



Chattanooga
Regional ITS Architecture Update Workshop

December 5, 2013

Chattanooga-Hamilton County RPA Regional Planning Agency

Kimley-Horn and Associates, Inc.

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Workshop Overview

- Introductions
- Review of the Draft Regional ITS Architecture and Deployment Plan Document
- Discussion on Existing and Planned ITS Projects in the Region
- Discussion on Use and Maintenance of the Regional ITS Architecture
- Concluding Comments
- Adjourn

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Project Overview

- Purpose: Update the 2010 Chattanooga Regional ITS Architecture and Deployment Plan
- Update goals:
  - Include participation from traffic, transit, and public safety stakeholders representing local, state, and federal agencies in the Chattanooga Region
  - Provide a high level plan that documents the Region's vision for the deployment, integration, and operation of ITS in the Chattanooga Region
  - Assist the Region in meeting the FHWA and FTA requirements for ITS architecture conformity

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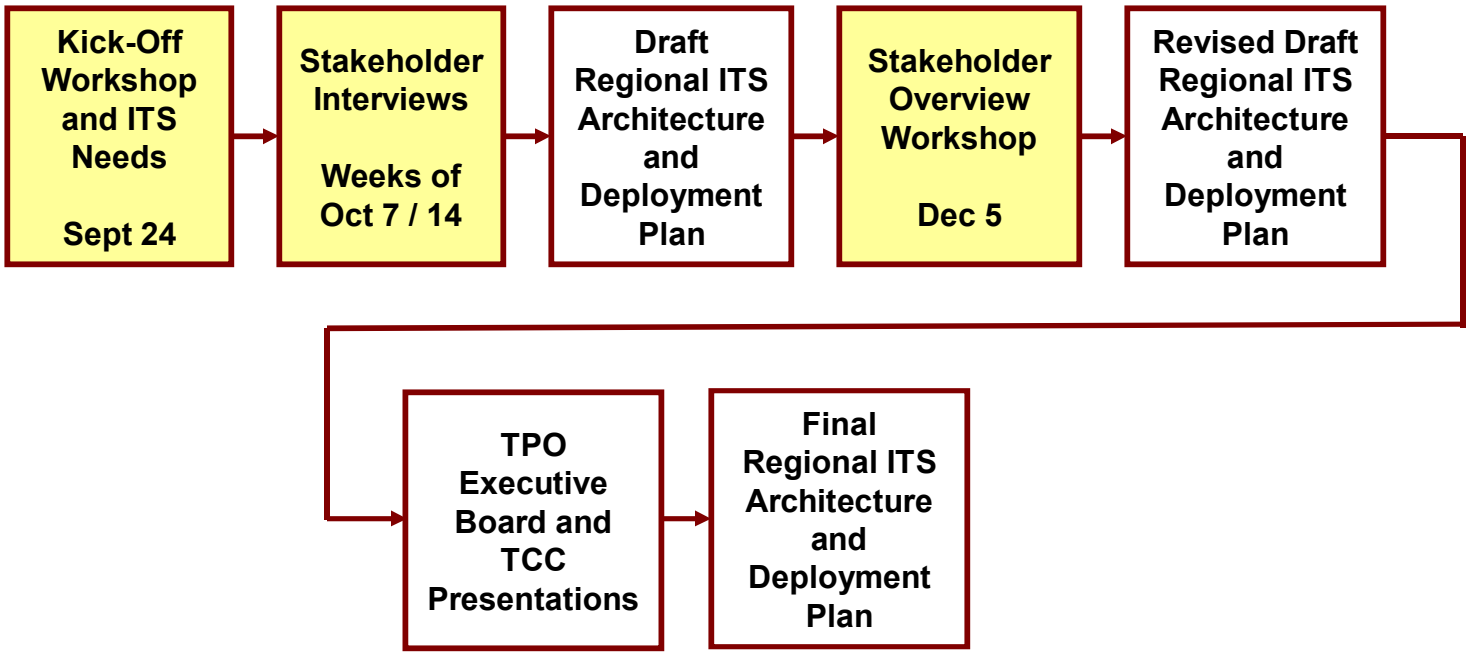
ITS Architecture Work Plan



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Remaining Deliverables

Revised Draft Regional ITS Architecture

ITS Architecture Website

Executive Summary
Final Regional ITS Architecture
Final Turbo Architecture Database

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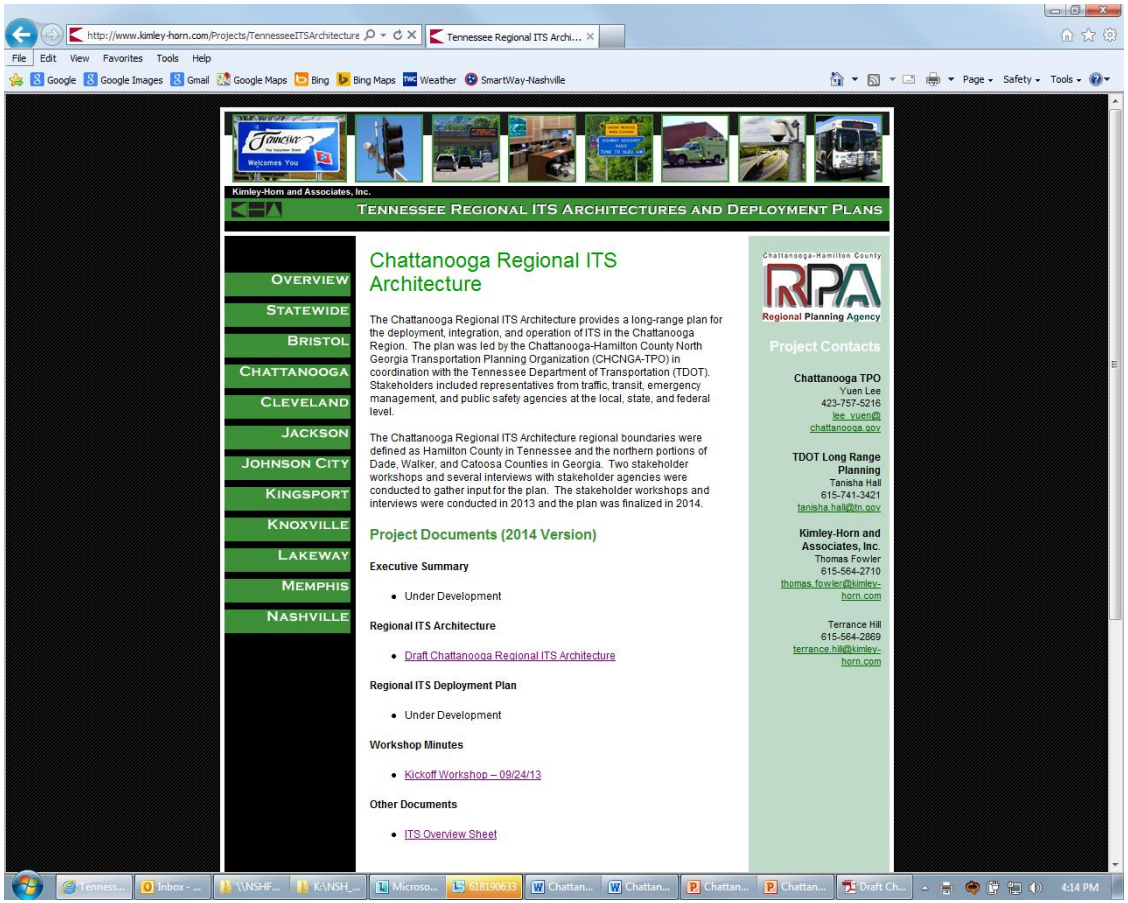
Project Website



www.kimley-horn.com/projects/TennesseeITSArchitecture

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Draft Regional ITS Architecture Document

- Draft Regional ITS Architecture Document
  - Sent to stakeholders on November 30
  - Documents updates to the Regional ITS Architecture
  - Includes regional ITS needs, ITS element inventory, ITS service packages, and use and maintenance plan
  - Section on Regional ITS Deployment Plan will be added in revised draft
- Document Review
  - Comments can be submitted to Tom Fowler or Yuen Lee
  - Comments requested by Friday, December 13
  - Document is currently available on project website

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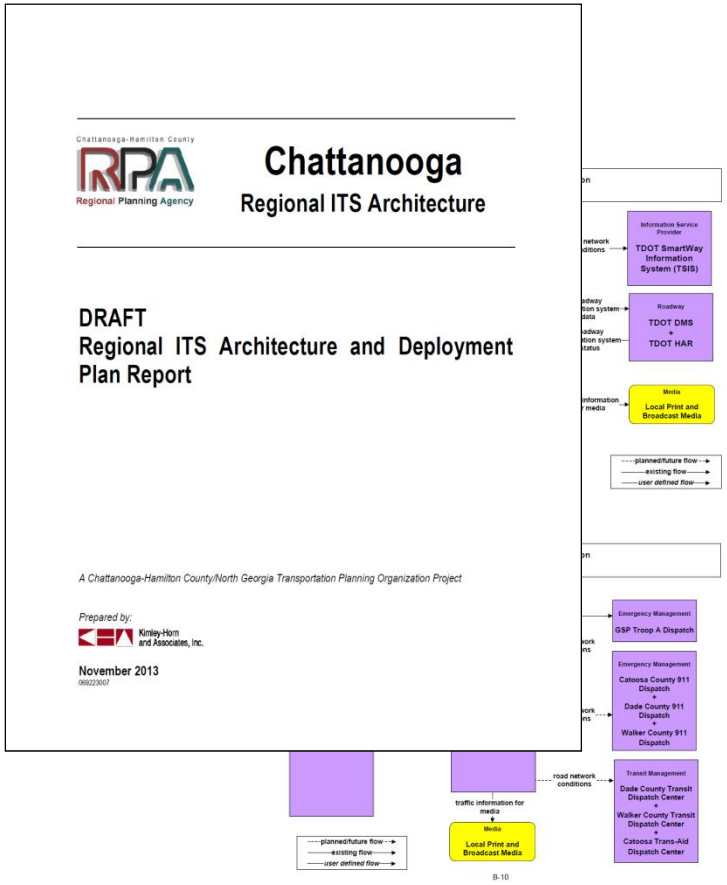
Draft Regional ITS Architecture Document

Key Sections in the Regional ITS Architecture Document

- Inventory of existing and planned elements (Section 4)
- Selected ITS service packages and regional prioritization (Section 5)
- Customized ITS service package diagrams (Appendix B)



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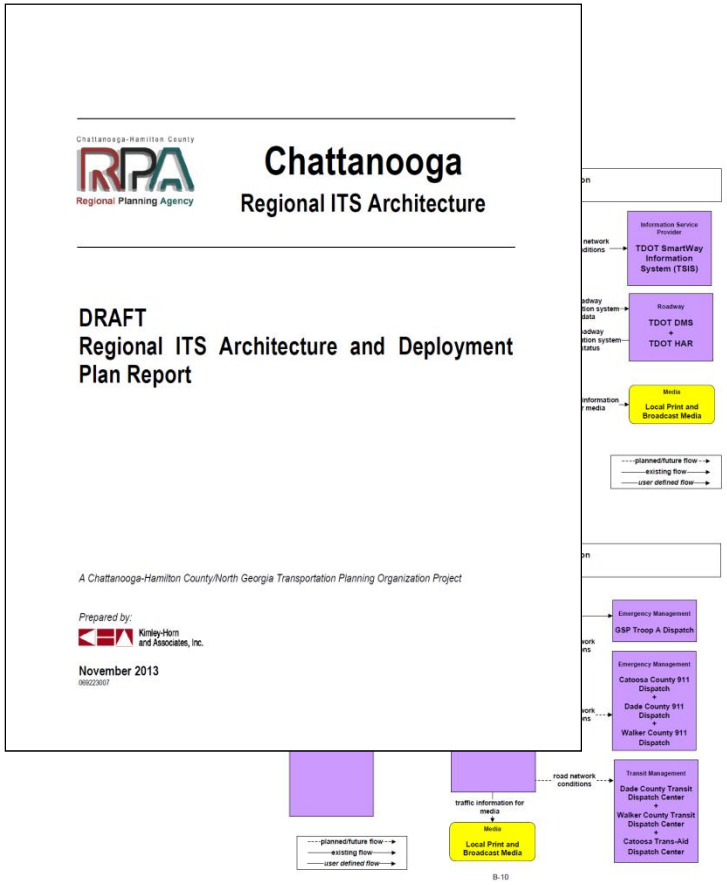
Draft Regional ITS Architecture Document

Key Sections in the Regional ITS Architecture Document

- Regional ITS deployment plan (Section 6)
- Use and maintenance plan (Section 7)
- Architecture Maintenance Documentation Form (Appendix E)



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Discussion on ITS Service Package Prioritization

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ITS Service Package Prioritization

High Priority Market Packages		Medium Priority Market Packages		Low Priority Market Packages	
Traffic Management					
ATMS01	Network Surveillance	ATMS04	Freeway Control	ATMS10	Electronic Toll Collection
ATMS03	Surface Street Control	ATMS13	Standard Railroad Grade Crossing	ATMS11	Emissions Monitoring and Management
ATMS06	Traffic Information Dissemination	ATMS19	Speed Monitoring	ATMS21	Roadway Closure Management
ATMS07	Regional Traffic Management			ATMS22	Variable Speed Limits
ATMS08	Traffic Incident Management System				
Emergency Management					
EM01	Emergency Call-Taking and Dispatch	EM06	Wide-Area Alert		
EM02	Emergency Routing	EM08	Disaster Response and Recovery		
EM04	Roadway Service Patrols	EM09	Evacuation and Reentry Management		
		EM10	Disaster Traveler Information		
Maintenance and Construction Management					
MC08	Work Zone Management	MC01	Maintenance and Construction Vehicle and Equipment Tracking		
MC10	Maintenance and Construction Activity Coordination	MC03	Road Weather Data Collection		
		MC04	Weather Information Processing and Distribution		

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ITS Service Package Prioritization

High Priority Market Packages	Medium Priority Market Packages	Low Priority Market Packages
Public Transportation Management		
APTS01 Transit Vehicle Tracking APTS02 Transit Fixed-Route Operations APTS03 Demand Response Transit Operations APTS04 Transit Fare Collection Management APTS05 Transit Security APTS08 Transit Traveler Information APTS10 Transit Passenger Counting	APTS06 Transit Fleet Management APTS07 Multi-Modal Coordination APTS09 Transit Signal Priority APTS11 Multimodal Connection Protection	
Traveler Information		
ATIS01 Broadcast Traveler Information ATIS02 Interactive Traveler Information		
Commercial Vehicle Operations		
	CVO06 Weigh-in-Motion	
Archived Data Management		
AD1 ITS Data Mart		AD3 ITS Virtual Data Warehouse

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ITS Deployment Plan Projects

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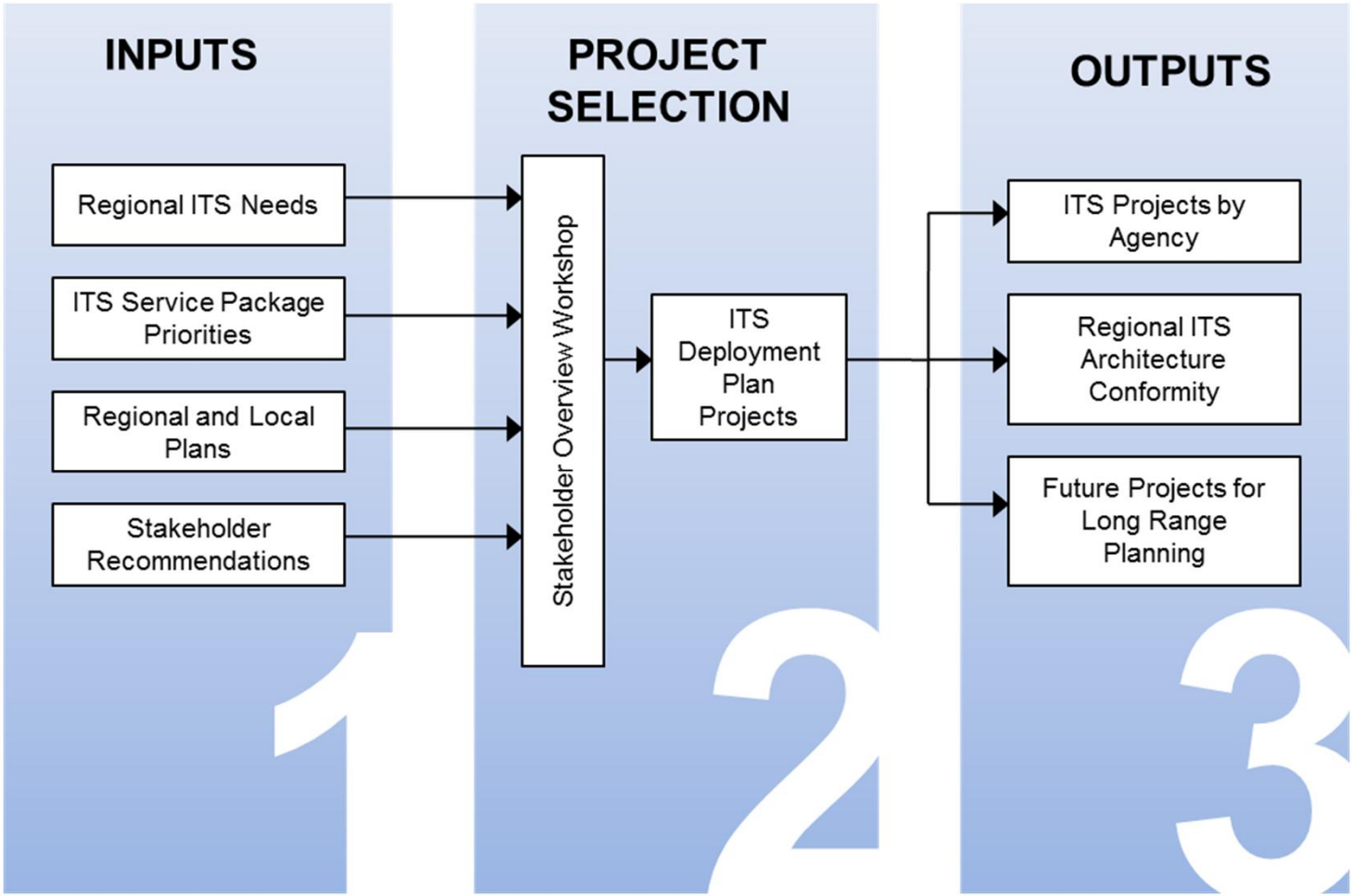
ITS Deployment Plan



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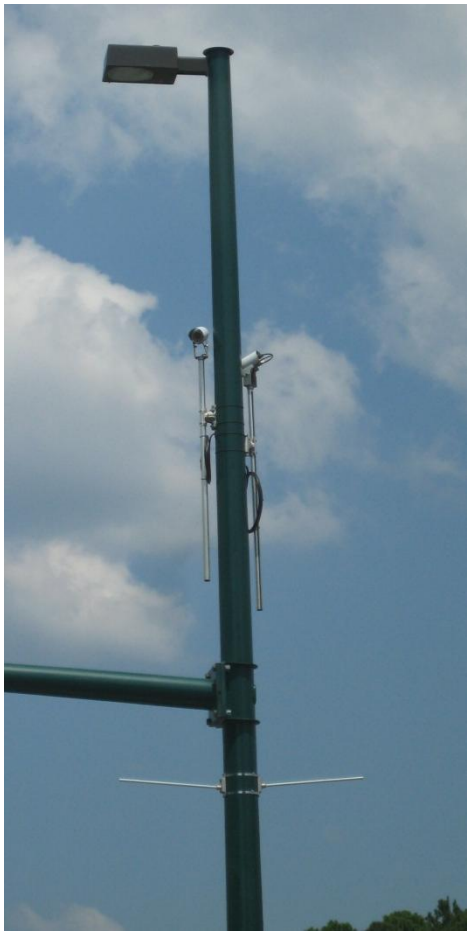
ITS Deployment Plan

- Projects to include:
  - Project name and description
  - Responsible agency
  - Probable cost (detail may vary by project)
  - Funding status
  - Deployment timeframe
    - Short-term 0-5 Years
    - Mid-term 5-10 Years
    - Long-term 10+ Years
  - Applicable ITS service packages



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Discussion on ITS Deployment Plan Projects

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Regional ITS Architecture Use and Maintenance Plan

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Systems Engineering

Definition

Systems engineering is an interdisciplinary approach to enable the realization of successful systems. It **focuses on defining customer needs and required functionality early** in the development cycle, documenting requirements, then proceeding with design synthesis and system validation while considering the complete problem.

Requirements

Using a systems engineering approach is required by the USDOT for ITS projects. The process includes demonstrating conformance to the Regional ITS Architecture.

Additional guidance has been developed by the FHWA Tennessee Division and TDOT.

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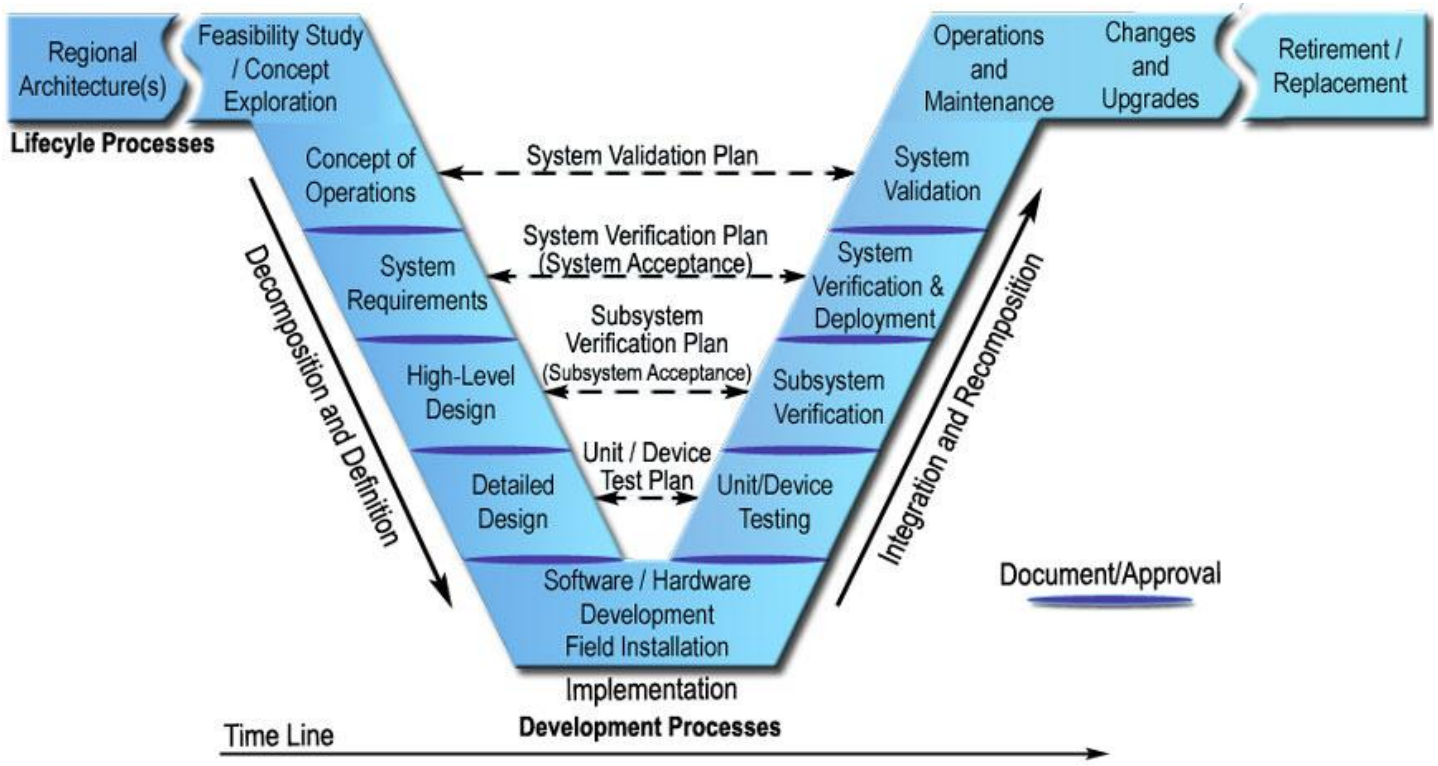
Systems Engineering



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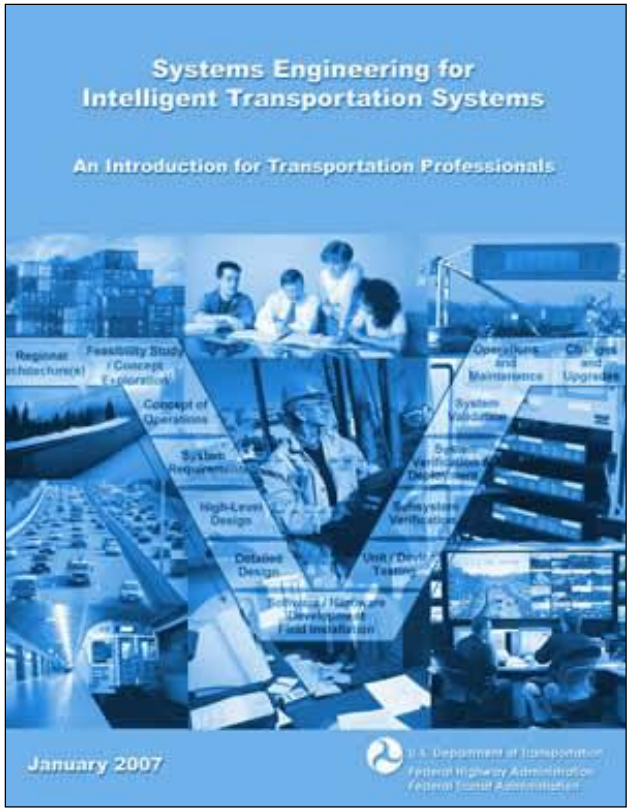
Resources

FHWA Systems Engineering for Intelligent Transportation Systems

An Introduction for Transportation Professionals



TDOT Traffic Design Manual

Chapter 8 - Intelligent Transportation Systems

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Why Systems Engineering?

- Looks at the **entire** project lifecycle…not just design
- Emphasizes **up-front planning** and addresses risk early
- **Functionality** first…technology purchase later
- Better **documentation** of system development, including trade-offs, alternatives, and design decisions
- **Benefits** include establishes expectations, reduces risk, minimizes costs and schedule overruns

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Systems Engineering in Tennessee

- FHWA Tennessee Division developed guidance document: "Tennessee Procedures for Implementing ITS Regulations"
- A systems engineering analysis (SEA) must be performed for ITS projects unless a project is categorically excluded
- Categorically excluded projects fall into one of the following:
  - Projects that do not utilize a centralized control or share data with any other agencies
  - Expansions or enhancements to existing systems that do not add any functionality

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Systems Engineering and the Regional ITS Architecture

The following portions of the Regional ITS Architecture can assist with performing a systems engineering analysis:

- Concept of Operations: Agency roles and responsibilities identified in the Regional ITS Architecture document. ITS service packages in Appendix B provide a high level concept of operation.
- System Requirements: Provided as part of the equipment packages identified in the Regional ITS Architecture Appendix C
- High Level Design: Applicable ITS standards identified using ITS service package data flows

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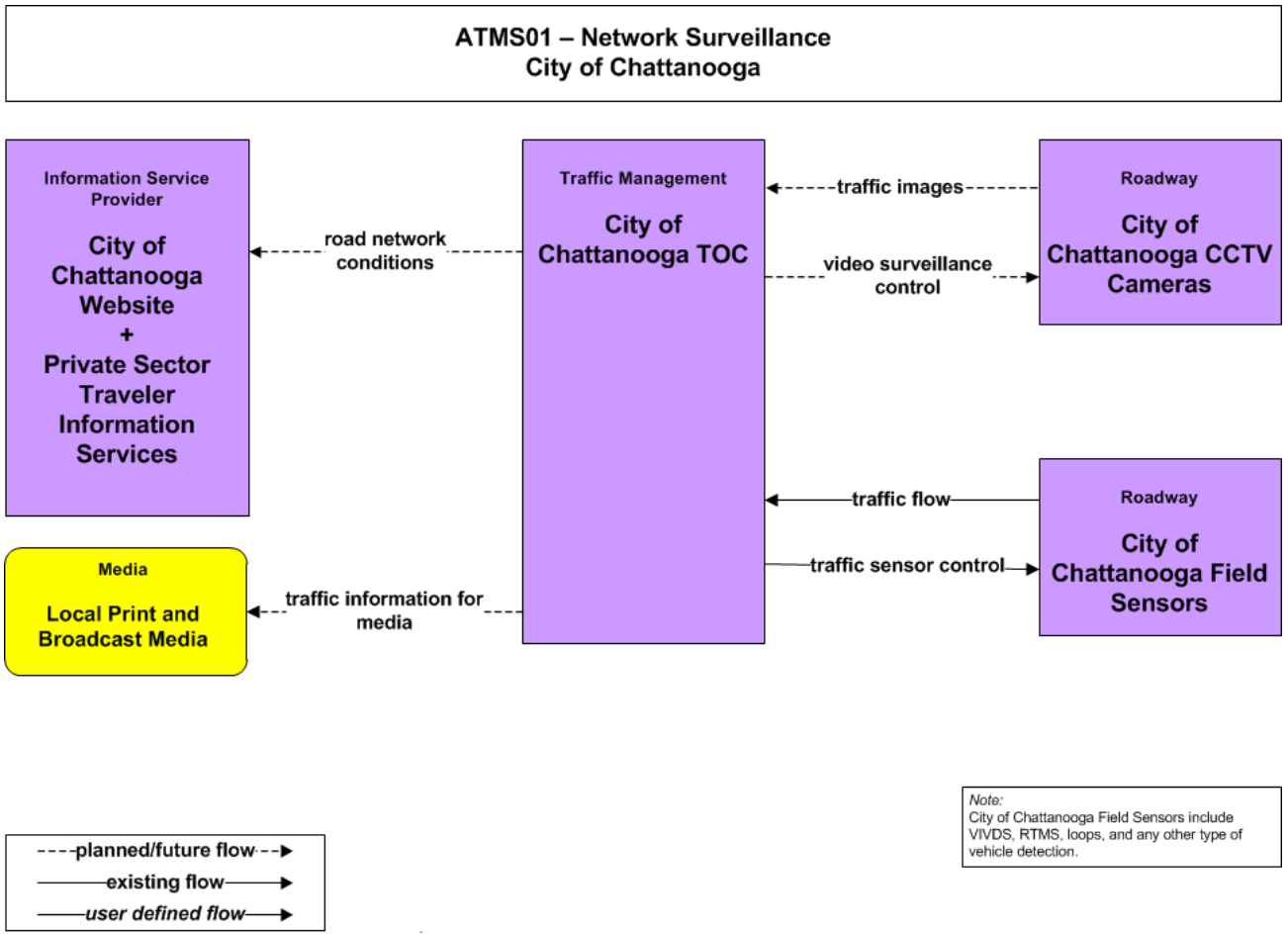
Systems Engineering

Concept of Operations and High Level Design for TOC



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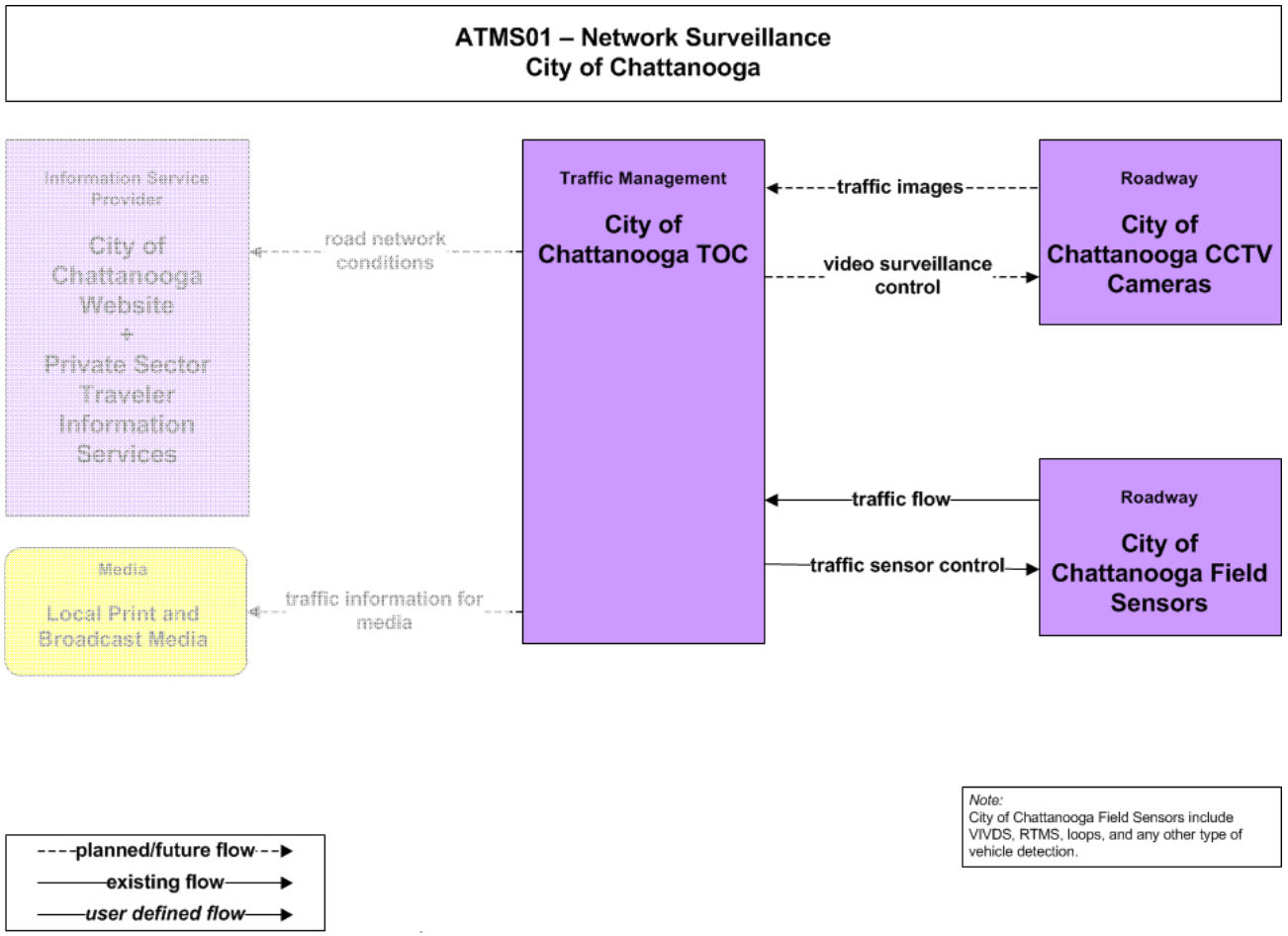
Systems Engineering

Concept of Operations and High Level Design for TOC



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Systems Engineering

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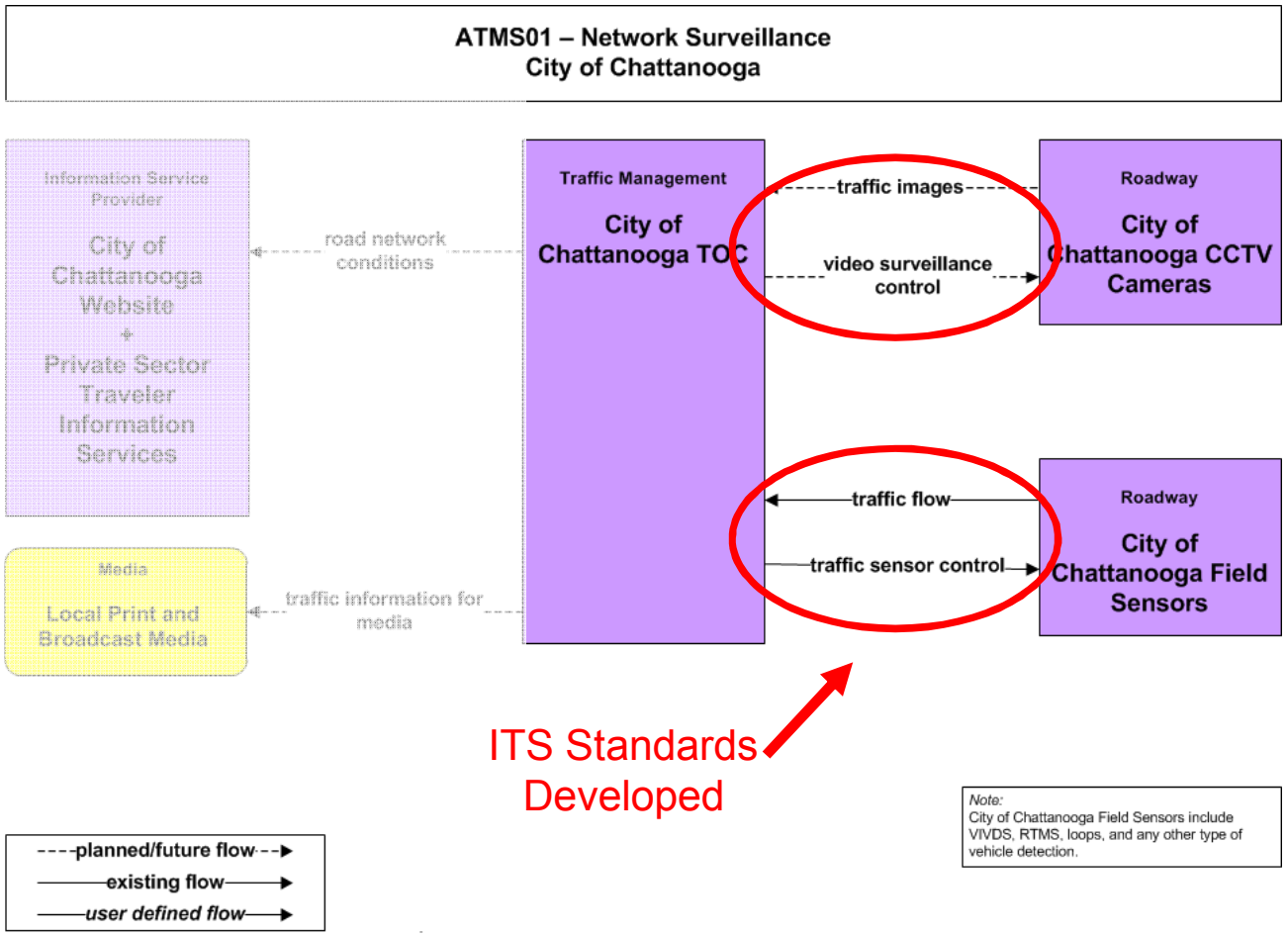

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USDOT ITS Architecture Conformity Requirements

Step 1 – Identify

Identify the ITS components of the project

Step 2 – Evaluate

Evaluate the applicable ITS service packages to determine if the project is accurately documented

Step 3 – Document

Document the conformance of the project to the Regional ITS Architecture

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USDOT ITS Architecture Conformity Requirements

Deployment of DMS for Traveler Information

Project	Description	Deployment Timeframe and Responsible Agency[1]	Opinion of Probable Cost and Funding Status[2]	Applicable Market Packages
Municipal Arterial DMS	Deploy arterial dynamic message signs (DMS) to provide traveler information on arterials for incident management and special event management capabilities. The arterial DMS could also be used to provide information on freeway conditions prior to travelers entering freeways.	Long-Term: Municipalities as Needed	Cost: $75,000/Site Funding Identified: No	ATMS06 – Traffic Information Dissemination

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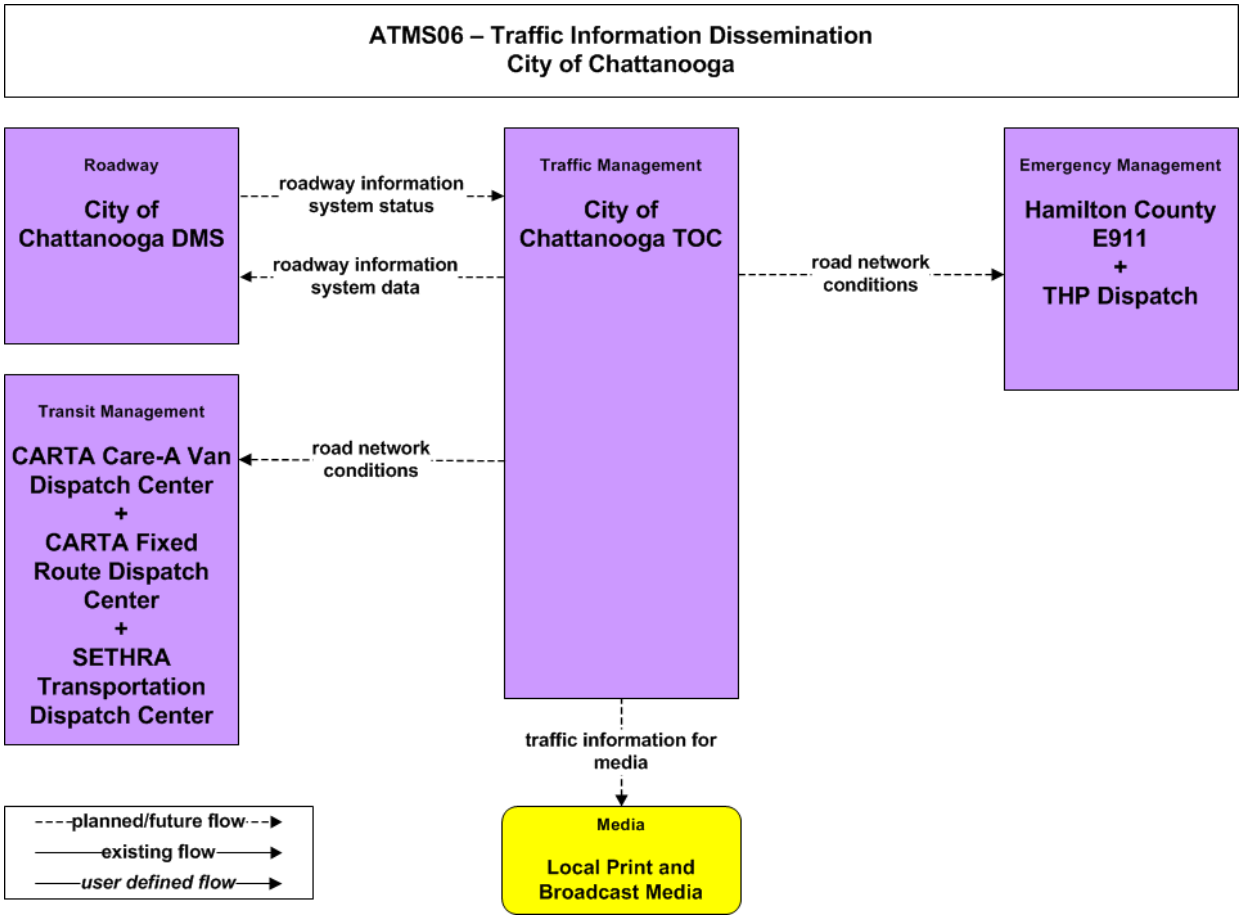
USDOT ITS Architecture Conformity Requirements

Deployment of DMS for Traveler Information



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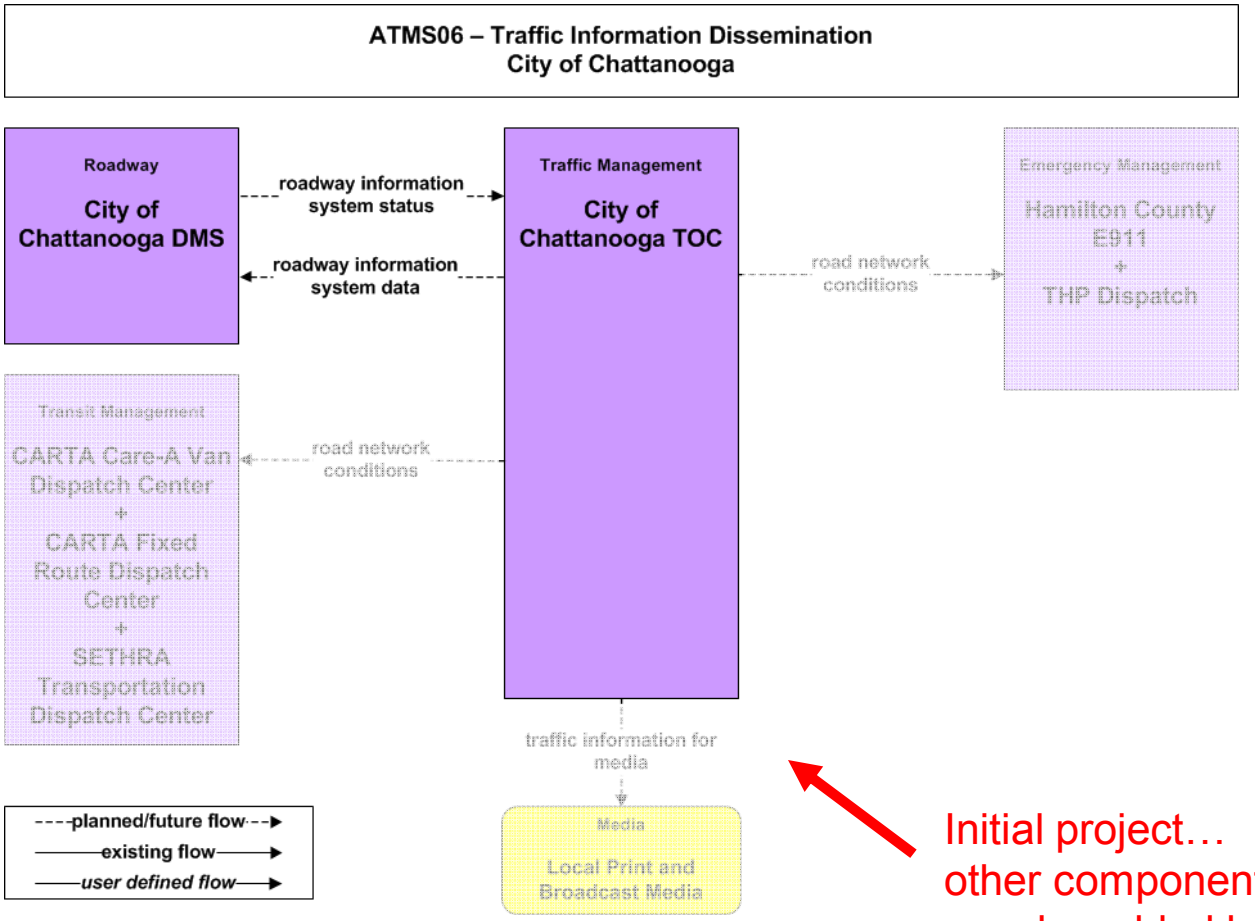
USDOT ITS Architecture Conformity Requirements

Deployment of DMS for Traveler Information



Initial project…
other components
may be added later.

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Use and Maintenance Plan

Project Manager Evaluates Conformance to Regional ITS Architecture

↓

Project Manager Completes ITS Architecture Maintenance Documentation Form and Submits to Maintainer

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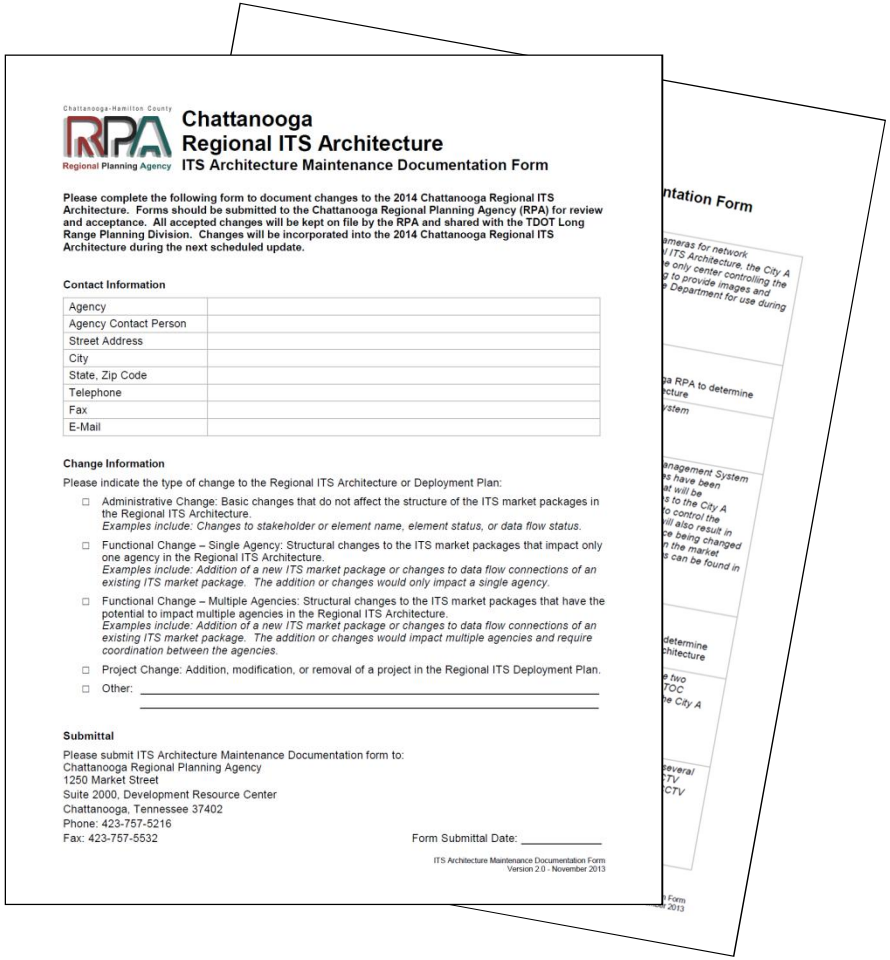
Maintainer Confirms Receipt of Form and Files Form for Use During Next Update



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Chattanooga Regional ITS Architecture

ITS Architecture Maintenance Documentation Form

Please complete the following form to document changes to the 2014 Chattanooga Regional ITS Architecture. Forms should be submitted to the Chattanooga Regional Planning Agency (RPA) for review and acceptance. All accepted changes will be kept on file by the RPA and shared with the TDOT Long Range Planning Division. Changes will be incorporated into the 2014 Chattanooga Regional ITS Architecture during the next scheduled update.

Contact Information

Agency	
Agency Contact Person	
Street Address	
City	
State, Zip Code	
Telephone	
Fax	
E-Mail	

Change Information

Please indicate the type of change to the Regional ITS Architecture or Deployment Plan:

- ☐ Administrative Change: Basic changes that do not affect the structure of the ITS market packages in the Regional ITS Architecture.
  Examples include: Changes to stakeholder or element name, element status, or data flow status.
- ☐ Functional Change – Single Agency: Structural changes to the ITS market packages that impact only one agency in the Regional ITS Architecture.
  Examples include: Addition of a new ITS market package or changes to data flow connections of an existing ITS market package. The addition or changes would only impact a single agency.
- ☐ Functional Change – Multiple Agencies: Structural changes to the ITS market packages that have the potential to impact multiple agencies in the Regional ITS Architecture.
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- ☐ Project Change: Addition, modification, or removal of a project in the Regional ITS Deployment Plan.
- ☐ Other: _____

Submittal

Please submit ITS Architecture Maintenance Documentation form to:
Chattanooga Regional Planning Agency
1250 Market Street
Suite 2000, Development Resource Center
Chattanooga, Tennessee 37402
Phone: 423-757-5216
Fax: 423-757-5532

Form Submittal Date: _____

ITS Architecture Maintenance Documentation Form
Version 2.0 - November 2013

Chattanooga-Hamilton County RPA Regional Planning Agency

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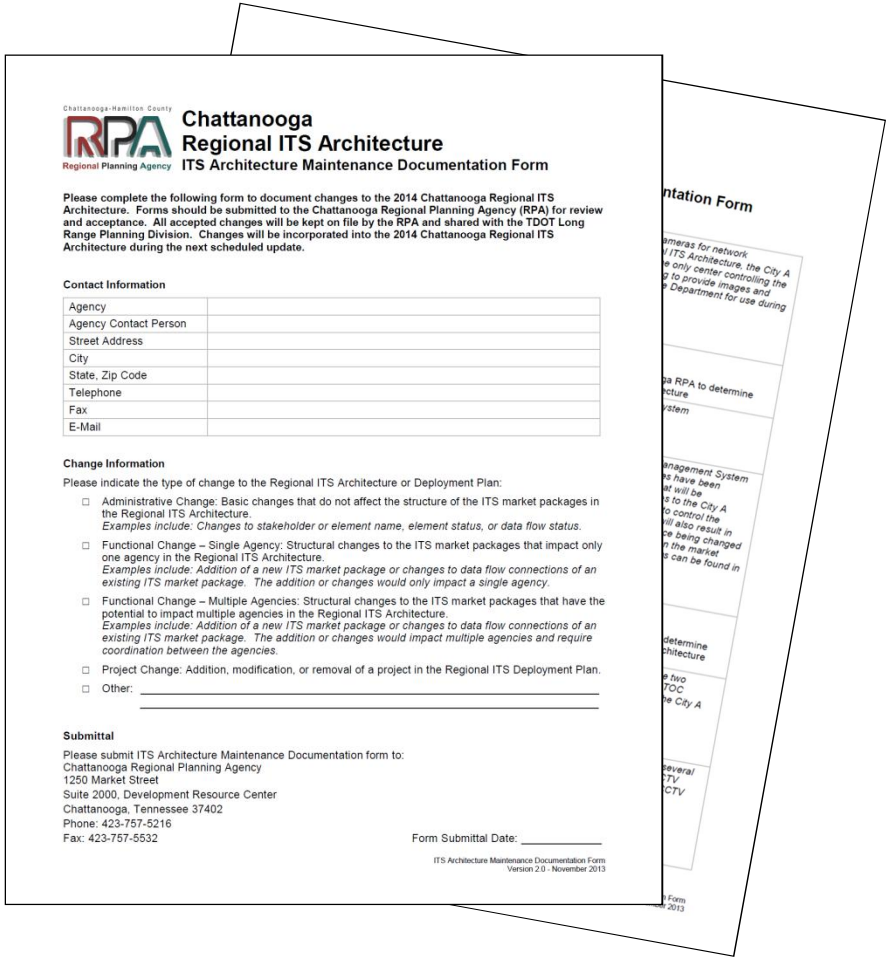
Use and Maintenance Plan

ITS Architecture Maintenance Procedure Needs to Identify:

- Lead Maintenance Agency
- Maintenance Process (Documentation form recommended)
- Timeframe for Updates



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Regional Planning Agency

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Regional ITS Architecture Maintenance Process

Maintenance Details	Regional ITS Architecture		Regional ITS Deployment Plan	
	Minor Update	**Major Update**	**Minor Update**	**Major Update**
Timeframe for Updates	As needed	Approximately every 4 years	Annually	Approximately every 4 years
Scope of Update	Review and update service packages to satisfy architecture compliance requirements of projects or to document other changes that impact the Regional ITS Architecture	Entire Regional ITS Architecture	Review and update project status and add or remove projects as needed	Entire Regional ITS Deployment Plan
Lead Agency	Chattanooga-Hamilton County RPA		Chattanooga-Hamilton County RPA	
Participants	Stakeholders impacted by service package modifications	Entire stakeholder group	Entire stakeholder group	
Results	Service package or other change(s) documented for next complete update	Updated Regional ITS Architecture document, Appendices, and Turbo Architecture database	Updated project tables	Updated Regional ITS Deployment Plan document

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Next Steps

- Comments on the Draft Regional ITS Architecture Due December 13, 2013
- Kimley-Horn to prepare Revised Draft Regional ITS Architecture (with ITS Deployment Plan) in early January 2014
- Presentations to the TPO Executive Board and Technical Coordinating Committee in January
- Obtain TDOT and FHWA Ready for Use Letter
- Final documents and executive summary submitted in April 2014

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Thank You!

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