Florida Department of Transportation Guidelines for the Implementation of *Part 940* in Florida

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DEFINITIONS

Change Control	A systems engineering process used to manage change within a system.
Harmonization	A technique employed to develop a common or compatible approach between ITS architectures.
ITS Architecture	Defines a structure of interrelated systems that work together to deliver transportation services. An ITS architecture defines how systems functionally operate and the interconnection of information exchanges that must take place between these systems to accomplish transportation services.
ITS Project	Any project that, in whole or in part, funds the acquisition of technologies or systems of technologies that provide or significantly contribute to the provision of one or more ITS user services.
Region	As defined by FHWA for the development of regional ITS architectures should be no less than the boundaries of the Metropolitan Planning Area. For Florida, it is recommended that the boundaries coincide with the Florida Department of Transportation District boundaries.
Stakeholders	A widely used term that notates a public agency, private organization, or the traveling public with a vested interest or a “stake” in one or more transportation elements within a Regional ITS Architecture.
Standards	Documented technical specifications sponsored by a Standards Development Organization (SDO) to be used consistently as rules, guidelines, or definitions of characteristics for the interchange of data. A broad array of ITS standards that will specifically define the interfaces identified in the National ITS Architecture is currently under development.
Systems Engineering	A structured process for arriving at a final design of a system. The final design is selected from a number of alternatives that would accomplish the same objectives and considers the total life cycle of the project including not only the technical merits of potential solutions but also the costs and relative value of alternatives.
Traceability	The process of directly correlating resulting ITS architecture components to previously defined stakeholder requirements.
Turbo Architecture	An automated software tool used to input and manage system inventory, market packages, and architecture flows and interconnects with regard to a Regional ITS Architecture and/or multiple Project ITS Architectures.

LIST OF ACRONYMS

APTS .....Advanced Public Transportation System
CFP ..... Cost Feasible Plan
CFR .....Code of Federal Regulations
CMB ..... Change Management Board
CMS ..... Congestion Management System
FDOT .....Florida Department of Transportation
FHWA .....Federal Highway Administration
FSUTMS .....Florida Standard Urban Transportation Model Structure
FTA .....Federal Transit Administration
IDAS ..... ITS Deployment Analysis System
ITS ..... Intelligent Transportation Systems
LRTP ..... Long-Range Transportation Plan
MMP ..... Mobility Management Process
MOU .....Memorandum of Understanding
MPA .....Metropolitan Planning Area
MPO ..... Metropolitan Planning Organization
MPOAC .....Metropolitan Planning Organization Advisory Council
NITSA .....National ITS Architecture
OCR .....Optical Character Recognition
PC .....Prescreening Committee
PD&E ..... Project Development and Environmental
RITSA .....Regional ITS Architecture
ROO ..... Regional Operating Organizations
SAFETEA ..... Safe, Accountable, and Efficient Transportation Equity Act
..... of the Twenty First Century
SCRITS.....SCReening Analysis for ITS
SDO .....Standard Development Organizations

SEMP ..... Systems Engineering Management Plan

SITSA ..... Statewide ITS Architecture

TDM ..... Travel Demand Model

TDP ..... Transit Development Plan

TEA-21 ..... Transportation Equity Act for the 21st Century

TIP ..... Transportation Improvement Program

TMA ..... Transportation Management Area

TMC ..... Traffic Management Center

TPA ..... Transportation Planning Agency

TRC ..... Technical Review Committee

USDOT ..... United States Department of Transportation

Approved:

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Secretary

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FLORIDA DEPARTMENT OF TRANSPORTATION GUIDELINES FOR THE IMPLEMENTATION OF *PART 940* IN FLORIDA

PURPOSE:

To establish guidelines for implementing ***Part 940*** in Florida's transportation planning processes for Intelligent Transportation Systems (ITS) projects.

AUTHORITY:

23 Code of Federal Regulations (CFR) Parts 655 and 940 Intelligent Transportation System Architecture and Standards

23 United States Code (U.S.C) 134 (f) and (g) – Scope of the Metropolitan Planning Process and Development of Long-Range Transportation Plans

23 CFR Parts 450, 500, and 650, Subchapter F – Transportation Infrastructure Management, Part 500 - Management and Monitoring Systems, Final Part

SCOPE:

All District and Central Office units of the Florida Department of Transportation (FDOT), including the Motor Carrier Compliance Office and Florida's Turnpike Enterprise.

REFERENCES:

1. *The National ITS Architecture, Version 6.0*, U.S. Department of Transportation, Washington D.C, April 2007
2. *Update of the Florida SITSA, Technical Memoranda No. 1 – 8,* Post Buckley Schuh & Jernigan, Tallahassee, FL*, & ConSysTec,* Shenorock, NY, February - March, 2006.

2. *Florida Statewide ITS Architecture and Standards Project Final Report*, Kimley-Horn and Associates, Tallahassee, FL, February 20, 2001.
3. *FHWA's Final Part and FTA's Policy for Applying the National ITS Architecture at the Regional Level*, FHWA-OP-01-029, U.S. Department of Transportation, Washington D.C.
4. *Regional ITS Architecture Guidance: Developing, Using and Maintaining an ITS Architecture for Your Region*, National ITS Architecture Team, October 12, 2001.
5. *Integrating Intelligent Transportation Systems within the Transportation Planning Process: An Interim Handbook*, TransCore, January 1998.
6. *Florida's ITS Planning Guidelines: Integration of ITS into the Transportation Planning Process*, Florida Department of Transportation, Tallahassee, FL, June 2000.
7. *Florida's ITS Integration Guidebook*, Florida Department of Transportation, Tallahassee, FL, October 1, 2002.
8. *Mobility Management Process Summary by MPO*, Florida Department of Transportation, Tallahassee, FL, April 19, 1999.
9. *Regional Concepts of Operations for Transportation System Management and Operations: Discussion Draft*, Federal Highway Administration (FHWA) and PBS&J, February 6, 2003.

BACKGROUND

On April 8, 2001, the Federal Highway Administration (FHWA) issued ***23 Code of Federal Regulations (CFR) Parts 655 and 940***, entitled ***Intelligent Transportation Systems Architecture and Standards***. Concurrently, the Federal Transit Administration (FTA) issued a policy entitled ***National ITS Architecture Policy on Transit Projects***. The intent of the ***Part and Policy***, commonly referred to as ***Part 940***, is to provide policies and procedures for implementing ***Section 5206(e) of the Transportation Equity Act for the 21st Century (TEA-21), Public Law 105-178, 112 Stat. 457*** which requires ITS projects to conform to the ***National ITS Architecture (NITSA) and Standards***.

The promulgation of ***Part 940*** is the driving force behind the development of the guidelines. After ***Part 940*** was issued, various transportation agencies within Florida began questioning how ***Part 940*** would affect their agency and how ITS will be incorporated into existing transportation planning and deployment processes. FDOT responded by addressing some preliminary issues in an ***Issue Paper*** and then set about resolving these questions through the development of a ***Part 940*** *Statewide Implementation Strategy (Strategy)* to meet the requirements of FDOT Planning Managers, the Metropolitan Planning Organization Advisory Council (MPOAC), and ITS professionals from across the state. This *Strategy* was designed to recommend an approach for the implementation of ***Part 940*** in Florida and to develop guidelines for the integration of ITS into Florida's transportation planning processes and Long-Range Transportation Plans (LRTPs). This *Strategy* was a collaborative effort developed by a ***Part 940*** Working Group comprised of District Planning representatives and MPO staff from across the state.

After review and approval of the *Strategy*, it was recommended that the *Strategy* be incorporated into a formal FDOT guideline to provide technical assistance to the Districts and MPOs and to update ***Florida's ITS Planning Guidelines***. This document presents the ***FDOT Guidelines for the Implementation of Part 940 in Florida (Guidelines)***.

Based on the issues and needs identified by the ***Part 940*** Working Group, these *Guidelines*, at a minimum, should:

- Define a Regional ITS Architecture (RITSA), its region, and stakeholders;
- Identify a method for validating and adopting the *Statewide ITS Architecture* (*SITSA)*, RITSA, and standards;
- Identify a methodology for ensuring RITSA consistency with ***Part 940*** requirements;
- Develop a change management process to update and maintain the RITSAs and standards;
- Define agency roles and responsibilities in the development and maintenance of architectures and standards;
- Identify state, District, transit agency, and MPO ITS representatives responsible for ITS architecture development and ITS integration into the planning processes;
- Recommend methods for integrating ITS into existing implementation processes, plans, and documents; and
- Identify options for stakeholder, transit agency, and MPO input into the development of the RITSAs and ITS options in Florida.

Additionally, the ***Guidelines*** will identify potential barriers to integration, discuss new processes and tools for evaluating and comparing ITS projects, and recommend implementation of systems monitoring and performance measuring strategies.

ARCHITECTURE DESCRIPTION AND PURPOSE

Part 940 primarily addresses the need for implementing agencies to develop a RITSA consistent with the *NITSA*, and to deploy federally funded ITS projects consistent with an area's adopted RITSA. In order to fully comprehend ***Part 940*** requirements, it is necessary to understand the purpose and function of a RITSA.

A RITSA is a conceptual framework for creating an interoperable ITS within a region. It functionally defines what the pieces of the ITS are and the information exchanged between the transportation, communication, and institutional systems. A RITSA is a living document because it reflects the vision, needs, goals, and objectives of regional

users. It must change as conditions change, as ITS projects are implemented, and as ITS needs and services evolve in the region. The architecture represents an ideal solution that may be implemented over a time horizon, typically ten to twenty years.

The RITSA represents a local implementation, or subset of the *NITSA* developed with local requirements in mind. It is comprised of ITS needs (user services), requirements (data flows and processes), and descriptions of groups of elements required to deliver ITS services (market packages). A compilation of applicable national ITS standards for deployment is usually associated with a RITSA. Additionally, a RITSA provides a framework for institutional integration in an organized, coordinated fashion by defining the roles and responsibilities of each agency in the provision of ITS services for a region.

The primary purpose of a RITSA, and its associated ITS standards, is to ensure that ITS projects in a region can be aggregated to provide an interoperable, seamless system. Projects that are designed consistent with a RITSA and ITS standards may result in lower design costs, reduced project development time, lower risk, and would likely be easier to expand or enhance.

The FDOT has provided leadership in the development of a *SITSA*. This *SITSA* was completed in February 2001 through a cooperative process with a number of stakeholders throughout Florida, including the MPOs and public transit agencies. An update to the SITSA was completed in February of 2006. The *SITSA* provides a strong foundation for systematic, cost-effective, and efficient ITS implementation in Florida. The *SITSA* is comprised of seven RITSAs that have boundaries that coincidence with the FDOT District boundaries, including Florida's Turnpike Enterprise (Districts 4 and 6 were combined). Additionally, a statewide layer was added to include statewide services and functions that were common to all the Districts. These eight components comprise the *SITSA*. This aggregation of components was selected for the *SITSA* so that FDOT Districts may utilize these regional architecture components as their RITSA. The most recent version of the *SITSA* can be obtained via the FDOT Traffic Engineering and Operations Office, ITS Section, Web site located at:
http://www.dot.state.fl.us/TrafficOperations/ITS/Projects_Arch/SITSA.htm

A majority of the FDOT Districts, MPOs, and transit agencies in Florida are utilizing regional components of the *SITSA* as their recognized RITSA. As part of the ***Guidelines*****,** a harmonization procedure will be recommended to integrate these architectures with the *SITSA*. This harmonization process will provide the necessary assurance that these customized architectures are consistent with the *SITSA* and *NITSA*, and that updates to the *SITSA* consider the unique characteristics and requirements from these regionally developed RITSAs.

SECTION 1

FEDERAL AND STATE ITS ARCHITECTURE GUIDANCE

This section details the actual ***Part 940*** requirements and identifies additional FDOT documentation that applies to ITS architectures and ITS integration with Florida transportation planning processes.

1.1 Part 940 REQUIREMENTS

1.1.1 The purpose of ***Part 940*** is to provide policies and procedures for implementing ***TEA-21, Public Law 105-178, 112 Stat. 457*** pertaining to conformance with the *NITSA*. ***Part 940*** applies to all ITS projects funded from the Highway Trust Fund, including transit projects funded from the Mass Transit Account. Although ***Part 940*** does not specifically address private or locally funded ITS projects, it is recommended that the policies set forth in ***Part 940*** and these ***Guidelines***, be applied to all ITS activity in Florida to ensure systems integration and interoperability.

1.2 REGIONAL ARCHITECTURE REQUIREMENTS

1.2.1 ***23 CFR Part 940.9 (a)*** requires that agencies develop a RITSA based on the *NITSA* that reflects their local needs, issues, problems, and objectives. The RITSA will be used to guide implementation of ITS in a region and should be consistent with the transportation planning process for statewide and metropolitan planning practices. ***23 CFR Part 940.9 (d)*** states, *"Each region must develop a regional architecture by April 8, 2005 that includes:*

(1) description of the region,

(2) identification of participating agencies and other stakeholders,

(3) operational concept,

(4) agreements required for implementation,

(5) system functional requirements,

(6) interface requirements,

(7) identification of ITS standards, and

(8) sequence of projects required for implementation."

1.2.2 Additionally, ***Part 940 (f)*** requires that a process for maintaining the RITSA be developed. The agencies and other stakeholders participating in the

development of the RITSA are also responsible for developing and implementing procedures to maintain the RITSA, as needs evolve within the region. After April 8, 2005, no new ITS projects can advance without demonstrating compliance with a RITSA.

1.3 PROJECT REQUIREMENTS

1.3.1 In addition to the RITSA requirements, ***23 CFR Part 940.11*** addresses project level requirements for the planning and designing of ITS deployments. ***Part 940*** stipulates that any project that moves into the design phase is required to follow a systems engineering process that is commensurate with the project scope. A project is defined as an ITS project or program that receives federal-aid, including federally funded advanced public transportation system (APTS) projects. If the project moves into design prior to completion of a RITSA, a project architecture is required to support the systems engineering process. Per ***Part 940***, project development requirements will take effect on April 8, 2001, and will require a structured approach. ***23 CFR Part 940.11 (c)*** states, *"The systems engineering approach shall include at a minimum:*

(1) identification of portions of the regional architecture being implemented,

(2) identification of participating agencies roles and responsibilities,

(3) requirements definition,

(4) analysis of alternate system configurations and technology options to meet requirements,

(5) procurement options,

(6) identification of applicable standards and testing procedures,

(7) procedures and resources necessary for operations and management of the system."

1.4 PROJECT ADMINISTRATION

1.4.1 This section of ***Part 940*** addresses project compliance and approval responsibility and authority. ***23 CFR Part 940.13*** states:

*"(a) Prior to authorization of highway trust funds for construction or implementation of ITS projects, compliance with **23 CFR 940.11** shall be demonstrated.*

*(b) Compliance with this part will be monitored under Federal-aid oversight procedures as provided under **23 U.S.C. 106 and 133**."*

1.5 ITS STANDARDS

1.5.1 Standards determine how the components of an ITS will interconnect and communicate with each other. By encouraging the development and use of national ITS standards, the United States Department of Transportation (USDOT) is addressing the goal of nationwide ITS interoperability. This interoperability between all ITS will ensure reliability and consistency, yielding a seamless ITS for all users.

1.5.2 Standards are researched, developed, tested, and approved through a cooperative effort among five Standard Development Organizations (SDOs). Currently, the SDOs have approved over 88 ITS standards, 8 published, 5 in ballot and 5 under development. Once the SDO-approved standards have matured and become available on the market, the USDOT will consider adopting the standards through a formal ***Part 940*** making process. To date, no ITS standards have been adopted by the USDOT.

1.5.3 ***Part 940*** requires that ITS projects shall conform to the *NITSA and Standards*. Additionally, a RITSA must identify ITS standards supporting regional and national interoperability. ***Part 940*** also requires that federally funded ITS projects use, where appropriate, USDOT adopted ITS standards. Since the USDOT has not adopted any standards at this time, ITS practitioners are encouraged to use SDO-approved standards.

1.6 ADDITIONAL FEDERAL GUIDANCE

1.6.1 In addition to ***Part 940***, FHWA has published two documents pertaining to ***Part 940*** implementation and RITSA development, including:

- *FHWA's Final Part and FTA's Policy for Applying the National ITS Architecture at the Regional Level, and*
- *Regional Architecture Guidance: Developing, Using and Maintaining an ITS Architecture for Your Region.*

1.6.2 These ***Guidelines*** will implement the recommendations and requirements detailed in these federal documents.

1.7 FDOT ITS INTEGRATION GUIDANCE

1.7.1 In May 2001 the FDOT Traffic Engineering and Operations Office, ITS Section, developed a ***Part 940 Issue Paper*** that presented the contents of ***Part 940***,

identified issues associated with the implementation of ***Part 940***, and recommended integration strategies for further development and consideration. These ***Guidelines*** build on the recommendations identified in the ***Part 940 Issue Paper.***

1.7.2 FDOT District 7 prepared ***Florida's ITS Integration Guidebook (Guidebook)*** to facilitate the application of ITS integration in Florida and nationally. This ***Guidebook*** was developed to serve as a practical resource that can be used to assist with ITS implementation and contains decision-making materials for ITS integration. Recommendations from the ***Guidebook*** will be incorporated in these ***Guidelines*****.**

SECTION 2

GUIDELINES FOR THE IMPLEMENTATION OF PART 940

This section provides guidelines for implementing ***Part 940*** in the state of Florida and developing a system to ensure the compliance of ITS architectures and projects with ***Part 940***.

2.1 DEFINITION OF REGION FOR FLORIDA REGIONAL ITS ARCHITECTURES

2.1.1 ***Part 940*** requires development of a RITSA for areas implementing ITS projects. The FHWA recommends that the minimum geographic area to be considered for development of a RITSA be a metropolitan planning area (MPA). Therefore, jurisdictions smaller than a MPA are strongly encouraged not to independently develop their own architecture. For the purposes of implementing ***Part 940*** in Florida, regions are defined geographically and functionally as the FDOT Districts. These regional boundaries are consistent with the smaller regional components of the *SITSA* allowing for easier update and maintenance of the RITSAs and *SITSA*.

2.1.2 It is important to note that as RITSAs evolve, the definition of the region may change based on the identification of new stakeholders, revised operational boundaries, or new integration opportunities. For ITS purposes, regions can expand beyond the boundaries of the FDOT Districts. However, these expanded boundaries should be agreed upon by the regional stakeholders and neighboring FDOT Districts.

2.2 ACKNOWLEDGEMENT OF THE RITSA

2.2.1 Because a RITSA provides a common framework and database of regional ITS project needs, operational concepts, and the stakeholder agencies involved in deploying and operating the ITS for a region, the acknowledgement of an architecture by its stakeholder agencies is essential for successful ITS implementation. ***Part 940*** requires that after April 8, 2005, only ITS projects with a RITSA in place will be funded with Federal Highway Trust Funds. The following paragraphs discuss the recommended process for compliance with ***Part 940*** regarding the development and recognition of these architectures.

2.2.2 The Florida *SITSA* was developed from RITSAs overlaid by a statewide services architecture component. Therefore, if a region has not developed a customized

RITSA, it may acknowledge its regional architecture contained in the *SITSA* as its RITSA. Regional transit agencies and private sector companies deploying ITS should work in close coordination with the Districts and MPOs in the development, acknowledgement, and implementation of a RITSA for their region.

2.2.3 MPOs may acknowledge their RITSA component by referencing the most recent version of the document in their 20-year LRTP. If the LRTP update cycle does not coincide with recent updates of the RITSA, MPOs may prepare a ***Memorandum of Understanding (MOU)***, or a resolution, recognizing the regional component of the *SITSA* as their regional architecture.

2.2.4 Districts or MPOs may choose to develop a customized RITSA independent of the *SITSA* effort. In this instance, it is recommended that the Districts or MPOs use the regional architecture component from the *SITSA* as a base to:

- Promote efficiency;
- Ensure a consistent structure; and
- Integrate regional ITS needs with statewide ITS needs.

2.2.5 Districts may utilize District funds and MPOs may use planning funds in their Unified Planning Work Program for any such independent customization of their RITSA. The District- or MPO-customized architecture should be recognized in the LRTP using the same process developed for acknowledging the *SITSA* regional architecture components.

2.2.6 As part of the customized RITSA development, the stakeholder agencies shall work to harmonize their customized RITSA with the *SITSA*. Harmonization involves the development of a common or compatible approach. The intent of harmonization is for each jurisdiction to retain its existing ITS architecture, but integrate it with the *SITSA* to achieve a coordinated, comprehensive approach to ITS in Florida. A RITSA developed by a District or MPO should identify compatible and incompatible elements with the *SITSA*. This effort will ensure that when the *SITSA* and its regional components are updated, the incompatibilities can be resolved through consensus, and the RITSA shall be consistent with the *SITSA*.

2.3 RITSA AND PROJECT COMPLIANCE WITH *PART 940*

2.3.1 As identified previously, RITSAs and ITS projects must be developed consistent with ***Part 940*** requirements. The following sections identify the process and agencies responsible for ensuring compliance with ***Part 940*** at the regional architecture and project levels.

2.3.2 RITSA COMPLIANCE WITH *PART 940*

2.3.2.1 It is the responsibility of the FDOT, in coordination with the MPOs, to determine whether the requirements of ***Part 940*** are being met in their region. For the purposes of RITSA consistency with ***Part 940***, the MPOs, regional ITS stakeholders, and Districts should review their corresponding RITSAs to determine compliance with the eight identified criteria for RITSA development. The FHWA has developed and recommended a ***Regional ITS Architecture Assessment Checklist*** for use by the developing agencies to ensure that all ***Part 940*** requirements have been addressed in the development of their RITSA. This checklist is contained in ***Appendix A***. The developing agencies will be responsible for completing the checklist and it is recommended that the checklist be included in the RITSA documentation for future reference purposes.

2.3.2.2 In addition to architecture compliance with ***Part 940***, it is also recommended that the MPO's LRTP include a high-level screening of ITS projects to determine their compliance with the RITSA prior to proceeding with the project implementation study or project design.

2.3.2.3 The FDOT Traffic Engineering and Operations Office, ITS Section, will be responsible for ensuring the *SITSA*'s consistency with ***Part 940***.

2.3.3 PROJECT COMPLIANCE WITH *PART 940*

2.3.3.1 As identified in ***23 CFR Part 940.13***, compliance with ***Part 940*** must also be exhibited at the project level. The recommended project compliance guidelines are similar to the project compliance requirements identified in the ***Federal-aid Oversight Procedures*** detailed below. Similarly, federal oversight regarding public transportation ITS projects should be consistent with existing project federal-aid oversight procedures for transit agencies.

2.3.3.2 As part of the oversight procedures, projects are determined as exempt or non-exempt from federal-aid oversight. Non-exempt projects are those projects:

- Funded using Congressional earmark funds;
- Located on the interstate system and greater than $1 million dollars; and,
- Determined for other reasons by FHWA to be non-exempt.

2.3.3.3 These ***Guideline*****s** recommend that, pursuant to ***Part 940*** and the required systems engineering process, the implementing agency determines the portions of the RITSA being implemented by the project. Additionally, the implementing

agency should confirm that the project was developed utilizing a systems engineering approach. Agency determination of compliance will be sufficient for projects classified as exempt projects by FHWA. For projects classified as non-exempt, a combination of agency demonstration and federal review of the project design and development procedures will be required.

2.3.3.4 The FDOT Traffic Engineering and Operations Office, ITS Section, has developed a *Statewide Systems Engineering Management Plan (SEMP)* to assist Districts and local agencies in developing, managing, and deploying ITS projects. The *SEMP* includes a review of current FDOT ITS project development and deployment processes and recommends an overall systems engineering plan that can be scaled and customized to fulfill individual District requirements and be consistent with District programs and policies. The *SEMP* also addresses project compliance with ***Part 940***, the RITSA, and the systems engineering process.

2.3.4 COMPLIANCE WITH ADOPTED NATIONAL ITS STANDARDS

2.3.4.1 Although the USDOT has not formally adopted any ITS standard at this point in time, and no requirement exists for ensuring that ITS projects are developed using SDO-approved standards, it is strongly recommended that agencies deploying ITS projects utilize the SDO-approved standards to promote system interoperability. One method to ensure consistency with the SDO-approved standards is to establish a project technical requirement for project compatibility with all applicable standards. Additionally, the implementing agency should include the SDO-approved standards in the project design standards and specifications documentation.

2.3.4.2 The use of applicable SDO-approved standards and FDOT ITS standards and specifications is required. Districts should confer with the FDOT Traffic Engineering and Operations Office, ITS Section regarding available ITS standards and specifications.

SECTION 3

UPDATE AND MAINTENANCE MANAGEMENT OF THE *SITSA* AND RITSAs IN FLORIDA

This section presents a recommended process for the update and maintenance management of the *SITSA* and RITSAs in Florida.

3.1 UPDATE OF THE SITSA AND RITSA

3.1.1 To maintain its effectiveness, the *SITSA*, like most other long-range plans, must be regularly maintained and periodically updated. With guidance and input from the regional ITS stakeholders, the FDOT Traffic Engineering and Operations Office, ITS Section, will be the primary agency responsible for conducting and coordinating all updates and routine maintenance of the *SITSA* and will ensure its consistency with ***Part 940*** and the *NITSA*.

3.1.2 Districts will be responsible for reviewing regional architectures and recommending changes to the Change Management Board (CMB), which will be responsible for reviewing such recommendations for consistency with the *NITSA*, *SITSA*, and ***Part 940***, updating the regional architectures, and incorporating such updates in the *SITSA*.

3.1.3 Scheduled updates of the RITSAs are recommended to ensure that they consistently reflect the ITS needs and requirements of the local agencies. Significant changes that may trigger the need for an architecture update include:

- New stakeholders that were not part of the previous architecture development;
- A region has been redefined;
- Identification of new statewide or regional needs;
- Design or deployment of ITS projects that are not included as part of the regional architecture;
- ITS project designs that require modifications to the architecture;
- New market packages and users services included in a *NITSA* update; and
- Issuance of new federal rules or policies.

3.1.4 Any one of these changes may not require the need to update the RITSA; however, a combination of these changes may necessitate an update.

3.1.5 In Florida, the *SITSA* and its regional components will be updated on an as needed basis. The regional components of the *SITSA* will be updated by the FDOT Traffic Engineering and Operations Office, ITS Section, in close coordination with the Districts, local MPOs, transit agencies, and other regional stakeholders, including private sector representatives. If agreed to by the regional stakeholders, an update of a *SITSA* regional component may suffice as an update of the RITSA for that District.

3.2 MAINTENANCE OF THE SITSA AND RITSA

3.2.1 In addition to planned updates, the *SITSA* and its regional components must be consistently maintained to reflect stakeholder needs and approved standards. This routine maintenance is typically based on minor corrections or adaptations of the architecture based on stakeholder input and request.

3.2.2 The FDOT Traffic Engineering and Operations Office, ITS Section, will be the agent for change management and control of the requested changes to the *SITSA*.

3.3 CHANGE MANAGEMENT PROCESS

3.3.1 The Department has developed the ***Change Management Process for the Deployment of ITS in the State of Florida*** to guide change management for ITS projects in Florida. This change management process has been established to ensure that appropriate change management procedures have been developed to support the FDOT Traffic Engineering and Operations Office, ITS Section, and Districts in maintaining the SITSA. This process was designed in accordance with standard systems engineering practices and was developed specifically to address the routine maintenance of the *SITSA* in Florida. This process may be found at: http://www.floridaits.com/PDFs/TWO28-CMB/071217-CM_Process-v5_1_final.pdf.

3.3.2 The change management process begins with the establishment of a baseline ITS architecture, which is identified as the *SITSA* completed on February 9, 2001 and the ***SITSA Update (v1.00) on February 27, 2006***. The baseline architecture consists of the **Turbo Architecture** database files, documentation, and associated architecture flow diagrams. Since the baseline architecture has been established in this case, requests for modifications can be presented for consideration.

3.3.3 Change requests may be submitted by various statewide and regional stakeholders; however, they should be submitted to, and reviewed by, the

appropriate FDOT District ITS contact and the FDOT Traffic Engineering and Operations Office ITS Section. No change requests will be considered without prior review and approval by the FDOT Traffic Engineering and Operations Office ITS Section and District ITS contact. A change request may be submitted via electronic mail; however, it should generally identify the stakeholder/agency requesting the change, an explanation of the requested change, and the justification for the change request. Change requests may include harmonization comments prepared by a sponsoring agency in conjunction with the development of a customized RITSA. The CMB will then consider the change request. The CMB was established by the FDOT Traffic Engineering and Operations Office, ITS Section, to oversee the planning and deployment of ITS in Florida. It is comprised of FDOT Traffic Engineering and Operations Office, ITS Section, and District ITS personnel and may be expanded to include other agencies as necessary.

3.3.4 If a requested change affects only local systems within a region, the FDOT Traffic Engineering and Operations Office, ITS Section, may elect to make the change without review by the CMB. All change requests forwarded to the CMB will be tracked and their disposition recorded. The CMB will evaluate the need for the change and analyze the impact of the change on other system components. Prior to the CMB taking any formal action by rejecting, deferring, or accepting the change, the CMB may request additional information or further clarification of the existing information. If the change is rejected or deferred, a response will be prepared to justify the reasoning for the decision. If the change is accepted, the change will be prioritized with other requests and scheduled for implementation.

3.3.5 After the change has been implemented and validated by the FDOT Traffic Engineering and Operations Office, ITS Section, a response to the requestor will be prepared which indicates that the change has been made and identifies any additional modifications required due to the implementation of the requested change. If the requestor does not conclude that the change was appropriately addressed, an alternative implementation strategy will be considered. If the requestor concludes that the change was sufficiently addressed, a new architecture baseline will be established and all stakeholders will be notified of the change and the new baseline architecture.

3.3.6 Future updates of the *SITSA* will include this maintenance process.

SECTION 4

ITS AGENCY ROLES AND RESPONSIBILITIES

One of the main barriers to integrating ITS into the planning processes is that no clear assignment of agency roles and responsibilities has been identified to achieve integration. This section identifies the FDOT and MPO personnel responsible for the coordination, update, and maintenance of the *SISTA* and RITSAs, and the implementation of ***Part 940*** in Florida.

4.1 FDOT CENTRAL OFFICE ITS PLANNING ROLES AND RESPONSIBILITIES

4.1.1 The FDOT Traffic Engineering and Operations Office, ITS Section, will be responsible for the maintenance and update of the *SITSA* and will review the RITSAs for consistency with the *NITSA*, *SITSA*, and ***Part 940***. The Traffic Engineering and Operations Office contact will be the State Traffic Operations Engineer and the ITS Section contact will be the Architecture and Standards Section Administrator, or their designated representative. The Systems Planning Office will be responsible for coordination with the District Planning Managers and Policy Planning Office regarding the implementation of the ***Guidelines*** and other ITS policy initiatives. Additionally, the Systems Planning Office will collaborate with the District Planning Offices and MPOs to ensure integration of ITS in the planning processes and LRTPs. The Systems Planning Office contact will be the Manager of Systems Management. The FDOT Transit Manager will be responsible for coordinating ITS issues with the state transit agencies in addition to port, rail, and other multimodal agencies.

4.2 FDOT DISTRICT ITS PLANNING ROLES AND RESPONSIBILITIES

4.2.1 Each District has established an ITS Program within the District Traffic Operations Offices to oversee the design, construction, operation, and management of ITS deployments. ITS program managers and engineers were identified in each District to manage the regional ITS program and serve on the CMB. These ITS managers and engineers are responsible for several areas of ITS deployment in their District, including:

- Conceptual design;
- Design-build criteria packages;

- ITS procurement strategies;
- Project deployment;
- ITS device and interface standards;
- Operations and maintenance;
- Testing and burn-in;
- Systems engineering management; and
- Review of ITS technical evaluations.

4.2.2 In addition to the ITS program managers and engineers, several Districts have identified representatives from the District Planning and Public Transportation Offices to coordinate with the FDOT Central Office and the MPOs regarding the update of the ITS architectures and the integration of ITS into the local planning programs and processes. These planning representatives are responsible for:

- Participating in *SITSA* updates;
- Coordinating and managing RITSA development and updates;
- Identifying ITS needs, goals, and objectives for the region;
- Identifying ITS impacts and affected agencies of major regional ITS projects;
- Reviewing ITS planning tools results;
- Providing assistance with ITS planning tools and information to the MPOs;
- Clarifying agency roles and responsibilities for the integration of ITS in the planning process;
- Reviewing the ITS chapter within local LRTPs;
- Ensuring RITSA and project consistency with ***Part 940***;
- • Funding and programming of ITS projects; and
- Conducting ITS alternatives analyses and implementation plans.

4.2.3 The District ITS contacts will also coordinate with the MPOs in conducting regional stakeholders meetings, documenting stakeholder input for the RITSA, and assisting in informing the MPO Board, MPO staff, and ITS committees with regard to the content and maintenance of the RITSA. Additionally, they will conduct and review ITS technical evaluations in coordination with the MPOs and planning agencies and will promote the deployment, funding, and programming of ITS projects within the District.

4.2.4 Districts may also take the initiative in the formation of multi-agency operational and planning organizations to oversee the planning, deployment, operations,

maintenance, and monitoring of ITS in the region. In Florida, the majority of the Districts, in addition to several urban areas, have formed incident management committees to enhance the communication, coordination, and response to incident management along the freeways and major arterials. These teams include transportation, emergency response, law enforcement, environmental quality, and private sector towing representatives, as well as other incident-related response agencies. These established teams provide a perfect forum to present, review, and discuss ITS planning, deployment, and operational issues.

4.2.5 Another trend in the formation of stakeholder groups at the District level is the establishment of regional operating organizations (ROOs). Many urban areas across the nation that are deploying ITS, are realizing the benefits of forming ROOs. The ROOs provide functional, organizational, and interjurisdictional coordination, as well as interoperability for ITS in a region. They bring together representatives from all aspects of ITS in a region, including the end users. ROOs are responsible for identifying regional ITS needs, obtaining the appropriate resources to meet these needs, and ensuring ITS interoperability and integration of ITS within a region.

4.2.6 In Florida, a type of ROO has been established in the Orlando area called the *Central Florida's Regional Transportation Operations Consortium* (Consortium). The Consortium's primary objectives are to:

- Provide a framework and guidelines for ITS operating agencies;
- Promote coordinated decision-making; and
- Encourage information sharing of ITS initiatives.

4.2.7 Additionally, Districts 4, 6, and the Turnpike in Southeast Florida have formed a regional coalition to share in the development, management and operations of ITS in their region called South Florida Regional ITS Coalition (SFRITSC). In the Jacksonville area, District 2 established an ITS Coalition in 2005. These regional operating organizations are built on institutional relationships among regional ITS operators, transportation engineers, transit agencies, law enforcement personnel, and educational institutions and have been solidified through a formal agreement in the form of an executed MOU. The Central Office ITS Section is encouraging and supporting the formation of these ROOs on a statewide level.

4.2.8 Each District should determine the role and responsibilities of the Planning and Traffic Operations Offices for ITS planning and implementation.

4.2.9 The District Planning Office would normally be responsible for LRTP, ITS planning, and coordination with local agencies, planning offices, MPOs, and transportation planning agencies (TPAs) in regard to the ITS Strategic Plan,

statewide and regional ITS architectures, planning policies, programming, and all ITS planning processes.

4.2.10 The District Traffic Operations Office ITS Section would normally be responsible for, or coordinate, ITS programming, design, construction, and operations and maintenance.

4.3 MPO ITS PLANNING ROLES AND RESPONSIBILITIES

4.3.1 MPOs should familiarize existing staff with the purpose and content of the *NITSA*, *SITSA*, ***Part 940***, and their RITSA. MPO staff is responsible for coordinating with the MPO Board, Districts, regional stakeholders, and ITS committees to ensure that local ITS needs are being addressed and that appropriate ITS strategies and projects are identified for implementation within their jurisdictional boundaries. Additionally, the MPOs are responsible for developing ITS goals and objectives, identifying criteria related to the goals and objectives for measuring the effectiveness of the ITS, conducting technical evaluations for ITS projects, and documenting this information in the LRTP. Some MPOs may elect to serve as the primary agency responsible for monitoring and measuring the performance of ITS.

4.3.2 At the MPO's discretion, it may create standing ITS subcommittees or utilize existing committees and forums to ensure stakeholder participation in the ITS planning process. Many ITS subcommittees are formed as an extension of the MPO Technical Advisory Committees or traffic signal committees. These committees should also include multi-agency ITS operating and planning organizations and should coordinate with, or participate in, the District ITS stakeholder committees or ROOs.

4.3.3 The MPOAC contact will be the Executive Director, who shall serve as a liaison between the FDOT and the MPOs.

4.3.4 The Districts' adoption of the RITSA is processed through their participation in stakeholders' meetings, review of the draft RITSA, and approval of the final RITSA.

4.3.5 MPO and TPA adoption of the RITSA may be processed through:

- Board formal adoption,
- Adoption letter, or
- Adoption in transportation plan chapter (preferred method).

SECTION 5

INTEGRATION OF ITS INTO THE LONG-RANGE TRANSPORTATION PLAN AND PLANNING PROCESSES

5.1 BACKGROUND

5.1.1 In addition to addressing the requirements of ***Part 940***, the MPOAC requested additional guidance for the MPOs to define the purpose and content of a RITSA and explain how this relates to the LRTP process in terms of identifying ITS needs, projects, and opportunities for stakeholder input. In more detailed terms, the opportunities and processes for identifying, planning, implementing, and evaluating ITS at the regional level should be further clarified.

5.1.2 Some MPOs and transit agencies in Florida are still unfamiliar with ITS strategies, their benefits, and their application in typical planning processes. This unfamiliarity has been, and still remains, a barrier to ITS integration. Historically, ITS were represented as a collection of transportation system management support technologies rather than transportation improvement strategies with specific objectives. ITS projects were classified as traffic operations improvements and were often funded with congestion mitigation funding or operations funding as part of congestion management programs. They were typically ignored in LRTPs. Federal funds for ITS projects were usually derived from research and development programs or earmarked funds. No dedicated process was in place for the equitable distribution of ITS funds at the state or local levels.

5.1.3 This trend, however, is changing. Federal and state governments are continuing to lobby to mainstream ITS into the surface transportation program. In support of this, the USDOT released its TEA-21 reauthorization proposal, entitled ***The Safe, Accountable, and Efficient Transportation Equity Act of the Twenty First Century-A Legacy for Users (SAFETEA-LU)*** in 2005. In its proposal, USDOT recommended moving ITS from a research and development program under ***TEA-21, Title V, Transportation Research*** to a formula-based program under ***TEA-21, Title I, Federal-aid Highway***. This means that the federal ITS program funds would be distributed to the states based on a formula, similar to the National Highway System. Additionally, ***Title 23, United States Code*** would be amended to include transportation systems management and operations programs as part of the capital planning and construction process. This proposed move would put ITS projects in the same funding categories as traditional capacity projects.

5.1.4 These ***Guidelines*** represent ongoing efforts by USDOT, FHWA, and the FDOT to inform the Districts, MPOs, and transit agencies as to the application and benefits of integrating ITS into the long-range planning processes. To attain overall integration, ITS must be wholly integrated in all stages of the planning and project development processes and at all institutional levels. Additionally, it must be mainstreamed into existing programs and processes.

5.1.5 Although many agencies are currently working together to promote and encourage the mainstreaming of ITS, certain barriers exist that are inherent to the nature of ITS. These barriers include:

- *Operations and Maintenance*: One of the biggest challenges in deploying ITS is considering the day-to-day operations and maintenance and how these systems will be funded over a period of time. Operations and maintenance are currently considered in the planning and programming processes. However, further efforts to ensure that operations and maintenance are properly planned and programmed around the state need to continue.

- *Crosscutting Applications*: Large ITS projects may involve several agencies, technologies, transportation modes, and geographical and jurisdictional boundaries. One ITS project may require commitments and coordination from several agencies to ensure that the ITS is deployed, operated, maintained, and monitored effectively. This crosscutting nature complicates the development and deployment process by pooling resources from various agencies and by getting the agencies to agree on one concept; hence, the requirement of determining stakeholder roles, responsibilities, and required agreements early in the planning and architectural stages of the project.

- *New Technology*: ITS are the use of technology to enhance existing transportation systems. Because ITS are technology-based, most policy boards and decision makers are unaware of the types of technologies available. Additionally, because technology matures and changes so often, it is difficult to keep pace with the latest technological advancements. Therefore, these new solutions are often not considered in the policy maker's realm.

- *New Terminology and Approach*: Systems engineering approaches have been applied in various transportation systems such as traffic control, high-speed rail, military applications, and the aerospace industry; however, no uniform or consistent processes have been adopted within the transportation community. Systems engineering is a structured process for arriving at a final design of a system. It involves the evaluation of several alternatives to arrive at a final design and considers the total life cycle of the project. Systems engineering comes with new applications and a new vocabulary, which most planners and

policy makers are unfamiliar with. These new processes and terminology make it difficult to relate the ITS process to the traditional transportation planning processes.

5.1.6 Because the implementation of ***Part 940*** and the authorization of ***SAFETEA*** will have a statewide impact on the funding and programming of regional and local ITS projects in LRTPs, the FDOT has developed these ***Guidelines*** to address the integration of ITS and LRTP activities.

5.2 REGIONAL ITS ARCHITECTURE AND LRTPs

5.2.1 If an LRTP is the expression of a state or metropolitan area's long-term approach to funding, constructing, operating, and maintaining a multimodal transportation system and a RITSA is a conceptual framework for the long-term deployment of ITS in a region, it seems logical that the LRTP would be the ideal location for the integration of the RITSA. The most recent update of the *2025 Florida Transportation Plan (2025 FTP)*, which is the policy framework to guide crucial investments in Florida's transportation system, included new goals and objectives for ITS. The *Transit 2020 Plan*, which is the transit element of the previous *2020 FTP*, is a statewide strategic plan designed to guide the development of transit in Florida over the next 20 years. It includes an objective to research, identify, and support opportunities to apply advanced technology to help improve transit performance. Additionally the State has developed the 2020 *Florida's Strategic Intramodal System* plan which provides guidance for enhancing mobility for people and freight. For consistency purposes, it is recommended that Florida agency LRTPs incorporate the goals and objectives of the *2025 FTP,* the update objects for the SIS noted in the *2025 FTP* and the *2020 Transit Plan*.

5.2.2 A RITSA relates to an ITS Needs Plan in the LRTP process by identifying needs, alternatives, and roles and responsibilities in deploying ITS projects. However, an architecture by itself does not identify a list of projects or a conceptual plan of how ITS will be implemented or operated in a region. Additional steps and documentation are required to bridge the gap between the technical structure and components of an architecture and the non-technical policy document such as the LRTP. ***Part 940*** requires additional steps for the provision of a sequence of projects and operational concepts for ITS architecture implementation.

5.2.3 A sequence of projects is an ordered list of ITS activities that, when implemented over time, will develop an integrated regional ITS as depicted in the RITSA. The sequencing of projects begins with the identification of all programmed and prioritized ITS projects within the region. This project list is augmented by identifying planned ITS activities included in the RITSA. It is important that this list also include transit, rail, and multimodal ITS projects that may be part of

traditional capacity improvements. This list should include private sector ITS initiatives as well.

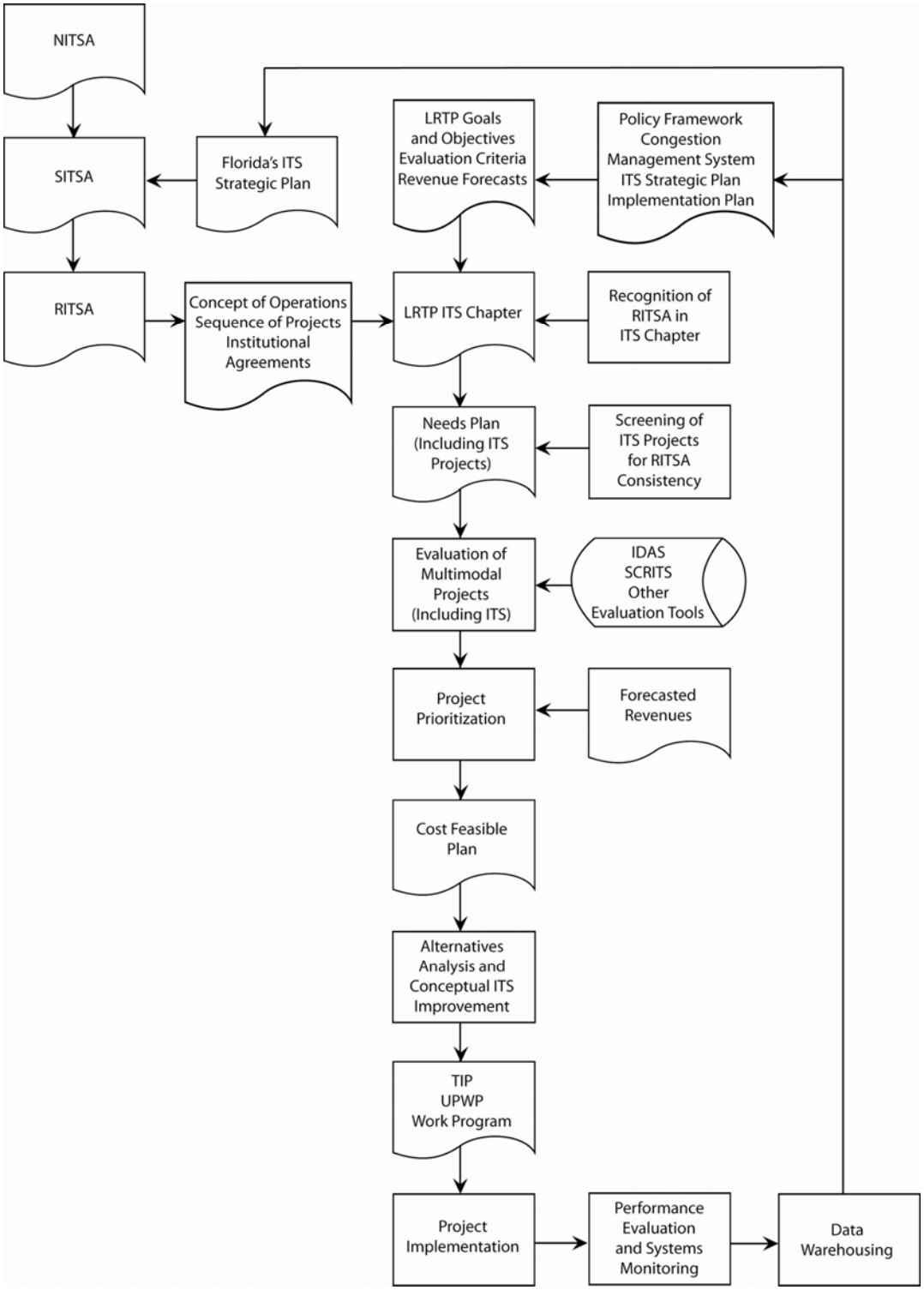
5.2.4 The sequence of projects is then phased based on technological project dependencies. Project dependencies involve the identification of the technological relationship between regional ITS projects and other systems that share information or functionalities. More simply stated, project dependencies identify those projects that require the implementation and technology of another ITS prior to its implementation. This becomes a dependency as one project is dependent on the technology of another system and cannot function if the other system is not in place.

5.2.5 In addition to dependencies, other local factors or policies may affect the prioritized implementation of some ITS projects, thus affecting the sequencing of ITS projects within the region. These additional factors may include: a list of priority corridors, agreed upon technologies, and identified roles and responsibilities. The result of the sequencing of ITS projects should be a phased list for the region that reflects the local policies and project priorities, and can be implemented in a logical sequence. The first projects on the list should be identical to the programmed and prioritized ITS projects identified in the region's Transportation Improvement Program (TIP). The goal in preparing the sequencing of ITS projects is to assist in developing ITS projects for inclusion in the LRTP Needs Plan and Cost Feasible Plan (CFP). The sequencing of ITS projects may be developed as part of a regional ITS implementation plan; however, it should also be referenced as part of the RITSA to fulfill ***Part 940*** requirements.

5.2.6 A concept of operations defines how future ITS will look and perform in a region. It identifies a regional strategy for integrating, operating, and maintaining ITS projects identified in the RITSA, as envisioned by the regional ITS stakeholders. It represents a consensus on how agencies and jurisdictions will work together to achieve integration, better system performance, and efficient operations. It is a nontechnical document that presents a conceptual vision for implementing the RITSA that considers technical, institutional, and communication needs.

5.2.7 **Figure 5.1** presents a recommended implementation process that incorporates the key components of the ***Part 940*** process and recommends a specific sequence of ITS activities that should be performed to integrate the RITSA and LRTP, in addition to other planning processes. The RITSA, and the accompanying sequence of projects, concept of operations, and institutional agreement, should be the starting point for identifying projects that could be incorporated into the existing planning process. These projects, in addition to the RITSA, should be acknowledged in an ITS section or chapter of a LRTP.

Figure 5.1 – Process Diagram for Integrating ITS into the LRTP



SCReening analysis for ITS (SCRITS) is a spreadsheet analysis tool for estimating the user benefits of ITS.

5.2.8 It is recommended that ITS projects be evaluated and prioritized consistent with other multimodal transportation projects as part of a Needs Plan. Specific ITS tools are available for evaluating ITS projects. These tools are discussed in detail in ***Section 5.7*** of these ***Guidelines***. ITS revenue forecasts can be estimated to identify allocated funding for some of the projects, while others would compete with general revenues for funding. The funded projects would become part of the MPO's Cost Feasible Plan and an alternatives evaluation and implementation plan would be conducted to further refine the conceptual ITS project for programming in the TIP and the FDOT's *Five-Year Work Program*.

5.3 RECOMMENDED CONTENT FOR LRTP

5.3.1 In addition to incorporating the RITSA sequence of projects and concept of operations, MPOs should develop ITS goals and objectives in their LRTP specifically related to the establishment of ITS to support multimodal alternatives which preserve the existing transportation system and enhance the mobility of people and goods. These ITS goals and objectives may be derived from existing transportation plans such as the *2025 FTP*, *Transit 2020 Plan*, T*he 2005 Update of Florida ITS Strategic Plan*, local ITS implementation plans, transit development plans, or other local ITS studies. These ITS goals and objectives should be quantified through the establishment of evaluation criteria to effectively measure the benefits and impacts of the ITS projects in comparison with traditional capacity improvement projects and other multimodal enhancements.

5.3.2 To assist the MPOs with integrating ITS into the long-range planning process, a recommended outline of an LRTP ITS chapter has been developed. The recommended ITS chapter contents for the LRTP are contained in ***Appendix B***. Although ***Part 940*** does not require the MPOs to develop an ITS chapter in their LRTP, it is strongly encouraged for those areas deploying ITS to maintain consistency with state and federal ITS architecture and project requirements. This ITS chapter should include a statement that recognizes a RITSA for implementation and integration into the MPO planning process. The ITS chapter should also discuss legacy ITS projects and planned projects and determine if these projects are included in the RITSA. It should summarize the findings of local or regional ITS studies and evaluate the cost and benefits of the recommended projects for consideration in the CFP. The contents of the chapter should be scaled commensurate with the level of ITS deployment within the urbanized area.

5.4 INTEGRATING THE RITSA WITH REGIONAL TRANSIT PLANS

5.4.1 Several FDOT Districts are preparing APTS master plans to identify technical solutions for improving regional transit service performance, operations, and safety. These master plan documents should not only recognize and discuss the adopted RITSA, but also identify ITS solutions that are consistent with the RITSA. Additionally, issues such as regional integration and stakeholder roles and responsibilities should be defined as part of the APTS master plan consistent with the regional concept of operations.

5.4.2 The FDOT requires each transit agency in Florida that receives State Transit Block Grant funding to prepare a Five-Year Transit Development Plan (TDP). The purpose of the TDP is to guide capital and operation improvements for regional transit systems. These TDPs are updated annually and contain a financially constrained five-year resource program for implementing operational transit and capital improvements. APTS projects contained in the TDP should be consistent with the RITSA and LRTP and should specifically address, at the project level, which portions of the RITSA the project will implement and how the project will be integrated with the overall regional ITS.

5.5 INTEGRATION WITH CONGESTION MANAGEMENT SYSTEMS AND CORRIDOR STUDIES

5.5.1 Districts and MPOs can also promote the integration of ITS by conducting ITS alternatives evaluation studies as part of congestion management systems, and major corridor studies, or by conducting a separate ITS evaluation and implementation plan for ITS improvements. Typically, as multimodal projects progress from the LRTP planning stages to an unfunded priority in the TIP, an alternatives evaluation study is performed as part of a congestion management system or corridor improvement study to determine the most effective solution, or combination of solutions, to improve mobility within the corridor or sub-area. This alternatives evaluation study is an important step in the ITS project development process to effectively transition a project from the RITSA and LRTP to a conceptually designed, programmed project ready for design/build. The project is guided by the FDOT Systems Engineering Management Plan which was approved by the FHWA. This detailed publication can be found at: http://www.floridaits.com/SEMP/Index.htm. These alternatives evaluation studies assist in narrowing the range of multimodal and ITS alternatives for consideration in the TIP. ITS strategies considered in the alternatives evaluation study should be consistent with the RITSA. If the recommended strategies are not consistent, the MPO or District should recommend an amendment to the RITSA to reflect the local requirements.

5.5.2 Currently, most Florida MPOs have a Congestion Management System (CMS) in place, which provides opportunities for the development and evaluation of ITS and other multimodal alternatives. As defined by ***Federal Part 23 CFR Parts 450, 500 and 626***, *"Congestion management is a systematic process for managing congestion that provides information on system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods. A CMS should recommend strategies that provide the efficient and effective use of existing and future transportation facilities. A CMS should include methods to monitor and evaluate performance of a multimodal system, identify causes of congestion, identify and evaluate alternative actions, assess and implement cost-effective actions and evaluate the efficiency and effectiveness of implemented actions."*

5.5.3 Appropriate alternative actions identified in a CMS may include the following strategies or combination of strategies:

- Transportation demand management (TDM) measures, including growth management and congestion pricing,
- Traffic operational improvements,
- Public transportation improvements,
- ITS technologies, and where necessary,
- Additional system capacity.

5.5.4 In accordance with the ***Federal Part***, all Transportation Management Areas (TMAs) are required to establish and implement a CMS. A TMA is defined as an urbanized area with a population over 200,000.

5.5.5 As required by ***Chapter 339.177, Florida Statutes***, all Florida MPOs must develop and implement a CMS. In Florida, this system is referred to as the *Florida Mobility Management Process* (*MMP*). The *MMP* is designed to manage congestion on Florida's roadways through monitoring and measuring system performance, identifying the causes of congestion, and identifying alternative strategies for alleviating congestion and enhancing the mobility of persons and goods. The *MMP* can serve as an excellent tool for regional transportation agencies in identifying, evaluating, and monitoring ITS within their region. Through this process, ITS strategies, consistent with the RITSA, can be evaluated with other multimodal solutions to determine their effectiveness in reducing congestion and can be recommended for inclusion in the TIP and *Work Program*. Detailed changes in traffic flow and routing, based on the ITS alternative selected, can be determined and system impacts and costs can be estimated at a conceptual level. The *MMP* will not only assist in identifying and

recommending ITS solutions for inclusion in the TIP, but, once deployed, it can be used to monitor and measure the performance of the system.

5.5.6 Once a typical capacity project is programmed in the TIP and FDOT *Five-Year Work Program*, the first step in the project development phase is a Project Development and Environmental (PD&E) study. The PD&E study is typically followed by the design, construction, or design/build phases of the project. The PD&E study considers the potential corridor improvement alternatives, their cost, impacts, and benefits, and recommends a design and phased implementation schedule for the proposed improvements. These recommendations are then carried forward into the design or design/build phase. The PD&E study for a typical capacity project provides an excellent opportunity to complete a detailed, comprehensive ITS alternatives evaluation study, which is required as part of the systems engineering process.

5.5.7 Similarly, once an ITS improvement is programmed in the FDOT *Five-Year Work Program*, a more detailed ITS alternatives analysis and implementation study, similar to a PD&E study, should be established as a requirement for ITS projects. However, decision-making for this alternatives analysis should take into consideration all relevant factors such as time available in project letting schedule, scale of project, cost of study versus the anticipated benefits, and other issues that may significantly affect the deployment of the ITS project. The primary purpose of this study, referred to as an Alternatives Analysis and Project Implementation Study, would be to fulfill the seven systems engineering requirements for project development identified in ***Part 940*** (i.e., identify portions of the RITSA being deployed and conduct an alternatives evaluation study). This study would also evaluate the detailed operational characteristics and impacts of the system, determine appropriate technologies, identify specific costs, and address systems engineering requirements prior to the design/build phase. At this level in the project development process, more detailed public agency participation is necessary and more project-specific decisions can be made based on stakeholder requirements, policies, and resources. Additionally, a plan for operations, maintenance, and performance monitoring of the system can be developed as part of the implementation plan. These post-deployment components are an important part of the project planning process and feedback loop and are required as part of the systems engineering process.

5.6 SYSTEMS PERFORMANCE MONITORING AND PERFORMANCE MEASURES

5.6.1 As part of the *MMP* requirements, MPOs and planning agencies throughout the state are collecting traffic and travel data to monitor and measure the performance of existing multimodal transportation systems. Data collection methods involve the manual or automated, periodic collection of traffic data during various times of the year to represent typical weekday traffic. These data

are then measured against standard criteria to determine how well the existing systems are meeting their specified goals or objectives. Systems performance monitoring is a necessary part of the feedback loop to ensure operational effectiveness, improve the reliability of transportation systems, and to assist in the planning and design of better systems for optimal performance.

5.6.2 The integration of ITS with the *MMP* provides an ideal opportunity for MPOs to enhance and improve systems performance data collection, monitoring, and reporting. ITS are very data intensive. Most applications involve the automated, real-time collection, monitoring, and dissemination of multimodal travel conditions. The ***Federal Part*** addressing CMS requires that, *"to the extent possible, existing data sources should be used as well as appropriate application of the real-time system performance monitoring capabilities available through ITS technologies."*

5.6.3 Automated data technology, such as roadside sensors and video imaging, allow ITS to capture and record data, such as traffic volume, vehicle speed, vehicle classification, and incidents. Integration with other multimodal systems enhances the primary data collection with en route transit information and construction work zone locations and impacts. These data are collected and stored in data warehouses located in traffic management centers (TMCs). These data can be smoothed, bundled, and repackaged for various planning applications including CMSs and model validation. The automated data collection, monitoring, and performance capabilities of ITS can provide more robust, comprehensive planning data to track performance while reducing the need for additional labor. Currently, the FDOT Traffic Engineering and Operations Office, ITS Section, is developing a central data warehousing study to determine the operational concept for a statewide ITS data warehousing, including an archive system to assess potential multi-agency use and application for the historical and real-time data.

5.6.4 The FDOT Traffic Engineering and Operations Office, ITS Section, has recently conducted studies to determine the feasibility of using electronic toll transponders as probes to provide vehicle tracking and travel time information. Additionally, the use of license plate readers and optical character recognition (OCR) technology was tested to determine if license plates would prove to be a viable method for collecting travel time and travel characteristics information. The FDOT also has demonstration projects for travel time estimation using cell phones and global positioning system technologies. As these technologies mature and accuracy improves, the applications for data collection and performance monitoring will become widespread.

5.6.5 In addition to automated data collection techniques and methodologies, the need for standardized ITS performance measures is becoming a statewide priority. The performance of the FDOT Statewide ITS Deployments should be measured

for accountability, efficiency, effectiveness, and stakeholder satisfaction. To ensure that all ITS are measured by the same standard, statewide performance measure criteria should be developed from the *The 2005 Update of the Florida ITS Strategic Plan* and *2025 FTP* goals and objectives and should be consistent with *Florida's MMP*. At the request of the Florida Transportation Commission, the FDOT Traffic Engineering and Operations Office ITS Program has developed initial ITS performance measures. The latest performance measures reports are available at:
http://www.dot.state.fl.us/TrafficOperations/ITS/Projects_Deploy/ITS_PM.htm

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5.7 ITS EVALUATION TECHNIQUES AND TOOLS

5.7.1 The evaluation of ITS strategies involves the qualitative and quantitative analysis and comparison of planned or proposed ITS strategies. As previously recommended, ITS strategies should be evaluated as part of major corridor studies, independent ITS implementation plans, and during the development of the LRTP CFP. The purpose of these project evaluations is to determine how well a proposed ITS improvement is expected to meet the identified goals and objectives of a plan, or to compare and select ITS alternatives that will best meet the identified goals and objectives. In order to effectively evaluate ITS strategies, ITS goals and objectives should be clear, well-defined, and measurable. Measures of effectiveness, or criteria, which quantify the goals and objectives, should be established to gauge the project's progress in meeting or exceeding the goals.

5.7.2 In most transportation system evaluations, measures of effectiveness may be qualitative, quantitative, or a combination of both. One of the difficulties in measuring the benefits of ITS is that many ITS benefits are qualitative, based on user convenience and perceptions, and cannot be accurately captured or measured. Applications such as *Advanced Traveler Information Systems* may prove convenient to the general public by facilitating pre-trip planning; however, this convenience is difficult to quantify. Depending on local priorities, qualitative benefits can sometimes outweigh quantified benefits.

5.7.3 The purpose of evaluating ITS in the LRTP stage is to estimate the costs and benefits of ITS projects for comparison and prioritization with other multimodal projects in the development of a CFP. However, if ITS strategies are to be evaluated and compared on an equal basis with traditional capacity projects, new evaluation criteria and techniques should be developed that are applicable to all modes, yet capture the true costs, benefits, and impacts of ITS. Most of today's evaluation tools rely on modeling of the ITS projects within a network and comparing network alternatives using traditional measures of effectiveness. Typical core evaluation criteria include volume, vehicle miles of travel, vehicle

hours of travel, person miles traveled, number of accidents, etc. Currently, little documentation exists regarding the application and effectiveness of ITS measures of effectiveness in relation to traditional capacity project measures of effectiveness. The Traffic Engineering and Operations Office (TEOO) ITS Section is currently supporting consultant efforts to define an effective process for reporting outcome measures. The latest documents can be found at: http://www.dot.state.fl.us/TrafficOperations/ITS/Projects_Deploy/ITS_PM.htm. More research, methodologies, and tools are necessary in evaluating ITS benefits.

5.7.4 A more recent indicator of transportation system efficiency, which has become more popular with the mainstreaming of ITS, is travel time reliability. Travel time reliability is an indicator of travel variability over time. Typical anticipated travel times (recurring congestion) can be drastically affected by non-recurring congestion due to incidents, special events, or major construction. Travel time reliability is usually reported as a reduction or increase in vehicle hours of delay. In some cases, it is reported as a percentage of expected travel times. Most evaluation tools can estimate ITS and other multimodal system performance; however, they do not include travel time reliability. This trend is changing as the demand for ITS evaluation models and tools increases with the integration of ITS.

5.7.5 Several off-the-shelf products or tools are available to assist in evaluating the impacts, costs, and benefits associated with ITS investments. These tools can be categorized as: travel demand models, sketch planning tools, and traffic simulation models. Additionally, emissions models can assist in evaluating and quantifying the environmental impacts of ITS.

5.7.6 Travel demand models (TDMs) are used to estimate travel demand for a multimodal transportation network based on various land use and socioeconomic scenarios. They report multimodal volumes and network performance measures for a typical weekday. Although a TDM would be useful to compare ITS performance to other modes, it is not sophisticated enough to effectively evaluate the impacts of ITS. For ITS, the application of TDMs is limited because the traffic assignment is a static assignment and most models consider daily travel instead of peak period travel. Real time traffic assignment during peak periods is more useful in assessing changes in traffic flow based on the implementation of ITS.

5.7.7 Sketch planning tools are designed to provide reasonable estimates of ITS impacts and benefits for various ITS strategies based on a common transportation network and land use scenario. Sketch planning tools are primarily used to compare ITS strategies and are not recommended for simulation purposes. Because these tools are more effective in quantifying ITS benefits at a conceptual level and are relatively inexpensive to compile and operate, they may be more applicable for high-level screening of LRTP project evaluations and ITS

alternatives evaluation studies. Note that the use of sketch planning tools on alternative evaluation studies may increase the cost and / or schedule on small ITS projects or system upgrades.

5.7.8 A sketch planning software called the ITS Deployment Analysis System (IDAS) has been developed by the FHWA. IDAS relies on the traditional TDM for input. In Florida, the adopted TDM is the Florida Standard Urban Transportation Model Structure (FSUTMS). IDAS operates as a post-processor from the TDM and gathers the results of the TDM to provide cost benefit analyses of various ITS alternatives. The FDOT Systems Planning Office has purchased several copies of the IDAS software for distribution to the District Planning Offices and the Traffic Engineering and Operations Office, ITS Section. To assist ITS professionals in evaluating ITS projects, the Systems Planning Office has developed an FSUTMS-IDAS interface. The interface provides FSUTMS output data into ready-to-use formats for IDAS. This interface provides assistance to ITS professionals by simplifying the use of IDAS in evaluating the benefits of ITS. Additionally, the FDOT Traffic Engineering and Operations Office, ITS Section, has developed customized IDAS cost and benefit databases to produce more Florida-specific costs and benefits for ITS deployments along the state highway system.

5.7.9 Traffic simulation models such as DYNASMART-P, TRANSIM, and AIMSIM are more applicable in evaluating ITS at the microscopic or sub-area level. Because they are more sophisticated at assessing changes in traffic flow and network characteristics due to ITS, they require more detailed input data, and can be labor intensive and expensive to operate. The benefit of these models is that they present a more complete representation of the network and the impacts of ITS. Typically, these models also have excellent graphical effects making it easier for policy and decision makers to visualize how ITS will operate within the existing transportation system.

DYNASMART is being used by the FDOT on active research as a tool to provide real-time route diversion planning, but the model itself is not being evaluated in real-time operating conditions. No updated documentation is available regarding TRANSIM and AIMSIM evaluations. The FDOT did some research on these systems in the past, and the TEOO will look for opportunities to further this research in the future.

SECTION 6

STAKEHOLDER INVOLVEMENT STRATEGIES FOR INTEGRATING ITS

This section discusses three primary strategies designed to educate, encourage, and involve stakeholders in fostering the integration of ITS and promoting the use of ITS strategies as solutions to multimodal transportation problems.

6.1 STAKEHOLDER OUTREACH

6.1.1 Stakeholder and public involvement is as important to ITS planning and deployment as any multimodal process. The systems engineering process used to develop ITS architectures and deployments is based on system requirements that are derived from a stakeholder's vision, which is reflected in the development of system needs, goals, and objectives. These needs, goals, and objectives are formulated through direct interaction, discussions, and interviews with regional ITS users, owners, and operators. The project or system requirements are documented, and, later in the project development process, traced back to the recommended solutions to verify that the architecture or system adequately fulfills the stakeholder's vision, needs, goals, and objectives. This process is called traceability. Traceability for an ITS architecture is demonstrated by directly tying the resulting architecture components back to the stakeholder requirements.

6.1.2 The RITSA development process provides the optimal forum for conducting ITS stakeholder outreach. Stakeholder meetings are held in each region or FDOT District prior to and during the development or update of a *SITSA* and RITSA. These meetings are designed to collect and document stakeholder input and to illustrate how the input was incorporated into the RITSA through traceability. The stakeholders are requested to verify that the resulting ITS architecture adequately meets their regional needs.

6.1.3 In addition to the RITSA, other opportunities may be available within the metropolitan transportation planning process for stakeholders to review and recommend ITS strategies. Stakeholder input may also be collected during the public outreach process conducted for LRTP updates. Information and recommendations identified during the LRTP update process can be brought forward and addressed in the RITSA update process. Similarly, suggestions and recommendations identified as part of corridor, sub-area, or project implementation plans may also be used to enhance or improve ITS deployment strategies.

6.2 TRAINING AND EDUCATION

6.2.1 One of the primary components of the original *Strategy* was an accompanying training, education, and outreach process. The training and outreach strategy was designed to inform the Districts and MPOs, in non-technical terms, of the:

- ***Part 940*** requirements;
- Purpose and content of a RITSA,
- Recommended RITSA development and maintenance process; and
- Strategy for integrating ITS into the LRTP processes.

6.2.2 A primary goal of the training and outreach was to ensure that stakeholder agency contacts and representatives at all institutional levels became familiar with the purpose, content, and terminology of a RITSA, and to present ***Part 940*** requirements and impacts. The relationship among the *NITSA*, *SITSA*, and RITSAs was illustrated and stakeholders learned to identify components of their local ITS in their RITSA.

6.2.3 The District and MPO outreach process for the *Strategy* was designed for implementation in three phases. These phases included:

- A statewide ***Part 940*** workshop;
- Customized architecture and implementation strategy workshops for regional stakeholder agencies; and
- Individual MPO and committee workshops.

6.2.4 The statewide ***Part 940*** workshop was conducted in October 2002. Over 80 participants from agencies across the state were informed of the ***Part 940*** requirements and the purpose and content of the *SITSA*, and were instructed on how to utilize their RITSA to identify existing or planned ITS projects. Two additional SITSA Update workshops were conducted July 25-26 and September 28, 2005. The SITSA update is focused on documenting and ensuring that the process followed complies with all requirements of ***Part 940*** of the CFR. In addition to these workshops, customized ***Part 940*** implementation presentations were conducted for several local municipalities, the MPOAC, the FDOT Planning Managers, and transportation demand modeling groups as part of IDAS training courses.

6.2.5 The FDOT Traffic Engineering and Operations, ITS Section, and ***Part 940*** Working Group have proactively sought new forums to present the findings of the

Guidelines. However, these workshops and training courses have been primarily conducted at the request of regional stakeholders. This outreach process has been an ongoing process and will continue through the development and acceptance of the ***Guidelines***.

6.3 IDENTIFYING ITS CHAMPIONS

6.3.1 One of the more effective means of promoting the use of ITS strategies as solutions to multimodal transportation problems is to identify ITS champions. ITS champions are regional stakeholders who provide strong leadership in developing and implementing ITS activities within a region. They are typically knowledgeable and well-versed in ITS strategies and applications and can drive the ITS process while building consensus at each step. ITS champions are not made; they are identified from existing leaders in the ITS and transportation planning arena. Although they must be stakeholders in the region, they can be part of a public or private agency, and can be ITS operators, managers, planners, or policy makers. Often, high profile individuals, who are leaders in the transportation planning process, make the best ITS champions because they are proven consensus builders, familiar with the transportation institutions, processes, and policies, and can draw upon a wealth of ITS expertise to assist in formulating ITS strategies for the region. The ***Part 940*** Working Group is an excellent example of ITS champions who sought to identify, resolve, and mitigate ***Part 940*** implementation impacts and integration issues for the state of Florida.

SECTION 7

SUMMARY OF *Part 940* GUIDELINES RECOMMENDATIONS

7.1 SUMMARY

7.1.1 The purpose of these ***Guidelines*** is to recommend an approach for the implementation of ***Part 940*** in Florida and to guide Districts, transit agencies, and MPOs with the integration of ITS into the long-range planning process. These ***Guidelines*** were developed in response to the FDOT District Planning and MPOAC requests for understanding and guidance regarding ITS architecture development and maintenance, agency roles and responsibilities, and steps for integrating the ITS architecture into a LRTP. With this in mind, the following recommendations were made as part of these ***Guidelines***:

- Florida RITSAs should be developed based on the Florida *SITSA* and *NITSA*;
- The RITSA should be no less than the metropolitan planning boundary;
- MPOs should formally recognize a RITSA in their LRTP;
- Districts and MPOs will be responsible for identifying harmonization issues between independently customized RITSA and their *SITSA* regional architecture component;
- The FDOT Traffic Engineering and Operations Office, ITS Section, in coordination with the Districts and MPOs, will update and maintain the *SITSA* and its regional components;
- A combination of issues or changes is recommended to initiate an RITSA update;
- The *SITSA* will be updated every three to five years consistent with LRTP updates and will meet ***Part 940*** requirements;
- A process was developed for regular maintenance and adaptation of the *SITSA*;
- ITS planning roles and responsibilities were identified for MPOs, FDOT Traffic Engineering and Operations Office, ITS Section, and FDOT District ITS Offices;
- The formation of ROOs is beneficial to regions;
- A sequence of projects is required to meet ***Part 940*** requirements and assist MPOs in identifying ITS projects for inclusion in their LRTP;
- A process for integrating the RITSA into an LRTP was established;
- A LRTP chapter outline was identified;

- ITS projects should be screened for RITSA consistency and evaluated during the LRTP development process;
- Further research is needed for ITS evaluation software tools and their applicability (See Section 5.7.9);
- A process for ITS project evaluation and implementation studies should be established (See Section 5.5.1);
- ITS performance measures should be developed and standardized (See Section 5.7.3); and
- Strategies for stakeholder input in the RITSA and project development processes were identified.

SECTION 8

NEXT STEPS

This section details the next steps in implementing the ***Guidelines*** recommendations.

8.1 AGENCY IMPLEMENTATION

8.1.1 Implementation of the ***Guidelines*** recommendations requires a thorough knowledge and understanding of ***Part 940*** requirements and should begin with the identification of regional stakeholders and ITS champions. Once approved, an ITS stakeholder training and outreach program should be conducted to ensure that all parties involved understand:

- The impact of ***Part 940*** in the planning process;
- Agency roles and responsibilities in planning and implementing ITS; and
- Integration barriers and strategies.

8.1.2 After the stakeholders are better informed, they can begin to breakdown the institutional, functional, and geographic barriers to define agency roles and responsibilities and develop an integration process at the regional level. Processes for identifying, funding, evaluating, monitoring, and coordinating ITS activities should be established to suit the needs of the region.

8.2 INTEGRATION AND UPDATE OF EXISTING DOCUMENTS

8.2.1 After approval and acceptance of the ***Guidelines*** by the FDOT Executive Committee, they will be published as a formal update of ***Florida's ITS Planning Guidelines: Integration of ITS into the Transportation Planning Process***. The ***Guidelines*** will be disseminated to the FDOT Central Office departments, FDOT Districts, and the MPOs. These ***Guidelines*** should also be referenced in the next update of the MPOs' handbooks as a guide for integrating ITS into the MPO planning programs.

8.2.2 Additionally, these ***Guidelines*** will be used as a resource material for the any future updates of *The 2005 Update of Florida's ITS Strategic Plan* and the *SITSA*. The FDOT Traffic Engineering and Operations Office ITS Section, will utilize the recommendations identified in the ***Guidelines*** to:

- Further define ITS roles and responsibilities in Florida transportation agencies;
- Research available ITS evaluation software tools and their applicability;
- Establish a process for ITS project evaluation and implementation studies; and
- Develop ITS performance measures.

APPENDIX A

FHWA REGIONAL ITS ARCHITECTURE ASSESSMENT CHECKLIST VERSION 1.0 (5/03)

Architecture Name:

Type of Architecture (e.g. Regional, Statewide, etc):

Date Architecture Developed or Last Updated (mm/yyyy):

Reviewer:

Review Date:

This checklist represents elements of a regional ITS architecture, and includes the requirements of the FHWA ***Part 940*** and *FTA Policy* on ITS Architecture and Standards Conformity. The checklist is a tool for assessing the completeness of and identifying improvements to the regional ITS architecture. The questions are listed by main topic area with an area for a reviewer to make an assessment. The "Comments" column allows a reviewer to document any suggestions, notes, strengths, or shortcomings.

Criteria/Question	Yes/No/ Partly	Comments
1. Architecture Scope and Region Description		
a. Is the region defined geographically? Have boundaries been established such as counties, municipal boundaries, metropolitan areas, statewide, etc.?		
b. Has a timeframe for the architecture been defined? (For example, 5 or 10 years into the future, or the TIP/STIP planning period)?		
c. Has the scope of the regional architecture been defined (i.e. the range of services, institutions, or jurisdictions)? Does the scope seem appropriate given the circumstances?		

Criteria/Question	Yes/No/ Partly	Comments
2. Stakeholder Identification		
a. Are the stakeholders identified in sufficient detail to understand who the players are and for what they are responsible? Are they identified by name, responsibility, jurisdiction, and/or typical roles and activities?		
b. Is the range of stakeholders commensurate with the defined scope of the regional architecture?		
c. Does the range represent a broad cross-section of all transportation related organizations in the region?		
d. Is there sufficient information to assess the degree of involvement of each critical stakeholder in the architecture development process?		
3. System Inventory		
a. Has a system inventory been defined?		
b. Does it include a list of applicable regional systems along with descriptions of each system and their functionality?		
c. Have National ITS Architecture subsystems and terminators been correctly linked to regional systems?		
d. Are user-defined entities described in sufficient detail to understand their function?		

Criteria/Question	Yes/No/ Partly	Comments
4. Needs and Services		
a. Are needs and services defined and described?		
b. Are the needs and services adequately represented in the regional architecture?		
5. Operational Concept		
a. Has an architecture operational concept been described in sufficient detail for the existing systems to understand the roles and responsibilities (technical, financial, human resource, mutual relationship and functional areas) of the primary stakeholders and the systems they operate in the region?		
b. Has an architecture operational concept been described in sufficient detail for the future systems?		
6. Functional Requirements		
a. Have high-level functional requirements been identified for each regionally significant system that is included in the architecture? (“Regionally significant systems” are defined as those with interfaces that cross agency boundaries.)		
b. Are the requirements categorized by stakeholders?		
c. Are the requirements unambiguously stated in terms of shall statements?		
d. Is the architecture output presented in a		

Criteria/Question	Yes/No/ Partly	Comments
way that is understandable to a variety of audiences, including the public and decision makers?		
7. Interfaces/ Information Flows		
a. Are interconnections defined to indicate what subsystems are connected together? Has this been illustrated by diagrams or tables?		
b. Have information flow diagrams or tables been developed to illustrate the information flows that are exchanged between subsystems?		
c. Is enough supporting information provided to understand the information exchanged?		
d. Does the architecture include appropriate linkages to overlapping or adjacent region architectures?		
e. Is the connection status (existing or planned) identified for each link?		
f. Are there any important integration opportunities that may have been overlooked?		
8. Project Sequencing		
a. Has a plan been established by which projects would be defined and sequenced over time?		
b. Has an initial sequencing of currently defined projects been established?		
c. Does the sequencing adequately		

Criteria/Question	Yes/No/ Partly	Comments
address the interdependencies among projects?		
d. Have opportunities to coordinate implementation schedules with other transportation improvements been investigated?		
9. Agreements		
a. Has a list of the agreements needed between key stakeholders in order to implement the projects that will come out of the regional ITS architecture been defined?		
b. Can existing agreements be used?		
10. Standards Identification		
a. Are ITS standards described that are applicable to the development of projects coming out of the regional ITS architecture?		
b. Are these standards associated with specific information flows or interconnects?		
c. Are there any important standards that may have been overlooked?		
11. Using the Regional ITS Architecture		
a. Is there a description for incorporating and using the regional ITS architecture in the region's planning process?		

Criteria/Question	Yes/No/ Partly	Comments
b. Will a regional stakeholder organization or committee monitor and manage the planning process and the architecture use? Are all important responsibilities addressed?		
c. Is there a description for using the regional ITS architecture in support of project implementation?		
12. Maintenance Plan		
a. Is there a documented plan for maintaining the architecture? (If not, are there informal agreements for how the regional architecture will be maintained?)		
b. Have the various reasons for updating the architecture been addressed (project updates, new requirements or initiatives, etc.)?		
c. Is there a plan for communicating changes in the architecture to stakeholders?		
d. Have the responsibilities of the various stakeholders or groups been well defined?		

Other comments: _____

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APPENDIX B

RECOMMENDED LRTP CHAPTER CONTENTS

1. Introduction
   a. Definition of ITS
   b. ITS Service Area and Types of Services (Market Packages)
   c. Benefits and Impacts of ITS

2. ***Part 940*** Requirements and Integration in the MPO Planning Process

3. Regional ITS Architecture
   a. Purpose of an Architecture
   b. Recognition of a Regional Architecture

4. Local ITS Plans and Consistency with Architecture

5. ITS Existing (Legacy) Systems
   a. Type of Deployment
   b. Location
   c. Stakeholders
   d. Performance of the System

6. Future Deployments
   a. Sequence of Projects from Local Architecture
   b. Recommendations from Local ITS Plans
   c. Project Costs and Impacts
   d. Evaluation of Benefits and Benefit/Cost Analysis