
- “Before and After” Videos
- Advertising (e.g. billboards, print, radio, etc.)

10.3.3 Non-FDOT Project Champions

One of the most instrumental factors in gaining support for an express lane project is to identify project champions (and in some cases program champions) early in the planning stages. Project champions are individuals or groups of individuals from organizations outside of the implementing agencies who can advocate for the project and help gain support. Project champions can be influential in political processes by communicating with affected politicians and interest groups, educating these groups on the concept of the project, answering questions, and addressing concerns. Early identification of champions and their continual support throughout implementation and operations is critical. Potential project champions include:
10.4 Best Practices

Best practices should be utilized during any communications messaging outreach. These best practices include providing advance notice for public meetings; facilitating brainstorming sessions and group problem solving; establishing walk-in offices and customer service centers; creating telephone information and service hotline; using mailing lists; and promoting project websites. When developing a communications strategy for express lane projects in various stages of planning and implementation, some more best practices to keep in mind include:

- **Choice.** The existing general use lanes will remain after the opening of the express lanes. However, it should always be emphasized that using the express lanes is a choice that can provide the user with a more reliable travel time in relation to the general use lanes.

- **Awareness of Public Perception.** In addition to an awareness of the community, it is important to be aware of and consider the overall public opinion concerning express lane projects. It is essential to know whether there is widespread support or focused opposition to the project and what factors into that opposition or support.

- **Early Educational Outreach Efforts.** Communicating with the public early has a positive impact on public acceptance. It is important to address the scale and scope of the transportation issues, needs, and challenges that a particular express lane project will address with the public early in the project cycle. To build public awareness, it is also important to communicate the impacts the project will have on the long-term needs of the area.

- **Unique Marketing Approach.** Because express lane facilities are relatively new and unique compared to traditional roadway facilities, it may be necessary to use different marketing approaches to gain public support. It is important to “sell” the project by communicating why this is the preferred congestion management alternative for the area.

- **Dedicated Public Information Officer (PIO) in the TMC.** A dedicated PIO should be available for customer service in the TMC. The PIO will help to ensure that a consistent message is being received by the public during customer service activities. The PIO can also handle questions from the media and other agencies that have questions about the operations and the status of the project.

Useful public communications tools can also be found on the statewide express lanes website ([floridaexpresslanes.com](http://floridaexpresslanes.com)) and on project specific websites. These websites contain information on express lanes as well as unique facts about each project.
11 Reporting

Collecting and reporting relevant information on express lane facilities is required to evaluate the performance of express lanes and the overall corridor. This information is typically provided to multiple audiences. High-level reports are designed to help management in Central Office, Turnpike, and the Districts assess how well the express lanes are performing. Detailed reports are used by technical staff for operational analysis on existing projects and to help plan for future projects. Other reports are generated for public outreach and advertising, or to meet a Federal obligation, such as the Urban Partnership Agreement on 95 Express. Finally, some reports are designed to disseminate information about the express lanes to stakeholders and elected officials.

This chapter is intended to establish a consistent framework of standard reports based on data needs, availability, and purpose. It is not designed to provide a comprehensive list of every report that is required. Additional reports beyond those discussed in this chapter can be produced depending on the needs of the specific project. Any new reports will require the approval of the Turnpike and Central Office.

Express lane reports will contain data related to traffic, revenue, tolling, system operations and reliability, safety, and enforcement. Day-to-day operations and management of the facility rely on the real-time knowledge and data used in the reports.

11.1 Sources of Data

There are three primary sources of information used to generate the current reports. These are the Turnpike Data Center (TDC), the District Traffic Management Centers (TMCs), and transit agencies. The TDC provides detailed SunPass® information in the express lanes at the toll transaction level that is aggregated to trips and further combined across the entire project. Data on traffic volumes, violations, vehicle classification, and revenues are available through the TDC. All traffic and revenue information will be provided by the Turnpike to the Districts to prepare their monthly and annual reports. The TMCs provide information on toll amounts, operating statistics, equipment availability, lane speeds, travel times, and toll exempt registrations. Transit ridership information is available from the transit agencies.

11.2 Types of Data

The collection of reliable data is critical for accurate reporting of information. To provide useful information about the performance of express lane projects, the following types of data should be collected:

Traffic: This data represents the volume of traffic using the express lanes and the general use lanes. Such data is gathered and reported at the toll transaction level and further accumulated in the back office to include the entire facility. A number of useful tables and graphs depicting the traffic conditions on the roadway can be generated using the following information:

- Toll-paying and non-revenue traffic volumes in the express lanes
- Weekday and weekend traffic by hour and by direction in the express lanes and general use lanes
- Express lane share of traffic compared to total corridor traffic, by day type
- Exempt vehicle registration and volume by type (i.e., transit buses, school buses, hybrids, etc.)
- Transit ridership, if express bus service is available
- Number of violations
- SunPass® participation
- Traffic by vehicle class (I-595 Express only)

**Gross and Net Revenue:** This data includes the amount of toll revenue collected in the express lanes. The cost to operate and maintain the express lanes can also be included in these reports resulting in net revenues. Net revenue reports are particularly important for assessing the statutory obligations of County equity as required by FS 338.166. The following information is important for assessing the revenue generated by the express lanes:
  - Gross revenue by toll gantry and by direction
  - Weekday and weekend revenue
  - Express lane share of revenue compared to total revenue from the facility (Turnpike projects only)
  - Express lane gross revenue by project
  - Operating and maintenance costs of express lanes by project
  - Net revenues by project

**Toll Amounts:** It is important to record the toll amounts charged to the customers and to monitor the variation in these rates to determine overall traffic conditions in the corridor. Multiple reports can be generated using the following toll amount information:
  - Transactions by toll amount and by day of the week
  - Revenue by toll amount and by day type
  - Number of times maximum toll is reached (95 Express, Phases 1 and 2 only)
  - Weekday toll amounts by hour and by direction
  - Weekday toll amounts by segment and by trip
  - Percent of time toll amount is in effect

**Operating Statistics:** These statistics provide information about the travel conditions in the express lanes and the general use lanes. They also help assess the efficiency of the express lanes by determining the percent of time when these lanes are open and free of incidents or crashes. The following information is necessary to prepare reports showing these operating statistics:
  - Average weekday speed in express lanes and general use lanes by direction
  - Peak-period weekday speed in express lanes and general use lanes by direction
  - Hourly weekday speed in express lanes and general use lanes by direction
  - Percent of time express lane speeds are greater than the predefined operating threshold speed
  - Hourly travel time savings by direction (i.e., difference between travel time in express lanes and general use lanes)
  - Percent of time express lanes are open
  - Percent of time express lanes are closed by incident type (i.e., accident, construction, maintenance, etc.)
  - Number of crashes in the express lanes and general use lanes by direction

**Equipment Availability:** It is also important to provide relevant reports showing the performance and reliability of ITS equipment in the express lanes. Such reports can be generated by gathering the following information about toll system equipment availability and functionality of the dynamic message signs:
  - Number of times and duration a tolling component is down
  - Time to detect a failure
  - Percent of time various signs are working (e.g., lane status signs, toll amount signs)
  - Percent of time traffic detection equipment used in the express lanes are working
11.3 Frequency of Reporting

Frequency of express lane reporting varies by type of report and express lane facility. Some reports are needed as frequently as daily, while others are generated on a monthly or annual basis. The frequency of reports is sometimes defined in contractual agreements, such as the one between FDOT and FHWA for 95 Express. In general, the timing of reports can differ based on the target audience and the purpose of the report, according to the following time periods:

- **Annually:** These reports offer a high-level annual review of the project to help FDOT managers in evaluating key performance measures. They can also be beneficial for responding to questions from the media and the general public. One example of an annual report is the Turnpike Enterprise Toll Operations Traffic Engineer’s Annual Report which can be found at: [www.floridasturnpike.com/about_reports.cfm](http://www.floridasturnpike.com/about_reports.cfm). This report includes the department’s official audited T&R numbers for the department owned toll facilities that are used in the State of Florida’s Comprehensive Annual Financial Report. This report can be accessed at: [http://www.myfloridacfo.com/division/aa/Reports/](http://www.myfloridacfo.com/division/aa/Reports/). Another example is the 95 Express Annual Operations Report prepared by FDOT District six: [www.sunguide.info/sunguide/index.php/tmc_reports/archives/111](http://www.sunguide.info/sunguide/index.php/tmc_reports/archives/111). Both reports will continue to be prepared independently since they serve different purposes and benefit different users.

- **Monthly:** The monthly reports help track the status of the project over time, especially during the first few months after the project opens to traffic. Data such as traffic volumes, revenue, toll amounts, and statistics about the performance of ITS equipment and DMS signs should be included in these reports. Examples of current reports include ITS monthly summary reports, DMS usage reports, and express lane performance reports.

- **Daily:** Detailed daily information should be collected and maintained to assist SunPass® Customer Service Representatives in responding to customer inquiries. These reports are prepared as needed for diagnosing equipment problems, tracking system errors, and providing ad-hoc queries about the express lanes in response to specific data requests.