

Surface Transportation Security and Reliability Information System Model Deployment

Cooperative Agreement Number
DTFH61-03-H-00105



Final System Requirements

Submitted by:
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1.0 Scope

This section provides an overview of the System Requirements document.

1.1 Introduction

In March 2003, the Florida Department of Transportation (FDOT) was selected to participate in a highly innovative model deployment with the Federal Highway Administration (FHWA). The formal name of the program is the Surface Transportation Security and Reliability Information System Model Deployment (DTFH61-02-X-0089). However, as its goal is to provide an information infrastructure, it is more commonly referred to as the “Infostructure” MDI. The objective of the model deployment – called iFlorida – is to demonstrate the wide variety of operational functions that are enabled or enhanced by a surface transportation security and reliability information system. The model deployment will:

- Expand and integrate existing data collection and monitoring systems;
- Collect and share data;
- Use the data operationally to improve transportation system security, safety, reliability and performance; and
- Where appropriate, distribute the data to the traveling public.

The model deployment will demonstrate today’s best practices and innovative approaches for the collection, processing, use, dissemination, sharing, and archiving of transportation information. As part of this model deployment, existing surveillance and monitoring systems will be augmented to fill gaps, and overall coverage will be enhanced with new sensor types, increased data rates, or increased coverage density. Existing institutional arrangements will be expanded to facilitate the enhancement of operational functionality and integration.

1.1.1 Program Objectives

The objectives of the iFlorida program (Program) are captured in the four “i”s of information, integration, intelligence, and innovation. The Program is designed to deliver information required by operating agencies to manage the transportation network more securely, reliably and efficiently and deliver the decision support information that travelers need to make best use of transportation facilities.

The Program will accomplish this through the seamless integration of information and telecommunication systems, incorporation of the highest levels of intelligence and the adoption of appropriate innovation. To be specific, the Program will:

- Expand the existing data collection, transportation management and information delivery infrastructure;
- Integrate data collection, monitoring and management systems both in normal operation and during times of crisis;
- Collect and share data;
- Use data operationally to improve transportation system management;
- Distribute decision-quality data to the traveling public;
- Establish a model for others and share the lessons and experiences learned along the way;
- Define performance measures, collect performance data and evaluate results;
- Illustrate how transportation, hurricane evacuation, weather information and security management can be integrated from both technical and organizational perspectives.

The iFlorida Team will achieve these objectives through the application of resources, experience and expertise within the framework of our proposed approach.

1.1.2 Project Partners

The iFlorida Project Team is composed of representatives from all public and private partners involved in iFlorida. These include:

Public Agencies

- Brevard County
- City of Daytona Beach
- City of Orlando
- Florida Department of Transportation (FDOT) District 2
- Florida Department of Transportation (FDOT) District 5
- Florida Highway Patrol (FHP), Troops D and G
- Florida Division of Emergency Management
- Florida’s Turnpike Enterprise
- Orlando International and the Orlando-Sanford International Airports
- LYNX
- METROPLAN
- Orlando-Orange County Expressway Authority (OOCEA)
- Orange County
- Seminole County
- United States Department of Transportation (USDOT)
- University of Central Florida’s (UCF)
- University of North Florida (UNF)
- Volusia County

Private Organizations

- Minnesota Mining and Manufacturing Company (3M)
- Cambridge Systematics, Inc.
- International Speedway Corporation
- Meteorlogix
- Post, Buckley, Schuh, & Jernigan, Inc (PBS&J)

Together, their role is to facilitate full program team communications. To this end, iFlorida Project Team partners have agreed to host full program team meetings on a rotating basis.

1.2 Identification

This System Requirements applies to the iFlorida project. The System Requirements document is utilized to identify and describe the iFlorida methodology, as well as detailing specific requirements for specific systems that can be implemented. Since not all of the iFlorida procurements are deployable systems some will not be discussed in this document. Below is a listing of all iFlorida procurements under their corresponding procurement bundle. Those procurements that are in listed in italics and numbered from 1 through 5 will be specifically detailed as part of the Draft Systems Requirements document. Those procurements numbered from 6 through 8 will be detailed in the Final Systems Requirements Document.

- **Central Florida Field Components**
 - *Field Components Design/Build (1)*
 - 3M Equipment
 - City of Orlando Agency Integration
- **Weather**
 - *Central Florida RWIS (2)*
 - *Road Weather Forecasting (3)*
- **Security Command and Control**
 - *Security Command and Control (4)*
 - Security Cameras
- **Data Fusion, Sharing and Use**
 - *iFlorida Conditions System (5)*
 - *Statewide TTMS Upgrade (6)*
 - *Data Warehouse Expansion (7)*
 - *iFlorida Operations (8)*
- **Broadband Wireless**
 - Broadband Wireless Trial
- **Probe Vehicle Test Bed**
 - Probe Vehicle Test
- **Studies**
 - METROPLAN Data Mining
 - Network Reliability / Traffic Modeling
 - Speedway Evaluation Plan / RTMC Vulnerability
- **Evaluation Support**
 - Evaluation Support

1.3 Document Overview

The System Requirements Document is intended to be the finalization of the effort to collect and document requirements. This document will identify specific requirements and define its relationship within the system. The iFlorida requirements methodology section provides an understanding of the process of requirements management.

Subsequent sections identify the requirements hierarchy and specific, detailed requirements for the various sub-systems within the iFlorida system. In order to be able to focus on the requirements for each of the eight critical path procurements, a separate section for each of these key procurements has been developed.

The Draft and Final versions of the System Requirements document are intended to be “living” documents that reflect the evolving requirements for each of the specific procurements. This System Requirements Document along with the Concept of Operations document forms the basis for the development of the various sub-systems within the iFlorida system.

1.4 System Overview

The iFlorida system will be designed and implemented at the Florida Department of Transportation District 5’s (“Department”) Regional Traffic Management Center (RTMC). The System is an Internet-based information system to collect, fuse and disseminate transportation system conditions on the Florida Intrastate Highway System throughout the state as well as more detailed and multi-modal conditions in the Central Florida region. For more information on iFlorida, visit <http://www.iflorida.net>.

The System will incorporate automated data from the Florida Highway Patrol’s Computer Aided Dispatch (CAD) system, the Department District 5’s Surveillance Motorist Information System (SMIS), the Orlando Orange County Expressway Authority’s Travel Time Data Server, and segment weather conditions, alerts and forecasts to be provided as part of the iFlorida model deployment program.

The System will include an operator interface to enable appropriate personnel from the Department, its partner agencies, and approved private contractors/consultants to enter incident/event reports directly into the System, both from the RTMC and remotely via a standard Internet browser. The System will also serve as the main statewide traveler information Internet Web site portal.

Within the system, a more granular level of monitoring will be established for the Orlando area, including the covered arterials, transit, and aviation elements.

In addition to the automated interfaces, for all limited-access roadways and covered arterials, the appropriate organizations or contracted operators will insert information, geo-located and linked to its corresponding segment(s), regarding any event that impacts the expected flow of traffic, such as construction, maintenance, incidents, weather events, and special events.

The Department’s Regional Traffic Management Center (RTMC) personnel will enter transit events verbally reported from LYNX regarding service disruptions, changes, and additions. RTMC personnel will enter information verbally reported from the Orlando International and the Orlando-Sanford International Airports regarding landside transportation (e.g., parking), generalized airport delays, and estimated wait times at security screening. Transit agency data and/or Airport data will be disseminated via a Central Florida website (<http://www.iflorida.org>). The RTMC will determine if significant Transit Agency (LYNX) data and/or Airport data should also be disseminated to the Central Florida 511 telephone system.

A two-way feed will be established with the Central Florida Data Warehouse (CFDW). The System will provide statewide and Central Florida area segment reports as well as raw weather, FHP CAD and operator-entered incident and event data to the CFDW. The CFDW will provide its segment forecasts to the System.

The Statewide ITS Architecture and Standards Application Plan maintained by FDOT contains the relevant standards for all elements and data flows associated with the ITS components in the ITS architecture. This Standards Application Plan will be enhanced and maintained through the course of the iFlorida program, and national standards that are made available through the Standards Development Organizations will be addressed where appropriate. Every effort will be made to implement designs that conform to existing, mature, ITS Standards and that are within the financial scope of the iFlorida program. Draft ITS Standards will not be tested or implemented.

As part of the system design required in the iFlorida program, Design Criteria Packages will be developed from the initial scopes of work, performance criteria, and functional requirements for each project element in the application and enhanced and refined to be sufficient to support design/criteria packages for procurement as

defined in Section 287 of the Florida Statutes.

These Design Criteria Packages will contain sufficient locations, designs, standards, and specifications to procure projects using the design-build procurement technique. If a traditional design and bid technique is preferred, FDOT will complete design prior to procurement. However, with the time allowed for system design, procurement, installation, and testing, a design-build procurement method is preferred at this time.

Maintenance of the System for the life of the iFlorida operational evaluation period (currently scheduled to end April 30, 2007) will be part of this project.

2.0 Referenced Documents

Documents that have been utilized in the development of the System Requirements document include:

- iFlorida Final Work Plan, Version 1.0, PBS&J, June 2003.
- Functional Requirements, iFlorida – Statewide and Central Florida Conditions System, FDOT, August 2003.
- Design and Implementation of the Central Florida Data Warehouse (CFDW) – Year 1: The TCSP Funding, UCF, October 2002.
- Design and Implementation of the Central Florida Data Warehouse (CFDW) – Year 1: The TCSP Funding, Approved Revision 6.0, UCF, May 2003.
- iFlorida Field Components Specification, PBS&J, June 2003.
- Scope of Work – Weather Forecasting by Road Segment, Meteorlogix, Version 2.3, FDOT, July 2003.
- Scope of Work – Road Weather Information System, University of Northern Florida, Version 2.2, FDOT, August 2003.
- iFlorida Conditions System Functional Requirements Meeting Summary. PBS&J, July 9, 2003.
- Conditions System ITN Concept Meeting #2 Presentation, PBS&J, July 16, 2003.
- Concept of Operations Workshop, July 23, 2003.
- Systems Requirements Workshop, September 9, 2003.

In addition, information from several interviews with stakeholders and a site visit to the RTMC was utilized in the development of the System Requirements document. The information contained in this document has been reviewed and confirmed in a workshop environment with the iFlorida Stakeholders on September 9, 2003.

3.0 iFlorida Requirements Methodology

This section describes a systematic and proven approach to the development of a structured set of activities to define and validate, manage, and trace iFlorida requirements. These activities will provide a clear and accurate set of defined requirements and will be used to form a solid basis from which to design the solution architecture.

3.1 Requirements Definition and Validation

The requirements for the iFlorida project can be found in the Cooperative Agreement issued by the Federal Highway Administration. The Cooperative Agreement identified nine distinct component areas to be addressed by the iFlorida proposal. Section 3.4.1 provides additional detail as to the tracing of the Cooperative Agreement requirements to the iFlorida proposal.

The DRAFT Concept of Operations documents the initial requirements capture. The initial capture of requirements was done via analysis, reviews and interviews with key operational staff. The operational and technical review of this document was supplemented by the stakeholder review at the Concept of Operations Workshop. Workshop comments were reviewed and incorporated, as appropriate, into the Concept of Operations Document, Version 1. This document, as a result of both stakeholder and FHWA comments and suggestions, has been validated and became the initial formal requirements' baseline for the project. The Concept of Operations document, having been identified as a "living document", currently includes the five key critical path projects. The remaining iFlorida sub-systems will be included in a subsequent revision of the Concept of Operations Version 1 document. This update, Concept of Operations Version 2, will fully document all of the remaining sub-system, as well as providing updates to the five critical path projects.

Critical path project requirements were further analyzed and refined in preparation for their inclusion as DRAFT Functional Requirements for FDOT procurements. Each of the DRAFT Scopes of Work and associated Functional Requirements was reviewed by FHWA and comments provided. Revised critical path project requirements were presented at the System Requirements Workshop for an operational and technical review by stakeholders. Workshop comments were reviewed and incorporated, as appropriate, into this document. This document, as a result of both stakeholder and FHWA comments and suggestions, is the validated formal requirements baseline for the project.

Concurrent with the development of this document is the development of the iFlorida requirements database. This database provides the tools necessary to control and manage the evolution of requirements for the iFlorida project. Section 3.3 provides additional detail regarding this essential toolset.

The iFlorida requirements documentation and database will be referred to throughout the rest of the system development process to ensure the developing projects align with FDOT operational needs and requirements.

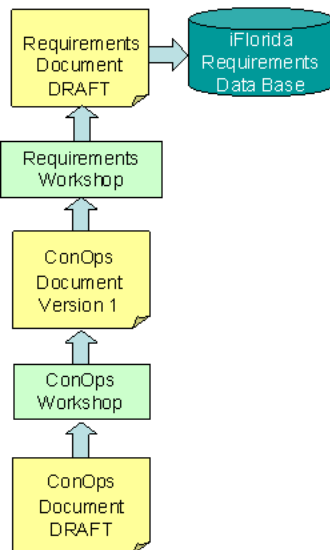


Figure 3.1-1: Overview of the iFlorida Requirements Documentation Process

3.1.1 Requirement Descriptions

Because incomplete or shifting requirements represent the single greatest risk to project success, requirements must be clearly defined and prioritized before the development phase begins. To this end, iFlorida requirements have been written with the following criteria in mind:

- **Understandable** – The meaning of the requirement must be clear from the text in the document.
- **Unambiguous** – Each requirement must have a single, clear meaning.
- **No redundancy** – Each requirement should be stated only once.
- **Complete** – Every functional behavior in the implemented project must appear in a requirement, and the requirements must capture the entire functionality of the system. All functionality described in scenarios must be described by a requirement.
- **Consistent** – The requirements must not contradict each other.
- **Correct** – The requirements must not specify invalid or undesirable behavior.
- **Testable** – It must be possible to construct a test that can be executed by a person who is not a member of the development team (e.g., FDOT Operations staff) to determine whether the requirement is satisfied.

3.1.2 Iterative Requirements Development

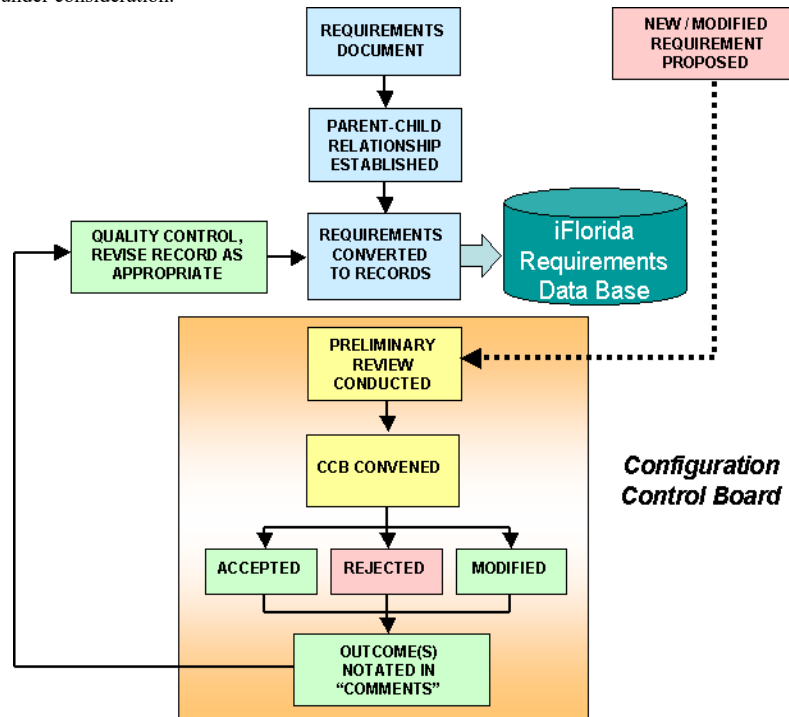
The goal of the iFlorida project is to encourage operational staff to review requirements as the sub-systems are being developed. The fundamental problem with the "traditional" fast track approach is that it assumes that users and analysts can know all the requirements at the outset of the project. This assumption creates too many details early in the project and produces thick requirements/analysis documents. Lost in the details is a clear understanding of the business operations and its needs that often lead to a faulty high-level design. To mitigate this risk the project will utilize an iterative requirements development process. This process has many advantages for a fast track model deployment project, including:

- Serious misunderstandings are made evident early in the lifecycle, when it's possible to react to them.
- It enables and encourages user feedback, so as to elicit the system's real requirements.
- The development team is forced to focus on those issues that are most critical to the project, and team members are shielded from those issues that distract them from the project's real risks.
- Continuous, iterative testing enables an objective assessment of the project's status.
- Inconsistencies among requirements, designs, and implementations are detected early.
- The workload of the team, especially the testing team, is spread out more evenly throughout the lifecycle.
- This approach enables the team to leverage lessons learned, and therefore to continuously improve the process.
- Stakeholders in the project can be given concrete evidence of the project's status throughout the lifecycle.

3.2 Requirements Management

The iFlorida requirements methodology chosen supports the project's need to define for whom the product, process or application exists, what it must do, and how well it must perform. A structured requirements management process will strongly support the iterative requirements development methodology. This process is depicted in Figure 3.2-1.

The purpose of this process is to formally define how an individual may request a change to an existing approved requirement. These requirements reside in the requirements database and any changes will require the formal approval by the Configuration Control Board (CCB). The CCB will be chaired by Anne Brewer (Program Manager). CCB membership will also include Rick Schuman (Business and Operations Manager), Joe Schuerger (Technical and Integration Manager) and the associated Project Manager for the sub-system under consideration.



iFlorida Requirements Management Process.

Changes to be submitted to the CCB may include the addition, deletion, or modification of an existing requirement. These changes may be submitted to the CCB at any time and a preliminary review will be conducted. The change will be reviewed for adequacy and accuracy, and if approved, a CCB will be convened. The originator will present their change and the reasons for the change to the CCB. The CCB will then review the change for technical, cost, schedule, operational, training, and documentation impacts. Upon a thorough review the CCB will make its recommendation (i.e., accepted, rejected, modified) to the originator. If applicable, the necessary changes will be made to the requirements database. All requests for changes will be logged and dispositions recorded.

3.2.1 Requirement Nomenclature

For ease in managing and analyzing requirements, a combination of alphabet prefixes and suffixes identify each requirement. Prefix characters denote a specific system requirement and suffix characters denote a specific function within the system. The prefix “SY” denotes a system level requirement. Nomenclature is based on the development of a requirements hierarchy. Figure 3.2.1-1 depicts the top-level requirements hierarchy and nomenclature that exist within the Conditions System project.

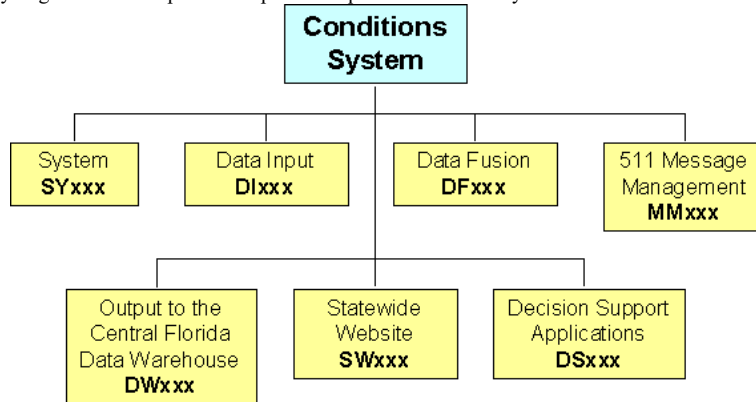


Figure 3.2.1-1: Conditions System Top-Level Requirements Hierarchy and Nomenclature.

Not all requirements have lower level requirements. The level of requirement decomposition depends on the level of detail required to specify a function or performance unambiguously. Each system specification is the parent of one or more sub-system requirements that have a two letter prefix identifying the subsystem the requirement applies to. In some cases, the component of the subsystem may require further interpretation so adding another letter after the Component suffix letter creates an Element level requirement.

The iterative requirements approach that was used to design the iFlorida system flows requirements from system level to lower levels. A requirement that spawns lower level requirements is called a parent requirement. The requirements created from the parent are called children requirements. One quality design rule is that a requirement can have only one parent requirement. A parent can have many children but if a child requirement has two or more parents then ambiguity or conflict can occur. The requirements database makes it easy to verify that this design rule has been met.

Each sub-system is made up of functional components and their requirements are identified by a letter suffix. Figures 3.2.1-2 through 3.2.1-4 provide sample detailed hierarchies for the Conditions System project.

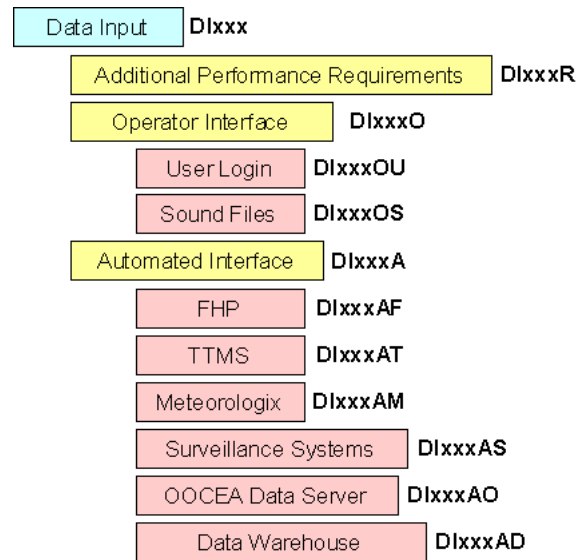


Figure 3.2.1-2: Sample “Data Input” Requirements Hierarchy and Nomenclature.

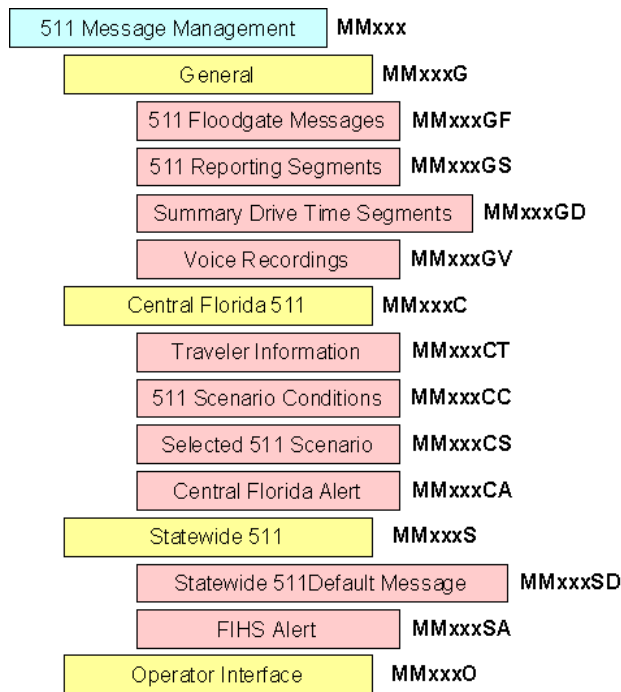


Figure 3.2.1-3: Sample “Message Management” Requirements Hierarchy and Nomenclature.

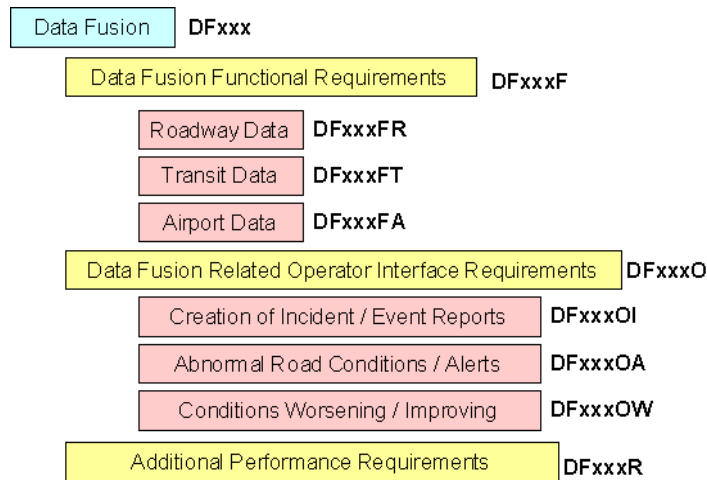


Figure 3.2.1-4: Sample “Data Fusion” Requirements Hierarchy and Nomenclature.

3.3 Requirements Management Toolset

The iFlorida program has chosen a relational database built upon FileMaker Pro[®] to maintain the “approved” requirements baseline. This application will provide traceability of requirements, track the evolution of requirements (i.e., new, modified, deleted) and provide necessary reports. This application has been used successfully on previous projects and provides the level of control necessary to manage the multiple projects required by the iFlorida program.

The application will enable the automatic creation of a Requirements Traceability Matrix (RTM) report. This report, generated from the relational database, can be sorted by system, subsystem, component, element, unit and part fields show all the parent child relationships and what paragraph they are found in.

The tracking of requirements as they evolve over the life of the project is an essential function of a requirements management tool. The application provides a comment field that will enable this tracking of requirements. Figure 3.3-1 provides a sample screen capture of an individual requirement for the Conditions System project. Figure 3.3-2 summarizes the information contained in the various fields of the requirement’s form.

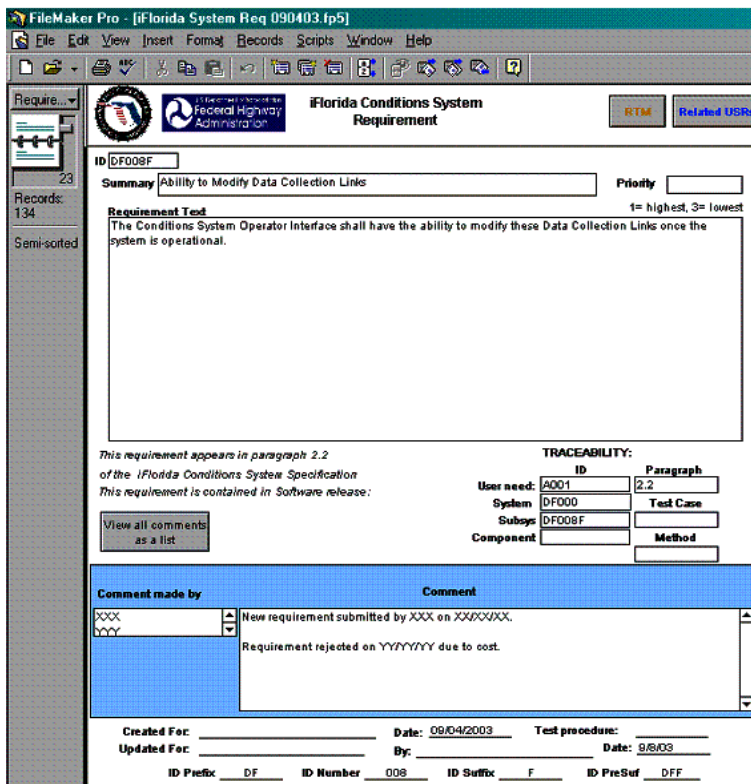


Figure 3.3-1: Sample iFlorida Conditions System Requirement.

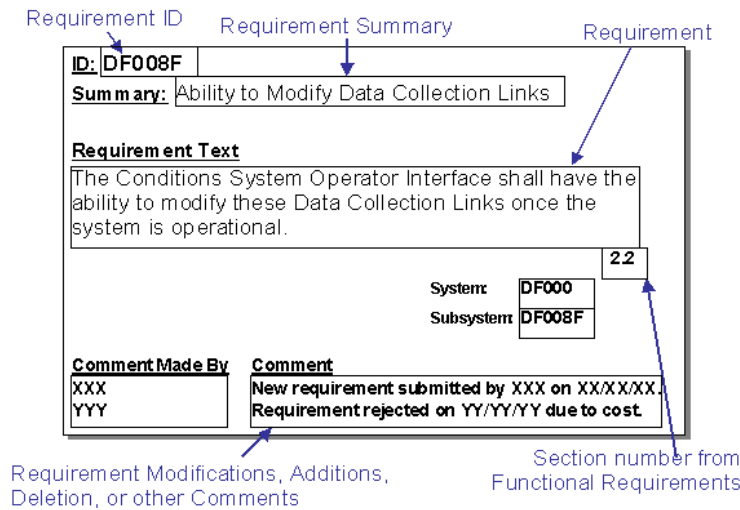


Figure 3.3-2: Sample Requirement Information Fields

3.4 Requirements Traceability

The identification, management and tracking of requirements are essential to the success of the iFlorida program and its associated projects. The following sub-sections address program and project related requirements traceability.

3.4.1 Program Requirements

The iFlorida program has ensured that all its proposal requirements can be traced to the FHWA Cooperative Agreement's requirements. Appendix A identifies each of the requirements in the Cooperative Agreement and traces that requirement to a specific iFlorida proposed project, or to a deliverable document. Appendix A provides the documentation that the iFlorida proposal has met all FHWA requirements.

Subsequent to the proposal, the following documents have shown the evolution of the Cooperative Agreement's nine Component Areas into the current 17 procurements in eight separate bundles:

- Work Plan – Draft and Final
- Concept of Operations – Draft and Final
- Deployment Plan – Draft

This evolution is summarized in Figure 3.4.1-1.

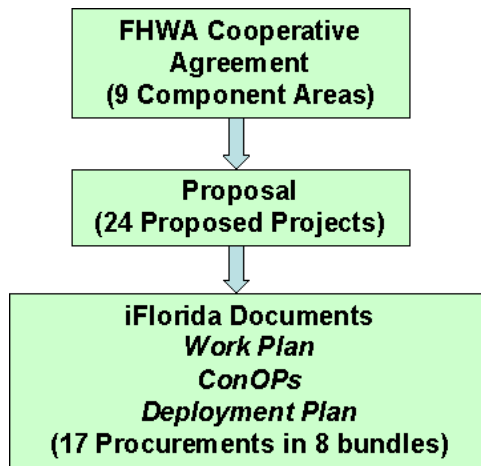


Figure 3.4.1-1: Evolution of FHWA Component Areas to iFlorida Projects

3.4.2 Project Requirements

As previously discussed, the requirements management application and its associated configuration control process will strongly contribute to the control, management and traceability of iFlorida project requirements as they evolve. The traceability feature is enhanced by the application’s report generation capability. The automatic creation of a Requirements Traceability Matrix (RTM) and a Requirements Verification Traceability Matrix (RTVM) can significantly increase the effectiveness of the requirements database.

Figure 3.4.2-1 depicts a sample RTVM. The RTVM report provides project-related traceability along with essential “Test Case” and “Verification Method” information that the Design Consultant will provide (at a later time) in their test documentation. The result is that each requirement having been identified will be tested in an appropriate manner. Thus, the documentation of the traceability from requirement to test case will be ensured. Appendices C–G provide RTVMs for five-iFlorida projects.

| User | System | Subsys | Component | Verif Method | Test Case | Requirement Summary | System Para. |
|------|--------|--------|-----------|--------------|-----------|--|--------------|
| A001 | SY001 | | | | | Incorporate Automated Data | 1.1 |
| A001 | SY002 | | | | | Include Operator Interface to Enable Manually Enter Data | 1.1 |
| A001 | SY003 | | | | | Input and Output Shall be Standards Compliant | 1.1 |
| A001 | SY004 | | | | | Serve as Statewide Website, Store/Provide to 511, and Feed Data | 1.1 |
| A001 | SY005 | | | | | Data Collection Definition | 1.2 |
| A001 | SY006 | | | | | Ensuring Operational | 1.2 |
| A001 | SY007 | | | | | Contractor Propose Redundant Architecture | 1.2 |
| A001 | SY008 | | | | | No User Intervention for Redundant System | 1.2 |
| A001 | SY000 | SY001C | | | | Coordinate with Department to Incorporate Master Clock | 1.3 |
| A001 | SY000 | SY002C | | | | Use Master Clock | 1.3 |
| A001 | SY000 | SY001B | | | | Develop Interfaces and Software to Interact with Applications | 1.4 |
| A001 | SY000 | SY002B | | | | Coordinate with Field Components Vendor | 1.4 |
| A001 | SY000 | SY001D | | | | Dissemination Content Derived from Conditions System | 1.5 |
| A001 | SY000 | SY002D | | | | Dissemination Content Derived from Same Information Source | 1.5 |
| A001 | SY000 | SY003D | | | | No Content Degradation | 1.5 |
| A001 | SY000 | SY004D | | | | Information Made Available within One Minute | 1.5 |
| A001 | SY000 | SY005D | | | | Ensure Data Provided to Appropriate End-users | 1.5 |
| A001 | DF001 | | | | | Use Existing Software, Customized as Necessary | 2.1 |
| A001 | DF002 | | | | | Process & Report in Format Consistent with Functional Requirements | 2.1 |
| A001 | DF003 | | | | | Data Sources to be Utilized | 2.1 |

Figure 3.4.2-1: Sample Requirements Traceability Verification Matrix

3.5 iFlorida Critical Path Project Requirements

Four critical path projects are identified in Figure 3.5-1. The Central Florida RWIS project has also been included in this requirements document. These projects form the basis for the five sets of functional requirements to be presented in Section 4.

- **Central Florida Field Components**
 - *Field Components Design/Build*
 - 3M Equipment
 - City of Orlando Agency Integration
- **Weather**
 - *Central Florida RWS*
 - *Road Weather Forecasting*
- **Security Command and Control**
 - *Security Command and Control*
 - Security Cameras
- **Data Fusion, Sharing and Use**
 - *iFlorida Conditions System*
 - Statewide TTMS Upgrade
 - Data Warehouse Expansion
 - iFlorida Operations
- **Broadband Wireless**
 - *Broadband Wireless Trial*
- **Probe Vehicle Test Bed**
 - *Probe Vehicle Test*
- **Studies**
 - METROPLAN Data Mining
 - Network Reliability / Traffic Modeling
 - Speedway Evacuation Plan / RTMC Vulnerability
- **Evaluation Support**
 - Evaluation Support

Red = Critical Path

Green = Not Critical Path but Included in this document

Figure 3.5-1: Critical Path Projects.

4.0 Detailed Sub-system Requirements

The following procurements encompass the critical path sub-systems of the iFlorida System. The functional requirements of each procurement have been delineated into requirement databases, which have organized the requirements into a defined structure and associated a unique ID. Reference Section 3.0 of these System Requirements for more information regarding the requirements methodology.

Each of the following sections provides a brief procurement summary and a list of all associated functional requirements.

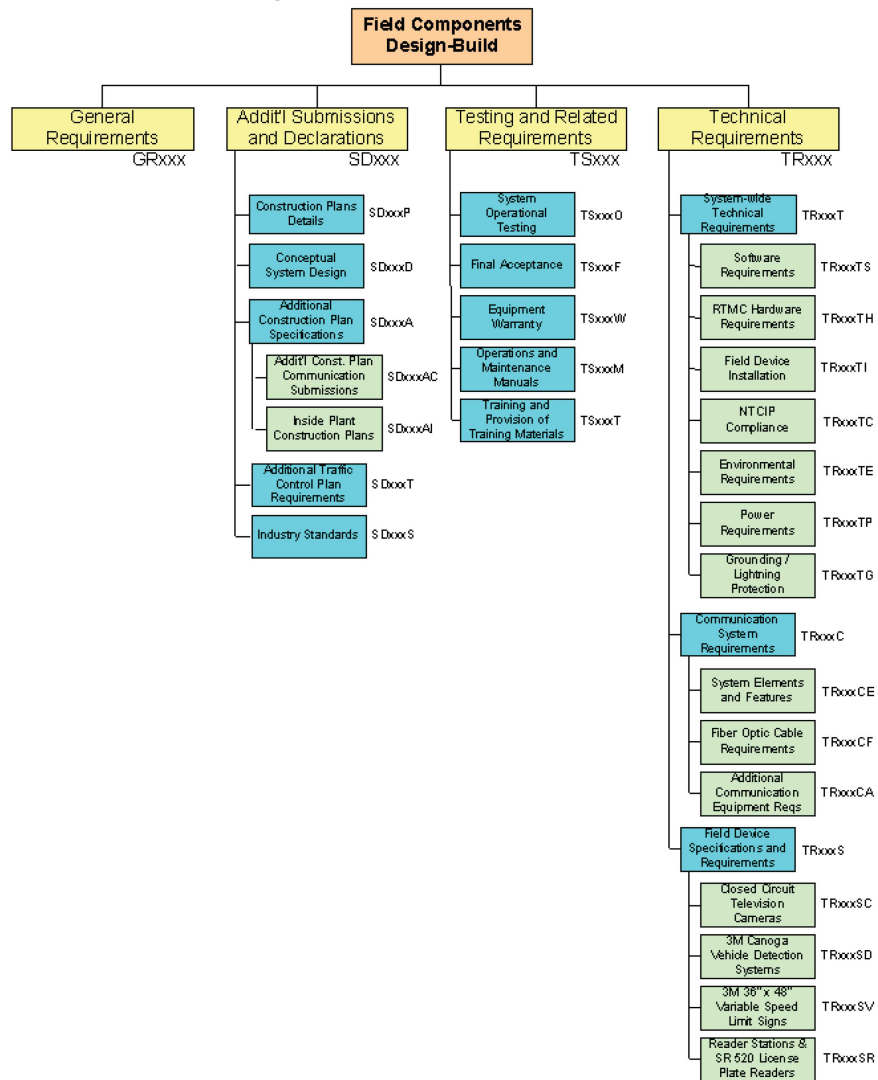
4.1 Procurement 1 – Field Components Design/Build

This procurement will encompass the design and deployment of various field elements associated with the iFlorida project. This deployment is broken down into several subprojects:

- Deployment of data sensors (e.g., license plate, transponder based automatic vehicle identification, or another suitable technology) on limited access roads
- Deployment of data sensors on principal arterials
- Deployment of CCTV cameras at select arterial locations
- Installation of fiber optic cable to link LYNX and the RTMC via a fiber backbone, as well as over 28.8 miles of aerial fiber along arterials in the Orlando Metropolitan area
- Variable Speed Limit System
- SR 528 Corridor Monitoring System
- Brevard County Agency Integration

The sub-system requirements are organized into a manageable database. Figure 4.1.1 illustrates how this requirements database is structured.

Field Components Design-Build Requirements Database Structure



**Figure 4.1.1: Field Components
Design-Build Requirements Database Structure**

4.1.1 Sub-system Requirements

General Requirements

- GR001 The iFlorida Central Florida Field Components project shall include the designing, furnishing, installation, integration, testing, staff training and provision of documentation for the full set of subsystems and system requirements described in this set of functional requirements.
- GR002 The DESIGN-BUILD FIRM shall develop design plans and specifications necessary for the various subprojects' hardware, software integration, and communication systems, according to the system requirements presented in this document (functional requirements).
- GR003 The procurement of any hardware, software or services shall not occur until the preliminary plans and specifications are completed, reviewed and approved by the Department.
- GR004 The DESIGN-BUILD FIRM shall install the system devices and fiber enhancement detailed in the design plans and specifications including all required structures and foundations.
- GR005 Device installations shall not occur until the Department has reviewed and approved the final design plans and specifications.
- GR006 The DESIGN-BUILD FIRM shall provide construction management, construction activities and all other related activities necessary to complete the construction and installation.
- GR007 The DESIGN-BUILD FIRM shall obtain all permits and licenses necessary for the construction of the system.
- GR008 The DESIGN-BUILD FIRM shall determine the exact locations of the field devices to meet the desired coverage and functional requirements of the subproject subsystems.
- GR009 The DESIGN-BUILD FIRM shall submit a list of all selected technologies/products, selection alternatives, reasons for selection, and selected device locations/mounting to the Department for review prior to commencement of any contract installation.

| | |
|-------|--|
| GR010 | No device shall be installed prior to this (Requirement SY010). |
| GR011 | The system components shall be new and production products. Untried or prototype units are not acceptable. |
| GR012 | If the DESIGN-BUILD FIRM proposes a device that becomes, for any reason, unavailable during the life of the project, the DESIGN-BUILD FIRM shall submit a document concerning the replacement for that device to the Department for approval. |
| GR013 | If the replacement is rejected, the DESIGN-BUILD FIRM shall submit documentations regarding alternative devices until the Department accepts a proposed replacement. |
| GR014 | The DESIGN-BUILD FIRM shall submit the mean time to fail and mean time between failure information for all electronic devices installed on this project and the method used to determine this information to the Department for review and approval. |
| GR015 | The DESIGN-BUILD FIRM shall ensure that all equipment installed as part of this project is compatible with existing Department systems. |
| GR016 | Consequently, proposals submitted in response to this RFP shall not contain any costs associated with O&M. |

Additional Submissions & Declarations: Construction Plans Details Requirements

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| SD001P | The DESIGN-BUILD FIRM shall take the following information into consideration when developing all site construction plans: Minimizing utility conflicts and adjustments, Maximizing roadway visibility/field of view of the CCTV cameras, Maximizing read effectiveness of Reader Stations, Minimizing Traffic impact, Maximizing Accessibility and ease of equipment maintenance, Maximizing Safety of equipment maintenance personnel and the traveling public, Environmental conditions, Minimizing impact of concurrent/future construction projects. |
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Additional Submissions & Declarations: Conceptual System Design Requirements

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| SD001D | The DESIGN-BUILD FIRM shall submit a Conceptual System Design concerning all field components and fiber enhancements for Department review and approval. |
| SD002D | The Conceptual System Design shall serve as the equivalent of 30% plans and shall include the following: (Requirements: SD003D, SD004D, SD005D, SD006D, SD007D, SD008D, SD009D, SD010D, SD011D, SD012D, and SD013D) |
| SD003D | Identify locations for field device/fiber deployment, and describe the means and methods for field device/fiber procurement and installation. |
| SD004D | Document potential impact to survivability of field components and fiber enhancements due to other projects in nearby agencies' near-long term work plans by identifying each device and its proposed location, mounting configuration, assessment of survivability, project in conflict, and installation life. |
| SD005D | The DESIGN-BUILD FIRM shall demonstrate that potential conflicts with future projects have been minimized. |
| SD006D | Document power requirements for each device including power service locations (existing power meters or new power supply locations finalized with utility owners), utility owner, power run distances, existing power meter numbers, cost justification for providing new power meters, and estimated cost for power service to each device. |
| SD007D | The DESIGN-BUILD FIRM must demonstrate that the use of existing power meters is maximized provided that installation cost is minimized. |
| SD008D | Document where devices can be co-located with existing device cabinets for communications and power interconnect. |
| SD009D | The DESIGN-BUILD FIRM must demonstrate that co-location of new devices with existing device locations is maximized provided that installation cost is minimized and system requirements are met. |
| SD010D | Identify existing or proposed structures for mounting reader stations. |
| SD011D | The DESIGN-BUILD FIRM must demonstrate that co-location of reader stations on existing sign structures, bridge overpasses, and other infrastructure is maximized provided that installation cost is minimized and system requirements are satisfied. |
| SD012D | The DESIGN-BUILD firm shall ensure that all existing structures used for mounting reader stations have sufficient structural integrity to bear the readers' weight and that the addition of these sensors will not interfere (physically or electronically) with the operation of existing equipment. |
| SD013D | Document that proposed installation of all field components and fiber enhancements meets the system requirements described in sections 2.1 and 2.4 of the functional requirements. |
| SD014D | As part of the Conceptual System Design, the DESIGN-BUILD FIRM shall document all problem areas and special requirements that have been identified as potentially affecting the development of the project. |

Additional Submissions & Declarations: Additional Construction Plan Spec Requirements

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| SD001A | The DESIGN-BUILD FIRM shall be responsible for detailed plan submission as outlined in the Plans Preparation Manual (PPM). |
| SD002A | The component design must be in conformity with the design and construction criteria requirements and the approved preliminary layout and concept, as provided for in the Technical Proposal. |
| SD003A | The DESIGN-BUILD FIRM'S 90% plans shall contain, at a minimum, the location of all proposed field components and fiber enhancements, power service for each device (finalized with utility owners), fiber optic interconnect (including conduit, |

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| | pullboxes, fiber optic cable, splice details, fiber allocation charts), definition of pay items, details, and general notes. |
| SD004A | After 90% plans are submitted to the Department, the DESIGN-BUILD FIRM and the Department representatives shall jointly survey the proposed field component and fiber enhancement locations to avoid unforeseen problem areas, as well as jointly reviewing the problem areas and special requirements solutions. |
| SD005A | At each milestone review, representatives from each organization having ownership, control or jurisdiction of highways, bridges, land, utilities, waterways, rights-of-way and other facilities shall provide input during a site survey and any major project issues shall be investigated and resolved by the DESIGN-BUILD FIRM. |
| SD006A | The DESIGN-BUILD FIRM shall be responsible for providing structural calculations and plan details for all structures and foundations required, as well as for mounting devices to existing or proposed structures. |
| SD007A | The DESIGN-BUILD FIRM'S Professional Engineer responsible for the project's design shall professionally endorse (signed and sealed and certified) the record prints, the special provisions and all reference and support documents. |
| SD008A | The professional endorsement shall be performed in accordance with the Department's Plans Preparation Manual. |
| SD009A | The DESIGN-BUILD FIRM'S 100% plans shall address all 90% comments, as well as provide all final quantities and design elements. |
| SD010A | Plans, specifications, product information sheets and calculations supporting the design, all signed and sealed, shall be submitted for review to the Department (as complete packages) and no construction may commence until the Department conditionally accepts and returns the submittal stamped "Released for Construction," initialed and dated by the reviewer. |

Addit'l Submissions & Declarations: Addit'l Const Plan Communication Submissions Reqs

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| SD001AC | Communications cable layout - These sheets shall be submitted by the DESIGN-BUILD FIRM |
| SD002AC | Communications cable layout - These sheets ... shall display all cable and conduit routing, pole number (aerial fiber), sizing and type, for each cable, as well as the splice vault locations. |
| SD003AC | When splicing to existing fiber, the existing fiber shall be identified by its operating agency. |
| SD004AC | The sheets shall also show the locations for placement of the proposed field devices and the work to be done and equipment to be installed at each specific field location. |
| SD005AC | All work shall be shown at the same scale with insets at a larger scale being used only to the extent necessary. |
| SD006AC | The roadway geometry, rights-of-way, existing utilities within the right-of-way , physical features affecting construction/installation (sign structures, light poles, fences, etc.), fiber optic cable route marker details where applicable, communications interconnect, fiber cable design to include link loss budget calculations, fiber cable routing summaries, fiber cable allocation charts, and splice details and tables, camera pole, foundation and mounting details, reader station structure, foundation and mounting details, controller cabinet and foundation details, Manhole/Pull box locations and stub-out details where applicable, power interconnect and details and grounding shall be included in the site construction plan sheets. |
| SD007AC | Communication layout for all field devices connected to the RTMC via means other than a fiber link - These sheets shall be submitted by the DESIGN-BUILD FIRM |
| SD008AC | Communication layout for all field devices connected to the RTMC via means other than a fiber link - These sheets ... shall display the locations for placement of the proposed field devices not making use of new/existing fiber, and the work to be done and equipment to be installed at each specific field location. |
| SD009AC | Communications fiber assignment sheets - These sheets shall be submitted by the DESIGN-BUILD FIRM |
| SD010AC | Communications fiber assignment sheets - These sheets ... shall display the use of each fiber for each cable segment between splice locations, thereby defining the communications path between all field devices and the RTMC. |

Additional Submissions & Declarations: Inside Plant Construction Plans Requirements

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| SD001AI | Inside-plant construction plans shall be prepared as part of 90%, 100%, and As-Built submittals for the iFlorida Central Florida Field Component Project. |
| SD002AI | The site specific inside-plant construction plans shall indicate the location of items to be installed the RTMC and other agencies' facilities, location of other equipment with connections to project equipment, equipment demarcations, power supply, backboards, conduit, etc. |
| SD003AI | Inside-plant construction plans shall be required for all equipment and operations rooms where equipment shall be installed and operated. |
| SD004AI | The DESIGN-BUILD FIRM shall be responsible for any data collection necessary to complete their design. |
| SD005AI | The DESIGN-BUILD FIRM and the Department/appropriate agency representatives shall jointly pre-survey the equipment rooms to identify potential installation problems. |
| SD006AI | Problems shall be identified and special requirements determined during the survey of this project. |
| SD007AI | Any problems identified during the survey shall be resolved in the 90% inside-plant construction plan submittal. |
| SD008AI | As part of the 90% review of the inside-plant construction plans, a field check of the equipment rooms shall be conducted with the Department/appropriate agency |

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| SD009AI | representatives to identify conflicts, issues and make-ready work required. The DESIGN-BUILD FIRM shall be responsible for all make-ready work. |
| SD010AI | The inside-plant construction plans shall include top view drawings of the equipment room and will indicate the exact location where equipment is to be installed. |
| SD011AI | The DESIGN-BUILD FIRM shall coordinate with the Department/appropriate agencies to receive input regarding the preferred location of the equipment at each facility. |
| SD012AI | The inside-plant construction plans will also include front and rear drawings of all related equipment clearly detailing all installation requirements and complete interconnection detail with all other associated equipment. |
| SD013AI | The DESIGN-BUILD FIRM will be responsible for supplying power to all network equipment and providing sufficient redundant power supplies to maintain fiber optic network availability and field device monitoring requirements. |
| SD014AI | The DESIGN-BUILD FIRM shall provide power distribution diagrams for all equipment locations. |
| SD015AI | All equipment shown on the inside-plant construction plans shall be clearly delineated as existing or for construction. |
| SD016AI | The DESIGN-BUILD FIRM shall be responsible for identifying and detailing on the inside-plant construction plans with notes and drawings any make-ready work required. |
| SD017AI | The DESIGN-BUILD FIRM shall also provide a table of quantities for all materials and equipment specified in the inside-plant construction plans. |
| SD018AI | The inside-plant construction plans shall be engineered to accommodate all requirements of the specified equipment including heat ventilation and front/rear access for operations and maintenance activities. |
| SD019AI | The DESIGN-BUILD FIRM shall sign and seal final inside-plant construction plans by a licensed professional Electrical Engineer registered in the state of Florida. |
| SD020AI | The inside-plant construction plans shall be subject to the review and approval of the Department. |
| SD021AI | The DESIGN-BUILD FIRM shall provide calculations for all equipment attached to interior walls signed and sealed by a licensed professional Civil Engineer registered in the State of Florida. |
| SD022AI | All calculations shall be subject to the review and approval of the Department. |

Additional Submissions & Declarations: Additional Traffic Control Plan Requirements

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| SD001T | The DESIGN-BUILD FIRM shall coordinate lane closures with all local agencies to avoid conflict with special events. |
| SD002T | The DESIGN-BUILD FIRM shall develop an incident response plan. The plan must address the actions that will be taken and the responsibilities of all field personnel in the event of an incident that creates life-threatening conditions for construction field personnel or the traveling public. |
| SD003T | |
| SD004T | Specific contact names and phone numbers shall be included. |

Additional Submissions & Declarations: Industry Standards Requirements

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| SD001S | The materials used by and workmanship completed by the DESIGN-BUILD FIRM shall be in accordance with reasonable best industry standards. |
| SD002S | All materials, equipment, supplies, installations and testing shall comply with the project requirements, the latest editions of the following standards, as applicable, and all other applicable standards and requirements. All materials, equipment, supplies, installations and testing shall comply with the project requirements, the latest editions of the following standards, as applicable, and all other applicable standards and requirements. <ul style="list-style-type: none"> · The Department Minimum Specifications for Traffic Control Signals and Devices (MSTCD), · Transmission Control Protocol/Internet Protocol (TCP/IP) · National Television Standards Committee (NTSC) · Wireless Application Protocol 5.8G (WAP) · Society of Automotive Engineers (SAE), · The American Society of Testing and Materials standards (ASTM), · Institute of Electrical and Electronic Engineers (IEEE) standards, · International Standards Organization Standards, · The American National Standards Institute (ANSI), · The National Electrical Manufacturer Association (NEMA), · The Underwriters' Laboratories Inc. (UL), · The National Board of Fire Underwriters, · The Electrical Testing Laboratories (ETL), · Bellcore Technical Advisories and technical requirements, · The Electronic Industries Association (EIA), · The National Electrical Code (NEC), · The Joint Electronic Device Engineering Council (JEDEC), · The Radio-Electronics-Television Manufacturers Association (RETMA), · The Lightning Protection Institute (LPI), · The Rural Electrification Administration (REA), · The International Radio Consultative Committee (CCIR), · The International Telephone and Telegraph Consultative Committee (CCITT), · The American Standard Code for Information Exchange (ASCII), · The National Television Systems Committee (NTSC), · The International Telecommunications Union (ITU), · The Motion Picture Experts Group (MPEG), · The Bureau of Radiological Health - Optical Radiation Hazard specifications, · Florida Transportation Communications for ITS Protocol (NTCIP), and · The Telecommunications Industries Association (TIA). |
| SD003S | |
| SD004S | In cases of conflict, the more stringent standard will apply unless stated otherwise by the Department's Project Manager. |

Testing & Related Requirements

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| TS001 | The DESIGN-BUILD FIRM shall submit a proposed testing plan, containing requirements developed to test the different components of each subproject, and which includes the expected result/data forms of each test. |
| TS002 | The DESIGN-BUILD FIRM shall not begin tests until the Department has approved the test plan procedures and data forms. |
| TS003 | All equipment and systems furnished by the DESIGN-BUILD FIRM shall be tested to determine conformance with project requirements and contract documents. |
| TS004 | The DESIGN-BUILD FIRM shall provide all test procedures, test data forms and other material required to perform the various tests. |
| TS005 | At a minimum, the tests shall include the System Operational Test. |
| TS006 | The DESIGN-BUILD FIRM shall submit testing procedures and forms to the Department for review at least 30 working days prior to performing the associated tests. |
| TS007 | The DESIGN-BUILD FIRM shall address any comments provided by the Department. |
| TS008 | If required, by the Department, the DESIGN-BUILD FIRM shall resubmit the test procedures and forms to the Department with the required modifications/additions for review. |
| TS009 | When the plan is approved, the DESIGN-BUILD FIRM shall perform the tests, document the results, and supply all necessary test equipment. At a minimum, the test procedures shall include: <ul style="list-style-type: none">· A step-by-step outline of the test sequence to be followed, showing a test of every function of the equipment or system to be tested.· A description of the expected operation 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, manpower, or conditions required for the test.· Wherever practicable, a description of the thresholds that would qualify test results as acceptable/unacceptable. |
| TS010 | The DESIGN-BUILD FIRM shall furnish and maintain all required test equipment along with their services. |
| TS011 | The test equipment shall be made ready for the Department's use at the time it is needed. |
| TS012 | The DESIGN-BUILD FIRM shall notify the Department of the time, date and place of each test at least 10 working days prior to the date the test is planned. |
| TS013 | The DESIGN-BUILD FIRM shall, if requested by the Department, postpone any test for up to 7 days. |
| TS014 | Such postponements shall not be ground for extensions of completion time. |
| TS015 | The tests shall be conducted in the presence of a designated the Department representative unless otherwise approved in writing by the Department. |
| TS016 | The DESIGN-BUILD FIRM shall perform a successful trial test prior to the scheduled start of testing. |
| TS017 | If the test is to be postponed due to an unsuccessful trial, the DESIGN-BUILD FIRM shall give the Department a 48-hour notification. |
| TS018 | The cost for testing shall be considered as part of the unit cost for the item tested; no direct payment will be made for testing. |
| TS019 | All diagnostic hardware and software used by the DESIGN-BUILD FIRM to perform testing shall be turned over to the Department and become the property of the Department after Final System Acceptance. |
| TS020 | |

Testing & Related: System Operational Testing Requirements

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| TS0010 | After all of the equipment has been installed in accordance with the applicable requirements and plans and each subsystem has been tested and acknowledged by the Department to be operating properly, a System Operational Test shall be conducted by the DESIGN-BUILD FIRM to validate the operational characteristics of the system when integrated with the RTMC System. |
| TS0020 | The System Operational Test shall test the system's ability to perform all system functions in actual operation conditions. |
| TS0030 | The System Operational Test shall include testing the system functions from the RTMC using the communications system specified for the project. |
| TS0040 | The System Operational Test shall consist of the field operation of the system in a manner in full accord with project requirements, the plans, all applicable standards, and shall conform to Section 611 Acceptance Procedures, of the Department's Standard Specifications for Road and Bridge Construction (latest edition). |
| TS0050 | At a minimum, the System Operational Test shall demonstrate full monitoring and control of the field devices at the RTMC via its communications channels. |
| TS0060 | The test shall also verify the system's ability to display real-time video on the RTMC monitors, workstations, and video walls, to provide data collected by reader stations and license plate readers to the OOCEA Data Server for analysis, and to provide microloop station data to MIST. |
| TS0070 | System Operational Testing shall commence only after all of the following requirements have been met: <ul style="list-style-type: none">· The System Operational Test Plan has been reviewed and approved by the Department's Project Manager, and· The testing schedule has been reviewed and approved by the Department's Project Manager. |
| TS0080 | The DESIGN/BUILD FIRM shall request System Operational Testing in writing a minimum of 10 working days in advance of the proposed test session. |
| TS0090 | During the System Operational Test, the DESIGN-BUILD FIRM shall provide qualified personnel to support the diagnosing and repair of system equipment during the operational test as required. |
| TS0100 | These personnel shall be available for this support within 24 hours of notification of |

- the need for their services.
- During this test, the field device subsystems, integrated as part of the RTMC, shall be operated continuously for a period of 30 working days without failure of any major subsystem component.
- TS0110
- In the event a major subsystem component fails or a problem arises that delays testing by more than 24 hours, then testing shall be terminated and rescheduled for restart after the problem has been corrected.
- TS0120
- In the event of a failure, the problem shall be corrected and the test shall then be restarted for another 30 working days.
- TS0130
- Failure of any DESIGN-BUILD FIRM supplied hardware item during the test period, with the exception of consumable items such as fuses, shall necessitate restarting the 30 working day test period after its repair with the additional requirements of no persistent intermittent failure.
- TS0140
- In the event a problem is discovered for which it is uncertain whether the cause is hardware or software related, the 30 working day test restart and repeat shall follow the procedure defined in the approved testing plan.
- TS0150
- However, this test shall not be deemed to have been successfully completed until the problem has been corrected.
- TS0160
- All software required to diagnose malfunctions of hardware and software shall be supplied by the DESIGN-BUILD FIRM and approved by the Department.
- TS0170
- A copy of all diagnostic software shall be supplied to the Department with full documentation.
- TS0180
- The DESIGN-BUILD FIRM shall correct any failure in the hardware or the software supplied by the DESIGN-BUILD FIRM at no additional cost to the Department.
- TS0190
- The DESIGN-BUILD FIRM shall submit the Failure Report Logs in demonstration that error rates are within requirements.
- TS0200
- No intermittent failure shall be permitted to persist during the test period.
- TS0210
- 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.
- TS0220
- For each period of system shut down, the scheduled 30 working day operational test shall be extended for the same period of time plus one day.
- TS0230
- If the total number of system shut downs exceeds 3 during the 30 working day test period, the System Operational Test shall be repeated for the full 30 working day period.
- TS0240
- Equipment configurations and software shall not be changed during this period. If a configuration change must occur, the test must be restarted.
- TS0250
- The DESIGN-BUILD FIRM shall certify the configuration of all elements prior to beginning this test.
- TS0260
- Corrective action for a failure shall be a part of the documentation process. The Department will have to approve the corrective action.
- TS0270
- The DESIGN-BUILD FIRM shall provide the required documentation to prove that all units have been successfully reconfigured or updated.
- TS0280
- The DESIGN-BUILD FIRM shall be responsible for repairing and replacing all components/software used on the project that have become defective during the 30 working day System Operational Test.
- TS0290
- Repairs made shall conform to the plans submitted by the DESIGN-BUILD FIRM as part of the design process, this scope of services, any and all Technical Special Provisions, and other the Department Standards.
- TS0300
- The DESIGN-BUILD FIRM shall be responsible for all costs associated with the maintenance, repair or replacement of the equipment.
- TS0310
- In the event that more than one System Operational Test is necessary, the DESIGN-BUILD FIRM shall be responsible for all costs.
- TS0320

Testing & Related: Final Acceptance Requirements

- TS001F All final "As-Built" documents shall be submitted to the Department at the time of Final Acceptance.
- TS002F Final acceptance of the completely installed and operational system will not be granted until all of the required submittals, testing, training, documentation, warranty, and warranty bond have been successfully completed as specified in these Functional Requirements and the requirements of the Department's Standard Specifications (latest version) and all other applicable standards.
- TS003F The DESIGN-BUILD FIRM shall furnish to the Department, upon project completion, the contract plans package, one set of record prints (As-Builts), one set of special provisions and all reference and support documents utilized in the preparation of the contract plans package.
- TS004F The record prints, the special provisions and all reference and support documents shall be professionally endorsed (signed and sealed and certified) by the DESIGN-BUILD FIRM'S Professional Engineer in responsible charge of the project's design.
- TS005F The professional endorsement shall be performed in accordance with the Department Plans Preparation Manual.
- TS006F System Operational Testing and Final Acceptance of the fiber deployment from the existing backbone along SR 528 onto the Bennett Causeway must be completed and accepted by September of 2004.
- TS007F System Operational Testing and Final Acceptance for all other parts of this project must be achieved by March 1, 2005.
- TS008F A bonus of \$300,000 will be provided to the DESIGN-BUILD FIRM under the condition that these subprojects have been completed, fully tested and accepted by the Department, and are fully operational by these dates.

Testing & Related: Equipment Warranty Requirements

- TS001W All hardware and software provided by the DESIGN-BUILD FIRM, 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 Department, through the operational evaluation period of iFlorida, ending April 30, 2007.

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| TS002W | 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 within five (5) working days. |
| TS003W | The DESIGN-BUILD FIRM shall be responsible for all labor and equipment costs for installing the new component. |
| TS004W | The DESIGN-BUILD FIRM shall supply a bond of \$1,000,000 to cover the Work required during the warranty period. |
| TS005W | If the failure is determined to be an issue of defect and/or failure in design, materials or workmanship, the DESIGN-BUILD FIRM warranty shall be employed. |
| TS006W | The DESIGN-BUILD FIRM shall have the right to accompany the Department's Maintenance Contractor on all site visits. |
| TS007W | Activities conducted by the Department's Maintenance Contractor shall not void the warranty. Any component that, in the opinion of the Department, fails three (3) times prior to the expiration of the warranty shall be judged as unsuitable and shall be replaced by the DESIGN-BUILD FIRM with a new component of the same type at no cost to the Department. |
| TS008W | |
| TS009W | The unsuitable component shall be permanently removed from the project. |
| TS010W | A failure shall also be defined as the field device becoming unable to comply with the project requirements and all applicable standards. |
| TS011W | The warranty period shall not begin until the date that the Department issues final acceptance for the project, as recorded by the Department. |
| TS012W | A log shall be maintained for all warranty-related operations conducted after final acceptance. |
| TS013W | Any and all replacement parts, all maintenance hours, and a brief description of activities shall be reported in the log. |
| TS014W | No charges shall be incurred during the warranty period. |
| TS015W | No spare field replacement units shall be used during the warranty period. |

Testing & Related: Operations & Maintenance Manuals Requirements

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| TS001M | The DESIGN-BUILD FIRM shall provide Operations and Maintenance Manuals on all major components within the system. |
| TS002M | Six (6) hard copies and one (1) compact disk copy (CD-ROM in PDF format) of complete sets of the Operations and Maintenance Manuals shall be provided. The manuals, as a minimum, shall include the following: <ul style="list-style-type: none"> · Items listed under Section 603-8 of the Department's Standard Specifications for Roadway and Bridge Construction · Complete description of system operations · Complete and accurate schematic diagrams · Complete installation procedures · Complete performance specifications (functional, electrical, mechanical and environmental) on the unit · Complete parts list including names of vendors for parts not identified by universal part numbers such as JEDEC, RETMA, or EIA · Pictorial of components layout on circuit boards · Complete maintenance and troubleshooting procedures, including a preventative maintenance schedule |
| TS003M | <ul style="list-style-type: none"> · Complete stage-by-stage explanation of circuit theory and operation |
| TS004M | The DESIGN-BUILD FIRM shall provide As-Built plans for the project and As-Built fiber splice diagram. |

Testing & Related: Training & Provision of Training Manuals Requirements

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| TS001T | The DESIGN-BUILD FIRM shall provide the Department staff with training for each subsystem (making accommodations for up to six (6) people per subsystem). |
| TS002T | The total combined hours of training provided shall be a minimum of 60 hours. |
| TS003T | Training shall be designed to familiarize trainees with the design, operation and maintenance of the system furnished under this contract. |
| TS004T | The training shall cover functionality, theory of operation, installation, calibration, operation, testing, maintenance, trouble-shooting, repair, and performance and operating parameters of all software and field equipment. |
| TS005T | The instructor shall have a minimum of 4 years experience in training personnel, unless otherwise approved by Department. |
| TS006T | The DESIGN-BUILD FIRM shall provide the training materials. |
| TS007T | These materials shall include, as a minimum, a course outline, operation and maintenance manuals, test equipment and tools and any other needed information. |
| TS008T | The DESIGN-BUILD FIRM shall videotape lecture portions of the course. |
| TS009T | The videotapes of the lectures shall become the property of the Department at the end of the courses. |
| TS010T | All training materials shall be submitted to the Department's Project Manager for review and approval. |
| TS011T | The DESIGN-BUILD FIRM shall make the necessary changes to the course, resubmit the required training materials to the Department for approval and reschedule the training course. |
| TS012T | In addition, the DESIGN-BUILD FIRM shall make provision for training one employee in actual field conditions at all times during the System Operational Tests. |

Technical: System-wide: Software Requirements

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| TR001TS | The DESIGN-BUILD FIRM shall design all subsystems for reader stations, CCTV cameras, microloops, variable speed limit signs, and license plate readers such that they will be monitored and controlled from the Department's District 5 RTMC using RTMC software, hardware, and communications. |
| TR002TS | The DESIGN-BUILD FIRM shall coordinate with the Department to ensure the |

appropriate integration of these systems.

TR003TS The communication system deployed by the DESIGN-BUILD FIRM as part of this project shall facilitate bi-directional data transmission in order to enable both the reception of images and data from all field devices, as well as the monitoring and control of all field devices.

TR004TS Any required modifications/additions to RTMC software, databases, and maps to accommodate the new field devices and fiber enhancements shall be submitted to the Department for review and approval.

TR005TS The DESIGN-BUILD FIRM shall implement all approved changes/additions in coordination with the Department prior to conducting any software development/procurement.

TR006TS The DESIGN-BUILD FIRM shall provide documentations for all modifications/additions made to RTMC software, databases, and maps.

TR007TS Documentation for all third party software used shall also be furnished to the Department.

Technical: System-wide: RTMC Hardware Requirements

TR001TH The DESIGN-BUILD FIRM shall provide the required upgrades to RTMC hardware, including any additional computer equipment, communication components, equipment racks, other hardware, and equipment wiring necessary to make the field components and fiber enhancements described in Section 1 fully operational and manageable from the RTMC.

TR002TH All equipment provided by the DESIGN-BUILD FIRM for installation at the RTMC shall be consistent with equipment supplied as part of existing RTMC contracts to ensure a uniform look and cable wiring of equipment.

Technical: System-wide: Field Device Installation Requirements

TR001TI The DESIGN-BUILD FIRM shall furnish and install all equipment in accordance with the manufacturer's recommendations, project requirements, and project documents and plans prepared by the DESIGN-BUILD FIRM.

TR002TI The DESIGN-BUILD FIRM shall submit device locations, mounting, and installation plans and details to the Department for review and approval prior to installation.

TR003TI All materials shall be delivered in unopened factory packaging with manufacturer's bar coding to the installation site and stored in original packaging in a climate-controlled environment (storage temperature not to exceed -40° C to +85° C).

TR004TI The DESIGN-BUILD FIRM shall inspect all equipment before installation to ensure it is free of any cosmetic defects or damage.

TR005TI Equipment shall be mounted on properly prepared surfaces adequate for the size and weight of the equipment.

TR006TI The placement of the equipment shall allow provision of cable and wire installation and maintenance as well as comply with the manufacturers mounting templates and installation manuals.

TR007TI All power equipment, cabling and grounding shall be installed according to the most recent version of the National Electric Code (NEC) and manufacturer's recommended installation procedures.

TR008TI The DESIGN-BUILD FIRM shall be responsible for properly disposing of all scrap materials upon completion of installation.

TR009TI The DESIGN-BUILD FIRM shall perform site preparation and other site upgrades required for subsystem installations.

TR010TI Field device installations shall meet all applicable clear zone requirements.

TR011TI In addition, the system shall provide for easy access of maintenance personnel and all equipment and vehicles required to perform various maintenance activities.

TR012TI The DESIGN-BUILD FIRM shall provide support structure and foundation designs for all field devices.

TR013TI The structures and foundations shall be in accordance with the Department's standards and specifications and in accordance with the manufacturer's recommendations, project requirements, and project documents and plans prepared by the DESIGN-BUILD FIRM.

TR014TI One set of vendor recommended cable(s) shall be provided for each field device site.

TR015TI The cable shall be of sufficient length including slack for maintenance purposes, extending from the device site to the field cabinet as detailed in the project plans.

TR016TI The DESIGN-BUILD FIRM shall provide each field device with a unique, easily changeable Identification (ID).

TR017TI The DESIGN-BUILD FIRM shall ensure that each field device is assigned an IP address.

TR018TI The DESIGN-BUILD FIRM shall ensure that all IP addresses conform to the Department's District 5 Regional IP Scheme.

TR019TI All cables shall be permanently and uniquely marked with function and cable number and shall be provided with strain relief.

TR020TI The DESIGN-BUILD FIRM shall provide communication details, which shall include but not limit to typical block diagrams, and riser (rackface) drawings for the interconnection of the field devices.

TR021TI All in-cabinet equipment shall be rack-mounted in 19-inch EIA racks.

TR022TI As part of its PROPOSAL, the DESIGN-BUILD FIRM shall submit to the Department a beta construction plan set.

TR023TI The beta construction plan set shall consist of site plans for one reader station / one CCTV mounted to an existing structure, one reader station / one CCTV mounted to a bridge overpass (if applicable), and one reader station / one CCTV mounted to a new structure.

TR024TI After this beta plan set has been reviewed and approved by the Department's Project Manager, the DESIGN-BUILD FIRM shall design all site locations applying the comments from the beta review to each location.

- TR025TI The DESIGN-BUILD FIRM shall identify a standard structure and foundation for the mounting of reader stations / CCTVs where existing structures cannot be used.
- TR026TI Any new structures required for field device deployment shall require geotechnical analysis.
- TR027TI All structural features shall be designed for a worst-case scenario.

Technical: System-wide: NTCIP Compliance Requirements

- TR001TC The DESIGN-BUILD FIRM shall implement a fully NTCIP (National Transportation Communications Intelligent Transportation System Protocol) compliant field device subsystem for the project.
- TR002TC If available at the time of the project design, the Department's Management Information Base (MIB) definitions and objects shall be utilized.
- TR003TC If the status of the NTCIP standards and device vendor compliance with these standards at the time of the system design does not allow the satisfaction of the NTCIP compliance requirement, the DESIGN-BUILD FIRM shall submit a documentation to the Department explaining the need to waive all or part of the NTCIP compliance requirement.
- TR004TC If the status of the NTCIP standards and device vendor compliance with these standards at the time of the system design does not allow the satisfaction of the NTCIP compliance requirement, the DESIGN-BUILD FIRM shall submit a documentation to the Department explaining the need to waive all or part of the NTCIP compliance requirement.

Technical: System-wide: Environmental Requirements

- TR001TE All system components, while housed in their associated environmental enclosures, shall comply with the applicable NEMA environmental specifications.
- TR002TE The system components shall be capable of operating in a temperature range of -34 C to +74 C and a relative humidity range of 5 to 95 percent non-condensing.
- TR003TE The field devices shall have complete protection from moisture and airborne contaminants, blowing rain at storm rates, wind, blowing sand, blowing dust, temperature, humidity, roadside pollutants, vandalism and theft of equipment.
- TR004TE The installed devices shall withstand airborne dust particles, fine sand and moisture through winds of up to 120 mph.
- TR005TE Fatigue, corrosion, and fungal growths shall not affect the performance of the system.
- TR006TE Appropriate enclosures shall be provided to prevent pests from attacking and damaging the system components.

Technical: System-wide: Power Requirements

- TR001TP The DESIGN-BUILD FIRM shall furnish and install the power service required for the field device subsystems.
- TR002TP Power service accounts shall be established by the DESIGN-BUILD FIRM in the name of the Department.
- TR003TP The DESIGN-BUILD FIRM shall provide the Department a summary of all new power services, which shall include the locations, field device, account number, power meter number, and the date of the power service energizing shall be recorded for billing purposes.
- TR004TP The DESIGN-BUILD FIRM shall pay all connection fees and monthly charges for the service until the date of Final Acceptance.
- TR005TP The DESIGN-BUILD FIRM shall make arrangements for the furnishing and installation of the power required for the inside plant equipment (Ethernet switches) in the master hubs, and the RTMC.
- TR006TP The DESIGN-BUILD FIRM shall ensure compliance with the Department Specification Section 639: Electrical Power Service Assemblies.
- TR007TP An analysis shall be performed to determine the cost effectiveness of providing solar power to field devices.
- TR008TP The design shall provide for battery operation of the component for 72-hours without sunlight.
- TR009TP All proposals for use of solar power shall be submitted to the Department for review and approval.
- TR010TP All wiring shall meet the requirements of the National Electric Code (NEC).
- TR011TP All wires shall be cut to proper length before assembly.
- TR012TP No wire shall be doubled-back to take up slack.
- TR013TP Wires shall be neatly laced into cable with nylon lacing or plastic straps.
- TR014TP Cables shall be secured with clamps.
- TR015TP Service loops shall be provided at all connections.
- TR016TP The equipment shall contain readily accessible, manually resettable or replaceable circuit protection devices (such as circuit breakers or fuses) for equipment and power source protection.
- TR017TP Circuit breakers or fuses shall be provided and sized such that no wire, component, connector, PC board or assembly shall be subjected to sustained current in excess of their respective design limits upon the failure of any single circuit element or wiring.
- TR018TP The power cable running between a device controller and electrical service shall be in a separate conduit.
- TR019TP Power and communication cables shall not be installed together in the same conduit.

Technical: System-wide: Grounding/Lightning Protection Requirements

- TR001TG All field devices and cables shall be protected from damage caused by lightning

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| | strikes and power surges. |
| TR002TG | All electrical interconnects shall be protected from voltage surges caused by lightning and external electromagnetic fields. |
| TR003TG | The method of protection shall be submitted to the Department for review and approval prior to installation and shall comply with all applicable industry standards. |
| TR004TG | At minimum, all equipment shall be grounded in accordance with Section 620 of the latest edition of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction and other applicable standards. |
| TR005TG | Surge protectors/TVSS shall be furnished for all cables and conductors (power, video, and data). |
| TR006TG | The surge protectors shall have leads that are at least three feet in length. |
| TR007TG | All field equipment shall meet all the requirements presented in Section 2.2.5 "power interruption" of the national electrical manufacturers association (NEMA) standard TS-1 for traffic control systems. |
| TR008TG | The field devices shall meet the requirements presented in Section 2.2.5, "transients, power service" of the NEMA standard TS-1. |

Technical: Communication System Requirements

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| TR001C | The communication system shall be an open-architecture, non-proprietary, cost-effective, real-time multimedia communications network, which is a state-of-the-art digital fault-tolerant, redundant communication network. |
| TR002C | This system shall allow expansion and system integration in a cost-effective manner. |
| TR003C | This system shall also support existing and future Department ITS applications, and allow sharing ITS information (data and video) with other agencies in the region. |
| TR004C | In order to obtain the above requirements and maintain interoperability and minimize interface incompatibilities with the City of Orlando, Orlando Orange County Expressway Authority, Orange County, Seminole County, Osceola County, Brevard County, Florida's Turnpike Enterprise District, LYNX, and regional communications initiatives, the DESIGN-BUILD FIRM shall develop their ITS communications network based on Gigabit Ethernet as the backbone communications technology. |
| TR005C | The Gigabit Ethernet communication system shall provide the backbone to support video and data transmittal from the field to the Department's District 5 Traffic Management Center (RTMC). |
| TR006C | The DESIGN-BUILD FIRM shall incorporate the project subsystems into the Gigabit Ethernet communication system. |
| TR007C | The DESIGN-BUILD FIRM shall verify location of existing fiber-optic cable in vicinity of the field devices and verify the condition and availability to splice to the existing fiber. |
| TR008C | The DESIGN-BUILD FIRM shall coordinate with all other agencies such as the City of Orlando, Orlando Orange County Expressway Authority, Orange County, Seminole County, Osceola County, Brevard County, Florida's Turnpike Enterprise District, LYNX, and regional communications initiatives for access to facilities, necessary permits, and installation and testing along their existing communication infrastructure including but limited to traffic control cabinets, pull boxes, fiber optic splice enclosures, and existing power service points. |
| TR009C | All outside plant construction shall conform to the Department's Technical Special Provisions for fiber optic conduit systems and pull boxes. |
| TR010C | Disruption to fiber optic cable or conduit that is designated by the Department for an existing purpose shall not be permitted. |
| TR011C | Disruption of existing survey markers shall be avoided in the installation of the conduit(s). |
| TR012C | No conduit shall be installed within 5 feet from existing survey markers. |
| TR013C | Damage and/disruption to these markers shall be reported immediately to the CEI personnel. The DESIGN-BUILD FIRM will be responsible for re-installing or making repairs to survey markers to the satisfaction of the Department's Project Manager according to the requirements of the Survey section. |
| TR014C | The Department shall have the right to make inspections and tests as deemed necessary to ensure the conformance as required in the Design/builder's plans. |
| TR015C | The Department shall have the right to reject cable and/or communication infrastructure that is defective in any respect. |

Technical: Communication: System Elements and Features Requirements

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| TR001CE | The DESIGN-BUILD FIRM shall design, provide, deploy, and test a communication system that will include the fiber optic cable and additional communication equipment, as discussed below. |
| TR002CE | In the areas of the iFlorida project where no new or existing backbone fiber optic cable is accessible, the DESIGN-BUILD FIRM shall design, furnish, install, test, calibrate, and otherwise seamlessly integrate an alternative communication technology. |
| TR003CE | This communication technology solution shall meet and/or exceed the Department's ITS communication requirements for this project such that all requirements contained in this document are achievable. |
| TR004CE | These elements may include, but are not limited to: leased line (dial up), wireless, and Dedicated Short Range Communications (DSRC) and shall include all ancillary equipment required for proper operation. |
| TR005CE | The DESIGN-BUILD FIRM shall submit this communication technology for the Department review and approval for before start of construction. |
| TR006CE | This communication technology shall be open-architecture, non-proprietary, cost-effective, and a high performance digital communication solution. |

- TR007CE This communication technology shall include options of expanded bandwidth for flexibility and scalability in addition to the necessary bandwidth for each ITS device.
- TR008CE The DESIGN-BUILD FIRM shall ensure interoperability and compatibility with the existing and proposed communication network.
- TR009CE This communication technology shall be transparent in terms of maintenance, performance, and operation to the user.
- TR010CE The DESIGN-BUILD FIRM shall ensure interoperability and compatibility with the existing and proposed communication network.

Technical: Communication: Fiber Optic Cable Requirements

- TR001CF The DESIGN-BUILD FIRM shall coordinate, investigate, and identify in conjunction with the appropriate agencies listed in section 2.4.2 of the functional requirements, individual fiber assignments and fiber optic patch panel assignments, and all fiber requirements in connecting all the required devices for this project.
- TR002CF In the event that existing and/or new proposed communication infrastructure doesn't include the necessary fiber for the connection to any required device in this project, or the existing fiber does not meet the minimum functional requirements for the field devices, the DESIGN-BUILD FIRM shall identify and include the necessary communication infrastructure as part of this project.
- TR003CF The new buried underground backbone fiber optic cable shall be a minimum of 72-count single mode fiber optic cable.
- TR004CF The new aerial backbone fiber shall be a 36-count hybrid fiber optic cable with a minimum of 24 single mode fibers and 12 multimode fibers.
- TR005CF The new "feeder" fiber optic cable shall be a 6-count single mode fiber optic cable.
- TR006CF This feeder fiber optic cable shall connect the individual devices to the backbone fiber optic cable.
- TR007CF The DESIGN-BUILD FIRM shall utilize the existing backbone communication infrastructure in the design of the project's communications system.
- TR008CF The DESIGN-BUILD FIRM shall furnish and install the new outside plant (OSP) system of buried conduits with fiber optic cable and its associated incidentals as close as possible to the Right of Way line, which shall include clearing and grubbing in accordance with the Department's Specification Section 110: Clearing and Grubbing if required.
- TR009CF Along Interstate roadways, the backbone communication infrastructure (aka an outside plant (OSP) system) shall include a four-inch underground conduit with four 1 and 1/4-inch HDPE SR 11 inner ducts with the 72-count fiber optic cable installed within one of the four 1 and 1/4-inch HDPE SR 11 inner ducts.
- TR010CF Along arterial roadways, the backbone communication infrastructure shall be installed aerially on existing utility poles in accordance with industry standards and according to local code, rules, and requirements.
- TR011CF Aerial cable shall be lashed to a 3/8-inch EHS or 10M messenger with stainless steel lashing wire for installation.
- TR012CF The installation shall be accomplished in accordance with accepted OSP construction practices.
- TR013CF Precautions shall be taken to ensure that installation specifications for the cable are not exceeded (tension, minimum bend radius).
- TR014CF This cable shall be installed in continuous runs in order to minimize end of reel splice location.
- TR015CF The splice locations at all field devices shall splice or terminate only those fibers necessary to complete that communication path, all other fibers in the cable(s) shall be left undisturbed; with a minimum of 5 feet of buffer tube coiled inside the closure.
- TR016CF Drop cable shall be routed from all aerial cable via conduit riser.
- TR017CF All fiber optic components will be installed in accordance with the manufacturer's instructions.
- TR018CF All necessary interconnections, services, and adjustments required for a complete and operable transmission system shall be provided.
- TR019CF All pole attachments, service loops, and conduit risers will be placed to minimize the possibility of damage, as well as to facilitate future expansion or modernization.
- TR020CF The installation of a lateral communication infrastructure shall complement the existing and/or new backbone communication infrastructure.
- TR021CF The Designer/Builder shall install this outside plant (OSP) system consisting of two two-inch underground conduits with a 6 count fiber optic drop cable and its associated incidentals for access to the fiber optic backbone cable for the Subsystem devices.
- TR022CF The conduits will be individually proofed by the use of a mandrel of 1 inch in diameter for the 1 1/4" HPDE conduit and 1 1/2" mandrel for the 2" PVC conduit.
- TR023CF The conduit shall also pass a pressurization test.
- TR024CF Conduit shall be plugged and pressurized to meet a minimum 100-psi for 2 minutes.
- TR025CF The DESIGN-BUILD FIRM shall furnish and install pull boxes as part of the communication infrastructure as required for each required device to connect into the backbone fiber optic cable and necessary spacing along the backbone communication infrastructure.
- TR026CF The DESIGN-BUILD FIRM shall install pull boxes in accordance with the Design Standards, Index 17721.
- TR027CF The Department shall accept two types of pull boxes. One pull box will be a round 36-inch diameter with cable racks and the second pull box will be a 24-inch by 36-inch rectangle box.
- TR028CF Both pull box types will have enough depth to store 100 feet (50 feet from each side of fiber optic cable) of fiber optic cable without exceeding the cables minimum bend radius and a fiber splice enclosure.

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| TR029CF | The DESIGN-BUILD FIRM shall use pull and junction Boxes listed on the Florida Department of Transportation's Approved Product List (APL) and ensure compliance with the Department's Specification Section 635: Pull and Junction Boxes. Pull boxes are not to be placed in a swell or drainage area and shall be placed at grade. |
| TR030CF | All pull boxes shall have concrete around them and shall meet all the requirements of Standard Index 17500. |
| TR031CF | The DESIGN-BUILD FIRM shall ensure that all pull and junction Boxes are marked in accordance with Section 603 and the markings are visible after installation. |
| TR032CF | Pull box covers for fiber shall read "FDOT FIBER OPTIC CABLE". |
| TR033CF | The cover shall be able to support loading in compliance with requirements of The American Association of State Highway Officials (AASHTO), Latest Edition, HS-20, Standard Specification of Highway Bridges. |
| TR034CF | All pull boxes shall be grounded according to the Department's Specification Section 620: Signal Installation Grounding. |
| TR035CF | The DESIGN-BUILD FIRM shall utilize the existing utility poles for the installation of the new aerial fiber optic backbone cable in the design of the iFlorida. |
| TR036CF | The DESIGN-BUILD FIRM shall coordinate with each utility for the appropriate position/height of the fiber optic cable placement on their pole. |
| TR037CF | In the event that existing communication infrastructure (poles, etc) doesn't exist for the necessary aerial fiber optic cable installation for the connection to any required device in this project, the DESIGN-BUILD FIRM shall identify and include the necessary communication infrastructure as part of this project. |
| TR038CF | The DESIGN-BUILD FIRM shall design the aerial fiber cable for the minimum number of aerial slack locations with the necessary amount of snowshoes. |
| TR039CF | |
| TR040CF | The spacing of the pull boxes on backbone communication infrastructure will be approximately 2600 feet alternating between a round and rectangle pull box meeting the Department 2002 specification for concrete collar around each pull box. |
| TR041CF | Arterial underground conduits shall be designed and installed to have the minimum number of pull boxes between signalized intersections. |
| TR042CF | The DESIGN-BUILD FIRM will be allowed to connect inner duct (Interstate)/conduit (Arterials) from plow portion or underground conduit to bore portion by means of approved connection methods. |
| TR043CF | The connection conduit method and material shall be submitted for approval to the Department's Project Manager. |
| TR044CF | A trace wire shall be pulled with the fiber cable (16 gauge) continuous from pull box to pull box. |
| TR045CF | Any splices to this wire shall only be done at a pull box (i.e. no in-conduit splicing shall be allowed). |
| TR046CF | Splices at the pull box for the tone wire shall meet NEC requirements for continuity and in pull box splices. |
| TR047CF | The connection conduit method and material shall be submitted for approval to the Department's Project Manager. |
| TR048CF | Pull boxes are not to be placed in a swell or drainage area and shall be placed at grade. |
| TR049CF | Pull boxes are not to be placed in a swell or drainage area and shall be placed at grade. |
| TR050CF | All pull boxes shall have concrete around them and shall meet all the requirements of Standard Index 17500. |
| TR051CF | The DESIGN-BUILD FIRM shall submit a fiber optic cable routing drawing, fiber allocation chart, and all fiber optic splicing details which show all individual fibers, their termination, and connection for each fiber deployed as part of the project for the Department review and approval, prior to the commencement of installation. |

Technical: Communication: Additional Communication Equipment Requirements

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| TR001CA | The Gigabit Ethernet communication architecture shall be a fully meshed Metropolitan Area Network (MAN). |
| TR002CA | The DESIGN-BUILD FIRM shall design the Gigabit Ethernet communication system to include field hardened Ethernet switches, routing switches, encoders or decoders as well as other required and necessary equipment, jumpers (fiber/UTP), rack, parts or devices to provide a full operational system. |
| TR003CA | The DESIGN-BUILD FIRM shall provide the configuration schematic showing equipment and its port/connector connections for the complete system. Additionally, a functional diagram will be provided showing all the devices connectivity. The proposed configuration and programming of the existing and new switches in the system will be submitted to the Department for review and approval before start of construction. |
| TR004CA | The DESIGN-BUILD FIRM shall conduct a bandwidth assessment for each existing connection to the Department RTMC to ensure available bandwidth for all required field devices. |
| TR005CA | The DESIGN-BUILD FIRM shall develop and submit this bandwidth assessment for the Department review and approval for integration of all components of each subsystem. |
| TR006CA | The DESIGN-BUILD FIRM shall have the ultimate responsibility to deliver a final communications network design that is flexible, maintainable, scalable, and manageable for iFlorida project. |
| TR007CA | All of the following units shall be delivered with a unique Media Access Control (MAC) address. |
| TR008CA | MAC address shall be derived from an address space of 10,000 sequential addresses. |
| TR009CA | The Field Hardened Ethernet Switch and Routing Switch shall provide full Layer 3 functions and support 10G Ethernet. |
| TR010CA | The Field Switch shall include a minimum of six RJ45 10/100BaseTX ports, which |

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| | operate as half-duplex or full-duplex over 100m segment lengths and provide auto-negotiation and MDI/MDIX capability. |
| TR011CA | The Field Switch shall include a minimum of two 100BaseFX fiber optical ports, which operate as full duplex over 15km segment lengths via SC, LC, or MTRJ fiber connectors and 9/125um single-mode fiber. |
| TR012CA | The Field Switch shall operate non-blocking, at full wire speed using RIPv1 or v2, OSPF, PIM (SM/DM) and DVMRP and shall support remote reset and remote management via web-based, console port (RS-232), Telnet, TFTP or FTP, CLI, SNMP, IGMP snooping, IP Multicast filtering, remote turn on/off of 10/100 BaseTX ports, and automatic address learning of a minimum of 1028 MAC addresses and ³ 1028 static Mac address. |
| TR013CA | The Field Switch shall provide the following advanced Layer 2 functions of VLAN, priority queuing, rapid spanning tree (optional), flow control ³ 1028, and automatic address learning of a minimum of 1028 MAC addresses and ³ 1028 static Mac address. |
| TR014CA | The Field Switch shall provide remote port security with the ability to configure static MAC addresses, to disable automatic address learning per ports, and trap and alarm upon any unauthorized Mac address and shutdown for programmable duration. |
| TR015CA | The Field Switch shall provide the SNMPv2, RMON, Port Mirroring, Spanning Tree, and Rapid Spanning Tree (optional) network management functions and shall have an integrated Web Interface. |
| TR016CA | The Field Switch shall have dual (i.e. redundant) power supplies and shall include a power status indicator as well as transmit, receive, link, speed LED status indicators. |
| TR017CA | The Routing Switch shall support full redundancy features in its hardware-switching platform and provide hardware redundancy in the Switch Fabric modules, fan assemblies, and dual hot swappable power supplies. |
| TR018CA | The Routing Switch shall include a power status indicator as well as transmit, receive, link, speed LED status indicators. |
| TR019CA | The Routing Switch shall include a passive backplane and a chassis with a minimum of ten (10) slots suitable for mounting in a 19-inch rack. |
| TR020CA | The Routing Switch shall include with a minimum of one Gigabit-Ethernet blade with two Gigabit-Ethernet GBIC interface modules, a minimum of six SMFO GBIC interfaces, a minimum of one MMFO GBIC interface, a minimum of one Fast-Ethernet copper interface module with a minimum of thirty-two (32) 10/100 BaseT ports. |
| TR021CA | The Routing Switch shall include a minimum of two (2) Switch-Fabric modules with an ASIC-based wire speed routing architecture. |
| TR022CA | The Routing Switch shall have fully redundant load-sharing and built-in link redundancy for active and backup data paths. |
| TR023CA | The Routing Switch shall be non-blocking and switch traffic at wire-speed operation. |
| TR024CA | The Routing Switch shall provide policy-based Quality of Service (QoS) for traffic prioritization and bandwidth management and de-queuing techniques, and shall support Voice over IP (VoIP). |
| TR025CA | The Routing Switch shall include access control lists that can be linked to a class of service, while performing Layer 1-4 packet-level security and controlling traffic flows all at wire-speed. |
| TR026CA | The Routing Switch shall include Secure Shell version 2 (SSH2), RADIUS security features. |
| TR027CA | The Media Converter shall include RJ45 10/100BaseTX port, which operates as half-duplex or full-duplex over 100m segment lengths and provide auto-negotiation capability. |
| TR028CA | The Media Converter shall have a 10/100BaseFX port, which operates as full duplex over 15km segment lengths via SC, LC, or MTRJ fiber connectors and 9/125um single-mode fiber. |
| TR029CA | The Media Converter shall include a power status indicator as well as transmit, receive, link, speed, and optical link activity LED status indicators. |
| TR030CA | The Video Encoder shall transmit data via RS-232/422/485 and accept composite or S-video NTSC video signal as input, digitally compress it at MPEG-2 in accordance with ISO/IEC 13818 standard and transmit it over the Gigabit Ethernet network. |
| TR031CA | The Video Decoder shall accept the RS-232/422/485 serial data signal and the digitally compressed video over Gigabit Ethernet network from a Video Encoder, and output the decoded video as a composite or S-video NTSC video signal and the serial data as RS-232/422/485. |
| TR032CA | The DESIGN-BUILD FIRM shall utilize the existing inside plant equipment (rack with available rack space, etc.) at the existing RTMC with the Department. |
| TR033CA | In the event that existing and/or new proposed inside plant equipment doesn't include the necessary equipment and/or space for any required device in this project, the DESIGN-BUILD FIRM shall identify and include the necessary inside plant equipment as part of this project. |

Technical: Field Device Specs & Reqs: CCTV Cameras Requirements

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| TR001SC | The CCTV camera/CCTV Assembly utilized by the DESIGN-BUILD FIRM must be compatible with and equal or better technology than the type of CCTV camera/CCTV Assembly (including Pan Tilt Unit, Lens, and Camera Controller/Receiver) presently deployed by District 5. |
| TR002SC | The CCTV Assembly shall include a CCTV camera, zoom lens, environmental enclosure, Pan and Tilt Unit (PTU), Controller/ Receiver, uninterruptible power supply (UPS), mounting pole and all hardware and components required to deliver a fully operational CCTV Subsystem that is integrated with the RTMC'S software, hardware and communication system. |

TR003SC CCTV shall be connected back to the RTMC through either existing or new fiber optic cable, or where a fiber connection is not available, another communications medium (e.g., dedicated dial-up or wireless).

TR004SC The CCTV Assembly components shall be compatible with each other.

TR005SC All CCTV Assembly Components shall be provided and fully warranted by a single vendor providing an End-to-End solution.

TR006SC The CCTV Assembly shall be designed and located to provide fields of view that optimize coverage of each intersection and the approaches to each intersection.

TR007SC The DESIGN-BUILD FIRM shall make a videotape clearly displaying the CCTV camera coverage from each proposed location.

TR008SC The videotape shall be made from a bucket truck at the proposed height for the CCTV camera.

TR009SC Each videotaped location shall be submitted to the Department for review with the 90% Plans Submittal.

TR010SC The CCTV Subsystem shall include protection of the camera electronics should the camera be pointed towards the sun.

TR011SC The CCTV camera pole foundation shall be placed within 500 feet of the Controller Cabinet.

TR012SC Placement of the CCTV camera pole foundation shall be outside of the clear zone and should not be placed within the line of sight of the intersection.

TR013SC The poles shall be accessible for maintenance vehicles.

TR014SC The CCTV camera pole shall support a camera assembly with a maximum load of 75 pounds.

TR015SC The slope of the terrain for cabinet placement shall be no steeper than 4:1.

TR016SC Level ground shall be provided around the CCTV camera pole and cabinet.

TR017SC The camera shall include privacy zones so that the operator cannot view scenes at preprogrammed camera positions.

TR018SC The privacy zones shall be user definable.

TR019SC There shall be a minimum of eight (8) privacy zones per CCTV.

TR020SC Privacy zones for each CCTV installation will be specified and approved as part of the design process.

TR021SC Camera enclosures/housings selected for use as part of this project shall be colored white.

TR022SC The CCTV camera assembly shall include a dome enclosure that provides complete protection for the camera and zoom lens assembly from moisture and airborne contaminants.

TR023SC The enclosure shall protect the camera electronics and zoom lenses from blowing rain at storm rates, blowing sand, blowing dust, temperature, and solar loading.

TR024SC The enclosure shall be corrosion resistant, and mountable in a manner, which leaves no exposed cabling.

TR025SC The enclosure shall be rated NEMA 4X and shall not require pressurization.

TR026SC The enclosure shall also assist in preventing lens fogging and effectively reduce internal temperatures and minimize glare.

TR027SC The dome shall be provided with a sunshield that covers the upper half.

TR028SC The sunshield shall permit air to freely circulate between the sunshield and the enclosure.

TR029SC The sunshield shall have a light color finish.

TR030SC The DESIGN-BUILD FIRM shall provide a dome camera housing that is secured to the camera connection box with a mounting plate/attachment designed to a minimum 5X factor of safety when subjected to a 120 mph wind with a 30% gust factor.

TR031SC The DESIGN-BUILD FIRM shall provide a housing that is keyed so that, after being removed from the camera connection box for service, it can be reinstalled with exactly the same orientation and ensure cabling from the camera assembly to the camera connection box is not exposed to external devices.

TR032SC As appropriate, cameras shall be co-located with reader stations when possible.

TR033SC However, when necessary, CCTV Assemblies shall be mounted on new poles within the Department's Right-of-Way.

TR034SC The mounting height and location for each camera shall be selected to provide the desired coverage of each arterial intersection, taking into consideration the glide slope criteria of any nearby airports or landing strips, and the availability of aerial Equipment to maintain the CCTV Assemblies from the ground.

TR035SC The CCTV Assembly shall be located and mounted taking into consideration the arterial intersection features that affect the camera vision.

TR036SC The DESIGN-BUILD FIRM shall determine the camera mounting height and location by performing a study at each proposed CCTV site.

TR037SC Camera mounting and installation shall ensure that the picture quality is not degraded due to movement and vibration of the CCTV Assembly Components.

TR038SC The support structure shall have a maximum deflection in any direction of 1.5 inches in wind speeds up to 120 mph sustained wind.

TR039SC The gust wind factor shall be in accordance with AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals.

TR040SC This deflection shall be measured at the top of the support structure where the base of the pan/tilt drive is attached.

TR041SC The support structure shall not be subject to harmonic vibrations due to environmental conditions.

TR042SC The DESIGN-BUILD FIRM shall furnish and install a pole-mounted cabinet at each CCTV site to house the communication and any ancillary equipment.

TR043SC The DESIGN-BUILD FIRM shall provide video cables with BNC connector terminations.

TR044SC A minimum of 7 feet of slack for each camera lead shall be provided in the base of the camera support pole and in the associated controller cabinet.

TR045SC The DESIGN-BUILD FIRM shall install RS-232/RS-422 converters as required.

TR046SC The DESIGN-BUILD FIRM shall design surge protection (both as part of each CCTV Assembly and within each CCTV cabinet) and UPS (including a power

transfer switch in each CCTV cabinet) systems for installation as part of each CCTV Assembly deployed as part of this project.

TR047SC Proposed surge protection and UPS systems shall be submitted to the Department for review and approval.

The DESIGN-BUILD FIRM shall furnish and install all equipment necessary to support integrating the project's video system into the RTMC'S existing video system, such that all project video is seamlessly integrated into the regional video display/control network, which includes display on the RTMC video wall, control and display on the operator workstations, and multicast video streams.

TR048SC

Technical: Field Device Specs & Reqs: 3M Canoga Vehicle Detection Sys Requirements

TR001SD All equipment associated with the 3M Canoga Vehicle Detection Systems shall be procured by the Department for provision to the selected DESIGN-BUILD FIRM.

TR002SD The system shall provide current measurements and vehicle detection information for use in supporting incident detection and advanced traffic management systems.

TR003SD The DESIGN-BUILD FIRM shall deploy Twenty-two (22) fully functioning 3M Canoga Vehicle Detection Systems (provided by the Department) along S.R. 520 and S.R. 528.

TR004SD 3M Canoga Vehicle Detection Systems shall be connected back to the RTMC through either existing or new fiber optic cable, or where a fiber connection is not available, another communications medium (e.g., dedicated dial-up or wireless).

TR005SD Each non-invasive sensor shall have an inductance change that will allow an appropriately designed, matched inductive loop vehicle detector to detect all licensed vehicles that contain ferromagnetic material.

TR006SD Each single, double, triple or quadruple non-invasive, magneto-inductive vehicle sensing assembly shall be connected to an appropriately designed, matched microloop vehicle detector (Canoga C800).

TR007SD Vehicle Detection Stations designed and installed by the DESIGN-BUILD FIRM shall adhere to the following criteria:

TR008SD Traffic data collection or traffic flow parameter measurements across diverse roadway geometry shall be optimized by installing single, double, triple or quadruple non-invasive sensors, as conditions require.

TR009SD The DESIGN-BUILD FIRM shall install the 3M Canoga Vehicle Detection Systems such that they meet all manufacturer-prescribed installation, verification of installation/testing, operational, and other functional requirements and specifications, and are capable of adhering to the requirements found in this document.

TR010SD The DESIGN-BUILD FIRM shall coordinate with the FDOT Project Manager and the involved 3M Representative to ensure that they have the most up to date requirements and specifications for this equipment.

TR011SD The operational and functional requirements of the Vehicle Detector Stations shall be considered when identifying specific placement of Non-Intrusive and Non-Invasive Detectors along SR 520 and 528.

TR012SD The Vehicle Detector Stations shall be placed outside of any "weaving" areas, where feasible.

TR013SD The sensors shall allow the configuration and relocation of detection zones to follow changing Roadway alignment during Construction.

TR014SD The DESIGN-BUILD FIRM shall ensure that the Vehicle Detectors are well calibrated to ensure that they perform as required by the Department's District 5 incident detection algorithm software.

TR015SD A communication link shall provide remote access to the detector for reading unit configuration settings, for fault identification and verification, for real-time system monitoring, and data collection on up to four channels for detection.

TR016SD It shall include password security to the detector to change configuration settings.

Technical: Field Device Specs & Reqs: 3M 36"x48" VSL Signs Requirements

TR001SV All equipment associated with the 3M Variable Speed Limit Signs shall be procured by the Department for provision to the selected DESIGN-BUILD FIRM.

TR002SV The DESIGN-BUILD FIRM shall deploy 22 fully functioning 3M 36" X 48" Variable Speed Limit Signs to serve as replacements for existing static speed limit signs currently being used along Interstate 4 between Maitland Blvd. (Exit 89) and John Young Parkway (Exit 79).

TR004SV This shall include all hardware, software, communications equipment, power supply equipment, and any other components required to integrate such field device.

TR003SV All Variable Speed Limit Signs will be connected to the Department Fiber backbone running along I-4.

TR005SV These signs shall follow the most current standards for placement and installation along the Department roadways.

TR006SV The DESIGN-BUILD FIRM shall be fully responsible for the removal all the existing static speed limit signs.

TR007SV At no time shall there be no speed limit posted.

TR008SV It shall be the responsibility of the DESIGN-BUILD FIRM to provide concrete protection around pull boxes and exposed conduit sweeps leading to Variable Speed Limit structures.

TR009SV The variable message sign shall utilize light emitting diodes (LEDs) and 3M™ Scotchlite™ Diamond Grade™ Fluorescent Reflective Sheetting on a shuttered pixel.

TR010SV The signs shall be permanently mounted on poles and shall be self-contained with either AC power or DC utilizing solar panels and batteries for power supply.

TR011SV The sign shall be programmed remotely via the existing the Department fiber optic backbone along I-4.

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| TR012SV | The display shall have the capability to display the following posted speeds: 10 MPH, 15 MPH, 20 MPH, 25 MPH, 30 MPH, 35 MPH, 45 MPH, 50 MPH, 55 MPH, 60 MPH, 65 MPH and 70 MPH. |
| TR013SV | The display shall have a programmable default message that is visible day and night through the use of retroreflective pixels providing a fail-safe display in the event of a continuous power failure beyond the battery supply. |
| TR014SV | In the event of a power failure the sign will default to the programmed default posted speed. |
| TR015SV | The DESIGN-BUILD FIRM shall install the 3M Variable Speed Limit Signs such that they meet all manufacturer operational and functional requirements and specifications and are capable of adhering to the requirements found in this document. |
| TR016SV | The DESIGN-BUILD FIRM shall coordinate with the FDOT Project Manager and the involved 3M Representative to ensure that they have the most up to date requirements and specifications for this equipment. |

Technical: Field Device Specs & Reqs: Reader Stations & License Plate Readers Reqs

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| TR001SR | Accordingly, the DESIGN-BUILD FIRM shall select and propose the most cost-effective approach and technology. |
| TR002SR | The reader stations shall be installed at or near the locations listed on Tables 1 (Limited Access Highways) and 2 (Arterials) in Appendix A of the Design-Build Functional Requirements, and along SR 520 (as listed on Table 5 in the functional requirements). |
| TR003SR | Whenever possible, the DESIGN-BUILD FIRM shall maximize the use of existing structures for the mounting of sensors, as well as existing power service. |
| TR004SR | For reader station and license plate reader deployment purposes, the DESIGN-BUILD FIRM shall mount sufficient infrastructure so as to collect data from a minimum of two lanes of traffic for each direction of travel from which data is being sought at each sensor site, depending on local conditions. |
| TR005SR | The lanes selected for sensor coverage by the DESIGN-BUILD FIRM shall be chosen based on an analysis indicating which lanes will provide the greatest amount of "matched link" data. |
| TR006SR | In all cases, sensor coverage shall enable the reading of at least 50% of completed trips over a given link (calculated based on the vehicular population being used as probes (e.g., cars with transponders vs. cars having license plates)). |
| TR007SR | Additionally, sensor coverage shall ensure that "matched link" data for a minimum of 5% of all vehicles traveling over a given link can be calculated based upon the raw data collected at each end of that link. |
| TR008SR | Reader stations and license plate readers shown in Table 2 (Appendix A of the Design-Build Functional Requirements) shall be deployed/mounted in such a manner as to only gather data from vehicles leaving an instrumented intersection in the direction from which data is being sought. |
| TR009SR | Data gathered from the reader stations and license plate readers shall conform to at least the "Good" data quality level for Traffic Sensor Data described in the ITS America document "Closing the Data Gap: Guidelines for Quality Advanced Traveler Information System (ATIS) Data." |
| TR010SR | Reader stations and license plate readers shall have the ability to collect, store, and transmit raw data for configurable amounts of time. |
| TR011SR | The default setting for data collection, storage, and transmission shall be one minute. |
| TR012SR | The processing associated with the collection of data and transmission to the OOCEA Data Server shall introduce a latency of no more than two (2) minutes (1 minute associated with collection; 1 minute associated with transmission) |
| TR013SR | The DESIGN-BUILD FIRM shall ensure that the each reader station and license plate reader is operational at least 99% of the time. |
| TR014SR | The DESIGN-BUILD FIRM shall ensure that all raw data adheres to ITS America's Fair Information and Privacy Principles. |
| TR015SR | All data received from the reader station shall be encrypted and/or truncated (to prevent a protected piece of identification data from being traced back to a non-protected transponder number or license plate id) for security and anonymity purposes. |
| TR016SR | The DESIGN-BUILD FIRM shall ensure that encrypted or otherwise protected identification information can be matched subsequent to encryption, etc. |
| TR017SR | All encryption/other information protection methods shall be documented and provided to the Department prior to system implementation. |
| TR018SR | The DESIGN-BUILD FIRM shall work with the Department's Project Manager and representatives of the Orlando Orange County Expressway Authority (OOCEA) to provide raw data in a format that most appropriately conforms to the requirements provided by OOCEA (using ITE TMDD and SAE ATIS standards as appropriate) for interfacing with the OOCEA Data Server. |
| TR019SR | As part of this process, the DESIGN-BUILD FIRM shall document all interfaces necessary to support this project. |
| TR020SR | All Interface Control Documentation (ICD), developed as part of this process shall be submitted by the DESIGN-BUILD FIRM to the Department for review and approval. |
| TR021SR | The DESIGN-BUILD FIRM shall develop a hardware/software package to enable the Department staff to remotely monitor and configure all reader stations and license plate readers. |
| TR022SR | This monitoring system shall have the following capabilities: a) identification of all reader station and license plate reader errors, whether related to the reader station/license plate reader itself, or the communications system connecting it to the RTMC, and b) monitor the status of communications with the OOCEA Data Server and detect, log, and report all communications errors. |
| TR023SR | The monitoring system shall be updated at minimum at a rate of one time per minute. |

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| TR024SR | The monitoring system shall have a user interface that provides operators and system administrators with the ability to conduct various monitoring and configuration/management functions. |
| TR025SR | This user interface shall operate within a secure environment utilizing password-based access protocols. |
| TR026SR | The monitoring system shall be sufficiently scaleable to accept a doubling in the total number of reader stations and license plate readers without the need to add additional memory or processing capability. |
| TR027SR | The monitoring system shall automatically synchronize with a common clocking source. |
| TR028SR | The monitoring system shall provide the clocking source for all reader stations and license plate readers. |
| TR029SR | The DESIGN-BUILD FIRM will coordinate with the Department's Project Manager and OOCEA to ensure that the benchmarking system used by the Department's Monitoring System and reader stations conforms to the system utilized by the OOCEA Data Server for clocking synchronization. |
| TR030SR | The monitoring system shall be designed such that Department staff, or the Department's representative, shall have the ability to communicate with any reader station from the roadside using a laptop computer, via, at a minimum, an RS-232 interface; in order to monitor the reader station's operation and diagnose/resolve problems. |
| TR031SR | To support this function, the DESIGN-BUILD FIRM shall provide a maintenance laptop and associated software to support the diagnosis, configuring, and testing of all field device installations deployed as part of this project. |
| TR032SR | This maintenance laptop shall be able to connect to the field device assemblies/stations in order to support the above functions. |

4.2 Procurement 2 – Central Florida RWIS

The focus of RWIS in Florida is to provide real-time information concerning critical weather and pavement conditions to transportation managers, travelers, and commercial carriers, law enforcement officials, and emergency management centers in order to ensure safe transportation under both everyday and emergency/evacuation conditions. As envisioned, RWIS will provide several methods for accessing current, forecasted, and historical road weather information. Raw data from RWIS will be provided to a number of agencies including Meteorlogix, who will configure the data into usable format. Meteorlogix will provide formatted RWIS data, in the form of Road Weather Forecasting (reference Section 3.4 of this document), to the iFlorida Conditions System, which will disseminate the data to a statewide website and, for severe traffic conditions, to a statewide 511 traveler information telephone service. The project will demonstrate the integration of weather-related data into both transportation and meteorological databases; and incorporate localized weather-responsive traffic management strategies for low visibility, high wind, wet pavement, and flooded road conditions.

The RWIS gathers raw data from Environmental Sensor Stations (ESS) making it available to both private and public meteorological services to process and to provide critical weather related travel impacts to help managers make traffic control decisions and disseminate road weather information to travelers. An ESS is a fixed roadway location with one or more sensors measuring atmospheric, pavement, and/or water level conditions. In addition, RWIS data can be processed by private or public meteorological services, such as the National Oceanic and Atmospheric Administration (NOAA), to improve weather predictions. Three categories of road weather information are significant for traffic management:

- Atmospheric data including air temperature, relative humidity, barometric pressure visibility distance, wind speed and direction, precipitation type and rate, tornado or waterspout occurrence, lightning, storm cell location and track, and air quality.
- Pavement data including pavement temperature, pavement condition (i.e., dry, wet, flooded, icy), and subsurface conditions (e.g., soil temperature).
- Water level data including tide levels (i.e., hurricane storm surge) as well as stream, river, or lake levels near roads

By integrating traffic flow data with timely, accurate, route-specific environmental data, transportation managers can assess weather impacts on the transportation network and implement road weather management strategies. Advisory strategies provide information on prevailing and predicted conditions to both transportation managers and motorists. Posting fog warnings on DMS and listing flooded routes on web sites are examples of advisory strategies. Control strategies alter the state of roadway devices to permit or restrict traffic flow and regulate roadway capacity. Reducing speed limits with VSL signs and modifying traffic signal timing are examples of control strategies. Transportation managers can coordinate with other managers who carry out treatment strategies, which supply resources to roads to mitigate weather impacts (e.g., fog dispersal).

The FDOT strategy for deployment of RWIS was developed in cooperation with the National Weather Service and supports a cooperative approach to surface weather prediction and modeling. The strategy consists of two elements: (1) permanent installation of sensors to support predictive model development and the provision of travel-related information on key corridors for evacuation and intercity travel, and (2) an ad-hoc system of RWIS that can be deployed to support travel advisories as needed. This balanced approach, utilizing a combination of permanent installations and an ad-hoc system, will result in the most efficient system possible for providing continuous coverage at key locations along vital corridors and maximizing the effectiveness of limited resources.

The sub-system requirements are organized into a manageable database. Figure 4.2.1 illustrates how this requirements database is structured.

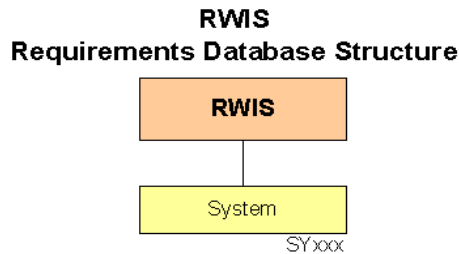


Figure 4.2.1: RWIS Requirements Database Structure

4.2.1 Sub-system Requirements

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| SY001 | The RWIS data provided by the UNF for iFlorida shall be provided to the Data Warehouse (TBD) and to the Conditions System interface located initially at the |
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Florida Department of Transportation interface at:

District 5 Regional Traffic Management Center (RTMC)
133 South Semoran Boulevard, Orlando FL

Design, build, and evaluate a web-enabled road weather information system (RWIS) for the Interstate Highway System in Central Florida (FDOT District 5) that shall include:

- Ten "basic" weather stations shall be installed at 10 FDOT microwave communication towers (and/or other sites to be determined in the design process).
- Four wireless "wind speed alert" stations shall be installed on four bridges (including two bridges in District 5 -- SR528, and another bridge to be determined in the design phase, and two bridges in District 2 -- the I-295 (Buckman) and the SR9A (Dames Point) bridges).
- A demonstration site that will enable the deployment of an 'ad hoc' wireless portable weather station between two towers on the RWIS network.

- SY002 Evaluate alternative weather sensor arrays and determine hardware and software requirements to be used in the deployed network.
- SY003 A "basic" weather station will provide the weather data determined by the FDOT to be necessary for achieving the general goals of the RWIS system.
- SY004 The "wind speed alert" stations will have, at a minimum, sensors for wind speed and direction.
- SY005 At a minimum, the "basic" and "wind speed alert" stations will conform to established NIST and NWS standards.
- SY006 Identify the specific towers in the FDOT's microwave communications network, the bridge "wind speed alert" locations, and other sites that may be required for the collection and dissemination of RWIS data.
- SY007 Design a web-based interface to the road weather data collected by the RWIS that shall make this information available in real-time, in a user-friendly and useful format to public and private users (processors) of the data.
- SY008 Conduct a workshop to determine the requirements of FDOT, and other potential stakeholders, and to get feedback about successive versions.
- SY009 The design of the site shall be done in cooperation with FDOT-ITS, UNF and NWS meteorologists.
- SY010 Design a preliminary version of the web site to be hosted on a UNF server computer.
- SY011 Design a simple web-based "historical weather database access system" for access to archived RWIS weather data by cooperating with research meteorologists at FSU, the NWS, and other potential users.
- SY012 Conduct workshop to determine the requirements of FDOT, the NWS, and other potential stakeholders for access methods and database design.
- SY013 Develop the database access system and host it on a UNF server computer.
- SY014

4.3 Procurement 3 – Road Weather Forecasting

Numerous sources of weather information, both current and forecasted, are available and will be increased through iFlorida. This portion of the weather project takes all those sources as input and develops current and forecasted weather for all defined road segments, both in Central Florida and statewide. The project will also include severe weather alerts and a Road Speed Index, an advisory value that the iFlorida Conditions System will use to calculate estimated travel times.

The resulting output of this project will be time-sliced forecasts for each road segment covered. Forecasts will be available for time periods ranging from 15 minutes (short-term predictions) to 48 hours (longer-term predictions) ahead of time. Using available National Weather Service (NWS) observational data sets from approved NWS reporting locations, as well as data from various Florida-based RWIS stations as input, Meteorlogix will utilize a high resolution numerical weather prediction model to develop highly specific current conditions and forecasts for each statewide, Central Florida, and 511 segment defined in the Conditions System. The Central Florida Data Warehouse will archive all raw and processed weather data.

The selected consultant will coordinate with the Consortium Central Florida Regional Travel's Information web site (<http://www.iflorida.org>) efforts to determine the best method of displaying current and forecasted weather information.

The sub-system requirements are organized into a manageable database. Figure 4.3.1 illustrates how this requirements database is structured.

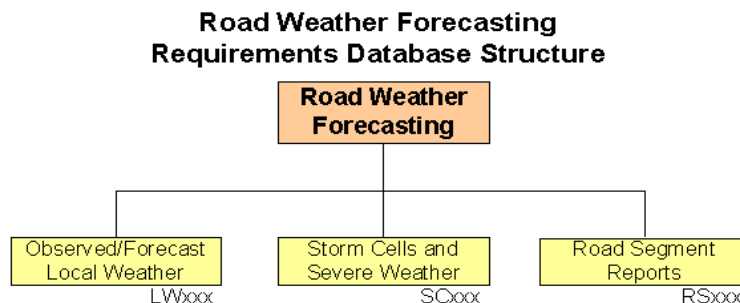


Figure 4.3.1: Road Weather Forecasting Requirements Database Structure

4.3.1 Sub-system Requirements

Observed/Forecast Local Weather Requirements

- LW001 Meteorlogix shall ingest available National Weather Service (NWS) Observational data sets from approved NWS reporting locations, as well as local Florida RWIS stations.
- LW002 The observed RouteWatch output shall incorporate data from these observing sites.
- LW003 The forecast RouteWatch data shall incorporate model data from a high-resolution

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| | numerical weather prediction (NWP) model. |
| LW004 | The output of the NWP model shall be a set binary files of data for a wide variety of forecast parameters. |
| LW005 | Included in the list of available parameters shall be precipitation, air temperature, relative humidity and wind speed/direction. |
| LW006 | In addition to the raw model binary output, Meteorlogix shall use the output to construct forecasts of Road Speed Index. |
| LW007 | The frequency with which improvements to the model algorithms are made is yet to be determined, but it is assumed that this frequency shall be of the order of once or twice per year. |
| LW008 | These [Output files of forecast weather parameters] files shall be converted and queried against the FDOT roadway segments in order to produce forecast Road Speed Index values and alerts. |

Storm Cells and Severe Weather Requirements

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| SC001 | Utilizing observations from all available NWS Doppler Weather radar in and around the state of Florida, Meteorlogix shall apply a projected storm track algorithm to each individual storm cell that meets or exceeds Florida's criteria for a "significant" storm. |
| SC002 | The output of this shall be a projected track (i.e. estimated time of arrival), for the next 30 minutes, for each significant storm. The following data shall be provided: · The projected storm tracks shall include: - Severe storm corridors, updated every with every NWS Volume scan - this is nominally every six minutes. - Criteria used to threshold a "significant" storm (Storms that contain a tornadic signature, Storms that contain an 80 % or greater probability of ¾" hail, Storms that are moving at a speed of 40 knots or greater, Storms that contain a mesocyclone (significant rotation)) · Other Current and forecasted severe weather data - Winds from NWS sites reporting sustained/gusts above 50 mph - Data from the RWIS sensors (this may include temperature, etc.) - Visibility from NWS sites less than (TBD) - Precipitation amounts exceeding 1.5 inches per hour - Areas affected by forecast of tropical storms force winds (> 40 mph) - Severe thunderstorm warnings as issued by the NWS |
| SC003 | - Tornado Warnings as issued by the NWS |

Road Segment Reports Requirements

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| SR001 | The forecast results, severe weather data and NWS/RWIS observed data shall be converted by Meteorlogix software and related directly to FDOT's defined road segments via the RouteWatch software mechanism. The output of RouteWatch shall be formatted as standard shapefiles, as well as a text file suitable for email, per incident per segment, that shall contain the following information: · Road Speed Summary (color-coded Green, Yellow, or Red) · Road Speed Impact · Road Alerts |
| SR002 | · Text Narrative of Road Segment Report Road Speed Summary (color-coded Green, Yellow, or Red) including: - Current Road Condition |
| SR003 | - Weather Significant code Yellow or Red Condition - Time information (as this will be "current" as well as "forecast" data) Road Speed Impact - Current observational data and storm corridor data. Current is defined as "real-time" weather, updated every 15 minutes by NEXRAD. This is a short-term "nowcast" of road speed index (delivered as a "flow factor" where the factor is a percentage (%) of posted speed limits). This data is based upon current precipitation, National Weather Service Severe Thunderstorm and Tornado bulletins for the next hour, as well as a 30-minute forecast of significant storm motion that will affect a roadway segment. This nowcast is used to transition from the current roadspeed to the forecast road speed that is based upon model guidance. o Current observational data and storm corridor data o Forecast data (derived from the model) for the next hour o Forecast data (derived from the model) at a time step of every 3 hours out to 48 hours. |
| SR004 | Road Alerts - Current data based upon NWS observations, RWIS observations and storm corridors - Forecast data based upon the output of the NWP model at a time step of every three hours out to 48 hours. |
| SR005 | - Road segments shall be as defined by Meteorlogix and FDOT. |
| SR006 | Each of the Road Segment Reports created shall be converted into a text narrative to be used on the 511 application. |
| SR007 | The information described in Section 3 of the Meteorlogix Scope for each road segment shall summarize current and expected conditions for the next three hours. |
| SR008 | All RouteWatch alerts shall go to the FDOT Conditions System to be parsed and integrated into the 511 and Transportation road alert systems via the Internet as defined in the design stage. |

4.4 Procurement 4 – Security Command and Control

This project will facilitate deployment of security-monitoring devices on two bridges, the Fuller Warren Bridge in Jacksonville and the I-4 St. John's River Bridge in Seminole County. The Fuller Warren Bridge (on I-95) serves as a bypass route through Jacksonville, the largest city in the nation in terms of square miles. The St. John's River Bridge is a major link between the Orlando and the Daytona Beach areas.

Security-monitoring devices will be deployed both above and below these bridges' decks. These devices will provide motion sensor oriented inputs to an automated security-monitoring system. This monitoring system will process these inputs in order to detect potential security problems, provide alerts, and assist in post-event

analysis. A single security application will be deployed as part of this project at each of locations listed below:

- FHP, Troop G, Jacksonville
- FDOT D5, RTMC - D5 staff is collocated with FHP Troop D

Staff at these locations will consequently be able to monitor events at the facilities under surveillance on a 24/7 basis.

During a security-related event, alarms and alerts from the Fuller Warren Bridge will be sent simultaneously to the following offices: Jacksonville FHP Troop G, and FDOT D5 RTMC in Orlando.

Similarly, alarms and alerts from the St. John's River Bridge will be sent simultaneously to the following office:

- FDOT D5 RTMC and FHP Troop D (co-located)

Alarms and alerts will automatically trigger the real-time digital recording of events for post event analysis.

Once an agency receives an alert, existing procedures will be used to handle the events appropriately. It is not the intent of iFlorida to develop new procedures to handle security events.

The selected contractor to provide an automated security monitoring and control will utilize Commercial Off The Shelf (COTS) software that will perform the following functionalities:

- Visual Alarm Annunciation;
- Security Surveillance;
- Video Assessment Capability; and
- Alarm Management necessary to support security applications on the two bridges being used as part of this model deployment.

In addition to monitoring the bridges' security cameras and alarm sensors, the VSOC application is capable of presenting a photo-realistic model of the bridges themselves. This virtual reality environment will provide FHP and FDOT staff with excellent situational awareness and improved command and control capability. Moreover, VSOC visually fuses video-oriented motion detector sensor alarms with video surveillance in order to decrease response times and improve the quality of alarms assessment.

The sub-system requirements are organized into a manageable database. Figure 4.4.1 illustrates how this requirements database is structured.

Security Command and Control Requirements Database Structure

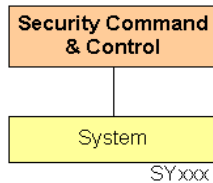


Figure 4.3.1: Security Command and Control Requirements Database Structure

4.4.1 Sub-system Requirements

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| SY001 | The Selected Contractor shall provide the Virtual Security Operations Console (VSOC) to the Security Command and Control project. |
| SY002 | VSOC surveillance and monitoring shall be provided to two critical bridges (I-4 St John's River Bridge in Seminole County and the I-95 Fuller Warren Bridge in Jacksonville) to detect potential security problems, provide alerts, and assist in post-event analysis. |
| SY003 | VSOCs with alarm options shall be located at FHP, Troop G headquarters in Jacksonville and FDOT District 5 Regional Traffic Management Center (RTMC) in Orlando. |
| SY004 | The Selected Contractor shall deliver photo-detailed three-dimensional site models of the two bridges as computer datasets. |
| SY005 | These computer datasets shall be delivered as part of the VSOC systems and be optimized for real-time rendering with the VSOC viewer. |
| SY006 | Both bridges shall be modeled and consist of a one square mile high-resolution area centered around the two ends of each bridge and the bridge span to include a quarter mile on either side of the bridge. |
| SY007 | High-resolution content shall also include prominent structures with significant security interest as related to the bridges, should these structures fall within the camera/sensor fields of view. |
| SY008 | Outside of the defined high-resolution area, other areas surrounding the bridges shall be shown in medium to low resolution out to a range of three miles. |
| SY009 | Site models shall include terrain, water, selected structures as defined previously, and detailed three-dimensional representations of the bridge structures themselves. |
| SY010 | For acceptance, the Contractor shall demonstrate through inspection that the bridge models and surrounding areas for the two locations can be viewed with VSOC software. |
| SY011 | The camera and sensor arrangement shall be jointly agreed upon with FDOT within 30 days after Notice to Proceed. |
| SY012 | Camera and sensor arrangements will be demonstrated using simulated communications for alarm stimulus. |
| SY013 | Demonstrations shall verify the system alerts and camera selection features. |
| SY014 | Command and Control communications between the Jacksonville FHP and FDOT District 5 RTMC shall be demonstrated. |
| SY015 | The FDOT District 2, Jacksonville TMC shall, upon FDOT acceptance of the cost option, shall also be demonstrated. |

4.5 Procurement 5 – iFlorida Conditions System

This project will design and implement the iFlorida Conditions System at the Florida Department of Transportation (FDOT) District 5 Regional Traffic Management Center (RTMC). The Conditions System is an Internet-based information management tool whose role is to collect, fuse, and disseminate transportation system-related conditions information for the Florida Intrastate Highway System (FIHS) throughout the state, as well as more detailed, multi-modal conditions information for the Central Florida region.

Statewide-oriented transportation system conditions information will be disseminated via FDOT’s web site (<http://www.myFlorida.com>). Central Florida-oriented conditions information will be disseminated by the Central Florida Data Warehouse, which will maintain a separate web site (<http://www.iflorida.org>).

A top-level overview of the Conditions System is presented in Figure 4.5.1.

The Conditions System will incorporate automated data from the Florida Highway Patrol’s (FHP) Computer Aided Dispatch (CAD) system, FDOT District 5’s Surveillance Systems, the Orlando Orange County Expressway Authority’s (OOCEA) Travel Time Data Server, and Meteorlogix’s segment weather conditions, alerts, and forecasts (to be provided as part of a separate iFlorida procurement). The Conditions System will provide an Operator Interface to manually incorporate construction and maintenance activities and available data from the Central Florida transit and airport agencies.

This procurement focuses on the operations of general traffic management, expanding the Statewide and Central Florida 511 service, and the traveler information systems. 511 will be supported through a number of parallel systems, including: the Statewide 511 System, the Central Florida 511 System, the Southeast Florida 511 System, the Tampa Bay 511 System, and other systems (e.g., the Jacksonville 511 System) as they come on-line. This procurement will serve many operational purposes:

- The Statewide and Orlando area 511 systems will be designed, implemented, operated and maintained through this project, incorporating and formatting the segment reports available from the iFlorida Conditions System as the foundation for content available via this service.
- The iFlorida Conditions System will provide pre-recorded 511 messages in electronic format for automated use on the 511 system. However, a 511 operator will have the ability to override the pre-recorded message.
- A 511 operator will be supplied to the District 5 RTMC as part of this project. They will utilize the iFlorida Conditions System, as well as other inputs to ensure that timely, accurate, and reliable information is available on the 511 System.
- FDOT RTMC Operators will serve as the primary interface with Dynamic Message Signs and variable speed limit signs used in roadway diversion and variable speed limit trials, respectively. While the iFlorida Conditions Systems contractor will develop applications to recommend what information to provide on these signs, it will be up to the operators themselves to review and implement these recommendations as appropriate.
- A major part of this project is to ensure that quality control and proper operator training and procedures are in place to optimally operate the tools iFlorida provides.

The sub-system requirements are organized into a manageable database. Figure 4.5.2 illustrates how this requirements database is structured.

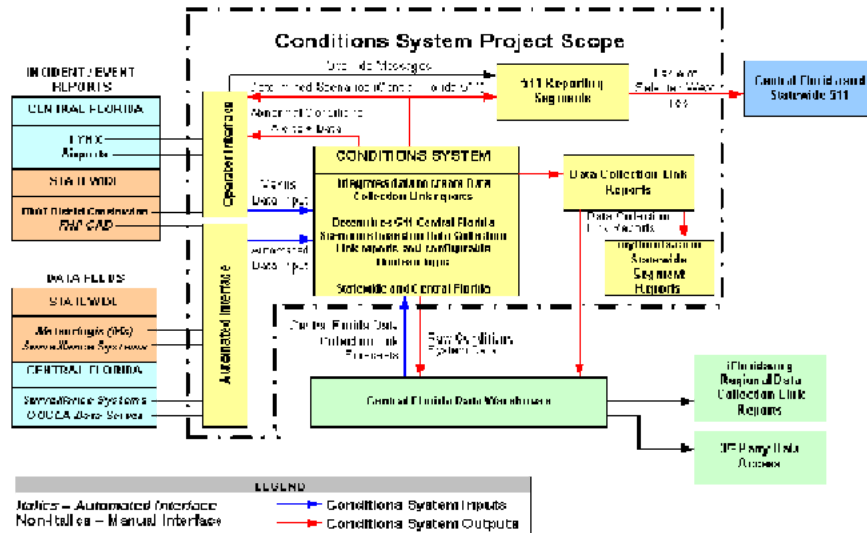


Figure 4.5.1: Conditions System Top Level Overview

iFlorida Conditions System Requirements Database Structure

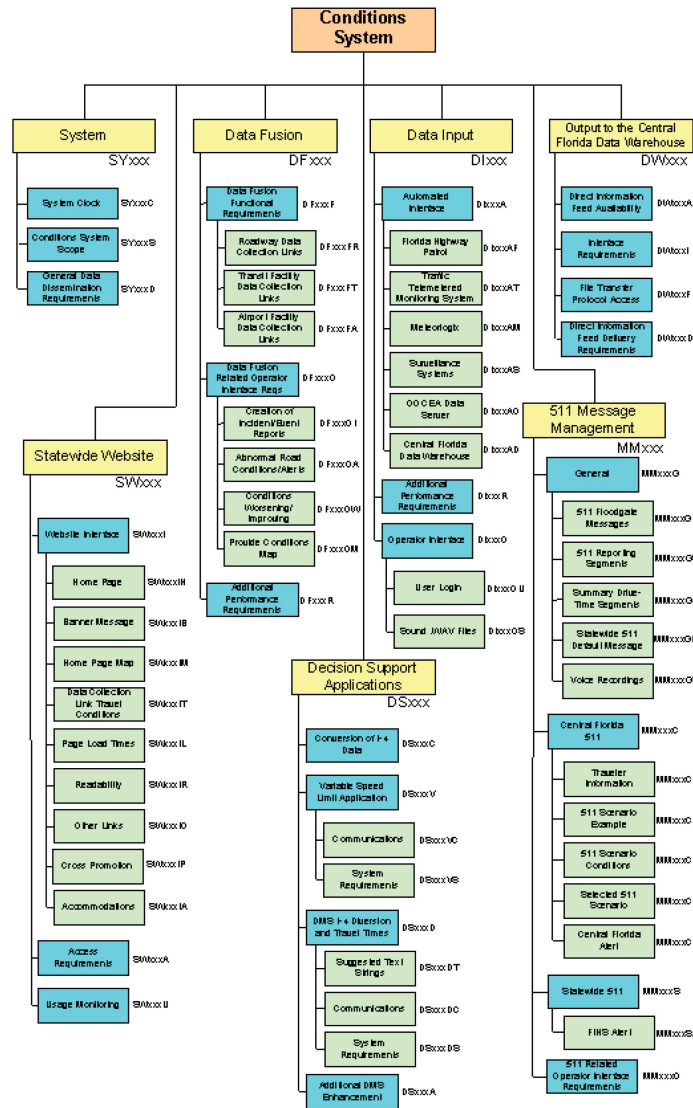


Figure 4.5.2: iFlorida
Conditions System Requirements Database Structure

4.5.1 Sub-system Requirements

System-level Requirements

- SY001 The iFlorida Conditions System shall incorporate automated data from the Florida Highway Patrol's Computer Aided Dispatch (CAD) system, District 5's Surveillance Systems, deployment program.

- SY002 The system shall also include an Operator Interface (the system's Graphical User Interface [GUI]) to enable appropriate personnel from the Department, its partner agencies, a and remotely via a standard Internet browser.

- SY003 The input and output from the iFlorida Conditions System shall be standards compliant to the maximum extent feasible.

- SY004 The iFlorida Conditions System shall also serve as the main statewide traveler information Internet website portal, store and provide the information necessary to operate the si

- SY005 Data collection shall be defined as the collection of data required to meet the basic system requirements outlined in Section 3 (Data Input) of the functional requirements.

- SY006 The selected Contractor shall ensure that the Conditions System is operational at least 99.9% of the time, measured annually. Operational is defined as that the system is runn

SY007 The selected Contractor shall propose the redundant architecture and hot swappable hardware in order to design the system to meet or exceed this operational requirement in

SY008 When the system is running with both the primary and redundant systems operational, the redundant server shall not require any user intervention.

System-level: System Clock Requirements

SY001C The selected Contractor shall coordinate with the Department and OOCEA to incorporate the Master Clock into the Conditions System.

SY002C The Conditions System shall use this Master Clock as the Condition System's master clock.

System-level: Conditions System Scope Requirements

SY001S Although this project does not include the procurement or deployment of field devices, or the provision of physical communication links between field devices, it shall require the:
· An Automated Interface
· An Operator Interface (web-based GUI)
· Software to interact with external applications
· Data Fusion Engine
· System Database

SY002S In order to ensure that all field devices deployed as part of the iFlorida Field Components Project perform in a manner consistent with that expected by the Conditions System's field components to the Conditions System via the Automated Interface.

System-level: General Data Dissemination Requirements

SY001D The content provided by each Data Dissemination Application shall be derived directly from the Conditions System's Data Fusion Engine described in Section 2 of the functional

SY002D The content made available by each Data Dissemination Application for any period of time shall be derived concurrently from the same information source.

SY003D No degradation of content (i.e., reduction in data quality, accuracy, or granularity) shall occur between the integration of data by the Conditions System's Data Fusion Engine and the output of that fused data via any of the Data Dissemination Applications described in this set of functional requirements.

SY005D The selected Contractor shall be responsible for ensuring that all raw and fused data is provided to appropriate end-users according to the requirements outlined in these functional

Data Fusion Requirements

DF001 The selected Contractor shall use existing software, customized to meet the functional requirements, to fuse and store the data required for the successful operation of the Conditions

DF002 The Data Fusion software shall be capable of processing all data sources described in Section 3 of the functional requirements and reporting the content in a format consistent

DF003 The data sources to be utilized shall include, but are not limited to: incident/event data, traffic sensor data, and Data Collection Link travel time forecasts.

DF004 All fused data shall be integrated in a standardized database.

DF005 Proposers shall suggest a database for use as part of the Conditions System based on the need to meet the requirements outlined in the functional requirements, overall cost-

Data Fusion: Data Fusion Functional Requirements

DF001F The Conditions System shall fuse and divide information into Data Collection Links to provide the basis for Data Collection Link Reports.

DF002F Data Collection Link information shall be presented at two levels.

DF003F The first level shall include a statewide, i.e., Florida Intrastate Highway System (FIHS) incident/event and weather reporting system.

DF004F The second level shall include a more robust level of segment-related incident/event, traffic sensor and Data Collection Link travel time data, and weather reporting pertaining to

DF005F The Conditions System shall be capable of fusing information from multiple automated and manual sources into a single report for each Data Collection Link, including weather

DF006F The fused data shall be derived from the various sources during concurrent time periods, having no duplicative information within a single Data Collection Link Report.

DF007F The selected Contractor shall implement the FIHS and Central Florida Data Collection Links identified in Appendix A of the Conditions System Functional Requirements.

DF008F The Conditions System Operator Interface shall have the ability to modify these Data Collection Links once the system is operational.

DF009F The Data Collection Links listed in Appendix A of the Conditions System Functional Requirements shall be the initial (default) list of road links.

DF010F The Conditions System shall be sufficiently scaleable to accommodate 100% growth in the number of required Data Collection Links, based on the size of the system at project

DF011F Data Collection Links are the lowest level for which the Data Fusion Engine will aggregate data (i.e. - Data Collection Links shall not be subdivided.).

DF012F Moreover, the Conditions System shall be scaleable such that it is capable of accepting data from additional data sources, including both data provided by the Department, as v

DF013F All processing conducted by the Conditions System associated with the collection, fusion, and dissemination of data shall introduce a latency of no more than two (2) minutes.

Data Fusion: Data Fusion Functional: Roadway Data Collection Links Requirements

DF001FR The Conditions System shall be capable of fusing and storing information for the Data Collection Links defined in Appendix A of the Conditions System Functional Requirement

DF002FR The Conditions System shall be capable of supporting both automated and manual data inputs for the Data Collection Links found in Appendix A of the Conditions System Fun

DF003FR The Operator Interface, through the Administrator level, shall provide the ability to add, delete, and modify FIHS and Central Florida Data Collection Links.

DF004FR Performing any of these functions shall alter the initial lists of FIHS and Central Florida Data Collection Links as listed in Appendix A of the Conditions System Functional Requi

DF005FR Upon adding or modifying FIHS and Central Florida Data Collection Links, the Conditions System shall begin fusing data on the new or modified road segments a maximum of

DF006FR The Conditions System shall ignore data received on deleted Data Collection Links.

DF007FR If the newly added or modified Data Collection Link exists on a road that was not originally listed in the FIHS and Central Florida Data Collection Link lists (Appendix A of the C

DF008FR The selected Contractor shall coordinate with the Department and/or the myFlorida.com Webmaster to develop an efficient method of updating the statewide <http://www.myflorida.com> an automatic process to the <http://www.myflorida.com> web server.

DF009FR Adding, deleting, or modifying Data Collection Links shall not require any programming or database table modifications.

DF010FR However, adding, deleting, and modifying shall be restricted to an Administrator level login via the Operator Interface. Reference Section 3.3.1 of the functional requirements fo

Types of data to be fused and stored shall include, but not be limited to:

- DF011FR · Incident Data: Vehicle breakdowns/crashes and other unplanned vehicle stoppages, emergency roadway construction, weather conditions and alerts, air-quality alerts, and di
- Construction and Maintenance: Transportation-related information regarding construction and maintenance activities and other scheduled delays, and lane closures shall be i
- Major Activities/Events: Activities/events that may impact the expected flow of traffic shall be included. Locations and times of major venue events, for those facilities within the

DF012FR The Conditions System shall interface with the Central Florida Data Warehouse to obtain Central Florida Data Collection Link-related travel forecasts.

DF013FR The Conditions System shall not be responsible for generating the Data Collection Link forecasts, but shall accommodate and store them.

DF014FR However all of these functions shall be restricted to an Administrator level login.

Data Fusion: Data Fusion Functional: Transit Facility Data Collection Links Requirements

DF001FT The Conditions System shall be capable of fusing and storing information for the Central Florida Regional Transportation Authority, doing business as LYNX.

DF002FT An operator shall have the ability to manually enter data from LYNX via the Operator Interface.

DF003FT Transit information shall include service events, major disruptions, and any other valued information for transit travelers.

DF004FT The selected Contractor shall coordinate with LYNX to determine what other types of information are necessary to accurately depict the status of the LYNX system.

DF005FT If overall services or travel are operating normally, then the Conditions System shall set the status of the appropriate Transit Facility Data Collection Links to normal operation.

DF006FT The Transit Facility Data Collection Links shall be capable of being expanded to include a minimum of six (6) additional transit facilities.

Data Fusion: Data Fusion Functional: Airport Facility Data Collection Links Requirements

DF001FA The Conditions System shall be capable of fusing and storing information for the Orlando International and Orlando-Sanford International Airports.

DF002FA An operator shall have the ability to manually enter data from various airports via the Operator Interface.

DF003FA The Conditions System shall contain passenger-focused information on these properties such as notifications of general service disruptions caused by weather and/or anomalc

DF004FA The selected Contractor shall coordinate with the Orlando International and Orlando-Sanford International Airports to determine what other types of information are necessary t

DF005FA If overall travel conditions are normal, then the Conditions System shall set the status of the appropriate Airport Facility Data Collection Links to normal operation.

DF006FA The Airport Facility Data Collection Links shall be capable of being expanded to a minimum of three (3) additional airport facilities.

Data Fusion: Related Operator Interface: Creation of Incident/Event Reports Requirements

DF001OI The Operator Interface shall have the ability to create Incident/Event Reports based on operator-entered data.

DF002OI The operator shall also have the ability to modify and/or delete Incident/Event Reports.

The Incident/Event Reports shall include a number of required fields to be populated by the operator. These required fields may include, but are not limited to:

- Roadway/Facility Data Collection Link
- Incident/Event Type
- DF003OI · Severity
- Impact to Traffic
- Location
- Estimated Clear Time

DF004OI The Severity and Impact to Traffic fields shall be limited to a finite number of choices which the operator shall be able to choose from Severity and Impact to Traffic lists using "

DF005OI The Operator Interface shall allow the operator to select "No Estimated Clear Time," in which case no Estimated Clear Time shall be required.

DF006OI In such cases where "No Estimated Clear Time" is selected, the operator shall have the option to select a "Reminder" time when an alert shall be presented to them reminding

DF007OI In addition to the listed required fields, the Operator Interface shall require any other fields pertinent to the Department's Construction Report, Transit Facility Incident/Event Re

DF008OI The selected Contractor shall coordinate with the necessary agencies to determine these fields.

DF009OI The Operator Interface shall be capable of alerting the operator prior to a previously entered Estimated Clear Time being reached.

DF010OI An Estimated Clear Time shall be defined as the time an incident/event is expected to clear or the information is no longer valid.

DF011OI The operator shall have an option to extend the Estimated Clear Time if the incident/event has not cleared or is still valid.

DF012OI The Operator Interface shall not alert the operator for a specific road segment if "No Estimated Clear Time" was selected in the Incident/Event Report, unless the operator had :

DF013OI The amount of time prior to an Estimated Clear Time being reached at which an operator is alerted shall be configurable; with the default being set at 5 minutes.

Data Fusion: Related Operator Interface: Abnormal Road Conditions/Alerts Requirements

DF001OA The Conditions System shall have the capability to determine whether an abnormal road condition and/or alert exist for a specific Data Collection Link.

DF002OA When an abnormal road condition and/or an alert is determined, the Conditions System shall report to the operator via the Conditions System's Operator Interface the cause ar

DF003OA Once an abnormal road condition and/or alert has been cleared for a specific Data Collection Link, then the operator shall be informed via Operator Interface within 15 seconds

The thresholds that dictate whether a given Data Collection Link exhibits an abnormal road condition and/or alert status include the following:

- In Central Florida, when no incident/event reports or adverse weather conditions exist, but travel times (delays) exceed thresholds identified as part of predefined 511 Scenari
- DF004OA · When an incident/event is affecting throughput capacity of the Data Collection Link. The selected Contractor shall work with the Department to determine the level of impact th
- When verifiable construction is occurring affecting throughput capacity of the Data Collection Link. The selected Contractor shall work with the Department to determine the le
- When adverse weather conditions presently exist or are forecasted within the next 60 minutes that will affect throughput capacity or safety along the Data Collection Link. The

DF005OA The Conditions System shall constantly monitor newly fused Data Collection Links verifying whether or not an alert previously sent to the operator via the Conditions System's (

Data Fusion: Related Operator Interface: Conditions Worsening/Improving Requirements

DF001OW The Operator Interface shall have a menu selection allowing an operator to indicate whether current conditions are worsening, improving, or remaining the same for Central Flo or worse.

DF002OW The contractor shall suggest appropriate language for these selections, and may include "no selection" as one of the choices.

Data Fusion: Related Operator Interface: Provide Conditions Map Requirements

DF001OM The Operator Interface shall provide a FIHS Conditions map and a Central Florida Conditions map.

DF002OM The FIHS Conditions map shall display all FIHS Data Collection Links and the Central Florida Conditions map shall display all Central Florida Data Collection Links, as listed in

DF003OM The FIHS Conditions map shall be similar to the Home Page map provided on the statewide FIHS website.

- DF004OM Even so, the FIHS Conditions map shall differ from the Internet Home Page map provided on the statewide FIHS website in that the FIHS Conditions map shall be capable of d
- DF005OM All segments on each map shall be color-coded and clickable.
- DF006OM The Operator Interface shall adhere to the following color-coding scheme for road segments on both maps:
- Green: No abnormal road conditions and/or alerts and traffic is free-flowing or light.
 - Yellow: Planned construction/closing lanes (only during the hours of construction operation), FHP incidents/closing lanes, slowing traffic, or any abnormal road conditions and
 - Red: Current severe weather, road closures, major incidents, or construction causing significant delays to travelers. Includes severe traffic delays in the Central Florida region
- DF007OM The Conditions System shall determine the appropriate color code based on the best available data.
- DF008OM If available traffic data is not sufficient for the Conditions System to make this determination, then the road segment shall report a "Gray" traffic level.
- DF009OM Upon clicking on a road segment on either map, a popup window shall be launched displaying all fused data associated with the selected Data Collection Link.
- DF010OM Due to quantity and nature of the input data available to the Conditions System, the Central Florida road segments shall have more fused data associated with a chosen Data C
- DF011OM The Operator Interface shall provide the ability for the operator to select the time period pertaining to the displayed traffic conditions for the Central Florida Conditions map.
- DF012OM The time periods shall include the following:
- Current: The Central Florida Conditions map shall display the most current traffic conditions. When this is selected, the data shall be updated at a minimum of once per minute
- DF0013OM The time periods shall include the following:
- Future Time Period: The Central Florida Conditions map shall display predictive traffic conditions based on the Central Florida Data Warehouse's predictive data.
- DF014OM The time periods shall include a number of hours/calendar days into the future depending on the quality of data available from the Central Florida Data Warehouse.
- DF015OM The operator shall have the ability to specify the number of hours/calendar days into the future desired.
- DF016OM The Central Florida Conditions map shall also provide the ability to display the traffic conditions in a tabular format on a single selected Data Collection Link evolve over time.

Data Fusion: Additional Performance Requirements

- DF001R New data must be incorporated into the Conditions System within one minute of being entered by an operator or made available by an automated feed.
- DF002R All information contained in the Data Collection Link Reports shall include accurate descriptions in terms plainly understandable to users unfamiliar with transportation terminol
- DF003R The Conditions System shall not degrade the accuracy of the data it receives and processes.
- DF004R The Conditions System shall have the ability to resolve disputes/anomalies that occur within the data stream.
- DF005R The Conditions System shall never report that "no data is available" for a given Central Florida Data Collection Link.
- DF006R Instead, the Conditions System shall have the ability to dynamically resolve "missing" Central Florida Data Collection Links (whether they be single/multiple individual links or r
- DF007R The selected Contractor shall coordinate with the Department to determine what data sources can be used to dynamically fill such "data gaps".
- DF008R The Operator Interface shall describe any errors that might have occurred during the data fusion process (automated fusion of data gathered by sensors along the Data Collect
- DF009R The Operator Interface shall describe the nature of any errors in language that is easy to understand and informative enough that the operator can properly troubleshoot any ar
- DF010R All errors shall be included as part of a continuously viewable "errors list."
- DF011R The Operator Interface shall provide for the "errors list" to be updated at configurable amounts of time; the default update rate shall be once every minute.
- DF012R The Conditions System shall be capable of fusing data 24-hours per day, seven days per week, for any contiguous 365-day period.
- DF013R The selected Contractor shall ensure that information for each Data Collection Link is available 98% of the time in whole or part, measured annually, except for service anomali
- DF014R All service disruptions defined as being "beyond the selected Contractor's control" are subject to the following limitation: Neither the selected Contractor, the Department, nor ar negligence. Causes beyond each party's control include, but are not limited to: Acts of God or war; changes in controlling law, regulations, orders, or the requirements of any gc or its partners where no other source of supply is available; power failures; telecommunication failures; and freight embargoes.

DF015R The Conditions System shall be sufficiently flexible to allow for the periodic addition, reconfiguration, or redefinition of Data Collection Links (including the addition and/or deletion of Data Collection Links).

Data Input Requirements

DI001 The iFlorida Conditions System shall utilize both an Automated Interface and an Intranet/Internet-oriented Operator Interface to facilitate data input.

The Condition System's automated interface shall accept data feeds from the following sources:

- Central Florida's Management Information System for Transportation (MIST)
- The Orlando-Orange County Expressway Authority's (OOCEA) Data Server
- Meteorlogix's (Mx) weather information

DI002

- The Florida Highway Patrol's (FHP) Computer-Aided Dispatch (CAD)
- The Department District 5's Surveillance Systems
- Central Florida Data Warehouse

DI003 The automated interface shall consist of an API (Application Program Interface) through which each of the participating organizations will transmit their respective data to the Conditions System.

DI004 This API shall be configured so as to have the ability to accommodate all existing data feeds, as well as additional data feeds, as they become available.

The Intranet/Internet Operator Interface shall have the capability of accepting operator-entered incident/event data related to the following:

DI005

- Transit Facility information
- Airport Facility information
- Construction and Incident Information on Covered Roadways

Data Input: Automated Interface Requirements

DI001A The selected Contractor shall coordinate with the necessary agencies and firms to establish the best method for implementing this interface, as well as to facilitate transmission of data to the Conditions System.

Data Input: Automated Interface: Florida Highway Patrol Requirements

DI001AF The selected Contractor shall coordinate with FHP and FHP's development vendor to determine the best method of receiving incident/event from the FHP's CAD servers, and to ensure that incident/event data will be "pushed" into the Conditions System via the automated interface.

Data Input: Automated Interface: Meteorlogix Requirements

This information shall be applied directly to the Condition System's pre-defined road segments via an application called RouteWatch. RouteWatch output shall be formatted as follows:

DI001AM

- Road Speed Summaries
- Thunderstorm and Tornado bulletins for the next hour, as well as 15 and 30-minute forecasts of significant storm motion that will affect a given Data Collection Link.
- Short-term "nowcast" of the Road Speed Index (delivered as a "flow factor," where the factor is a percentage of the posted speed limits). This data is based upon current precipitation.
- Other road alerts

Data Input: Automated Interface: Central Florida Data Warehouse Requirements

DI001AD The Conditions System shall interface with the Central Florida Data Warehouse (CFDW) to provide Central Florida traffic data, as well as raw weather, FHP CAD, and operator-entered incident/event data.

DI002AD The Conditions System shall subsequently fuse the segment forecasts transmitted by the CFDW into the final Data Collection Links.

Data Input: Operator Interface Requirements

DI001O The Condition System's Operator Interface shall be a web-based system that shall enable users to manually enter relevant data via an Intranet/Internet connection.

DI002O This interface shall dynamically produce HTML pages and utilize JavaScript functions to create a user-friendly, intuitive medium that the average user can easily understand.

Data Input: Operator Interface: User Login Requirements

DI001OU The Operator Interface shall provide users with a login screen on which they will be required to enter their user name and password.

DI002OU The Conditions System shall have a minimum of 50 operator-level users and one administrator-level user.

DI003OU Operator-level users shall be furnished with the ability to enter data into the system, but shall be unable to alter system configuration.

DI004OU Administrator-level users shall have all the capabilities of operator-level users, plus an ability to alter system configuration and add, delete, and edit other users' accounts.

DI005OU Upon operator/administrator login, a pop-up window shall open displaying all recently updated information, including all active incident/event reports.

DI006OU As other users enter additional data into the system, this pop-up window shall be updated and the user alerted.

Data Input: Operator Interface: Sound .WAV Files Requirements

- DI001OS The Operator Interface shall be capable of recording and previewing .WAV files.
- DI002OS The selected Contractor shall determine the best approach to record and preview any such files, whether pre-recorded (canned) or custom-made.

Data Input: Additional Functional Requirements

- DI001R The Conditions System shall have the ability to resolve disputes/anomalies/timeout issues that may occur during the exchange of data.
- DI002R Neither the Automated nor Operator Interfaces shall degrade the accuracy of any of the data they collect at any time.
- DI003R All interfaces, including the Operator Interface, shall be capable of exchanging data 24-hours per day, seven days a week, during any contiguous 365 day period.
- DI004R All interfaces shall be sufficiently flexible to allow for the periodic addition, reconfiguration or redefinition of fields, at minimum cost, without any loss of current or past data, in or
- DI005R The Conditions System shall gather internal status data concerning its operation and make this information available to the user.
- DI006R Users shall also be provided with the capability of managing system operation and resolving system performance issues via the Operator Interface.

511 Message Management: General Requirements

- MM001G The Conditions System's interface with the Central Florida and Statewide 511-telephone services shall include the development of a table, called 511 Reporting Segments, and
- MM002G Information shall be delivered in such a manner as to complement the medium over which it is being delivered.

511 Message Management: General: 511 Floodgate Messages Requirements

- MM001GF The top level of the 511-telephone system shall include an entry for a Special Floodgate Message only if the operator has added this message via the Operator Interface.
- MM002GF The Operator Interface shall provide the ability to add/modify, remove, and preview Floodgate Messages (.WAV files) relevant to the entire state (played to all users at the top le
- MM003GF When adding Floodgate messages, the Conditions System shall insert the Floodgate voice recording into the 511 Reporting Segments table of .WAV files, designating it as a sp
- MM004GF Each Floodgate Message recording shall have a maximum length of 60 seconds.
- MM005GF The second level of the 511-telephone system shall include an entry for a Special Floodgate Message relevant to a roadway facility, section of roadway facility, or specific 511 F
- MM006GF These Floodgate Messages shall play ONCE, just after 511-telephone service user has selected the 511 Reporting Segment in which they are interested, and shall not be inter
- MM007GF The Operator Interface shall also provide the ability to add/modify, remove, and preview Floodgate Messages (.WAV files) relevant to an entire roadway facility (played to all us

511 Message Management: General: 511 Reporting Segments Requirements

- MM001GS The Conditions System shall distinguish between Central Florida 511 Reporting Segments and FIHS 511 Reporting Segments; containing one entry for every Central Florida 51
- MM002GS The Conditions System shall link all 511 Reporting Segments to a table of pre-recorded .WAV files.
- MM003GS The initial pre-defined 511 Reporting Segments for the Central Florida and statewide FIHS systems that the selected Contractor shall use in support of this project are denoted
- MM004GS The Conditions System shall have the ability to manage a minimum of 100 Central Florida 511 Reporting Segments and 150 FIHS 511 Reporting Segments.
- MM005GS The Operator Interface shall provide a list of 511 Reporting Segments, that is the entire table of currently applicable .WAV files that shall be shared with the Statewide and Cent

511 Message Management: General: Summary Drive-Time Segments Requirements

- MM001GD The Conditions System shall have the capability to provide summary reports on up to a minimum of 25 (twenty-five) Drive-Time Segments.
- MM002GD A Summary Segment Report shall encompass a Travel Corridor, including multiple Data Collection Links, and possibly more than one roadway.
- MM003GD All Summary Drive-Time Segments shall include information concerning both directions of travel.
- MM004GD Only an administrator-level user shall have the ability to create, edit, or delete these Summary Drive-Time Segments.
- MM005GD All Summary Drive-Time Segments shall be available to the Central Florida Data Warehouse and the Central Florida 511 telephone service.
- MM006GD Once created, the Conditions System shall calculate the total Travel Time along the Summary Drive-Time Segment by summing the travel times along each Data Collection Lin
- MM007GD This information shall be provided to the 511-telephone services as a text report;

511 Message Management: General: Statewide 511 Default Message Requirements

- MM001GM In the event that no anomalous conditions are present along a particular Statewide 511 Reporting Segment, a default outgoing message shall be used.
- MM002GM The selected Contractor and the Department shall agree on the exact language for this default message during the system design phase.

MM003GM The default message shall have a maximum length of 30 seconds.

511 Message Management: General: Voice Recordings Requirements

MM001GV A recorded human voice shall be used to report current traffic conditions using complete sentences.

MM002GV All voice recordings shall be recorded/stored via the Operator Interface.

MM003GV All voice recordings shall be saved in a .WAV file format.

MM004GV The operator shall have the ability to preview all voice recordings via the Operator Interface.

511 Message Management: Central Florida 511 Requirements

MM001C The Conditions System shall enable operators to configure a set of pre-recorded scenarios for each Central Florida 511 Reporting Segment via the Operator Interface.

MM002C The Conditions System shall allow a minimum of 30 scenarios per Central Florida 511 Reporting Segment.

MM003C A scenario shall be defined as a Boolean comparison of travel times and conditions for Central Florida 511 Reporting Segments along specific Central Florida limited-access or

511 Message Management: Central Florida 511: Traveler Information Requirements

MM001CT The traveler information contained in the Central Florida 511 Reporting Segments shall include, but not be limited to: generalized conditions and/or traffic flows, travel times, inf (when appropriate).

MM002CT The pre-recorded scenarios shall only contain generalized conditions and/or traffic flows and travel times.

MM003CT The selected Contractor shall ensure that the Conditions System provides all pertinent information in a timely fashion.

511 Message Management: Central Florida 511: 511 Scenario Example Requirements

MM001CE 511 Scenarios shall apply only to Central Florida road segments, as these scenarios are chosen based on pre-determined conditions associated with automated data.

MM002CE The selected Contractor shall ensure that the Boolean logic string used by the Conditions System has the ability to evaluate data collected from both directions of travel as part

MM003CE Additionally, the selected Contractor shall ensure that the Conditions System has the ability to support the analysis of data from multiple segments and/or groups of segments a

MM004CE The Conditions System shall allow an Administrator to edit a 511 Scenario's Boolean logic string.

511 Message Management: Central Florida 511: 511 Scenario Conditions Requirements

MM001CC When the Conditions System determines that the conditions are true for a particular scenario, then the system shall select the pre-recorded .WAV file associated with that scen:

MM002CC If no pre-recorded .WAV file is associated with a given scenario, then the operator shall be alerted via the Operator Interface.

MM003CC The Operator Interface shall alert the operator if all 511 Scenarios are found to be false for a specific Central Florida 511 Reporting Segment.

MM004CC If the operator does not record an override message when no 511 Scenario is found, the Conditions System shall trigger additional alerts until the operator records an override

MM005CC Consequently, no message shall be associated with such a Central Florida 511 Reporting Segment until the operator creates an override message.

511 Message Management: Central Florida 511: Selected 511 Scenario Requirements

MM001CS When the Conditions System selects a scenario for a given segment, the associated .WAV file shall be added to that 511 Reporting Segment's .WAV file table, which shall be sl

MM002CS The Operator Interface shall provide a list of selected 511 Scenarios and the qualifying conditions that make the 511 Scenarios' conditions true.

MM003CS The Operator Interface shall provide a map of the Central Florida area that visually depicts the 511 Reporting Segments.

MM004CS Each of the 511 Reporting Segments shall be labeled with the 511 Scenario Number that is currently selected.

MM005CS Upon clicking on a 511 Reporting Segment, the Operator Interface shall display the qualifying condition(s) that make the selected 511 Scenario true via a pop-up window.

MM006CS The Operator Interface shall also provide the ability to preview the pre-recorded .WAV file associated with the selected 511 Scenario.

MM007CS If a 511 Reporting Segment has an override message associated with it, this map shall indicate that the 511 Scenario has been overridden via an "override" map label or disting

MM008CS For 511 Reporting Segments with an override message, the Operator Interface shall provide the ability to preview the override message.

511 Message Management: Central Florida 511: Central Florida Alert Requirements

MM001CA If an incident/event, significant weather condition, or any other abnormal traffic-related conditions occurs on a particular Central Florida 511 Reporting Segment, then the operator

MM002CA The operator shall then have the ability to record a unique override message.

MM003CA The Conditions System shall replace the selected 511 Scenario message with the override message.

511 Message Management: Statewide 511 Requirements

MM001S The Conditions System shall provide selected .WAV files to the Statewide 511 service within one minute of their being recorded.

511 Message Management: Statewide 511: FIHS Alert Requirements

MM001SA If an incident/event, significant weather condition, or any other abnormal traffic-related conditions occurs on a particular FIHS 511 Reporting Segment, then the operator shall b

MM002SA The operator shall then have the ability to record a unique override message.

MM003SA The Conditions System shall replace the default message with the override message.

511 Message Management: 511 Related Operator Interface Requirements

MM001O The Operator Interface shall provide the ability to add, delete, and modify 511 Scenarios and 511 Reporting Segments.

MM002O Performing any of these functions to the 511 Reporting Segments shall alter the initial lists of FIHS and Central Florida 511 Reporting Segments as listed in Appendix A of the C

MM003O The system administrator (or an approved operator) shall be able to record a 511 Scenario report in a .WAV file format and associate the .WAV file with a 511 Scenario.

MM004O The maximum length for a scenario .WAV file shall be 30 seconds.

MM005O The Conditions System shall have the ability to archive a minimum of 1000 scenario .WAV files.

MM006O The operator shall be able to view a list of currently selected scenarios.

MM007O When a scenario is newly selected, the Conditions System shall insert the newly selected scenario into the 511 Segment Reports automatically, without any operator actions.

MM008O If the operator chooses to reject the selected scenario (even if there is no abnormal condition or alert has been issued), the operator shall have an option to select a different sc

MM009O The override message shall be a maximum length of 60 seconds.

MM010O The Conditions System shall have the ability to archive a minimum of 200 override messages.

MM011O At any time, an operator shall have the ability to override a selected scenario with an override message.

MM012O Upon adding or modifying FIHS and Central Florida 511 Reporting Segments, the Conditions System shall begin fusing data on the new or modified 511 Reporting Segments a

MM013O The Conditions System shall ignore data received on deleted 511 Reporting Segments.

MM014O If the newly added or modified road segment exists on a road that was not originally listed in the FIHS and Central Florida 511 Reporting Segments (Appendix A of the Conditio

MM015O The Operator Interface shall provide the ability to add, delete, or modify any road in the state of Florida.

MM016O Additions, deletions, or modifications shall not require any programming or database table modifications.

MM017O However all of these functions shall be restricted to an Administrator.

Statewide Website Requirements

SW001 The selected Contractor shall disseminate Conditions System FIHS data via a FIHS Internet-based traveler information website.

SW002 This site shall be directly accessible by way of the Department's website (<http://www.myFlorida.com>).

SW003 As part of this statewide website, the selected Contractor shall include links to all other metropolitan area traveler information systems in the state.

SW004 This shall include Orlando (Central Florida), Southeast Florida, Tampa, and (later) Jacksonville.

SW005 The selected Contractor shall provide sizing and volume-related information to the Department in order to ensure that the Department's website (<http://www.myFlorida.com>) is c

SW006 The selected Contractor shall coordinate with appropriate personnel from Florida's Office of Information Services to determine detailed requirements for web posting.

Statewide Website: Website Interface: Home Page Requirements

SW001IH The selected Contractor shall design, develop, and implement an Internet website whose Home Page displays a map of the state and has the capability to navigate to the metr

SW002IH The selected Contractor shall additionally propose the means by which users will navigate to the information desired.

SW003IH From the Home Page, the user shall be able to access information for a requested segment with no more than two "clicks" of the mouse, unless one of these "clicks" takes the

Statewide Website: Website Interface: Banner Message Requirements

SW001IB The Home Page shall display a banner message above the state map, which shall provide emergency information and/or serious/major conditions affecting the entire state or a

SW002IB The Operator Interface shall be capable of making, adding to, deleting, or otherwise modifying the statewide website banner.

SW003IB The selected Contractor shall coordinate with the Department and/or the myFlorida.com Webmaster to develop an efficient method for updating the banner.

Statewide Website: Website Interface: Home Page Map Requirements

SW001IM The selected Contractor shall develop a Home Page map that allows users to select a given FIHS segment (by clicking on the road segment) in order to view its most recently u

SW002IM As with the 511-telephone services, no road segment shall ever be labeled as having "no data".

SW005IM The insertion of such icons shall be a simple process not requiring major website redesign or database update.

SW006IM The Home Page map shall include all FIHS roads partitioned by FIHS road segment as defined in Appendix A of the Conditions System Functional Requirements.

SW007IM Each FIHS road segment shall be color-coded.

SW008IM The statewide website shall adhere to the following color-code definition:
· Green: No abnormal road conditions and/or alerts.
· Yellow: Planned construction/closing lanes (only during the hours of construction operation), near-term inclement weather conditions (within 60 minutes), FHP incidents/closin
· Red: Current severe weather, road closures, major incidents, or construction causing significant delays to travelers.

SW009IM A legend of all color-coding and traffic-related icon descriptions shall be available on the same page as the map.

SW010IM The map, including the color-coded segments, shall automatically update after configurable amounts of time;

SW011IM the default update rate shall be once per minute.

SW012IM The Home Page map shall have clickable links that will route the user to the following regional websites:
· Central Florida (<http://www.iflorida.org>)
· Southeast Florida (<http://www.smarttraveler.com/scripts/sflmap.asp?city=sfl&cityname=South+Florida>)
· Tampa Bay Area (website address TBD)
· Florida-Georgia Border (<http://www.georgia-navigator.com>)
· Florida-Alabama Border (<http://www.fhwa.dot.gov/trafficinfo/al.htm>)
· Jacksonville Area (website address TBD)

SW013IM The Home Page map shall be designed such that the integration of additional clickable links to other regional websites is a simple process not requiring major website redesign

SW014IM Clicking on the icon shall open a pop-up window displaying relevant information for use by website users.

SW015IM These pop-up windows shall be capable of displaying a variety of items, including both text and image captures (in JPEG file format).

Statewide Website: Website Interface: Data Collection Link Travel Conditions Requirements

SW001IT Details on Data Collection Link travel conditions shall be provided, either through opening a pop-up window or by opening a new web page with the additional information, whei

SW002IT Data Collection Link naming shall be consistent, with the start and end points of the segments being well-defined and easily understood.

SW003IT All detailed Data Collection Link reports shall provide information for both directions of travel along a selected segment.

Statewide Website: Website Interface: Page Load Times Requirements

SW001IL The selected Contractor shall make every effort to ensure that users are not confronted with inordinately long website load times.

SW002IL To that end, the selected Contractor shall work with the Department to ensure that the website is designed and data provided by the Conditions System such that reasonable w

Statewide Website: Website Interface: Readability Requirements

SW001IR Information shall be delivered in such a manner as to complement the medium over which it is being delivered.

SW002IR Therefore, messages delivered through the Internet website shall be formatted in brief, non-technical language that is readily understandable by the average user.

Statewide Website: Website Interface: Other Links Requirements

SW001IO The website shall provide a link to a Help Page offering information in text and/or graphic format on the basic use of the Internet website, and listing types of content available c

- SW002IO A separate page shall also include information pertaining to the use of the 511-telephone service, including, at a minimum, a listing of all commands (both voice and touch-tone).
- SW003IO The website shall have an e-mail link that will enable users to send a message to the Webmaster (Customer Service).
- SW004IO The website shall have the capability of linking to other websites as directed by the Department.
- At a minimum, the website shall have clickable links that will route the user to the following websites:
- Florida Transit Agencies (http://www.apta.com/links/state_local/fl.cfm)
 - Amtrak (<http://www.amtrak.com>)
 - Florida Airports (<http://www11.myflorida.com/aviation/>)
 - I-95 Corridor Coalition (<http://www.i95coalition.org/>)
- SW005IO
- SW006IO The website shall be designed in such a manner that the integration of additional clickable links to other websites is a simple process not requiring major website redesign.
- SW007IO The selected Contractor shall develop a method for identifying and fixing broken links to other websites in a timely fashion.

Statewide Website: Website Interface: Cross Promotion Requirements

- SW001IP The website shall promote use of the 511-telephone service.
- SW002IP This promotion, in the form of the 511 logo (and possibly additional text), shall be located on all pages of the website.
- SW003IP The selected Contractor shall coordinate with the Department to refine the manner in which cross-promotion will occur.

Statewide Website: Website Interface: Accommodations Requirements

- SW001IA The selected Contractor shall coordinate with the iFlorida Project Manager and the myFlorida.com website manager to ensure that the Internet website complies with Section 5

Statewide Website: Access Requirements

- SW001A The selected Contractor shall coordinate with the myFlorida.com website manager to determine existing performance requirements and scalability.
- SW002A The selected Contractor, as part of the analysis to be performed during the system design phase, shall provide the Department with an updated traffic analysis for the website.
- SW003A In the event that the website is unable to accommodate the additional iFlorida traffic requirements, the selected Contractor shall notify the Department in writing of this potential

Statewide Website: Usage Monitoring Requirements

- SW001U The selected Contractor shall employ a usage monitoring system to obtain information about patterns of usage of different parts of the Internet website.
- SW002U The selected Contractor shall propose in its design what parameters will be tracked.

Output to Data Warehouse Requirements

- DW001 The selected Contractor shall provide Conditions System data to the Central Florida Data Warehouse (CFDW) via a direct information feed.
- DW002 This data feed shall include, but not be limited to, real-time Central Florida Data Collection Link Reports, as well as raw weather, FHP CAD, and operator-entered incident and
- DW003 To be clear, the data flow between the Conditions System and the CFDW shall occur in three steps.
- DW004 The content provided to the CFDW via the direct information feed shall be derived directly from the Conditions System's data fusion engine.
- DW005 As with other dissemination media, no degradation of content shall occur between the Conditions System's fusion engine and the output of that content by the direct information
- DW006 The Conditions System shall provide all appropriate data to the direct information feed within one minute of its becoming available.

Output to Data Warehouse: Direct Information Feed Availability Requirements

- DW001A The Direct Information Feed shall be capable of providing data to the CFDW 24-hours per day, seven days a week, during any contiguous 365-day period.
- DW002A In instances when the Conditions System is experiencing problems, the Direct Information Feed shall be provided with a message to inform both the Operator Interface and the
- DW003A The Direct Information Feed shall be available for use by the Data Warehouse at least 98% of the time, except for service disruptions beyond the selected Contractor's control.
- DW004A Availability shall be measured as a percentage of "up time" and shall be monitored and reported by the selected Contractor on both a monthly and annual basis.

Output to Data Warehouse: Interface Requirements

- DW001I The Direct Information Feed shall be available via a documented interface.
- DW002I The selected Contractor shall make staff available to assist the operator of the CFDW in understanding the Direct Information Feed interface.
- DW003I The Direct Information Feed shall be available in a common format capable of being imported into a standard database product for use by the CFDW.
- DW004I The selected format shall be sufficiently documented by the selected Contractor to facilitate ease of usage.

Output to Data Warehouse: File Transfer Protocol Access Requirements

- DW001F The Direct Information Feed shall be accessible by the CFDW through standard FTP sessions following the National Transportation Communications for ITS Protocol (NTCIP)
- DW002F The selected Contractor shall maintain an FTP site for this purpose.

Output to Data Warehouse: Direct Information Feed Delivery Requirements

- DW001D The Application Programming Interface (API) used to access the Direct Information Feed shall be capable of generating error messages in cases where the data slated for delivery is unavailable, or only a portion of the data is unavailable.
- DW002D These messages shall indicate whether all data slated for delivery is unavailable, or only a portion of the data is unavailable.
- DW003D The exact details and format of these error messages shall be outlined during the design phase of the Direct Information Feed's development.
- DW004D The selected Contractor shall ensure that the database file contains timestamps indicating the date/time (in a commonly used format) that the file was created and/or last modified.
- DW005D This time stamp shall not be stored within the content area of the file.

Decision Support Applications Requirements

- DS001 The Conditions System's Operator Interface shall provide a Decision Support window for the Variable Speed Limit (VSL) signs and Dynamic Message Signs (DMS) located along I-4.
- DS002 The Decision Support window shall display currently recommended speed limits, alert users when speed limit changes are recommended, display currently recommended DMS messages, and display the status of the DMS.
- DS003 All status updates and/or recommendations shall refresh at a configurable rate; the default rate being once per minute.
- DS004 All information displayed as part of the Conditions System's Decision Support Applications shall include accurate descriptions in terms plainly understandable to users unfamiliar with the system.

Decision Support Applications: Conversion of I-4 Data Requirements

- DS001C This sub-project shall require the development of an application to convert existing Surveillance Systems speed, volume, and occupancy data collected from loop detectors and convert it into a format compatible with the Conditions System.
- DS002C These travel times shall be associated with and fused into the Central Florida Data Collection Links and 511 Reporting Segments.
- DS003C This process shall be automatic, requiring no operator action.

Decision Support Applications: Variable Speed Limit Requirements

- DS001V This sub-project shall require the development of an application to recommend speed limit values for each of the 22 variable speed limit signs deployed as part of the I-4 Variable Speed Limit Trial.
- DS002V Recommended speed limit values shall be determined using real-time and segment forecast information available in the Conditions System.
- DS003V The Conditions System's Operator Interface shall display all recommended speed limit values.

Decision Support Applications: Variable Speed Limit: Communications Requirements

- DS001VC This sub-project shall not directly interface with or control the I-4 VSL Signs.

Decision Support Applications: Variable Speed Limit: System Requirements

- DS001VS This sub-project shall alert the operator in order to recommended changes in speed limit values for each of the 22 VSL signs deployed as part of the I-4 VSL Trial within one minute.
- DS002VS This sub-project shall log all recommended changes in speed limit.
- DS003VS The log file shall list each newly posted speed limit, the corresponding variable speed limit sign(s) involved, and a time/date timestamp.
- DS004VS The log file shall be accessible to the operator via the Condition's System Operator Interface and output to the CFDW.

Decision Support Applications: DMS I-4 Diversion/Travel Times Requirements

- DS001D This sub-project shall include two parts:
- DS002D The first part shall require the development of an application to calculate travel times and/or delays for the SR 417 and SR 423 diversion routes around I-4.
- DS003D This sub-project shall determine these travel times using both real-time and segment forecast information available as part of the Conditions System.
- DS004D The second part shall require the development of an application to calculate travel times and/or delays that occur on I-4.
- DS005D The calculated travel times shall factor in any incidents/events that occur on I-4, as well as any incidents/events that may affect travel times along I-4 (this includes, but is not limited to, accidents, construction, and other events).
- DS006D This sub-project shall display these travel time calculations and/or delays via the Operator Interface.
- DS007D This application shall be capable of producing recommendations for posting on all DMS along I-4.
- DS008D The Conditions System's Operator Interface shall display all recommended DMS messages.

DS009D Each recommendation shall clearly indicate the DMS sign(s) to which the message applies.

DS010D During the system design phase, the selected Contractor shall work with the Department to define default travel time messages.

Decision Support Applications: DMS I-4 Diversion/Travel Times: Text Strings Requirements

DS001DT Both parts of this sub-project shall require the selection and display of a text string from a database of suggested messages.

DS002DT The message selection shall be based on the calculated travel times and current traffic conditions.

DS003DT As message size is limited by DMS constraints, the selected Contractor shall ensure that DMS' are capable of displaying the contents of their suggested text strings message d

Decision Support Applications: DMS I-4 Diversion/Travel Times: Communications Requirements

DS001DC This sub-project shall not directly interface with or control any DMS'.

Decision Support Applications: DMS I-4 Diversion/Travel Times: System Requirements

DS001DS This sub-project shall alert the operator to recommended changes to the DMS' within one minute of the Condition System determining that such a change is needed.

DS002DS This sub-project shall log all recommended changes in DMS messages.

DS003DS The log file shall list each newly posted DMS message, the corresponding DMS' involved, and a time/date timestamp.

DS004DS The log file shall be accessible to the operator via the Condition's System Operator Interface and output to the CFDW.

Decision Support Applications: Additional DMS Enhancement

DS001A This functionality shall integrate into the Conditions System to allow decision support and control of DMS signs from anywhere on the Internet and shall allow operators to eithe

DS002A This functionality shall determine which signs should display which messages to most appropriately manage traffic.

DS003A This functionality shall interface and communicate with existing DMS central software using the TMDD Center to Center standards for DMS communications.

4.6 Procurement 6 – Statewide TTMS Upgrade and Statewide Corridor Monitoring

The purpose of this project was originally to expand FDOT's ability to provide traffic and video images at 54 key locations throughout the state (specifically at Telemetered Traffic Monitoring System [TTMS] sites). The project's goal was to improve communications with each of the sites in order to support real-time data collection and CCTV image collection.

This project has now been formally split into two projects: (1) TTMS Video Upgrades and (2) Statewide Corridor Monitoring. The TTMS Video Upgrade project should move forward with TranStat in the lead. TranStat will utilize \$239,000 in project funds they have allocated for iFlorida to develop the most cost-effective method for collecting video and better serving emergency operations functions. With the project split, TranStat is not expected to deploy 54 sites as originally proposed. FDOT District 5 (D5) will take the lead in implementing the Statewide Corridor Monitoring project, with assistance from the ITS Central Office. D5 will utilize \$575,000 in project funds to establish the most beneficial monitoring network to support real-time operations and travel information along the state's major interstate corridors – I-95, I-75, I-10 and the Turnpike.

4.6.1 Sub-system Requirements

Sub-system requirements have not been finalized as of the date of this publication. These requirements will be provided as separate appendices at a later time.

4.7 Procurement 7 – Central Florida Data Warehouse Expansion

This procurement will leverage the existing Central Florida Data Warehouse (CFDW) and upgrade the system to archive all iFlorida data. The feed between the Data Server, located at OOCEA Headquarters, and the CFDW, located at FDOT District 5 Regional Traffic Management Center (RTMC) will be completed as part of a separate ongoing project. In addition to data supplied by the FDOT Surveillance Systems and the OOCEA Data Server, new data sources will be collected and integrated into the CFDW, including:

- Meteorlogix weather-related data
- Road weather data from the FDOT RWIS
- FHP CAD Data
- Operator-entered incident and event reports
- Statewide and Orlando area segment reports from the iFlorida Conditions System
- Transit (i.e., LYNX) events regarding service disruptions, changes, and additions should they arise.
- Airport (i.e., Orlando International Airport and Orlando-Sanford International Airport) events regarding major landside transportation issues (such as parking), generalized airport delays, and estimated wait times at security screening should they arise.

The CFDW will be the location from which all third party access to iFlorida data will be available via a published data feed accessible to all licensed users.

The CFDW will make use of standardized interfaces to the maximum extent possible, both in terms of data input and data retrieval.

The raw data provided to the CFDW will be retained for a period of time to be determined.

Redundant architecture methodologies will be incorporated to limit risks involved as a single point of failure.

4.7.1 Sub-system Requirements

Sub-system requirements have not been finalized as of the date of this publication. These requirements will be provided as a separate appendix at a later time.

4.8 Procurement 8 – iFlorida Operations

This procurement focuses on the operations of general traffic management, expanding the Statewide and Central Florida 511 service, and the traveler information systems. 511 will be supported through a number of parallel systems, including: the Statewide 511 System, the Central Florida 511 System, the Southeast Florida 511 System, the Tampa Bay 511 System, and other systems (e.g., the Jacksonville 511 System) as they come on-line. This procurement will serve many operational purposes:

- The Statewide and Orlando area 511 systems will be designed, implemented, operated and maintained through this project, incorporating and formatting the segment reports available from the iFlorida Conditions System as the foundation for content available via this service.
- The iFlorida Conditions System will provide pre-recorded 511 messages in electronic format for automated use on the 511 system. However, a 511 operator will have the ability to override the pre-recorded message.
- A 511 operator will be supplied to the District 5 RTMC as part of this project. They will utilize the iFlorida Conditions System, as well as other inputs to ensure that timely, accurate, and reliable information is available on the 511 System.
- FDOT RTMC Operators will serve as the primary interface with Dynamic Message Signs and variable speed limit signs used in roadway diversion and variable speed limit trials, respectively. While the iFlorida Conditions Systems contractor will develop applications to recommend what information to provide on these signs, it will be up to the operators themselves to review and implement these recommendations as appropriate.
- A major part of this project is to ensure that quality control and proper operator training and procedures are in place to optimally operate the tools iFlorida provides.

4.8.1 Sub-system Requirements

Sub-system requirements have not been finalized as of the date of this publication. These requirements will be provided as a separate appendix at a later time.

**Appendix A - Requirements Traceability
Cooperative Agreement and iFlorida Proposal**

| <i>General (G)</i> | | | |
|--------------------|---|---|------------------------------------|
| | Cooperative Agreement | Proposal | Source |
| G.1 | The lead agency for the model deployment will design, deploy, and operate monitoring systems that demonstrate the vision of a surface transportation information system that supports national security needs, improves travel time reliability, and addresses local safety, operational and information needs. | We will do this through the seamless integration of information and telecommunication systems, incorporation of the highest levels of intelligence and the embrace of appropriate innovation. To be specific we will: <ul style="list-style-type: none"> • Expand our existing data collection, transportation management and information delivery infrastructure • Integrate our data collection, monitoring and management systems both in normal operation and in times of crisis • Collect and share data • Use data operationally to improve transportation system management • Distribute decision-quality data to the traveling public • Establish a model for others and share the lessons and experiences we learn along the way • Define performance measures, collect performance data and evaluate • Illustrate how transportation, hurricane evacuation, weather information and security management can be integrated from both technical and organizational perspectives | Executive Statement |
| G.1.1 | The lead agency may be the state or another transportation-related public agency designated by the state. | FDOT D5 will take the management lead for iFlorida, on behalf of FDOT. D5 is the ideally positioned for this role as the lead transportation agency in the Central Florida region. | Technical Plan - The iFlorida Team |

| <i>General (G)</i> | | | |
|--------------------|---|---|---|
| | Cooperative Agreement | Proposal | Source |
| G.1.2 | Other participants may include - but are not restricted to - commercial companies or organizations, consultants, public and private institutions of higher education, non-profit organizations, and not-for-profit organizations. | <p>PBS&J will assist FDOT D5 in managing iFlorida. PBS&J's presence throughout the state, its experience in ITS and program management and its strong relationships with many of the involved public agencies – they currently serve as the ITS general consultant to the Statewide ITS Office, the general engineering consultant to OOCEA, the ITS general consultant to LYNX, and participate in the ITS general consultant contract for Florida's Turnpike Enterprise – provide the additional staff necessary to deliver this project.</p> <p>3M, a leading provider of traffic control and ITS devices, will provide variable speed limit signs and vehicle detector stations at discount to iFlorida.</p> <p>The design-build contractor for security applications and military support will provide the security command and control application at discount to iFlorida.</p> <p>Meteorlogix, a weather content provider that tailors observed and forecasted weather conditions to public and private organizations, will map and provide current and forecasted weather to iFlorida's covered roadways, at a substantial discount.</p> <p>University of Central Florida's Center for Advanced Transportation Systems Simulation will expand the Central Florida Data Warehouse they have already developed to accept multi-modal data and provide roadsegment forecasting.</p> <p>University of North Florida, currently demonstrating and evaluating RWIS for FDOT, the National Weather Service and the National Oceanographic and Atmospheric Administration (NOAA), will provide RWIS modeling and support.</p> <p>Cambridge Systematics, Inc., a leading consultant in ITS planning and evaluation work, will provide formative and summative evaluation services to the iFlorida program. More than a dozen public agencies are mentioned throughout this application and will participate and support iFlorida. Letters of support from these agencies are located in the appendices. FDOT D5 and many of its public partners have existing contractual mechanisms to achieve much of the work required to deliver iFlorida. Where existing contracting mechanisms are not available, the letters of intent provided in Volume II of this application secure the commitment of iFlorida's private sector partners.</p> | Technical Plan - The iFlorida Team |
| G.2 | The model deployment shall include, as a minimum, the operational components described below. | <p>iFlorida has selected the following locations for each component:</p> <ul style="list-style-type: none"> • Metropolitan Area Data and Information Systems: Orlando • Evacuation Route Monitoring: SR 528 Corridor (including SR 520) between Cape Canaveral and Orlando • Weather Response: Central Florida • Security Monitoring: I-295 Buckman Bridge (Jacksonville) and the SR 528 Bennett Causeway Bridge (Merritt Island) • Locally Defined: Daytona International Speedway <p>In addition to program management and coordination with the national evaluation, iFlorida comprises 24 specific projects, including one locally defined component.</p> | Technical Plan - iFlorida Locations / iFlorida Projects |
| G.2.1 | Additional geographic coverage, expanded data collection, greater institutional integration, and more innovative operational use of the data beyond these minimum requirements is desirable. | {Maximum feasible coverage area has been chosen.} | |

| <i>Metropolitan Area (M)</i> | | | |
|------------------------------|---|--|--|
| | Cooperative Agreement | Proposal | Source |
| M.1 | <i>Location</i> | | |
| M.1.1 | The state shall select one major metropolitan area for the model deployment with a population greater than one million | Florida has selected the Orlando metropolitan area as the focus for the Metropolitan Area Data and Information Systems component of the project. | Metropolitan Area Data & Information Systems |
| M.2 | <i>Scope</i> | | |
| M.2.1 | The vision calls for inclusion of all jurisdictions and all freeways, expressways and principal arterials within a metropolitan area, it may not be feasible to do so within the timeframe or budget of the model deployment. Nonetheless, the model deployment should strive to achieve coverage of as many roadway and transit facilities as possible, and the cooperation of as many jurisdictions within the chosen major metropolitan area as is feasible. | <p><i>Limited-Access Highways</i></p> <ul style="list-style-type: none"> • Centerline miles: 194 (growing to 198 in 2004) • Facilities: I-4, SR 408, SR 417, SR 528, Florida's Turnpike, and SR 429 <p><i>Principal Arterials</i></p> <ul style="list-style-type: none"> • "Major Roads" of Central Florida Regional Network • 21 roads, 255 miles | Metropolitan Area Data & Information Systems |

| <i>Metropolitan Area (M)</i> | | | |
|------------------------------|---|--|---|
| | Cooperative Agreement | Proposal | Source |
| M.2.2 | The model deployment shall include the state, the principal city government and at least one other local jurisdiction. | <p><i>METRO Key Agencies</i></p> <ul style="list-style-type: none"> • FDOT District 5 (D5) • FDOT Turnpike Enterprise • Orlando-Orange County Expressway Authority (OOCEA) • Central Florida Regional Transportation Authority (LYNX) • Florida Highway Patrol (FHP), Troop D • Florida Division of Emergency Management (FDEM) • City of Orlando (Public Works, Police, and Fire Departments) • Orange County (Public Works, Sheriff's and Fire Departments, and Office of Emergency Management) • Seminole County (Public Works, Sheriff's and Fire Departments, and Office of Emergency Management) • Osceola County (Public Works, Sheriff's and Fire Departments, and Emergency Management Division) • Greater Orlando Aviation Authority (GOAA) • METROPLAN Orlando | Metropolitan Area Data & Information Systems |
| M.2.3 | At least one intermodal connector and/or intermodal freight facility such as a port shall be included. | GOAA personnel will enter information regarding landside transportation (such as parking), generalized airport delays, and estimated wait times at security screening. A key element of the project will be to train the appropriate personnel from all agencies to quickly and accurately enter, update, and close events. | Project M.3 – Metropolitan Extension of Florida Conditions System |
| M.2.4 | The model deployment shall include at least one, and preferably more transit systems, in areas where multiple transit systems operate. | LYNX personnel will enter transit events regarding service disruptions, changes, and additions. | Project M.3 – Metropolitan Extension of Florida Conditions System |
| M.3 | <i>Data Collection and Quality Assurance</i> | | |
| M.3.1 | Collection and processing of traffic flow, speed, volume, and weather data on freeways, expressways, and other principal arterials | iFlorida METRO will strengthen the region's data fusion and archiving. This includes establishing a single, integrated, multimodal closures and restrictions-oriented event reporting system, enabling geo-location of incident/events on a regional speed map that displays automated travel time conditions over 73 roadway segments spanning at least seven operating jurisdictions. Some modest, but critical, improvements to communications and operational facilities will increase the number of agencies sharing data, video, and information. The existing Central Florida Data Warehouse (CFDW) will be expanded to incorporate transit and arterial data along with limited-access data. The concept of roadway "segment forecasts" will be introduced and evaluated. Much like weather forecasting, roadway segment forecasts will be provided on a sliding 24-hour horizon. Forecasts for each segment will be based upon current conditions, historical statistical information, current conditions of upstream segments, and outside factors, such as weather and special events. | Metropolitan Area Data & Information Systems Data Fusion/ Archiving |
| M.3.2 | The collection and processing of data on transit operations, arrival / departure times of buses and trains through the use of such technologies as automated vehicle tracking, and the status of transit stations and other transit facilities. | <p>This project [Orlando Conditions System] integrates all available roadway, transit, and airport data into segment reports.</p> <p>LYNX broadcast and service disruption information will be output, as will similar information regarding Orlando International Airport.</p> | Project M.5 – Orlando Conditions System |
| M.4 | <i>Data Integration and Archiving</i> | | |
| M.4.1 | Integration, cooperation, and data sharing among the appropriate public- and private-sector agencies involved in the model deployment. | <p>iFlorida METRO will focus as much on using the data generated from the project as it will on collecting and fusing it. This project offers three elements, each modest in dollar value, which could have dramatic impacts on the usage and the value of data collected:</p> <p>Broadband Wireless Internet – The project will implement short-range, IEEE 802.11 type, broadband Internet access on most or all of the limited-access highway system in the Orlando region. Public-sector oriented applications will focus on giving public safety and incident management personnel – starting with FHP troopers, who will all have computers in their vehicles, and Road Rangers – access to the Internet and RTMC sources, including video feeds, via low-cost wireless modems. An exciting element of the project is the opening up of the network to private firms, on a nonexclusive basis at no cost to the project, who wish to try or deploy applications to take advantage of broadband access.</p> <p>Data Usage Promotion Project – A small project element will focus on actively cultivating and supporting additional public and private uses of the data generated from this project.</p> <p>METROPLAN Data Mining – This project element will enable the region's metropolitan planning organization, METROPLAN, to identify, experiment and evaluate how comprehensive multi-modal data – available through the data warehouse – can be used to improve regional planning and decision-making.</p> | Project M.10 – Innovative Uses of Data |

| Metropolitan Area (M) | | | |
|------------------------------|--|--|---|
| | Cooperative Agreement | Proposal | Source |
| M.4.2 | The model deployment should also consider the requirements for archiving key data to support long-term operational and safety analyses. | The existing Central Florida Data Warehouse (CFDW) will be expanded to incorporate transit and arterial data along with limited-access data. The concept of roadway "segment forecasts" will be introduced and evaluated. Much like weather forecasting, roadway segment forecasts will be provided on a sliding 24-hour horizon. Forecasts for each segment will be based upon current conditions, historical statistical information, current conditions of upstream segments, and outside factors, such as weather and special events. | Metropolitan Area Data & Information Systems Data Fusion/ Archiving |
| M.5 | <i>Operations</i> | | |
| M.5.1 | Operational use of the data for improved integration and operations of security management, safety management, freeway management, arterial management, freight management, transit management, incident response, and weather response. | {• Security Management implied by Projects S.1 – Security Command and Control, S.2 – Traffic Modeling, and S.4 – District 5 RTMC Vulnerability Assessment • Safety and Transit Management implied by Project S.3 – LYNX Streaming Video Proof-of-Concept • Freeway Management, Arterial Management, Incident Response, and Weather Response implied by Projects M.5 – Orlando Conditions System and SW.4 – FIHS Conditions System • Freight Management implied by Projects A.1– Central Florida 511 System Expansion, A.2 – Statewide ATIS, and M.6 Central Florida Data Warehouse and Internet Web Site Expansion} | |
| M.5.2 | This model deployment will include the provision of near real-time multi-modal traveler information through a publicly available traveler information service in the metropolitan area | A comprehensive, regional 511 system and Internet Web site will be established from existing systems, incorporating transit and airport information along with highway and arterial information. | Metropolitan Area Data & Information Systems Data Usage |

| Statewide Reporting (SW) | | | |
|---------------------------------|--|---|---|
| | Cooperative Agreement | Proposal | Source |
| SW.1 | Collection, use, and dissemination of information, through a statewide reporting system, on any incidents, weather events, or other scheduled and non-scheduled lane and road closures that significantly reduce travel capacity on the state's roadways. | The statewide ATIS will provide the same types of services as the urban regions: a 511 system, a publicly available Internet Web site, and an information feed for use by other public agencies and private companies, accessible under a no-cost memorandum of understanding (MOU) or license. | Project A.2 – Statewide ATIS |
| SW.2 | The statewide incident and closures reporting system shall include timely (i.e., near real-time) updates from state transportation units on scheduled road closures and known weather or other events that will affect roadway capacity. | The interface [with the Florida Conditions System] to the FHP dispatch system will be applied here as well to automatically inject incident data into the system. | Project M.3 – Metropolitan Extension of Florida Conditions System |
| SW.3 | It shall also include the capability of integrating real-time incident reports from public safety agencies within the state, reports from the traveling public on incidents and congestion affecting roadway capacity, and other information on road conditions. | At its core, the FIHS Conditions System will be an enhanced version of the statewide incident/event reporting systems in place today in many other parts of the country. The system, which will likely be an adaptation of an Internet-based system currently operational in the U.S., will incorporate automated data from the sources previously listed: FHP CAD, TTMS, and segment weather conditions and forecasts. | Project SW.4 – FIHS Conditions System |
| SW.4 | Although the vision of this state-wide system involves the collaboration of all public safety agencies within the state, for purposes of this model deployment, the state shall demonstrate its ability to incorporate reporting from at least one major public safety agency, such as the state highway patrol. | To harness the data that exists within FHP, this project will create an interface between the FHP's Traffic Crash and Road Conditions System and the FIHS Conditions System. | Project SW.1 – FHP Conditions System Interface |

| Evacuation Monitoring (E) | | | |
|----------------------------------|---|---|-----------------------------|
| | Cooperative Agreement | Proposal | Source |
| E.1 | <i>Scope</i> | | |
| E.1.1 | Traffic and weather monitoring of one key roadway or corridor outside the metropolitan area that supports emergency evacuation, caused by either natural or man-made disasters | Due to its importance, the institutional relationships already in place and recent ITS investments, we have selected the SR 528 corridor, including SR 520, between Brevard County and the Orlando metropolitan area as the corridor for evacuation route monitoring. | Evacuation Route Monitoring |
| E.1.2 | This selected roadway or corridor must include a route that would not ordinarily be instrumented as part of the instrumentation of the major metropolitan area selected for the model deployment. | {Outside the Orlando Metropolitan area} | |
| E.1.3 | The evacuation scenario may combine more than one type, if it deals with a route that supports multiple types of evacuation. | In addition to hurricane and tropical storm-related evacuations, the EOC is the county's focal point in all types of evacuations, including those related to rocket/shuttle explosions, rocket fuel hazmat accidents (rocket fuel is shipped by truck), and radiological emergencies. | Evacuation Route Monitoring |
| E.2 | <i>Data Collection and Quality Assurance</i> | | |

| Evacuation Monitoring (E) | | | |
|----------------------------------|--|---|---|
| | Cooperative Agreement | Proposal | Source |
| E.2.1 | The deployment model shall demonstrate the collection, processing and innovative use of operational data to support evacuation. This could be for evacuation from natural disasters such as hurricanes or man-made events such as a dangerous hazardous materials release or security-related incident. | Historically, evacuation planning in [the SR 528 Corridor] has been oriented towards hurricane evacuations. However, with Kennedy Space Center, Port Canaveral, and Patrick Air Force Base along the Brevard County coastline, this corridor will also be essential in any hazardous materials release or terrorist-related attack associated with these facilities. This proposed project will build upon the I-95/SR 528 Hurricane Evacuation System (HES) to obtain full traffic sensor data coverage and additional strategic CCTV coverage on SR 528 and SR 520. Three specific forms of data collection will be implemented. | Evacuation Route Monitoring / Project E.1 – SR 528 Corridor Monitoring System |
| E.3 | <i>Data Integration</i> | | |
| E.3.1 | The deployment model shall demonstrate the coordination and data sharing among emergency managers, public safety, and transportation agencies. | EVACUATION will enable the first full-scale implementation of the user service. Through the model deployment, we propose to significantly improve real time data collection along the corridor, facilitate greater situational awareness of all agencies involved in the evacuation, including emergency managers, real time data sharing with evacuation planning models, and improved evacuation-related traveler information. This focus of this project is to facilitate the sharing of data and video with the Brevard County EOC and the TMC via integration into the fiber backbone. Physical connection to the backbone will occur via a six-mile connection from existing fiber on I-95. In addition, a workstation will be installed in the EOC to connect the EOC and the RTMC in Orlando, allowing for the real time sharing of transportation data and high quality video. | Evacuation Route Monitoring Operations |
| E.4 | <i>Operations</i> | | |
| E.4.1 | The state shall develop an operational concept for one of the following types of evacuation scenarios: Weather-related, with specific emphasis desired on hurricane evacuation, Significant hazardous material release, Military deployment (not strictly an evacuation, but has similar operational issues), Terrorist attack-related | As described, plans are in effect to one-way the central section of SR 528 to support evacuations. iFlorida EVACUATION projects will: 1. Support the process of determining the need for implementing the reversible lane plan, based on current and projected demand. 2. Provide monitoring capability to the key transportation, emergency management, and law enforcement personnel to manage evacuations whether or not the reversible lane plan has been put into effect. 3. Provide traveler information tailored to evacuee needs both in leaving from and returning to Brevard County. Key in all these areas is the ability to get the data/video to the RTMC, where it can utilize the same systems established to support metropolitan Orlando activities. For example, the data feed from the regional Web site can provide FDEM's access to volume and segment travel time data to assist in determining if and when the SR 528 one-way plan should be put into effect, as well as provide archived data for post-event analysis. | Evacuation Route Monitoring |
| E.5 | <i>Simulation</i> | | |
| E.5.1 | Since it is unlikely that a real evacuation will occur during the operational period of the model deployment, the USDOT is looking for innovative ways to demonstrate and test the effectiveness of evacuation route monitoring. | The data collection and monitoring components implemented during this project will be integrated with the FDEM's Hurricane Evacuation Analysis Decision Support System (HEADSUP) program, which is being developed as a comprehensive statewide hurricane evacuation planning tool. This first phase of HEADSUP will be completed in fall 2002. | Evacuation Route Monitoring Exercises and Simulations |
| E.5.2 | As part of the operational use of the deployed data collection and monitoring systems, the state DOT, along with public safety and emergency managers, shall plan and execute an evacuation exercise that demonstrates the use of the data to support the type of evacuation proposed in its operational concept. | Exercises and simulations will use [HEADSUP] to test connectivity and system features. Exercising evacuation plans in a real-world test is difficult, and testing contraflow operations is not feasible. This corridor has a huge advantage, however, with regular Space Shuttle launches, when 100,000 or more people will travel from the interior of Florida to the coast to view the launch. Each launch results in a situation analogous to an evacuation, as most of these travelers will head back inland along the SR 528 corridor immediately after the launch. On launch days, the RTMC is fully staffed, as is the Brevard EOC. The data available from the model deployment – and the effectiveness of the data and how it is shared in the real time operating environment – can be assessed on a regular basis. | Evacuation Route Monitoring Exercises and Simulations |

| Weather Response (W) | | | |
|-----------------------------|------------------------------|-----------------|---------------|
| | Cooperative Agreement | Proposal | Source |
| W.1 | <i>Scope</i> | | |

| Weather Response (W) | | | |
|-----------------------------|---|--|---|
| | Cooperative Agreement | Proposal | Source |
| W.1.1 | Effective response to adverse weather requires weather information that is tailored to the surface transportation environment. There are multiple processing paths from data collection to tailored road weather information, and there are many public and private entities that play a role in its production. Therefore, the ability to integrate the data into both transportation and meteorological databases is essential. | <p>The [FIHS Conditions System], which will likely be an adaptation of an Internet-based system currently operational in the U.S., will incorporate automated data from the sources previously listed: FHP CAD, TTMS, and segment weather conditions and forecasts.</p> <p>[The Metropolitan Extension of the Florida Conditions System] will leverage the web-based Statewide Incident/Event Reporting System, creating a more detailed level of information in the Orlando area, including the covered arterials, transit, and aviation elements. For the all limited-access roadways and covered arterials, the appropriate organizations will insert information, geo-located and linked to its corresponding segment(s), regarding any event that impacts the expected flow of traffic, such as construction, maintenance, incidents, weather events, and special events.</p> | Project SW.4 – FIHS Conditions System / Project M.3 – Metropolitan Extension of Florida Conditions System |
| W.1.2 | The model deployment shall include incorporation of a locally-defined weather response component for such conditions as flood, fog, snow, or ice. | <p>iFlorida WEATHER focuses on the particular local weather conditions that could be important to traveler safety including low visibility as a result of fog, heavy rain, or smoke, and hazardous driving conditions caused by strong winds or flooding. Weather information to be collected includes:</p> <ul style="list-style-type: none"> • Wind Speed • Wind Direction • Precipitation • Barometric Pressure • Visibility • Air Temperature • Relative Humidity | Weather Response |
| W.2 | <i>Data Collection and Quality Assurance</i> | | |
| W.2.1 | Depending on local weather response needs, the data collection can be in metropolitan or non-metropolitan areas. | <p>The iFlorida WEATHER deployment strategy supports a cooperative approach to surface weather prediction and modeling and consists of two primary elements: permanent high-end weather station installations to support predictive model development and travel-related information on key corridors for evacuation and intercity travel; and an ad-hoc wireless networked system of devices that can be deployed to temporary sites to support travel advisories when needed.</p> <p>The system will include 10 permanent “basic” weather stations that will each have a sensor array capable of measuring relative humidity, air temperature, precipitation rate and amount, wind speed and direction, and barometric pressure.</p> | Weather Response |
| W.3 | <i>Data Integration</i> | | |
| W.3.1 | Demonstrate how such locally-driven weather information can be effectively integrated in an overall operational concept and design. | The [FIHS Conditions System] will provide direct operator interface to enable appropriate personnel from FDOT, its partner agencies, and approved private contractors/consultants to enter reports directly into the FIHS Conditions System. | Project SW.4 – FIHS Conditions System |
| W.3.2 | The system should enable the open exchange of observation data (e.g., into environmental data networks, also known as mesonets). | The project will provide several methods of access to current, forecasted, and historical road weather information, allowing travelers to get current and forecasted road weather via expansion of the 511 Travel Information System, iFlorida Web site, and the state's “MyFlorida.Com” Web site, as well as providing real time traveler information via highway advisory radio, dynamic message signs, and variable speed limit signs. | Weather Response |
| W.4 | <i>Operations</i> | | |
| W.4.1 | Demonstrate how operational use of this additional weather information addresses local needs and improves the operation of the surface transportation system. | <p>For the all limited-access roadways and covered arterials, the appropriate organizations will insert information, geo-located and linked to its corresponding segment(s), regarding any event that impacts the expected flow of traffic, such as construction, maintenance, incidents, weather events, and special events.</p> <p>The statewide Internet site will contain an FIHS base map, with color-coded segments for easy identification of trouble spots. When a segment is selected, all available information will be provided for that segment, including all incident/events, current weather conditions, and near-term forecasts.</p> | Project M.3 – Metropolitan Extension of Florida Conditions System / Project A.2 – Statewide ATIS |
| W.4.2 | The system should integrate the forecast products from both public agencies (e.g., the National Weather Service) and private sector weather information providers into the appropriate management and information systems. | Meteorlogix, a weather content provider that tailors observed and forecasted weather conditions to public and private organizations, will map and provide current and forecasted weather to iFlorida’s covered roadways, at a substantial discount. | Technical Plan The iFlorida Team |

| Traveler Information (T) | | | |
|---------------------------------|------------------------------|-----------------|---------------|
| | Cooperative Agreement | Proposal | Source |

| Traveler Information (T) | | | |
|---------------------------------|--|---|---|
| | Cooperative Agreement | Proposal | Source |
| T.1 | Establishment of a basic, publicly available, near real-time, multi-modal traveler information system, supported by the data collected in the first four components. | As part of the Central Florida Data Warehouse and Internet Web Site Expansion project, the region's Web site will be expanded to a fully intermodal site and will incorporate all the integrated real time data of the project. The statewide ATIS will provide the same types of services as the urban regions: a 511 system, a publicly available Internet Web site, and an information feed for use by other public agencies and private companies, accessible under a no-cost memorandum of understanding (MOU) or license. | Orlando Metropolitan ATIS / Project A.2 – Statewide ATIS |
| T.2 | If a 511 traveler information service is not already operational, this information will form the basis for 511 services that will become operational during the period of performance of the model deployment. | The current approach [for the Central Florida 511 telephone service] of having announcers record efficient messages summarizing each of the segments of I-4 will be expanded to cover all limited-access facilities. Covered arterials will use concatenated text-to-speech based upon information provided to the phone system by the data warehouse. The statewide 511 system will be implemented with the allocated state resources. The FIHS Conditions System reporting segments will aid in offering road conditions by segment as recommended in the guidelines. | Project A.1 – Central Florida 511 System Expansion / Project A.2 – Statewide ATIS |

| Security Monitoring (SC) | | | |
|---------------------------------|--|--|--|
| | Cooperative Agreement | Proposal | Source |
| SC.1 | The state shall select at least <u>one</u> critical bridge or tunnel, and at least <u>one</u> critical transit facility to demonstrate effective surveillance and monitoring for security and safety purposes. | Two bridges, the I-295 Buckman Bridge located in Jacksonville and the SR 528 Bennett Causeway Bridge in Brevard County, have been identified by FDLE as critical transportation assets needing protection. The current command center at LYNX's South Street Facility will be upgraded by iFlorida METRO to include a Gigabit Ethernet fiber connection between LYNX's Command Center and the FDOT D5 RTMC. This will enable LYNX security-related data and images to be transported to the RTMC. | Security Monitoring / Project S.2 - Traffic Modeling |
| SC.2 | Other locally-defined critical infrastructure elements or key facilities may be included in the model deployment. | A single security application will be networked and deployed in each of locations listed below: • FHP, Troop G, Jacksonville • FDOT D5, RTMC - D5 staff is collocated with FHP Troop D | Project S.1 - Security Command and Control |
| SC.3 | The model deployment is seeking creative and cost-effective ways to monitor critical infrastructure and facilities to detect potential problems, provide alerts, and assist in post-event analysis. | • Brevard County Emergency Operations Center Each of these facilities provide 24/7 operations and monitoring capability. Alarms and alerts will trigger an automatic, real time digital recording for post event analysis. | |
| SC.4 | Innovative solutions that address specific security requirements are also sought. | In [the Locally Defined Components] project, the Daytona International Speedway will work with FDOT D5 and the transportation agencies of Volusia County to focus on coordinating transportation activities necessary to support an emergency evacuation, both in terms of getting spectators out and public safety and law enforcement personnel in. | Locally Defined Components |

| Data Availability (D) | | | |
|------------------------------|---|--|--|
| | Cooperative Agreement | Proposal | Source |
| D.1 | A system for providing the data, including weather data, to other public agencies and private companies. | The key elements of the iFlorida DATA module include functionalities that provide fused information by highway segment. The fusion functionality will integrate all available roadway, transit, and airport data into segment reports. Segment reports will provide the traveler traffic flow, incident/event reports, weather fusion and forecasts, transit, and airport-related information. Once the raw weather data is received by the Regional Traffic Management Center (RTMC) it will be incorporated into the Central Florida Data Warehouse and made available in a format suitable for direct interfacing with the NWS predictive models and to other agencies who request the information in real time. | Data Availability / Weather Response |
| D.2 | This "data pipe" shall make the data available for use in traveler information, value-added services, modeling and other applications in a standard format. | As part of the Central Florida Data Warehouse and Internet Web Site Expansion project, the region's Web site will be expanded to a fully intermodal site and will incorporate all the integrated real time data of the project. The statewide ATIS will provide the same types of services as the urban regions: a 511 system, a publicly available Internet Web site, and an information feed for use by other public agencies and private companies, accessible under a no-cost memorandum of understanding (MOU) or license. | Orlando Metropolitan ATIS / Project A.2 – Statewide ATIS |
| D.3 | Selected portions of the data shall be archived as appropriate. | The Central Florida Data Warehouse supports the data being collected by the I-4 SMIS and OOCEA projects and disseminates this data regionally via 511. [Central Florida Data Warehouse and Internet Web Site Expansion] expands the regional data warehouse to accept the new data and provide the new data feeds. One new data source will be LYNX's CAD/AVL database. Static data, such as routes, stops, schedules, and fares, will be provided as will schedule adherence and automatic passenger count data. | Current Situation / Project M.6 – Central Florida Data Warehouse and Internet Web Site Expansion |

| <i>Data Availability (D)</i> | | | |
|------------------------------|------------------------------|-----------------|---------------|
| | Cooperative Agreement | Proposal | Source |

| <i>Local Defined Components (L)</i> | | | |
|-------------------------------------|---|--|----------------------------|
| | Cooperative Agreement | Proposal | Source |
| L.1 | Incorporation of additional locally-defined transportation data elements that are effectively integrated into the overall system design and support local operational and information needs are encouraged. | <p>The first portion of [Recommended Practices for Emergency Evacuation of Attractions and Special Events Venues] would develop and evaluate responses to a variety of evacuation scenarios (e.g., a panic mass evacuation with spectators in panic, a precautionary evacuation with no obvious public reason, an evacuation when one or more exits cannot be used).</p> <p>The second portion of the proposed project will review the results of this study with other major venue operators in the region.</p> | Locally Defined Components |

| <i>National Evaluation (NE)</i> | | | |
|---------------------------------|--|---|--------------------------------------|
| | Cooperative Agreement | Proposal | Source |
| NE. 1 | Partnerships participating in this model deployment are expected to cooperate with the U.S. DOT Program Assessment team and any national evaluator designated by that team, to evaluate all of the eight components listed above. This cooperation includes: | The objective of this project is to conduct evaluation tasks, in close coordination with national evaluators, to identify the impacts, costs, and lessons learned from the deployment of iFlorida. | Cooperation with National Evaluation |
| NE.1.1 | Providing the evaluator with all relevant project information, including system descriptions, contractual documents, briefings, etc. | A detailed test plan will be developed, including specific performance measures and targets to evaluate the following eight components of the deployment: metropolitan area data and information systems, statewide reporting, evacuation route monitoring, weather responses, multi-modal traveler information, security monitoring, data availability, and locally defined components. | Cooperation with National Evaluation |
| NE.1.2 | Providing the evaluator with a comprehensive list of project participants and their roles and responsibilities on the task. This should include identification of the project partner and the primary evaluation point of contact. | <p>The FDOT evaluation team will be prepared to provide the national evaluators with information regarding:</p> <ul style="list-style-type: none"> • Project descriptions. • Proposed deployment timelines. • Roles and responsibilities of project partners. • Identified deployment goals of the project partners. • Potential data sources (including the data formats). • Initial assessment of the opportunities for evaluation. | Cooperation with National Evaluation |
| NE.1.3 | Development of an evaluation strategy. This strategy should: | During [the Develop Strategy and Evaluate Baseline Conditions] phase, FDOT and national evaluators will coordinate to develop and implement a comprehensive evaluation strategy. This strategy must be structured to meet the needs of the national evaluators, as well as provide supplementary data feedback of specific interest to the project partners regarding the deployment and to Florida, in general, with respect to state transportation goals and objectives. | Cooperation with National Evaluation |
| NE.1.3.1 | Clearly identify the purpose of the test and the problems it is trying to solve (e.g. there is currently a ½ hour delay in clearance times at border crossing X, this is causing air pollution and considerable delay). | The Plan will also provide the blueprint for conducting the evaluation through the identification of evaluation goals. For each identified goal, one or more evaluation objectives will be identified to test achievement of the goal. These evaluation objectives will serve the basis for hypothesis to be tested in the conduct of the evaluation. Once the objectives are established, appropriate performance measures will be identified to test the identified hypothesis. Structuring the evaluation in this manner will ensure that the data collected and performance measures analyzed are directly relevant to the evaluation goals for each component of the deployment. | Cooperation with National Evaluation |
| NE.1.3.2 | Propose a number of hypotheses outlining the expected outcome (s) of the deployment (e.g. deploying of the automated tags at toll plaza X will reduce vehicle emissions by Y %). | | |
| NE.1.3.3 | Identify one or more measures of effectiveness to investigate each hypothesis (e.g. vehicle idling time will serve as a surrogate measure for vehicle emissions). | Performance measures related to both output (agency actions) and outcomes (user's experience) for the iFlorida program will be employed [within the Evaluation Plan]. | Cooperation with National Evaluation |
| NE.1.3.4 | Describe how data will be collected to support quantify these measures. | Once finalized, detailed Individual Test Plans will be developed to guide the implementation of the evaluation. These test plans will more specifically identify data collection techniques, methods, and tools to be employed; and will specify responsibilities for carrying out the data collection and analysis. | Cooperation with National Evaluation |
| NE.1.4 | Collecting and providing the evaluators with relevant benefits data identified in the evaluation strategy. | The testing plan will identify a minimum number of sites and will include before and after studies to assess the benefits of the major project elements that comprise the model. | Cooperation with National Evaluation |
| NE.1.5 | Collecting and providing the evaluators with detailed costing information, including both deployment and operations and maintenance costs. | Data and findings will be shared with national evaluators, so that they may present significant findings in their own documentation of the evaluation. The results of this analysis will be documented in the Evaluation Report. This report will identify the benefits achieved from the systems, document the costs encountered in implementing and operation the systems, and document significant lessons learned by the project partners. | Cooperation with National Evaluation |
| NE.1.6 | Ensuring that this information is provided in a timely fashion. | {Implied in Project M.3 - Metropolitan Extension of Florida Conditions System} | |
| NE.1.7 | Making accommodations (where appropriate) for evaluators to be present at coordination or partnership meetings. | The objective of this project is to conduct evaluation tasks, in close coordination with national evaluators, to identify the impacts, costs, and lessons learned from the deployment of iFlorida. {Making accommodations is implied.} | Cooperation with National Evaluation |

| <i>National Evaluation (NE)</i> | | | |
|---------------------------------|--|--|--------------------------------------|
| | Cooperative Agreement | Proposal | Source |
| NE.1.8 | Ensuring that self-evaluation activities being conducted by the project participants are coordinated with and reviewed by the national evaluators. | The DOT evaluation team will work closely with the national evaluators to identify the appropriate measures to include in the Evaluation Plan. The team will also ensure that all of the measures necessary to evaluate the deployment from project, state, and national perspectives will be included in the Plan. National evaluations are typically segmented into three distinct phases. At the completion of each phase, the findings are presented to U.S. DOT to aid in their decision of what promising opportunities should be carried into subsequent evaluation phases. Local evaluations often proceed similarly. | Cooperation with National Evaluation |
| NE.1.9 | Providing review of relevant reports, presentations, etc. prepared by the national evaluation team. | <i>Deliverables include:</i> Management Plan – Documenting communication and management plan. Technical Memo – Presenting findings from initial opportunity screening. Evaluation Plan – Documenting project background and stakeholders, and identifying evaluation goals, objectives, measures and targets. Individual Test Plans – Detailing data collection and analysis methods, and identifying roles and responsibilities. Baseline Evaluation Report – Documenting baseline conditions and providing a risk analysis of post-deployment evaluation. Evaluation Report – Documenting benefits, costs, and lessons learned. Presentations – To key local and national stakeholders. Florida Report – Report on the components of the evaluation which would be useful to Florida partners and stakeholders. RFA No. DTFH61-02-X-00089 | Cooperation with National Evaluation |

| <i>Planning & Design (PD)</i> | | | |
|-----------------------------------|---|---|-------------------------------|
| | Cooperative Agreement | Proposal | Source |
| PD.1 | <i>General</i> | | |
| PD.1.1 | The lead agency will carry out all model deployment activities in accordance with professionally recognized systems engineering and software acquisition practices. | FDOT has been a national leader in the application of a systems engineering approach to ITS project planning and design. The approach has been fully documented by FDOT and is currently being used for ITS deployments along the Florida Intrastate Highway System (FIHS) for limited-access corridors. This assertion is evidenced by reviewing the completed documents available on the Florida ITS Web site: http://www.floridait.com/corridor_concept_plans.htm . | Phase 1 – Planning and Design |
| PD.1.2 | The use of industry standards for documenting the model deployment is encouraged. | The systems engineering approach is organized into two major areas: program management and technical/project management. Use of this documented approach will promote cost-efficient and effective model deployments that will be fully integrated, seamless, and fully documented. | Phase 1 – Planning and Design |
| PD.1.3 | Planning and design of all components of the model deployment will be completed within 8 months of the effective date of the agreement. | {Denoted in the "Surface Transportation and Reliability Information System Model Deployment Schedule" insert.} | Part IV - Schedule |
| PD.2 | <i>Operational Concept</i> | | |
| PD.2.1 | The operational concept will address the operation of each of the proposed components as well as the functions that will use the information. | The+E122 describes at a high level what a system is to do. The OCD is used to describe the intended functions of a system in narrative form that should be readable by wide variety of audiences. | Phase 1 – Planning and Design |
| PD.2.2 | IEEE Standard 1362-1998 provides one possible outline for an ops concept. | Concept of Operations and Business Plan – This application provides an initial concept of operations developed consistent with the IEEE Std. 1362 -1998 and an initial deployment or business plan. | Phase 1 – Planning and Design |
| PD.2.3 | The ops concept will describe the operational characteristics of the current and proposed data collection and monitoring system from a user agency's viewpoint. It will include such items as data requirements; functional capabilities; geographic coverage; organizations and their roles; external interfaces and standards to be used. | The concept of operations will reflect the result of the requirements collection and validation of requirements validation with the stakeholders. FDOT D5 will be the lead agency for the operations of the projects proposed in the iFlorida program. However, many aspects of the deployment plan require a cooperative approach to the management and operations of the transportation system to enhance security and reliability. These relationships are outlined in greater detail in the concept of operations. | Phase 1 – Planning and Design |
| PD.2.4 | The ops concept will identify limitations in the current transportation data that justify the need for the proposed changes as part of the model deployment. | {Requirement included within IEEE Standard 1362-1998.} | Phase 1 – Planning and Design |
| PD.2.5 | The ops concept will also include scenarios, that is, step-by-step descriptions of how the proposed surveillance and monitoring system will function and how the data provided will be used to improve operations. This includes the ops concept for the evacuation scenario discussed in the "Description of the Model Deployment." | {Requirement included within IEEE Standard 1362-1998.} | Phase 1 – Planning and Design |
| PD.3 | <i>Requirements Definition</i> | | |
| PD.3.1 | The lead agency will define and document requirements for the additional surveillance and monitoring that are based upon the ops concept. | The [Operations Concept Document] serves as input into the requirements process. | Phase 1 – Planning and Design |

| Planning & Design (PD) | | | |
|-----------------------------------|---|---|-------------------------------|
| | Cooperative Agreement | Proposal | Source |
| PD.3.2 | These requirements will address the collection, processing, sharing, and archiving of data using standard data formats. Functional, performance, interface, input, and output requirements will be included. | Data Formatting Standards and Technologies – Will follow those as prescribed by the STMCS [Statewide Traffic Management Center Software] addendum for optional services to be performed. | Data Availability |
| PD.4 | <i>System Design</i> | | |
| PD.4.1 | The lead agency will develop a system design for the proposed surveillance and monitoring system. | Applying ITS Standards and Specifications – As part of the system design required in the iFlorida program, the initial scopes of work, performance criteria, and functional requirements for each project element in the application will be enhanced and refined to be sufficient to support design/criteria packages for procurement as defined in Section 287 of the Florida Statutes. | Phase 1 – Planning and Design |
| PD.4.2 | The system design will consider and use ITS standards as appropriate. | The position of the iFlorida program as related to standards will be the adoption of the Standards Application Plan: ITS Corridor Master Plans for Florida's Principal Limited-Access Corridors completed in May 2002. The primary purpose of the document is to provide unified guidance for ITS projects in the following areas: <ul style="list-style-type: none"> • Identification of ITS standards that are applicable to corridor implementations. • Discussion of relevant issues related to the implementation of these standards. • Identification of high-priority standards for ITS deployments. To ensure harmonization of corridor projects with the statewide architecture, the plan also includes the following: <ul style="list-style-type: none"> • Identification of ITS standards that support the corridor ITS deployments. • Current status/maturity of the identified ITS standards. • Categorization of ITS standards by corridor ITS market sectors. • Determination of the interoperability types supported by the identified standards. • Standards procurements issues. • Legacy system considerations. • High-priority standards discussion. | Phase 1 – Planning and Design |
| PD.5 | <i>High-level Work Plan</i> | | |
| PD.5.1 | The lead agency will develop a high-level work plan that guides the overall sequence of activities and management approach for the model deployment. | {The following defines the "Work Plan":} | Phase 1 – Planning and Design |
| PD.5.2 | This plan will identify all of the organizations involved in the model deployment as well as the contractual and other working arrangements among them. | The technical/project management functions support the technical development of the ITS model deployment projects in Florida. The activities associated with this program area are intended to ensure that individual ITS projects are deployed in a cost-effective and efficient manner. This program area addresses the requirements of the FHWA's Rule 940 for systems engineering and fully satisfies the IEEE Standard 1220-1998, Standard for Application and Management of the Systems Engineering Process. This program area is the traditional emphasis of the systems engineering process for project development and includes: | |
| PD.5.3 | The work plan will address systems engineering and software acquisition practices to be followed, including the risk management, configuration management, software acquisition, and system acceptance testing approaches to be used throughout the model deployment. | <ul style="list-style-type: none"> • Requirements analysis and definition • Design • Validation • CEI and maintenance | |
| PD.5.4 | This plan will include a project schedule of such model deployment tasks as establishing institutional agreements, developing a regional ITS architecture, deploying surveillance and monitoring components, using the data and information to carry out operations, and assisting in the conduct of an evaluation. | | |
| PD.6 | <i>System Architecture Updates</i> | | |
| PD.6.1 | The lead agency will work to incorporate the proposed systems into the appropriate regional architecture. | <p>FDOT has developed and maintains the ITS Corridor Master Plans and ITS Master Plans. These are available for review on the Web site. The site includes completed FHHS corridor architectures for I-4, I-95, I-75, I-10, and Florida's Turnpike, as well as the logical and physical architecture components of the Florida Statewide Architecture. The statewide architecture harmonizes the five corridors into a single architecture.</p> <p>Evidence of a completed I-4 corridor architecture may be found at: http://www.floridait.com/corridor_concept_plans.htm.</p> <p>This architecture was completed in September 2000 and updated to reflect the Statewide Architecture 2002. The I-4 corridor architecture includes both the logical and physical architecture components.</p> <p>The iFlorida program will utilize these architectures as the validated foundation for defining functional requirements based on user service requirements and process specifications. These architectures already provide a comprehensive, robust capability that ensures that all aspects of the iFlorida program are addressed.</p> <p>Should a change be required to either the statewide or the I-4 corridor architectures, a configuration management approach to maintaining these architectures has already been established. This approach to change will be used to refine and enhance the architecture, as necessary, based on the refinements to the proposed concept of operations and deployment plan that will be performed in Phase I.</p> | Phase 1 – Planning and Design |

| Planning & Design (PD) | | Proposal | Source |
|-----------------------------------|---|---|-------------------------------|
| Cooperative Agreement | | | |
| PD.6.2 | If the proposed deployment involves more than one region, such as a metropolitan area and the overall state, more than one regional architecture may need to be updated. | | |
| PD.6.3 | If a regional architecture does not exist, the lead agency will work with other relevant agencies to develop a regional ITS architecture that addresses the new surveillance and monitoring systems and their integration with other ITS systems. | {Does not apply since a Regional Architecture does exist.} | |
| PD.7 | Deployment Plan | | |
| PD.7.1 | The lead agency will develop a deployment plan. | Implementation Strategy – This application includes an initial deployment plan for the iFlorida program. | Phase 1 – Planning and Design |
| PD.7.2 | This plan will include schedules that show when and where each component of the model deployment will be deployed as part of a phased deployment process. | | |
| PD.7.3 | This plan will also describe the system acceptance criteria to be used in determining when individual elements of the model deployment are ready for operational use. | | |
| PD.7.4 | The plan will be submitted to the designated Agreement Officer's Technical Representative (AOTR) for review and comment. Based on comments received, the plan will be revised prior to delivery in final form. | | |

| Deployment & Operations (D) | | Proposal | Source |
|--|---|--|-------------------------------------|
| Cooperative Agreement | | | |
| D.1 | Deployment | | |
| D.1.1 | The lead agency will develop and deploy the components designed during Phase 1, Planning and Design. Those components are as follows: Statewide Reporting, Metropolitan Area Data and Information Systems, Evacuation Route Monitoring, Weather Response, Multi-modal Traveler Information, Security Monitoring, Data Availability, and Locally-defined Components. | {The Schedule} charts define each activity of the project, the duration of each activity, and the dependencies between these activities. {The Schedule identifies all components to be developed and deployed.} | Part IV - Schedule |
| D.1.2 | To facilitate an incremental approach, the Government may at its discretion give approval to develop and deploy portions of the model deployment at various times. | {The lead agency has agreed to add and incorporate a Probe Vehicle Test Bed project to the model deployment. This project is not mentioned in the Proposal.} | |
| D.1.3 | Unless otherwise directed, the lead agency will use its final deployment plan as the governing tool guiding the timing and nature of the system. | {The Schedule} charts define each activity of the project, the duration of each activity, and the dependencies between these activities. This schedule identifies the critical factors that will influence the execution plan. {The deployment plan includes all contains of the schedule.} | Part IV - Schedule |
| D.1.4 | The lead agency will carry out and document system acceptance of the deployed components in accordance with the deployment plan developed during Phase 1 to ensure that each component is ready for operational use. | Every project in the iFlorida program will require the development and documentation of a testing plan and successful execution of that plan based on criteria established in the testing plan. The incremental build approach is preferred for larger or more complex system elements as opposed to a single final acceptance test. FDOT will oversee the execution of the testing plan for any incremental improvements. Following each test, an action report will be developed by the contractor/partner to define the steps needed to achieve final acceptance for the project. | Phase 1 – Planning and Design |
| D.1.5 | The deployment phase will be completed and the entire system will be integrated and operational within 24 months of the start of the model deployment. | First, our experience has taught us that to design and deploy 24 discrete projects should not be taken lightly and will require our team's considerable skills to deliver within 24 months. | Phase 2 – Deployment and Operations |
| D.2 | Implementation, Operations and Maintenance | | |
| D.2.1 | New components will be implemented and brought on-line, with approval of the Government, as soon as they become available. | {The schedule identifies the critical path. The critical path dictates when the components are to be brought on-line.} | Part IV - Schedule |
| D.2.2 | The operational use and evaluation of the system will then continue for at least 2 years. | FDOT and its partners commit to operating and maintaining all project elements from the time each is operational through the two-year operating period. | Phase 2 – Deployment and Operations |
| D.2.3 | The lead agency will be responsible for maintenance and repair of the model deployment systems as needed during this period. | FDOT and its partners will maintain the iFlorida program elements in top working condition through the entire operational period. | Phase 2 – Deployment and Operations |
| D.2.4 | As part of the operational use of the deployed system, the lead agency must plan and execute an evacuation exercise that demonstrates the operational capabilities of the system to support the type of evacuation proposed in its operational concept. This evacuation exercise will be part of the evaluation of the deployment conducted by the U.S. DOT. | In addition to exercises and simulations, the SR 528 corridor offers a unique opportunity for regular real-world testing and evaluation of the corridor monitoring and management arrangements. Space vehicle launches from Cape Canaveral induce post launch traffic levels and network conditions that are a useful approximation to evacuation conditions. | Evacuation Route Monitoring |

| <i>Deployment & Operations (D)</i> | | | |
|--|---|---|--------------------------------------|
| | Cooperative Agreement | Proposal | Source |
| D.2.5 | Upon completion of this project, the lead agency will submit a final technical report. This report will document the operational use of the surface transportation information system, realized benefits (qualitative or quantitative), and any problems or limitations encountered. This report will include findings on effective techniques for surveillance of critical infrastructure elements and other key facilities, and the costs for achieving them. | Phase 3 – Post-deployment or “after” data are collected, analyzed, and compared with the baseline data to identify significant impacts of the system on the identified performance measures. In addition to these evaluation phases, a management and communication strategy will be developed to ensure that coordination is carefully planned. The FDOT team foresees opportunities to assist the national evaluators during all of these potential phases. We have assumed that the national evaluators will be responsible for gathering most of the data needed for the evaluation. We have set aside funds to fully support cooperation with the national evaluators. | Cooperation with National Evaluation |
| D.3 | <i>Cooperation with National Evaluation</i> | | |
| D.3.1 | The state, and its partners in this model deployment, are expected to cooperate with the U.S. DOT and its national evaluation team throughout the development and deployment of the project. | <p>Phase 1 – Evaluation Opportunity Screening Evaluation efforts will be initiated during the early stages of the project to begin identifying opportunities for evaluation and to assess the availability of data. Discussions between project partners and evaluators will be conducted to identify the goals of the partners in deploying the systems and to communicate the benefits of the evaluation to the partners. During this phase, particular opportunities for evaluation will be identified and investigated. Consistent with the Management Plan, this will include an identification of all participants in the deployment, along with their respective roles and responsibilities, and an assessment of the available data sources that may be used in evaluating the particular deployment. During this phase, the national evaluators may wish to work alongside the FDOT evaluation team, or may choose to allow the FDOT evaluation team to perform the initial screening of opportunities and review the assessment when complete.</p> <p>The FDOT evaluation team will be prepared to provide the national evaluators with information regarding:</p> <ul style="list-style-type: none"> • Project descriptions. • Proposed deployment timelines. • Roles and responsibilities of project partners. • Identified deployment goals of the project partners. • Potential data sources (including the data formats). • Initial assessment of the opportunities for evaluation. | Cooperation with National Evaluation |
| | | <p>Phase 2 – Develop Strategy and Evaluate Baseline Conditions During this phase, FDOT and national evaluators will coordinate to develop and implement a comprehensive evaluation strategy. This strategy must be structured to meet the needs of the national evaluators, as well as provide supplementary data feedback of specific interest to the project partners regarding the deployment and to Florida, in general, with respect to state transportation goals and objectives. The first step in formulating this strategy will consist of the development of a detailed Evaluation Plan, including specific performance measures and targets to address project deployment, state, and national evaluation needs.</p> | |
| D.3.2 | The independent national evaluator will be selected and provided by the USDOT. | <p>Cambridge Systematics, Inc. Summary Tasks</p> <ul style="list-style-type: none"> • Conduct evaluation tasks in close coordination with national evaluators. • Assess deployments for the opportunity to provide meaningful and transferable evaluation results. • Develop detailed strategies, evaluations, and tests plans for each of the iFlorida components. • Conduct post-deployment data collection and analysis. | Staffing Plan |