



FIRST COAST ITS COALITION

First Coast Regional Intelligent Transportation Systems Master Plan



FOREWORD

In 2004, the City of Jacksonville, the First Coast Metropolitan Planning Organization (FCMPO), the Florida Department of Transportation (FDOT), the Jacksonville Transportation Authority (JTA), and other agencies in the First Coast Region joined together to create the First Coast Intelligent Transportation Systems (ITS) Coalition. The Coalition now has over 150 members representing 60 agencies, not including private consultants. The Coalition was an outgrowth, in part, from the ITS Summit organized by JTA in April 2004. The Coalition's mission is to foster ITS deployment in the region in a manner that makes the best use of scarce resources and ensures interoperability of ITS subsystems and elements.

In April 2006, the FCMPO and JTA, in partnership with FDOT, the City of Jacksonville, and the remaining members of the First Coast ITS Coalition, launched a study to develop a First Coast Regional ITS Master Plan. This document series is that Master Plan. The Regional ITS Master Plan is in four parts:

1. "First Coast Regional ITS Operational Concept," which presents the regional mission, vision, goals, and objectives, and identifies the stakeholders that play a part in regional ITS activities and defines their roles and responsibilities for providing key transportation services within the region.
2. "First Coast Regional ITS Architecture," which is a roadmap for transportation systems integration in the First Coast region over the next 10 years.
3. "Approach to ITS Project Planning and Implementation" (or "Implementation Plan" for short), which defines a process that will bring proposed ITS projects into the funding mainstream of either the First Coast Metropolitan Planning Organization or other mechanism for areas outside the FCMPO.
4. "5- & 10-Year Implementation Plan," which establishes the planned ITS deployment for the members of the Coalition in the near- and mid-term periods.

A fifth document, the Regional ITS Deployment Plan is published separately because it is an initial deployment plan for the 5- & 10-Year Implementation Plan and will likely change frequently; thus it is not a permanent part of the Master Plan per se.

This Regional ITS Master Plan (FCIMP) is published on the Coalition's page on the FCMPO Web site (<http://www.firstcoastmpo.com/>) in the following formats:

- This complete document in all four parts formatted for double-sided printing, "FCIMP_Full_Plan_2-Sided.pdf,"
- This complete document formatted for single-sided printing, "FCIMP_Full_Plan_1-Sided.pdf," and
- Each part separately formatted for double-sided printing, "FCIMP_Part_1_2-Sided.pdf," and so forth for the other three parts.

Other documents and files are also on the Coalition Web site, as reported in the various parts.

An important consideration of any ITS undertaking is the compliance by project sponsors with federal regulations concerning the use of federal funds (and for all practical purposes, State of Florida funds as well). Specifically, ITS deployment is governed by 23 CFR Part 940.9 Section D of the Federal Highway Administration (FHWA) Final Rule (referred to herein as “FHWA Rule 940”) and a similar Federal Transit Authority (FTA) Policy covering transit ITS projects (the “FTA ITS Policy”). The following outlines the requirements of FHWA Rule 940 and where each requirement is documented as indicated in parentheses:

1. A description of the region (provided in the Operational Concept),
2. Identification of participating agencies and other stakeholders (provided in the Operational Concept),
3. An operational concept that identifies the roles and responsibilities of each agency (Part 1 of the FCIMP is the Operational Concept),
4. Any agreements (existing or new) required for operations, including at a minimum those affecting the ITS project (provided in the Implementation Plan),
5. System functional requirements shown as information data flows from Turbo Architecture output (located on the FCIMP CD-ROM and the ITS Master Plan section of the FCMPO Web site),
6. Interface requirements and information exchanges with planned and existing systems (same as 5),
7. Identification of ITS standards supporting regional and national interoperability (same as 5),
8. The sequence of projects required for implementation (the Implementation Plan Process, Part 3, provides the mechanism to do this and the 5-Year Implementation Plan identifies the known projects at this time),
9. The agencies and other stakeholders participating in the development of the Regional ITS Architecture shall develop and implement procedures and responsibilities for maintaining it as needs evolve within the region (provided in the Regional ITS Architecture document), and
10. All ITS projects funded with highway trust funds shall be based on a systems engineering analysis (while this is beyond the scope of the FCIMP project per se, the Implementation Plan developed under this project follows the Systems Engineering process).



FIRST COAST ITS COALITION

**First Coast Regional Intelligent Transportation Systems
Master Plan
Part 1: ITS Operational Concept**



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ITS OPERATIONAL CONCEPT

1.1 INTRODUCTION

In April 2006, the First Coast Metropolitan Planning Organization (FCMPO) and the Jacksonville Transportation Authority (JTA), in partnership with the Florida Department of Transportation (FDOT), the City of Jacksonville, and other agencies in the First Coast Region, launched a study to develop a Regional Intelligent Transportation Systems (ITS) Master Plan. This document series, in four parts, is that Master Plan.

This part describes the First Coast Regional ITS Operational Concept, effective for the next five years (2008-2012). The ITS Operational Concept provides a framework to foster ITS integration and improve inter-agency communication, cooperation, coordination, and commitment. Specifically, the ITS Operational Concept identifies the stakeholders that play a part in regional ITS activities and defines their roles and responsibilities for providing key transportation services within the region. This is accomplished through high-level descriptions that explain how ITS elements, owned and operated by these agencies, interconnect to effectively share information and data. This provides agencies the ability to easily understand where they fit into regional ITS activities, which reduces confusion and breeds an environment where inter-agency consensus can be achieved. Additionally, the ITS Operational Concept accomplishes the following:

- Identifies possibilities for institutional cooperation and coordination, laying the foundation for institutional agreements or memoranda of understanding.
- Ensures conformance with 23 CFR Part 940.9 Section D of the Federal Highway Administration (FHWA) Final Rule (referred to herein as “Rule 940”) and a similar Federal Transit Administration (FTA) Policy covering transit ITS projects (the “FTA ITS Policy”).

- Supports project design by providing a starting point that systems engineers can reference when designing systems, which is also a Rule 940 requirement.

Although the ITS Operational Concept begins to provide details important to the development of the regional ITS, it is not intended to provide the specific details needed to implement ITS at the project level. Instead, the Operational Concept should be considered as the initial step taken to begin this process and to foster inter-agency agreement and understanding.

The First Coast Regional Operational Concept was developed in large part through use of the National ITS Architecture—a proven and consistent approach for developing a Regional ITS Architecture. Additionally, this plan was prepared and completed under the guidance of the aforementioned sponsors with the participation and support of the Region’s ITS stakeholders (e.g., transportation, public safety, public transportation agencies, planned special events, and commercial and military interests). This group of stakeholders had been formed into the First Coast ITS Coalition, which is the organization that oversees this entire effort. The membership of the Coalition is given later in this report.

1.2 BACKGROUND

The Operational Concept builds upon stakeholder input and the regional inventory of ITS elements to develop an understanding of how agencies operate and how their associated ITS elements can be used to help each regional agency satisfy its mission. It paints a clear picture showing how agencies and their associated ITS elements come together to form an integrated “system of subsystems” (generally within an agency’s regime of operations).

The ITS Operational Concept, along with the Regional ITS Architecture, provides the information needed to develop the ITS implementation Plan. The ITS Implementation Plan will describe a process by which future ITS planning, implementation, and management and operations will be accomplished in the First Coast Region. Strawman Regional ITS Plans will recommend ITS initiatives that help satisfy the Regional ITS Vision over the near-term (0-5 years), and longer-term (5-10 years).

1.2.1 Coordination with State, Regional, and National Rules, Policies, and Guidelines

In early 2001, the United States Department of Transportation (U.S.DOT) announced the release of FHWA’s Rule 940 and FTA’s ITS

Policy for applying the National ITS Architecture at the regional level.¹ This rule/policy requires regions that are funding ITS projects through the National Highway Trust Fund, to develop a regional ITS architecture that is consistent with the National ITS Architecture. Specifically, Section 940.9D of the rule/policy states that a Regional ITS Architecture shall include, at a minimum, the following information:

1. A description of the region.
2. Identification of participating agencies and other stakeholders.
3. An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems included in the regional ITS architecture.
4. Any agreements (existing or new) required for operations, including, at a minimum, those affecting ITS project interoperability, utilization of ITS related standards, and the operation of the projects identified in the regional ITS architecture.
5. System functional requirements.
6. Interface requirements and information exchanges with planned and existing systems and subsystems (for example, subsystems and architecture flows as defined in the National ITS Architecture).
7. Identification of ITS standards supporting regional and national interoperability.
8. The sequence of projects required for implementation.

This part, The First Coast Regional ITS Operational Concept, satisfies items 1, 2, and 3, and to some extent item 4 of the rule/policy. The remaining items are addressed in the ITS Architecture and Implementation parts. This includes a more thorough discussion of items 2 and 4.

1.2.2 Definition of the First Coast Region

The formal First Coast region coincides with the First Coast MPO planning boundary (see Figure 1-1). The First Coast region spans

¹ FHWA's Rule 940 and FTA's policy are virtually identical, except for the types of projects covered, namely highway or transit, respectively. To minimized repetition, in this document any reference to Rule 940 should be taken to also refer to the FTA ITS Policy for transit projects. The rule/policy and other helpful information can be found at: http://www.ops.fhwa.dot.gov/its_arch_imp/index.htm.

nearly 1,118 square miles and serves a population of roughly 1.2 million. The region includes all of Duval County (which constitutes the City of Jacksonville with the exception of four separate municipalities) and significant portions of Clay, Nassau and St. Johns Counties. The region spans from the Camden/Nassau County line in the north and continues south to just south of the City of St. Augustine. The region is bound by the Atlantic Ocean to the east and the Baker/Duval and Baker/Clay County lines to the west. The region includes all of I-295, and portions of I-10 and I-95.

For practical purposes, however, the full Counties of Clay, Nassau, and St. Johns, and the immediately neighboring Counties of Baker, Bradford, Putnam, Union, Alachua, and Flagler are included to the extent that ITS information flows extend from the core region to entities within these counties.

1.2.3 ITS Mission and Vision

The ITS Operational Concept represents a reflection of the missions and goals of the key agencies responsible for delivering transportation services, but more importantly it sets a direction for how agencies will effectively communicate with each other in the future. This direction for growth is stated in the region's ITS mission and long-term vision. By setting a future direction for growth, inter-agency consensus can be achieved, improving relationships and delivering greater operational efficiencies. In other words, the ITS Operational Concept through its stated ITS mission, vision, and goals and objectives helps eliminate the traditional stove-pipe mentality that limits the benefits of so many public investments. The "Regional ITS Mission, Vision, and Goals and Objectives" for the First Coast Region are articulated in the following sections.

Regional ITS Mission

The regional ITS mission is a clear, concise statement that best describes what ITS should do (i.e., its purpose). It describes the system as a whole; therefore, until all needed and desired ITS elements are in place, efforts to deploy ITS within the region can be viewed as taking steps toward satisfying the mission. The Regional ITS Mission for the First Coast Region is as follows²:

"The First Coast Regional ITS Mission is to provide residents, visitors, commercial, and military interests with a safe, efficient, and socially responsible travel experience, with the ability to rapidly respond to

² The mission and vision, as well as the goals, objectives and performance measures to follow, were presented to the First Coast ITS Coalition at a workshop on November 8, 2006, and subsequently modified and then approved by the First Coast ITS Steering Committee on or about December 7, 2006.

*incidents and special events of all types and of any magnitude to enhance the economic viability of the region.*³

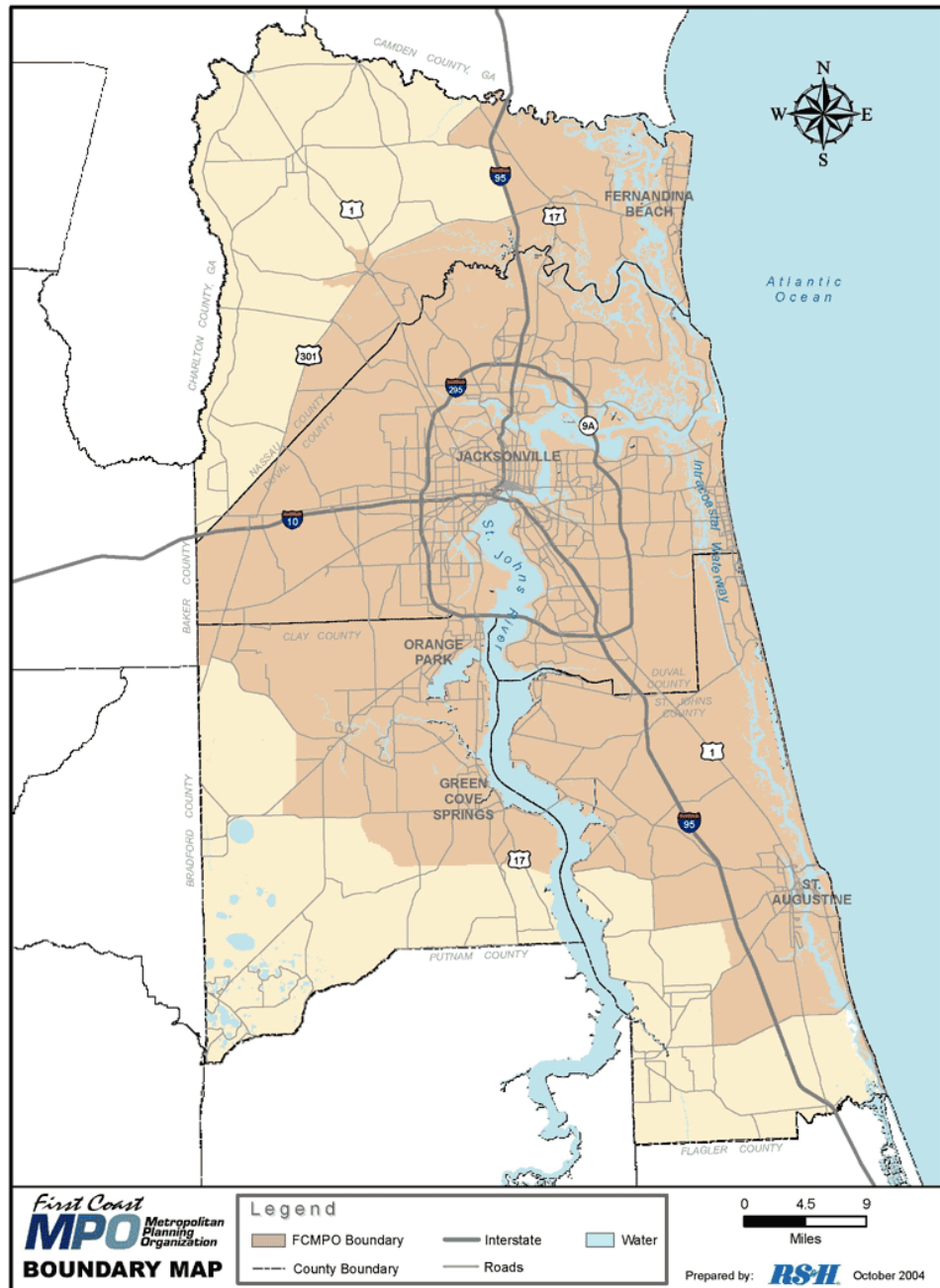


Figure 1-1: First Coast Region (FCMPO Boundary)

³ This mission and the following vision statement were adapted from the FDOT District 1 ITS Concept of Operations.

Regional ITS Vision

Unlike the Regional ITS Mission, which defines the purpose of ITS, the Regional ITS Vision identifies what the ITS should become.

The Intelligent Transportation System for the First Coast Region shall strive to become:

- An institutionally integrated and fully cooperative coalition of all transportation, public safety, and emergency services stakeholders in the region and beyond,
- A technologically integrated transportation system electronically linking all stakeholders as necessary for each to have available all necessary data and information it needs to accomplish its mission, and to share command and control responsibilities as warranted by the situation and to the extent possible operating out of a centralized, multi-agency transportation management center,
- An information-rich source of travel information for all travelers in the region and beyond,
- Cohesive and effective teams for dealing with traffic incidents and special events,
- A fully prepared system for mitigating and otherwise managing large-scale evacuations for both natural (e.g., hurricane) and man-made (e.g., terrorist attacks) disasters, and
- A means for enhancing existing and future transportation capacity.

1.2.4 ITS Goals and Objectives

ITS goals represent stepping stones that lead to satisfying the ITS Vision. ITS objectives on the other hand represent actions that can be measured to determine the success of reaching a particular goal. First Coast ITS goals and objectives, as well as their associated performance measures, are identified in Table 1-1.

Table 1-1: Regional ITS Goals, Objectives and Performance Measures

Goals	Objectives	Performance Measures
1) Provide safe transportation for residents, visitors, and commerce.	1.1. Minimize the occurrence of traffic incidents.	<ul style="list-style-type: none"> • Number of incidents by type.
	1.2. Minimize the duration of incidents by implementing proactive multi-jurisdictional, multi-agency Traffic Incident Management (TIM) programs.	<ul style="list-style-type: none"> • Regional TIM Teams. • Verification, response, and clearance times. • Safety of emergency responders.
	1.3. Minimize the occurrence of secondary incidents.	<ul style="list-style-type: none"> • Number of secondary incidents by type.
	1.4. Improve emergency management communications by coordinating interagency communication systems and real-time traveler information systems for incidents, special events, evacuations, major route closings, re-routings, or other restrictions.	<ul style="list-style-type: none"> • Inter-agency communications channels. • Missed communications.
	1.5. Improve special events management by coordinated interagency planning and both pre-event and real-time operations and traveler information systems for major events.	<ul style="list-style-type: none"> • Inter-agency communications channels. • Event planning meetings and participation.
	1.6. Identify hazardous roadway conditions both on the roadway and those impacting highway safety (e.g., weather) and track mitigations.	<ul style="list-style-type: none"> • Mitigation of hazardous conditions.
	1.7. Identify emergency services resources in real time, such as trauma center capacity and remote triage venues.	<ul style="list-style-type: none"> • Inter-agency communications channels, including medical services. • Emergency services response time (including to trauma centers).
2) Provide protection of the public's investment in transportation.	2.1. Reduce vehicular delay from incidents by implementing incident response and special event traffic management programs.	<ul style="list-style-type: none"> • Vehicle-hours of travel. • Average speed. • Travel time index⁴.

⁴ Definitions: Travel time index = the ratio of travel time in the peak period to travel time at free-flow conditions. A TTI of 1.35 indicates a 20-minute free-flow trip takes 27 minutes in the peak. Buffer Index = extra time allowance for travel. Source: Schrank, David and Tim Lomax, "The 2004 Urban Mobility Report," Texas Transportation Institute, September 2004 and prior years.

Goals	Objectives	Performance Measures
	2.2. Improve peak period flow and throughput via deployment of traffic surveillance and control systems and coordinated interagency operations.	<ul style="list-style-type: none"> Corridor throughput. Buffer index². Number of 5-1-1 calls.
	2.3. Assist in providing safe and efficient maintenance of traffic during project construction by deploying smart work zone monitoring systems and real-time traveler information systems.	<ul style="list-style-type: none"> Incidents and crashes per million vehicle miles of travel. Work zone speeds.
	2.4. Ensure the preservation of the ITS and transportation investments by providing sufficient resources for operations and maintenance (O&M).	<ul style="list-style-type: none"> Operator staffing level. Device availability. Mean time between repair/replacement.
	2.5. Improve coordination of intermodal conflicts (such as rail road crossings and terminal exits).	<ul style="list-style-type: none"> Inter-agency communications channels. Number of real-time alerts.
3) Provide an interconnected transportation system that enhances Northeast Florida's economic competitiveness.	3.1. Minimize shipping and delivery delays to improve freight operations through the use of real-time system management programs.	<ul style="list-style-type: none"> Travel time index. Mean shipping transfer time.
	3.2. Improve the predictability of travel and delivery times through traffic surveillance and control and incident management systems.	<ul style="list-style-type: none"> Travel time index. Buffer index.
4) Provide travel choices to ensure mobility, sustain the quality of the environment, preserve community values and reduce energy consumption.	4.1. Improve tourist access and mobility through the use of specialized traveler information systems.	<ul style="list-style-type: none"> Number and nature of 5-1-1 calls. Number of www511 visits. Comments to Conventions and Visitors' Bureau.
	4.2. Reduce delay, energy use and environmental degradation by means of ITS "systems management" to reduce vehicle trips and vehicle miles of travel.	<ul style="list-style-type: none"> Total gallons of fuel. Vehicle miles of travel.
	4.3. Improve service for special traveler needs through the use of ITS applications.	<ul style="list-style-type: none"> Diversity of ITS services for special populations, pedestrians, cyclists, and school children.
	4.4. Improving transit use by relaying timely and accurate information to travelers and providing proactive transit operations through ITS.	<ul style="list-style-type: none"> Transit ridership. Transit travel times.

1.3 ITS OPERATIONAL CONCEPT OVERVIEW

The First Coast Regional ITS Operational Concept defines at a high-level the roles and responsibilities ITS stakeholders have in the day-to-day operation of ITS. These responsibilities not only include operations, but also planning, construction, and maintenance of existing and planned ITS elements. In defining these activities the ITS Operational Concept begins to answer the who, what, where, why, and how questions that surround existing and planned ITS elements, in essence taking the first step to develop individual subsystems that fulfill the Regional ITS Vision. However, the ITS Operational Concept is only the beginning step in the larger process, and is not intended to capture all the details needed to design/deploy individual systems or subsystems. To this regard, the ITS Operational Concept is written in a non-technical voice that is easy to understand and allows stakeholders to achieve consensus and buy-in.

Throughout this document (all parts), references are repeatedly made to the requirement to conform to FHWA Rule 940 and/or the FTA Policy. That adherence to these policies is required to use federal funds (and by extension, FDOT strongly encourages the same policy for purely state funds) is a given; however, the principal regional stakeholders recognize that developing a Regional ITS Architecture and following a Systems Engineering approach to future ITS planning and development are the proper things to do—this just makes good business sense to ensure that public (and even private in some cases) funds are effectively invested and the needs of the traveling public are well met.

1.3.1 Operational Concept Development Process

The process to develop this ITS Operational Concept began with the creation of the First Coast ITS Coalition to bring all the stakeholders to the table so that all their related aspirations would be realized. Then the FCMPO and JTA—again with significant input from FDOT and the City of Jacksonville’s Traffic Engineering Department—jointly selected a consultant team to conduct the First Coast ITS Master Plan study.

Acquisition of information feeding into the plan began with a review of stakeholder inputs collected at ITS Coalition Workshops #1 and #2, and through interviews and questionnaires. These inputs provided a high-level understanding of the interactions that currently exist or are desired between ITS elements owned and operated by stakeholder agencies. Next, agency missions, goals, and objectives helped narrow the focus of the ITS Operational Concept to the high-level transportation services that ITS ought to perform within the region. Without narrowing the focus to key transportation services, the ITS

Operational Concept for an area as large as the First Coast region would require significant effort and would be so complex that it would ultimately add confusion and defeat the purpose of the Operational Concept, which is to provide clear understanding of agency roles and responsibilities.

In parallel with the series of workshops, two sets of Stakeholder Group Meetings were held to focus in on these services for both the application to this Operational Concept and also to help build the Regional ITS Architecture. A survey of ITS Market Packages (that is, ITS services) was conducted, and a physical inventory of actual ITS devices in place was collected. These latter two activities are covered in Part 2, which covers the Regional ITS Architecture.

Finally, several meetings were held with the ITS Steering Committee and individual interviews were conducted with key stakeholders to gain more in-depth insights.

The underlying goal was to develop the ITS Operational Concept (and other components of the Master Plan) based on inputs from, and consensus of, the stakeholders, rather than the imagination of the consultant team. This approach followed the (required) Systems Engineering process for ITS deployment.

1.3.2 Identification of Regionally Significant Transportation Services

The benefits of ITS are often maximized only when multiple agencies and multiple systems are integrated, or at least closely linked. This, in combination with the earlier fact that developing an ITS operational Concept for every agency in a region as large as First Coast would be complex, suggests that it is best that the First Coast Regional ITS Operational Concept be focused on only the transportation services that require significant integration and are considered most important for satisfying the Regional ITS Vision. These “bite-sized pieces” are referred to as component ITS Operational Concepts and are roughly aligned with ITS functions derived from the National ITS Architecture. This approach ensures consistency with a nationally accepted and proven approach. The approach also eases the process of developing the more detailed Regional ITS Architecture that provides the information flows that do or will occur between all agencies thought to have a role in ITS activities within the region.

Transportation services that pertain to the operations of one or a few agencies that require little to no integration are not discussed in this Operational Concept (for example an isolated traffic signal operated by a city). However, a more comprehensive listing of the transportation services (Market Packages) applicable to the First Coast Region can be found in the Regional ITS Architecture part of the ITS Master Plan. For the purpose of this Operational Concept, however,

only the following transportation services/ITS Operational Concepts will be discussed.

- Transit Fixed-Route Operations
- Transit and Highway Traveler Information
- Broadcast Traveler Information
- Traffic Information Dissemination
- Regional Traffic Control
- Traffic Incident Management
- Regional Parking Management
- Emergency Call Taking and Dispatch
- Road Weather Data Collection

Each of these component Operational Concepts are described briefly below and will be the focus of the discussions in terms of agency roles and responsibilities later in this document.

1.3.3 Organization of the Operational Concept

The remainder of the Operational Concept presented herein is presented in two sections. First, ITS stakeholders thought to have a role in or are impacted by ITS activities within the region are identified in section 1.4. More importantly, key ITS stakeholders within the region are identified and described in terms of their general day-to-day activities and functions. This discussion touches on their roles and responsibilities for implementing, operating and maintaining regional ITS elements, which is described in greater detail in section 1.5. In section 1.5, key transportation services, referred to as ITS Operational Concepts are described. These concepts are considered key in that they help satisfy the region's ITS goals and objectives. Together sections 1.4 and 1.5 foster a better understanding of how regional agencies operate and define the activities each agency will be responsible for operating ITS within the region. This understanding is critical in moving forward with development of the First Coast ITS Master Plan, which culminates in the identification of ITS project initiatives, which in turn spurs development of ITS within the region.

1.4 STAKEHOLDER IDENTIFICATION

To date, consensus among stakeholders has allowed the First Coast Region to successfully deploy ITS elements. Efforts like this ITS Master Plan only help to strengthen inter-agency relationships and will further help the region deploy ITS as it moves forward into the future.

Stakeholders thought to have a role in ITS activities, or are impacted by them, were invited to participate in the development of the Regional ITS Master Plan, including this ITS Operational Concept. Participation by all these agencies was needed to flesh out the various existing and planned ITS elements and to capture the needs of the

region as a whole. However, the roles and responsibilities of regional ITS stakeholders shown in Table 1-2 vary significantly in terms of planning, programming, operating, and maintaining ITS. Some agencies like FDOT and JTA are heavily involved in these activities, whereas agencies like county school districts, and the U.S. Department of Defense play much smaller roles and are typically only “receivers” of information. To that regard, stakeholders considered key to the region include transportation, transit, public safety, and public works departments. These agencies are also the primary agencies that own and operate ITS within the region and are the ones discussed in greater detail following Table 1-2.

Table 1-2: First Coast Regional ITS Stakeholders

Airport Authorities	Florida Department of Environmental Protection
Amtrak	Florida Department of Law Enforcement
Archived Data Users	Florida Division of Emergency Management
Care-A-Van Transportation	Florida Highway Patrol
Center for Simulation Education and Safety Research (University of Florida)	Gainesville Transportation Services Division
CHEMTREC	Gainesville-Alachua County Regional Airport Authority
City of Atlantic Beach Police Department	Greyhound Bus Company
City of Atlantic Beach Public Works Department	Jacksonville Aviation Authority
City of Fernandina Beach Department of Public Safety	Jacksonville Port Authority
City of Fernandina Beach Police Department	Jacksonville Transportation Authority
City of Fernandina Beach Public Works Department	Local Agencies
City of Green Cove Springs Police Department	Local Agencies – Fire EMS/Rescue Departments
City of Green Cove Springs Public Works Department	Local Agencies – Police Departments
City of Jacksonville	Local Media
City of Jacksonville Beach Department of Public Safety	Local Traffic Management Agencies
City of Jacksonville Beach Police Department	Local Transit Operators
City of Jacksonville Beach Public Works Department	Local Venue Promoters
City of Jacksonville Department of Public Works	Metropolitan Transportation Planning Organization
City of Jacksonville Emergency Management	Nassau County Department of Public Safety
City of Jacksonville Fire and Rescue	Nassau County Emergency Management
City of Jacksonville Sheriffs Office	Nassau County Public Works Department
City of Jacksonville Traffic Engineering Division	Nassau County Sheriffs Office
City of Neptune Beach Department of Public Safety	National Oceanographic and Atmospheric Administration
City of Neptune Beach Police Department	One Call System
City of Neptune Beach Public Works Department	Parking Facility Operators
City of Palatka	Private Commercial Vehicle and Fleet Operators
City of St. Augustine Department of Public Safety	Private Concierge Service Provider
City of St. Augustine Police Department	Private Maintenance Contractors
City of St. Augustine Public Works Department	Private Sector ISPs
Clay County Council On Aging	Private Taxi Operators
Clay County Department of Public Safety	Private/Public Utilities
Clay County Emergency Management	Private/Public Regional Medical Centers
Clay County Public Works Department	Probe Information Providers
Clay County Public Works Traffic Control Division	Putnam County
Clay County Sheriffs Office	Rail Operators
Council of Supply Chain Management Professionals	Regional Public Safety Agencies
Counties and Cities	Regional Transit Management Agencies
County and City Traffic Engineering	St. Johns County Council on Aging
County Emergency Management Agencies	St. Johns County Department of Public Safety
County Paratransit	St. Johns County Emergency Management
County Public Safety Agencies	St. Johns Public Works Department
County Public Safety Agencies – Fire/EMS	St. Johns Sheriffs Office
County Public Safety Agencies – Sheriffs Department	St. Johns County Traffic and Transportation Department
County School Districts	SunGuide Partners/ISP Vendor Team
Florida Department of Transportation (FDOT)	Town of Baldwin Department of Public Safety
FDOT Commission for the Transportation Disadvantaged	Town of Baldwin Public Works Department
FDOT District 5/FHP	Town of Orange Park Department of Public Safety
FDOT District 2	Town of Orange Park Police Department
FDOT Motor Carrier Compliance Office	Town of Orange Park Public Works Department
FDOT Turnpike Enterprise	Traveler Information Radio Network
Federal Highway Administration	Travelers
Federal Transit Administration	University of North Florida
Financial Institutions	US Coast Guard
First Coast MPO	Vehicle Infrastructure Integration (VII) Provider
Florida Department of Highway Safety and Motor Vehicles	US Department of Defense

1.4.1 Traffic and Transportation Management Agencies and Centers

Regional traffic and transportation management agencies are responsible for monitoring and controlling the public transportation network. Transportation Management Centers (TMCs) and Traffic Control Centers (TCCs) are responsible for collecting transportation data, operating and controlling highway field devices, and (in the case of a TMC) disseminating traveler information. Additionally, TMCs frequently coordinate with emergency, transit, and maintenance management agencies to quickly identify incidents and request/provide the necessary resources to clear incidents quickly and effectively. The primary First Coast regional stakeholders in this area are introduced below.

Florida Department of Transportation District 2 Transportation Management Center

The Florida Department of Transportation is responsible for planning, designing, constructing, and maintaining state facilities in all modes of transportation, including air, water, and land. Coordination with other state, county, and federal programs is needed in order to achieve this objective. The FDOT mission is:

“The Department will provide a safe transportation system that ensures the mobility of people and goods, enhances economic prosperity, and preserves the quality of our environment and communities.”

FDOT assigns traffic management responsibilities at the district level. District 2 covers 18 counties in Northeastern Florida. The district operates 2,548 centerline miles of state highways totaling 7,920 lane miles, 1,077 fixed bridges, and 12 movable bridges (such as draw bridges). Many of these bridges are key features on both routine travel routes, but also on evacuation routes, so they take on a significant role in ITS.

Several districts perform their traffic management responsibilities through regional transportation management centers (TMC). FDOT District 2 (specifically the Jacksonville Urban Office) is one such region. The District 2 TMC located at 2250 Irene Street in Jacksonville is the primary TMC for the First Coast Region, and is responsible for monitoring operations on I-95, I-295 and I-10. The center monitors operations through several types of ITS devices deployed along these corridors. These devices include (current numbers):

- 41 video identification and detection cameras (VIDs),
- 22 closed circuit television (CCTV) cameras,
- 1 classification/count station,
- 2 weather sensors, and

- 8 dynamic message signs (DMSs).

The District 2 TMC is connected with the Orlando TMC through center-to-center (C2C) communications available in the state's SunGuideSM Software System. Eventually, this C2C capability will allow linking to other TMCs throughout the state. This allows authorized users at the TMCs to effectively share information and—with appropriate permission given—even control of field devices when incidents cross district boundaries.

The Jacksonville TMC acts as the day-to-day focal point for information collection and dissemination within the region, and therefore is largely responsible for coordinating with other traffic, transit, emergency and maintenance management agencies. Specifically, the Jacksonville TMC operates all the aforementioned ITS devices, dispatches the freeway service patrol (known as Road Rangers), notifies other FDOT assets when needed, and communicates traffic conditions to public safety and other agencies. Beginning in the spring 2007 the regional 5-1-1 traveler information system will be based in the TMC and it already hosts the regional traveler information Web site (<http://jax511.com>).

It should be noted that the region is currently planning a multi-agency, multi-functional Regional Transportation Management Center (RTMC) to replace the current one. The Jacksonville Transportation Center (JTC) will house the new RTMC and the existence of this integrated center will change the Operational Concept of the region substantially; however, it will not be completed until about 2010 or 2011, so it is not included in this initial First Coast ITS Operational Concept. Once the JTC, or more specifically the new RTMC, is programmed and funded, then this Operational Concept should be updated, in addition to the development of a Concept of Operations, which is a more detailed, project-specific framework.

The TMC accedes to the Duval County Emergency Operations Center (EOC) when it is activated for emergency management functions that can be transferred to the EOC.

City of Jacksonville Traffic Control Center

The City of Jacksonville Traffic Control Center (TCC) operates the coordinated traffic signal system in the county, including some signals on state routes in the independent municipalities. The county-wide system is actually three closed loop subsystems.

1.4.2 Emergency Management Agencies/Centers

Emergency Management Agencies/Centers are generally responsible for protecting lives and property of residents within the First Coast Region. They are responsible for responding to natural and man-made disasters, as well as implementing procedures to mitigate and recover

from these events. Disasters include all major incidents (e.g., weather, large fires, acts of terror, and serious HAZMAT spills).

Duval County Emergency Operations Center

The Duval County EOC (also serving the City of Jacksonville), is the primary Emergency Management Center in the First Coast Region. The Duval County EOC provides a coordinating point for the effective management of events ranging from local emergencies to catastrophic events in and around the county. It is the lead organization in coordinating disaster response from a municipal level to state and federal levels. Recovery planning and financial assistance from the State of Florida and the Federal Emergency Management Agency (FEMA) are established through the EOC.

Other Regional Emergency Operations Centers

There are three other EOCs whose jurisdiction overlaps the boundary of the First Coast Region. These are listed below:

- St. John's County Department of Emergency Management,
- Clay County Emergency Operations Center, and
- Nassau County Emergency Management Center.

There also are EOCs in most other counties bordering on the First Coast Region that exchange information directly or indirectly with the foregoing.

Each Emergency Operations Center provides a coordinating point for the effective management of local emergencies to catastrophic events in and around their respective counties.

The county emergency management agencies that are responsible for the operation of the EOCs are also responsible for providing information to assist in the preparation of anticipated emergencies, including evacuation procedures and routes.

The Florida Division of Emergency Management's State Emergency Operations Center, located in Tallahassee, provides central statewide command and control during major emergencies in the State of Florida. It serves as an information clearinghouse for disaster-related information. It houses a statewide database containing the evacuation routes for the regional areas and includes basic primary and secondary route information.

1.4.3 Emergency Response Agencies

Emergency response agencies provide timely response and treatment of individuals involved in incidents as well as control at the scene of the incident so emergency personnel can provide treatment without public interference. These agencies are typically among the first to respond to incidents and emergencies affecting the regional highway

network. Thus, emergency response personnel are usually the first to verify conditions in the field and report the information needed to initiate an appropriate response and clear roadways in a timely manner. The agencies introduced below have been identified as the primary emergency response agencies within the First Coast Region.

Florida Highway Patrol Regional Dispatch Center

The Florida Highway Patrol (FHP) Regional Dispatch Center (RDC), located at 908 North Jefferson Street in Jacksonville, operates out of the Jacksonville Regional Communications Center (JRCC) and is managed by FHP Troop G.

The state law enforcement agencies serviced by the RDC are as follows:

- Florida Highway Patrol troops,
- Alcoholic Beverages and Tobacco,
- Department of Law Enforcement,
- Department of Environmental Protection Park Police,
- State Fire Marshal,
- FDOT Office of Motor Carrier Compliance,
- Insurance Fraud,
- Medicaid Fraud,
- Agricultural Law Enforcement,
- Juvenile Justice,
- Corrections, and
- Fish and Wildlife Commission (separate dispatch, but co-located in the same JRCC control room).

The RDC routinely receives and shares information with the following:

- Sheriff's Offices in 18 counties,
- Police Departments,
- Fire Rescue Departments,
- Georgia Law Enforcement,
- Motorists,
- Citizens,
- Coast Guard,
- Military,
- Media Outlets (currently have over 100 in group e-mail list),
- and
- Florida Department of Transportation:
 - TMC,
 - Maintenance,
 - Construction,
 - Road Rangers, and
 - Maintenance of Traffic/Asset Maintenance Contractor.

While the RDC's role is primarily law enforcement, they are also deeply involved in dispatching associated with major incidents and emergencies.

Florida Highway Patrol

The FHP District headquarters in the first Coast Region is Troop G, located at 7322 Normandy Blvd. in Jacksonville. Troop G is responsible for traffic enforcement and crash investigations on all state highways in the region, which includes these counties: Baker, Bradford, Clay, Duval, Flagler, Nassau, Putnam, St. Johns, and Union.

FHP takes its mission from its parent Department of Highway Safety and Motor Vehicles (DHSMV), which states, "Making highways safe through service, education, and enforcement."

The troop's primary communications links are through the RDC.

Sheriffs Offices and Local Police Departments

Sheriffs Offices and Local Police Departments provide enforcement services for the First Coast Region, including the various transportation elements within the region. Sheriffs Offices and Local Police Departments are primarily responsible for providing local emergency response services to the region as well as being an active participant in incident detection and monitoring. They may have other roles and responsibilities, however it is expected that their involvement with other agencies will be to a lesser extent. Sheriffs Offices and Local Police Departments participating in the First Coast Regional ITS Master Plan are listed below:

- City of Jacksonville Sheriffs Office (JSO),
- Clay County Sheriffs Office,
- Nassau County Sheriffs Office,
- City of Atlantic Beach Police Department,
- City of Fernandina Beach Police Department,
- City of Jacksonville Beach Police Department,
- City of Neptune Beach Police Department,
- City of St. Augustine Police Department, and
- Town of Orange Park Police Department.

Emergency Medical Services, Fire Rescue Departments

Generally speaking, Emergency Medical Services, Fire Rescue Departments provide on-site medical treatment to persons involved in crashes. Since time is of the essence whenever responding to injury crashes, these agencies must respond quickly. Any hesitation can be the difference between life and death. Therefore, these agencies must communicate frequently with traffic management agencies, Sheriffs Offices, and local Police Departments to initiate a timely and appropriate response. Information obtained by personnel at the crash

scene and images obtained from cameras provide valuable information for determining the nature and extent of crashes, and other incidents. This information is key to assigning the resources and equipment needed to properly treat injured persons.

1.4.4 Public Transportation Management Agencies

The Jacksonville Transportation Authority (JTA, see their Web site at <http://www.jtafla.com/>) is the primary provider of public transportation services within the First Coast Region. JTA is an independent state agency that not only provides mass transportation options to the public but also designs and constructs bridges and highways. JTA's mission is:

"To be the Northeast Florida leader in providing effective, coordinated and integrated multimodal transportation solutions."

JTA operates the fixed-route/scheduled bus system [currently 175 full-sized peak hour buses and five "Ride Request" (16+/-) passenger buses], Jacksonville's Skyway monorail (10 train units using eight stations), and within Duval County the Community Transportation Coordinator (CTC) service called JTA Connexion, which is the county's primary paratransit service with 107 vehicles.

JTA coordinates with Clay, St. Johns, and Putnam Counties to provide the ChoiceRide paratransit service that is integrated with JTA. A principal application is to carry passengers to Shands JAX and the Mayo Clinic in Jacksonville and Shands Medical Center in Gainesville (no Alachua County passengers, however).

JTA is responsible for alerting traffic and emergency response agencies of transit-related incidents so traffic management and emergency response can be implemented. JTA is also responsible for disseminating incident and major evacuation information, as well as basic transit information (fares, routes, schedules, etc.) to information service providers so the public can make/adjust their travel plans based on real-time information. JTA owns and operates a Web site where this information is also posted.

1.4.5 City Public Works Departments

City Public Works Departments are responsible for maintaining city infrastructure and in many cases inventorying city transportation/ITS assets. These departments often hold information that might benefit other agency operations. For instance, real-time or scheduled construction information may be communicated to public transportation agencies so that transit vehicles can be routed around areas impacted by construction activities. This information is also applicable for emergency response agencies in routing their vehicles.

Similarly, planned construction activities should be communicated to traffic management agencies so traffic management strategies can be implemented before construction activities occur. Additionally, coordinating construction plans with FDOT will help identify locations where multiple construction activities are scheduled, enabling these activities to be completed at the same time, thus reducing costs and the overall length of time that traffic is impacted.

City Public Works Departments will primarily push information to other agencies, however, a regional ITS offers the potential for these agencies to receive information that benefits their operations. Coordination with other nearby city public works departments may help identify construction activities occurring near city boundaries that may affect operations of the bordering city.

The following city public works departments have participated in the development of the First Coast MPO.

- City of Jacksonville (primarily the Traffic Engineering Division),
- City of Atlantic Beach Public Works Department,
- City of Fernandina Beach Public Works Department, and
- City of Green Cove Springs Public Works Department.

1.4.6 Other Regional Agencies

A number of other agencies and organizations have interest in ITS in general and many of the operational concepts discussed previously, but they have no formal operational role in traffic and transit operations. Their influence in the region however, warrants mentioning them in this Operational Concept. These are introduced briefly below, along with their “roles.”

First Coast ITS Coalition

The Coalition is made up of the key stakeholders in the region, as listed in Table 1-2. The coalition itself does have a major role in the Regional ITS Master Plan and also this Regional Operational Concept because it is given the role of “ownership” of the Plan. While others are responsible for actually carrying out the Plan, the Coalition approves it and serves as the champion for ITS in the region.

First Coast Metropolitan Planning Organization

The First Coast MPO (FCMPO) covers nearly 1,118 square miles and includes Duval County and portions of St. Johns, Clay, and Nassau Counties. The First Coast MPO is responsible for transportation-related air, noise, and water quality planning within the Jacksonville urbanized area; development of the transportation improvement plan; an annually updated unified planning work program; and the comprehensive transportation plan, which includes consideration of long-range goals and transportation systems management measures.

In addition to these transportation planning activities, the First Coast MPO is also responsible for identifying issues, convenes stakeholders, conducts studies, and develops policies in light of local, national, and global trends. Recent initiatives include coordinating regional legislative priorities, integrating land use and transportation planning, and preparing for increased global trade through First Coast Region ports. The MPO also addresses current needs and challenges that impact our daily lives through programs for commuters, the transportation disadvantaged, bicyclists, and pedestrians.

The role of the First Coast MPO is that of a regional champion that supports the planning, programming, design, deployment, operation, and maintenance of ITS within the region. The First Coast Metropolitan Planning Organization is the principal planning agency for the core First Coast Region, as defined in section 1.2.2. For this region, the FCMPO will program all ITS projects that emerge from the First Coast ITS Master Planning process for this (partially) four-county region; thus the MPO is a critical link in the whole ITS deployment process. The MPO also acts as a point source for storing and archiving information and is responsible for making this information available to the agencies responsible for ITS activities. The First Coast MPO—in partnership with the JTA, FDOT, and City of Jacksonville—is responsible for maintaining the First Coast ITS Master Plan and Regional ITS Architecture on a periodic basis to ensure these documents remain viable, living documents.

Area Airports

The airports, particularly Jacksonville International and Cecil Field (now a commercial carrier airfield), serving the passenger and (in the latter case) commercial aviation communities, have a great interest in moving traffic efficiently in and out of their facilities. The military bases have similar concerns, albeit tied more directly to their missions. As a result, these all have an interest in how ITS can maximize the effectiveness of ITS services. Indeed, the Commander of Naval Air Station Jacksonville even serves on the FCMPO Board of Directors.

Area Sea Ports

The sea ports—both civilian and military—are similarly interested in the efficient movement of cargo. Additionally, they have security concerns that make them a willing partner in sharing information on Homeland Security.

Colleges and Universities

The regional colleges and universities certainly have traffic issues similar to the above groups. Additionally, they can serve as resources directly to the operating agencies. The University of North Florida actually installed the region's only RWIS devices, as part of an FDOT-funded research project. The university's Institute of Police Technology

and Management is one of the premier training programs for law enforcement in the state and the nation, and is very proactive in delivering training in traffic incident management best practices to their students.

Hospitals and Emergency Clinics

In addition to the routine access/egress issues, these facilities have a more serious issue due to the nature of their business; namely the timely access to injured and sick patients. The University of Florida's Center for Simulation Education and Safety Research (CSESaR) recently became active in the First Coast ITS Coalition and is promoting more direct information exchanges between transportation and the medical community to not only get ambulances to medical facilities more effectively, but to locate and direct them to trauma facilities that have the capacity to take on multiple victims. In some areas, the TMC provide trauma centers with details of crashes (e.g., speed of vehicles, vehicle, impact zone, and of course information on any injuries) so that the centers can better anticipate the injuries to expect. This information can also lead to en route care.

Business, Industry and Government

This is an organization that links the three groups that make up its title. As such, BIG is a forum for the private sector making its case for better transportation to the public sector. It may also be a forum for future public-private partnerships to share resources to provide better transportation services.

Coordination with Other Regions

Another important aspect is inter-regional coordination. Figure 1-2 shows a direct center-to-center (C2C) link with the FDOT RTMS in Orlando. This was a pilot for the state. Eventually, the First Coast's RTMC will be linked to all other TMCs in the state, a number of TCCs, and with Georgia as well. Indeed, eventually, all TMCs throughout the I-95 Corridor will be linked by a common Information Sharing Network (ISN).

1.5 REGIONAL ITS CONCEPTS

As mentioned earlier, the First Coast Regional ITS Operational Concept is broken down into regionally significant transportation services, or ITS concepts. This is done so agency roles and responsibilities can be more clearly articulated and understood. Also, to be concise and to reduce confusion, only the transportation services thought to be key in fulfilling regional goals and objectives are provided. Key transportation services can be interpreted as those that are most needed and involve the broadest involvement among stakeholders. Therefore, the transportation services detailed in this

section only represent a subset of all the transportation services needed to fulfill the First Coast Region's ITS Mission, Vision, Goals, and Objectives. Of the applicable services not mentioned in this section, it is expected that many, if not most, will apply only to an individual agency and not require multi-agency integration. For the purpose of this Operational Concept and for ensuring consistency with the National ITS Architecture framework, ITS concepts have been grouped by the general service areas listed below.

- Traffic Management (ATMS)
- Public Transportation (APTS)
- Traveler Information (ATIS)
- Emergency Management (EM)
- Commercial Vehicle Operations (CVO)
- Maintenance and Construction Management (MC)
- Archived Data Management (AD)
- Vehicle Safety (AVSS)

Each transportation service/operational concept considered key for the region is described in the following sections. At the end of the section high-level agency roles and responsibilities pertaining to each operational concept are provided in Table 1-3. Additionally, Figure 1-2 illustrates how key agencies will interconnect to perform ITS activities.⁵

The last two service areas are not covered in the following subsections for the reasons given below:

- Archived Data Management—this is currently done individually by agency with little to no integration. When the JTC is opened, it is expected that there will be more activity in the AD area.
- Vehicle Safety—this is not currently active in the region, but the proliferation of ITS-equipped vehicles will make it more so. In planning ITS projects, the region should strongly consider the advances in this area, particularly in the Vehicle Infrastructure Integration (VII) arena.

1.5.1 Traffic Management Concepts

Regional Traffic Control

This is the transportation service responsible for sharing traffic information and control among transportation management centers to support a regional control strategy. The regional transportation

⁵ Note that "future connections" in this figure refer to additions within the near-term period, but prior to the deployment of the new Regional Transportation Management Center, which will dramatically change the operational concept within the region.

management agencies/centers are the primary agencies responsible for performing this transportation service.

Traffic Incident Management

This is the transportation service responsible for managing both predicted and unexpected incidents so that the impact to the transportation network and traveler safety is minimized. Specifically, this is the service that collects incident-related information from available resources to detect and verify incidents, and implement the appropriate response based on the data collected.

Transportation management agencies are responsible for detecting incidents, monitoring incident status as the response unfolds and assisting emergency response agencies and Road Ranger service patrols during the response. In performing these duties, transportation management agencies may use available highway field equipment such as cameras to monitor conditions, and dynamic messages signs to divert traffic around incidents.

Emergency response agencies are responsible for coordinating with transportation management agencies to effectively and efficiently deploy appropriate traffic enforcement and emergency medical personnel to incident locations. As part of their response, emergency response agencies should communicate incident status and expected length to traffic management personnel so they can implement appropriate traffic management strategies.

Regional Parking Management

This is the transportation service that supports coordination between parking facilities to enable regional parking management strategies. The underlying goal of this transportation service is to improve mobility and accessibility to parking facilities. This improves transportation efficiency and convenience of travel.

At the current time, there is no ITS in the parking system in the region. The City of Jacksonville's Parking Facilities & Enforcement Division, however, plans to add ITS services in the future, to possibly include the following:

- Parking availability signs,
- Electronic fee collection, and
- Empty space indicators.

Indeed, some of these features (the first and third to some extent) are already in use in the Jacksonville International Airport's parking garage facility.

1.5.2 Public Transportation Concepts

This section covers fixed and variable route/schedule transit operations.

Transit Fixed-Route Operations

This is the transportation service responsible for scheduling and routing fixed-route transit vehicles. As part of this service, transit managers determine vehicle schedule performance and passenger loading using sensors located on-board transit vehicles. Schedule performance information can be used to implement corrective actions and to alert the public of delays and changes in service. The Jacksonville Transportation Authority is the primary agency associated with this transportation service. JTA is responsible for disseminating information needed to plan transit trips (e.g., fares, schedules, routes, rider alerts, etc.). JTA is responsible for posting this information on their Web site and providing it to private information service providers and 5-1-1. In addition to JTA, regional transportation management centers are responsible for providing JTA with relevant information that affects their operations (e.g., roadway conditions, weather conditions, incidents, etc.).

Paratransit Operations

As noted earlier, there are several paratransit operators in the region. Several had been partnering in an ITS pilot project in which the paratransit operators coordinated daily trips to have vehicles meet at designated locations at specific times to exchange passengers to traverse their jurisdictions in transporting medical patients from the First Coast Region to Shands Medical Center (and possibly other facilities) in Gainesville. This involved “real-time” scheduling of the next day’s trips based on reservations made “today.”

Although the pilot study has ended and the service has reverted to “normal,” there remains interest in resuming this type of activity to provide more efficient service. The main pitfall at this time is the absence of a common software product to enable integrated scheduling and routine among agencies.

Additionally, JTA now sponsors the First Coast Mobility Coalition, which is a public-private partnership to coordinated paratransit operations in the region.

Transit Traveler Information

This is the transportation service responsible for proving transit users with relevant transit information before and during a trip. JTA is the primary agency responsible for performing this transportation service. JTA is responsible for disseminating transit traveler information via sources users can access before and during their trips. This may include the JTA Web site, JTA-owned dynamic message boards (as these are implemented in the future), and on-board transit information systems.

Currently JTA does provide this service via the Web site and will be furnishing near-real-time information to the regional 5-1-1 when it

becomes operational (or more likely have reciprocal links with the 5-1-1 Web site). JTA also operates telephone hot lines for fixed-route, Skyway, and paratransit services.

JTA also operates the Plan Your Trip program to assist riders to choose the best way to use transit, whether by JTA bus, the Trolley or the JTA Skyway.

Multi-Modal Coordination

This is the transportation service responsible for establishing two-way communications between multiple transit and traffic agencies to improve coordination. This increases traveler convenience at transit transfer points and also improves operating efficiency. Coordination with transportation management agencies provides the ability to adjust traffic controls to improve route schedule adherence. For example, this transportation service supports limited local coordination between the transit vehicle and the individual intersection for signal priority.

JTA and other transit agencies in the broader region will be the primary agencies responsible for this transportation service. Besides JTA, the City of Jacksonville Traffic Control Center will also be involved in this transportation service, but to a lesser degree. This center would primarily respond to requests made by transit agencies for priority treatment at equipped traffic signals and for implementing these traffic controls.

1.5.3 Traveler Information Concepts

Broadcast Traveler Information

This is the transportation service responsible for broadly disseminating transportation information to the public, private agencies and private information service providers through existing low cost user equipment (e.g., FM subcarrier, cellular data broadcast). Transportation management agencies/centers, emergency management agencies/centers and emergency response agencies are responsible for performing this transportation service. Depending on the agency, the following types of information provided include:

- Traffic conditions and advisories,
- General public transportation information,
- Toll and parking information,
- Incident information,
- Highway maintenance and construction information, and
- Air quality and weather information.

Traffic Information Dissemination

This is the transportation service responsible for broadly disseminating transportation information to the public, private agencies and private

information service providers through highway field devices such as dynamic message signs or highway advisory radio. Since transportation management agencies/centers typically own the equipment needed to disseminate information to motorists at specific points, they are the primary agencies responsible for performing this transportation service. With that said, however, other agencies including Emergency management and response, and maintenance management are responsible for providing regional transportation management agencies/centers with pertinent information to disseminate via highway field devices. The types of information typically provided under this service include:

- Traffic and road conditions,
- Closure and detour information,
- Incident information, and
- Emergency alerts and driver advisories.

1.5.4 Emergency Management Concepts

Emergency Call Taking and Dispatch

This transportation service provides basic public safety call-taking and dispatch services. It includes emergency vehicles, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Emergency Management Subsystems supports emergency notification between agencies. Wide area wireless communications between the Emergency Management Subsystem and an Emergency Vehicle supports dispatch and provision of information to responding personnel.

1.5.5 Commercial Vehicle and Military Concepts

Commercial Vehicle Traffic Information

This is the transportation service responsible for managing commercial vehicle traffic within and through the First Coast Region. The underlying goal of this transportation service is to facilitate the safe and efficient movement of goods within and through the region. This service includes the utilization of dynamic message signs (DMSs) and highway advisory radio (HAR) to alert truck traffic of alternative truck routes in the case of congestion due to incidents, security alerts, high wind warnings, special events, etc. This service also utilizes Internet-accessible traffic information for use by commercial vehicle dispatch operations in addition to live feeds (kiosks and other mechanisms) accessible at truck stops and rest areas. In addition, commercial vehicles will have access to 5-1-1 traffic information.

Port and Terminal Access and Egress

This is the transportation service responsible for managing intermodal truck traffic and commercial vehicle traffic at their points of origin (or destination). For intermodal port traffic, this service involves the use of HAR and DMSs to direct traffic to terminal locations as well as provide information concerning security threat levels at the port and/or any terminal closings due to weather or security threats. At the intermodal terminal egress points themselves, HAR will be used to alert drivers of alternate routes based on incidents or congestion levels. Information will also be provided for routing those intermodal vehicles transporting hazardous materials. In addition, CCTV camera images will be available to the intermodal community to identify terminal gate queue lengths and determine wait times.

At major commercial vehicle activity centers (such as Wal-Mart, Publix, and Bridgestone Firestone Distribution Centers) this service will provide fleets with HAR traffic data so that routing decisions can be made on a pre-trip basis.

Intermodal Conflict Points

This is the transportation service responsible for notifying the intermodal trucking community with real-time railroad crossing blockages allowing for alternate route selection prior to arriving at a road closure due to a stopped train.

Safety and Security Operations

This is the ITS concept responsible for ensuring the safety of the citizens of the First Coast Region with respect to commercial vehicle operations (CVO). This service will utilize ITS technologies to ensure that commercial traffic (hazardous and non-hazardous) is routed efficiently and to minimize commercial traffic through local residential streets. Sensors are utilized to warn commercial traffic of excessive speeds on freeway ramp curves, detect vehicles that exceed maximum threshold heights for bridge clearances, etc. This service will also inform commercial traffic of any restricted routes/road closures due to security threats.

Military Special Events Representation

This is the ITS concept of formal liaison(s) between military personnel (or their designees) and First Coast Region special events personnel. These parties will collaborate to ensure that any special needs of the military are coordinated with civilian transportation operations.

Military Transportation Operations

This is the ITS concept of formal liaison(s) between military deployment logistics personnel and First Coast Region transportation operators. While most military convoys are limited in platoon size to no more than five vehicles, there may be occasions where larger

platoons are necessary. On these occasions the military will work closely with civilian operations personnel to take full advantage of ITS transportation management strategies to facilitate platoon movement and minimize adverse civilian traffic impacts.

Military Security Operations

This is the ITS concept of formal liaison(s) between military deployment logistics personnel and First Coast Region transportation operators. On those occasions where sensitive military cargo must move through the First Coast Region, military and civilian personnel will work together to take full advantage of the ITS infrastructure (sensors and surveillance technology) to supplement primary military and law enforcement security measures.

Recently, the U.S. Navy, U.S. Coast Guard, and the Department of Homeland Security have created the Joint Inter-Agency Fusion Center (JIAFC), which includes other law enforcement and intelligence representation and currently serves as a regional watch-floor for information and incidents. The purpose of the aforementioned collaboration is to streamline funding, reduce redundancy and is intelligence focused, serving as the national Beta model for more such collaborations around the country. The JIAFC currently has some communication links but wants to get more involved with and linked to other stakeholder activities in order to increase efficiency and reduce redundancy. JIAFC will work to validate the inter-agency links and determine which ones are needed and which ones are missing from the list.

Examples of the need for coordination were provided including information to ambulance on traffic, information to decision makers on hurricane conditions in other parts of the state, and information to hospitals about incidents and patient expectations.

JIAFC plans to install CCTV cameras on all major bridges in the area to monitor them. These images can be shared with transportation and law enforcement if desired.

1.5.6 Maintenance and Construction Concepts

Currently, the only ITS active in this area is that of road weather operations. As ITS expands, particularly with new in-vehicle services, this area may become more active, for example, using Automated Vehicle Location (AVL) systems to manage construction and maintenance fleets.

Road Weather Data Collection

This transportation service collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed sensor stations at the roadside, sensing of the highway environment can also occur from

sensor systems located on maintenance and construction vehicles and on-board sensors provided by auto manufacturers. The collected environmental data is used as input into weather forecasting software to process the information and make decisions regarding operations.

Currently all Road Weather Information Subsystem (RWIS) data comes from sensors installed and operated by the University of North Florida. These were deployed as part of a research project, but the units remain operational.

Table 1-3: Agency Roles and Responsibilities by ITS Operational Concept

Transportation Service/Function	Agency	Operational Roles and Responsibilities
Archived Data Management		
ITS Device Status	Florida Department of Transportation	<ul style="list-style-type: none"> Collect and record ITS device status in SunGuide Software.
Public Transportation		
Transit Fixed Route Operations	Jacksonville Transportation Authority (JTA)	<ul style="list-style-type: none"> Post/provide static transit information (routes, schedules, fares, etc.) to: <ul style="list-style-type: none"> JTA Web site with Trip Planner. SunGuide partners and other private information service providers. Provide road condition, construction activity and weather alert information to transit vehicle operators. Provide operating schedule information and corrective actions to transit vehicle operators. Coordinate with other transit agencies and service providers.
	City of Jacksonville Traffic Control Center	<ul style="list-style-type: none"> Provide road network condition information to JTA.
	FDOT District 2 Transportation management Center	<ul style="list-style-type: none"> Provide road network condition information to JTA.
Transit Traveler Information	Jacksonville Transportation Authority (JTA)	<ul style="list-style-type: none"> Operate/maintain JTA Web site Post/provide static transit information (routes, schedules, fares, etc.) to: <ul style="list-style-type: none"> JTA Web site with Trip Planner. SunGuide partners and other private information service providers. Jacksonville transit vehicles. Transit kiosks. Coordinate with other transit agencies and service providers.
Multi-Modal Coordination	Jacksonville Transportation Authority (JTA)	<ul style="list-style-type: none"> Coordinate plans and share information with other transit management agencies for the purpose of improving operational efficiency. Initiate requests for traffic signal priority from traffic management agencies (mainly City of Jacksonville Traffic Control Center).
	Clay Co. Council on Aging, Flagler Co. Transit, St. John's Council on Aging, Putnam Co. Transit, Regional Transit System (Alachua County)	<ul style="list-style-type: none"> Coordinate plans and share information with other transit management agencies for the purpose of improving operational efficiency. Coordinate routing and scheduling to have integrated multi-county service (planned).

Transportation Service/Function	Agency	Operational Roles and Responsibilities
	City of Jacksonville Traffic Control Center	<ul style="list-style-type: none"> • Provide traffic signal priority to buses upon receiving request from transit agencies.
Traveler Information		
Broadcast Traveler Information	Jacksonville Transportation Authority (JTA)	<ul style="list-style-type: none"> • Provide the following information to SunGuide partners and other Private Information Service Providers: <ul style="list-style-type: none"> ○ Transit incident information. ○ Commuter Alert.
	City of Jacksonville Traffic Control Center	<ul style="list-style-type: none"> • Provide the following information to SunGuide partners and other Private Information Service Providers: <ul style="list-style-type: none"> ○ Road network conditions.
	FDOT District 2 Transportation management Center	<ul style="list-style-type: none"> • Provide the following information to SunGuide partners and other Private Information Service Providers: <ul style="list-style-type: none"> ○ Road network conditions. ○ Incident information.
	Local Police and Emergency Response Agencies	<ul style="list-style-type: none"> • Provide the following information to SunGuide partners and other Private Information Service Providers: <ul style="list-style-type: none"> ○ Incident information. ○ Evacuation Information and Instructions. • Provide the following information to traffic management agencies: <ul style="list-style-type: none"> ○ Incident/weather related highway closures.
	Local County Sheriff's Offices	<ul style="list-style-type: none"> • Provide the following information to SunGuide partners and other Private Information Service Providers: <ul style="list-style-type: none"> ○ Incident information. ○ Evacuation Information and Instructions. • Provide the following information to traffic management agencies: <ul style="list-style-type: none"> ○ Incident/weather related highway closures.
	Florida Highway Patrol	<ul style="list-style-type: none"> • Provide the following information to SunGuide partners and other Private Information Service Providers: <ul style="list-style-type: none"> ○ Incident information. ○ Evacuation Information and Instructions • Provide the following information to traffic management agencies: <ul style="list-style-type: none"> ○ Incident/weather related highway closures.
Traffic Management		
Traffic Information Dissemination	City of Jacksonville Traffic Control Center	<ul style="list-style-type: none"> • Provide real-time road network condition information to: <ul style="list-style-type: none"> ○ SunGuide partners and other Private Information Service Providers. ○ City of Jacksonville Emergency Operations Center. ○ Media (television and radio stations). • Provide planned road network condition information (e.g., planned construction activities and road closures) to print media (e.g., newspapers) as well as broadcast media (television and radio stations). • Operate and maintain associated highway field equipment (Dynamic Message Signs, Closed Circuit Television). • Respond to inquires made by regional institutions:

Transportation Service/Function	Agency	Operational Roles and Responsibilities
	<hr/> FDOT District 2 Transportation management Center	<ul style="list-style-type: none"> ○ Air and marine ports. ○ Colleges and universities. ○ Hospitals and Emergency Clinics. ○ Medical Examiners. ○ Military. ○ Commercial Vehicle Operators. <hr/> <ul style="list-style-type: none"> ● Provide real-time road network condition information to: <ul style="list-style-type: none"> ○ SunGuide partners and other Private Information Service Providers. ○ Jacksonville Transportation Authority ○ Media (television and radio stations). ● Provide planned road network condition information (e.g., planned construction activities and road closures) to print media (e.g., newspapers) as well as broadcast media (television and radio stations). ● Operate and maintain associated highway field equipment (Dynamic Message Signs, Closed Circuit Television). ● Respond to inquires made by regional institutions: <ul style="list-style-type: none"> ○ Air and marine ports. ○ Colleges and universities. ○ Hospitals and Emergency Clinics. ○ Medical Examiners. ○ Military. ○ Commercial Vehicle Operators.
Regional Traffic Control	City of Jacksonville Traffic Control Center <hr/> FDOT District 2 Transportation management Center	<ul style="list-style-type: none"> ● Monitor traffic on interstates, highways, and other roadways of principal interest. ● Monitor weather on interstates, highways, and other roadways of principal interest. ● Coordinate with FDOT District 2 Regional Transportation management Center on the following: <ul style="list-style-type: none"> ○ Traffic Information (congestion, incidents, traffic data, signal timing plans, etc.). ○ Field Device Control. ● Operate and maintain associated highway field equipment (traffic signals, traffic sensors/detectors, etc.). <hr/> <ul style="list-style-type: none"> ● Monitor traffic on interstates, highways, and other roadways of principal interest. ● Monitor weather on interstates, highways, and other roadways of principal interest. ● Coordinate with City of Jacksonville Traffic Control Center on the following: <ul style="list-style-type: none"> ○ Traffic Information (congestion, incidents, traffic data, signal timing plans, etc.). ○ Field Device Control. ● Operate and maintain associated highway field equipment (traffic signals and traffic sensors/detectors, etc.).
Traffic Incident Management	City of Jacksonville Traffic Control Center	<ul style="list-style-type: none"> ● Provide Emergency Response Agencies the following types of information. <ul style="list-style-type: none"> ○ Road network conditions. ○ Incident information.

Transportation Service/Function	Agency	Operational Roles and Responsibilities
		<ul style="list-style-type: none"> ○ Traffic images. ○ Resource availability and status. ● Implement traffic management strategies during incidents. ● Share control of field devices with Emergency Management Agencies (if applicable).
	FDOT District 2 Transportation Management Center	<ul style="list-style-type: none"> ● Provide Emergency Response Agencies the following types of information: <ul style="list-style-type: none"> ○ Road network conditions. ○ Incident information. ○ Traffic images. ○ Resource availability and status. ● Implement traffic management strategies during incidents. ● Share control of field devices with Emergency Management Agencies (if applicable). ● Operate Road Ranger Service Patrol Program (via contractor) and disseminate information to emergency, transit, and maintenance management agencies.
	Local Police and Emergency Response Agencies	<ul style="list-style-type: none"> ● Provide traffic management agencies the following types of information: <ul style="list-style-type: none"> ○ Incident status. ○ Request for resources. ○ Roadway weather observations. ● Coordinate with Public Works and Maintenance Departments to clear incidents/remove debris.
	Local County Sheriff's Offices	<ul style="list-style-type: none"> ● Provide traffic management agencies the following types of information: <ul style="list-style-type: none"> ○ Incident status. ○ Request for resources. ○ Roadway weather observations. ● Coordinate with Public Works and Maintenance Departments to clear incidents/remove debris.
	Florida Highway Patrol	<ul style="list-style-type: none"> ● Provide traffic management agencies the following types of information: <ul style="list-style-type: none"> ○ Incident status. ○ Request for resources. ○ Roadway weather observations. ● Coordinate with Road Rangers, Public Works and Maintenance Departments to clear incidents/remove debris.
	Public Works and Maintenance Departments	<ul style="list-style-type: none"> ● Provide information on the status of maintenance activities to: <ul style="list-style-type: none"> ○ Local Police Departments. ○ Local County Sheriff's Offices. ○ Florida Highway Patrol. ○ Transportation management Centers. ○ Emergency Response Agencies.
	Road Rangers	<ul style="list-style-type: none"> ● Provide traffic management agencies the following types of information: <ul style="list-style-type: none"> ○ Incident status ○ Request for resources

Transportation Service/Function	Agency	Operational Roles and Responsibilities
		<ul style="list-style-type: none"> ○ Impact on traffic (e.g., lanes affected, expected time to clear the incident) ○ Coordinate with Emergency Response to clear incidents/ and treat injured persons.
	Medical Examiner, Districts 4, 8 & 23	<ul style="list-style-type: none"> ● Coordinate with law enforcement and other responders to enable removal of deceased victims under certain conditions.
Regional Parking Management	City of Jacksonville Parking Facilities & Enforcement Division, JTA	<ul style="list-style-type: none"> ● Deploy/Implement technologies that support regional parking management control strategy in the City of Jacksonville.
Commercial Vehicle Operations		
Motor Carrier Compliance	Florida DOT Office of Motor Carrier Compliance	<ul style="list-style-type: none"> ● Deploy/Implement technologies that support regional commercial vehicle operations.
Emergency Management		
Emergency Call Taking and Dispatch	Emergency Operations Centers	<ul style="list-style-type: none"> ● Coordinate all natural and man-made emergency planning in each of the counties. ● Coordinate with other EOCs, TMCs, law enforcement dispatch and district headquarters to carry out emergency management function during emergencies.
	Local Police and Enforcement Agencies	<ul style="list-style-type: none"> ● Track and manage emergency vehicle fleets. ● Coordinate response activities with other police and emergency response agencies. ● Report road closures to traffic management and other emergency management agencies. ● Initiate requests for control of highway field devices (e.g., cameras) from Emergency Management Agencies.
	Emergency Medical Services/Response Agencies	<ul style="list-style-type: none"> ● Track and manage emergency vehicle fleets. ● Coordinate response with enforcement, medical, and traffic management agencies.
	Local County Sheriff's Offices	<ul style="list-style-type: none"> ● Track and manage emergency vehicle fleets. ● Coordinate response activities with other police and emergency response agencies. ● Report road closures to traffic management and other emergency management agencies. ● Initiate requests for control of highway field devices (e.g., cameras) from Emergency Management Agencies.
	Florida Highway Patrol	<ul style="list-style-type: none"> ● Track and manage emergency vehicle fleets. ● Coordinate response activities with other police and emergency response agencies. ● Report road closures to traffic management and other emergency management agencies. ● Initiate requests for control of highway field devices (e.g., cameras) from Emergency Management Agencies.
	Regional Dispatch Center	<ul style="list-style-type: none"> ● Dispatch all law enforcement operations in the region. ● Coordinate with TMC, EOCs, and to the agencies to manage incidents and emergencies.

Transportation Service/Function	Agency	Operational Roles and Responsibilities
	City of Jacksonville Traffic Control Center	<ul style="list-style-type: none"> • Provide traffic images upon receiving requests from the following agencies: <ul style="list-style-type: none"> ○ Local Police and Emergency Response Agencies ○ Local County Sheriff's Offices ○ Florida Highway Patrol
	FDOT District 2 Transportation management Center	<ul style="list-style-type: none"> • Provide traffic images upon receiving requests from the following agencies: <ul style="list-style-type: none"> ○ Local Police and Emergency Response Agencies ○ Local County Sheriff's Offices ○ Florida Highway Patrol
	Jacksonville Transportation Authority (JTA)	<ul style="list-style-type: none"> • Report transit-related incidents and emergencies.
Transportation Infrastructure Protection	Joint Inter-Agency Fusion Center	<ul style="list-style-type: none"> • Coordinate military and Homeland Security in region • Furnish security cameras and share with transportation and law enforcement agencies and Emergency Operations Centers (planned).
Maintenance and Construction Management		
Road Weather Data Collection	University of North Florida	<ul style="list-style-type: none"> • Collect Road Weather Information Subsystem (RWIS) data. • Transmit RWIS data to TMC.

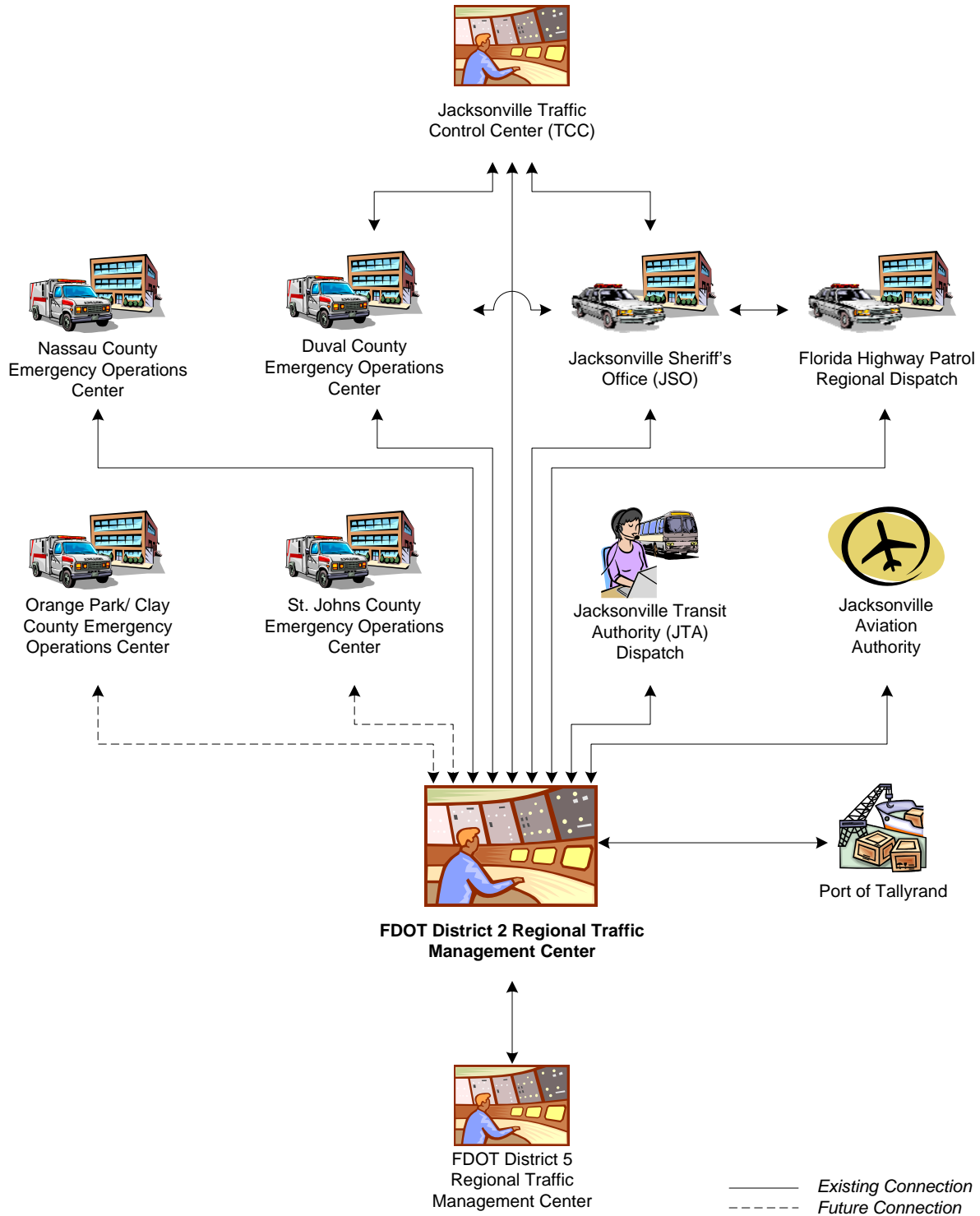


Figure 1-2: Key Agency Interconnects for the First Coast Region

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FIRST COAST ITS COALITION

**First Coast Regional Intelligent Transportation Systems
Master Plan**

Part 2: First Coast Regional ITS Architecture

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2

FIRST COAST REGIONAL ITS ARCHITECTURE

2.1 INTRODUCTION

The First Coast Regional ITS Architecture is a roadmap for transportation systems integration in the First Coast region over the next 10 years. The ITS Architecture¹ has been developed through a cooperative effort by the region's transportation planning and operating agencies, covering all modes and all highways and streets in the region. The ITS Architecture represents a shared vision of how each agency's systems will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in the region.

The timeframe considered is a 10-year outlook for ITS activities in the region. The ITS Architecture addresses existing ITS subsystems, as well as those planned for development over the next 10 years. It represents a snapshot of the currently anticipated ITS and other projects based on information gathered from stakeholders. The ITS Architecture is viewed as a living document that will require regular updates to ensure that it maintains accurate representation of the region's ITS.

The Architecture covers services across a broad range of ITS, including:

- Traffic management,
- Incident management,
- Emergency services,
- Transit management,
- Traveler information,
- Archived data management,

¹ To avoid undue repetition, we refer to the First Coast Regional ITS Architecture herein more simply as "ITS Architecture" or just "Architecture." If a different Architecture is referred to, it will be so designated.

- Electronic payment,
- Maintenance and construction operations, and
- Commercial vehicle operations.

The Architecture is an important tool that will be used by:

- Operating agencies to recognize and plan for transportation integration opportunities in the region,
- Planning agencies to better reflect integration opportunities and operational needs into the transportation planning process, and
- Other organizations and individuals that use the transportation system in the region.

The Architecture provides an overarching framework that spans all organizations and individual transportation projects. Using the Architecture, each transportation technology project can be viewed as an element of the overall network, providing visibility into the relationship between individual transportation technology projects and ways to cost-effectively build an integrated ITS network over time. The Architecture can be represented as a series of interconnected systems, as shown at a high level in Figure 2-1, which is often referred to as a “sausage diagram” in the National ITS Architecture.

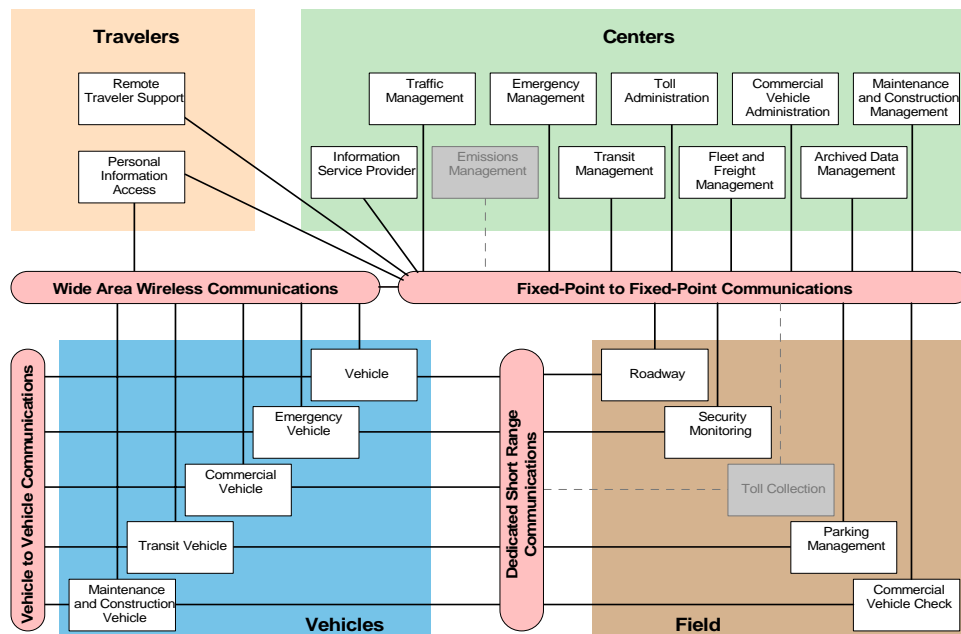


Figure 2-1: Subsystem Interconnect Diagram for First Coast Regional ITS Architecture

2.2 ITS ARCHITECTURE METHODOLOGY

The First Coast Regional ITS Architecture was developed over several months in 2006 and 2007 as part of the First Coast ITS Regional Master Plan project. The Architecture encompasses the “core” region, which includes Duval, Clay, Nassau, and St. Johns Counties, as well as neighboring counties: Alachua, Baker, Bradford, Flagler, Putnam, and Union to the extent that they interact with the “core region.” The Architecture was developed in compliance with the National ITS Architecture Version 5.1.

Development of the ITS Architecture relied heavily on stakeholder input to ensure that the ITS Architecture reflected local and regional needs and plans. The following five-step process was used to develop the ITS Architecture:

1. Conduct stakeholder input to gather information regarding inventory and services.
2. Create an initial draft inventory of regional ITS elements and a draft set of customized ITS services, including market packages.
3. Create the Web-based ITS Architecture for review.
4. Conduct stakeholder outreach through a series of functional validation meetings.
5. Consider stakeholder review of the draft ITS Architecture and finalize the ITS Architecture based on review comments.

The Regional ITS Architecture was developed in close coordination with the existing Florida Department of Transportation (FDOT) District 2 ITS Architecture. All work was documented using the Turbo Architecture software package. The Architecture is illustrated using a Web-based format so it can be easily displayed and used by key stakeholders. Each agency has a unique view of the Architecture specific to their own operations, showing the connections they have with ITS elements owned by other stakeholders as well as the information/data that is being passed between them (both existing and future).

2.2.1 ITS Inventory

The foundation of the Regional ITS Architecture is the inventory of existing ITS devices in the region. As an early task of the Regional ITS Master Plan study, the consultant team collected a physical inventory for all stakeholders who own and/or operate ITS devices. The inventory is available and maintained in a Microsoft Excel® spreadsheet called “First Coast Reg ITS Inventory _date.”

2.2.2 ITS Architecture Rule 940

The First Coast region is currently in compliance with 23 CFR Part 940.9 Section D of the Federal Highway Administration (FHWA) Final

Rule (referred to herein as “FHWA Rule 940”) and a similar Federal Transit Authority (FTA) Policy covering transit ITS projects (the “FTA ITS Policy”). The Regional ITS Architecture was derived from the recently updated District 2 ITS Architecture developed for FDOT. The region remains in compliance with this updated, Regional Architecture and Master Plan, and thus is fully compliant with that Architecture.

The following outlines the requirements of FHWA Rule 940 and where each requirement is documented as indicated in parentheses:

1. A description of the region (provided in the Operational Concept),
2. Identification of participating agencies and other stakeholders (provided in the Operational Concept),
3. An operational concept that identifies the roles and responsibilities of each agency (Part 1 of the FCIMP is the Operational Concept),
4. Any agreements (existing or new) required for operations, including at a minimum those affecting the ITS project (provided in the Implementation Plan),
5. System functional requirements shown as information data flows from Turbo Architecture output (located on the FCIMP CD-ROM and the ITS Master Plan section of the First Coast MPO Web site²),
6. Interface requirements and information exchanges with planned and existing systems (same as 5),
7. Identification of ITS standards supporting regional and national interoperability (same as 5),
8. The sequence of projects required for implementation (the Implementation Plan Process, Part 3, provides the mechanism to do this and the 5-Year Implementation Plan identifies the known projects when the plan was produced),
9. The agencies and other stakeholders participating in the development of the regional ITS Architecture shall develop and implement procedures and responsibilities for maintaining it, as needs evolve within the region (provided in section 2.3.3 Architecture Maintenance), and
10. All ITS projects funded with highway trust funds shall be based on a systems engineering analysis (while this is beyond the scope of the FCIMP project per se, the Implementation Plan developed under this project follows the Systems Engineering

² The FCIMP Web site is at <http://www.firstcoastmpo.com/> and the ITS Coalition can be reached by clicking ITS > ITS Coalition (http://www.firstcoastmpo.com/pages_sec.php?page_id=24) and the ITS Master Plan is just below that choice (http://www.firstcoastmpo.com/pages_sec.php?page_id=26). For ease of reference in this document, we refer to the latter, where most of the documents and files referred to in this part are located, as the “FCIMP Web Site.”

process, which is described further in Part 3, Implementation Plan).

2.2.3 Turbo Architecture Software

The First Coast Regional ITS Architecture was developed in part using the Turbo Architecture software tool (Version 3.1). The 2005 FDOT District 2 Architecture Turbo electronic files were used as the base.

2.2.4 Stakeholder Input

First Coast Region stakeholders attended the First Coast ITS Coalition Workshop 2 on November 8, 2006, at the First Coast MPO offices in Jacksonville. At the meeting, stakeholders were briefed on the Architecture effort and received copies of a survey that asked for details about their organization, including name, point of contact, and general description of activities. The survey also listed and briefly described all market packages in the National ITS Architecture, and asked stakeholders to identify the market packages in which they currently (or plan to) participate. Stakeholders who were not present at the meeting were emailed an electronic copy of the survey. A copy of the survey is provided on the FCIMP CD-ROM and the FCIMP Web site.

2.2.5 Market Packages

As noted previously, the First Coast Regional ITS Architecture was derived from the 2005 FDOT District 2 ITS Architecture. The database file corresponding to this Architecture was customized to reflect the geographic extent and needs of the First Coast Region. National ITS Architecture market packages were then used to further customize the First Coast Regional ITS Architecture. Market packages represent groups of information flows and standards in the National ITS Architecture that work together to implement a transportation service. For example, traffic information sharing and dissemination can involve many different information flows and stakeholders. Market packages group these flows and systems together into succinct pieces that work together to meet a need. The Traffic Information Dissemination market package is illustrated in Figure 2-2 below.

By associating stakeholders with one or more market packages, a more complete First Coast Regional ITS Architecture was developed.

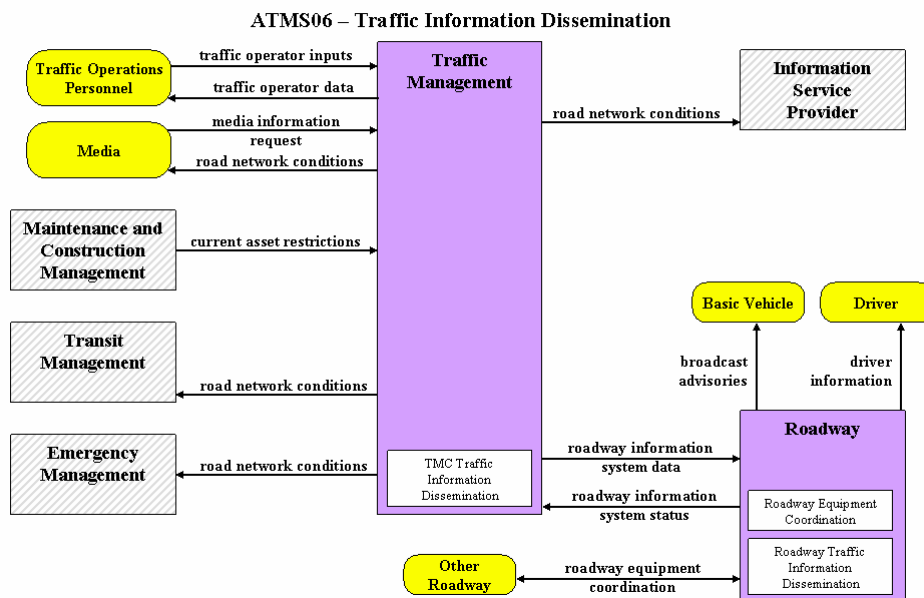


Figure 2-2: Example of Market Packages and Information Flows

2.2.6 Validation Meetings

Once a draft ITS Architecture was completed, stakeholders met to validate the draft Architecture in Jacksonville at the First Coast MPO offices on December 4 and 5, 2006. Stakeholders were divided into three groups by functionality, with each group meeting for three hours. Copies of the agenda and notes from the validation meetings are located on the FCIMP CD-ROM and the FCIMP Web site.

In the validation meetings, stakeholders received customized packets for their agency. Each packet reflected an agency’s primary Architecture element, or piece of the Architecture representing a system or facility. For example, the FDOT District 2 representative received a packet customized for the FDOT District 2 Regional Transportation Management Center element. By focusing on agencies’ primary elements, stakeholders were able to validate the Architecture with minimal overlap.

Each packet listed its Architecture element’s interfaces with other elements in the region, and further noted if the interface was planned, existing, or programmed. Interfaces were shown both in graphic and text format. A copy of an example packet is located on the FCIMP CD-ROM and the FCIMP Web site.

Stakeholders then discussed each element briefly, noting several regional needs and potential new connections. Stakeholders were asked to review their package and provide changes.

2.2.7 Final Regional ITS Architecture

The final version of the First Coast Regional ITS Architecture can be found at the First Coast ITS Coalition Web site:

<http://www.firstcoastmpo.com>.

2.3 USING THE REGIONAL ITS ARCHITECTURE

The ITS Architecture has been created, in part, to be used as a key reference in the transportation planning process. This will ensure all proposed ITS projects are consistent with the ITS Architecture and additional integration opportunities are considered, leading to more efficient implementations.

The First Coast MPO is responsible for the region's Long-Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP). The LRTP is updated every five years. The LRTP is the long-range guide for major investments for the region's multimodal ground transportation system. The TIP recommends major projects and enhancements to maintain the existing transportation system and serve the region's future travel needs. From a planning standpoint, and specifically from an ITS standpoint, the planning document for ITS is the ITS Master Plan, which has been developed as a part of this project.

The ITS Architecture should be considered in the ITS project development cycle. This begins with project definition, followed by procurement, and leading to implementation. Information in the Regional ITS Architecture can assist in all three of these areas of project development.

Project definition may occur at several levels of detail. Early in the planning process, a project may be defined only in terms of the transportation services it will provide, or by the major system pieces it contains. At some point prior to the beginning of implementation, the details of the project must be developed. This could include further system definition and interface definition including exactly what systems or parts of systems will make up the project, what interconnections the project entails, and what information needs to flow across the system interconnections. Requirements definition may go through similar levels of detail, starting with very high-level description of project functions and moving toward system specifications. By identifying the portions of the ITS Architecture that define the project, the ITS Architecture outputs can be used to create key aspects of the project definition.

There are several ways the Architecture can assist in project definition including:

- Identification of agency cooperation can come from the interconnect diagrams,
- Requirements definition can be completely or partly defined by using the ITS Architecture functional requirements applicable to the project, and
- ITS Architecture includes mapping to ITS standards.

In addition, by mapping the project to the Architecture, it is possible to extract the specific applicable ITS standards for the project.

Once a project is defined—and funding for it is committed—the implementation process can commence with the generation of a Request for Proposal (RFP), Request for Bid (RFB), or Invitation to Negotiate (ITN), which are the common governmental practices for initiating a contract with the private sector to implement a project. Once a contract is in place, project implementation begins and moves through design, development, integration, and testing. The ITS Architecture, and the products produced during its development, can support this RFP/ITN generation process.

First, the project definition described above forms the basis for what is being procured. Mapping the project to the ITS Architecture allows proposers to have a clear understanding of the scope of the project and of the interfaces that need to be developed. The functional requirements created as part of the ITS Architecture can be used to describe the functional requirements for the project. In addition, a subset of the ITS Standards identified as part of the ITS Architecture development can be specified in the RFP/ITN.

2.3.1 Conformity

In order to fully utilize the Architecture, ITS projects in the region must be designed with the intention of conforming to the First Coast Regional ITS Architecture. Ensuring Architectural conformity nets the following benefits for the region:

- Expedites development and deployment of ITS,
- Promotes interoperability and reduces incompatibility,
- Encourages efficient investment and reduces duplication,
- Promotes use of optimal rather than dead-end technologies,
- Enables more effective planning and programming,
- Gives credibility to conforming ITS projects, and
- Provides enhanced transportation services.

Additionally, federal requirements mandate that conformity with the Architecture be demonstrated for ITS projects funded using federal

Highway Trust Fund dollars (including those from the Mass Transit Account). Use of the systems engineering process is also required. To ensure that the First Coast ITS Regional Architecture and associated planning process conform to the Rule/Policy, the process articulated in the exhibit on the next page was followed in the FCIMP project.

**First Coast Metropolitan Transportation Organization
Jacksonville Transportation Authority**

**First Coast Intelligent Transportation Systems (ITS)
Master Plan
Rule 940/FTA Regulation Conformity**

The following outlines the requirements of Rule 940 and the approach taken by the First Coast region. The Rule 940 language is shown in italics, with the approach for the First Coast region following.

Rule: The Regional ITS Architecture shall include, at a minimum, the following (940.9(d)):

Rule 1. A description of the region (940.9(d)(1))

The rule defines a region as the geographical area that identifies the boundaries of the Regional ITS Architecture and is defined by and based on the needs of the participating agencies and other stakeholders. In metropolitan areas, a region should be no less than the boundaries of the metropolitan planning area. The regional description should identify features that are relevant to the deployment of ITS projects as shown in the regional architecture. For the First Coast region, the description will include the counties, major cities, the modes being addressed, key geographical features that introduce congestion (e.g., waterways and bridges), major traffic generators (whether perpetual, such as ports, bases, etc., or event-based, such as Alltel Stadium), weather events that affect traffic operations, and tourism. The First Coast MPO has identified the four-county core of First Coast MPO, as well as the entire impact area of the region.

Rule 2. Identification of participating agencies and other stakeholders (940.9(d)(2))

The stakeholders already identified will represent the region well.

Rule 3. An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems included in the regional ITS architecture (940.9(d)(3))

The Operational Concept (Part 1 of this Master Plan) identifies the who, what, when, and where of integrated operations.

Rule 4. Any agreements (existing or new) required for operations, including at a minimum those affecting ITS project interoperability, utilization of ITS related standards, and the operation of the projects identified in the regional ITS architecture (940.9(d)(4))

Often, the Architecture itself constitutes the agreement between agencies. Funding

agreements for capital or operations funding, data privacy agreements, and operations agreements can sometimes be required as well. With the exception of funding agreements, many regions find that they can integrate and operate together without written agreements.

Rule 5. System functional requirements (940.9(d)(5))

A Systems Engineering analysis method, based on regional operational needs, was applied to identify the needed Market Packages and associated functional requirements for the First Coast region. This study followed a Systems Engineering process for the FCIMP.

Rule 6. Interface requirements and information exchanges with planned and existing systems and subsystems (for example, subsystems and architecture flows as defined in the National ITS Architecture) (940.9(d)(6))

All selected Market Package data flows and system interface requirements were identified and referenced to the National Architecture and they conform to the District 2 ITS Architecture as well.

Rule 7. Identification of ITS standards supporting regional and national interoperability (940.9(d)(7))

Each data flow identified in the architecture was connected to a supporting standard. The standards support regional and national systems interoperability. Some of the standards may become U.S.DOT-adopted "critical" standards that specifically support national interoperability. As of this writing, there are no critical standards currently adopted by U.S.DOT. If U.S.DOT does adopt any standards, they will require that they be implemented on federally-funded ITS projects.

Rule 8. The sequence of projects required for implementation (940.9(d)(8))

The plan includes a short-term (identified as a 5-year horizon) and mid-term (10-year) horizon for implementation. A listing of project sequencing appears in the Transportation Improvement Programs (TIP) of the First Coast Metropolitan Planning Organization. Rule 940 emphasizes that the region ensure that projects be implemented in a logical sequence. For example, a communications backbone may be required before field devices can be connected. Based on the implementation approach selected, the required sequencing will be documented.

Rule 9. The agencies and other stakeholders participating in the development of the regional ITS architecture shall develop and implement procedures and responsibilities for maintaining it, as needs evolve within the region (940.9(f))

The First Coast ITS Coalition will assist the regional stakeholders in identifying the roles and responsibilities for maintaining and updating the Regional ITS Architecture. The update approach typically depends on the expected pace of deployment. A regular schedule has been proposed, or an update might be triggered by the need to incorporate unanticipated activities into the Architecture.

Rule 10. All ITS projects [emphasis added] funded with highway trust funds shall be based on a systems engineering analysis (940.11(a))

While this step is beyond the scope of the FCIMP project per se, the Implementation Plan developed under this project (Part 3) takes this requirement into account.

To ensure conformity to the First Coast Regional ITS Architecture, new projects should be submitted using the First Coast Regional ITS Project Form, available through the First Coast ITS Coalition Web site. The online application will require users to submit the following information:

- Organization name,
- Contact information,
- Project name and detailed description, and
- Project schedule and funding information.

The ITS Administrator will forward the notice to the First Coast ITS Architecture Steering Committee, who will determine each project's conformity to the First Coast Regional ITS Architecture.³ Questions the committee could ask might include, but will not be limited to, the following:

- Has the submitting agency adequately coordinated with other stakeholders in the planning of the project?
- Has the systems engineering process been used in the development of the project?
- Does the project conform to the First Coast Regional ITS Architecture? If not:
 - Should the project be reflected in the next Architecture update, or
 - If the project will cause interoperability and other problems, should the First Coast MPO recommend modifications to the project?
- If federal or state funds are requested, should it be funded?

Any First Coast MPO project planning guidance will be updated to reflect the need for ITS projects to conform with the ITS Architecture. If the Architecture Steering Committee deems it necessary, the Project Champion will be asked to submit a First Coast Regional ITS Architecture Update Form, also available through the First Coast ITS Coalition Web site. The Update Form, once accepted, is archived by the Architecture Steering Committee, and these accepted Update Forms are considered part of the First Coast Regional ITS Architecture and eligible for funding until they can be incorporated into the next formal Architecture update.

The project and update forms and instructions for completing them are included in Appendix A of this document.

³ Note that this process has been legislated in the Jacksonville City Council via Ordinance 2007-0066, which has been agreed to for process by FDOT, JTA, and FCMPO.

2.3.2 Systems Engineering

It is very important to follow a systems engineering approach to designing and implementing the project, because all ITS projects involve subsystems and their interconnections. While the exact process followed is at the discretion of the local agency (stakeholder), the FHWA/FTA Rule/Policy lay out a set of required system engineering analyses for ITS projects funded through the Highway Trust Fund.

The required systems engineering analysis steps are:

- Identification of portions of the Architecture being implemented,
- Identification of participating agencies' roles and responsibilities,
- Requirements definitions,
- Analysis of alternative system configurations and technology options to meet requirements,
- Procurement options,
- Identification of applicable ITS standards and testing procedures, and
- Procedures and resources necessary for operations and maintenance of the system.

Figure 2-3 below shows the systems engineering requirements mapped to the ITS Architecture output. This mapping allows conformity to happen in logical ways during the project development process.

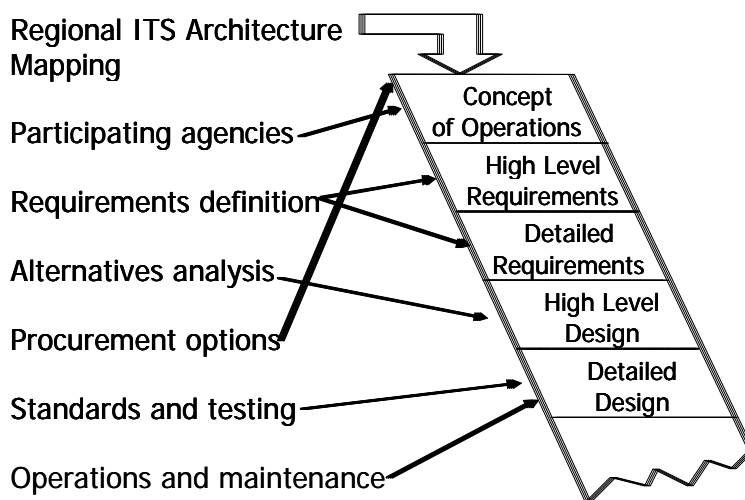


Figure 2-3: ITS Architecture Conformity Mapped to the Systems Engineering Process

In summary, the First Coast Regional ITS Architecture represents a detailed plan for the evolution of ITS in the region and can be used to support regional transportation planning and project development efforts.

2.3.3 Architecture Maintenance

As ITS projects are planned and implemented, the First Coast Regional ITS Architecture will need to be updated to reflect new ITS priorities and strategies emerging through the transportation planning process. The Architecture must also grow and adapt as plans and technologies change, ITS projects are implemented, and ITS needs and services evolve.

In order to serve as a regional framework, the Architecture must be maintained so that it continues to reflect the current and planned ITS, interconnections, etc. The following circumstances or conditions may trigger the need to make changes to the Architecture:

- Changes in regional needs. The First Coast Regional ITS Architecture was created to support transportation planning in addressing regional needs. Over time, these needs can change and the corresponding aspects of the Architecture that address these needs may have to be updated. These changes in needs will also typically be expressed in updates to planning documents, such as regional transportation plans.
- New stakeholders. As new stakeholders become active in ITS, the Architecture should be updated to reflect their place in the regional view of ITS elements, interfaces, and information flows.
- Changes in scope of services considered. The range of services considered by the First Coast Regional ITS Architecture may expand, either because the National ITS Architecture has been expanded and updated to include new user services, or because the First Coast Regional ITS Architecture may expand to encompass parts of the National ITS Architecture that were previously not represented in the region. Changes in the National ITS Architecture are not, of themselves, a reason to update a Regional ITS Architecture, but the region may want to consider new services in the context of their regional needs.
- Changes in stakeholder or element names. An agency's name, or the name used to describe their element(s), undergoes change. Transportation agencies occasionally merge, split, or just rename themselves. In addition, element names may evolve as projects are defined. The Regional ITS Architecture should be updated to use the current names for both stakeholders and elements.

- Changes in other Architectures. The First Coast Regional ITS Architecture covers not only elements and interfaces within the region, but also interfaces to elements in adjoining regions. Changes in adjacent architectures may necessitate changes in the First Coast Regional ITS Architecture to maintain consistency between the two.

The purpose of maintaining the Architecture is to keep it current and relevant, so that stakeholders will use it as a technical and institutional reference when developing specific ITS project plans. In order to maintain the Architecture, three decisions must be discussed:

- Who will lead and implement the maintenance effort?
- When will the First Coast Regional ITS Architecture change be updated?
- How will the Architecture be maintained?

Who Will Maintain the Architecture?

The First Coast MPO will lead the maintenance effort, although all stakeholders will still need to participate in the process. Maintenance of the Architecture is a recurring, ongoing effort that requires inputs from all stakeholders in the First Coast region.

When Will the Architecture be Updated?

The First Coast Regional ITS Architecture is expected to be formally updated every five years to coincide with updates to the LRTP, starting in 2009; thus the next update to the First Coast Regional ITS Architecture should be completed by then. This is a formal update, complete with stakeholder input, validation workshops, and other activities that led to its creation.

How Will the Architecture be Maintained?

The First Coast MPO will be responsible for maintaining the First Coast Regional ITS Architecture. In order to document the necessary changes to the Architecture, the First Coast MPO will track documentation from new projects and other changes in the region through the First Coast MPO Web site. All stakeholders in the First Coast region involved in ITS project activity will be responsible for documenting additions, changes, and updates to the Architecture by submitting documentation through the First Coast MPO Web site.

It is important that changes occurring between formal updates be captured; thus the FCMPO should continuously “maintain” the Architecture by recording these changes, in contrast to the formal “update” referred to above. The FCMPO should adopt a configuration management policy to maintain the integrity of the ITS Architecture.

2.3.4 System Functional Requirements

In the First Coast Regional ITS Architecture, system functional requirements define the activities (i.e., “functionality”) that are performed by various systems in the First Coast Region. This is done by associating each system with its share of the work to provide a particular ITS service. Functional requirements are descriptions of what the system will do rather than detailed design requirements.

The first step in defining the system functional requirements in the FC Regional ITS Architecture is to associate all elements with one or more “functional areas” based on their market package assignments. Assigned functional areas for each Architecture element, as well as their definitions, are provided on the FCIMP CD-ROM and on the FCIMP Web site. These functional areas may be used—at a high level—as the basis for writing project-specific functional requirements. These functional areas are provided by Turbo Architecture to meet the functional requirements specified by the National ITS Architecture.

2.3.5 Interfaces and Standards

At its core, the First Coast Regional ITS Architecture consists of a database of detailed connections and interactions between Architecture elements. These connections between two elements are called “interfaces,” while the specific data that moves between two elements are “information flows.” Both interfaces and information flows are represented in the First Coast Regional ITS Architecture as diagrams, located on the FCIMP CD-ROM and the FCIMP Web site. Information flows are also assigned a status, one of three described below:

- Existing: the information flow has been implemented, or does occur,
- Programmed: the information flow does not currently exist, but there are dedicated funds for its implementation, or
- Planned: the information flow is in the future, and has not been budgeted.

In the Architecture, information flows are linked directly to ITS standards. ITS standards are industry-consensus standards that define how system components operate within a consistent framework. By specifying how systems and components interconnect, ITS standards promote interoperability. An example benefit of interoperability includes facilitating the linking of transportation management centers with police dispatch, allowing seamless communication between agencies. By improving communication, agencies can respond faster to incidents, thereby improving safety and reducing congestion. To realize these benefits, systems and the underlying equipment must be designed according to standards that enable interoperability.

The U.S.DOT's ITS Standards Program is working with existing standards development organizations to establish a national collection of ITS standards. The following organizations participate in ITS standards activities:

- AASHTO (American Association of State Highway and Transportation Officials),
- ASTM (American Society for Testing and Materials),
- IEEE (Institute of Electrical and Electronics Engineers),
- ITE (Institute of Transportation Engineers),
- NEMA (National Electrical Manufacturers Association), and
- SAE (Society of Automotive Engineers).

The American National Standards Institute (ANSI) oversees the development of ITS standards.

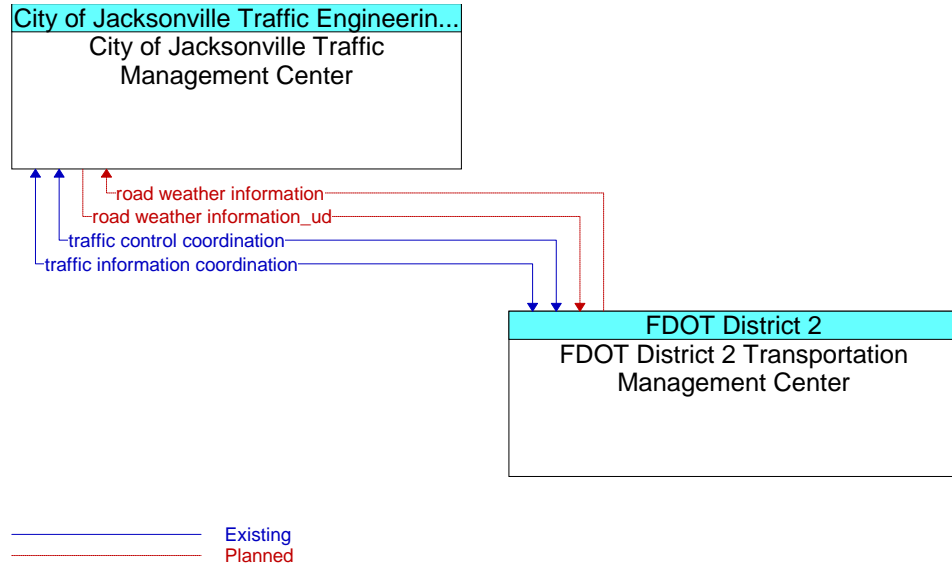
For more information on ITS standards, visit, <http://www.ntcip.org> or <http://www.standards.its.dot.gov>.

In Florida, the FDOT ITS Section in the Central Office publishes ITS standards for the state. Agencies using federal or state funds must use these standards. Others are strongly encouraged to do so as well. To access these standards, see the following site:

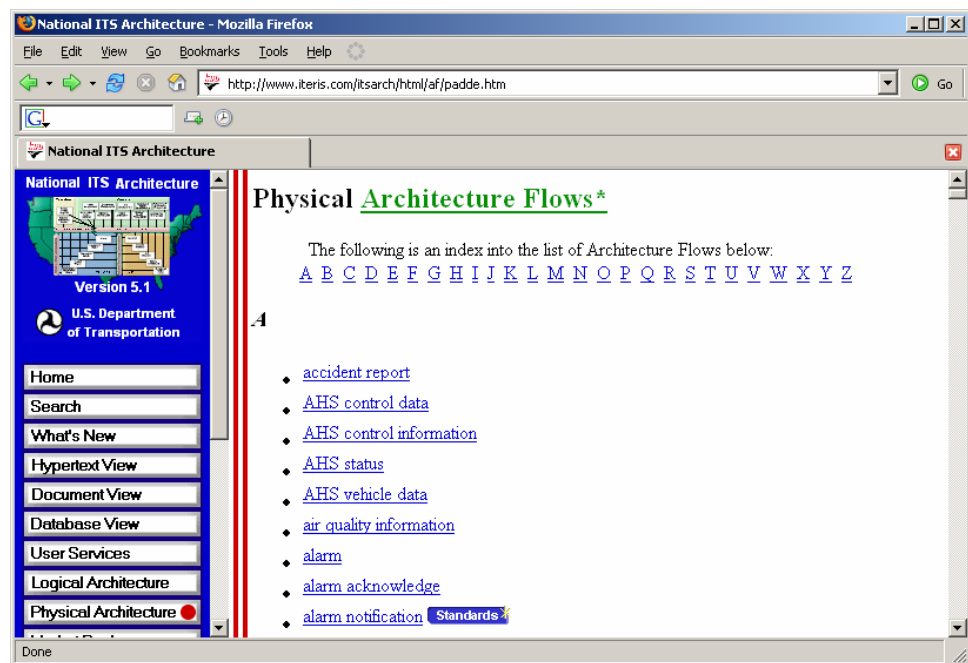
http://www.dot.state.fl.us/TrafficOperations/ITS/Projects_Deploy/Specs.htm

To find federal standards for an information flow in the First Coast Regional ITS Architecture, use the following steps:

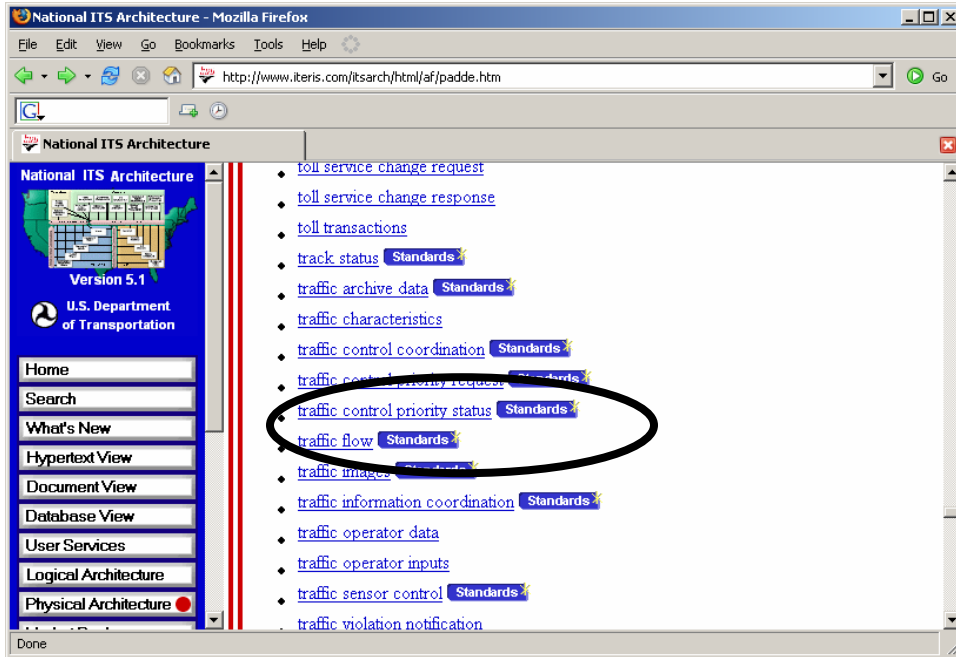
1. Select the information flow from the diagram below. For example, use the information flow diagram below for the interface between the City of Jacksonville Traffic Control Center and the FDOT District 2 Transportation Management Center. Select "traffic control coordination" as the information flow. For other diagrams, refer to the full set of Architecture diagrams on the FCIMP CD-ROM or the FCIMP Web site.



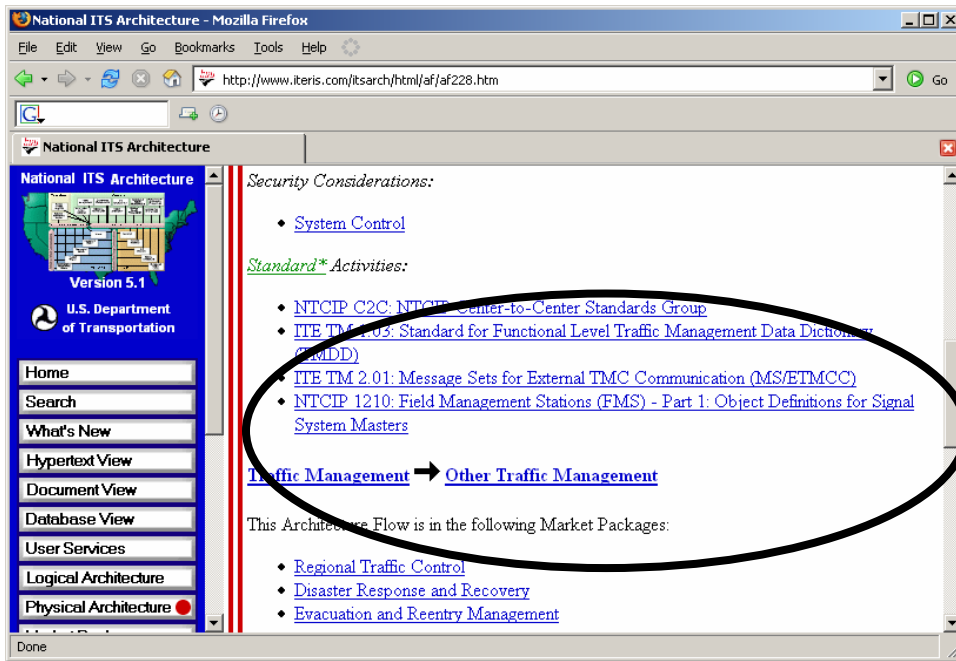
- Visit the National ITS Architecture Web site: <http://itsarch.iteris.com/itsarch/html/af/padde.htm>.
- This site provides a listing of all National ITS Architecture information flows and their associated standards.



2. Select the information flow from the list.



3. Locate the associated standards.



This process can be repeated for any information flow and for any interface. The National ITS Architecture Web site contains the most recent information on standards activities.

2.4 FHWA REGIONAL ARCHITECTURE ASSESSMENT CHECKLIST

FHWA assesses conformity to Rule 940 using a checklist. The completed checklist for the First Coast Regional ITS Architecture is given in Table 2-1.

Table 2-1: FHWA Regional Architecture Assessment Checklist

Criteria/Question	Yes/No	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.?	Yes	
b. Has a timeframe for the Architecture been defined? (For example, 5 or 10 years into the future, or the TIP/STIP planning period?)	Yes	
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?	Yes	
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?	Yes	
b. Is the range of stakeholders commensurate with the defined scope of the regional Architecture?	Yes	
c. Does the range represent a broad cross-section of all transportation related organizations in the region?	Yes	
d. Is there sufficient information to assess the degree of involvement of each critical stakeholder in the Architecture development process?	Yes	
3. System Inventory		
a. Has a system inventory been defined?	Yes	
b. Does it include a list of applicable regional systems along with descriptions of each system and their functionality?	Yes	
c. Have National ITS Architecture subsystems and terminators been correctly linked to regional systems?	Yes	
d. Are user-defined entities described in sufficient detail to understand their function?	Yes	
4. Needs and Services		
a. Are needs and services defined and described?	Yes	
b. Are the needs and services adequately represented in the regional Architecture?	Yes	

Criteria/Question	Yes/No	Comments
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?	Yes	As part of the Master Plan
b. Has an Architecture operational concept been described in sufficient detail for the future systems?	Yes	As part of the Master Plan
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.)	Yes	
b. Are the requirements categorized by stakeholders?	Yes	
c. Are the requirements unambiguously stated in terms of shall statements?	Yes	
d. Is the Architecture output presented in a way that is understandable to a variety of audiences, including the public and decision-makers?	Yes	
7. Interfaces/ Information Flows		
a. Are interconnections defined to indicate what subsystems are connected together? Has this been illustrated by diagrams or tables?	Yes	
b. Have information flow diagrams or tables been developed to illustrate the information flows that are exchanged between subsystems?	Yes	
c. Is enough supporting information provided to understand the information exchanged?	Yes	
d. Does the Architecture include appropriate linkages to overlapping or adjacent region Architectures?	Yes	
e. Is the connection status (existing or planned) identified for each link?	Yes	
f. Are there any important integration opportunities that may have been overlooked?	No	
8. Project Sequencing		
a. Has a plan been established by which projects would be defined and sequenced over time?	Yes	As part of the Master Plan
b. Has an initial sequencing of currently defined projects been established?	Yes	As part of the Master Plan

Criteria/Question	Yes/No	Comments
c. Does the sequencing adequately address the interdependencies among projects?	Yes	As part of the Master Plan
d. Have opportunities to coordinate implementation schedules with other transportation improvements been investigated?	Yes	As part of the Master Plan
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?	Yes	As part of the Master Plan
b. Can existing agreements be used?	Yes	As part of the Master Plan
10. Standards Identification		
a. Are ITS standards described that are applicable to the development of projects coming out of the regional ITS Architecture?	Yes	
b. Are these standards associated with specific information flows or interconnects?	Yes	
c. Are there any important standards that may have been overlooked?	No	
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?	Yes	
b. Will a regional stakeholder organization or committee monitor and manage the planning process and the Architecture use? Are all important responsibilities addressed?	Yes	
c. Is there a description for using the regional ITS Architecture in support of project implementation?	Yes	
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?)	Yes	
b. Have the various reasons for updating the Architecture been addressed (project updates, new requirements or initiatives, etc.)?	Yes	
c. Is there a plan for communicating changes in the Architecture to stakeholders?	Yes	
d. Have the responsibilities of the various stakeholders or groups been well defined?	Yes	

Other comments: _____

APPENDIX A: ITS FORMS AND INSTRUCTIONS

First Coast Regional ITS Project Form and Instructions

First Coast Regional ITS Project Form

Version: March 2007



Overview

The First Coast Regional ITS Project Form allows stakeholders across the region to inform the First Coast MPO of new or changed projects. The FHWA Rule 940 defines an ITS project as 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 as defined in the National ITS Architecture.

To submit a project, simply fill out the Project Form below and click submit. Your entry will be sent to the First Coast ITS Moderator who may contact you for follow up. The Architecture Steering Committee will then review the form and determine if an Architecture Update Form should be submitted. If deemed necessary, the ITS Administrator will contact you and request that you submit the Architecture Update Form.

*Be sure to print the Project Form before submitting, and keep for your records. You may have to re-enter this information at a later date. The Project Name will be the identifier of your submission.

Contact Information	
Name of Submitter: <input type="text"/>	Submission Date: <input type="text"/>
Organization: <input type="text"/>	Phone Number: <input type="text"/>
Email: <input type="text"/>	

Project Information	
Project Name: <input type="text"/>	Project Stakeholder: <input type="text"/>
Other Stakeholders and Roles: <input type="text"/>	<input type="checkbox"/> Local Funding <input type="checkbox"/> State Funding <input type="checkbox"/> Federal Funding Details: <input type="text"/>
Location: <input type="text"/>	Anticipated Project Start: <input type="text"/> <input type="text"/>

Prerequisite Projects: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Anticipated Project Completion: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Project Description: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
<input type="submit" value="Submit"/>	

Instructions

The following instructions will assist you in filling out the First Coast Regional ITS Project Form.

- In “Contact Information,” enter the information that may be used to contact you for more information.
- In “Project Information,” provide the following information:
 1. “Project Name” – Provide the project’s unique name. Please record this information, as it will be used to identify your project in future updates and submissions.
 2. “Project Stakeholder” – Enter the stakeholder or agency responsible for the project. For a list of stakeholders used in the Architecture, refer to the First Coast Regional ITS Architecture, posted on the First Coast MPO Web site, at <http://www.firstcoastmpo.com>. Your stakeholder may not be reflected in the Architecture, please enter it into the form regardless.
 3. “Other Stakeholders and Roles” – Often a project, while occurring under a single agency, involves other agencies in different capacities. For example, an information sharing project would involve not just the primary agency, but other stakeholders receiving the new information. List other stakeholders involved in the project, and details of their roles and responsibilities.
 4. “Funding Details” – Check if the project receives local, state, or federal funding, or a combination. Provide details, including funding amounts, required matches, percentage of funding coming from various sources, etc.
 5. “Location” – Provide the anticipated location of the project. If a project is regional, describe the region to be covered.
 6. “Anticipated Project Start” – Enter the month and year that work on the project is scheduled or anticipated to begin.
 7. “Anticipated Project Completion” – Enter the month and year that work on the project is scheduled or anticipated to end, and the project becomes fully operational.
 8. “Prerequisite Projects” – Describe any projects that must be underway or completed before work on this project can begin, or before this project can become fully operational.
 9. “Project Description” – Include a brief yet detailed description of the project. Include any other information that may be relevant, but that was not given in the previous responses. Also, use this space to explain any answers that may be unclear from the previous sections of the form.

First Coast Regional ITS Architecture Update Form and Instructions

First Coast ITS Architecture Update Form

Version: March 2007



Overview

The First Coast ITS Architecture Update Form allows stakeholders across the region to inform the First Coast MPO when projects or changes will impact the ITS Architecture. This will greatly simplify and streamline the Architecture update process, to occur every five years.

If requested to help maintain the Architecture, simply fill out the Update Form below and click submit. Your entry will be sent to the First Coast ITS Moderator who may contact you for follow up. The Update Form will be archived by the Architecture Steering Committee. Submitted Update Forms are considered part of the First Coast ITS Architecture and eligible for federal funding until they can be formalized in the next update.

Contact Information

Name of Submitter: Submission Date: Organization: Phone Number: Email:

Project Form Referencing Information

Project Name:

Additional Information Needed

In specifics, what is being deployed?

What standards are being used?

Are you willing to share the data and information?

Yes

No

If yes, what key stakeholders will receive what data/information?

Other Pertinent Information:

Also, please feel free to submit the optional [First ITS Architecture Market Package Participation Form](#).

Instructions

The following instructions will assist you in filling out the First Coast Regional ITS Architecture Update Form.

- In “Contact Information,” enter the information that may be used to contact you for more information.
- In “Project Form Referencing Information,” enter the project’s name. Please record this information, as it will be used to identify your project in future updates and submissions.
- In “Additional Information Needed,” provide the following information:
 1. “In specifics, what is being deployed?” – Describe the project in greater detail, specifically any technologies, hardware, software, or systems being deployed.
 2. “What standards are being used?” – Provide ITS standards information. For more information on ITS standards, refer to Section 2.3.5 Interfaces and Standards.
 3. “Are you willing to share the data and information?” – If you are planning to exchange or distribute new data and information either as part of this project or as a result of this project, or if you are open to the idea of sharing information, check the box marked “Yes.”
 4. “If yes, what key stakeholders will receive what data/information?” – If you answered yes to the previous question, specify what data would be available to exchange and which stakeholders or agencies. Be as specific as possible.
 5. “Other Pertinent Information” – Include here any other project information that may be relevant, or explain any answers that may be unclear from the previous sections of the form.



FIRST COAST ITS COALITION

First Coast Regional Intelligent Transportation Systems Master Plan Part 3: Approach to ITS Project Planning and Implementation

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3

APPROACH TO ITS PROJECT PLANNING AND IMPLEMENTATION

3.1 INTRODUCTION

The emergence of Intelligent Transportation Systems (ITS) as effective traffic management tools has required transportation agencies and Metropolitan Planning Organizations (MPOs) across the country to assess the ability of their current transportation improvement prioritization processes to accommodate alternative approaches. The responses to these assessments are varied:

- Prioritization of proposed projects specific to a funding category,
- Heavy emphasis on specific criteria (e.g., improvements in travel time reliability),
- Current conditions at the improvement location (relative measure) for all projects under consideration, and
- Use of objective criteria for some categories and subjective criteria for others.

The list above is not all-inclusive; additional variations are numerous. Central to the point is that all of these approaches are the direct result of efforts to open up the prioritization process to a wider array of alternative transportation improvements—ITS being among the most significant. The First Coast ITS Coalition’s objective of bringing ITS projects into the funding mainstream is based upon a similar desire.

3.2 PURPOSE

The purpose of this part of the First Coast ITS Master Plan is to define a process that will bring proposed ITS projects into the funding mainstream of either the First Coast Metropolitan Planning Organization (FCMPO) or other mechanism for areas outside the FCMPO. Additionally, this part identifies and describes general

considerations for fostering ITS implementation and supporting the region's ITS program.

A process of this type has several facets. There are portions of the process that deal with regulatory requirements imposed from outside the region. These requirements may be either federal or state in origin. There are also local policies and procedures, some of them derivatives of federal requirements, that impact the development of an ITS Implementation Plan.

Processes are needed because there are generally more projects to fund than funds available. Equity among interested parties, or stakeholders, is safeguarded when the distribution of scarce resources is done in accordance with a known, agreed upon methodology for prioritizing competing needs. According to R. E. Turochy, in a paper presented at the *85th Annual Meeting of the Transportation Research Board*,¹ the process for developing a prioritized list of proposed transportation improvements should be:

- Rational—the steps in the process should be easily understood, and
- Defensible—the process used should be open to examination and the results related to needed improvements.

Much of what is required within the federal regulations is aimed at implementing these guiding principles. The local process is also highly compatible with them.

Before getting into the heart of the matter of presenting the First Coast ITS Implementation Plan, we wish to establish some additional overarching tenets, which are stated as follows:

- This plan is "owned" by the First Coast ITS Coalition, acting as the representative of all its active members.
- This is a plan—or more to the point, a planning process—intended only as a guideline.²
- This plan is not proscribed for agencies outside the FCMPO boundaries. It should be followed by FCMPO members within the context of the previous point. Those agencies outside the FCMPO boundaries are encouraged to use this process as a means of ensuring regional interoperability, but no effort is

¹ Turochy, R. E., "Procedures for Prioritizing Proposed Transportation Improvements at the Metropolitan Level," Paper presented at 85th Annual Meeting of the Transportation Research Board, Washington, D.C., 2006.

² As an exception, when federal funds are involved in an ITS project—and for all practical purposes, state funds as well—issues related to Rule 940 and the FTA ITS Policy should be followed as outlined herein and in the First Coast Regional ITS Architecture document to ensure conformity.

made herein to usurp any authority, prerogative, or independence from those agencies.

- For agencies within the FCMPO boundaries, nothing in this plan precludes those agencies from pursuing other resources outside the MPO process (such as earmarks and special grants), but ITS projects using federal or state funds will have to comply with the Regional ITS Architecture.
- The goal of this process is to serve the entire region, including those areas outside the FCMPO, equitably in consideration for project selection and funding.
- When prioritization is applied to multiple projects, an agency's assigned priority will be respected in this process. In the event that the First Coast ITS Coalition, acting as a clearinghouse for all ITS projects in the region, would take issue with the stated priority, the issue will be negotiated with the impacted agency and their satisfaction assured—that is to say that prioritization will only be changed by mutual consent.
- The First Coast ITS Coalition itself is clearly in a position to view the entire region from a "high-level," so the Coalition can, and should, originate projects for consideration.

More details on several of these points are provided in the discussion to follow.

3.3 CONSIDERATIONS FOR SUCCESSFUL ITS IMPLEMENTATION

There are several issues the region needs to be mindful of before implementing ITS projects, in order to foster an environment where ITS can successfully satisfy regional transportation goals and objectives. For some of these considerations, it is best that they are addressed as early as possible in the project's life cycle so results can be taken into consideration when weighing projects against each other for possible implementation and prioritization. These issues, if not addressed, may ultimately act as barriers to project implementation or may simply affect the success of the project after it is implemented. These issues include:

- Outreach,
- Financial Considerations,
- Staffing,
- Implementation approach,
- Continuity of operations,
- Standards, and
- Performance Monitoring.

Failure to consider and address these issues may also decrease the effectiveness of the regional planning process, lead to poor

perception of public agencies and their investment, and result in ITS being viewed as an inefficient means of addressing transportation goals and objectives.

3.3.1 Outreach

Funding ITS projects, and for that matter incorporating ITS into the traditional planning process, cannot be achieved without broad-based support and approval of ITS. To be effective in implementing ITS projects, agencies involved in the traditional planning process must be comfortable with ITS, what it does, and how it can be used to satisfy regional goals and objectives, perhaps more from the institutional than technological perspective. This means providing continuing education for those individuals and agencies that do not have a solid understanding of ITS. This includes not only individuals and agencies associated with a project, but also elected officials, agency staff, as well as the general public. Reaching out to these groups of individuals helps to break-down barriers and misconceptions of ITS, making it easier for them to visualize how ITS can be used alongside traditional highway improvements to deliver benefits at significantly lower costs.

The First Coast Region has already taken several steps to achieve broad-based understanding and support for ITS, as demonstrated by the activities already undertaken, as identified below:

- Established the First Coast ITS Coalition—a multi-agency effort to effectively plan, coordinate, obtain funding and implement ITS projects.
- Endorsement of ITS as an effective means to satisfy regional goals and objectives, by the First Coast MPO, Florida Department of Transportation, Jacksonville Transit Authority, City of Jacksonville (COJ), as well as many other agencies.
- Effective communication and coordination of ITS between agencies and individuals, and across jurisdictional boundaries.

These activities have been key in addressing ITS activities and spurring region-wide discussion so far. To continue this course and to solidify support for ITS, the First Coast ITS Coalition, primarily through its lead agencies (FDOT, FCMPO, JTA, and COJ), must not let up on these efforts and instead should continue to gather support through effective and targeted outreach.

Outreach provides a medium through which the reasons for, and benefits of, ITS can be expressed. It is also a valuable tool for smoothing the implementation of strategies by promoting inter-agency cooperation, while at the same time mitigating any adverse reaction. ITS outreach activities include both delivering and gathering information from four key stakeholder groups:

- Intra-agency stakeholders,

- Inter-agency stakeholders,
- General public, and
- Key decision makers.

Outreach activities should be on-going, whether or not anything “new” is happening within the region. Additionally, project champions should tailor their outreach efforts to the specific groups to which information is being delivered. In doing so, the benefits of ITS activities will be more easily understood and consistently communicated, breeding an environment where ITS can flourish.

3.3.2 Financial Considerations

As with any type of project, the ITS Coalition must secure the funds needed to support ITS projects. The funding needs of ITS differ significantly when compared with traditional highway improvement projects. With traditional highway projects, funding is needed to design, build and maintain hard highway infrastructure. Depending on the type of ITS project being implemented, funding may be needed to support the following activities:

- Planning and design of new ITS elements—this includes hiring and retaining staff that have the knowledge, skills and abilities to determine how new systems or subsystems will be built.
- Purchasing ITS equipment and materials—this includes the respective field elements, communications, and computer hardware needed to support the ITS project.
- Providing training and materials—since ITS projects often contain new subsystems or functionality, additional funding may be needed to train staff.
- Operating and maintaining ITS equipment—additional funding will likely be needed to support on-going operations and maintenance. New ITS projects often employ new functions and involve additional maintenance activities that staff currently does not perform, nor have training to do. Also, owing to the critical nature of intelligent transportation systems, maintaining ITS equipment may require that staff work overtime to fix serious problems.

Potential funding opportunities and sources are identified later in this document.

3.3.3 Staffing

Staff education, availability, and retention are critical aspects of ITS projects and should be carefully considered before projects are implemented. Agencies sponsoring ITS projects need to identify individuals that will be responsible for operation and maintenance of that system. If, for some reason, this individual is unavailable, it is wise

to have additional staff trained so seamless operations will not be affected. This is currently well evidenced by the need to split RTMC staff between itself and the FHP's Joint Regional Communications Center (JRCC).

Staff Skills and Knowledge

Staff responsible for implementing, operating, and maintaining ITS elements should be appropriately trained. For instance, systems engineers should have knowledge of the system engineering process, ITS standards and their applicability, ITS procurement process, communications requirements, and needs for ITS deployments. Agencies may find it beneficial to develop staff skill matrices to quickly identify the skills or knowledge needed when staff leaves.

Staffing Levels

Before ITS projects are approved for implementation, the First Coast ITS Coalition should verify that the project can be adequately supported given current agency staffing levels. Agency staff is needed to plan, deploy, operate, and maintain ITS projects. It is critical that an appropriate number of staff be available to ensure that subsystems are operated effectively, maintained, and replaced accordingly. If staff is not available to perform these functions, maintenance issues may be ignored and subsystems may be operated in an unsafe and/or inefficient manner. This may result in costly and otherwise unneeded replacements, inefficient use of expensive resources and a poor public perception of ITS investment. Sponsoring agencies should consider hiring outside contractors to supplement staffing needs, if necessary.

3.3.4 Implementation Approach

After ITS projects are approved and prioritized for implementation, the First Coast ITS Coalition should look at ways to ensure that projects are implemented in a cost-effective, consistent fashion. One way that is gaining popularity among ITS professionals is a process known as Systems Engineering. The Systems Engineering Process ensures that the subsystems proposed for implementation meet the needs and requirements defined in the early stages of a project. There are multiple ways to represent the Systems Engineering Process. One way, the Systems Engineering "V" diagram (see Figure 3-1), represents the typical life cycle of any subsystem or project. Each step in the process represents a "bite-sized" portion of the entire process that individuals can easily "digest" to better manage the intricacies of subsystem implementation.

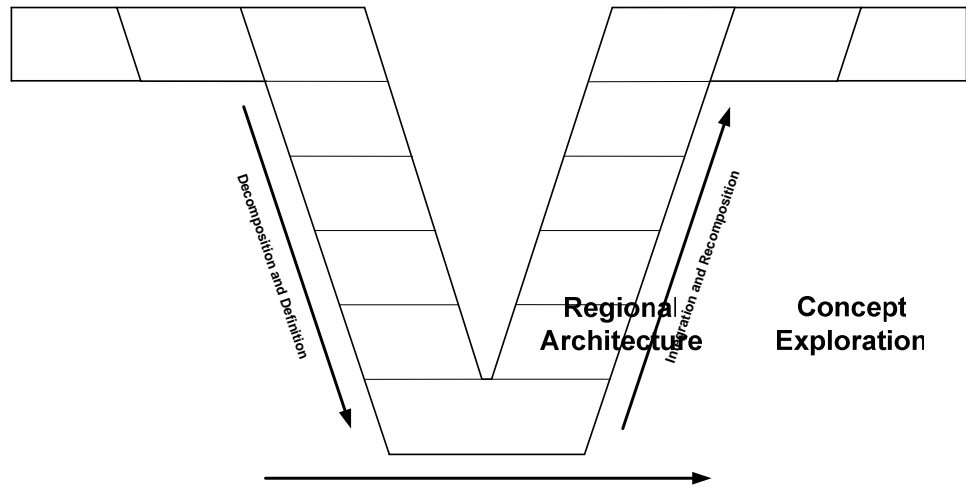


Figure 3-1: Systems Engineering "V" Diagram

Additional information on the Systems Engineering Process, including a brief discussion of the steps leading to project implementation (left side of the "V" Diagram) is provided in Appendix A. Additionally, activities that support project development are discussed in Appendix B.

3.3.5 Continuity of Operations

Maintaining operational continuity is an absolute must for ITS projects. Failure to keep subsystems up and running will result in public distrust. For most new ITS applications, maintaining operational continuity will not be much of an issue, since this activity is simply a process of adding on additional functionality; however, consideration should be given to operating the system correctly. Besides new projects, there will be ITS projects proposed for the First Coast Region that will replace existing subsystems. In this regard, halting operations for a designated period of time, while the new subsystem is being installed, is not an option. For example, the Jacksonville Regional Communications Center will manage traffic 24 hours a day, 7 days a week, and therefore, cannot cease to operate, nor do they have the ability to manage traffic with some functions enabled and others not. Operating in this fashion opens the door to several problems, the biggest being a reduction in safety. Maintaining operational continuity before, during, and after subsystems are implemented is a challenge that the First Coast Region must address to ensure that the public's first perception of ITS is a good one.

3.3.6 Standards

Standards define how elements associated with an ITS project will interconnect and interact with other ITS elements within the region. The underlying principle behind standards is that they enable subsystems to be designed using “open” platforms. In other words, standards allow subsystems to be easily upgraded or replaced when they fail, and are interoperable. Before the introduction of standards, subsystems were often developed using proprietary software that could not be replaced with a similar subsystem or product other than those made by the same manufacturer.

The First Coast ITS Coalition should require that subsystems being implemented be developed in line with U.S.DOT approved standards. Standards must be identified prior to implementing projects funded by the National Highway Trust Fund. The FHWA rule and FTA Policy on Regional ITS Architectures states that, “... federally funded ITS projects use, where appropriate, U.S.DOT adopted ITS standards.” To find more information on ITS-related standards, visit:

<http://www.standards.its.dot.gov/>

Also see the First Coast Regional ITS Architecture document in Part 2 of this FCIMP.

3.3.7 Performance Monitoring

Before an ITS project is implemented, the First Coast ITS Coalition should set up procedures for monitoring, evaluating, and reporting the performance of the project. Performance measures, such as those provided in the Operational Concept part of this FCIMP provide the basis for evaluating the effectiveness of the ITS projects, and determining whether or not projects satisfy project-related goals and objectives. This information is extremely beneficial for:

- Demonstrating the benefits of ITS projects to the public and local elected officials and decision makers,
- Justifying the need for additional funding for ITS projects,
- Obtaining a better understanding of the transportation network and how it is performing over time, and
- Improving the efficiency and effectiveness of ITS projects, particularly where demands on the transportation agency have increased while the available resources have become more limited.

In essence, the First Coast ITS Coalition, will want to make sure that performance measures are both in place and measurable before ITS projects are implemented to evaluate how the system performs with respect to the overall goals and objectives; and based on this evaluation, make more informed, effective decisions when similar projects are proposed in the future.

3.4 MAINSTREAMING ITS INTO THE REGIONAL PLANNING PROCESS

The role and function of ITS in the First Coast Region is continually expanding to address more and more complex transportation needs. Such needs include funding and environmental constraints. Federal law proscribes that the place where multi-modal transportation solutions, including ITS, should be identified is the regional transportation planning process. For the First Coast Region, the First Coast Metropolitan Planning Organization is the logical agency where this work should occur, since this agency is typically charged with the responsibility of developing and maintaining the Long-Range Transportation Plan (LRTP) and Transportation Improvement Plan (TIP). Numerous transportation planning activities conducted on a statewide, regional, and/or local level feed information into the development of the LRTP and TIP. These planning activities include ITS strategic plans (such as this Regional ITS Master Plan) Regional ITS Architectures, corridor and sub-area studies, major investment studies, congestion management plans, and others.

To date, numerous state and local agencies have implemented processes to integrate ITS into traditional planning processes. This has required transportation agencies and MPOs to assess the ability of their current transportation improvement prioritization processes to accommodate alternative approaches. Typically, a region relies on at least one of the following methods:

- Prioritization of proposed projects specific to a funding category,
- Heavy emphasis on specific criteria (e.g., improvements in travel time reliability),
- Current conditions at the improvement location (relative measure) for all projects under consideration, and
- Use of objective criteria for some categories and subjective criteria for others.

The list above is not all-inclusive; additional variations are numerous. Central to the point is that all of these approaches are the direct result of efforts to open up the prioritization process to a wider array of alternative transportation improvements; ITS being among the most significant. The First Coast ITS Coalition's objective of bringing ITS projects into the funding mainstream is based upon a similar desire.

3.4.1 Considerations for Mainstreaming ITS

Mainstreaming ITS into the regional planning process, must be achieved given the following considerations:³

1. The integrity of the existing FCMPO prioritization process must be maintained.

To its credit, a variety of transportation-related needs with a significant array of alternatives across numerous constituencies are annually reconciled through the existing approach. Participants understand the process; they are familiar with their role, comfortable with their responsibilities, and have mastered the mechanics of participation.

2. Confidence in the process must be sustained even though changes might be made to it.

Participants in the process must continue to believe in the fairness of the process. Their faith in its ability to represent their interests equitably must remain intact.

3. The First Coast ITS Regional Master Plan must become a component of the FCMPO regional planning process (and optionally other regional processes, as appropriate).

The broad sweep of the FCIMP, as laid out in the 5- and 10-year planning horizons, must be included in the FCMPO Long-Range Transportation Plan. This will be accomplished through the LRTP updating and amendment procedures. But first, the FCIMP must be prepared as an input to the LRTP. It must be one of the source documents used to determine alternative solutions to congestion, safety, and other transportation issues.

4. ITS projects proposed by the First Coast ITS Coalition must be within the broad area of Coalition members, as defined in the Operational Concept.

Projects outside the area covered by the Master Plan, as presented in the Operational Concept would not be considered.

5. ITS projects proposed by project champions and ultimately accepted into funding streams by the First Coast ITS Coalition must be reflected in the Regional ITS Architecture.

³ While focused on the FCMPO, this process is not limited to, or proscribed by, the FCMPO for agencies outside the boundaries, as explained in more detail later.

The First Coast Regional ITS Architecture can be thought of as a roadmap that describes and illustrates how various ITS components will come together to form a large integrated system composed of smaller individual subsystems. The Regional ITS Architecture should be viewed as a gate-keeper whose responsibility it is to ensure that region-wide ITS activities conform to the consensus of how the regional intelligent transportation system should be developed.

ITS projects should only advance within the implementation process if they are represented in the Regional ITS Architecture, or if the Architecture is updated as a legitimate result of a new, innovative project or subsystem.

6. The foregoing notwithstanding and as noted earlier, agencies are perfectly free to pursue resources outside of this process.

3.5 RECOMMENDED APPROACH TO PROJECT PLANNING

3.5.1 Structure

The general process for the First Coast Regional ITS Master Plan is based on a two-tiered planning horizon. The first tier covers from the present out five years. This will be referred to as the “near-term plan.” The second tier runs from the end of the first tier out five more years. This will be referred to as the “mid-term plan.” The total coverage of the two tiers is 10 years: a single decade. There are several good reasons for a tiered structure of these durations, which are detailed below.

The Rate at Which Technology Is Evolving

Technology is evolving far too swiftly to make operational commitments to equipment that will not be deployed within the near-term. A “near-term” horizon of five years allows for the identification of ITS functions and strategies that can be converted to projects in a timely manner without over-committing to a technology-based application before it is necessary.

The 5-to-10-year horizon, or mid-term, allows for the identification of an ITS concept and supporting function without committing to a specific strategy. More will be said of this approach later. For now it is sufficient to say the rate of technological evolution makes it wiser to defer the “how,” of implementing an ITS strategy to a point in time closer to actual deployment.

Further, the deployment of a new shared Regional Transportation Management Center (RTMC)⁴ in the vicinity of the Prime Osborne Convention Center, and, as envisioned currently, a component of the larger Jacksonville Transportation Center (JTC)⁵, in the 2011 timeframe (the 5th year of the initial near-term period) will dramatically change the Operational Concept of the region. Thus, this milestone event is a logical break point in the planning horizon.

Rather astutely, an observation cited in the “Threats” section of the SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis warned that, “With changing technologies, the ITS Master Plan could quickly become obsolete.” Likewise, the opening of the new RTMC will necessitate a completely fresh look at the deployment objective as that time nears.

Near-Term Efforts Often Focus on Immediate Benefits and/or Areas of Immediate Need

The most readily identified areas of immediate need in the First Coast Region are the Interstate System, the major expressways and bridges, and critical arterial highways. These corridors that traverse the area produce a great deal of mobility in terms of their capacity; however, demand for that capacity is growing. The implications of the growing demand are operating characteristics associated with congestion and related increases in motorist risk. As capacity or throughput shrinks, mobility is eroded.

The interstate and bridge corridors are also the elements in the network that will yield the greatest magnitude of immediate benefits by virtue of their importance to local, regional, and national mobility—for both people and goods, the latter of which is an increasingly rapidly rising transportation market in the region, particularly when the new port facility on Dames Point is completed and open in early 2009. The tendency is to preserve the largest capital investment or the facility that contributes significantly to the desired public good—in this case, mobility.

Complex Projects Are Undertaken in Stages

The tiered structure allows public officials to address the infrastructure requirements for supporting future projects. For example, the essential components of intelligent transportation systems are inter-agency communications, cooperation, and coordination—technologies are simply the enabler. When the communications infrastructure is deployed in advance, the ITS that follows can be

⁴ Housing the FDOT TMC operations staff, Florida Highway Patrol Regional Dispatch Center, JTA dispatch, and Jacksonville Traffic Control Center and Sheriffs Office.

⁵ The JTC will house multi-modal transfer terminals, parking, offices for JTA, the FCMPO, and others, as well as commercial space.

designed for performance within the capacity of the supporting communications network.

Tiered Planning Horizon Fosters Inter-Jurisdictional Cooperation

The single greatest barrier to enhancing mobility and improving safety on the nation and state's highway system is the availability of funding. The investment necessary to address the plethora of capital requirements confronting the surface transportation network is beyond the public's willingness to endure.

A tiered planning horizon accepts this political fact of life by distinguishing that which must, or could be done in the near-term from that which can be deferred to the mid-term or later. This is not a perfect solution, but it positions policy makers, legislators, and planning departments to overcome the acrimony and stalemate associated with an "all or nothing" annual budget process.

Tiered Planning Horizon Fosters Maximizing Investment

Tiered planning makes possible incremental improvements. It allows for the leveraging of previous investments or can be used to position current investments in support of future deployment. To get the full benefit of the approach, virtually nothing related to ITS anywhere in the region should be taking place in isolation.

That is not to say that the various jurisdictions are being required to relinquish their autonomy. Rather, each jurisdiction needs to be aware of how its efforts integrate with previous and parallel ITS deployments, what contribution its efforts are making to future ITS deployment, and how the total deployment of intelligent transportation systems can be integrated for the benefit of the entire region. *This is the purpose of the First Coast ITS Coalition and why the Coalition produced this Regional ITS Master Plan.*

3.6 RECOMMENDED APPROACH TO PROJECT IMPLEMENTATION

The approach to developing the Implementation Plan can be thought of as a stool with three legs. Two of the three "legs" have already been introduced. They are...

- The ITS concepts discussed in the Operational Concept part of the Master Plan, and
- The two-tiered planning horizon discussed above.

The third leg is the basis for addressing regional needs.

The Implementation Plan generally takes a corridor orientation toward addressing regional needs. Within this orientation, the preponderance of effort will be towards previously initiated actions, which can be

addressed in the near-term. Based upon the results of the ITS Inventory,⁶ the stakeholder meetings held in June 2006 and the SWOT analysis, it is clear that this is the proper approach.

The Implementation Plan is not, however, exclusively oriented towards corridors in the First Coast Region. There is ample evidence in the same documents and proceedings to warrant inclusion of an “area/service/infrastructure” (ASI)-oriented approach. The following chart sets in relative terms the balance between emphasis areas.

Approach	Near-term	Mid-term
Corridor	Primary Orientation	Secondary Orientation
Area/Service/Infrastructure	Secondary Orientation	Secondary Orientation

The inclusion of the secondary orientation makes good sense in that the ASI orientation offers several opportunities to leverage ITS investments already made. In some instances, the leveraging is a direct follow-on. This would be the case with several potential investments in transit, for example. In another case, 5-1-1 enhancements become possible as the traffic data collection capacity increases. These increases are part of the ongoing effort to improve traffic management capabilities, but the resulting data are equally valuable in a traveler information application. Synergy in the multiple applications of data is where ITS can provide greater benefits than the sum of its parts.

3.6.1 Applying the Approach

There are seven steps in applying the three-pronged approach to developing the 5-Year and 10-Year Implementation Plans. In reality, this discussion is directed more at the 10-Year Plan, since initially the 5-Year Plan is composed of ITS projects already known in the region. The initiatives in the 10-Year Plan would then go through the project planning approach in Section 3.7 and would evolve into the next 5-Year Plan. However, changing needs might dictate a “new” initiative having a high priority and thus might be inserted directly into the 5-Year Plan, so steps 2 and 6 below account for that possibility.

The seven steps are described as follows:

1. Identify the regional needs to be addressed in terms of corridors and ASIs. In this step, the corridors and ASIs are identified for inclusion in the Implementation Plan.

⁶ See the Regional ITS Architecture, Part 2 of the Master Plan.

2. Designate corridors (including ASI) to the appropriate planning tier. During this step, the corridors will be designated as near-term or mid-term, or even relegated to later, pending further review.
3. Assign ITS concepts/components. These are the concepts and their components that are presented in the Operational Concept. Based upon the needs to be addressed, ITS concepts/components will be assigned to the identified corridors and ASI.
4. Break all corridor components down to functions. The components of an ITS concept can be further broken down to functions. Performance of these functions will be the basis for fulfilling the purpose of an ITS concept.
5. Indicate responsible agencies for all functions. Relying on the designations of agency responsibility presented in the Operational Concept, agencies with responsibility for performing the role and responsibility associated with the ITS Concept will be identified. For example, an ITS solution might involve transit (JTA) and signal control (COJ).
6. Propose strategies to implement functions for near-term corridors. There are known strategies for performing the several functions associated with the ITS concepts. In this step, they will be discussed in terms of the principal needs and potential for synergy.
7. Designate projects to put the strategies into action. Long-term guidance at a strategic level is the basic product of the Master Plan. Any deployment suggestions will be for strategic infrastructure or projects that are virtually ready to go. This last step is for the Coalition members to perform using the process described in section 3.7 of this Implementation Plan.

Steps 1&2: Corridor Identification and Designation

The first two steps in the process may be completed in a manner similar to the chart below. The identification and designation would be established through stakeholder exercises at developmental hearings, meetings and/or workshops, review of the inventory, and discussions with key agency representatives.

The importance of this step is for stakeholders to focus on near-term efforts if warranted, otherwise mid-term, or even “shelved” for long-term consideration. These, particularly the former, would be the

regional priority areas. They do not supersede localized priorities, but rather establish circumstances in which local priorities may be pursued in the context of a larger regional perspective and in a manner that assures they will ultimately support regional objectives. The chart offers sample considerations.

Approach	Near-term	Mid-term
Corridor	I-10, I-95, I-295, transit signal priority pilot	Expressways and arterial street networks, downtown
Area/Service/Infrastructure	Transit, traveller information, CVO, communications network	Variable pricing, wide-spread transit signal priority, automated fare collection through cell phone accounts

Step 3: Assignment of ITS Concepts

For each element of the surface transportation network identified above, single or multiple ITS concepts would be assigned. The ITS concepts, as presented in the Operational Concept, are regionally significant transportation services. The basis for this label is the regional need for the service and the broad involvement of stakeholders in providing it. There is no differentiation between near-term and mid-term concepts at this point in the process.

An example of this step might look like the following:

Corridor/ASI	ITS Concept	Concept Components
Interstate Corridors	Traffic Management (ATMS)	Regional traffic control Traffic incident management Regional parking management
	Traveler Information (ATIS)	Enhanced 5-1-1 Broadcast traveler information Traffic information dissemination
	Commercial Vehicle Operations (CVO)	Commercial vehicle traffic information

Corridor/ ASI	ITS Concept	Concept Components
		Port and terminal access and egress Intermodal conflict points Safety and security operations Planned special events Military/port transportation operations Military/port security operations

Steps 4&5: Break Corridor Components Down to Functions and Indicate Responsible Agencies

In these steps the components are decomposed into functions, and then “assigned” to the appropriate stakeholder, for example:

ITS Concept/ Component	Functions	Stakeholder
ATMS—Regional traffic control (recall this example is on the Interstates)	Traffic surveillance Traffic management Network performance evaluation	FDOT FDOT/FHP/JSO FDOT, COJ

Step 6: Propose Strategies to Implement Functions

The stakeholders (preferably working together) would then examine the potential solutions, or implementation strategies, as in the example below:

ITS Concept/ Component	Function	Implementation Strategies
ATMS—Regional traffic control	Traffic surveillance	<ul style="list-style-type: none"> • Traffic detectors along freeways • Traffic detectors on ramps • Traffic detectors with vehicle classification identification capabilities • Cameras along freeways • Cameras at major interchanges • Probe Data Collection • Road weather information

ITS Concept/ Component	Function	Implementation Strategies
		subsystem <ul style="list-style-type: none"> • Geo-location hardware on construction and maintenance and Road Ranger vehicles • Portable camera trailers/buses • Portable traffic detector trailers • Portable Multi-Device (DMS, HAR, CCTV, detectors) trailers • Wireless local area network (WLAN) communications infrastructure • Fiber-optic communications infrastructure

Step 7: Project Designation

From the foregoing, the stakeholders then define projects designed to meet needs and requirements. In the course of doing this, it is desirable to use analytical tools to access what solutions best meet the project needs.

Once the project takes form, a Project Form (and, if needed an Architecture Update Form) should be completed on the ITS Coalition Web site to get it into the funding and approval process, as discussed in the next section.

First, it is important to emphasize that projects are recommended to the process from a variety of sources, which include at a minimum:

- Unfunded priority projects;
- FCMPO member counties, cities, and authorities;
- Adopted Long-Range Transportation Plan;
- Congestion Management System Plan;
- Concurrency Management System Plan;
- The First Coast ITS Coalition itself; and
- Public input.

3.7 RECOMMENDED APPROACH TO PROJECT APPROVAL

The most straightforward means of maintaining the integrity of the existing prioritization process and the confidence of its users is to conform to the framework of the existing process. For ITS projects to become a part of the process without changing the process, they

must enter and be scrutinized like every other proposed transportation improvement.

Since consideration of ITS projects is going to occur within the existing framework for prioritization, it is important to understand the components of that framework. The process is illustrated in Figure 3-2 and described below.

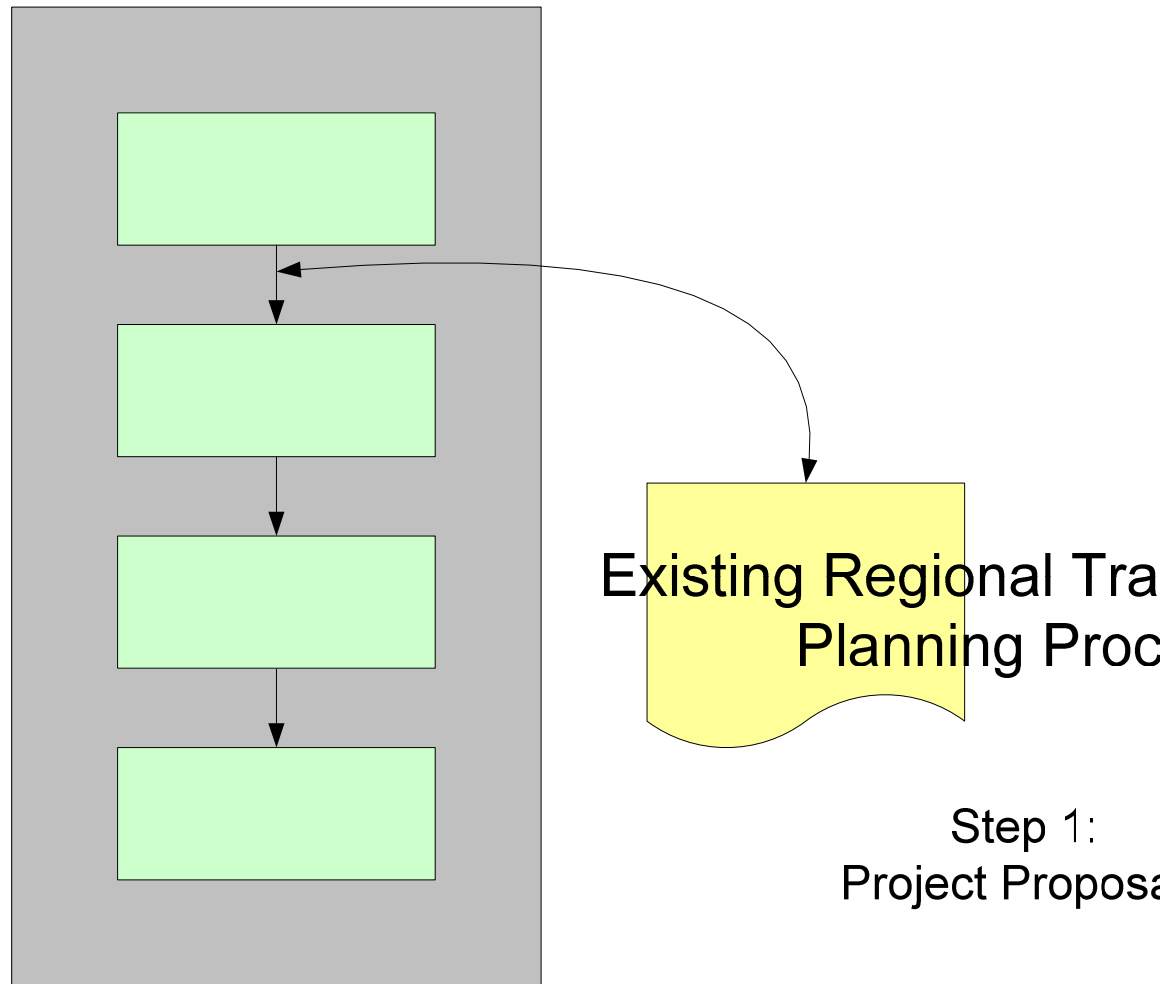


Figure 3-2: Incorporation of ITS into the Existing Transportation Process

Step 1: Project Proposal

The project proposal step includes all the activities leading up to and including the point where project champions present potential projects to the First Coast ITS Coalition for future funding. During this step, project champions should complete and submit the First Coast Regional ITS Project Form, located on the FCMPO Web site. This process will be overseen by the First Coast ITS Coalition; and because this organization does not have staff or resources associated with it,

Step 2:
Update Long-Range
Transportation Plan
(5 Year Horizon)

the process will be supported by the FCMPO. This brief form seeks information on the proposed project, in order to make a determination of whether or not the project is currently reflected in the Regional ITS Architecture. If not, the project champion should complete the First Coast ITS Architecture Update Form so that the project can be considered for inclusion into the Regional ITS Architecture the next time it is updated. In either case, both forms provide high-level details that help regional decision makers understand how the project fits into the Regional ITS framework. Based on the availability of funding, proposed projects that are reflected in the Regional ITS Architecture can then be considered for possible inclusion into the Long-Range Transportation Plan (LRTP), or other local planning process.

For the most part, agencies within the FCMPO boundary submitting projects into this step of the prioritization process will put forward a prioritized list. In fulfilling this role, the ITS Coalition will tender a prioritized list of proposed ITS projects. This list would include projects from outside the FCMPO boundary at the request of the project owner. Every ITS project included on the list should adhere to the mainstreaming considerations identified earlier in this document (see section 4.1.1).

Within the boundaries of the FCMPO, proposed projects further must be included in the Long-Range Transportation Plan (or eligible for inclusion through LRTP amendment). At this juncture, it is pertinent to say that agencies proposing projects from outside the strict FCMPO area might fall into one of two categories:

- If they are covered by a MPO (such as Gainesville/Alachua County) they will likely program their project entirely separately from this process, but if there was a project linkage to a FCMPO county, the “linking” project could follow this process, particularly if the origin of that project falls within the FCMPO area, or
- For agencies not covered by a MPO, they could voluntarily use this process as a means for ensuring conformity with federal and state requirements for ITS projects and as the mechanism for exposing their project for funding by some source.

Step 2: Incorporate ITS Projects into the Long-Range Transportation Plan

In general, this first step in programming projects within the First Coast Region is the development/update of the Long-Range Transportation Plan (LRTP). The LRTP is the product of regional long-range planning as mandated by Federal Statute. It can be viewed as the “blueprint” for maintaining and enhancing the regional transportation system. At its essence, the LRTP is a list of multi-modal

transportation projects that are needed and can be funded within a 20-year planning horizon. It is updated at least every five years to consider new growth trends, developments, and technologies. It can be amended, as needed, between updates.

The First Coast MPO's LRTP is based on current needs and forecasted future growth. ITS needs should feed into this process, and be included in the LRTP. Future updates to the LRTP should reference the First Coast Regional ITS Architecture as the framework for existing and planned ITS investments. When considering the elevation of ITS as an important part of its integrated regional plan, the policy objectives guiding the LRTP should provide clear reference to the role ITS will play in meeting regional needs.

Before projects are accepted into the LRTP, there are several questions one needs to answer before a project can be incorporated. Although all FCMPO projects must go through this process, it is intended to make sure ITS projects, that are funded with federal moneys, are consistent with the Regional ITS Architecture before funding is assigned. This process is illustrated in Figure 3-3.

Step 3A: Initial Project Prioritization

Next comes the prioritization step, which is in three sub-steps. The proposing agencies and the First Coast ITS Coalition technical staff take the first cut at establishing a prioritized list of all proposed projects.⁷ Eligibility for certain funding streams affects the process. Proposed projects that are fundable as a Strategic Intermodal System (SIS) Priority Project enjoy a 3:1 funding ratio over non-SIS projects. Although this funding approach ensures that the majority of the available funding goes to the highway network supporting Strategic Intermodal System facilities, it leaves a large portion, actually more centerline miles, of the state's highway system to be supported by only a quarter of the funding.

During this step, the ITS Coalition and agency staff will have at their disposal the ITS Deployment Analysis System (IDAS) software application, which assists regional and local planning agencies with the inclusion of ITS projects in the traditional transportation planning process. Specifically, IDAS is an alternatives analysis tool that provides the capability to conduct a systematic assessment of ITS deployments. It estimates the benefits, costs, impacts, and traveler responses of

⁷ It is noted that the apparent focus is on the FCMPO and its official area, and the proposed process would naturally apply fully to projects located therein; however, the current FCIMP study includes areas beyond the strict boundaries of the FCMPO. The proposed process described herein would apply to ITS projects beyond the strict boundaries of the FCMPO only if the affected agencies chose to participate. When exceptions to explicit FCMPO projects are included herein, they are qualified accordingly.

various ITS deployment alternatives, individually or in combination. The set of impacts evaluated by IDAS includes user mobility, travel time/speed, travel time reliability, costs (i.e., fuel, operating, and accident), emissions, and noise).

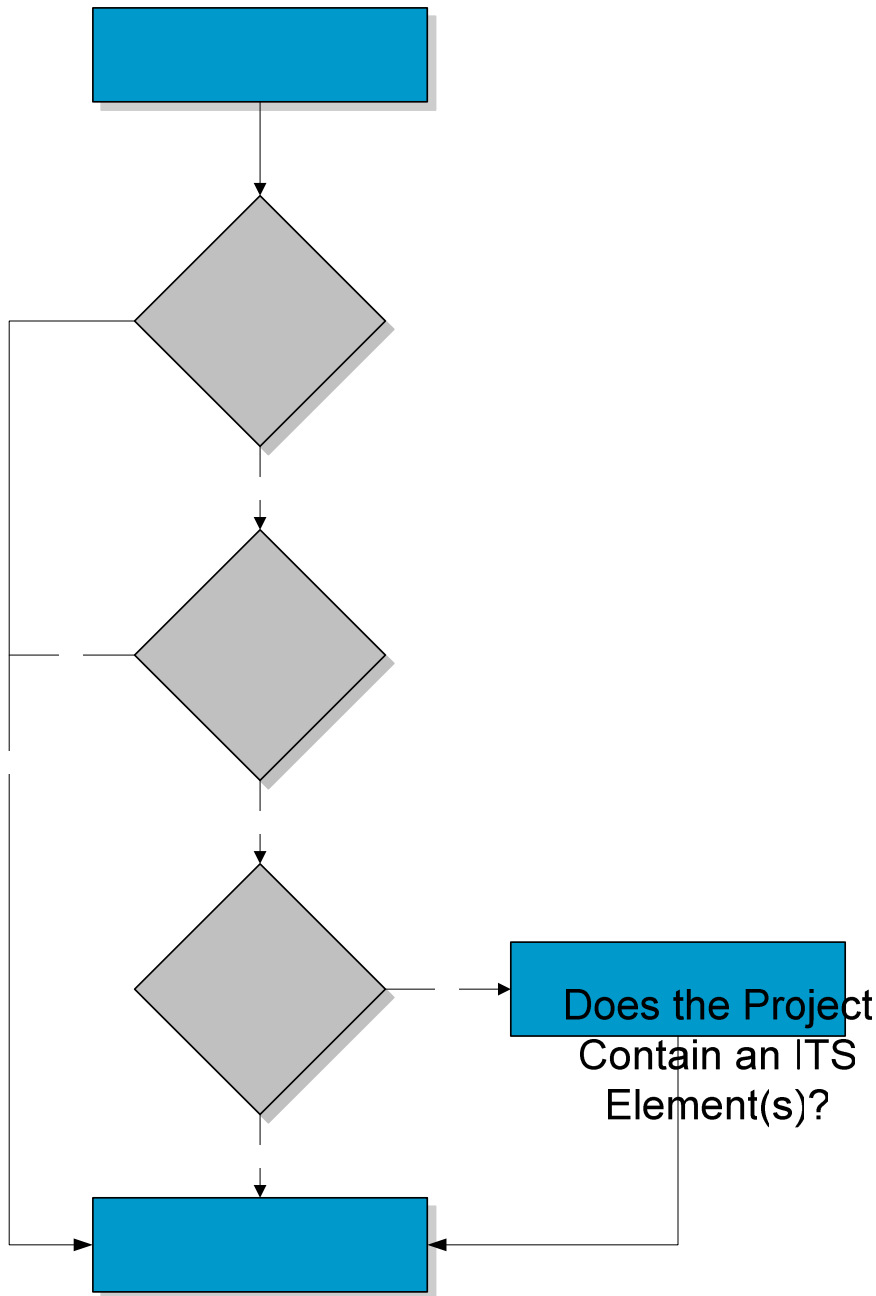


Figure 3-3: Process of Mapping Proposed ITS Projects to the Regional ITS Architecture

Yes

The software provides the capability to import the output of several existing transportation planning models to provide the baseline. The user can then model proposed deployments to estimate life-cycle costs (including capital and operations and maintenance costs), estimate benefits (based on experiences around the nation⁸), and to provide documentation for transitioning projects into design and implementation.

The IDAS tool can predict relative benefits and costs for more than 60 types of ITS investments. The benefits and costs can be displayed in several different ways and combinations:

- Annual Benefits:
 - Changes in user mobility, user travel time, user costs, external costs, public agencies costs, other calculated benefits; and user defined additional benefits;
- Annualized costs (including annualized capital costs, both private and public sector);
- Annual net benefit; and
- Annual benefit/cost ratio.

These predictive results, or a subset of them, would be used as a basis for systematic, objective ranking of proposed ITS projects; however, some subjectivity needs to be retained (for example, IDAS does not cover all potential ITS deployments). Reliance upon IDAS by the Coalition eliminates, to the extent practical, the quagmire of developing and assigning value to evaluation criteria. By using the output of the IDAS tool, again to the extent practical, the Coalition ensures the submission of a prioritized list of ITS projects that has been developed on a highly technical basis without the introduction of other factors that will be brought to bear in the later steps of the overall process. It will be a ranking that Coalition members might argue over in terms of relative position of one project in comparison to another, but otherwise will generally accept as a reasonable outcome.

Step 3B: Project Prioritization Review

The FCMPO staff's first cut at prioritizing proposed projects, including those submitted by the ITS Coalition, is submitted to the First Coast MPO Project Prioritization Subcommittee for their review, comment, and modification. The Prioritization Subcommittee is made of members of the MPO Board (but not all of its members), Citizens Advisory Committee, and the Technical Coordinating Committee.

⁸ FDOT has a "Floridized" version of the costs and benefits data that are more relevant to this state. See <http://www.floridait.com/IDAS.htm>, select "ITS Deployment Analysis System Customization (Final Report, Version 2, October 27, 2005)." The database file may be obtained from FDOT; contact Mr. Liang Hsia at 850-410-5615.

Consideration should be given to expanding Subcommittee membership to include other ITS Coalition representation.

Step 3C: Project Prioritization Final Acceptance

Upon completion of their review, the proposed project prioritization list, in the final step of the process, is sent to the full First Coast MPO Board for review, modification, and final adoption of an equitable regional project prioritization list.

ITS projects from the First Coast region can be accommodated within this framework as it currently is construed. Projects totally outside the FCMPO region would not go through steps 3B and 3C (unless somehow involved in funding within the FCMPO) and would, rather, be prioritized by the First Coast ITS Coalition's Steering Committee.

Step 4: Update the Transportation Improvement Plan

The final phase of a standard MPO process for considering transportation improvements is the presentation of proposed projects for funding within the Transportation Improvement Program, the TIP process.

3.8 PROJECT FINANCING

As is the case with any project, mechanisms are needed to fund ITS projects. Specifically, funding is needed to plan, develop, implement, operate, and maintain subsystems. Project champions, as well as the First Coast ITS Coalition, should understand the various types of funding opportunities that can be used to deploy ITS and how the characteristics of each apply to potential ITS projects. In addition, project champions within the First Coast Region need to investigate how coordination among other agencies and departments can be drawn upon to help distribute funding responsibilities. This may include identifying how resources such as staff, equipment, and actual funding can be shared across different programs in an effort to reduce costs and maximize benefits when planning and implementing an ITS project.

Funding is needed to support the ITS project throughout its entire life cycle. Without adequate funding, it will be difficult to complete ITS projects on time, and to the desired functionality. An important consideration in determining how much funding is needed, and when it is needed, is the project schedule. Longer more complex projects will often require more funding to complete versus projects smaller in scope and duration. Additionally, since costs are often difficult to estimate, contingency funding may need to be garnered to account for underestimates.

3.8.1 National Funding Sources

National Highway System—NHS provides \$30.5 Billion in funds through 2009 (nationally). These funds can be used for improvements to rural and urban highways that are part of the NHS, including the Interstate System and designated connections to major intermodal terminals. Also included are highways that provide motor vehicle access between the NHS and major intermodal transportation facilities, the defense strategic highway network, and strategic highway network connectors. These corridor designations are particularly important for the First Coast Region, which has major ports and significant military interests. These funds may also be used to fund transit improvements in NHS corridors, but certain restrictions apply.

Additional information on the National Highway System Program can be obtained at:

<http://www.fhwa.dot.gov/safetealu/factsheets/nhs.htm>

Surface Transportation Program—the STP is a flexible funding program that state and local governments can use on any Federal-aid Highway (including NHS) project, including capital transit or bridge projects. STP funds are allocated to the states, and must be distributed according to program specifications. Distribution requirements are outlined at:

<http://www.fhwa.dot.gov/safetealu/factsheets/stp.htm>

“Infrastructure-based intelligent system capital improvements” are eligible for STP funding. STP funds can be used for capital and operating costs for traffic monitoring, management, and control facilities; however, as with NHS funding, they cannot be used for routine maintenance. The State of Florida’s share of STP funds amount to roughly \$290,000,000.

Construction Mitigation and Air Quality—CMAQ provides funding for projects and programs in air quality non-attainment and maintenance areas for ozone, carbon monoxide (CO), and particulate matter (PM-10, PM-2.5), which reduce transportation related emissions. [23 USC 149(a)]”. States are eligible for CMAQ funds so long as the ITS project reduces emissions. The state of Florida’s share of CMAQ funds is over \$8,400,000.⁹

More information on CMAQ funding can be found at:

<http://www.fhwa.dot.gov/safetealu/factsheets/cmaq.htm>

Intelligent Transportation Systems Operational Testing to Mitigate Congestion Grant—The ITS-OTMC program provides funding for ITS

⁹ The First Coast region is currently an attainment area.

projects that “make innovative uses of technology to address congestion on a specific facility or facilities, such as a corridor, an urban area, or region. Accordingly, qualifying projects must be expected to directly result in significant, broad, and near-term congestion relief.” Types of projects that apply include:

- Demand management pricing strategies,
- Advance traffic signal control,
- Innovative detection and management strategies,
- Integrated corridor management,
- Parking management strategies tied to transit service,
- High occupancy/toll (HOT) lanes,
- Managed lanes,
- Ramp control,
- Lane-keeping devices,
- Signal priority subsystems,
- Contactless fare collection,
- Real-time travel information,
- Advanced traveler information subsystems, and
- Parking alerts or automatic vehicle locator subsystems.

Project applications should demonstrate that proposed strategies will be implemented in a relatively short time frame (e.g., within 12 to 18 months from the date of procurement).

The U.S.DOT will provide up to 80 percent of the estimated costs of an approved project. Funds available for the ITS-OTMC Program are intended to support the implementation costs of the proposed operational testing. Costs of planning, testing, managing, operating, demonstrating, monitoring, evaluating, and reporting are eligible for reimbursement. The U.S.DOT will evaluate the allowability of proposed costs in accordance with OMB Circular A-87, “Cost Principles for State and Local Governments.”

Additional information about this grant opportunity can be found at:

<http://www.grants.gov/search/search.do?oppld=11970&mode=VIEW>

The full announcement can be found at:

<http://apply.grants.gov/opportunities/instructions/oppDTFH61-07-RA-00111-cfda20.200-instructions.pdf>

Bus and Bus Facilities Discretionary Program Grants—this Federal Transit Administration (FTA) funding program is open to State and local agencies and is intended to finance “capital projects to replace, rehabilitate, and purchase buses and related equipment (including intelligent transportation systems) and to construct bus-related facilities....” Grants under this program are subject to a 20% local

match. Special consideration will be given to the following priority areas:

- Fleet replacement needs that cannot be met with formula funds,
- Fleet expansion that allows significant service increase and/or improvements and/or operating efficiencies,
- Facility construction or renovation to support increased service or introduction of clean fuels,
- Strategic investments in rural areas where formula funding is inadequate,
- Purchase of clean fuel vehicles,
- Intermodal terminal projects that include intercity bus providers, and
- Gulf Coast Recovery—capital to support bus and bus facilities replacement and expansion related to the impacts of the 2005 hurricanes (special eligibilities requirements apply).

Proposals may be submitted electronically through the following Web site:

<http://www.grants.gov>

The full notice of this program can be obtained at:

<http://a257.g.akamaitech.net/7/257/2422/01jan20071800/edocket.access.gpo.gov/2007/E7-4832.htm>

Value Pricing Pilot Program (VPPP)—this FHWA funding program is open to state or local governments, or public authorities (e.g., tolling agencies) and is intended to finance local value pricing pilot programs to reduce congestion, improve system performance, and promote mobility. Funds provided by this program are not intended for commonly used and accepted value pricing concepts [e.g., high-occupancy vehicle (HOV) to high-occupancy toll (HOT) lane conversions]. Projects that are eligible for funding under this program include, but are not limited to:

- Cordon tolls,
- Fair lanes,
- Priced new lanes,
- Pricing on toll facilities,
- Usage-based vehicle charges,
- "Cash-out" strategies/parking pricing,
- Regional pricing initiatives, and
- Truck-only toll facilities.

The emphasis of project selection will be based on the ability to demonstrate near-term congestion relief and general alignment with

the objectives outlined in the U.S.DOT's national strategy to reduce congestion on America's transportation network.

The current VPPP makes available \$12 Million for applicable projects on a yearly basis through 2009. One fourth of this annual distribution will be set aside for value pricing projects that do not include tolls.

Grants submitted under this program are subject to a 20% local match. Other project costs applicable for funding under this program and details on how to submit an application can be found in the full notice at:

http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2006_register&docid=fr22de06-132

Additional information on this grant program can be obtained at:

http://ops.fhwa.dot.gov/tolling_pricing/value_pricing/index.htm

Transportation Infrastructure and Finance Act (TIFIA)—The Transportation Infrastructure and Finance Act offers three types of funding that can be used by public or private entities to fund expensive transportation projects, including ITS. These funding options include: direct loans, loan guarantees, and lines of credit. Only ITS projects in excess of \$30 million are eligible. Additionally, the project must conform to the following conditions to be eligible for funding:

- Must be supported in whole or in part by user charges or other non-Federal funding mechanisms.
- Must be included in the State's Transportation Plan.

TIFIA funds were used in part to fund development of Miami's Intermodal Center. The new Jacksonville Regional Transportation Management Center that is scheduled to be operational by 2011 is a similar project that may be eligible for TIFIA funds. More information on TIFIA can be found at:

<http://www.fhwa.dot.gov/innovativefinance/brochure/credit.htm#3>

3.8.2 State and Local Funding Sources

State and local funding sources that may be used to finance ITS projects are discussed in the following subsections.

Transportation Regional Incentive Program (TRIP)—this state program helps finance improvements to regionally significant transportation facilities that are identified and prioritized by regional agencies. There are several classifications of agencies that are able to apply for this funding source, one of which is MPOs comprised of three or more counties. Since the First Coast MPO is comprised of portions of four counties, it is eligible to receive funding.

Projects eligible for TRIP funding must meet the following criteria:

- Support facilities that serve national, statewide or regional functions and function as an integrated transportation system,
- Be identified in appropriate local government capital improvements program(s) or long-term concurrency management system(s) that are in compliance with state comprehensive plan requirements,
- Be consistent with the Strategic Intermodal System,
- Be in compliance with local corridor management policies, and
- Have commitment of local, regional or private matching funds.

An overview of TRIP, including district contact information, can be obtained at:

<http://www.dot.state.fl.us/planning/trip/facts.pdf>

State Transportation Trust Fund via the Strategic Intermodal System (SIS)

The State Transportation Trust Fund allocates \$60 Million to support the Florida Strategic Intermodal System (SIS). The SIS includes transportation services and facilities that support strategic and essential state interests. Such interests include, but are not limited to those that:

- Improve the mobility needs of Florida's citizens, businesses, and visitors;
- Enable Florida to become a worldwide economic leader;
- Enhance economic prosperity and competitiveness;
- Enrich quality of life; and
- Promote environmental stewardship.

The SIS will, in part, be a system that integrates individual facilities, services, and transportation modes and links them into a single, integrated transportation network. As such funds designated for the SIS program may be used, in part, to develop and deploy ITS; however, ITS projects can only draw upon SIS funds if they are located on facilities that serve these interests, which include:

- The Florida Intrastate Highway System (FIHS);
- The National Highway System (NHS);
- Airport, seaport, and spaceport facilities;
- Rail lines and rail facilities;
- Existing or planned corridors that serve a statewide or inter-regional purpose; and
- Selected intermodal facilities; passenger and freight terminals; and appropriate components of the State Highway System, county road system, city street system, inland waterways, and local public transit systems that serve as existing or planned

connectors between the components listed in the above bullets.

Much of this information was found at, or using the links provided at the following web site:

<http://www.dot.state.fl.us/planning/SIS/legislation/default.htm>

This website can be used to obtain additional information on and explanation of the SIS program.

Fuel Taxes—state, county, and municipal fuel taxes may be used to support ITS development and implementation. The Cost Feasible Plan of the First Coast Long-Range Transportation Plan identifies and describes the various fuel taxes applicable to the region. The cost feasible plan is available at:

[http://www.firstcoastmpo.com/documents/FCMPO%20TR7%20Cost%20Feasible Complete AUG05.pdf](http://www.firstcoastmpo.com/documents/FCMPO%20TR7%20Cost%20Feasible%20Complete%20AUG05.pdf)

The Better Jacksonville Plan—the Better Jacksonville Plan is a voter-approved local-option sales tax package that outlines a comprehensive approach to growth management, transportation, the environment and economic development. Of the \$2.25 Billion allocated by the half-cent sales tax program, \$1.5 Billion has been allocated strictly for road and infrastructure improvements (e.g., improvements to city roads, drainage projects, new sidewalks, bike paths, grade crossings and intersection improvements, bus rapid transit). Through 2005, over 20 roadway projects have been completed leaving approximately \$1.3 Billion in available funds. Although, most projects covered under this program are infrastructure projects, this does not preclude ITS. For instance, ITS applications can be implemented to improve safety and mobility at intersections (i.e., an intersection improvement). ITS projects that can be funded under this program include:

- Red-light running cameras and equipment,
- Signal pre-emption, and
- Centralized traffic signal control.

The Better Jacksonville Plan is funded through participation in the State Infrastructure Bank (SIB) Program. SIB funding covers only the transportation element of the plan. In 2005, a SIB loan was taken to fund the Better Jacksonville Plan. The loan was valued at \$50 Million over 15 years effective June 30, 2006.

3.8.3 Other Sources

Other funding sources that may be used to finance ITS in the First Coast Region are discussed below.

State Infrastructure Banks—SIBs are revolving loan programs that can be created at the state or regional (multi-state) level. SIBs provide states with a wide range of loan and credit enhancement for eligible transportation projects. Eligible projects include transportation facility projects on the State Highway System or projects that provide for increased mobility on the state's transportation system. Under the SIB program states are allowed to transfer a portion (up to 10%) of its allocated highway trust fund allocation to a SIB. The Jacksonville Port Authority is currently participating in the SIB program and in July 2006 was awarded a 12-year loan effective July 2007 to develop an additional terminal.

More information on Florida's SIB Program, including applicability requirements can be obtained at:

<http://www.dot.state.fl.us/financialplanning/finance/sib.htm>

Public-Private Partnerships—a PPP is a business relationship between the public and private sectors. To a specific degree, both entities share responsibilities and the costs, risks, and benefits associated with delivering goods and/or services. From a transportation standpoint, a public-private partnership is a form of service delivery with a collaborative approach based on reallocating traditional responsibilities, costs, risks, and benefits between the public agency and private entities. PPPs are authorized by Florida Statute 334.30 ("public-private transportation facilities").

Private Enterprise—a purely privately funded source to implement an ITS subsystem of value to the owner and the general public. Naturally, such investments must comply with normal business regulations, ordinance, and covenants, but otherwise are within the purview of the investor.

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APPENDIX A: OVERVIEW OF SYSTEMS ENGINEERING

There are several models or approaches available to the ITS Coalition to assist with the successful implementation of ITS projects in the First Coast Region. The most important aspect of each is that they provide structure, which is the key to effective engineering and decision-making. Of all these available models, one has gained wide acceptance and use in the ITS industry. This model is collectively referred to by ITS professionals as the System Engineering Process.

What is Systems Engineering?

The Systems Engineering process, or approach, ensures that the subsystems proposed for implementation meet the needs and requirements defined in the early stages of a project. The United States Department of Transportation (U.S.DOT) ITS Standards Program Web site defines Systems Engineering as:

“...a process-oriented means of deploying a system or migration project that leads to reduced risk, controlled cost and schedule, improved system quality, and a resultant system that meets user needs.”

Using a Systems Engineering approach, large and/or highly complex engineering projects are often decomposed into stages and then managed throughout the product or subsystem lifecycle. This process of managing the subsystem's lifecycle resembles a series of interconnected engineering projects, each executed in sequence and drawing upon the results of preceding or contemporaneous projects, until the desired end result is achieved.

Systems Engineering “V” Model

As alluded to in the following section, there are multiple ways to represent the Systems Engineering Process. One way, the Systems Engineering “V” Diagram (see Figure A-1), represents the typical life cycle of any subsystem or project. Whether the subsystem being deployed consists of a basic computer-aided dispatch (CAD) subsystem for a transit agency, or a more complex interface between a traffic management center and a public safety agency, all subsystems will follow some variation of this life cycle.

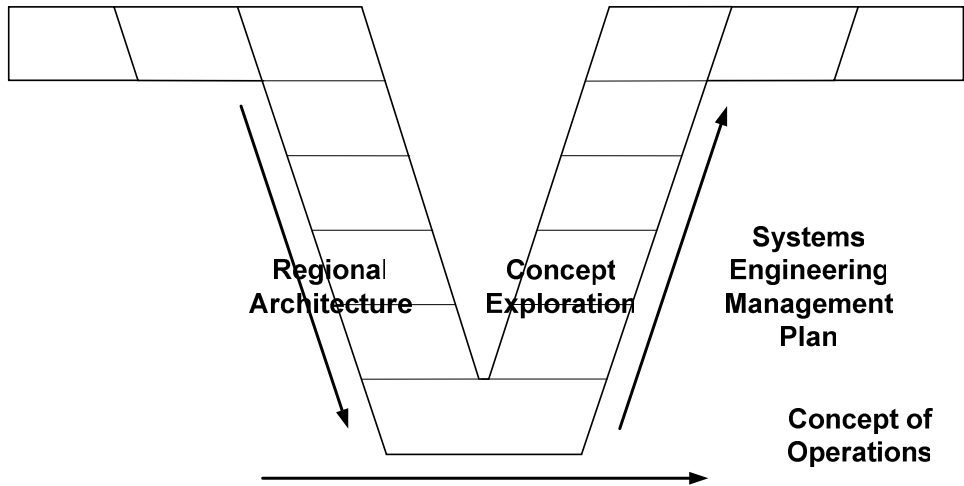


Figure A-1: Systems Engineering "V" Diagram

Concept of Operations

After an ITS project is deemed feasible, work toward implementing the ITS project can begin. The Concept of Operations is the first of this process. The Concept of Operations, is similar to Operational Concept detailed in this Master Plan, but is more detailed and usually includes operational standards and even typical operational scenarios. In other words the Operational Concept defines the high-level roles and responsibilities for implementing and operating ITS region-wide, whereas the Concept of Operations defines the more specific roles and responsibilities for operating the system.

Although the Concept of Operations is more detailed than the Operational Concept, it is still a relatively high-level document that sets the stage for further analysis and more detailed Standard Operating Procedures (SOPs) for individual agencies, units, or other entities.

The task of developing the Concept of Operations is often assigned to the project champion; however the involvement of the First Coast ITS Coalition as a whole will be critical to ensuring that this document accurately reflects the needs of the region, and opinions of those involved with the project. The First Coast ITS Coalition should actively work with the project champion to make sure that regional agencies and individuals that have a stake in the system are brought into the project planning process as early as possible. To be effective, the Concept of Operations should not only be reflective of the regional needs, but also should be based upon the input of all individuals who have a role in the system. This group of individuals includes those that own, operate and maintain the system.

Decomposition and Definition

System Requirements

High Level Design

Detailed Design

Software Coding
Hardware Fabrication

Project Time Line

System Verification

Subsystem Verification

Unit Testing

As new projects evolve, the Concept of Operations—indeed, perhaps even the Operational Concept as well—should be updated with the new project details serving the appropriate role in the Systems Engineering Process.

System Requirements

Requirements define what the ITS project or subsystem is expected to do, but not how the subsystem will do it. As such, requirements set the baseline for how the ITS subsystem will be built.

Requirements are based off the concepts and ideas documented in the Concept of Operations, but often these concepts and ideas are not organized and represent more of a “wish list” than what can be reasonably implemented. Requirements attempt to state in very specific terms exactly what the subsystem is expected to do (i.e., the function the subsystem will perform). For example “the subsystem shall be capable of displaying travel times” is a typical requirement of TMC software.

During the requirements process, the First Coast ITS Coalition should involve all agencies and individuals that have a stake in the ITS project. This is due to the fact that these entities have the intimate knowledge of how the subsystem should operate. Without their input, requirements will likely not reflect true needs or will be missed altogether. This may ultimately delay the project and incur additional expense associated with revisiting previously completed project tasks.

High-level and Detailed Design

The design phase of project implementation is where a solution is developed that meets the needs and requirements documented in previous steps. This is essentially where subsystem components and software are developed. This task will largely, if not completely, fall to the team that has been assembled by the project champion; however, that team will need the feedback of the ITS Coalition to verify that the subsystem and software components being implemented meet the needs and requirements of the region—particularly during the high-level design. Feedback is often achieved through a process referred to as prototyping, where the anticipated users of the subsystem get to experience the subsystem or components thereof before it is fully built, albeit scaled down with limited functionality. In working with the users in this fashion, the team designing the subsystem and software gain an understanding of what works and what doesn't, which ultimately allows them to design a superior product in an effective and efficient manner. The First Coast ITS Coalition should carefully review the high-level design.

Detailed design is the step when detailed plans and specifications are derived. During this step of product implementation, the role of the First Coast ITS Coalition will be minimal; however like in previous

steps a close working relationship with the project champion is key. The closer the relationship, the more likely that the ITS project can be built on time, within budget, and within the desired timeframe. The lack of coordination between the Coalition, the member agencies it represents, and the project champion may ultimately result in a project that fails to meet the needs of the entire region, and is designed in such a fashion that users might ultimately reject the new subsystem. In turn this can needlessly consume funding that could have been applied to projects with greater returns.

Software Coding and Hardware Fabrication

The implementation phase of a project is where the associated subsystems and software are physically developed and ultimately deployed in the field. This includes some testing during “construction” to make sure that the product or subsystem operates correctly. Typically subsystems are implemented and tested before being introduced to the public.

Integration and Re-composition

The “right side” of the “V” is the formal testing regimen, which is not discussed in detail here because the First Coast ITS Coalition as a group would not usually be involved; however, representatives of the key member agencies should review the test plans and perhaps even participate on the test team.

APPENDIX B: SUPPORTING ACTIVITIES

Besides following a structured approach, such as the Systems Engineering approach outlined in Appendix A, there are several activities that the Coalition ought to be mindful of when ITS projects are being developed. These activities are undertaken at various points during the project's typical life cycle and help ITS projects achieve greater efficiencies and benefits. Although the Coalition is not responsible for conducting these activities per se, it should be aware of them and should refer project champions to this document so projects can be developed and implemented in an effective and efficient fashion. This will ensure that funds allocated to develop and implement ITS projects are spent effectively and that the benefits associated with projects are maximized. Activities that support the success of ITS projects are briefly described below.

Collect and Review Existing Documentation

Before a project can be closely considered, existing documentation pertinent to that project should be collected and reviewed. Existing documentation and plans provide valuable insights into the First Coast Regional ITS framework, and may help answer the following questions:

- What subsystems currently exist within the region?
- How do these subsystems currently operate?
- Who operates these subsystems?
- With what other agencies/subsystems do these subsystems communicate?
- What needs have been identified for the region?

At a minimum the First Coast ITS Coalition needs to be aware of the various documents and plans that impact ITS project implementation and should be capable of directing project champions to these documents when the project is first mentioned. It is critical that project champions be directed to only those documents considered up-to-date and still valid. Old documents that have not been updated over the years may in some cases be a worse alternative than no documentation at all. Old documentation may not have kept pace with changes in technology, and therefore may be misleading as they are no longer reflective of the region's current situation. Therefore, besides simply knowing where documentation exists, the ITS Coalition should know which documents are still valid.

Configuration Management

As the number of ITS subsystems and technologies grow within the First Coast Region, it will become increasingly important that the First Coast ITS Coalition implement, or require that project champions

implement, formal procedures to track and manage changes made to subsystems. This process, referred to among ITS professionals as “configuration management,” preserves knowledge associated with system change. This keeps the physical implementation of a product consistent with the documentation that describes how to build it and what it is supposed to do. Essentially, the configuration management process establishes a new baseline every time a subsystem is modified, changed or replaced. In doing so, adverse effects of system change are minimized and system performance, reliability and interoperability are improved. Specifically, the configuration management process aims to document characteristics of subsystem change such as:

- The individual or parties making the change,
- A description of the change that is made and its effects,
- Reasoning as to why the change was made, and
- The date and time when the change was made.

These characteristics will help individual agencies and the region as whole to:

- Maintain individual ITS elements,
- Maintain reliability of the regional ITS,
- Easily upgrade and expand existing subsystems, and
- Share information with other systems.

Failure to document changes may result in maintenance personnel having to needlessly back track, investigate what changes have been made, and establish a new baseline for the system so future changes or improvements can be made without difficulty. In some cases where documentation has not been preserved, it may not be possible to update subsystems, eventually resulting in their obsolescence.

The FHWA has two excellent documents that discuss configuration management for ITS. They are “Configuration Management for Transportation Management Systems Handbook,” report number FHWA-OP-04-013, and “A Guide to Configuration Management for Intelligent Transportation Systems,” report number FHWA-OP-02-048.)

Risk Management

All ITS projects should include a risk management process. Risk management helps in the prioritizing of ITS projects so that projects with lower risks are (generally) given priority over those with greater risks. This assumes that all projects are created equal, which obviously is not always true. In this regard, a project’s risks must be balanced with its other attributes (i.e., potential benefits, implementation time-frame, etc.).

In terms of risk management, the role of the First Coast ITS Coalition should be to oversee the project development process to ensure that a project's risks are adequately defined. The level of effort undertaken should be commensurate with the scale of the project. In other words, smaller projects will require less effort addressing risks than a large, complex project with greater costs, schedule, and staffing implications.

When overseeing a project's development, the First Coast ITS Coalition should work with project champions and seek answers to the following types of questions.

- What can go wrong on this project?
- What is the likelihood of each of these risks?
- If realized, how severe would the effect of these risks be?
- What are the external forces that threaten the project?
- What can be done to avoid, or reduce the impact of, identified risks?

Risks are typically characterized as negative impacts to cost, schedule, and scope.

Cost-based risks—this type of risk includes impacts that cause the project to exceed the programmed budget, as well as the risk of losing project funding. In addition, on a program-wide basis, the risk of unmanageable ongoing operations and maintenance costs needs to be assessed.

Schedule-based risks—this type of risk includes impacts that affect the ability to meet project schedules. When multiple projects need to interact, the risks are compounded. To reduce risks, the First Coast ITS Coalition could require that project champions develop contingency plans to mitigate the schedule-related impacts when risks do occur. Contingency plans may not be worth the time, expense, and effort for smaller, low cost projects.

Scope-based risks—this type of risk includes impacts that cause a device or subsystem to fall short of functionality goals.

In March 2000, the American Association of State Highway and Transportation Officials (AASHTO) released a report, titled "ITS Software: Effective Acquisition Practices." In this report a basic process for managing risks is defined. The first Coast ITS Coalition should review this process and at their discretion hold project champions to following it.

Planning for Change

Planning for change is simply a process that considers not only existing needs, but also those likely to arise in the future; therefore, planning for change works toward building quality into the system

development process. This process may seem obvious, but it is often overlooked, resulting in subsystems that become out-dated or obsolete in just a few years.

Planning for change requires that plans, and the subsystems that are implemented, be as flexible as possible to accommodate future changes in ITS Program direction. The First Coast ITS Coalition should address the need to “plan for change” by making sure that planning timeframes are appropriate for ITS projects and that future needs are addressed whenever a project is recommended. Due to the rapid evolution of technologies which ITS subsystems are based, it is impractical to plan beyond 10 years. That is because in 10 years the types of technologies available will be much different than those available today. When planning for ITS a 5- to 10-year planning horizon is generally recommended, which is, of course, the horizon used in this First Coast Regional ITS Master Plan.

Designing for Change

Similar to planning for change, designing for change is a continuous process that seeks to enhance the design of a system, subsystem, or software over time so that it can evolve without incident. The First Coast Region needs to remain vigilant to the possibilities of improving subsystems and designing them so that they can be easily upgraded or replaced. Designing for change seeks to reduce attributes of subsystems and software that ultimately lead to their failure. Such attributes include:

- **Rigidity**—rigid subsystems and software are those that are designed with little consideration of interoperability. In other words, rigid subsystems and software cannot easily be changed because they cannot handle changes.
- **Fragility**—subsystems and software are often referred to as fragile in the fact that a simple change to the subsystem may result in damage to, or misbehavior in, other aspects of the subsystem or software.
- **Immobility**—inability to reuse software from other projects or from parts of the same project.
- **Viscosity**—inability to preserve the design of subsystems or software. When viscosity is high it is very hard to preserve the design of the subsystem or software.



FIRST COAST ITS COALITION

First Coast Regional Intelligent Transportation Systems Master Plan

Part 4: 5- & 10-Year Implementation Plan

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4

INTRODUCTION

4.1 INTRODUCTION

The 5- and 10-Year Implementation Plan is Part 4 of the First Coast Regional ITS Master Plan. This portion of the Master Plan establishes for the members of the Coalition their shared expectations regarding the regional:

- Outlook for ITS,
- Direction of ITS, and
- Deployment of ITS.

By endorsing the expectations established in the 5- and 10-Year Implementation Plan, Coalition members express their support of the regional ITS Vision. The Vision states in part that the intelligent transportation system for the First Coast Region shall strive to become:¹

An institutionally integrated and fully cooperative coalition of all transportation, public safety, and emergency services stakeholders in the region...

This segment of the Vision speaks to the organizational linkage that is necessary to bring forward the adoption and deployment of the ITS concepts presented in the Operational Concept over the next decade. The existence of the ITS Coalition in the First Coast Region is an important milestone in terms of achieving this vision.

This plan provides stakeholders with the guidance they need to make their individual agency decisions compatible with those being made by other members of the Coalition. These combined efforts will produce a sum that is greater than the individual pieces, and fully interoperable.

¹ For the full mission, vision, goals and objectives, see the Operational Concept, which is Part 1 of the Master Plan.

The rationale for the 5- and 10-Year (near- and mid-term) planning horizon was given in Section 3.4.2 of the Implementation Plan (Part 3 of this Master Plan). The contents of this plan are as follows:

- 5-Year (Near-term, 2007-2011) Plan:
 - Project descriptions;
 - Estimated capital, operations, and maintenance costs; and
 - Recommended agreements.
- 10-Year (Mid-term, 2012-2016) Plan:
 - ITS initiatives;
 - High-level cost estimates; and
 - Recommended agreements.

There is clearly a difference in the level of detail between these two. The Near-term Plan is somewhat more specific. For this initial 5-Year Plan, the project development process was conducted by the stakeholders, generally in coordination with one another, but not following a particularly structured process. In the future, the process outlined in the Implementation Plan will be followed to transition the initiatives in the current 10-Year Plan into more specific projects in the next 5-Year Plan.

Note that the timing of the updates to the First Coast Regional ITS Master Plan (FCIMP) and all its components, including the Regional ITS Architecture and the 5- and 10-Year Plan is tied to the updates to the First Coast MPO's update to the 2030 Long Range Transportation Plan (LRTP). The last update to that plan was accomplished in 2004, so in order for ITS projects to be included in the next update, there should be at least an interim update to the FCIMP documents in 2008, which would then put it in sync with the LRTP cycle.

4.2 5-YEAR IMPLEMENTATION PLAN

The 5-Year, or Near-term, Plan is summarized in Table 4-1. Brief descriptions of each project in the 5-Year Plan are provided below. While we strive to stress integration of the First Coast Regional ITS, these projects will be implemented by member agencies. The descriptions below are organized by the several implementing agencies.

4.2.1 Florida Department of Transportation, District 2

The Florida Department of Transportation (FDOT), specifically District 2, continues to build out its regional ITS to ultimately cover all Interstate Highways (I-10, I-95, and I-295) and State Road freeways (SR 9A), expand 5-1-1 services, and deploy a new joint-use Regional Transportation Management Center (RTMC). District 2 will also assist the local agencies with several deployments.

The near-term projects are identified as follows:

1. ITS Deployment: Various ITS devices [e.g., sensors, closed circuit television (CCTV) cameras, dynamic messages signs (DMSs), and the associated telecommunications] will be deployed to augment segments previously deployed. The remaining sections are along I-95 from the St. Johns County line to I-295, I-295 South from I-95 to I-10 and North to Main St., and SR 9A (which is the continuation of I-295) to I-95. Table 4-1 gives the dates for these deployments, as it does for all projects.
2. CCTV Camera Deployment: Closed circuit television cameras will be deployed along US 17 (Roosevelt Blvd.) in the Town of Orange Park to provide Clay County, and other coalition partners, with traffic surveillance capability in a congested arterial corridor.
3. ITS RTMC: Deployment of a new Regional Traffic Management Center near the Prime Osborne Convention Center. Part of a larger planned Jacksonville Transportation Center, the new RTMC will be co-occupied by FDOT's complete RTMC and regional E5-1-1 subsystems, the Florida Highway Patrol (FHP) Joint Regional Communications Center (JRCC), also referred to as the Regional Dispatch Center, RDC, in the Operational Concept), the City of Jacksonville's Traffic Control Center (TCC), Jacksonville Sheriffs Office (JSO) traffic and incident management (but not the main JSO dispatch or administrative headquarters), and the Jacksonville Transportation Authority (JTA) transit dispatch.
4. Transportation Critical Infrastructure Security Subsystem: The U.S. Navy, using a Department of Homeland Security grant, is providing all coastal bridges from Kings Bay, GA, to Port Canaveral, FL (highway and rail), with CCTV, primarily for homeland security purposes. It has opened the Joint Inter-Agency Fusion Center, Jacksonville (JIAFCJ) at the Naval Air Station Jacksonville, which is one of only four such centers in the nation. The JIAFCJ has offered access of the camera images, and even limited control, to transportation and public safety agencies for traffic, incident, and emergency management. Images routed to the JIAFCJ will be linked to the RTMC (current and future), JRCC (FHP et al.) and JSO. Traffic and public safety managers will be able to view entire bridges or zoom in to specific situations. This component of the project will complete the linkage from the JIAFCJ to the FDOT fiber network and integrate the Navy's cameras into the SunGuide software.
5. My jax511 Traveler Information Subsystem: Enhanced 5-1-1 services (by subscription) that would advise commuters or other regular travelers of traffic, environmental and other conditions that would encourage telecommuting, or altering their trip time

and/or route. This subsystem would tie into the JTA Alert and Trip Planner programs and transit trip information in the FCMPO area. This would be routine during large planned special events or other major disruptions.

6. Systems Manager/Integrator: Integrate all public sector ITS and traffic operations in a Regional Transportation Management Center, which will house freeway and arterial operations, transit, and regional law enforcement dispatch. The RTMC will be integrated with Emergency Operations Centers (EOCs), fire rescue, JAXPORT, airports, Navy JIAFCJ, and the Town of Orange Park, at a minimum. For regional evacuations purposes it will also be linked via center-to-center communications with all other RTMCs in the State of Florida (including new ones in Gainesville and Tallahassee), plus the NaviGator TMC in Atlanta and any satellites along the I-95 and I-75 corridors. Via the I-95 Corridor Coalition's coming Emergency Information Network, it will be further linked to all TMCs on the entire east coast and into Canada.

4.2.2 City of Jacksonville, Traffic Engineering Department

The City of Jacksonville (COJ) Traffic Engineering Department is deploying ITS and upgrading the traffic signal controllers in a number of priority corridors. The individual projects (one per year) are described below in the deployment sequence (we continue the project numbering from above for ease of reference to any individual project).

7. Signal System Upgrade/ITS Phase 1A: Installation of new ITS control software platform for city-wide use, including installation of new ITS traffic signal controller assemblies on Baymeadows Road (Craven Road to R.G. Skinner Pkwy.); Southside Blvd. (Belle Rive to Deerwood Park); Philips Highway (Shad to J.T. Butler); and installation of ITS traffic signal controllers, CCTV cameras, DMSs, and uninterruptible power supply (UPS) in the Central Business District (CBD).
8. Stadium Contraflow Signal System/Phase 1B: Installation of reversible lane signal system for planned special event use entering and exiting the sports complex area.
9. Signal System Upgrade/ITS Phase 2A: Installation of ITS traffic signal controllers on Atlantic Blvd, Beach Blvd, Lem Turner Rd, Philips Hwy, and Emerson St.
10. Signal System Upgrade/ITS Phase 2B: Installation of ITS traffic signal controllers on San Jose Blvd and Roosevelt Blvd. (US 17).
11. Signal System Upgrade/ITS Phase 2C: Installation of ITS traffic signal controllers on Monument Rd., and install CCTV cameras and DMSs on Atlantic and Beach Blvds.

12. Signal System Upgrade/ITS Phase 2D: Installation of CCTV cameras and DMSs on Lem Turner Rd, Philips Highway, and Emerson Street.

4.2.3 Jacksonville Transportation Authority

JTA has a number of ITS projects planned for the near-term period. These are described below.

13. ITS Transit Signal Priority (TSP): Signal priority allows transit vehicles to traverse the designated route in less time by reducing or eliminating time spent waiting for traffic signals to go through the cycle. The transit vehicle advises the traffic signal of its arrival at the intersection and the signal responds by adjusting the cycle to give priority to the transit vehicle by extending the green if the bus arrives during the green phase, or shortening the red phase otherwise. A pilot project is underway on Atlantic Blvd. Use of TSP will be explored in all future transit route enhancements (also see Item 17).
14. Bus Cameras: On-board camera use is a critical element in providing passengers and drivers with both a sense of security and real security while traveling aboard transit vehicles. This project would equip some or all the fleet with cameras.
15. AVL for Remaining Fleet: Automated vehicle location (AVL) is a means of tracking the movement and exact location of transit vehicles. This project would expand this subsystem, which already exists on some buses.
16. APC Units in all Buses: On-board operations and fare collection reconciliation will be enhanced on transit vehicles through the automated passenger count (APC) capabilities. This project would expand this subsystem, which already exists on some buses.
17. TSP for BRT: This project would expand TSP to other major bus route corridors that will have Bus Rapid Transit (BRT) to provide, in part, the "rapid" in BRT.
18. Transit Commuter Alert System: This will provide direct real time text, voice mail, and e-mail notices to all who sign up via the Web. This will be first used for bus information, delays, detours, etc. Once fully tested, JTA will add highway and other functions. This will be linked to 5-1-1.
19. Real-Time Transit Information Signage: Provide transit users with timely, accurate information regarding current operating conditions along selected transit routes. Information will convert operating headway information into arrival information displayed by dynamic message signs or kiosks at key stops.

20. I-Stop Signage: I-Stop is an electronic lighted bus stop sign, which can be linked to an ITS. These signs are mainly used in construction zones for bus stops.
21. Traffic Control for Queue Jumps: JTA is planning to install Queue jumps (restricted lanes or partial lanes that allow buses to by-pass the auto queue) at key locations. While most of the project expense is for right of way and road construction, the ITS element is priority signal phasing to enable the bus to move forward into the next block unimpeded by the queued general traffic.
22. Parking Integration and Direction Signage: This project will set up for integration of public and private parking facilities to offer directions and information on availability of spaces in near real-time via DMS, cell phone message with availability, and price information. This will be tied to the Commuter Alert program.
23. Smartcard Fare Collection: Fare collection accuracy and speed is increased through the use of an automated fare collection subsystem. Smartcard is a stored-value fare collection instrument with several payment options made possible by the presence of a computer chip embedded in the plastic card. JTA will transition to this form of payment.
24. Universal Trip Planner for Transit and Highway Impacts: This project will provide Web-based bus route plans and highway detour detail schedule information. While JTA has a transit trip plan program now, this would automatically tie into the AVL system so updates would be immediate.

4.2.4 Florida Highway Patrol

The FHP wishes to install in the JRCC (and eventually in the new RTMC) an Integrated Secure Data Fusion Center that would, in essence, be a central data warehouse for traffic and public safety information in their region (which is larger than the First Coast Region). The project is described as follows:

25. Integrated Secure Data Fusion Center: A centralized data management subsystem located in the new RTMC will serve all transportation and public safety sectors to ensure timely and ready access to all pertinent data and information (fused data), while at the same time protecting sensitive or proprietary data and information from unauthorized access. This project would provide an interim subsystem and would be housed either at the JRCC or another existing Jacksonville site.

4.2.5 Recommended Agreements

The following agreements are likely to be needed during this Near-Term Period:

- An interagency agreement for the operation and maintenance of ITS devices deployed by FDOT and the COJ Traffic Engineering Department (TED) and Clay County for the devices deployed under Project 2 above.
- An interagency agreement between FDOT, FHP, the COJ, JTA, and JSO for the implementation, operation, and maintenance of the new RTMC under Project 3.
- A memorandum of understanding (MOU) between the Navy, FDOT, and possibly others to deal with access and security issues needed for Project 4.
- Projects 6, 13 and 22 might lead to the need for one or more MOUs for various activities.
- Project 23 will require MOUs, if not contracts, for multi-agency fare collections and the flow of moneys among agencies.
- Since cost sharing will likely be involved, Project 25 will need MOUs between FHP, JSO, and possibly FDOT and others.

Table 4-1: 5-Year Plan

Agency	Project Type	Location	Projected Start Date	Costs (O&M/Yr, 2007 \$) \$000		
				Capital	Operate	Maint.
FDOT	ITS Deployment	I-295 (I-95 to I-10)	12 / 2006	5,000	20	30
		I-95 (I-295-SJC line)	12 / 2008	3,000	5	5
		I-295N (I-10 to Main St.)	6 / 2010	13,000	10	50
		SR 9-A (Main St. to I-95 S)	6 / 2011	15,000	10	50
	CCTV Camera Deployment	US 17 (Orange Park)	4/2007	300	5	3
	ITS RTMC	I-95 @ Forsythe Avenue	9/2010	15,000	1000	300
	Transportation Critical Infrastructure Security	JIAFCJ		550	30	30
My jax511 Traveler Information Subsystem	FCMPO area		1,000	100	200	
	Systems Manager/Integrator	RTMC and system-wide		2,500	100	200
City of Jacksonville	Signal System Upgrade/ITS Phase 1A	Baymeadows Rd, Southside Blvd Philips Hwy, Central Business District, Atlantic Blvd, Beach Blvd, State St, Union St, Emerson St, Bay St.	1/2007	2,000	20	30
	Stadium Contra-flow Signal System 1B	Sports Complex, Bay St.	8/2007	2,000	5	5
	Signal System Upgrade/ITS Phase 2A	Atlantic, Beach, Lem Turner, Philips/Emerson	1/2008	2,000	10	5
	Signal System Upgrade/ITS Phase 2B	San Jose, Roosevelt	1/2009	2,000	10	5
	Signal System Upgrade/ITS Phase 2C (CCTV-DMS)	Monument Rd, Atlantic, Beach	1/2010	2,000	10	5
	Signal System Upgrade/ITS Phase 2D (CCTV-DMS)	Lem Turner, Philips/Emerson	1/2011	2,000	10	5
JTA	ITS Transit Signal Priority	Atlantic Blvd.	3/2007	400	10	5
	Bus Cameras	Bus fleet	8/2007	1,100	10	3
	AVL for Remaining Fleet	Bus fleet	1/2008	500	20	5
	Expand APC Units	Bus fleet (partial)	1/2008	300	5	10
	TSP for all major bus route corridors (BRT)	TBD	9/2008	500	10	20
	Transit Commuter Alert System	Bus stops and area-wide	3/2008	50	5	2
	Real-Time Transit Information Signage	Bus stops and other strategic locations	10/2008	200	20	20
	I-Stop Signage	TBD	10/2009	300	4	2
	Queue Jumps (Priority Signal Phasing)	TBD	12/2009	1,500	10	5

Agency	Project Type	Location	Projected Start Date	Costs (O&M/Yr, 2007 \$) \$000		
				Capital	Operate	Maint.
	Parking Integration and Direction Signage/ Notice	TBD	TBD	400	10	5
	Smartcard Fare Collection	Region-wide	2010	3,366	340	175
	Universal Trip Planner for Transit and Highway Impacts	Region-wide	2009	500	20	5
FHP	Integrated Secure Data Fusion Center	JRCC (or another Jacksonville site)	TBD	300	30	20

4.3 10-YEAR IMPLEMENTATION PLAN

The 10-Year, or Mid-term, Plan is summarized in Table 4-2. Before providing descriptions of each project, it is important to discuss the new RTMC's impact on the provision of information-based transportation services in the First Coast Region.

4.3.1 New Jacksonville Regional Transportation Management Center

Financing and construction of the new RTMC is scheduled for late in the Near-term Phase of the Master Plan. Full operational impact of the RTMC will be realized during the Mid-term Phase, or the five- to ten-year period.

The RTMC is one of several structures planned for the Jacksonville Transportation Center slated for initial construction in 2010. It will be constructed near the Prime Osborn Convention Center. FDOT District 2 will be a prime tenant and is expected to be joined in the RTMC by FHP's JRCC, COJ Traffic Engineering Department (TED), Jacksonville Sheriff's Office, and the dispatch unit of JTA. The underlying rationale for having key stakeholders co-located is the improved inter-agency communication and coordination that will result from sharing facilities. Similar arrangements in other communities have resulted in improved traffic management, more highly coordinated incident response resulting in improved clearance times, improved coordination in managing major planned special events and emergencies (such as hurricane evacuation), and a general improvement in the appreciation of the partners' respective roles and responsibilities related to regional mobility.

Exact plans for the RTMC, including its precise location, have not been finalized at this time. The facility could be part of a larger structure or it could be stand alone. Several criteria, including security considerations, will be brought to bear in the final decision process. FDOT currently has approved funding of \$17 million for the RTMC construction.

Since the RTMC will be completed right around the time this Mid-term Plan period begins (2012), it is a significant milestone marking a major change in the management and operations of First Coast Regional ITS. It is fitting that the opening of this facility ushers in the 5- to 10-year deployment period. As noted earlier, an interim update of this plan was recommended in (late) 2008; by which time the scheduling and other decisions regarding the new RTMC should have been finalized and the update can deal more precisely with the scheduling of Mid-term Plan projects described below.

It should be noted that applications have been made (on April 30, 2007) to secure one or more federal grants that could help finance some or all of these projects, in which case they could be accelerated into the Near-term Plan period.

4.3.2 Mid-term Projects

Unlike the 5-Year Plan, the initiatives/projects identified for the Mid-term Plan are not associated as closely with particular agencies. This is because they will be more cooperative efforts than the Near-term Plan's projects, and funding sources are less defined at this point in time. Potential funding sources (outside the grant, if realized) are indicated in the descriptions below. When FDOT is listed, these could be federal or state funds, as described in the Implementation Plan document.

1. Integrated Traffic and Emergency Management System: Implement real-time ambulance and other emergency vehicle routing to avoid congestion and railroad crossings that block access to trauma centers. Ambulances would be routed to the most appropriate trauma center considering both emergency room (ER) capacity and travel time. As E911 capability becomes more robust, this can be used for locating incidents far more accurately and will be added to the data links to the RTMC. This project would likely be financed by FDOT, local agencies, and/or the medical emergency services community. Cooperation from the railroad companies is essential.
2. Integrated Freeway/Expressway Management: Add HAR and a more robust road weather information subsystem (RWIS) to existing ITS-equipped freeways throughout the urbanized area. Also, add ramp meters and/or arterial DMSs at key interchanges to encourage diversion when there is congestion or an incident. DMSs, My jax511, HAR would deliver alerts and rerouting information. This more complete freeway management subsystem will be integrated with the other subsystems. This project would likely be financed by FDOT with possible assistance from the COJ.
3. Integrated Arterial Corridor Operations: Apply ITS traffic and transit management to improve flow in a highly congested arterial corridor (Blanding Blvd and US 17), which is over capacity and current signal timing strategies cannot alleviate. The corridor would have adaptive signal control, transit signal priority (coupled with queue jumps), DMS, HAR, highway surveillance and control cameras, and real-time traffic information through enhanced My jax511. The subsystem would issue situation alerts to encourage telecommuting. Traffic incident management will be enhanced via the Integrated Traffic and Emergency Management Subsystem

introduced above. Sources of funding for this project would likely include FDOT, COJ, and JTA.

4. TSP on Other Corridors: Continued expansion of the transit signal prioritization program to additional corridors will improve the travel time associated with transit use. This project would identify the appropriate corridors and deploy TSP on them. Benefits would include improved travel times and more stable travel times for transit users for both single-route riders and transfers. The most likely routes for this treatment would be BRT routes and this project would be closely coordinated with the queue jump project in the Near-term Plan. Likely funding sources could be FDOT, COJ, and/or JTA for various components of the subsystem. The service could also be used for communicating with Web-accessible personal digital assistants (PDAs).
5. WiFi on Corridors: Provision of WiFi along transit corridors offer transit riders the opportunity to connect to the Internet during their trip. Riders will be able to use their time on the transit vehicle productively or in pursuit of on-line based entertainment. JTA is considering this enhanced service.
6. Cell Phone Fare Payment: Use of the cell phone as a fare payment medium will further reduce “exact change” barrier to using transit. Ease of fare payment increases the convenience of using transit for personal travel. It will also reduce error in fare collection and improve overall fare collection efficiency. This project would be coordinated with the COJ Parking Facilities and Enforcement Division (PFED), which would likely adopt this fee-payment mechanism for the city’s parking lots as well. This is an opportunity for public-private partnerships involving the JTA, COJ PFED, private parking lot owners, cell phone companies, and even other commercial interests.
7. Expanded Personalized Service: This service is aimed at increasing the ease and convenience of using transit. Services expanded in scope and timeliness will be added to baseline services already available.

4.3.3 Recommended Agreements

The following agreements are likely to be needed during this Mid-term Period:

For Project 1, MOUs may be needed to grant transportation agencies permission to place sensors within the railroad right of way and to articulate any restrictions, such as maintenance. Also, since critical information will be shared with the medical community, there are some potential issues of liability that will need to be resolved.

- Projects 2, 3, 4, and 5 will no doubt need MOUs among FDOT, COJ, JTA, and possibly others dealing with implementation, operations, and maintenance.
- Since, under the deployment concept envisioned for Project 6, there will be cost sharing, a MOU will likely be needed between the affected agencies (JTA, COJ at a minimum).

4.4 SUMMARY

A Regional ITS Master Plan is as much a process as it is a roadmap for implementing intelligent transportation systems. If the Master Plan is not treated as a living document, its value will be very short-lived. The First Coast Master Plan was developed to be a living document. A good deal of the Master Plan documents how to prepare and update the plan. The First Coast ITS Coalition is uniquely positioned to monitor changes, both subtle and substantial, in the demand for mobility within the First Coast Region. Through the sponsorship of the development of the Regional ITS Master Plan, the Coalition has established itself as a forum for exploring fulfillment of regional transportation needs from an ITS perspective. The documentation of their deliberations will be accomplished by periodically updating the First Coast Regional ITS Master Plan.

Table 4-2: 10-Year Plan

Project Type	Location	Costs (O&M/Yr, 2007 \$) \$000		
		Capital	Operate	Maint.
1. Integrated Traffic and Emergency Management System	Regional, freeways and arteries	1,300	30	40
2. Integrated Freeway/Expressway Management	Regional, freeways and interchanges	2,500	100	200
3. Integrated Arterial Corridor Operations	Blanding Blvd. (SR 21) and Roosevelt Blvd. (US 17) corridor	6,000	100	100
4. TSP on Other Corridors	TBD	1,500	25	35
5. WiFi on Corridors	TBD	1,300	80	200
6. Cell Phone Fare Payment	Area-wide	3,000	170	45
7. Expanded Personalized Service	TBD	TBD	TBD	TBD

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