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# Toll Siting Technical Memorandum

Project Name

Financial Project ID: XXXXXX-X-XX-XX

**Prepared For:**

Florida Department of Transportation

Florida’s Turnpike Enterprise / District X *(As applicable)*

Client Address Line 1

Client Address Line 2

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*Engineer of Record: PE Name*

*P.E. No: xxxxx*

*[Notes to preparer are shown in brackets and italics.]*

**Document History and Status**

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| *[Final DCN XXXX]* | *[xx/xx/xxxx]* | *[Toll Siting Technical Memorandum]* | *[initials]* | *[initials]* | *[xx/xx/xxxx]* | *[initials]* | *[xx/xx/xxxx]* |
| *[Additional Submissions as required.]* | | | | | | | |
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*[Toll Siting Technical memorandum must be developed as part of the PD&E or RFP preparation, before the project moves to the design phase.]*

# I. Purpose and Executive Summary

**A. Project Information**

*[What is the purpose of this memorandum?]* Ex. “The purpose of this technical memorandum is to determine and recommend an appropriate location for the tolling points required for…”

*[Briefly describe the overall project. Include details about whether express lanes are intended in this project or as part of a future AET project (Interim and Ultimate conditions), mainlines, ramp-based tolling facilities, etc. Include the number of tolling sites needed and why. Include a project location map illustrating the project limits and the proposed tolling locations. Identify each toll site with a project specific toll site number and all related toll plaza names which can be obtained from FTE Toll Systems. If Express Lanes are part of this project or intended as part of a system wide implementation, include the Express Lane Diagrams with interim(s) and ultimate phases.]*

**B. Project Location Map**

Figure 1 - Project Location Map

**C. Express Lane Diagrams** *[Express Lane Projects Only- This is the EL diagram for the corridor or region of which the project is a part; including all interim and ultimate conditions.]*

Figure 2 - Single Line Concept Express Lane Diagrams

# II. Evaluation Criteria

*[Provide a list and summary description of all the criteria utilized in the evaluation of these toll sites.]*

**Criteria:** The following criteria was utilized to evaluate the limits of the project to establish recommended tolling point locations:

**1. Current GTR Version:** *[Input the applicable version.]*

**2. Florida Gas Transmission**

*[Site locations must consider any impacts to any FGT infrastructure located within the proximity of the tolling site.]*

**3. Roadway Design Criteria**

*[Roadway design criteria that is not met due to toll site requirements must be documented.]*

**4. ITS / Communication**

*[The existing and proposed ITS system must be coordinated for communication with the proposed tolling sites. E.g. how far away is the nearest communication connection point?]*

**5. Power Service**

*[Power service must be evaluated for availability to the proposed tolling sites.]*

**6. Maintenance of Traffic**

*[Maintenance of Traffic must be coordinated such that traffic and tolling operations are not impacted by construction or demo of proposed or existing tolling sites. Also verify that the toll site placement will not be impacted by the MOT of any future work. E.g. future bridge widening.]*

**7. Environmental**

*[Environmental conditions must be reviewed to ensure the site is not in wetland areas, muck soil conditions, etc.]*

# III. Toll Site Location Analysis & Recommendations

*[For each toll site:]*

*[Introduce each site location with a single paragraph describing the development surrounding the toll site such as urban/suburban/rural, and the type of land use as commercial /residential /farmland /forest etc.]*

*[Describe how the recommended toll site locations were identified. Describe not only why these sites were chosen, but why other sites were not chosen. Provide station ranges for areas eliminated by specific GTR criteria and any remaining station ranges eligible for toll site placement. Document areas not considered and related justifications. Identify gantry type and how it was determined. E.g. cantilever, full span, half span? Preliminary TSTMs prepared during PD&E must assume TEB sites unless directed otherwise by FTE Tolls Design. Identify whether the toll site will be TEB or RTC and how it was determined. For RTC toll sites, determine if on-site power service or off-site power service will be used and how it was determined.]*

*[Propose options for each site and associated evaluations. Of the proposed options, provide a recommended toll site location with applicable stations and mile posts as needed. Include plan / profile and gantry section exhibits showing the final recommended location of each site. Identify key features/issues as call outs on the exhibit. Include interim and ultimate conditions for any sites for which it may be applicable. Provide a figure showing the aerial view of the toll site location with the 200-foot radius and the 500-foot radius surrounding the proposed toll site envelope and whether any high voltage circuits or wireless devices are located within these limits as required in GTR 202.3. Include supplemental appendices as needed to support the recommendations.]*

*[Describe any GTR criteria violations that are unavoidable. E.g. high voltage power lines that run the entire length of the corridor. Provide exhibits to describe. Request meetings as needed with FTE Tolls Design and the other FTE Discipline Leads for complex situations.]*

*[Describe how power and communication services will be provided to the site and provide supporting exhibits as required in GTR 202.3. Additionally, describe any environmental or right-of-way implications to the proposed primary routing including any routing outside the limits of construction.]*

*[Identify the impacts to other design disciplines, including drainage, environmental permitting, roadway, MOT/Constructability, site accessibility, right-of-way constraints, project costs, etc.]*

*[Identify any study unknowns that are still undefined by the publication of this report.]*

*[Include toll avoidance analysis and recommendations as described in the GTR.]*

*[Identify if proposed toll site is being constructed to replace an existing toll site / plaza. Identify the distance between existing and proposed gantries / canopies and whether existing building will be utilized to support the new toll gantry. Verify alignment between the existing and proposed to ensure they can both operate simultaneously for the TEC installation, commissioning, and testing periods.]*

**Roadway Plan with Toll Site Shown**

**Align Stationing for Plan and Profile**

**Roadway Profile with Toll Site Shown**

Figure XXX – Plan and Profile

**Typical Sections / Gantry Cross Sections**

Figure XXX Typical Section of Study Area [Quantity of figures as needed]

*[Provide interim and ultimate typical sections (or gantry cross sections if available) of the portions of the roadway for the recommended toll site locations*.]

# IV. Tabulation of Recommended Sites

The following table summarizes criteria analysis provided in Part III against the recommended toll sites:

*[Provide up to 5 site columns as needed to get the full summary of all sites and all interim and ultimate conditions that are applicable. When quantity of sites exceeds 5 instances, create additional tables as needed.]*

*[Provide a separate deviation per GTR 110 and 202 for each “fail” criteria.]*

| *Criteria* | *Description* | *Pass/Fail* | | | | | *Notes* |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Site 1 Station*  *MP*  *Toll Site ID* | *Site 2 Station*  *MP*  *Toll Site ID* | *Site 2 Station*  *MP*  *Toll Site ID* | *Site 3 Station*  *MP*  *Toll Site ID* | *Site 4 Station*  *MP*  *Toll Site ID* |
| *Site 1* | *Site 2 Interim* | *Site 2 Ultimate* | *Site 3* | *Site 4* |
| 220.2(1) | Located on tangent or curve greater than 3000'. | Pass | Fail | Fail | Pass | Pass | *[Be as descriptive as possible for each item regardless of pass or fail condition. Fail conditions should document why the condition cannot be met for the recommended site location. For anything requiring a specified distance or length requirement, provide the measured value for that distance or length here.]* |
| 220.2(2) & (3) | Centerline of gantry must be perpendicular or radial to travel lanes. |  |  |  |  |  |  |
| 220.2(4) | Located outside of sag and crest vertical curves or areas susceptible to standing water. (Toll loop pavement area may be located within sag and crest vertical curves only when the vertical grade is at least 0.3% at any point within the toll loop pavement area.) |  |  |  |  |  |  |
| 220.2(5) | Lane, shoulder, and buffer widths are constant through the toll loop pavement area. |  |  |  |  |  |  |
| 220.2(6) | Minimum 10 foot separation is provided between equipped lanes/shoulders and any adjacent non-tolled lanes, except where EL buffers are used. |  |  |  |  |  |  |
| 220.2(7) | Toll sites must not be located within a superelevation transition/cross slope transition, except shoulder rocking. |  |  |  |  |  |  |
| 220.2(8) | Toll sites must not be located within queuing areas as identified by the design year traffic analysis. |  |  |  |  |  |  |
| 220.2(9) & (10) | No merge or weave conditions (min. 200 ft upstream of the first lane drop sign or 50 ft beyond end of merge area.) |  |  |  |  |  |  |
| 220.2(11) | The gantry centerline must be located a minimum of 200 feet from nearby sign structures, bridges, or toll plaza canopies. More distance required for:   * The taper of the maintenance pull-off area must tie into the shoulder a minimum of 25’ before bridges or similar roadside features * MOT for bridge/sign structure inspection and maintenance that may extend into the toll site. * MOT for bridge widening and/or replacements that may extend into the toll site. |  |  |  |  |  | *[Consideration should be given to shadows cast by nearby structures through the toll loop pavement area.]* |
| 220.2(12) & 101.2(2) | Roadway cross slope under gantry must not result in an elevation difference of more than 26" between the highest and lowest j-arm. |  |  |  |  |  | *[Site 1 - 20”*  *Site 2 Interim - 14”*  *Site 2 Ultimate – 18”*  *Site 3 – 19”*  *Site 4 – 11”]* |
| 220.2(13) | Gantry must be located within 1 mile of express lane entry points. |  |  |  |  |  |  |
| 220.2(14) | Gantry must not block an overhead sign. At least 800 feet for static panels and 1000 feet for DMS. |  |  |  |  |  |  |
| 221.1.1(1) & (2) | Tolling point must be 100 feet with gantry at the midpoint. |  |  |  |  |  |  |
| 221.1.2(1) (2) (3) & (4) | Lane and shoulder widths at the toll site meet GTR requirements. |  |  |  |  |  |  |
| 221.5(2) | Tolling pavement must be free of metal objects at or below grade. |  |  |  |  |  |  |
| 221.5(3) | Curb and gutter, and shoulder gutter must not be within the toll loop pavement area except for toll header curb. |  |  |  |  |  |  |
| 221.6.2 | To avoid closing the entire ramp for maintenance of toll equipment, the width and length of the shoulders approaching and departing single lane ramp toll loop pavement areas must be designed to support using the widened shoulder under the gantry as a travel lane. |  |  |  |  |  |  |
| 223.1(6) & (7) | Maintain all existing toll operations with no interruption to toll collection during construction. |  |  |  |  |  |  |
| 223.3.1(6) | Ensure sufficient space for approach and departure pavement limits. |  |  |  |  |  |  |
| 230.2(1) | Electromagnetic field emitting sources must be located at least 5 feet from the toll site envelope and loop infrastructure |  |  |  |  |  |  |
| 230.2(2) | Low voltage power lines (120/240 V or 480V) AC or DC power must be located at least 5 feet from the toll site envelope. This includes roadway light poles, conduits, conductors, etc. |  |  |  |  |  |  |
| 230.2(3) | Low voltage circuits (120/240 V or 480V) AC or DC power must be located at least 5 feet from loop conduit(s). |  |  |  |  |  |  |
| 230.2(4) | Pipes carrying or intending to convey fluids must be located at least 10 feet from the toll site envelope and 5 feet from the loop conduits. |  |  |  |  |  |  |
| 230.2(5) | Existing and proposed utilities, mechanically stabilized earth (MSE) metallic wall straps, drainage structures, box culverts, or bridge foundations must be located at least 5 feet from the toll site envelope. |  |  |  |  |  |  |
| 230.2(6) | MSE wall strap layout and associated slabs must not conflict with toll site infrastructure. |  |  |  |  |  |  |
| 230.2 (7) & 231.1(3) | Wall foundations with metallic reinforcement must not be located within the toll site envelope. |  |  |  |  |  |  |
| 230.3(1) | Toll Site Envelope must not be located within 200 feet of high voltage (>600VAC RMS or VDC) circuits or conductors. |  |  |  |  |  | *[Identify the distance to the high voltage lines from the CL of the gantry if it is less than a quarter mile]* |
| 230.4(1) | Tolling point must not be within 500' of any devices operating within the 902 MHz to 928 MHz frequency band. |  |  |  |  |  |  |
| 230.5 | New toll sites must be located such that existing toll facilities continue to operate until the new toll sites are commissioned and collecting tolls. |  |  |  |  |  |  |
| 231.1(6) | Finished floor elevation must be a minimum of 18" above 100-year flood elevation and 100-year design stage of adjacent storm water management facilities. |  |  |  |  |  |  |
| 231.1(13) | The generator/fuel tank must be a minimum of 8 feet from the edge of shoulder/toe of barrier. |  |  |  |  |  |  |
| 231.6(4) | Adjacent top of ditches and swales must be at least 5 feet from toll site envelope. |  |  |  |  |  |  |
| 231.7 (1) & (2) | Provide fencing at toll site perimeter if there are adjacent pedestrian facilities or if the site is outside the LA/RW. |  |  |  |  |  |  |
| 234.3(1) | The maximum cable distance between the E6 Reader and antenna cable is under 100 feet. |  |  |  |  |  |  |
| 234.3 (2) | The maximum cable distance between the E6 readers and toll equipment working spaces must not exceed 250 feet. |  |  |  |  |  |  |
| 234.3 (3) | The maximum cable distance between any remaining toll equipment mounted to the j-arms and toll equipment working spaces must not exceed 250 feet. |  |  |  |  |  |  |
| 234.3 (4) | The maximum cable distance between any toll loop and toll equipment working spaces must not exceed 250 feet. |  |  |  |  |  |  |
| Florida Gas Transmission 202.3(5) | Site tolling points must not conflict with FGT line or specified width. |  |  |  |  |  |  |
| Roadway Design Criteria  202.3(5) | Roadway design criteria coordination. |  |  |  |  |  |  |
| ITS/Communication  260.1(1) | Availability and redundancy of fiber optic infrastructure paths (including commercial Metro Ethernet service providers.) |  |  |  |  |  |  |
| ITS/Communication  260.1(4) | Availability of existing ITS FOC backbone. |  |  |  |  |  |  |
| Power Service  202.3(2) | Availability of power and location of point of service. |  |  |  |  |  |  |
| Environmental  202.3(5) | Avoided environmental impacts. |  |  |  |  |  |  |
| Maintenance of Traffic  202.3(5) | Site tolling points must be proposed in locations where Maintenance of Traffic can be maintained Verify that the toll site is not impacted MOT of future work. Existing toll site can be maintained during construction / testing of new toll sites. |  |  |  |  |  |  |
| Right-of-Way  202.3(5) | Sufficient right-of-way to accommodate the toll site. |  |  |  |  |  |  |
| *[Any other applicable project specific criteria]* | *[Descriptions as needed]* |  |  |  |  |  |  |