Florida District 4 & 6
Southeast Florida Regional ITS Architecture Update Stakeholder Workshop

October 26, 2015
Agenda

10:00 AM  Introductions, Workshop Goals & Project Overview
10:15 AM  ITS Architecture Overview
  » National ITS Architecture Terms and Concepts
  » Regional ITS Architecture Overview
  » Website Overview
10:45 AM  Review and Update Regional ITS Stakeholder and ITS Elements
11:15 AM  Discussion of Regional ITS Projects
12:15     Lunch
1:15 AM   Service Package Overview
1:30 PM   Review and Update Service Package Diagrams
2:45 PM   Interagency Agreements/Operational Concepts
3:00 PM   Use of Regional ITS Architecture
3:15 PM   Next Steps
3:30 PM   Adjourn
Workshop Goals
Workshop Goals

– Understand the purpose and benefits of an ITS Architecture

– Understand the major portions of a Regional ITS Architecture
  – Understand what portions needs to be reviewed by stakeholders

– Review and update major portions of the Regional ITS Architecture
  – Stakeholders who have not yet provided input
  – Questions the project team may have
Project Overview
Project Overview

- Complete update of the existing Florida ITS Architecture

- Includes
  - Florida Statewide Services
  - Florida District 1
  - Florida District 2
  - Florida District 3
  - Florida District 4 & 6
  - Florida District 5
  - Florida District 7
  - Turnpike Enterprise

- Also includes Update of Architecture Documentation
  - 23 CFR Part 940 Compliance Documentation
  - SITSA QA/QC Documentation
Project Schedule

- Kickoff Meeting: September 18
- Stakeholder Interviews: September 21 – October 20
- Development of Draft Update: October 20 – October 28
- Stakeholder Workshop: October 29
- Complete Draft ITS Architecture: November 13
- Stakeholder Comment Period: November 13 – December 7
- Final ITS Architecture: December 18
ITS Architecture Overview
Intelligent Transportation Systems

– Definition
  ● “The Application of data processing and data communications to surface transportation, to increase safety and efficiency.”

– Includes Systems within
  ● Traffic Management
  ● Transit Management
  ● Emergency Management
  ● Traveler Information
  ● Maintenance Management
What is an ITS Architecture?

– Does Provide:
  – A blueprint on how ITS systems will work together to satisfy surface transportation needs.
  – Identifies the ITS stakeholders in a region and their elements
  – Identifies the information to be exchanged between stakeholder elements
  – Selects standards for information exchange

– Doesn’t Define:
  – Select specific technologies or design
  – Determine how projects are selected or funded
National ITS Architecture – Framework and Template
What is a Regional ITS Architecture?

- A regional framework for ensuring institutional agreement and technical integration for the implementation of ITS projects in a particular region.
How National ITS Architecture relates to Regional ITS Architecture

- National ITS Architecture (the cookie cutter)
  - a Framework or Template
  - a menu of possibilities

- Regional ITS Architecture (the cookies)
  - Specific instances, associated with local stakeholders and projects
  - Current inventory + future projects
  - Only the pieces you need
  - Put together based on local needs
  - Extensions, where necessary
Look Beyond Current Set of Projects

- How will your systems evolve?
  - What new or enhanced services will you provide?
  - What systems will you connect to and what information will you share?
  - What agreements need to be in place to make it happen?

- The Southeast Florida ITS Architecture will provide the framework and plan for the evolution of your systems over the next 10 to 20 years.
Benefits of a Regional ITS Architecture

- Transportation planning tool
  - Get a handle on where we are going with our Intelligent Transportation System
- Regional information sharing opportunities
  - The problem: patchwork deployments that make sharing information difficult
  - Regional ITS Architecture: Get early insight into what ITS information others have that can help you do your job better (or you can provide to others)
Benefits of a Regional ITS Architecture (Cont.)

- AND -- Addresses FHWA Rule/FTA Policy on ITS Architecture and Standards
  - Requires Development of a Regional ITS Architecture if using Highway Trust Fund money to fund deployment of projects containing ITS elements.
  - Intended to foster integration of ITS Systems
  - Defines requirements for ITS projects
What is in a Regional ITS Architecture?

FHWA Rule/FTA Policy Require:

1. Description of the region (Scope)
2. Identification of participating agencies and their systems (Inventory)
3. Operational concept
4. Agreements required for implementation
5. System functional requirements
6. Interface requirements
7. Identification of ITS standards
8. Sequence of projects required for implementation
9. Process for maintaining your ITS Architecture
What does the Rule/Policy Require for ITS Projects?

- Systems Engineering Analysis
- Regional ITS Architecture partially satisfies the systems engineering requirements for FHWA Rule/FTA Policy
- Part 940.11 Requirements:
  - Portion of the regional ITS architecture
  - Roles and responsibilities
  - High-level requirements
  - Alternative communications infrastructure
  - Applicable ITS Standards
  - Procurement options
  - Operations and Maintenance
Website Overview
Discussion of Regional Stakeholders
Who is a Stakeholder?

– Technical Definition:
  ● Someone that sends or receives transportation information to/from other stakeholders either directly or with their systems.

– Institutional Definition:
  ● Someone who builds, operates or maintains ITS equipment.
Who is a Stakeholder?

– Let’s go to the stakeholder list….
Discussion of Regional ITS Architecture Elements
ITS Inventory

- A list of ITS elements and the elements that interface with them

- And an ITS element is:
  - “The name used by stakeholders to describe high level parts of an ITS system.”

- Types of Elements:
  - Centers – Traffic, Emergency, Transit
  - Field Devices – Traffic, Maintenance
  - Traveler Interfaces – Web sites
  - Data Systems – Planning, Archives
  - Vehicles – Transit, Emergency, Maintenance
Regional ITS Inventory

- Review current and planned elements
  - Owner
  - Status
  - Definition
  - Entity Type
Regional ITS Inventory

- Types of Subsystems
Regional ITS Inventory

– Let’s go to the inventory…. 
Regional ITS Projects
Review ITS Projects

- ITS Projects Identified from
  - Interviews with key stakeholders
  - Current TIP

- For each project consider
  - Name, Description
  - Key Stakeholders
  - Timeframe (short, medium, or long-term)
  - Mapping to Architecture
ITS Projects

- Will input ITS projects into the Turbo Architecture database.

- Ability to generate outputs to create a systems engineering analysis and functional requirements for each project.

- Let’s go to Project List…….
Discussion of ITS Services – Service Packages Overview
ITS Services Cover

- Traffic Management
- Traveler Information
- Transit Management
- Emergency Management
- Commercial Vehicle Operations
- Maintenance and Construction
- Archived Data Management
- Advanced Vehicle Safety
Traffic Information Dissemination

Television Station → TMC → Dynamic Message Signs → Web Site → Motorist
Automated Transit Fare Payment

- Enforcement
- Transit Management Center
- Point of Sale / Kiosk
- Financial Institution
- Transit Vehicle
Service Packages = ITS Services

Architecture
Framework spanning all of ITS

Service Packages
Pieces of the architecture that provide a particular transportation service.
National ITS Architecture Service Package

APTS02 – Transit Fixed-Route Operations

Traffic Management
- road network conditions
- incident information
- traffic images

Information Service Provider
- transit and fare schedules
- transit schedule adherence information

Transit Operations Personnel
- transit operations personnel inputs
- transit operations status

Transit Management
- transit vehicle schedule performance
- transit schedule information + transit vehicle operator information

Transit Vehicle Operator
- current asset restrictions + roadway maintenance status + work zone information

Maintenance and Construction Management
- on-board schedule management
- transit vehicle operator inputs

Transit Vehicle
- transit vehicle operator display
- transit vehicle operator availability
- route assignment
Customized Service Package

**APTS02 - Transit Fixed-Route Operations**
Miami-Dade Transit Agency (1 of 2)

**Traffic Management**
- FDOT District 6 SunGuide
- Transportation Management Center + MDX TMC + Miami-Dade Traffic Control Center

**Maintenance and Construction Management**
- County and City Roadway Maintenance and Construction Systems + FDOT District 6 Maintenance

**Transit Management**
- Miami-Dade Transit Metrobus System
  - transit schedule information + transit vehicle operator information
  - transit vehicle schedule performance
  - transit and fare schedules + transit schedule adherence information

**Transit Vehicle**
- Miami-Dade Transit Metrobuses

**Information Service Provider**
- Local Agency Traveler Information System + Miami-Dade Transit Customer Information Services

Legend:
- Planned and future flow
- Existing flow
- User-defined flow
Customized Service Package Diagrams

- Customize to reflect regional operational concepts

- Add/Delete:
  - Subsystems, Terminators and Architecture Flows

- Moderator/Analysts assist by:
  - Asking questions
  - Capturing results
Customized Service Package Diagrams

- Review selected service package diagrams based on:
  - Questions we have
  - Regional projects or initiatives
  - Stakeholders present

- Let’s go to the Service Package Diagrams…
Interagency Agreements/Operational Concepts
Interagency Agreements

- Agreements needed for
  - Data Sharing, System Maintenance, +?

- Many types of agreements possible
  - Handshake
  - Memorandum of Understanding (MOU)
  - Interagency/ Intergovernmental
  - Operational
  - Funding
  - Master Agreements

- What are some of your current Interagency agreements?
Planned Agreements

– Are there any agreements planned in the region that haven’t been implemented yet?
## Operational Concepts

- Defines Roles and Responsibilities of stakeholders in providing the ITS services (Example)

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>RR Area Name</th>
<th>RR Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDOT District 4</td>
<td>Highway Management</td>
<td>Coordinate traffic information with other FDOT District transportation management centers (TMCs)</td>
<td>Existing</td>
</tr>
<tr>
<td>FDOT District 4</td>
<td>Highway Management</td>
<td>Determine highway travel times</td>
<td>Existing</td>
</tr>
<tr>
<td>FDOT District 4</td>
<td>Incident Management</td>
<td>Monitor highway traffic centers</td>
<td>Existing</td>
</tr>
<tr>
<td>FDOT District 4</td>
<td>Incident Management</td>
<td>Operate dynamically tolled express lanes</td>
<td>Planned</td>
</tr>
<tr>
<td>FDOT District 4</td>
<td>Emergency Management</td>
<td>Monitor highway surveillance cameras</td>
<td>Existing</td>
</tr>
</tbody>
</table>
Use of Regional ITS Architecture
ITS Projects

- Regional ITS Architecture partially satisfies the systems engineering requirements for FHWA Rule/FTA Policy on ITS Architectures and Standards

- Part II Requirements:
  - Portion of the regional ITS architecture
  - Roles and responsibilities
  - High-level requirements
  - Alternative communications infrastructure
  - Applicable ITS Standards
  - Procurement options
  - Operations and Maintenance
Why Use the Systems Engineering Process?

- Reduce Risk
  - Control costs and schedule
  - Satisfy users’ needs

- Fulfill the requirements of the Federal Rule
Systems Engineering/Project Development

- Project Initiation
- Preliminary Engineering
- Plans, Specs & Estimates
- Construction
- Project Closeout
- Operations & Maintenance

- Concept of Operations
- System Requirements
- High-Level Design
- Detailed Design
- Software Coding
- Hardware Fabrication

- System Validation
- System Verification
- Subsystem Verification
- Unit Test

- Definition and Decomposition
- Integration Verification and Validation
Systems Engineering Analysis Requirements

- Rule/Policy requires all HTF-funded projects be based on a systems engineering analysis
  - Scale commensurate with project scope

23 CFR 940.11

1. Portion of Regional ITS Architecture
2. Participating agencies roles and responsibilities
3. Requirements definitions
4. Alternatives analysis
5. Procurement options
6. ITS standards and testing procedures
7. Operations and management procedures and resources
Systems Engineering Analysis

- If a project architecture has been created, look at the Projects web page.

- If a project architecture has not be created, look at the regional ITS architecture and find the appropriate web pages based on ITS services in the project.
Next Steps
Next Steps

– Complete Draft Regional ITS Architecture will be available on the project website approximately November 13:

– Email to all stakeholders and attendees

– Comments solicited by December 7
  ● Additional week added for the Thanksgiving Holiday

– Final ITS Architecture created by December 18

– Thank you for attending the workshop today!!