State of Florida
Department of Transportation

EXHIBIT A

ENGINEERING SCOPE OF SERVICES

for

FL 511 -
Florida’s Next Generation Advanced Traveler Information System

ITN-DOT-15/16-9009-SJ

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<thead>
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<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>° F</td>
<td>Degrees Fahrenheit</td>
</tr>
<tr>
<td>ADA</td>
<td>Americans with Disabilities Act</td>
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<tr>
<td>AMBER</td>
<td>America’s Missing: Broadcast Emergency Response</td>
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<tr>
<td>ANI</td>
<td>Automatic Number Identification</td>
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<tr>
<td>ATIS</td>
<td>Advanced Traveler Information System</td>
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<tr>
<td>C2C</td>
<td>Center-to-Center</td>
</tr>
<tr>
<td>CCTV</td>
<td>Closed-circuit Television</td>
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<tr>
<td>CIN</td>
<td>Consumer Information Network</td>
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<tr>
<td>DIVAS</td>
<td>Data Integration and Video Aggregation Subsystem</td>
</tr>
<tr>
<td>DMS</td>
<td>Dynamic Message Sign</td>
</tr>
<tr>
<td>DTMF</td>
<td>Dual-tone Multi-frequency</td>
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<tr>
<td>Email</td>
<td>Electronic Mail</td>
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<tr>
<td>EM</td>
<td>Event Management</td>
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<tr>
<td>FAT</td>
<td>Factory Acceptance Test</td>
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<tr>
<td>FDE</td>
<td>Florida Division of Emergency Management</td>
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<tr>
<td>FDOT</td>
<td>Florida Department of Transportation</td>
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<tr>
<td>FL511</td>
<td>Florida’s Next Generation Advanced Traveler Information System</td>
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<tr>
<td>FLATIS</td>
<td>Florida’s Statewide Advanced Traveler Information System</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
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<tr>
<td>GPS</td>
<td>Global Positioning System</td>
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<tr>
<td>HTTP</td>
<td>Hypertext Transfer Protocol</td>
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<tr>
<td>ICD</td>
<td>Interface Control Document</td>
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<tr>
<td>IDS</td>
<td>Information Dissemination Subsystem</td>
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<tr>
<td>IP</td>
<td>Internet Protocol</td>
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<tr>
<td>ITN</td>
<td>Invitation to Negotiate</td>
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<tr>
<td>IVR</td>
<td>Interactive Voice Response</td>
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<tr>
<td>JPEG</td>
<td>Joint Photographic Experts Group</td>
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<tr>
<td>LEO</td>
<td>Law Enforcement Officer</td>
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<tr>
<td>MDX</td>
<td>Miami-Dade Expressway Authority</td>
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<tr>
<td>NTP</td>
<td>Notice to Proceed</td>
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<tr>
<td>O&amp;M</td>
<td>Operations and Maintenance</td>
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<tr>
<td>PDF</td>
<td>Portable Document Format</td>
</tr>
<tr>
<td>PMP</td>
<td>Project Management Plan</td>
</tr>
<tr>
<td>RTMC</td>
<td>Regional Transportation Management Center</td>
</tr>
<tr>
<td>SDD</td>
<td>System Design Document</td>
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SEMP .............................................................. Systems Engineering Management Plan
SIS ................................................................................ Strategic Intermodal System
TMC ............................................................................... Transportation Management Center
TvT ...................................................................................... Travel Time
URL ................................................................................ Uniform Resource Locator
UTC ............................................................................... Universal Time Code
WBS ............................................................................... Work Breakdown Structure
1. Introduction

1.1 Purpose

This document is identified as Exhibit A of the Invitation to Negotiate (ITN) No. ITN-DOT-15/16-9009-SJ for Florida’s Next Generation Advanced Traveler Information System (FL511). This exhibit describes the Florida Department of Transportation’s (FDOT) engineering scope of services and functional requirements for the next generation of Florida’s 511 system.

1.2 Identification

The system being specified is called Florida’s Next Generation Advanced Traveler Information System, referred to herein as FL511.

From this point onward FDOT Districts and their partners (e.g., Florida’s Turnpike Enterprise, Miami-Dade Expressway Authority, and Central Florida Expressway Authority) will be referred to as Agency or Agencies in this document.

1.3 Background

FDOT currently operates one of the most widely used traveler information programs in the country. On June 18, 2009, FDOT implemented a statewide advanced traveler information system (ATIS), known as FLATIS, which replaced five regional 511 systems that were in operation throughout the state.

Currently, Agency regional transportation management centers (RTMC) collect traffic information and video, which is sent to one central location in FLATIS where it is then further disseminated via a 511 web site, a 511 interactive voice response (IVR) system, 511 personalized services (e-mail, phone, and text alerts), mobile applications, and a 511 third-party data feed. The RTMCs use SunGuide® software (SunGuide), FDOT’s advanced traffic management systems software, and its center-to-center (C2C) communications protocol to forward this 511 data.¹ For complete details on the design of the current statewide FLATIS, including the current Video Aggregation Subsystem, refer to the System Design Document (SDD) for FLATIS.²

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¹ SunGuide is a registered trademark of the Florida Department of Transportation.

² The FLATIS System Design Document (SDD) can be found at: http://tinyurl.com/FLATIS.
1.4 **Goal**

FL511 is the second phase of FLATIS. The goal of FL511 is to improve upon what was achieved with FLATIS.

FL511 is a traveler information system that shall deliver accurate and reliable traveler information seamlessly to the public through a 511 IVR telephone service, a 511 web site (www.fl511.com), a third-party data feed, personalized services, and smartphone applications as well as any other dissemination components that may be presented. These components are considered the core functions of the FL511 system.

FDOT is looking for a partner that can deliver an FL511 system that is innovative and recommends solutions that promote a progressive approach. The contractor is encouraged to propose ideas and options for FL511 that demonstrate this outside-the-box thought process. The FL511 system will integrate with FDOT’s Data Integration and Video Aggregation System (DIVAS). DIVAS will collect the data via C2C from SunGuide, and other partner interfaces. This data will then be processed for dissemination to various partners/systems. The FL511 system will be one of many users of the data compiled by DIVAS.

The contractor is encouraged to examine the current FLATIS subsystems (IVR, web site, mobile apps, etc.) to gain a better understanding of what has already been accomplished and what is available from the Agencies (e.g., the current roadway coverage). Also identified in this ITN are lessons-learned from the existing FLATIS to make the system function better and respond to the needs of the users. These lessons-learned are included within the requirements.

1.5 **Government-furnished Equipment**

FDOT’s DIVAS will provide data and video information to FL511. The contractor shall work with the DIVAS contractor for Interface Control Document (ICD) documentation. Details of the DIVAS are provided within this document for informational purposes only. (See Appendix A)

The servers utilized by the current FLATIS for the web site and IVR will be made available. (See current SDD for details).

Both the iPhone and Android smartphone applications will be available to the contractor to use. If the contractor uses these provided smartphone applications they will be responsible to operate, maintain, and upgrade these as needed. FDOT will still maintain ownership of the code for the FL511 mobile applications.

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3 The FLATIS System Design Document (SDD) can be found at: [http://tinyurl.com/FLATIS](http://tinyurl.com/FLATIS).
The recorded audio (.WAV) files used on the current FLATIS will be available for the contractor to utilize in development on the FL511 system.

The contractor shall be responsible for the development and integration of the information dissemination subsystem (IDS) and the quality management subsystem.

1.6 How to Use This Document

Section 2 of this document details the project work tasks required of the contractor.

Section 3 of this document contains the functional and performance requirements for the system, arranged according to the functional architecture described in that section. The requirements are allocated to subsystems and each time a requirement is allocated, further detail is provided specifically for the function. Subsystems are specified in detail by component requirements and, if necessary, by functional elements of the component.

2. Project Work Tasks

The contractor shall be responsible for all activities necessary to ensure the success of the project including, but not limited to, contract management, accounting and financial management, schedule management, project administration, reporting and record-keeping, and day-to-day coordination with the FDOT project manager.

2.1 Project Management Plan

The contractor shall develop a project management plan (PMP) that describes all project management activities to be conducted in support of the design, implementation, integration, testing, and operations and maintenance of the project. This plan shall include a schedule that describes when requirements will be completed and the interim milestones for each of the program areas. The contractor shall maintain a single project schedule using Microsoft Project® or an equivalent application accepted by the FDOT project manager. The contractor shall perform all project monitoring and reporting necessary to ensure schedule compliance. If it becomes necessary to modify the existing project schedule, the contractor shall propose changes and reasons for the modification in its cover letter for the monthly status report. The FDOT project manager must approve all modifications and changes in writing.

At a minimum, the contractor shall define and describe the following elements in the PMP:

- A detailed work breakdown structure (WBS) whereby activities have the following characteristics:

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4 Microsoft Project is a registered trademark of Microsoft Corporation in the United States and/or other countries.
status/completion is measureable;
- Start/end events are clearly defined;
- A deliverable (i.e., a visible sign of completion);
- An estimated time and contractor cost of completion;
- An assigned resource;
- Duration is reasonable/acceptable. (Note: Common practice is for a two-week duration; if duration is greater than two weeks then it needs to be justified); and
- Independent.

- A schedule based on the WBS with all milestones and deliverables;
- A configuration management plan;
- A risk management plan;
- A performance monitoring/quality assurance plan;
- A transition plan;
- An operations and maintenance plan;
- A staffing plan;
- A training plan;
- A subcontractor management plan;
- A marketing interaction plan; and
- A budget.

The contractor shall provide a draft PMP no later than 15 business days after issuance of the initial Notice to Proceed (NTP). This draft plan shall include a prioritization of project-related plans and a schedule for the completion of these plans during the initial phase of the project. The draft PMP, all project-related plans contained therein, and the suggested schedule for the completion of these documents are subject to FDOT’s review and approval. All subsequent submissions of completed planning documents detailed below are also subject to FDOT’s review and approval.

The schedule shall provide 15 business days for FDOT’s review of all submittals and 15 business days for FDOT’s review of re-submittals. The contractor may continue project efforts while submittals are being reviewed. However, doing so in no way relieves the contractor of the responsibility to answer and incorporate review comments into the project, nor does it entitle the contractor to any compensation as a result of making changes due to review comments. If FDOT’s submittal review time is exceeded, the contractor shall not assume that the submittal is approved without comment. However, schedule adjustments shall be made if FDOT’s review time is exceeded.
2.1.1 Schedule

The contractor shall utilize a schedule that consists of a closed network with a single critical path that will be reported on each month. The project schedule shall be baselined and changes to the baseline shall be reported (i.e., variance reporting). The schedule may only be re-baselined with the concurrence of FDOT.

The contractor shall demonstrate specific system functionality at key milestones or demonstrations. The contractor shall identify these key milestones in the schedule.

2.1.2 Configuration Management Plan

The contractor shall develop and adhere to a configuration management plan. The configuration management plan shall provide a structure to maintain control over all requirements, specifications, configuration definition documentation, and design changes to ensure the effective management of system configuration modifications for both hardware and software. This configuration management plan shall identify the configuration management tools and processes, methodologies, standards, and procedures to be used.

The configuration management plan shall be submitted to the FDOT project manager for review and approval prior to implementation.

2.1.3 Risk Management Plan

The contractor shall develop and submit a risk management plan for use in proactively recognizing, evaluating, and controlling project-related uncertainties that have the potential to result in schedule delays, contractor cost overruns, performance problems, or other undesired consequences.

The risk management plan shall enable FDOT and the contractor to:

- Identify potential sources of risk;
- Ensure that risk is factored into all decisions;
- Quantify risks, including both the probability of occurrence and seriousness of impact, and assess their impacts on contractor cost (including life-cycle costs), schedule, and performance;
- Determine and evaluate alternative approaches to mitigate moderate and high risks; and
- Take action to avoid, control, assume, or transfer each risk as appropriate.

The status of risk management issues and any mitigation of those issues shall be documented in each written monthly status report.
The risk management plan shall be submitted to the FDOT project manager for review and approval prior to implementation.

### 2.1.4 Performance Monitoring / Quality Assurance Plan

The contractor shall develop and implement a performance monitoring/quality assurance plan. This plan shall document the contractor’s compliance with the functional requirements listed in this document.

Performance monitoring activities to be undertaken by the contractor shall, at a minimum, include:

- Documentation of the contractor’s compliance with the functional requirements listed in this document; and
- Usage data on the various dissemination methods as described in the functional requirements.

The performance monitoring/quality assurance plan shall suggest a set of metrics to use for tracking the contractor’s performance. At a minimum, these metrics shall address system availability/reliability (e.g., 511 web site, 511 personalization component, 511 IVR system, smartphone apps, etc.), customer satisfaction, IVR Recognition Accuracy Rate, and system access. FDOT will define penalties associated with not meeting the project/system metrics. (See Appendix B)

As part of the performance monitoring/quality assurance plan, the contractor shall generate an automated performance statistics report for inclusion in the monthly status report commencing after system acceptance. The contents of the performance statistics report shall indicate whether the contractor is meeting the functional requirements related to each of the project’s program areas.

The contractor shall make system improvements, if necessary, as indicated by the results of its performance monitoring activities. Continued non-performance by the contractor shall result in the assessment of penalties by FDOT, according to the provisions of the performance monitoring/quality assurance plan. Details are specified as outlined in this section. (See Appendix B)

This performance monitoring/quality assurance plan shall be submitted to the FDOT project manager for review and approval prior to implementation.
2.1.5 Transition Plan

The contractor shall develop and implement a transition plan that incurs no downtime for the statewide FLATIS. The transition plan shall document the contractor’s plan to work with FDOT and their current contractors to minimize disruptions during the move from the existing FLATIS to FL511. The transition plan shall be submitted to the FDOT project manager for review and approval prior to implementation.

2.1.6 Operations and Maintenance Plan

The contractor shall develop and implement an operations and maintenance (O&M) plan, including a component that defines a replacement schedule for equipment/parts that are approaching the end of the manufacturers’ recommended useful life, and an O&M manual. At the very least, the O&M plan shall mandate the repair of critical malfunctioning devices within the time necessary to meet the availability requirements as specified in Section 3, and shall recommend the type and quantity of spare parts that are to be available at any given time. The O&M plan shall indicate which O&M activities are to be accomplished via subcontract to other vendors.

The O&M manual shall document the policies and procedures to be applied in addressing all scheduled (i.e., preventive) and unscheduled (i.e., on-call emergency) maintenance responses for all hardware and software, communication links and networks, power supplies, and processing systems.

It is required that the O&M plan will include a 24 hour-a-day/7 days-a-week response system to address issues. The contractor shall provide an interactive secured web-based trouble ticket system to be utilized by the contractor, FDOT, and Agency partners for reporting and tracking issues with any components of the system. The contractor shall ensure that the ticketing system is monitored at all times.

The O&M plan must be approved by the FDOT project manager prior to, or in conjunction with, system implementation. The selected contractor shall update the O&M plan as appropriate, but not less than annually.

2.1.7 Staffing Plan

The contractor shall develop a staffing plan that outlines how all staff functions and responsibilities shall be met during all phases of the contract. At a minimum, this plan shall:

- Outline staffing levels (i.e., number of personnel) by day and time;
- Describe the type of staff who will be on-duty at any given time;
- Include the staff structure (i.e., hierarchy) and outline the reporting structure for the operations staff;
• Identify key staff members;
• Identify location of staff;
• Identify percent allocation of staff to FL511 during various phases of contract; and
• Identify how key staff will be replaced if they leave to seek other opportunities or become otherwise unavailable.

This staffing plan shall be submitted to the FDOT project manager for review and approval prior to implementation. Key staff identified by the contractor shall not be removed from the project or reassigned within the project without written approval by FDOT. Any new staff identified as key by the contractor shall be approved prior to that staff being assigned to the project, including but not limited to the project manager.

2.1.8 Training Plan

The contractor shall develop a training plan that will be used to train key FDOT staff in operating and maintaining the contractor’s system. The contractor shall get approval from FDOT on the training plan, which shall cover all the Agencies. FDOT employs a “train-the-trainer” philosophy with a maximum utilization of contractor-generated course materials.

The training plan shall specify any pre-qualifications that FDOT staff will need prior to implementation of training. The training plan shall be submitted to the FDOT project manager for review and approval prior to implementation. The training plan shall be in an editable document format. The contractor shall record the training materials in digital versatile disc format and shall provide the training materials to FDOT.

If necessary, FDOT will provide classroom space in a mutually satisfactory facility located in Florida. Class size per session will be limited to 10 students. The contractor will be allowed to provide virtual training pending FDOT’s approval.

All contractor-generated course materials shall remain the property of FDOT. These course materials shall be in an editable document format. FDOT will retain unlimited rights to make copies of the training materials within the state of Florida.

As part of the training plan, the contractor shall develop a system operations manual and set of standard operating procedures to be used by its staff in providing operations support for FL511. All documentation shall be provided to FDOT for review and approval prior to use.
2.1.9 **Subcontractor Management Plan**

If the contractor utilizes subcontractors, the contractor shall develop a subcontractor management plan that describes the process that will be used to select and manage qualified subcontractors. The subcontractor management plan shall address concerns related to project planning, requirements management, project tracking, and general project oversight as well as coordination with quality assurance and configuration management processes, as appropriate. The subcontractor management plan shall be submitted to the FDOT project manager for review and approval prior to implementation.

2.1.10 **Marketing Interaction Plan**

The contractor shall be prepared to work in conjunction with FDOT’s designated 511 marketing contractor. This includes providing statistics, assisting with surveys, and providing support to the 511 marketing goals. The contractor’s marketing interaction plan will outline how the contractor will assist FDOT’s designated marketing contractor.

2.1.11 **Budget Plan**

The contractor shall develop a budget to describe all contractor costs for FL511. Earned value management shall be used. The budget shall include both high-level costs and sub-level costs to include the contractors cost per subsystem and component as well as each subcontractor’s cost per subsystem and component.

2.2 **Systems Engineering Management Plan**

The contractor shall develop and adhere to a systems engineering management plan (SEMP). The SEMP supplements the PMP and focuses on the technical aspects and the systems engineering process to be used on the project.

The following engineering-related contract deliverables shall be defined and described in the SEMP:

- System design document (SDD);
- Software design specification;
- Interface control document (ICD);
- Software integration case plan and procedures;
- Acceptance test plan;
- Corrective action plan, if necessary;
- Deviations and waivers, if necessary;
- Software version description document;
- Software users’ manual; and
- System operations manual.

The contractor shall provide a draft SEMP no later than 30 business days after issuance of the initial NTP. This draft plan, and all plans contained therein, is subject to FDOT’s review and approval. All subsequent submissions of completed planning documents herein are also subject to FDOT’s review and approval.

### 2.2.1 System Review

A review of the existing FLATIS (e.g., 511 web site, 511 personalization component interface, 511 IVR menu structure, smartphone apps, etc.) and the existing FLATIS SDD is recommended to ensure that the FL511 system requirements are fully understood and that they have been met in the new FL511 SDD. At a minimum the contractor’s review should include the FLATIS System Design Document, Version 1.5, LogicTree, dated September 4, 2008. (Refer to: [http://tinyurl.com/FLATIS](http://tinyurl.com/FLATIS))

FDOT does not warrant or guarantee the accuracy of the documentation, and the use of such documentation is at the sole risk of the contractor.

### 2.2.2 Design Phase

#### 2.2.2.1 System Design Document

All design requirements shall be specified in a SDD and each design requirement shall show which functional requirement is being satisfied by the design. Design requirements shall be maintained in a requirements database, referred to as the design Requirements Traceability Matrix. The requirements database shall provide requirement traceability to the functional/performance requirements listed in the functional requirements section of this document. The SDD shall summarize the purpose of the project, the operational concept, and the system objectives. The SDD shall divide the system into physical subsystems and shall specify the subsystem interfaces. Where applicable to each subsystem, the major components of the SDD shall be specified, including hardware dependencies, module definitions, file formats, inputs and outputs, global variables, data elements, data structures, data types, business rules, communications, database table design, constraints, assumptions, and dependencies.
2.2.2.1 **Peer Review**

Prior to submitting the SDD to FDOT, the contractor shall conduct an internal peer review of the design requirements specification according to the quality control plan approved by FDOT. Peer review shall be completed prior to sending the SDD to FDOT for formal review and within the allocated schedule. The peer review shall be documented in the revision summary table of the SDD.

2.2.2.1.2 **Formal Review**

Following successful completion of the internal peer review process, the contractor shall submit copies of the draft SDD to FDOT. This submittal shall be delivered to FDOT at least three weeks prior to the system design review meetings that will be scheduled by the contractor with FDOT.

FDOT and the contractor staff shall participate in a system design formal review meeting. The contractor shall present the results of their analysis and the proposed detailed design. Review comments shall be addressed and incorporated into the SDD as necessary. FDOT’s approval is necessary before the system design milestone is considered complete.

2.2.2.2 **Software Design**

2.2.2.2.1 **Specification**

The contractor shall deliver a draft software design specification for FDOT’s review and comment. The software design specification shall be reviewed at a software preliminary design review. After review of the draft, the contractor shall incorporate recommended changes and deliver a final software design specification.

FDOT will review and comment on the draft software design specifications. At a minimum, the software design specifications shall include the following:

- An overview of what software modules are included in the software build;
- A description of what functions the software build will provide;
- A list of the functional modules that make up the software build and how they relate to the architecture;
- A list of what requirements will be satisfied by each module;
- A schedule for detailed design and unit testing, and identification of the software engineer that will provide the detailed design, code, and test for each functional module; and
- A list of resources that will be needed by both the contractor and FDOT to support the design, coding, and unit testing of each module.
2.2.2.2 Preliminary Design Review

The contractor shall conduct a software preliminary design review at an FDOT facility, which will be identified in the future. Each software build design shall be formally reviewed at a software preliminary design review. The number of reviews shall depend on the contractor’s implementation plan.

The contractor’s software engineering team shall not begin developing/coding any software until the software preliminary design review is completed to the satisfaction of FDOT, and FDOT has authorized the contractor to proceed with the software coding/development. Development/coding for the purpose of evaluating the feasibility of an approach to reduce implementation risk is authorized without FDOT’s approval as long as the code developed is clearly identified to FDOT and not reused in the deliverable software (i.e., throw away code).

FDOT shall retain the option of allowing the contractor to reuse code that was developed for the purpose of evaluating the feasibility of an approach to reduce the implementation risk.

The software preliminary design review shall be held no later than 45 calendar days after release of the draft software design specifications, but no earlier than 14 calendar days, to provide enough time for FDOT’s technical and management team to review.

2.2.2.3 Critical Design Review

A software critical design review shall be held for the software modules that comprise the software build. The initial software critical design review shall be held no later than when 20 percent of the software build has been coded. The number of reviews shall depend on the contractor’s implementation plan.

2.2.3 Interface Control Documents

The contractor shall document all interfaces necessary to support the project via an ICD that is subject to FDOT’s review and approval. The purpose of an ICD is to document all of the functional and physical interfaces. Note: an example of an interface that needs an ICD is the interface with DIVAS.

As part of this effort, the contractor shall:

- Complete an ICD for each external interface and deliver the document to FDOT for review, comment, and approval. Conduct interface working group meeting(s), as necessary and appropriate, between the parties to the interfaces.
• Validate the ICD between interface parties over a series of meetings and/or teleconferences in which the representatives of each side of the interface directly present the performance or needs for their side of the interface. The contractor shall be the author of each ICD and shall ensure that copies are available to other parties before a meeting.

2.2.2.3.1 **Internal Review**

The contractor’s technical staff shall perform an internal peer design review prior to sending the ICD to FDOT. The review shall be documented in the ICD revision summary table.

2.2.2.3.2 **Formal Review**

The ICD shall be submitted to FDOT for formal review. Review comments shall be addressed to the satisfaction of FDOT and shall be incorporated in revised ICDs that are submitted for final approval.

2.2.3 **Implementation Phase**

The contractor shall be required to hold at least three implementation design reviews to evaluate and ensure that the FL511 system end-user interfaces (e.g., 511 web site, 511 personalization component interface, 511 IVR menu structure, smartphone apps, etc.) meet end-user requirements. The goal is to improve upon the existing end-user interfaces to achieve the most efficient, user-friendly, simple interface possible with the requested functionality. During the design reviews, FDOT will address several of the lessons-learned, such as streamlining the menu and allowing users to request information using combined commands, to name a couple.

Comparisons to the current FLATIS (e.g., 511 web site, 511 personalization component interface, 511 IVR menu structure, smartphone apps, etc.) will be done during these implementation design reviews.

Full end-to-end reviews of data/information flows shall be done during these implementation design reviews.

2.2.3.1 **Software System Implementation**

There are two major tasks associated with software implementation. The first is code and unit testing of the software and the integration of the software units into working modules that comprise a functional software build. The second task is to verify that the software build works and satisfies the functional system requirements. The integration and testing task is addressed separately from the code, unit testing, and build integration. The contractor shall be responsible for all integration and testing.
The contractor shall be responsible for verifying that the system meets the requirements of the software final design specifications. While the contractor is responsible for providing software that meets the system functional requirements, the contractor shall coordinate with FDOT to verify jointly that the software build meets the functional system requirements.

### 2.2.3.2 Software Code and Unit Testing

After approval of a software build’s design, the contractor shall begin code and unit testing of the software in accordance with the approved design and, in the case of key interfaces (e.g., 511 website, 511 personalization component interface, 511 IVR menu structure, smartphone apps, etc.), with the implementation design reviews. The contractor shall develop the system in accordance with the contractor-developed and FDOT-approved quality control plan.

FDOT and the contractor shall agree on a set of functions that can be effectively demonstrated as a part of the logical implementation of the system. This approach, called functional thread testing, is designed to build confidence that the project is on track and meets its requirements, and to identify problems early to permit resolution within schedule.

#### 2.2.3.2.1 Software Integration Case Plan and Procedures

The contractor shall develop a software integration case plan and software integration case procedures that identify the specific functionality of a system build and satisfy a set of system requirements for the system. A software build that supports specific functions is called an integration case. The contractor shall identify an appropriate number of logical integration cases. Each integration case shall be formally identified as a system milestone, and the system’s functions shall be formally demonstrated by the contractor for FDOT and invited guests. For planning purposes, contractors can assume that software demonstrations shall take place at an FDOT facility that will be identified in the future. FDOT shall review and approve the integration plan.

### 2.2.4 Acceptance Test Phase

#### 2.2.4.1 Test Plan and Test Procedures

The acceptance test plan shall include a description of the contractor’s approach to verifying that the integrated system meets its requirements. The plan shall include a description of test cases that will demonstrate functional threads through the system. The contractor shall be responsible for systems integration and proving that the integrated system meets all the system functional and performance requirements.
The systems and subsystems shall be standalone modular components that, when integrated, provide a functional thread through the system or subsystem. Each major functional thread shall be demonstrated to FDOT in a milestone demonstration to provide FDOT with the confidence that the system is being integrated on schedule and will meet its requirements. Approximately three milestone demonstrations shall be described and executed by the contractor.

After approval of the acceptance test plan, the contractor shall develop acceptance test procedures in accordance with the approved plan. The test procedures shall be of sufficient detail that a person unfamiliar with the system can execute the test procedures and get a repeatable result each time. The test procedures shall identify the requirements being verified in each step and shall describe the test set up and the support hardware and software needed for each test case, and shall predict the result of each step in the procedure. The acceptance test shall verify the system’s ability to meet or exceed all system and subsystem requirements. The acceptance test shall include the testing of system functions using the communications system specified for the project by the contractor. The acceptance test shall commence only after the acceptance test plan has been reviewed and approved by the FDOT project manager.

Prior to formal acceptance testing, a test readiness review shall be held no earlier than three business days prior to formal testing. The final acceptance test procedures will be reviewed and agreed to by FDOT. It is understood that if all acceptance tests pass, the system shall be deemed acceptable by FDOT and the development phase of the project shall be concluded. The acceptance test procedures document shall be signed by FDOT and the contractor prior to the start of formal testing.

**2.2.4.1.1 Test Plan Development**

At a minimum, the acceptance test plan shall include:

- A traceability matrix to ensure that all contractual requirements will be met by system tests;
- Test responsibilities;
- Test monitoring methods;
- Pretest activities;
- Test environment requirements, including any hardware and software required for testing;
- A description of the expected operational outputs and test results;
- An estimate of the test duration and a proposed test schedule;
- A data form to be used to record all data and quantitative results obtained during the test;
- A description of any special equipment, setup, staff, or conditions required for the test;
- A description of the thresholds that would qualify test results as acceptable/unacceptable, where practical;
- A description of how system loading under extreme conditions will be tested, where applicable;
• An end-to-end test plan, testing all deployed elements; and
• A 30-day burn-in of all systems to be initiated after the successful completion of the 14-calendar day system acceptance test.

If failures occur during any individual test, the test shall be terminated and restarted after the cause of the failure is identified and corrected at FDOT’s discretion.

The acceptance test plan shall clearly define the project acceptance criteria that will be used to measure the test results to determine acceptability. Criteria shall include requirements traceability, equation and logic validation, performance to design capacity, and fail-over capability of redundant components. FDOT reserves the right to expand any acceptance criteria and to define minimum criteria that supports the project needs, expectations, and requirements. The acceptance test plan shall specify the extent and level of FDOT’s participation in testing.

During the operational test, the system shall be operated continuously for a period of 30 calendar days without failure of any major component as defined in the approved acceptance test plan. If a major component\(^5\) fails or a problem arises that delays testing by more than 24 hours, testing shall be terminated and scheduled for restart after the problem has been corrected. In the event of a system failure, the problem shall be corrected and the test shall be restarted for another 30 calendar days. Failure of any contractor-supplied software or hardware item during the test period, with the exception of consumable items, such as fuses, shall necessitate restarting the 30-calendar day test period. There shall be no persistent intermittent failures allowed during testing. If a problem is discovered, and it is uncertain whether the cause is hardware or software related, the 30-calendar day test shall be restarted according to the approved acceptance test plan.

All software required to diagnose hardware and software malfunctions shall be supplied by the contractor and approved by FDOT. A copy of all diagnostic software, if needed, shall be supplied to FDOT with full documentation during the testing and acceptance period. The contractor shall correct any failure in the contractor-supplied hardware or software at no cost to FDOT. The contractor shall submit failure report logs to demonstrate that error rates are within requirements.

No intermittent failure shall be permitted to persist during the test period. If such problems are encountered, the test shall be terminated and restarted after the cause of the intermittent failure is identified and removed from the system. The system may be shut down for purposes of testing and correcting identified deficiencies. For each period of system shutdown, the scheduled 30-calendar day operational test shall be extended for the same period of time. If the total number of system shutdowns exceeds three during the 30-calendar day test period, the operational test shall be repeated for the full 30-calendar day period.

\(^5\) Major components include the systems, subsystems, components, and units described in Section 3.
Equipment configurations and software shall not be changed during this period. If a configuration change must occur, the test must be restarted. The contractor shall certify the configuration of all elements prior to beginning this test. The corrective action for a failure shall be included in the documentation process. FDOT will review and approve the corrective action.

The contractor shall be responsible for repairing and replacing all hardware and software used on the project that has become defective during the operational test. Repairs made shall conform to the plans submitted by the contractor as part of the design process and this Engineering Scope of Services. The contractor shall be responsible for all costs associated with the maintenance, repair, or replacement of the equipment.

In the event that more than one system operational test is necessary, the contractor shall be responsible for all costs.

### 2.2.4.2 Final Acceptance Test

#### 2.2.4.2.1 Readiness Review

The contractor shall attend a FDOT-hosted final acceptance test (FAT) review that will be held no sooner than seven calendar days prior to the commencement of the formal FAT and no later than the start of the FAT. The purpose of the FAT readiness review is to verify that the system is ready for formal testing, and that the contractor and FDOT agree on the scope of the testing, the criteria for acceptance, the testing ground rules, and the process to follow for resolution of any discrepancies resulting from the FAT. At a minimum, the FAT readiness review shall:

- Review the status of any test discrepancies resulting from the integration case testing;
- Review the test procedures and agree on pass/fail criteria for each test; and
- Review and agree on the process for resolution of any test irregularities.

#### 2.2.4.2.2 Final Acceptance Test

The contractor shall support FDOT and/or their designated representative in conducting a 30-day operational test. Operational testing shall take place at a site designated by FDOT.

#### 2.2.4.2.3 Hot Wash-up

A hot wash-up denotes an immediate review of a process or a test, and will be used to verify that all participants perceived the same results, or to identify significant differences of opinion on the results of the process or test. Immediately after testing, FDOT will convene a meeting with the contractor’s project manager and test director, and FDOT management to discuss the results of the testing and to agree on a preliminary list of actions that may result from the FAT. FDOT will publish the minutes of the hot wash-up, and the contractor shall review and provide comments.
2.2.4.2.4 **Final System Inspection**

Prior to final acceptance, the contractor shall repair and replace all components/software that became defective during the acceptance test. Repairs made shall conform to the plans submitted by the contractor as part of the design process and this *Engineering Scope of Services*. The FDOT project manager (or a designated representative) shall perform a final inspection of the entire system in the presence of a representative of the contractor.

2.2.4.2.5 **Final Acceptance Test Report**

FDOT will generate a FAT report based on the results of the operational test and the final system inspection. The contractor shall review and comment on the report. Once the contractor has addressed all comments and deficiencies noted in the final acceptance test report to the satisfaction of the FDOT project manager and the issues have been retested, FDOT will issue a formal notification of system acceptance.

2.2.4.2.6 **Corrective Action Plan**

The contractor shall generate a plan to correct any deficiencies noted by FDOT in the FAT report. In some cases, no corrective action may be required if the contractor’s analysis of the reported anomaly does not constitute a system failure. At a minimum, the corrective action plan shall address each FAT discrepancy noted in the FAT report by:

- Noting the test procedure where the discrepancy was observed;
- Noting and quantifying what requirements were not met;
- Providing a description of the problem and its impact on the suitability and functionality of the system;
- Providing a description of possible solutions;
- Providing any interim work-around procedure recommended until the problem is fixed;
- Providing an estimated schedule for how long it will take to correct the problem and test the software; and
- Noting what FDOT resources are needed to support the contractor in fixing the problem.

FDOT will review and approve the corrective action plan. In some cases, the contractor may request a deviation or waiver for the requirement(s) not met. FDOT has the discretion to approve the request, and will seek either consideration or a contract adjustment.

2.2.4.2.6.1 **Deviations**
The contractor may request a deviation from a stated requirement if the system can be shown to provide an equivalent functionality. A formal deviation request shall be submitted in accordance with the process and format described in the FAT plan. FDOT has the discretion to accept or reject a deviation request. If accepted, the requirement shall be rewritten to reflect the new functionality and the documentation shall be revised accordingly.

2.2.4.2.6.2 Waivers

The contractor may also request a waiver for a requirement that is not met due to a design or implementation error. A waiver may be granted by FDOT to accept the system as-is with the proviso that the problem shall be fixed in accordance with the contractor-furnished, FDOT-approved corrective action plan within the approved schedule. If a fix for the problem proves impractical for the contractor, FDOT may grant a waiver to accept the system as-is if the contractor provides commensurate consideration for the lack of specified functionality, and if there is an acceptable work-around procedure for FDOT. FDOT may also reject the waiver request and require that the contractor meet its obligations under the contract.

2.2.5 Software Documentation

2.2.5.1 Software Users’ Manual

O&M of the delivered software shall be documented in a software users’ manual. The software users’ manual shall be written so that an operator with at least a ninth grade education can read the manual, and operate and maintain the delivered software.

2.2.5.2 Software Version Description Document

The software developed and delivered to satisfy the functional requirements shall be documented so that professional software engineers can use the documentation to understand the software source code and make changes, if necessary. The delivered software shall be documented in a software version description document.

2.3 Responsibility for Backbone Numbers, Web Site, Carriers, and Circuits

2.3.1 Responsible Organization for Backbone Numbers

The contractor shall be the responsible organization for all existing toll free and, if applicable, local backbone numbers to which the landline and wireless carriers terminate their 511 translations for the existing 511 services. Thus, the transfer of the 511 service will not require any reprogramming for 511 translations by the carriers. The FL511 contractor shall coordinate with the current FLATIS contractor to transition all backbone numbers.
2.3.2 Web Site

The contractor shall be responsible for the operation and maintenance of the statewide traveler information web site (www.fl511.com), including maintaining hosting of the web site on behalf of FDOT. The contractor shall create a new FL511 web site. During development of the web site, the contractor shall be responsible for providing a temporary uniform resource locator (URL). Once the transition from the FLATIS to the FL511 system occurs, FDOT will work with the FL511 contractor to redirect the Internet Protocol (IP) address of the newly developed web site to the existing URL (www.fl511.com). The cut over shall result in no downtime of the FL511 web site.

The FL511 web site shall have the capability of linking to other web sites as directed by the FDOT project manager including, at a minimum, all web sites to which the current statewide FLATIS links. The contractor shall develop a method for identifying broken links to other web sites in a timely fashion.

The contractor shall ensure that a configurable emergency management (EM) page exists on the FL511 web site.

The contractor shall also configure the web site to be able to have the FDOT emergency alert displayed when activated by FDOT Public Information Officer staff. Information for this configuration will be provided during design/modification of the FL511 web site.

2.3.3 Carrier Coordination and Carrier Costs

The contractor shall assume responsibility for all 511 carrier coordination and associated carrier costs. This includes costs carriers charge for routing 511 calls.

2.3.4 Circuits

The contractor shall assume responsibility for all circuits needed to connect FL511 to DIVAS and any other communications necessary to provide the FL511 functionality.

2.4 511 Roadway Coverage

FDOT expects that the system procured via this ITN shall cover the roads on which the Agencies provide traveler information and will allow for quarterly updates by the Agencies. These updates will account for such items as new SunGuide EM locations, new travel time (TvT) links, new floodgate slots, new grammars, etc. In addition, FDOT has procured third-party TvT/speed information for all limited-access facilities as well as major non-limited-access facilities around the state. The contractor will integrate the TvT/speed data into FL511 to display the TvT data on the FL511.com web site and to provide the information utilizing the IVR and smartphone apps. The SunGuide transportation management center (TMC) software has been modified to accept the third-party data.
The contractor shall review the current FLATIS and account for all current 511 roadway coverage as well as new routes that will be added under this contract.

The contractor will also be responsible for any new routes that will be added to the system on a quarterly basis. This may include both primary and secondary routes. As with the existing routes, the contractor will be provided with the EM and TtvT locations for the new routes that will be added.

2.5 Meetings

2.5.1 Scheduled Meetings

The contractor shall plan on meeting with the FDOT project manager no less than weekly from issuance of the NTP until the time of final system acceptance by the FDOT project manager. The weekly meetings can be by teleconference. After system acceptance by the FDOT project manager, the contractor shall meet with the FDOT project manager no less than bi-weekly through the first six months of system operation. After the first six months of system operation, the contractor shall meet with the FDOT project manager monthly. The FDOT project manager shall have the right to change the frequency of these meetings based on contractor performance.

Every month, the prior month’s monthly status report shall be reviewed at one of the weekly meetings.

The contractor shall meet with the FDOT project manager once per year for an annual project review. This review will assess the accomplishments of the contractor during the previous year and will determine the course of the project for the upcoming year.

The contractor shall schedule, attend, participate in, and prepare appropriate materials for meetings as directed by the FDOT project manager. For all meetings, the contractor shall document meeting minutes and items of relevance to the project for distribution to appropriate staff.

2.6 Reports

2.6.1 Monthly Status Reports

The contractor shall provide FDOT with a monthly status report summarizing its activities. Each monthly status report shall contain a minimum of the following information:

- Review and analysis of the approved PMP, including major task accomplishments and milestones, and the status of all tasks the contractor has worked on during the reporting period and plans to work on during the subsequent reporting period.
Schedule update and adherence, including a summary of all tasks that are behind schedule or expected to fall behind schedule, all tasks that are over budget or expected to go over budget, the reasons for the schedule slippage and/or contractor cost overrun, and the remedial actions in place or proposed.

For each element of the WBS, information shall be provided concerning the following contractor cost management items:

- Planned value (i.e., the budgeted contractor cost of the work scheduled);
- Earned value (i.e., the budgeted contractor cost of the work performed); and
- Actual cost (i.e., the actual contractor cost of the work performed).

Performance statistics report that indicates whether the contractor is meeting all the FDOT-approved performance metrics described in the performance monitoring/quality assurance plan.

A list of all deliverables (e.g., memoranda, plans, reports, etc.), any updates to deliverables that have been provided to FDOT, and their status (e.g., draft, final, approved, etc.).

A log of user comments and questions and the contractor’s responses, including dates for all correspondence.

An action item database that the contractor shall maintain to support the closure of ongoing tasks/problems in a timely manner; an updated list of action items with priority, status, resources being applied, and required resolution dates shall be included as part of the monthly status report.

The monthly status report shall also include a report on new hires and retraining for that month.

2.6.2 Annual Report

The contractor shall submit an annual project report to the FDOT project manager no later than 12 months after contract execution, with subsequent reports delivered every 12 months thereafter. The annual project report shall summarize activities to-date and propose a PMP for the next year. The annual project report shall include, but not be limited to:

- Performance by the contractor;
- Plans, priorities, and objectives for the next year;
- Evaluation of the effectiveness of the PMP as well as individual elements of the plan (e.g., the marketing plan);

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6 A Guide to the Project Management Body of Knowledge, Section 5.3.2 – Create WBS: Tools and Techniques, p.113. More information is available online at http://www.pmi.org/.
• Recommendations, such as whether certain goals need to be reconsidered or certain plan elements revisited;
• Lessons-learned;
• Recommendations for new dissemination components or termination of current dissemination components (Contractor will be responsible to validate drop in use of a current dissemination component);
• Breakdown of system usage; and
• Project inventory.

2.6.3 Tuning / Caller Recognition Report

Caller recognition is the ability of the FL511 system to distinguish between English and Spanish as well as the ability of the FL511 system to recognize and understand a caller’s commands in response to system prompts. Recognition rate will be determined by an examination of all dialog states for all calls made to the IVR during the period being assessed. Recognition will be defined as how well the application recognizes things it is supposed to recognize, such as menu items and highway names.

FDOT will define graduated Recognition Accuracy Rates for both English and Spanish and the contractor will be required to analyze the recognition rate and present it in a Tuning/Caller Recognition Report every three months. If the contractor does not meet the graduated recognition accuracy rates, they will be assessed a penalty as defined by FDOT. (See Appendix B)

2.6.4 Record Keeping

The contractor shall be responsible for all aspects of project accounting, budget management, cash flow, and other financial management.

The contractor shall conform to state and federal requirements for audit and contract compliance, accounting and financial management requirements, normal procurement procedures, financial management, and revenue reporting.

The contractor shall alert the FDOT project manager of any prospective contractor cost or in its cover letter for the next monthly status report, such as the possible need for reallocation, potential contractor cost overruns, or cash flow problems, as soon as such a concern becomes known. Deviations from the PMP need to be reviewed and approved in writing by the FDOT project manager. If approved by the FDOT project manager, the contractor shall reallocate project funds accordingly.

All financial record keeping shall be in accordance with generally accepted accounting principles, and shall be compatible with FDOT’s accounting systems, processes, billing cycles, and its standard terms and conditions.
2.6.5 Correspondence

As appropriate, the contractor shall send correspondence necessary to meet contract commitments to FDOT and its partners. All correspondence and communications made by the contractor shall be concise and professionally written. Copies of all such correspondence shall be provided to the FDOT project manager. Correspondence with FDOT staff shall occur during FDOT business hours, 8:00 a.m. and 5:00 p.m. Eastern Standard Time.

2.7 Contractor’s Staff

The contractor shall designate a project manager who shall be their representative for the project. Thus, the contractor’s project manager shall coordinate with the FDOT project manager on decisions that affect the contractor’s participation in the project. However, the final direction on all matters of this project shall remain with the FDOT project manager.

The contractor shall identify key project staff to FDOT. The contractor shall make no changes in key personnel without formal written notification and approval from FDOT.

2.8 Subcontracts and Agreements

The contractor shall keep records of all subcontracts, permits, and any other agreements, including service level agreements, entered into as part of the project. At a minimum, the contractor shall keep copies of all such agreements and a database that includes at least the following information:

- Parties to each agreement;
- Beginning date for the agreement;
- Termination date for the agreement;
- Cost of the agreement, if appropriate;
- A brief statement of the agreement’s purpose or scope of work; and
- Parties’ contact information.

Any and all use of subcontractors to carry out the activities described in this Engineering Scope of Services must receive the prior written approval of the FDOT project manager.

2.9 Equipment

Any hardware/equipment for the operation of the FL511 system shall be purchased by the contractor and become the property of FDOT.

The contractor shall account for upgrades to hardware throughout the life of the project and should plan accordingly for replacement in the FL511 O&M plan.
2.9.1 Equipment Warranty

All equipment provided by the contractor as part of this project shall be warranted and guaranteed against defects and/or failure in design, materials, and workmanship from the date of final system acceptance, as recorded by the FDOT project manager, through the contract period.

The warranty shall provide that, in the event of a malfunction during the warranty period, the defective system component shall be replaced with a new component according to the schedule defined and agreed upon by FDOT in the O&M plan. The contractor shall be responsible for all labor and equipment costs for installing the new component.

2.10 Project Inventory

The contractor shall keep an inventory of all equipment purchased for use in this project, and shall update this equipment inventory annually. Equipment information to be included as part of this inventory shall include:

- Equipment description;
- Manufacturer’s serial number;
- FDOT property decal, if applicable;
- Date of purchase;
- Acquisition cost;
- Location of equipment;
- Warranty information, including expiration date; and
- Vendor contact information.

If a piece of equipment is replaced or a portion of the equipment is replaced, the contractor shall also provide the details listed above for the replacement piece(s). The contractor shall also associate the primary piece of equipment with the replaced piece of equipment.

The contractor shall also keep a record of all software used in the project, and associated licenses.

2.11 General Record Keeping

The contractor shall keep the following general records, along with any other records necessary for the efficient management and auditing of the project:

- Project documentation and record keeping;
- Insurance and bonding requirements;
- Communications record keeping; and
• Staff management and employment records and policies.

The contractor shall also implement procedures for creating and maintaining backup copies of all records.

2.12 Ownership of Deliverables

FDOT shall retain all rights to and ownership of products and software developed during the course of this project.

2.13 Coordination with the DIVAS Contractor

The contractor shall work with the DIVAS contractor to develop the necessary interface documentation and ICDs necessary to support the provision of data to the IDS. In addition, the contractor shall test the components to ensure that it provides data in a manner that conforms to all requirements. All development and testing of the necessary interface shall be done at no expense to FDOT or the DIVAS contractor. Therefore, the FL511 contractor will need to budget accordingly to directly offset those costs.

The contractor is responsible for all O&M of the FL511 interface which connects to the DIVAS database as well as all costs associated to this interface itself.

At a minimum, the contractor shall set aside sufficient resources to support one meeting per week beginning at the time of system design acceptance and continuing through the initiation of operations, and one meeting every month after the initiation of operations.

The contractor shall budget sufficient meeting time to support the development and refinement of all ICDs, other interface coordination, and interface testing in conjunction with the DIVAS contractor.

3. Functional Requirements

The system’s functional requirements shall be maintained in a database that supports requirements traceability, tracks all changes to each requirement, displays the hierarchical relationship of the requirements, and identifies the requirement’s root source. The requirements for FL511 are allocated to functions of the system, therefore creating a functional design that consists of subsystems, components, and units. The physical design may be different from the functional design, and it is the contractor’s responsibility to derive design requirements from the functional requirements and to maintain traceability from the design back to this functional specification. Each functional requirement is assigned a unique alphanumeric identification code that relates to the functional architecture.
Table 3-1 lists the codes and the part of the system to which the requirements apply. Refer to Figure 3-1 to see how the parts of the system relate to each other.

### Table 3-1 — Requirement Identification Codes

<table>
<thead>
<tr>
<th>REQUIREMENT CODE</th>
<th>SYSTEM PART THE REQUIREMENT APPLIES TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sxxx</td>
<td>FL511</td>
</tr>
<tr>
<td>IDxxx</td>
<td><strong>Information Dissemination Subsystem</strong></td>
</tr>
<tr>
<td>IDxxxD</td>
<td>Information Dissemination Subsystem Database Component</td>
</tr>
<tr>
<td>IDxxxI</td>
<td>DIVAS Interface Component</td>
</tr>
<tr>
<td>IDxxxP</td>
<td>Personalization Component</td>
</tr>
<tr>
<td>IDxxxR</td>
<td>Reporting Component</td>
</tr>
<tr>
<td>IDxxxV</td>
<td>Interactive Voice Recognition Component</td>
</tr>
<tr>
<td>IDxxxW</td>
<td>Web site Component</td>
</tr>
<tr>
<td>IDxxxMA</td>
<td>Mobile Application Component</td>
</tr>
<tr>
<td>IDxxxE</td>
<td>Emergency Notifications</td>
</tr>
<tr>
<td>IDxxxVI</td>
<td>Video component</td>
</tr>
<tr>
<td>IDxxxIN</td>
<td>Innovative Dissemination Options</td>
</tr>
<tr>
<td>QMxxxx</td>
<td><strong>Quality Management Subsystem</strong></td>
</tr>
<tr>
<td>CMxxxx</td>
<td><strong>Configuration Management Subsystem</strong></td>
</tr>
<tr>
<td>CMxxxxR</td>
<td>Receive Data Component</td>
</tr>
<tr>
<td>CMxxxxA</td>
<td>Accept Data Component</td>
</tr>
<tr>
<td>CMxxxxM</td>
<td>Configuration Moderator Component</td>
</tr>
<tr>
<td>CMxxxxT</td>
<td>Self-Test Component</td>
</tr>
</tbody>
</table>

Note that “xxx” is a number from 001 to 999.

### 3.1 System Definition

The FL511 concept takes advantage of software (i.e., SunGuide) already owned by FDOT and deployed in the Agencies. Each Agency has an augmented version of SunGuide that incorporates advanced traveler information technology to allow operators to review and edit traveler information before it is sent to the DIVAS dissemination hub. The DIVAS hub integrates and aggregates both data and video from the various SunGuide systems and other Agency interfaces. An overview of the major FL511 functions and external interfaces is shown in Figure 3-1. The cross-hatched area represents the SunGuide and DIVAS, which will be provided by FDOT.
At its core, FL511 will consist of one major system—the IDS, which will be centrally located. In addition, FL511 will have several independent dissemination subsystems/components, a configuration management subsystem, and a quality management subsystem. The IDS will interface with the DIVAS hub, which will be provided by FDOT and will be located at a central location. Refer to Appendix A for a sample of the DIVAS output that FL511 will need to ingest for use in developing the dissemination components. The contractor shall be responsible for working with the DIVAS contractor to establish communications to the database in order to obtain SunGuide data, video/image data, and any other data processed by the DIVAS contractor such as weather or partner agency data to integrate into the FL511 system for dissemination.
FL511 will have to obtain access to the digital information from DIVAS to utilize when providing information via the traveler information dissemination subsystems/components. This will include, but not be limited to, an IVR, web site, mobile applications (apps), and other innovative components presented by the contractor. The system will also provide customized traveler information for people who subscribe to the service through the web site and will be able to customize the traveler information based on the location of the caller if they are using a global positioning system (GPS)-enabled smartphone. The development of the IDS shall allow for all of the information dissemination subsystems/components to be operated independently of each other and be modular to allow FDOT the ability to add and remove components with relative ease based on component usage. FDOT encourages the contractor to suggest other dissemination subsystems/components to be proposed within the FL511 system.

### 3.1.1 Operational Assumptions

This specification is based upon the following assumptions or facts:

- The FL511 system will have a similar look and feel to the public such that the transition between the current system and the new system is as seamless as possible.
- The data and video received from the Agencies’ SunGuide systems with input from public information offices, construction and maintenance offices, and EM offices, such as the Florida Highway Patrol computer-aided dispatch services, etc., will be aggregated by the DIVAS and used by the FL511 system.
- The interface between the DIVAS and the IDS will be coordinated between contractors. The DIVAS contractor is responsible for providing data connectivity between Agency RTMCs and the DIVAS system. The FL511 contractor is responsible for the communications interface between DIVAS and the FL511 system as well as any other communications needed for the dissemination subsystems.
- The FL511 system shall be modular and each subsystem/component shall operate independent of each other.

### 3.1.2 System Interface Requirements

This section discusses the external and major internal interfaces for FL511.

#### 3.1.2.1 External Interfaces

There are nine external interfaces to FL511 as shown in Figure 3-2.
External Interface 1 — A Universal Time Code (UTC) standard signal is obtained from the Internet and is used to synchronize the time for all servers/computers that make up FL511. Each instance of FL511 uses the same source for the time reference signal, which allows for time-based analysis of transportation events throughout the state.
External Interface 2 — Special information, such as America’s Missing:Broadcast Emergency Response (AMBER) alerts, SILVER alerts, Law Enforcement Officer (LEO) alerts, transit alerts, emergency notifications, and similar messages that apply to a wide region of Florida are received through an Internet connection by the IDS. The source for special information can be the District/Agency, FDOT Central Traffic Engineering and Operations Office, or other authorized agencies.

External Interface 3 — FL511 provides the ability to manage the system remotely through an Internet connection. This connection is used for maintenance, administration, or operation and also shall have the ability to post floodgates/special alerts in the event the FL511 system is down.

External Interface 4 — Speech messages that respond to user selections on menu choices are sent to the local telecommunications provider. Also a part of this interface will be the caller’s location information in terms of latitude and longitude if the caller is using a GPS-equipped cellular phone and has the geo-location option active.

External Interface 5 — Traveler information is also packaged into mobile applications that are available to the public through the smartphones. This interface is both input and output to respond to users who request different information from the system. The system includes access to the Internet.

External Interface 6 — Traveler information is also packaged into web pages that is available to the public through the Internet. This interface is both input and output to respond to users who request different web pages from the system. The system includes access to the Internet.

External Interface 7 — The public has the ability to select a closed-circuit television (CCTV) camera and obtain the images from that camera through the web interface.

External Interface 8 — The public has the ability to select a CCTV camera and obtain the images from that camera through the mobile application interface.

External Interface 9 — The system is able to transmit reports, customized traveler information, and send alert messages to emails through the Internet as well as print out reports locally.
3.1.2.2 Subsystem Internal Interfaces

FL511 is comprised of three subsystems as indicated in the requirements identification code legend (Refer to Table 3-1.). Figure 3-3 is a detailed system block diagram that depicts the major internal system interfaces at the subsystem level. Section 3.3 discusses the interfaces within the subsystems in more detail. The following is a general discussion of the major internal interfaces between functional subsystems.

Special information, such as AMBER, SILVER, and LEO alerts and floodgate messages, is routed through the DIVAS interface to the website, mobile apps, IVR, etc. for dissemination to the public. This means that there could be several special messages broadcast as floodgates on the system. Operationally, FDOT will need to determine how to manage the special messages so that messages of statewide importance are available at the top level of the caller menu tree and messages of District importance are available at the District branches of the menu tree.

The IDS will obtain the master clock signal from the Internet, so all FL511 system components share the same time base.

The FL511 system reports incidents within two time zones. The times on all subsystems shall reflect the current time that the events are reported in: Eastern Standard Time, Eastern Daylight Time, Central Standard Time, or Central Daylight Time.
Traveler information from the Agencies is acquired by the IDS through the DIVAS interface that is provided by FDOT as government-furnished equipment. The IDS functionally consists of an IVR component, a database component, a personalization component, a web site component, and mobile application components as well as any other components the contractor recommends.

The IVR component acquires Agency traveler information from DIVAS and merges it with the database component of the IDS, making the information available to callers who dial 511 and ask for traveler information using the FL511 call menu. The IVR component also collects statistics on its use and stores that information in the database for later retrieval and analysis by FDOT.

The personalization component manages customized traveler information output to subscribers as well as provides the tools and data to manage subscribers’ accounts. The customized output is both through the IVR component as well as through the web site and typically involves pushing traffic information using emails, text alerts, and phone alerts that meets the criteria for notification established by the subscriber whose profile is maintained in the database component by the subscriber management unit.
FL511 requires that the system recognize the caller’s location and tailor the traveler information for the caller’s local area. This will be feasible only for callers using cellular telephones equipped with GPS activated for automatic location reporting (e.g., smartphone). The caller will have the option to go to the main menu to obtain traveler information for anywhere in the FL511 coverage area.

FL511 also requires that the system ‘learn’ a caller’s requests by their automatic number identification (ANI) and time of day, and offer that information to the caller prior to offering them the ability to go to the main system. The system shall recognize a caller’s ANI and determine if the caller makes the same request for the same area during the same timeframe each day. If so, the system shall ask the caller if they would like the system to play back reports for the area for which the caller normally requests information. Once the events are played, the system shall then ask the caller if they would like to proceed to the main menu of the FL511 system.

The web site component also provides the same information that the IVR component does, but in a map-based graphical format superimposed on a scalable map of Florida. Additional information about Florida that is of interest to travelers is available on the web site through links to other useful sites. The web site component also collects usage data and makes it available for analysis by FDOT. The web component of the current FLATIS can be accessed at: http://fl511.com.

The mobile application component also provides the same information as the IVR and web site components. The information shall be available in both audible and visual format. The visual format shall be conveyed in a map-based graphical format superimposed on a scalable map of Florida. The mobile applications, using the phone’s GPS, shall be able to determine if a user is approaching an incident and push an audible and visual alert to the user and automatically play/display the incident to the caller.

Both the web site component and the IVR component are able to transfer FL511 users to other sites that may be of interest to travelers. The mobile applications shall also have some limited availability in transferring the FL511 user to other resources.

The virtual clock signal shall use the most current version of the Network Time Protocol that is used to synchronize the FL511 system clocks. The clock synchronization data is obtained through the Internet by each subsystem and not through a physical clock on the system.

FL511 will receive configuration and status data from DIVAS. DIVAS will ingest and aggregate data from multiple agencies throughout Florida. Configuration data received from DIVAS will dictate how FL511 reports traveler information. Configuration data includes information, such as traffic event locations, device and location names, descriptions, latitude/longitude, roadway, and TvT link network information. Status data includes information such as device operational status, current TvT and traffic event information, and other real-time and/or regularly updating information. The configuration information that FL511 receives will also be supplemented with additional configuration information specific to FL511’s IVR system. This information includes configuration information, such as pre-recorded spoken names of streets and cross streets, and
IVR-understood aliases and grammars. Refer to Section 3.3.5 for the requirements for this new functional subsystem.

### 3.2 System Requirements

The functional architecture depicted in this document may not represent the physical architecture that is currently in operation. The contractor will be required to provide a new SDD, which identifies that each design requirement fulfills a functional requirement listed in this specification as being satisfied by the design.

FL511 is composed of subsystems and each subsystem in turn has one or more components. Functionally, some of the components contain units that perform specific functions within the component.

In the identification requirement, the letter “S” and a number identifies the system functional and performance requirements. All requirements contain the word “shall” and are identified by a unique alphanumeric code. Any other text is descriptive to help explain the requirement and how the system will operate in the context of the requirement. The descriptive text is nonbinding. All requirements specified herein must be satisfied by the FL511 system. An independent contractor will assist FDOT in the final acceptance testing of the FL511 system by testing the delivered system against the functional and performance requirements listed in this document as modified during contract negotiations and baselined in the functional baseline. The entire system will be regression tested, including parts of the system that are not modified by the FL511 contractor.

Each system requirement, identified by a requirement identification of “Sxxx,” states a requirement that the entire system must meet. Often, further detail is needed to make the requirement understandable so a contractor can design a solution that meets the requirement. This is done by allocating the system requirement to specific functions of the system that are identified as subsystems, components, and units.

Note: System requirements may be stated ambiguously in some cases; however, the contractor must read through the child requirements associated with the system level requirements to see the details that specify a requirement objectively.

#### 3.2.1 Functions and Performance Requirements

- **S001** FL511 shall consist of hardware and software that work together to meet the requirements for an integrated statewide traveler information system.

- **S002** FL511 shall provide the capability for users to access the system by minimizing the time it takes for them to gain access to the system and obtain their desired information.

- **S003** FL511 shall provide the option to transfer or link users to other sources of traveler information, when available.
S004 FL511 shall provide information about FDOT-defined roadways that allow a traveler to make informed decisions about the best route to take to reduce their travel time.

S005 FL511 shall provide selected travel information to registered users based on their travel profile entered into the system when they establish a subscription account.

S006 FL511 shall be designed to use table driven configuration parameters to make it easy to configure the system and add new features.

S007 FL511 shall provide current traveler information for all facilities identified in the Florida Intrastate Highway System, the Strategic Intermodal System (SIS), emerging SIS, SIS collectors, and other roads specified by FDOT.

S008 FL511 shall be able to compose traffic alert messages and disseminate them to subscribers.

S009 FL511 shall provide the capability to generate reports based on saved data.

S010 FL511 shall be able to alert users to critical, time sensitive information.

S011 FL511 shall be able to push alerts to users via the FL511 mobile application using the GPS position from their smartphone.

S012 FL511 shall provide access and data that supports the management of the system's quality.

S013 FL511 shall synchronize all servers/workstations to a universal time standard obtained through the Internet.

S014 FL511 shall not degrade the accuracy of the received data.

S015 FL511 shall allow the addition, reconfiguration, or redefinition of roadway segments without any loss of current or past data.

S016 FL511 shall be able to report on all active events.

S017 FL511 shall customize the traveler information based on the caller's location if the caller is using a cellular telephone able to report position information and the caller has activated that feature.

S018 FL511 shall provide a configuration management function to facilitate configuration updates received by DIVAS.

### 3.2.2 Physical Characteristics

S019 FL511 shall be network-based using Transmission Control Protocol/IP connectivity, HyperText Transfer Protocol (HTTP), and extensible markup language data formats and shall be consistent with the Traffic Management Data Dictionary 3.03b (and National Transportation Communications for ITS [Intelligent Transportation Systems] Protocol 2306).

S020 FL511 shall make use of commercial or existing software to the maximum extent possible.
3.2.3 Reliability

S021 FL511 availability shall be 99.9 percent annually measured over an operating cycle of 24 hours starting at midnight.

Availability is closely related to reliability. Simply stated, availability means the system will be doing its job when it is being operated. Since FDOT intends for FL511 to be operated 24 hours a day/7 days a week throughout the year for many years, reliability can be expressed in terms of how much time the system must be available to anyone who uses it or operates it. This degree of availability (i.e., 99.9 percent) means that in one 24-hour period the entire system cannot be down for more than 1 minute and 26 seconds. To achieve this level of reliability, it is assumed that hot backup servers will be utilized in the IDS with databases that use the redundant array of independent disks (RAID) or other common technology. However, it is up to the contractor to propose a physical design that meets this requirement. It will be easy to test the availability requirement during acceptance testing. The weak link in reliability will be the Internet, which is outside the control of the project.

3.2.4 Maintainability

S022 FL511 shall be a modular design based on the functions performed with well-documented interfaces with remote access for maintenance.

3.2.5 Environmental

S023 FL511 shall operate normally in a sheltered environment with a controlled temperature ranging from 60 degrees Fahrenheit (°F) to 90° F, and a non-condensing humidity ranging from 30 percent to 80 percent.

3.2.6 Interoperability

S024 FL511 shall use standards for data transmission that support open architecture and interoperability with other FDOT systems.

3.2.7 Human Factors

S025 FL511 shall make the traveler information available to the public regardless of their skill level or abilities.

This requirement applies to both the web site, IVR, and mobile applications subsystem as will be seen in the subsystem requirements.
3.3 Subsystem Requirements

FL511 consists of four functional subsystems that are specified in this section and depicted in Figure 3-4. The shaded subsystems and components will be provided by FDOT as government-furnished equipment.

The depiction of the system architecture is functional and may not reflect the physical configuration. The requirements are functional and performance in nature, and are not intended to be design requirements. The contractor is expected to provide solutions that meet these functional requirements. Deviations or waivers from the requirements must be negotiated before system design commences.
3.3.1 Data Integration and Video Aggregation System (DIVAS)

SunGuide is the mechanism for entering traveler information events and is provided by FDOT. DIVAS will take the data from SunGuide and provide it to the FL511 system.

DIVAS is provided by FDOT as government furnished equipment. An output of DIVAS information is included in Appendix A for informational purposes only (e.g., to provide assistance in determining the data that will be available to the FL511 contractor). The data from DIVAS will be used to populate the information disseminated via the various subsystems/components.

Access to DIVAS will be provided to the contractor by FDOT for integration and testing purposes. However, design of the system will utilize the information format/fields as shown in Appendix A to understand what data will be provided to the contractor. The FL511 contractor is responsible for the communications interface to DIVAS.
3.3.2 Information Dissemination Subsystem Requirements

The IDS is responsible for delivering traveler information to the public and to subscribers who want customized traveler information pushed to them based on their needs. Figure 3-5 is a block diagram of the IDS.

Figure 3-5 — Information Dissemination Subsystem
3.3.2.1 Major External Interfaces

Figure 3-6 depicts the external interfaces to the IDS.

**Figure 3-6 — Information Dissemination Subsystem External Interfaces**

The IDS provides the public output for the FL511 system primarily through either web pages, speech, or mobile applications. Most of the output is in response to user requests; however, some information is pushed to travelers who have subscribed to the FL511 system and want customized travel information based on a profile they establish with the system. Data output to a local telecommunications provider or to the Internet is required. FDOT wishes to see more innovative solutions that push information to transportation users without them having to subscribe for information.

1. The DIVAS will provide aggregated traveler information to the IDS through a dedicated communication connection.
2. DIVAS will provide streaming video and digitized camera images from the Agencies to the IDS for display on the web page, mobile applications, etc. Selection of the video will be accomplished by a connection from the web site component to the DIVAS.

3. Access to the IDS database will provide for data analysis and troubleshooting.

4. A UTC standard signal will be obtained through the Internet and used to time-synchronize all the servers/computers that constitute the IDS.

5. Remote access by the quality management subsystem will provide for performance monitoring of the IDS and the ability to extract performance measure data.

6. Administrative remote access will provide the ability to configure the system and input any data files needed by the system to process the data received from the DIVAS. It is assumed that this access will be through the Internet and will use a Microsoft remote access communications accessory. This assumption will be confirmed during the design phase. Administrative access is needed to configure the FL511 system and input any data files needed to process the data received from the DIVAS.

7. Email alerts will be sent to key individuals when the IDS detects problems.

8. The IDS will connect to the local telecommunications provider to disseminate traveler information from the IVR subsystem and to receive user responses to the IVR prompts. This interface includes receiving the caller’s location information from GPS-equipped smartphones.

9. Access to the Internet, either through an Internet service provider or through the local telecommunications provider, will provide the capability to post special messages, such as floodgate messages and AMBER, SILVER, and LEO alert messages.

10. Output to a local printer will provide the capability to print reports.

11. Configuration information from the Configuration Management Subsystem.

3.3.2.2 Major Internal Interfaces

Through the DIVAS interface over the dedicated communications line, the IDS will obtain the current traveler information file from the DIVAS and send it to the IVR component, the web site component, and smartphone apps, etc. for processing. All data files received by the IDS are stored in the database component to assist with troubleshooting problems and to serve as a medium for the exchange of data with other components.

The personalization component identifies certain data in the traveler information that is of interest to subscribers, and composes custom messages and alerts for the subscribers. The subscribers’ profiles are stored in the database component and managed through the subscriber management unit that is accessed through a secure page on the web site.
The IVR component delivers specific parts of the traveler information to callers who respond to a menu of prompts that are used to identify specific parts of the state for which the traveler wants information. Additional information is available via the IVR component for call transfers to other agencies, such as transit.

The web site not only provides real-time travel information, but also supports links to travel planning, rest areas, weigh stations, transit agencies, etc. The web site also allows users to select a CCTV camera icon from the map display and to use that information to select video from that camera, if it is available to the system.

The mobile applications provide real-time traveler information to transportation users via various menu/screens for traffic, travel times, cameras, and map-based events, etc. The mobile applications deliver specific parts of the traveler information to users who request traveler information from one of the menu choices. Each menu can query the data for specific routes, locations, and geographic areas. In addition to its current functions, FDOT would like the mobile applications to be able to push data and audible alerts to users as they are approaching an incident or event currently active on the FL511 system.

FDOT is also looking for other innovative solutions to providing traveler information to Florida’s transportation users. FDOT encourages contractors to propose additional solutions to the current subsystems/components now available in FLATIS.

The new system shall also be modular in design, thus allowing FDOT the ability to add and remove subsystems with little effort. Each of the FL511 components shall operate/function independent of each other to allow for this flexibility and modularity.

### 3.3.2.3 Functional and Performance Requirements

The following are the functional requirements for the IDS. The following paragraphs specify the requirements for the components and units of the IDS.

- **ID001** As a user option, IDS shall provide dynamic TVTs and speeds as reported by the DIVAS.
- **ID002** The IDS shall output travel information in voice format through the telephone system, in graphic format through the Internet suitable for smartphones as well as personal computers, and in both voice and graphical format for the mobile applications.
- **ID003** Information shall be filtered based on the area of interest expressed by the traveler contacting the IDS.
- **ID004** The IDS shall provide the capability for users to access the system from personal portable devices.
- **ID005** The IDS access media shall comply with the Americans with Disabilities Act (ADA).
ID006 The IDS shall transfer calls or link to other agencies or web sites for trip planning and other uses as requested by the user in response to options provided by the IDS.

ID007 The IDS shall provide an option for context sensitive help to the user.

ID008 The IDS shall provide requested traveler information within three seconds of when requested.

ID009 The IDS shall provide for trip planning capabilities.

ID010 The IDS shall provide a backdoor service number.

ID011 FL511 shall be able to handle the statewide 511 calls (at a minimum five million calls/year) and have excess capacity for future growth.

ID012 The IDS shall be user-friendly and capable of correctly responding to users with different accents, pronunciations, and patterns of speech, and use icons and other symbols that are intuitive to use.

ID013 The IDS shall provide a personalization function to customize traveler information reports for individuals who subscribe to the service that has, at a minimum, the functionality currently displayed by FLATIS (see http://www.fl511.com).

ID014 FL511 shall include the ability to alert the traveler, in both audible and graphical formats, to adverse conditions that may impact travel.

ID015 The IDS shall provide messages of critical importance to all users called floodgate messages on the IVR or banner alerts on the web site to include AMBER, SILVER, and LEO alerts.

ID016 The IDS shall be able to provide current information to assist in emergency evacuations.

ID017 The IDS shall be standards based and avoid the use of proprietary applications.

ID018 The IDS shall reference all events to FDOT-specified location tables.

ID019 The IDS shall be synchronized to a universal time standard obtained through the Internet.

ID020 The IDS shall allow the periodic addition, reconfiguration, or redefinition of roadway segments within five business days.

ID021 The IDS shall allow the periodic addition or changes to system configuration, such as barge in, transfers, links, floodgate settings, call duration limits, surveys, text-to-speech translation list, and automated system maintenance alerts.

ID022 The IDS shall provide the current date and time to all dissemination components respective to the time zone in which the event is reported.

ID023 Operators with appropriate permissions shall be able to access the IDS to enter or update floodgate or banner messages from a password-protected remote access point.

ID024 The IDS shall be able to generate reports based on data saved in FDOT-specified format and data saved.
ID025 The IDS shall use a dedicated communication interface to receive fused traveler information from the DIVAS.

ID026 The IDS shall operate normally in a sheltered environment with a controlled temperature ranging from 60° F to 90° F, and a non-condensing humidity ranging from 30 percent to 80 percent.

ID027 The IDS shall be able to monitor system performance, network health, disk status, application status, load levels, and status of interfaces, and alert the administrator and designated personnel to system problems.

ID028 The IDS shall have a simple mail transfer protocol server to allow email messages to be sent to designated addresses.

ID029 The IDS shall archive FDOT-defined data and messages into a database.

ID030 The IDS shall provide for secure, remote computer-based access to the servers and control of the system software for upgrading and quality monitoring of the data.

ID031 The FL511 shall provide traveler information on FDOT-defined roadways and bridges to the public using IVR technology, the Internet using interactive graphical user interface (GIS) map-based web technology, and mobile applications using interactive GIS map-based web technology.

ID032 The IDS shall be able to support automated and manual data entry for all event types.

ID033 The IDS shall have the ability to create a manual floodgate message separate from the alerts being sent to FL511 from DIVAS.

ID034 Separate floodgates shall be able to be configurable using the following criteria:

- Ability to set date and time floodgate begins;
- Ability to set date and time floodgate ends;
- Ability to set the order the floodgates play in per floodgate level;
- Archiving of audio files:
  - Ability to upload audio files to the floodgate tool and use a pre-recorded audio file on the system; and
- Ability to define:
  - Description of floodgate (not generic),
  - Is it active or not, and
  - Last update time.

ID035 Operators posting a manual floodgate shall be able to listen to the floodgate prior to the message being played on the FL511 system.

ID036 The contractor shall provide the ability for an operator to delete and/or add a floodgate to the system and manipulate all floodgate criteria in the event that the FL511 system becomes inoperable/inaccessible to the caller.

ID037 A monitoring display shall display the current floodgate (or recorded message) status for each “slot,” allowing operators to see which slots have messages and their status (barge-in on/off) as well as any other parameters that they might be able to set.
ID038  The FL511 system shall “allow barge in” and “end call” attributes for each manual floodgate message.

ID039  FDOT staff shall be able to review the current status of all floodgate messages known by the FL511 system.

ID040  Users shall be able to select the reports to be generated based on a drop down list from a separate archive data page.

ID041  The floodgate shall be able to set status to statewide for each manual floodgate message.

ID042  The floodgate messages shall be able to be edited based on FDOTs statewide floodgate naming convention.

ID043  The IDS shall be able to push data to users in both an audible and graphical format using the GPS from a user’s smartphone.

3.3.2.3.1  Information Dissemination Subsystem Database Component Requirements

ID001D  Information shall be accessible from the database for a period of at least one year.

ID001D1 Information from the database shall be retrieved and presented to the administrator or authorized user within 60 seconds of the submission of the request for data.

ID001D2 The database component shall support data archiving to external media for long-term storage for the duration of the project.

ID001D3 The database component shall be a relational database.

ID002D Users shall be able to generate custom reports using a structured query language interface embedded within the archived data page.

ID003D All reports shall be generated in portable document format (PDF), and Microsoft Word and Excel formats.

ID004D The status of the system wide FL511 floodgate messages shall be obtained by the DIVAS through the communication interface.

ID005D The status of the floodgate messages shall be derived from the FL511 database.

ID006D The IDS shall have a database component that process and assembles data that is received from DIVAS.

ID007D The database component shall maintain a log of all events.

ID008D The database component shall contain a repository for all data collected and disseminated by the IDS.

ID009D The database component shall support data archiving to external media for long term storage.
ID010D  The database component shall be a relational database.

ID011D  The database component shall have an operational availability annually of at least 99.9 percent over an operating cycle of 24 hours starting at midnight.

3.3.2.3.2  Data Integration and Video Aggregation System (DIVAS) Interface

ID001I  The IDS shall use a dedicated communication interface to receive data from the DIVAS.

3.3.2.3.3  Personalization Component Requirements

ID001P  Personalized traveler information delivery shall be based on settings provided by subscribers set up via the FL511 web site.

ID001P1  Subscribers who have registered with FDOT may obtain a UserID and personal identification number to access their account and establish or edit their travel profile.

ID001P2  The public shall be able to register for personalized traveler information through the web site.

ID001P3  Location based information shall be delivered as first choice to caller based on cell phone location system awareness.

ID001P4  Personalization shall not allow the set-up of a personalized account with somebody else’s cell phone number and/or email address.

ID002P  The personalization component shall establish and manage subscriber accounts in the IDS database component.

ID002P1  Personal information in the customer account files shall be encrypted with access restricted to system managers.

ID002P2  FDOT staff shall have access to the personalization accounts, (i.e. - phone number, email, passwords) in order to assist in user requests for password/account access received via the FL511 feedback email account.

ID003P  The personalization component shall provide alerts via telephone, e-mail, and text messaging.

ID003P1  The personalization component shall enable subscribers to request that personalized traffic alerts be transmitted to them using up to two e-mail addresses and/or up to two telephone numbers.

ID003P2  Alerts shall be generated according to the segment of roadway selected; time-of-day and day-of-week; FDOT-defined categories of events; and severity of the event.

ID003P3  Users shall be able to define single location/addresses to receive alert messages.

ID003P4  Alert messaging capabilities shall include email messages, text alert messages, and alerts to phone numbers.
ID003P5 Alert messaging shall be available for new events, modified events, and terminated events.

ID003P6 Alert message format shall be user definable.

ID003P7 Users shall be able to define frequency, time-of-day, day-of-week, roadway location, and event severity for receiving message alerts.

ID003P8 Users shall be able to specify whether to receive all updates or specific updates to events.

ID003P9 Alert message content shall be editable to enable operators with appropriate permission to create alert message content.

ID003P10 A configurable permission setting shall be added to enable operators the ability to edit alert message content.

ID003P11 The alert messaging function shall structure the content of the message based on account information of each recipient.

ID003P12 The alert message function shall configure content of each message based on recipient account/device restriction (i.e., cell phone with limited message size capabilities of approximately 150 characters).

ID003P13 Users shall have the ability to define when their personalized services are active and not active without removing their routes/alerts, etc. (i.e., users shall be able to turn on/off their notifications at will).

ID004P The personalization component shall have an operational availability annually of at least 99.9 percent measured over an operating cycle of 24 hours starting at local midnight.

ID005P The personalization component shall provide TTVs on user-defined origin/destination pairs that may be composed of more than one road across more than one District.

ID006P The personalization component shall allow a user to specify the language preference for receiving information.

ID007P When a caller is in the personalization portion of the FL511 IVR, the caller shall be able to easily transition to the main FL511 system.

3.3.2.3.4 Information Dissemination Subsystem Reporting Requirements

ID001R The IDS shall be able to display a report within 30 seconds of when the last report criteria was received from DIVAS and a report was requested.

ID001R1 The IDS shall provide the following options on publishing reports from the web site:

• Export to PDF,
• Export to Excel,
• Export to Word,
• Export to comma-separated values data table, and
• Export to HTML5.

ID002R The IDS reports shall be broken out into the following categories:

A. Web Reports
1. **Application Summary Report** – Provides an overall summary of the application usage
   a. **Activity Dates**
      i. Activity Summary: Calls, Active Ports, Minutes
      ii. Report Date
      iii. Lowest Call Duration (min, sec)
      iv. Average Call Duration (min, sec)
      v. Highest Call Duration (min, sec)
   vi. Call Duration Summary:
      • Duration (0 – 30 sec; 30 – 60 sec; 1 – 1.5 min; 1.5 – 2.0 min; 2 - 3 min; 3 – 4 min; 4 – 5 min; 5 – 7 min; 7 – 10 min; over 10 min)
      • Occurrence (number of calls in each duration period)
      • Percentage of Calls in Each Duration Period
   vii. Call Duration Graph (bar graph of Call Duration Summary)
   viii. Daily Call Volumes on an hourly basis
      • Time Period (12:00 AM – 11:00 PM – broken out by hour)
      • Calls (number of calls each hour)
      • Avg. Duration (min)
      • Percentage of Total Calls
2. **Custom Report** – Provides number of call transfers and line type category
   a. **Call Transfers**
      i. Agency (list of all agencies 511 transfers to)
      ii. Number of transfers (to each agency)
      iii. Total number of transfers
   b. **Line Type Category**
      i. Wireline
      ii. Wireless
      iii. Others
3. **Daily Usage Report** – Provides a summary on the daily usage of the application
   a. **Daily Call Volumes (monthly snapshot)**
      i. Maximum simultaneous calls (per day of month in graph format)
      ii. Number of calls (per day of month in graph format)
   b. **Daily Call Volumes (weekly snapshot)**
      i. Number of calls per day-of-week (Sunday – Monday) in graph format

**ID003R** The IDS shall report on personalization statistics to include:
   - Number of subscribers
   - Number of subscribers with at least one alert
   - Number of subscribers with at least one route
   - Total number of email messages sent to My Florida511 subscribers/number of alerts per subscriber
   - Number of traffic alert emails sent each month broken out by severity categories for the following:
     - Region and roadway alerts (top regions/roadways requested)
     - Route alerts
     - Floodgate alerts
   - Language breakout – English versus Spanish

**ID004R** The IDS shall report the statistics for the FL511 mobile site (mobile.FL511.com.) to include, as a minimum, the following statistics:
   **Application Summary Report** – Provides an overall summary of the application usage
   a. Activity Dates
i. Activity Summary: Calls, Active Ports, Minutes
ii. Report Date
iii. Lowest Call Duration (min, sec)
iv. Average Call Duration (min, sec)
v. Highest Call Duration (min, sec)
vi. Call Duration Summary:
   • Duration (0 - 30 sec; 30 – 60 sec; 1 – 1.5 min; 1.5 – 2.0 min; 2 - 3 min; 3 – 4 min; 4 – 5 min; 5 – 7 min; 7 – 10 min; over 10 min)
   • Occurrence (number of calls in each duration period)
   • Percentage of Calls in Each Duration Period
vii. Call Duration Graph (bar graph of Call Duration Summary)
viii. Daily Call Volumes on an hourly basis
   • Time Period (12:00 AM – 11:00 PM – broken out by hour)
   • Calls (number of calls each hour)
   • Avg. Duration (min)
   • Percentage of Total Calls

ID005R The FL511 system shall be able to query data and develop custom reports that track outgoing calls, text alerts, and email alerts through an online portal.

### 3.3.2.3.5 Interactive Voice Response Component Requirements

ID001V Callers entering the system shall have access to all information, including detailed Agency data.

ID002V The system shall use natural language allowing a caller to interact with the system in a more conversational manner, as they would a live operator.

ID003V The IVR component shall allow 511 callers from throughout the state to: a) Access information using the 511 dialing code; b) Retrieve information using spoken commands (with touch-tone back-up); c) Receive that information as pre-recorded concatenated phrases instead of “live recorded” information; d) Have the option to leave a feedback message about the service; and e) Receive information based on the requested locations (i.e., city, county, mile marker) or based on actual location as determined by GPS data.

ID003V1 The IVR component shall use concatenated speech for a minimum of 90 percent of the responses.

ID003V2 Input (data) to the IVR component shall restrict the use of free-form text, which will be delivered by the system using text-to-speech.

ID004V The IVR component shall provide separate menus and messages in English and Spanish.

ID004V1 The IVR shall provide the same level of detail and accuracy of the information regardless of which language is used.

ID004V2 The IVR shall recognize the language spoken by the caller and respond in the same language, either English or Spanish.

ID005V The IVR shall have the ability to transfer calls to other agencies based on the transfer information defined by FDOT.
ID005V1 The IVR shall use attended call transfers to assure that the caller is not transferred to a busy or unavailable number.

ID005V2 To the extent possible, the IVR component shall transfer the charges associated with the initial call to the receiving agency through the phone service provider of both the FL511 system and the receiving agency.

ID006V The IVR component shall provide adaptive error handling for calls.

ID006V1 The IVR shall flag caller choices that it misunderstood and ignore and eliminate them from the list of proper responses.

ID006V2 The IVR shall learn from the proper answers to help speed the caller through the interaction and remember the statistics for later use.

ID006V3 The IVR component shall use prompt escalation for handling various levels of recognition and timeout errors.

ID007V The IVR component shall have an annual operational availability of at least 99.9 percent measured over an operating cycle of 24 hours starting at midnight, local time of the IVR host facility.

ID008V The IVR shall deliver route segment specific information through the telephone using an automated system so that users do not have to interact with a live operator.

ID009V The IDS shall include an IVR component to provide assistance to individuals with impairments.

ID009V1 The IVR component shall provide assistance to individuals with impaired vision.

ID009V2 The IVR component shall provide an alternative touch-tone response for users in a high ambient noise environment or that have impaired speech.

ID009V3 The IVR component shall provide teletype service for the hearing impaired.

ID010V The IVR component shall not provide context sensitive help to callers who request it.

ID011V The IVR component shall use and be able to edit a text-to-speech dictionary that can be used to modify the pronunciation of words (such as place names, etc.) and save them to the dictionary for future use.

ID011V1 Text-to-speech engine (software) shall have a tool so the originator of the message can be assured that the wording was being read and pronounced properly.

ID012V The IVR shall use an integrated menu, which can be reached by calling 511 anywhere in the state.

ID013V The IVR component shall provide access with an authorization code to a backdoor service number that is the toll free number to which 511 calls are translated.

ID014V The IVR shall answer all calls.
ID014V1 The IVR shall be able to add additional capacity within 10 business days or less to meet its response time.

ID014V2 The IVR shall have the ability to handle all calls through bursting capability.

ID014V3 The IVR shall answer a call within three seconds.

ID015V The IVR component shall be able to handle 4,000 calls per hour with a peak of 400 simultaneous calls.

ID015V1 The IVR component shall be able to add port capacity to handle the required call volume.

ID015V2 The IVR shall have additional ports dedicated to bursting capacity.

ID016V The IVR shall accept the use of dual-tone multi-frequency (DTMF) or touch-tone codes for caller input.

ID016V1 The IVR shall provide an option key to return to speech recognition by the caller once they are in the DTMF mode.

ID017V The IVR shall offer a conversational approach to 511 callers by asking the user what information they are seeking in general terms to minimize the number of subsequent menus required for the caller to clearly convey their request.

ID017V1 The IVR shall make maximum use of Universal Grammar to interpret a caller's request for traveler information.

ID017V2 The IVR shall recognize combined commands from a caller; the combined commands shall include route/city, route/county, and route/direction, etc.

ID018V The IVR component shall minimize menu navigation.

ID018V1 Disambiguation of a caller's request shall limit the number of questions asked of the caller to no more than four.

ID018V2 The menu structure shall allow for selective "barge-in," where the caller may interrupt the menu voice if they already know how to ask for the information they wanted. FDOT can specify what parts of the menu the caller can barge in on.

ID018V3 The IVR shall allow users to short-cut to their information without requiring a series of menu selections (questions and answers).

ID019V The IVR component shall be able to provide different levels of floodgate messages.

ID019V1 The levels of floodgate messages shall be at the statewide, region, county, roadway, and roadway segmented by county, airport, seaport, and transit agency.

ID019V2 Each floodgate message shall be able to be designated to allow barge in or not.

ID019V3 The IVR shall allow calls to be terminated after playing a floodgate message.
ID019V4 The IVR shall be able to use bilingual pre-recorded as well as text-to-speech messages.

ID019V5 Alternate road recommendations shall be played to the caller as a floodgate message if a floodgate is available based on the road requested by the caller.

ID019V6 If a floodgate is associated to multiple slots, the IVR shall only play a floodgate at one point in the menu. The same message shall not be played multiple times to a caller on the same call.

ID020V The IVR component shall report traveler information based on EM location references currently existing within SunGuide and FDOT-modified Society of Automotive Engineers codes.

ID020V1 When the information for a route is unavailable, the IVR shall notify the caller that information for their route is currently not available.

ID021V The IVR shall provide dynamic TtVs on roadways covered in the 511 call menu.

ID021V1 As a configurable option at the Agency level, delay times may be provided instead of dynamic TtVs.

ID021V2 Callers shall have the ability to provide origin and destination to receive TtVs.

ID022V Transfers to other telephone systems shall be included that provide additional information to supplement the multimodal information already provided.

ID022V1 Call sites hosted by other Agencies to which transfers shall be provided shall include at a minimum:

- Transit agencies;
- Airport services;
- Seaports;
- Tourism agencies;
- Evacuation management agencies;
- Other partners;
- Border state (e.g., Georgia) ATIS services;
- Consumer Information Network (CIN) Regional Transportation Organization;
- Parking;
- Major event venues;
- Rest area amenities and locations; and
- Welcome center amenities and locations.

ID023V The IVR component shall recognize callers based on their telephone numbers identified in their user profile.

ID023V1 The IVR shall offer the caller personalized travel information based on their pre-defined preferences, which is part of their profile.

ID023V2 The IVR shall respond in the language indicated by the user's profile.
ID024V The IVR shall be capable of adding, modifying, and deleting prompt recordings, if necessary, within five business days.

ID025V IVR call statistics report shall, at a minimum, include:

- Call volume;
- Average call duration over the reporting period;
- Number of calls not answered;
- What hour during the month had the most calls (peak calls);
- What day of the month had the most calls (peak calls);
- Wait time for each call not answered immediately;
- Number of errors made in the call menu;
- Where the errors occurred (what menu selection the error occurred in);
- Number and percentage of call transfers;
- Feedback statistics; and
- Number and percentage of category of information reported.

ID026V IVR call statistics shall be able to be sorted by date/time/telephone number and composed into reports and made available in print or electronic format.

ID027V The IVR shall be able to generate reports on an hourly, daily, weekly, monthly, and yearly basis.

ID028V The IVR component shall provide travel messages in order of priority.

ID028V1 The priority will only be used to select which roadway is played first, but the order of the events played on a roadway will always be geographic (South -> North, then North ->South or West -> East, then East -> West, Inner beltway -> Outer beltway, Outer beltway -> Inner beltway).

ID029V The IVR shall maintain a log of all calls.

ID030V The IVR component shall be developed so that it is flexible and scalable to allow the addition/modification of various data elements (e.g., adding new roads and/or changing road segments) without the need for major system redesign.

ID031V The IVR shall be able to prioritize reports by severity and type of incident.

ID031V1 The playback of reports list shall be dynamic, (i.e., move weather incidents to top during emergencies like a hurricane).

ID031V2 Incidents should be played in order of type and severity. The types of incidents should be able to have the order of how they are played with little impact to the system.

- Type:
  - Accident
  - Congestion
  - Unconfirmed Event
  - Weather
  - Construction
  - Maintenance
  - Other
• Severity:
  o Major
  o Intermediate
  o Minor

ID031V3 The IVR system shall disambiguate conflicting entities/agencies. (i.e. - Orlando International Airport and Orlando Sanford airports in both voice and DTMF).

ID031V4 The menu for airports shall have the airport agencies covered by FL511 listed and spoken to the caller in alphabetical order.

ID032V For uncovered roadways and other uncovered areas, the FL511 system shall notify callers that their requested roadway, city, etc. is not covered.

ID033V For partially covered roadways, the FL511 system shall notify callers that their requested roadway, city, etc. is a partially covered roadway.

ID033V1 For partially covered roadways, the FL511 system shall notify callers which portion of the partially covered roadways are covered by the system.

ID034V The FL511 system shall report weather information received from the DIVAS.

### 3.3.2.3.6 Web Site Component Requirements

ID001W The web site component shall provide context sensitive help to users who request it.

ID002W The web site component shall handle a minimum of 50 million page views during the first year of service.

ID003W The web site component shall handle a minimum of 75 million page views per year by the fifth year of operation.

ID003W1 The web site component shall be able to support an annual increase of at least 5 million hits per year as compared to the previous year.

ID004W The web help page shall provide information in text and/or graphic form on the basic use of the Internet web site and statewide FL511, including listings of available information on the site.

ID004W1 The web help page shall include an email link to contact the system’s webmaster.

ID005W Links to other web sites shall be included that provide additional information to supplement the multimodal information already provided.

ID005W1 Web sites hosted by other agencies to which links shall be provided shall include, at a minimum:
  • Transit agencies;
  • Airport services
  • Seaports
  • Tourism agencies
  • Evacuation management agencies
  • Other partners;
• Border state (e.g., Georgia) ATIS services
• CIN Regional Transportation Organization;
• Parking
• Major event venues;
• Rest area amenities and locations;
• Welcome centers amenities and locations; and
• Weigh Stations

ID006W The web site component shall provide a scrolling banner across the web site containing floodgate messages according to whether the user is viewing at the statewide, region, county, and roadway segment.

ID006W1 The web site shall have the capability of displaying an override message on the home page for use in displaying severe weather, evacuation, homeland security, and child abduction alerts.

ID006W2 The web site shall have the ability to activate the FDOT’s Public Information Offices’ statewide emergency banner in the event of a statewide emergency. Information for the coding for this alert will be provided to the contractor.

ID007W The web site shall comply with all ADA Section 508 requirements.

ID007W1 All information shall be delivered in both a graphic and text-based format using one or more multicolored maps and tables of roadways and other facilities for which information is provided.

ID007W2 The web site component shall support color-blind web site users.

ID008W The map and all content contained on the web site shall be automatically updated and refreshed whenever new information is available.

ID008W1 All data provided to users via the web site shall be time stamped to indicate its freshness (except for scheduled road work).

ID008W2 The web site shall indicate the last date/time the web site was updated with new information.

ID009W All congestion-related roadway information shall be color-coded for ease of understanding by users.

ID009W1 Multiple color-coding options shall be provided to meet the needs of color-blind users.

ID010W Selectable (on/off) map layers shall be utilized to indicate the location of a variety of information/data points, including:

• TtvTs/speeds and/or traffic flow/congestion (Roadway links will be color-coded according to roadway condition);
• Incidents/events;
• Roadwork and other construction;
• Lane and road closure;
• Severe weather;
• CCTV locations – clicking on a CCTV icon will result in a pop-up window appearing in which the current video (either snapshot or streaming) will be displayed along with a time stamp indicating the time the image was captured; and
• Dynamic message sign (DMS) locations - clicking on a DMS icon will result in a pop-up window appearing in which the current text on that DMS is displayed.
Clicking on or mousing over any of the icons or other data elements listed above shall result in a pop-up window that displays more detailed information.

Clicking on a CCTV icon shall display the current image or streaming video for that camera.

A separate section of the FL511 web site shall contain a clickable list of cameras and their locations.

A legend of all illustrations (e.g., color coding of links and icon definitions) shall be available on the same page as the map.

The web site shall provide Tvs it receives.

The web site shall provide camera images and streaming video as specified by FDOT.

The web site shall be able to expand the number of camera videos as FDOT increases the number of CCTV cameras in the field.

The web page shall be accessible through wireless application protocol-enabled cell phones or similar personal digital assistant-type devices.

The web site shall enable users to view a set of active traffic incidents and events that can be filtered according to incident/event severity (i.e. Critical, important, routine or all incidents) and region/city where they are occurring.

The web site shall have information concerning terms of service, disclaimers, and user privacy.

The web site disclaimer shall focus on the personalized aspects of the web site/FL511 system for which personal information is collected.

The web site component must have an operational availability annually of at least 99.9 percent measured over an operating cycle of 24 hours starting at local midnight.

The ATIS web site shall provide a usage monitoring capability to obtain information about patterns of usage on different parts/pages of the web site.

The following usage data shall be able to be reported for the web site:

**Summary Data**
Viewed traffic: Unique Visitors, Number of Visits, Page Views, Hits, Bandwidth
Not viewed traffic – including traffic generated by robots, worms, or replies with special HTTP status codes: Pages, Hits, Bandwidth

**Monthly History:** shown in graph and table views
- Month
- Unique Visitors
- Number of Visits
- Page Views
- Hits
- Bandwidth

**Days of Month:** shown in graph and table views
- Day
- Number of Visits
- Page Views
- Hits
- Bandwidth
- Totals for Month
Days of Week: shown in graph and table views
- Day Monday thru Sunday
- Page Views
- Hits
- Bandwidth

Hour: shown in graph and table views
- Hour [Beginning 00 – 23]
- Page Views
- Hits
- Bandwidth

Hosts – by IP address [Top 10, Full List, Last Visit, Unresolved IP Address]
- Page Views
- Hits
- Bandwidth
- Last Visit

Robots/Spiders Visitors [Top 10, Full List, Last Visit]
- Hits
- Bandwidth
- Last Visit

Visit Duration
- Duration Length: 0 sec – 30 sec; 30 sec – 2 min; 2 min – 5 min; 5 min – 15 min; 15 min – 30 min; 30 min – 1 hour; 1 hour+
- Number of Visits in duration category
- Percentage of Visits in duration category
- Avg. Duration of Visits

File Type
- File type
- Hits
- Percent
- Bandwidth
- Percent

ID015W2 The format of the reports shall be as specified by FDOT.
ID016W The web site shall be bilingual providing a language option for both English and Spanish.
ID016W1 The web site shall allow a user to configure for either English or Spanish so that when the user logs in to the web site in the future the selected language is used.
ID016W2 The web site default language shall be English.
ID016W3 The web site shall provide information that is the same level of detail and accuracy for both the English and Spanish language versions.
ID017W The web site shall be standards based and avoid the use of proprietary applications.
ID018W The web site shall be developed so that it is flexible and scalable to allow the addition/modification of various data elements (e.g., adding new roads and/or changing road segments) without the need for major system redesign.
ID019W The web site component shall receive aggregated camera image data from the data integration and video aggregation subsystem (DIVAS) for access through the web site.
ID019W1 The web site shall provide CCTV icons that show the location of CCTV cameras that can be used to access images from that camera.

ID019W2 The web site shall allow the user to specify the connection speed they are using.

ID019W3 The web site shall modify the type of camera images displayed depending on the user's connection speed.

ID020W Under special situations, such as during evacuations, more detailed information, such as evacuation route information (links to information), shall be provided on the web site.

ID021W The web site component shall provide TvTs between user-selectable origin/destination pairs identified on the web site map.

ID022W The web site shall offer personalized travel information based on the user's login and associated pre-defined preferences that are part of their profile.

ID023W The web site shall display the current date and time received from the IDS.

ID023W1 As a configurable option at the Agency level, delay times may be displayed instead of TvTs.

ID024W The web site shall have an option for a printer-friendly version of the currently viewed page that does not exceed 600 pixels in width.

ID025W When users click the event icon on the interactive web map, they shall be provided details of the event and the associated alternate road information if provided by DIVAS.

ID026W The IDS web site component shall snap latitude/longitude points provided by Agencies to the closest latitude/longitude point on the roadway.

ID027W The web site shall provide streaming video to system users.

ID028W When the user selects a filter on a web site page, that filter shall carry through other pages the user switches to when navigating the FL511.com web site.

ID029W The user shall be able to filter incident information on the web site based on type of incident, severity of incident, region, county, highway, directions, etc.

ID030W The FL511.com web site shall be able to support 25,000 simultaneous users.

ID031W FDOT shall determine icons that will be used for display on the FL511.com web site.

ID032W Information displayed on the web site shall have the same visual format as the FL511 mobile applications.

3.3.2.3.7 Mobile Application Component Requirements

The following are general requirements for the mobile applications. Any requirement identifications that do not follow in numerical order have been previously deleted from the requirements.

ID001MA Mobile applications shall be compatible with Android, iPhone/iOS, and Windows platforms.

ID001MA1 The Android mobile application shall be compatible with the most current version available and three previous versions.

ID001MA2 The iPhone/iOS mobile application shall be compatible with the most current version available and three previous versions.
ID001MA3 The Windows mobile application shall be compatible with the most current version available and three previous versions.

ID002MA The mobile applications shall allow the user the option to close the mobile applications fully (no background operation) or just close the applications and have the applications continuing to operate in the background.

ID003MA Mobile applications shall support auto-rotate functionality.

ID004MA The mobile applications shall provide a traffic component.

ID004MA1 Mobile applications shall allow user to choose a distance of 1 to 200 miles for the inclusion radius of displayed incidents.

ID004MA2 Mobile applications shall allow the user to filter traffic incidents by city.

ID004MA3 Mobile applications shall allow the user to filter traffic incidents by county.

ID004MA4 Mobile applications shall allow the user to select from a list of counties and cities restricted to those defined by the FL511 system.

ID004MA5 Mobile applications shall allow the user to navigate through city and county choices by scrolling, manual text entry, and an alphabetic navigation bar.

ID004MA6 Mobile applications shall allow the user to filter out construction events.

ID004MA7 Mobile applications shall allow the user to access all active traffic incidents available in the FL511 system.

ID004MA8 Mobile applications shall display traffic incident information in a scrollable list view.

ID004MA9 Mobile applications shall allow the user to view the location of a chosen traffic incident in a Google maps view.

ID004MA10 Mobile applications shall associate the closest camera or cameras with the incident and allow the user to view a recent still image or streaming video from each associated camera.

ID004MA11 Mobile applications shall create an automated process that updates the closest camera to the incident.

ID004MA12 Mobile applications shall allow the user to refresh traffic information by pulling down the list view while at the top of the list.

ID004MA13 Mobile applications shall allow the user to listen to an audio version of the incident description.

ID004MA14 Mobile applications shall allow the user to play the audio version of the incident description for all incidents using a single action.

ID004MA15 Mobile applications shall allow the user to replay/repeat the audio version of the incident description for all incidents using a single action.

ID004MA16 Mobile applications shall allow the user to halt any audio playback.

ID004MA17 Mobile applications shall be configurable to automatically play the audio version of the incident description for all incidents upon opening the mobile applications.

ID005MA The mobile applications shall provide a TvT component.

ID005MA1 Mobile applications shall provide current TvT information.

ID005MA2 Mobile applications shall display roadways in a scrollable list view.

ID005MA3 Mobile applications shall display all TvTs for a given roadway when a roadway is selected by the user.
ID005MA4 Mobile applications shall display TvT information for a selected roadway in a scrollable list view.

ID005MA5 Mobile applications shall provide the current TvT of a segment to the user in minutes.

ID005MA6 Mobile applications shall provide the current average speed of a segment to the user in miles per hour.

ID005MA7 Mobile applications shall provide the length of the TvT segment.

ID005MA8 Mobile applications shall provide the length of the TvT segment in miles or portion of a mile.

ID005MA9 Mobile applications shall allow the user to refresh TvT information by pulling down the list view while at the top of the list.

ID006MA The mobile applications shall provide a feedback component.

ID006MA1 Mobile applications shall allow the user to record an audio recording of no longer than two minutes.

ID006MA2 Mobile applications shall allow the user to play and stop recorded audio.

ID006MA3 Mobile applications shall allow the user to submit recorded audio as either a traffic incident or a general comment.

ID006MA4 Mobile applications shall display a confirmation message to the user when a recorded message is successfully transmitted.

ID006MA5 Mobile applications shall allow a caller to listen to their recording prior to sending.

ID006MA6 Mobile applications shall have a drop down menu for different menu options/types of feedback.

ID006MA7 Mobile applications shall allow the ability for the user to provide feedback via text with a maximum of 255 characters.

ID007MA Mobile applications shall contain a hyperlink to the FL511.com web site.

ID008MA Mobile applications shall contain a hyperlink to the FL511 Twitter accounts page.

ID009MA Mobile applications shall allow the user to share a link to the FL511 mobile applications download page using the standard sharing interfaces.

ID009MA1 Mobile applications shall allow the user to share a link to the FL511 mobile applications download page using the standard Android sharing interface.

ID009MA2 Mobile applications shall allow the user to share a link to the FL511 mobile applications download page using the standard iPhone/IOS sharing interface.

ID009MA3 Mobile applications shall allow the user to share a link to the FL511 mobile applications download page using the standard Windows sharing interface.

ID010MA Mobile applications shall allow the user to access an external help page.

ID011MA Mobile applications shall allow the user to enable or disable background audio.

ID012MA Mobile applications shall allow the user to choose whether or not their GPS and caller information is available for use by the mobile applications.

ID013MA Mobile applications shall allow the user to view the current software version number.

ID014MA Mobile applications shall provide trip planning abilities.
ID014MA1 Mobile applications shall allow user to input a start point or use their current location to determine trip information.

ID014MA2 Mobile applications shall allow user to input an end point to determine trip information.

ID015MA Mobile applications shall provide data layers (e.g., traffic events, congestion events, rest area location/information, weigh station location/information, weather, TVTs, congestion map information, etc.) that a user can select from when displayed in map view.

ID016MA Mobile applications shall provide the user the ability to filter the information they wish to receive information on (e.g., traffic events, congestion events, rest area location/information, weigh station location/information, weather, TVT, congestion map information, etc.).

ID017MA FDOT shall determine icons that will be used for display in the mobile applications.

ID018MA Information displayed in the mobile applications shall have the same visual format as the FL511.com web site.

ID019MA The mobile applications shall provide red, yellow, and green congestion maps.

ID020MA Events listed in the mobile applications shall indicate whether there is a CCTV close by and allow the user to click on the icon to view the camera image or streaming video.

ID020MA1 The icon shall display a generic CCTV symbol to indicate that there is an image/video available that is associated with the event.

ID020MA2 FDOT shall provide an example of the icon to be used to convey the availability of a CCTV near an event.

ID020MA3 When a user clicks on the CCTV icon, a camera image(s) or streaming video shall be displayed.

### 3.3.2.3.8 Video Component Requirements

The following are general requirements for the video component. Any requirement identifications that do not follow in numerical order have been previously deleted from the requirements.

ID001VI FL511 shall provide video to the web site component.

ID002VI FL511 shall be able to block specific camera images from being available to the web site.

ID003VI FL511 shall accept digital video and images from the DIVAS to use in populating the FL511.com web site.

ID004VI FL511 shall accept digital video and images from the DIVAS to use in populating the FL511 mobile applications.

ID005VI FL511 shall provide a way for web site users to select a CCTV camera to view images/streaming video from the camera on the web site.

ID006VI A progress bar or equivalent representation shall be displayed to indicate the progress of the video stream download after the CCTV is selected until the video stream is displayed.

ID007VI All camera images shall be made available to the end-user through the FL511 web site either as still images or streaming video feeds depending on the source video.

ID008VI The FL511 design shall be scalable to accommodate future CCTV growth, which may include adding new Agencies to the FL511 system for display on the web site.
The FL511 design shall be scalable to accommodate future CCTV growth, which may include adding new agencies to the FL511 system for display on the mobile applications.

The FL511 system shall be able to expand the number of camera images/videos that are selectable by the end-user to a minimum of 7,500 CCTVs.

The FL511 system shall not require the end-user to install any special software in order to view FL511 CCTV images/videos on their browser through the FL511 public web site.

The video provided shall initially be the same as the current FLATIS.

The process by which FL511 prevents end-users from obtaining ‘blocked’ streaming video and images shall not change.

A still image shall appear on the web site within two seconds of when a CCTV icon is either clicked or hovered over.

The maximum amount of time between when a user of the FL511 web site selects to view the video from a CCTV camera icon to when streaming video from the selected CCTV camera appears shall be less than five seconds.

Still images shall meet the following minimum requirements:
- Refresh at a minimum rate of one frame per every 2 minutes
- Minimum resolution equal to that of the existing system; and
- Use JPEG2 compression.

The FL511 web site shall support streaming a single CCTV video to 25,000 users simultaneously.

The FL511 web site shall be capable of streaming up to 2,000 individual CCTV video streams to 25,000 simultaneous users.

All camera images shall be able to be viewed simultaneously from each Agency through the Internet via the FL511 web site.

End-users shall be able to view any video stream made available via the FL511.com web site.

If streaming video is being provided by a CCTV selected by the end-user through the web site, the motion in the video frame shall start within five seconds of when the CCTV icon was selected.

All video streams shall be available as still images at a sampling period that is configurable by FDOT or their designated representatives.

The IDS shall obtain all images/video from the DIVAS at least every 120 seconds.

The IDS shall distribute the video streams to end-users, on demand, using Real-time Transport Protocol / Real-time Streaming Protocol, or Real Time Messaging Protocol to establish and manage each video stream session.

### 3.3.2.3.9 Innovative Component Requirements

The contractor of the FL511 system shall take advantage of current technology and propose additional dissemination components that will assist in notifying transportation users of current and planned events/incidents on the FL511 system.
3.3.3 Emergency Notifications

The Florida Division of Emergency Management (FDEM) strives to ensure that Florida is prepared to respond to emergencies, recover from them, and mitigate against the impacts from these emergencies. The FDEM supports local and county EM agencies and other emergency response partners in responding to both natural and man-made disasters. These range from floods and hurricanes to incidents involving hazardous materials or nuclear power. FDOT is one of the many partners who support EM in achieving their goals. As part of the FL511 project FDOT wants to ensure that components that will ensure the ability to disseminate information to the public in the most expeditious manner possible are included. Therefore, with the FL511 project, FDOT wishes to include an Emergency Notification module for use by state and local emergency managers. The goal of both FDEM and FDOT is to notify the public as quickly as possible to allow them to have the most current information available to use in making critical decisions related to their personal safety.

ID001E FL511 shall have the ability to notify Floridians, tourists, and other interested stakeholders of critical, life-safety information in the time-frame appropriate to the hazard or threat.

ID001E1 FL511 shall communicate the following weather warnings to the user: Tornado Warnings, Hurricane Warnings, High Wind Warnings, Flash Flood Warnings, Flood Warnings, Storm Surge Warnings, Severe Thunderstorm Warnings, Shelter-In-Place Warnings, and on-going or significant violent incidents that have the potential to impact the life safety of the user.

ID001E2 FL511 should communicate the following weather watches to the user: Tornado Watches, Hurricane Watches, and on-going or significant violent incidents that have the potential to impact the life safety of the user.

ID001E3 FL511 shall communicate the following emergency alerts to the user: Mandatory Evacuations, Civil Emergency Messages, AMBER, Silver, and LEO Alerts, Nuclear or Hazardous Material incidents and on-going or significant violent incidents that have the potential to impact the life safety of the user.

ID001E4 Information dissemination for emergency notifications in FL511 shall communicate the information to the recipient immediately for imminent threats, such as tornado warnings, to within a reasonable time frame for emergent or medium-term events.

ID001E5 FL511 shall disseminate, at a minimum, the emergency information via landline phones, mobile phones, short message service text messaging, email, FL511.com web site, and alerts, “push notifications” via mobile device applications, digital signage, wireless emergency alerts, social media, and emerging communications technology.

ID001E6 The method of communications for FL511 shall be accessible to visual and hearing-impaired users.

ID001E7 FL511 emergency notifications shall be accessible in both English and Spanish.

ID002E The FL511 system shall be able to automatically ingest and disseminate threat and warning messages from DIVAS.
ID003E  The FL511 system should have the ability to coordinate messaging with other systems that may be used to reach the same population during emergency notifications.

ID004E  The FL511 system shall have the ability to allow for multiple message creations and initiation points to allow validated, trained users to access the system to disseminate messaging.

ID005E  The FL511 system shall allow recipients to choose the parameters of their notifications.

ID005E1 The FL511 system shall allow users to choose the dissemination method by which they receive the emergency notifications.

ID005E2 The FL511 system shall allow users the ability to choose the types of threats for which they desire to receive notifications.

ID005E3 The FL511 system shall allow users the ability to choose the time-frame in which to receive the notifications they have elected to receive.

ID006E  FL511 shall have the option to make emergency notification messages mandatory or not.

ID007E  The FL511 system shall have the ability to geographically target messages so that only those in the impact area or who have interest in the impacted area are notified and minimize the risk of over-messaging to those who are not impacted.

ID008E  The FL511 system shall have the ability to incorporate future watches and warnings that may be developed by the National Weather Service or other EM officials/partners.

ID009E  The FL511 system shall be scalable to allow for significant growth in subscription and utilization.

ID010E  The FL511 system shall have an on-line and mobile component that allows users to gain additional information about the situation that may not be able to be delivered via other dissemination methods.

ID011E  The FL511 system shall utilize the cellular network and/or GPS location features available in smartphones and other mobile devices to present geographically targeted messages when a mobile device user enters a specific alert polygon or other geographically “fenced” area.

ID012E  The FL511 system shall minimize repeat messaging for the same incident.

ID013E  The FL511 system shall communicate all-clear messaging for those situations in which an end time was not initially indicated.

ID014E  The FL511 system shall be designed to easily allow the addition of other emergency notification systems by other government agencies to the system.

ID015E  FL511 shall be capable of ingesting any alert provided to the system in the most current Common Alerting Protocol format adopted by the Organization for the Advancement of Structured Information Standards. Reference document: http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2-os.html
ID016E The module that provides outgoing notifications should contain logic to ensure the same notification is not sent to the same telephone number multiple times when the same number appears in two or more different contact profiles.

ID017E The module that provides outgoing notifications should be capable of “throttling” calls so that numerous calls to landlines in the same geographic area or prefix do not overload or “knock out” a Private Branch Exchange OR a telephone company central office, exchange, switch, or other related component of the Public Switched Telephone Network.

3.3.4 Quality Management Support Subsystem

The quality management support subsystem (QMS) supports data monitoring and measuring of system performance. The requirements for this subsystem provide the hooks into the subsystems so that an external entity can access the system in real-time and evaluate how well the system is working. One important performance measure is the time it takes for new data to be delivered to the public, so there must be a requirement to date and time stamp each piece of data as it travels through the system. This information is added to the metadata that accompanies the information until it is passed to the public.

When data files are passed between subsystems, the QMS will have the ability to read the data and save it to an external database. The QMS should be able to constantly monitor FL511, operate without human intervention, and support the ability to send email alerts to designated support personnel. Access to the data files shall be through a secure Internet connection.

The QMS will have access to the IDS so it can provide an easy-to-read summary of the health and status of FL511 that will be available on remote computer desktops for designated personnel, such as FDOT managers and support personnel.

3.3.4.1 Major External Interfaces

Figure 3-7 is a simple block diagram showing the external interfaces to the QMS.

The QMS must be able to access the messages that go from the DIVAS and the central IDS. Further, the DIVAS and IDS must make time stamped data messages that are transferred between components available to the QMS so that the QMS can support analyses to determine where problems occurred. The database component in the DIVAS and the IDS must also be accessible to the QMS so that logs and other pertinent data can be examined if needed. It is assumed that access to the system will be through the Internet using a secure user identification and password.
3.3.4.2 Quality Management Subsystem Requirements

QM001 FL511 data shall be saved and time stamped in the QMS.
QM002 The QMS shall provide remote access and alerting for hardware components:
- Network health,
- Disk status,
- Mobile application status, and
- Usage warnings (i.e., system approaching levels where queuing is necessary).
QM003 The QMS shall log the date/time when an incident report is received into the system and the date/time the information about that incident is available in the IVR for callers and when it is on the web site and mobile applications.
QM004 The QMS shall provide the ability to see a graphical representation of the system status and latency.
QM005 The QMS shall provide information used to analyze problems.
QM006 The QMS shall be able to generate reports based on data saved.
QM007 The QMS shall be synchronized to a universal time standard obtained through the Internet.
QM008 The QMS shall be able to automatically, to the maximum extent possible, monitor and report the FL511 performance, including system component availability.
QM009 Data shall be archived with Read Only permissions.
QM010 Data shall be retained in the QMS for a minimum of 90 days.
QM011 Data shall be able to be transferred to long-term external storage media.
QM012 The quality management data shall be capable of being exported to external long-term storage medium.
Q013 The data shall be time stamped to the nearest tenth second to indicate when the data was received from DIVAS and ingested into the IDS database.

Q014 The QMS shall be able to automatically, to the maximum extent possible, monitor and report the availability of the DIVAS.

Q015 The QMS shall be able to automatically, to the maximum extent possible, monitor and report the availability of the DIVAS dedicated communication interface.

Q016 The QMS shall be able to automatically, to the maximum extent possible, monitor and report the availability of the IDS.

Q017 The QMS shall be able to automatically, to the maximum extent possible, monitor and report the availability of the IVR component.

Q018 The QMS shall be able to automatically, to the maximum extent possible, monitor and report the availability of the web site component.

3.3.5 Configuration Management Subsystem

A new function to be provided for FL511 is the ability of the system to automatically modify the system configuration based on changes made by the DIVAS.

FDOT has current standardized configuration practices that agencies providing data to the existing FLATIS follow in order to ensure a consistency within FLATIS. These guidelines are published in FDOT's Data Entry FLATIS Style Guide. FDOT has also provided training to Agencies throughout the state for further guidance in following these practices. However, since maintaining and following these practices is still a manual process, FDOT also has a management process for manual configuration updates in place.

The Configuration Management Subsystem (CMS) consists of the following component parts:

- Receive data,
- Accept data,
- Configuration moderator (the user interface), and
- Self-test.

The following are the functional requirements for the CMS of FL511.

3.3.5.1 Receive Data Component

CM001 FL511 shall receive configuration information from DIVAS via the dedicated communications interface.

CM001R FL511 shall accept configuration information from the DIVAS via the dedicated communications interface.
CM002R FL511 shall receive CCTV camera configuration via the DIVAS dedicated communications interface.

CM002R1 CCTV camera configuration consists of Latitude, Longitude, Camera Name, Camera Location Description, a Blocked Camera Flag, Center Identifier, and a Publish Camera Flag.

CM003R FL511 shall receive DMS configuration via the DIVAS dedicated communications interface.

CM003R1 DMS configuration consists of Latitude, Longitude, DMS Name, DMS Location Description, DMS Rows, DMS Columns, Center Identifier, and a Publish DMS Flag.

CM004R FL511 shall receive TvT link and associated node and midpoint configuration via the DIVAS dedicated communications interface.

CM004R1 TvT link configuration consists of Travel Time Identifier, Travel Time Node Identifiers, Travel Time Location Description, Travel Time Length, Center Identifier, and a Publish Travel Time Flag.

CM004R2 TvT node and midpoint configuration consists of Latitude, Longitude, Start and End Node Identifier, Roadway Identifier, and a Publish Travel Time Flag.

CM005R FL511 shall receive EM location configuration via the DIVAS dedicated communications interface. (See Appendix C)

CM005R1 EM location configuration consists of Latitude, Longitude, Roadway, Roadway Direction, Offset, Cross Street, City, County, Location Identifier, and a Publish Travel Time Flag, etc.

3.3.5.2 Accept Data Component

CM002 FL511 shall automatically process received configuration data.

CM001A FL511 shall automatically recognize updates to configuration information received from the DIVAS dedicated communications interface.

CM001A1 FL511 shall flag updates to configuration information received from the DIVAS dedicated communications interface as new, deleted, or modified.

CM002A FL511 shall not incorporate configuration updates until they are approved by an administrator.

CM002A1 Administrator approval of configuration updates shall occur using the configuration moderator.

CM002A2 FL511 shall produce a report of configuration information that has been added, deleted, or modified between selectable time periods.

3.3.5.3 Configuration Moderator Component

CM003 The configuration management system function shall provide an interactive interface to modify, edit, and/or accept configuration changes.

CM001M FL511 shall provide a user interface, called the configuration moderator, for an administrator to review configuration updates.

CM002M The FL511 configuration moderator shall flag errors detected in the configuration updates.

CM002M1 When the configuration moderator flags detected errors in configuration updates, the flagged errors shall be listed on the configuration moderator’s user interface as configuration issues that need to be addressed.
CM003M The FL511 configuration moderator shall detect issues with data format, acceptable ranges, and missing data.

CM003M1 The FL511 configuration moderator shall allow an administrator to configure a specific data format for all configuration fields.

CM003M2 The FL511 configuration moderator shall flag an error for a configuration field if data does not comply with the specified data format.

CM003M3 The FL511 configuration moderator shall allow an administrator to configure acceptable ranges for certain configuration fields.

CM003M4 The FL511 configuration moderator shall allow an administrator to configure acceptable ranges to be all, which would allow all data ranges to be accepted without error.

CM003M5 The FL511 configuration moderator shall flag an error for a configuration field if data is outside of the acceptable ranges.

CM003M6 The FL511 configuration moderator shall allow an administrator to configure if a field is optional.

CM003M7 The FL511 configuration moderator shall not flag an error for a configuration field if the field is blank and is configured as optional.

CM003M8 The FL511 configuration moderator shall flag an error for a configuration field if the field is blank and is configured as not optional.

CM004M The FL511 configuration moderator shall flag an EM location configuration field if a roadway was added that was not previously configured.

3.3.5.4 Self-Test Component

CM004 The configuration management system function shall provide test tools to validate the configuration changes.

CM001T FL511 shall have a test function available to allow the testing of configuration updates.

CM002T The FL511 test system shall have a test web site that can use updated configuration information.

CM003T The FL511 test system shall have a test IVR that can use updated configuration information.

CM004T The FL511 test system shall be accessible to FDOT for testing purposes.

CM005T The FL511 test system shall be capable of being loaded with status data that is currently being reported from the FL511 production system.

CM005T1 The FL511 test system shall use the loaded status data in order to test the currently loaded configuration data.

CM006T The FL511 test system shall have mirrored functionality of the FL511 production system.

CM007T The FL511 test system software shall have the ability to be updated with a different version of software than what is deployed on the FL511 production system.

CM008T The FL511 test system shall interface with FDOT’s Traffic Engineering and Research Laboratory to test changes made to data in the DIVAS.
APPENDIX A – Sample DIVAS Data Output
  <Events>
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      <Description_En>Crash in Escambia on SR-291/Davis Hwy south ramp to I-110, on-ramp left lane blocked. Last updated at 02:31:33PM.</Description_En>
      <Description_Es>Choque en Escambia en SR-291/Davis Hwy sur rampa en dirección I-110, carril izquierdo de la rampa de entrada bloqueado. Última actualización en 02:31:33PM.</Description_Es>
      <ID>118760</ID>
      <Center>District 3</Center>
      <Type>current</Type>
      <Severity>minor</Severity>
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        <Name>-I-110 SB</Name>
        <County>Escambia</County>
        <Highway>SR-291/Davis Hwy</Highway>
        <Direction>s</Direction>
        <Exit />
        <Offset_Type>rampTo</Offset_Type>
        <Cross_Street>I-110</Cross_Street>
        <Latitude>30506334</Latitude>
        <Longitude>-87221918</Longitude>
      </Primary_Location>
      <Secondary_Location />
    </Event>
    <Event>
      <Timestamp>08/17/2015 02:10:14 PM</Timestamp>
      <Description_En>Unconfirmed crash in Jackson on I-10 east at MM 155. Last updated at 02:14:11PM.</Description_En>
      <Description_Es>Choque no confirmada en Jackson en I-10 este en MM 155. Última actualización en 02:14:11PM.</Description_Es>
      <ID>133073</ID>
      <Center>District 3 Jax</Center>
      <Type>current</Type>
      <Severity>minor</Severity>
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      <Data_Last_Updated_At>08/17/2015 02:14:11 PM</Data_Last_Updated_At>
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        <Name>MM 155</Name>
        <County>Jackson</County>
        <Highway>I-10</Highway>
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        <Exit />
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        <Longitude>-84993370</Longitude>
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      <Secondary_Location />
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  </Events>
</Event_Data>
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  <Description_Es>Choque en Broward en I-95 norte más allá de salida 19 Pembroke Rd, 2 carriles al lado derecha bloqueados. Última actualización en 02:48:43PM.</Description_Es>
  <ID>1350096</ID>
  <Center>District 4</Center>
  <Type>current</Type>
  <Severity>intermediate</Severity>
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  <Primary_Location>
    <Name>Exit 19: SR-824/Pembroke Rd</Name>
    <County>Broward</County>
    <Highway>I-95</Highway>
    <Direction>n</Direction>
    <Exit>19</Exit>
    <Offset_Type>beyond</Offset_Type>
    <Cross_Street>Pembroke Rd</Cross_Street>
    <Latitude>25999972</Latitude>
    <Longitude>-80166277</Longitude>
  </Primary_Location>
</Event>

<Event>
  <Timestamp>08/17/2015 02:05:21 PM</Timestamp>
  <Description_En>Crash in Washington on I-10 west at CR-279. Last updated at 02:09:15PM.</Description_En>
  <Description_Es>Choque en Washington en I-10 oeste en CR-279. Última actualización en 02:09:15PM.</Description_Es>
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    <Highway>I-10</Highway>
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    <Longitude>-85795620</Longitude>
  </Primary_Location>
</Event>

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  <County>Duval</County>
  <Highway>I-295 E</Highway>
  <Direction>n</Direction>
  <Exit>55</Exit>
  <Offset_Type>at</Offset_Type>
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  <County>Duval</County>
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  <Offset_Type>at</Offset_Type>
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  <Longitude>-81513090</Longitude>
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  <Description_ES>Choque en Duval en SR-202 / Butler Blvd oeste más allá de I-295 E. Última actualización en 02:53:29PM.</Description_ES>
  <ID>258352</ID>
  <Center>District 2</Center>
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  <Severity>major</Severity>
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  <Data_Last_Updated_At>08/17/2015 02:53:29 PM</Data_Last_Updated_At>
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    <County>Duval</County>
    <Highway>SR-202 / Butler Blvd</Highway>
    <Direction>w</Direction>
    <Exit />
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  <Description_Es>Choque en Duval en I-295 E sur en salida 55 Gate Pkwy. Última actualización en 02:52:15PM.</Description_Es>
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  <Severity>major</Severity>
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  <Secondary_Location/>
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  <Description_Es>Construcción planeada en Broward en Pines Blvd oeste en Palm Ave, un carril central bloqueado. Última actualización en 02:36:38PM.</Description_Es>
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  <Severity>intermediate</Severity>
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    <Exit/>
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  <Timestamp>08/17/2015 02:33:25 PM</Timestamp>
  <Description_En>Planned construction in Broward on Hollywood Blvd east at US-441, 2 right lanes blocked. Last updated at 02:36:26PM.</Description_En>
  <Description_Es>Construcción planeada en Broward en Hollywood Blvd este en US-441, 2 carriles al lado derecha bloqueados. Última actualización en 02:36:26PM.</Description_Es>
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  <Center>BCTD</Center>
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  <Description_Es>Choque en Miami-Dade en I-95 sur antes de salida 12 Florida's Turnpike/US-441/SR-9/SR-826, carril derecho obstruido. Última actualización en 02:49:16PM.</Description_Es>
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  <Center>District 6</Center>
  <Type>current</Type>
  <Severity>major</Severity>
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  <Data_Last_Updated_At>08/17/2015 02:49:16 PM</Data_Last_Updated_At>
  <Primary_Location>
    <Name>Florida's Turnpike/US-441/SR-9/SR-826</Name>
    <County>Miami-Dade</County>
    <Highway>I-95</Highway>
    <Direction>s</Direction>
    <Exit>12</Exit>
    <Offset_Type>before</Offset_Type>
    <Cross_Street>Florida's Turnpike/US-441/SR-9/SR-826</Cross_Street>
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</Event>
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  <County>Broward</County>
  <Highway>Broward Blvd</Highway>
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  <Exit />
  <Offset_Type>at</Offset_Type>
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<Event>
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    <Highway>Hollywood Blvd</Highway>
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    <Offset_Type>at</Offset_Type>
    <Cross_Street>US-441</Cross_Street>
    <Latitude>26010180</Latitude>
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<Event>
  <Timestamp>08/17/2015 02:50:28 PM</Timestamp>
  <Description_Es>Crash in Miami-Dade on I-95 south at Exit 16 NE 203 St/Ives Dairy Rd, left lane blocked. Last updated at 02:54:30PM.</Description_Es>
  <Primary_Location>
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    <County>Miami-Dade</County>
    <Highway>I-95</Highway>
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    <Offset_Type>at</Offset_Type>
    <Cross_Street>NE 203 St/Ives Dairy Rd</Cross_Street>
    <Latitude>26107018</Latitude>
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  </Primary_Location>
</Event>
Choque en Miami-Dade en I-95 sur en salida 16 NE 203 St/Ives Dairy Rd, carril de la izquierda obstruido. Última actualización en 02:54:30PM.

Emergency road construction in Miami-Dade on I-95 east at Exit 1 I-95 North/I-95 South, right lane blocked. Last updated at 02:32:36PM.

Traffic congestion in Orange on I-4 east from Exit 81A Michigan St to at Exit 84 Ivanhoe Blvd. Last updated at 02:54:07PM.

Congestión de tránsito en Orange en I-4 este desde salida 81A Michigan St a en salida 84 Ivanhoe Blvd. Última actualización en 02:54:07PM.
<Center>District 5</Center>
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  <Name>Exit 84: Ivanhoe Blvd</Name>
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  <Highway>I-4</Highway>
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  <Cross_Street>Michigan St</Cross_Street>
  <Latitude>28514857</Latitude>
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  <Timestamp>08/17/2015 01:59:17 PM</Timestamp>
  <Description_En>Crash in Orange on SR-417 south at MM 8, left shoulder blocked. Last updated at 02:03:18PM.</Description_En>
  <Description_Es>Choque en Orange en SR-417 sur en MM 8, carril izquierdo de emergencia bloqueado. Última actualización en 02:03:18PM.</Description_Es>
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<Description_En>Planned construction in Walton on I-10 east at Exit 85 US-331. Last updated at 02:15:04PM.</Description_En>
<Description_Es>Construcción planeada en Walton en I-10 este en salida 85 US-331. Última actualización en 02:15:04PM.</Description_Es>
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<Data_Last_Updated_At>08/17/2015 02:15:04 PM</Data_Last_Updated_At>
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<Secondary_Location/>
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<Description_Es>Construcción planeada en Hillsborough en Veterans Expressway sur rampa de salida 9 Gunn Hwy, carril al lado izquierda de la rampa de salida bloqueado. Última actualización en 08:52:45AM.</Description_Es>
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<Center>Turnpike SG C</Center>
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<Description_Es>Construcción planeada en Hillsborough en Veterans Expressway norte rampa en dirección salida 7 Linebaugh, rampa de salida cerrada. Última actualización en 08:52:56AM.</Description_Es>
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APPENDIX B – FL511 System Penalties
Operations and Maintenance Penalties

Purpose

The purpose of this document is to define the penalty requirements and associated penalties that the contractor will be assessed if the requirements outlined here are not met. The penalties are associated to particular problems/issues that are identified by users and operators of the FL511 system. The contractor will ensure that the system is operating at peak performance and will be penalized if any of the following occur:

- The bi-annual tuning/call recognition reports do not meet specified thresholds
- Issues reported by system users/operators/administrators are not responded to and/or resolved in the defined times
- Root Cause Analysis reports are not delivered within the specified timeframe

Tuning and Caller Recognition

Caller recognition is being update to recognize the difficulties in achieving error free recognition and to distinguish between the usage levels of English verses Spanish. Spanish is the lesser used option as most callers choose to utilize the English option. Spanish recognition is less critical due to the limited amount of callers who utilize the Spanish option and the defined penalty rate reflects the difference in utilization. The following are the updated metrics regarding the assessment of penalties for caller recognition.

Recognition Rates

Recognition is the ability of the IVR to understand a caller’s commands in response to system prompts. Recognition rate will be determined by an examination of all dialog states for all calls made to the IVR using the prior three month period to when the tuning report is performed. Recognition will be defined as how well the application recognizes the caller responses it is supposed to recognize, such as menu items and highway names. The rate which the system shall recognize responses will increase incrementally each year.

<table>
<thead>
<tr>
<th>Initial Commitment</th>
<th>Recognition Accuracy Rate: 85% for English and 65% for Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured</td>
<td>Every three months using the Recognition Rate established via the recognition rate report. The report will be provided by the contractor via the FL511 web reports interface.</td>
</tr>
</tbody>
</table>
Penalty

Each 2% or portion of 2% below the target = $5,000 for English, $2,000 for Spanish.

Penalty Application

- Calculated every 3 months separately for each language
- The Recognition Accuracy Rate will be utilized to calculate the penalty at every three (3) month interval, starting with the initial recognition rate report.
- The penalty for the Recognition Rate will be assessed based on a comparison of the results of the appropriate recognition targets versus the calculated recognition rate.

Recognition Accuracy Rate Commitment

The commitment level for each language will increase based on the following schedule:

<table>
<thead>
<tr>
<th>Year</th>
<th>English</th>
<th>Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 2017</td>
<td>85%</td>
<td>65%</td>
</tr>
<tr>
<td>Jan 2018</td>
<td>87%</td>
<td>66%</td>
</tr>
<tr>
<td>Jan 2019</td>
<td>89%</td>
<td>67%</td>
</tr>
<tr>
<td>Jan 2020</td>
<td>91%</td>
<td>68%</td>
</tr>
<tr>
<td>Jan 2021</td>
<td>93%</td>
<td>69%</td>
</tr>
</tbody>
</table>

Note: The Recognition Accuracy Rate Commitment Levels may be reevaluated upon a request from the contractor or the Department and supported by the results of a current Recognition Rate Report.

System Reliability

System reliability is how well the system performs and measures the availability of the FL511 system and its components.

Reliability Rates

Reliability is a measure of the system’s operational availability when queried by a user. System availability will be determined by the ability of users/operators to access information from the FL511 system components. The following classifications identify what an ‘outage’ is and the associated penalties are for the ‘outage’ levels.
### Classification Details Example Penalty Response Time Penalty

<table>
<thead>
<tr>
<th>Classification</th>
<th>Details</th>
<th>Example</th>
<th>Penalty</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A Mission Critical – Complete or major system or service outage; performance degradation causing dysfunction; major functional failure; Data is not being reported back to the users request;</td>
<td>User cannot access one or more of the FL511 dissemination subsystems</td>
<td>$1,000 - 0 min to1 hr $5,000 - 1 to 2 hrs $7,500 - 2 to 4 hrs $10,000 - 4 to 6 hrs $15,000 - greater than 6 hrs</td>
<td>$500</td>
<td></td>
</tr>
<tr>
<td>B Severe – Performance or functional degradation causing problem of major significance; database corruption or loss of data feed causing major service degradation</td>
<td>Loss of a component of each of the FL511 system components. Such as the information for the Travel Times tab is not available on the mobile apps</td>
<td>$500 - 0 min to1 hr $1,000 - 1 to 2 hrs $2,000 - 2 to 4 hrs $2,500 - 4 to 6 hrs $5,000 - greater than 6 hrs</td>
<td>$250</td>
<td></td>
</tr>
</tbody>
</table>

* For mission critical outages, the penalty will increase for every hour over 6 hours by $1,000 per hour to a maximum of $25,000.

** For severe outages, the penalty will increase for every hour over 6 hours by $500 per hour to a maximum of $10,000.

The outage clock will start when the outage is reported to the contractor via either email, phone, a ticketing system, or by making a call to an emergency contact number.

- Outages defined for Mission Critical classification include, but are not limited to, the following:
  - System is not available to the users
  - IVR not accepting calls
  - IVR inaudible to the caller
  - IVR answering caller, but not responding to caller commands
  - IVR not updating information
- Web site is not accessible
- Web site is not updating information
- Either of the mobile applications are not accessible
- Either of the mobile applications are not updating information
- New innovative dissemination tools are not accessible
- New innovative dissemination tools are not updating information
- Failure to have information updated in the FL511 dissemination components when the data is available from DIVAS.

Outages defined for Severe classifications include, but are not limited to, the following:
- Outages of the Personalization system (Email, Text, and Phone alerts)
- Partial outage of the IVR
- Calls not being transferred via the IVR
- A single web site component is not available
- A single web site component tab is not updating
- A single component of the mobile applications is not available
- A single component of the mobile applications is not updating
- A single component of any new FL511 dissemination component is not available
- A single component of any new FL511 dissemination is not updating

**Issue Reporting and Response Time**

Reporting requirements are the time that it takes the contractor to respond to a ticket once they are notified of an issue with any of the FL511 system components.

**Reporting Requirements**

For all Class A or B issues, FDOT will report issues via one of the following methods: email, phone, a ticketing system, or by making a call to an emergency contact number. Class A and B Issues shall receive a response to the reporter within 15 minutes and 30 minutes respectively.

For all Class C, D, or E issues, FDOT will report the issue through a web accessible ticket reporting system. Class C, D, and E tickets will receive a response within 24 hours of the issue being reported.
A penalty will be assessed for failure to meet Class A and Class B ticket response times in the amounts of $500 for Class A tickets and $200 for Class B tickets. (See table above)

**Root Cause Analysis Report**

Root Cause Analysis (RCA) reports are reports required by the Florida Department of Transportation to provide the Department with information regarding failure of the system or a component of the system. The RCA shall identify what the issue was, why it occurred, what was done to resolve the issue, who the issue originated with, time issue was reported, time issue was resolved, and total outage time.

- A complete Incident report will be submitted to FDOT within 5 business days of when the issue was resolved.

- In the event the contractor fails to meet this deadline, the contractor will pay FDOT a penalty of $500 for each day the RAC Report is delayed, excluding delays associated with 3rd Party request for information.
APPENDIX C – Sample EM DATA
<table>
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<th>EM Reference Point Long Name</th>
<th>Mile Marker</th>
<th>Offset</th>
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<th>Longitude</th>
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<td>D2</td>
<td>802</td>
<td>Duval</td>
<td>SR-202</td>
<td>WB</td>
<td>State Road 202, JTB-Butler Boulevard</td>
<td>State Road 202, J Turner Butler Boulevard</td>
<td>US 1, Philips Highway, State Road 5</td>
<td>I-95</td>
<td>95/1US/Phillips</td>
<td>US 1</td>
<td>Philips Highway</td>
<td>I-95</td>
<td>I-95</td>
<td>beyon d</td>
<td>11750</td>
<td>Jacksonville</td>
<td>30245470</td>
<td>-81599170</td>
<td>WB</td>
<td>Beach Boulevard</td>
<td>Beach Boulevard State Road 212</td>
<td>Beach Boulevard State Road 212</td>
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<tr>
<td>D2</td>
<td>803</td>
<td>Duval</td>
<td>I-295 W</td>
<td>SB</td>
<td>I-295 West, Interstate 295 West, I-295 West</td>
<td>I-295 West</td>
<td>Airport Road, Duval Road, Exit 33</td>
<td>Exit 33, Duval Road, Airport Road</td>
<td>295S/Duval Ex</td>
<td>Duval Rd</td>
<td>Duval Rd</td>
<td>Duval Rd</td>
<td>33 ramp To</td>
<td>33</td>
<td>33</td>
<td>1990</td>
<td>Jacksonville</td>
<td>30461250</td>
<td>-81676610</td>
<td>SB</td>
<td>I-95</td>
<td>Interstate 95/I-95</td>
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<td>D2</td>
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<td>I-295 W</td>
<td>SB</td>
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<td>I-295 West</td>
<td>, Mile Marker 34, Exit 33, Duval Road, Airport Road</td>
<td>295S/M 34</td>
<td>MM 34</td>
<td>Duval Rd</td>
<td>Duval Rd</td>
<td>34</td>
<td>34</td>
<td>1500</td>
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<td>-8167840</td>
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<td>I-95</td>
<td>Interstate 95/I-95</td>
<td>Interstate 95/I-95</td>
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</tbody>
</table>
### Exhibit A
Part 3 of 3

| Dist-  
| EM  
| Location  
| ID  
| County  
| Roadway  
| Roadway  
| Direction  
| Roadway  
| Alias  
| Roadway  
| Spoken  
| Name  
| Cross  
| Street  
| Alias  
| EM  
| Location  
| Short  
| Name  
| EM  
| Reference  
| Point  
| Short  
| Name  
| EM  
| Reference  
| Point  
| Long  
| Name  
| Mile  
| Marker  
| Off-  
| set  
| Exit  
| Number  
| Exit  
| Design-  
| ator  
| Sort  
| Order  
| Metro  
| Area  
| City  
| Latitude  
| Longitude  
| Alternate  
| Roadway  
| from  
| Direction  
| Primary  
| Alternate  
| Roadway  
| Name  
| Secondary  
| Alternate  
| Roadway  
| Spoken  
| Name  

**Row 1**
- **District**: D2
- **EM Location ID**: 809
- **County**: Duval
- **Roadway**: I-295 W
- **Roadway Alias**: I-295 West, Interstate 295 West, I-295 West Beltway
- **Roadway Spoken Name**: Exit 33, Duval Road, Airport Road
- **Cross Street Alias**: 2665 S/Duval Rd
- **Cross Street Spoken Name**: between MM 34/Duval Rd
- **EM Location Short Name**: Duval Rd
- **EM Reference Point Short Name**: Duval Rd
- **Mile Marker**: 33 before
- **Exit Number**: 1750
- **Exit Designator**: Jacksonville 30460850 -81673420 SB I-95
- **Sort Order**: Interstate 95/S-95
- **Metro Area**: Jacksonville
- **City**: Jacksonville
- **Latitude**: 30460850
- **Longitude**: -81673420
- **Alternate Roadway Name**: SB I-95
- **Primary Alternate Roadway Name**: Interstate 95/S-95
- **Secondary Alternate Roadway Name**: Interstate 95/S-95

**Row 2**
- **District**: D2
- **EM Location ID**: 810
- **County**: Duval
- **Roadway**: I-295 W
- **Roadway Alias**: I-295 West, Interstate 295 West, I-295 West Beltway
- **Roadway Spoken Name**: Exit 33, Duval Road, Airport Road
- **Cross Street Alias**: 2665 S/Duval Rd Ent
- **Cross Street Spoken Name**: Between MM 34/Duval Rd
- **EM Location Short Name**: Duval Rd
- **EM Reference Point Short Name**: Duval Rd Exit
- **Mile Marker**: 33 ramp From
- **Exit Number**: 2010
- **Exit Designator**: Jacksonville 30461250 -81679510 SB I-95
- **Sort Order**: Interstate 95/S-95
- **Metro Area**: Jacksonville
- **City**: Jacksonville
- **Latitude**: 30461250
- **Longitude**: -81679510
- **Alternate Roadway Name**: SB I-95
- **Primary Alternate Roadway Name**: Interstate 95/S-95
- **Secondary Alternate Roadway Name**: Interstate 95/S-95