

GENERAL TOLLING REQUIREMENTS

PART 1 - DEVELOPMENT AND PROCESSES **JULY 2019**



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100 Introduction

100.1 Purpose

The **General Tolling Requirements (GTR)** is the source of toll infrastructure requirements for project delivery methods, such as, Conventional Projects (Design-Bid-Build), and Non-Conventional Projects (Design-Build, Design-Build Finance, and Public-Private-Partnership). The intent of the GTR is to provide criteria for a complete and standardized toll infrastructure design.

100.2 Procedure

GTR criteria are for toll sites on the Department's toll roads and express lanes. Requests for deviations from these requirements must be approved by the Florida's Turnpike Enterprise (FTE) through the GTR deviations process as outlined in **GTR 110**.

100.2.1 Organization

The **GTR** has three parts:

- (1) **Part 1** contains development and processes
- (2) **Part 2** contains design criteria
- (3) **Part 3** contains the plans preparation and assembly requirements

Special requirements for Non-Conventional Projects are shown in a "Modification for Non-Conventional Projects" box. See example below:

Modification for Non-Conventional Projects:

Delete **102.2.1 (1)** and replace with the following:

Issues the RFP that identifies the project scope. The Department reviews ATCs in accordance with the procedures set forth in the RFP.

These boxes are located at the beginning of the chapter, or after a section, paragraph, or table which is to be modified. The requirements listed within these boxes are only applicable to Non-Conventional Projects.

Exhibits in GTR Part 2 are criteria for design of toll sites. The EOR and the AOR may request approval for adaptations to meet project specific conditions from FTE Tolls Design.

Exhibits may contain notes to the preparer which are shown in a shadow box within each exhibit. These shadow boxes will be titled “Notes to Preparer”.

All items requiring FTE Tolls Design approval must be in writing and routed to the FTE Project Manager to distribute to the appropriate parties within FTE for approval.

101 Abbreviations and Glossary of Terms

101.1 Abbreviations

The following is a list of the commonly used abbreviations that are found throughout the GTR. Some have been identified previously in **GTR 100**; however, for completeness those are included below.

AASHTO	<i>American Association of State, Highway and Transportation Officials</i>
ADA	<i>Americans with Disabilities Act</i>
AET	<i>All Electronic Tolling</i>
AHU	<i>Air Handling Unit</i>
AIA	<i>American Institute of Architects</i>
AOR	<i>Architect of Record</i>
APE	<i>Average Pavement Elevation</i>
ATC	<i>Alternative Technical Concept</i>
AVI	<i>Automatic Vehicle Identification</i>
BCA	<i>Building Code Administrator</i>
CCTV	<i>Closed-Circuit Television</i>
CEI	<i>Construction Engineering and Inspection Professional</i>
CSI	<i>Construction Specifications Institute</i>
CU	<i>Condensing Unit</i>
DBPR	<i>Department of Business and Professional Regulation – State of Florida</i>
DVAS	<i>Digital Video Auditing System</i>
E6	<i>Encompass 6 Multiprotocol Reader</i>
EL	<i>Express Lane</i>

EOR	<i>Engineer of Record</i>
EPA	<i>Environmental Protection Agency</i>
FBC	<i>Florida Building Code</i>
FDOT	<i>Florida Department of Transportation (Department)</i>
FDM	<i>FDOT Design Manual</i>
FDP	<i>Fiber Distribution Panel</i>
FOC	<i>Fiber Optic Cable</i>
FTE	<i>Florida's Turnpike Enterprise</i>
GTL	<i>General Toll Lane</i>
GTR	<i>General Tolling Requirements</i>
GUL	<i>General Use Lane</i>
HOV	<i>High Occupancy Vehicle</i>
ITS	<i>Intelligent Transportation Systems</i>
HDPE	<i>High Density Polyethylene</i>
KML	<i>Keyhole Markup Language</i>
KMZ	<i>Compressed version of KML file</i>
LRFD	<i>Load and Resistance Factor Design</i>
LRFDLTS-1	<i>LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1st Edition</i>
MOC	<i>Maintenance of Communications</i>
MSE	<i>Mechanically Stabilized Earth</i>
MSP	<i>Modified Special Provision</i>
NEC	<i>National Electric Code</i>
NEMA	<i>National Electrical Manufacturers Association</i>
NESHAP	<i>National Emissions Standard for Hazardous Air Pollutants</i>

NOA	<i>Notice of Acceptance</i>
NRTL	<i>Nationally Recognized Testing Laboratory</i>
OPUS	<i>Optical Profile Unifying System</i>
ORT	<i>Open Road Tolling</i>
OSHA	<i>Occupational Safety and Health Administration</i>
PD&E	<i>Project Development and Environment</i>
PCMS	<i>Portable Changeable Message Sign</i>
RFP	<i>Request for Proposal</i>
SBS	<i>Styrene-Butadiene-Styrene</i>
SCADA	<i>Supervisory Control and Data Acquisition</i>
SMFOC	<i>Single Mode Fiber-Optic Cable</i>
TEB	<i>Toll Equipment Building</i>
TEC	<i>Toll Equipment Contractor</i>
TDH	<i>Turnpike Design Handbook</i>
TSP	<i>Technical Special Provision</i>
TSTM	<i>Toll Siting Technical Memorandum</i>
TTCP	<i>Temporary Traffic Control Plans</i>
UL	<i>Underwriter's Laboratory</i>
UPS	<i>Uninterruptible Power Supply</i>
VAC	<i>Voltage – Alternating Current</i>
VCAR	<i>Vehicle Capture and Recognition</i>
VDC	<i>Voltage – Direct Current</i>
VDAC	<i>Vehicle Detection and Classification</i>

101.2 GTR Definitions

The following is a list of terms used in the **GTR** with their definitions or explanation of the context in which they are used.

- (1) **Architect of Record:** The architect registered in the State of Florida that applies the criteria for the project, performs the analysis, designs the project, and is responsible for the preparation of plans, and specifications. The AOR may be Department in-house staff or a consultant retained by the Department.

The AOR for design must not be employed as the Contractor's AOR.

Modification for Non-Conventional Projects:
The last sentence above is replaced as follows: The Architect of Record is employed by the Contractor.

- (2) **Average Pavement Elevation:** The average between the worst case highest and the worst case lowest pavement elevations of all interim and the ultimate conditions within the toll loop pavement area of all travel directions and shoulders under a single span as measured along the centerline of the gantry.
- (3) **Buffer:** Space between an express lane and GULs or GTLs.
- (4) **Express Lane:** A travel lane, delineated or physically separated from a general use lane or general toll lane, within a roadway corridor in which tolls are set based on traffic conditions. See **FDM 102.2** and **FDM 211** for additional information on ELs.
- (5) **Fiber Optic Backbone:** Fiber Optic trunk line supporting communications pathways along the corridor (typically 96 or 144 strand single mode fiber), running along the roadway in either or both directions (northbound / southbound or eastbound / westbound) that is owned by the Department and or tolling agency.
- (6) **Florida's Turnpike Enterprise:** A part of the FDOT that governs the design and construction of the Department's toll roads in Florida.
- (7) **General Toll Lanes:** Tolloed roadway lanes for which tolls are constant and not set based on traffic conditions.
- (8) **General Use Lanes:** Un-tolloed roadway lanes.

- (9) **Leased Circuit Digital Communication Lines:** High speed digital communication line from the local incumbent telephone/data communications provider (Telco) to the TEB.
- (10) **Toll Equipment Building:** A free-standing building that houses electronic equipment associated with toll collection from one or more toll gantries.
- (11) **Toll Equipment Contractor:** The TEC is a tolling vendor under contract with FTE to furnish and install the toll system.
- (12) **Toll Equipment Space:** Each instance (cabinet, backplane, etc.) of tolling equipment installed by the TEC within the toll equipment building.
- (13) **Toll Gantry:** Truss structure supporting the toll equipment over the roadway.
- (14) **Toll Infrastructure:** The gantry, building, portion of the roadway, and any other components that support the toll system.
- (15) **Toll Loop Pavement Area:** 100 feet of pavement centered on the gantry that covers all tolled lanes, shoulders adjacent to tolled lanes, buffer, and lane adjacent to the buffer as identified in **GTR 221**.
- (16) **Toll Loop(s):** In-pavement inductive system used to detect and count the vehicle's axles through the toll system.
- (17) **Toll Site Envelope:** The area defined as the boundary surrounding the toll site as shown in the exhibits of **GTR 231**.
- (18) **Toll Site / Toll Facility:** All toll infrastructure required to support one or more tolling movements at a unique location.
- (19) **Toll System:** The equipment required to collect toll revenue. This includes the equipment installed on the gantry, in the building, toll loops, and all equipment wiring furnished and installed by the TEC.
- (20) **Tolling Movement:** A separately tolled direction of travel at a single toll site.
- (21) **Tolls Fiber-Optic Lateral:** Fiber optic connection between the toll equipment building and the FO backbone with associated conduit.
- (22) See FDOT [Specifications](#) for definitions of other entities frequently used in the GTR (e.g. contractor, engineer, engineer of record, etc.).

102 Requirements and Governing Documents

102.1 General Requirements

The GTR contains infrastructure requirements for new toll facilities. The GTR also includes requirements for maintaining toll operations at existing toll sites during construction.

The GTR alone may not contain all toll infrastructure requirements necessary for the installation and testing of a fully functional tolling system. For additional requirements, directly or indirectly related to tolling, refer to the following:

- (1) Request for Proposal (RFP) – For Design-Build Projects
- (2) Scope of Services for Consulting Engineering Services – For Design-Bid-Build projects
- (3) FDOT Standard Plans
- (4) FDOT Design Manual (FDM)
- (5) FDOT Structures Manual
- (6) FDOT Soils & Foundations Handbook
- (7) AASHTO LRFD Bridge Design Specifications
- (8) AISC Steel Construction Manual
- (9) ACI Building Code Requirements for Reinforced Concrete
- (10) Aluminum Association Design Manual Specifications and Guidelines for Aluminum Structures
- (11) Florida Building Code (FBC)
- (12) Institute of Electrical and Electronics Engineers (IEEE) Standards
- (13) Florida's Fire Prevention Code
- (14) FDOT Drainage Manual
- (15) Turnpike Supplement to the FDOT Drainage Manual
- (16) FDOT Basis of Estimates Manual
- (17) AWS Structural Welding Code

- (18) Turnpike Supplement to the FDOT Structures Manual
- (19) FDOT CADD Manual
- (20) FDOT Traffic Engineering Manual (TEM)
- (21) Turnpike Design Handbook (TDH)
- (22) LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals (LRFD-LTS-1)

102.1.1 Plans and Designs

All plans and designs must be prepared according to the criteria contained in the GTR. In case of discrepancy between the GTR and other sources of tolling related requirements:

- (1) If the GTR conflicts with applicable federal, state, or FDOT/FTE codes, criteria, and standards, the more stringent requirement governs.
- (2) The AOR/EOR must coordinate with and obtain approval from FTE Tolls Design to resolve all conflicts that would impact the project's schedule, budget, and quality.

102.2 Responsibilities

102.2.1 Department

The Department's responsibilities are listed below:

- (1) Issues a scope of services.

Modification for Non-Conventional Projects:

Delete **102.2.1 (1)** and replace with the following:

Issues the RFP. The Department and FTE Tolls Design review ATCs in accordance with the procedures set forth in the RFP.

- (2) Any items directly or indirectly related to tolling, shall require coordination with and approval from FTE for FTE projects or from FTE and the District(s) for non-FTE projects. Coordination and approval shall be obtained at the appropriate project stage.

102.2.2 AOR/EOR

The AOR's/EOR's responsibilities are listed below:

- (1) Prepare detailed contract plans and supporting documents to delineate the construction work required to furnish and install the toll infrastructure.
- (2) Prepare and submit contract documents for building permit review and approval. Refer to **GTR Part 2** for additional information and requirements regarding building permits and State Fire Marshal requirements.
- (3) Inter-discipline coordination within the toll site to accommodate the toll pavement requirements and toll site infrastructure (roadway typical section(s), gantry structures, toll site signing, etc.).

102.2.3 TEC

The Department's TEC is responsible for furnishing, installing, testing, and commissioning:

- (1) Toll equipment and toll equipment cabling
- (2) Toll loops in the pavement

The TEC activates the toll system for each tolling movement once they have been accepted by the Department.

110 GTR Deviations

110.1 Introduction

GTR Part 2 ensures the following:

- (1) Toll collection accuracy is within the ranges established by FTE
- (2) Consistent, predictable and repeatable design and construction
- (3) Maintainability of toll infrastructure

A GTR deviation submittal letter must be provided whenever GTR criteria cannot be met. FTE approval is required for any GTR deviations identified.

The need for GTR deviations must be identified early enough in the process to obtain the required approval prior to the start of design. This is done during the PD&E process and finalized during the early part of Final Design, as part of the Toll Siting Technical Memorandum (TSTM) development.

Modification for Non-Conventional Projects:
Delete the second sentence of the above paragraph and replace with the following: This is required during RFP development as part of the Toll Siting Technical Memorandum (TSTM).

As design progresses, additional GTR deviations may be needed. Such deviations must be identified as early as possible during the design process. GTR deviations identified during the design phase must also be submitted for review and approval.

110.2 Justification

Sufficient detail and explanation must be provided to justify approval of the GTR deviation. Documentation to support the GTR deviation request must include:

- (1) A brief project description and a figure identifying the toll site location associated with the GTR deviation request
- (2) GTR Section whose criteria cannot be met
- (3) Reasons associated with not meeting criteria and supporting documentation (sketch, plans, etc.)
- (4) Considerations of design alternatives to eliminate or reduce criteria deviation.

110.3 GTR Deviation Request

- (1) GTR deviation requests must be submitted using the GTR Deviation Submittal Letter as described in **GTR 111.1.1**.
- (2) FTE Tolls Design approves or denies the GTR deviation request.
- (3) GTR Deviation Submittal Package

The submittal package consists of the following:

- (a) GTR Deviation Submittal Letter(s)
 - (b) Supporting documentation: The supporting documentation that justifies and supports the GTR deviation request, consisting of the required plans, profiles, cross sections, reports, and analysis for each deviation for a preferred toll site.
- (4) FTE Tolls Design will notify the FTE Project Manager of the review results of GTR Deviation Submittal Packages.
- (5) GTR deviations identified prior to final engineering design must be approved by FTE prior to submitting the final TSTM and must be included with the final TSTM submission.
- (6) GTR deviations that are identified during final engineering design:
 - (a) FTE must be informed of deviations identified during final engineering design.
 - (b) If any phase submittal (for tolls subcomponents) includes GTR deviations that have not been previously approved by FTE Tolls Design, the phase submittal for all subcomponents for the affected site location (site, building and gantry) will be rejected.
 - (c) All GTR deviations must be approved by FTE prior to Phase III submission.

Modification for Non-Conventional Projects:

Delete **110.3 (6) (c)** and replace with the following:

- (c) All GTR deviations must be approved by FTE prior to 100% submission

111 Standard Letters, Forms, and Templates

This section includes standard letters, forms, and templates that must be used in planning and design development of toll sites. Unless noted otherwise, these standard forms and templates can be obtained from:

<http://floridasturnpike.com/design/disciplines/tolls.html>

111.1.1 GTR Deviation Submittal Letter

The submittal must consist of:

- (1) Complete GTR deviation submittal letter signed by the EOR.
- (2) Documentation to support the GTR deviation as described in **GTR 110.2**.

111.1.2 Level 3 Specifications Approval Form

The AOR/EOR must comply with the FDOT [Proprietary Products Review and Certification Procedure \(Topic No. 630-020-005\)](#) to obtain approval for each Level 3 specification. See **GTR 210.1.1** for additional requirements on Level 3 TSP sections.

The AOR/EOR must submit the request for the use of the proprietary product to the FDOT. The submittal must consist of:

- (1) Completed certification form signed by the AOR/EOR.

The Proprietary Products Certification Form No. 630-020-07 can be obtained from the FDOT website at:

<https://fms.fdot.gov/Form?sort=name>

- (2) Documentation package to support the form request.

111.1.3 TSTM Template

The TSTM template must be used to prepare the toll siting technical memorandum.

111.1.4 Estimate of Values Template

The Estimate of Values template must be used to develop the engineering estimates for each toll site.

120 Plan Development Process

120.1 Introduction

The **FDM 110** through **112** discusses the plan development process. This chapter identifies the additional processes that are required for toll projects.

All toll projects require the development of a TSTM prior to the start of the plan development process. See **GTR 202** for details regarding the TSTM.

120.2 Initial Engineering Design Process

Tolling projects must have additional major activities included in the various steps of the flow chart presented in **FDM Figure 110.1.1** as follows:

- (1) Add to the activities in the fifth step of the flow chart “Review, Confirm, & Approve” the following:
 - (a) Express lanes ingress and egress locations
 - (b) Conceptual locations for toll facilities
- (2) Add to the activities in seventh step of the flow chart “Develop” the following:
 - (a) Toll site locations based on GTR toll siting requirements vs. project geometry
 - (b) Draft TSTM
- (3) Add to the activities in the last step of the flow chart “Review and Confirm” the following:
 - (a) Express lanes ingress and egress locations
 - (b) Toll site locations
 - (c) GTR Deviation Submittal Letter
 - (d) Preliminary TSTM

120.3 Final Engineering Design Process

Tolling projects must have additional major activities included in the various steps of the flow chart presented in **FDM Figure 111.1.1** as follows:

- (1) Add to the activities in the second step of the flow chart “Perform Final Engineering” the following:
 - (a) Finalize TSTM
 - (b) Confirm location of express lanes ingress and egress locations
- (2) Add to the activities in the third step of the flow chart “Coordinate Disciplines” the following:
 - (a) Toll facilities
- (3) Add to the activities in the fifth step of the flow chart “Perform Roadway Structural Design” the following:
 - (a) Toll gantries
- (4) Add to the activities in the sixth step of the flow chart “Coordinate and Advance” the following:
 - (a) Toll site’s engineering, plans, specifications, and reports
 - (b) Toll site’s GTR deviation submittals
- (5) Add to the activities in the seventh step of the flow chart “Finalize Design & Plans” the following:
 - (a) Toll site’s design calculations, reports, and cost estimates
 - (b) Toll site’s permit packages
- (6) Add to the activities in the last step of the flow chart “Prepare and Document” the following:
 - (a) Toll site’s permit review is complete
 - (b) GTR deviations package

120.4 Meetings

Project meetings are conducted at key milestones during design and construction, and periodically as determined by FTE's or FDOT's Project Manager in coordination with the EOR.

120.4.1 Toll Site Pre-Design Meeting

For any project, the toll site pre-design meeting occurs within 2 weeks after the EOR/AOR receives notice to proceed with the design which must be attended by the FTE's and FDOT's Project Managers and key staff together with EOR's design team (toll site, building, gantry, roadway, drainage, lighting, ITS, utilities, etc.). The items to be discussed include:

- (1) Site visit – At the FTE's Project Manager's discretion, a site visit is conducted to review critical items that must be addressed during the plans development process
- (2) Project schedule – Milestone dates for the project are discussed, including how they relate to the Tolls specific deliverables in **GTR Part 3** and the permitting described in **GTR 270**
- (3) Scope clarification – The EOR/AOR responsibilities are discussed
- (4) General discussion
- (5) All known, approved or under review, GTR deviations