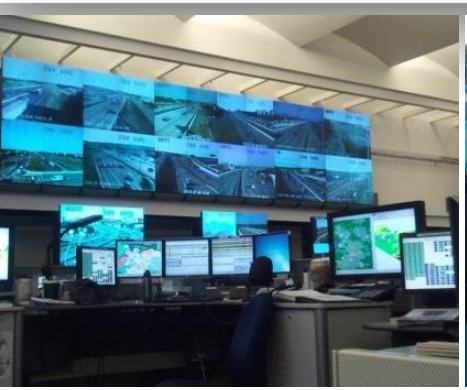
Kimley»Horn

Austin Regional Intelligent Transportation Systems

Architecture and Deployment Plan

STAKEHOLDER WORKSHOP



November 2018

Outline

- Welcome and Introductions
- Overview of the Regional ITS Architecture
- Review of Regional ITS Needs and Level of ITS Deployment
- Use and Maintenance of the Regional ITS Architecture
- Regional ITS Architecture Website
- Next Steps

Overview of the Regional Architecture

What is ITS?

ITS

An acronym that stands for Intelligent Transportation Systems.

One Definition of ITS

The application of data processing and data communications to surface transportation to increase safety and efficiency.

What is ITS?

Why Deploy ITS?

REDUCE CONGESTION

Congestion caused urban Americans to travel **6.9 billion hours** longer and use an extra **3.1 billion gallons** of fuel for an estimated congestion cost of **$160 billion.***

INCREASE SAFETY

In 2017, Texas had 3,721 traffic fatalities and 14,299 serious injury crashes.

IMPROVE RELIABILTY and DECREASE TRAVELER FRUSTRATION

Travelers report variability in travel times to be one of their greatest sources of frustration.

**from the 2015 Urban Mobility Scorecard*

What is the Regional ITS Architecture?

A long-range plan for the deployment, integration, and operation of ITS.

The architecture acts as a framework for ensuring institutional agreement and technical integration among **stakeholders** for the implementation of ITS projects in a particular region.

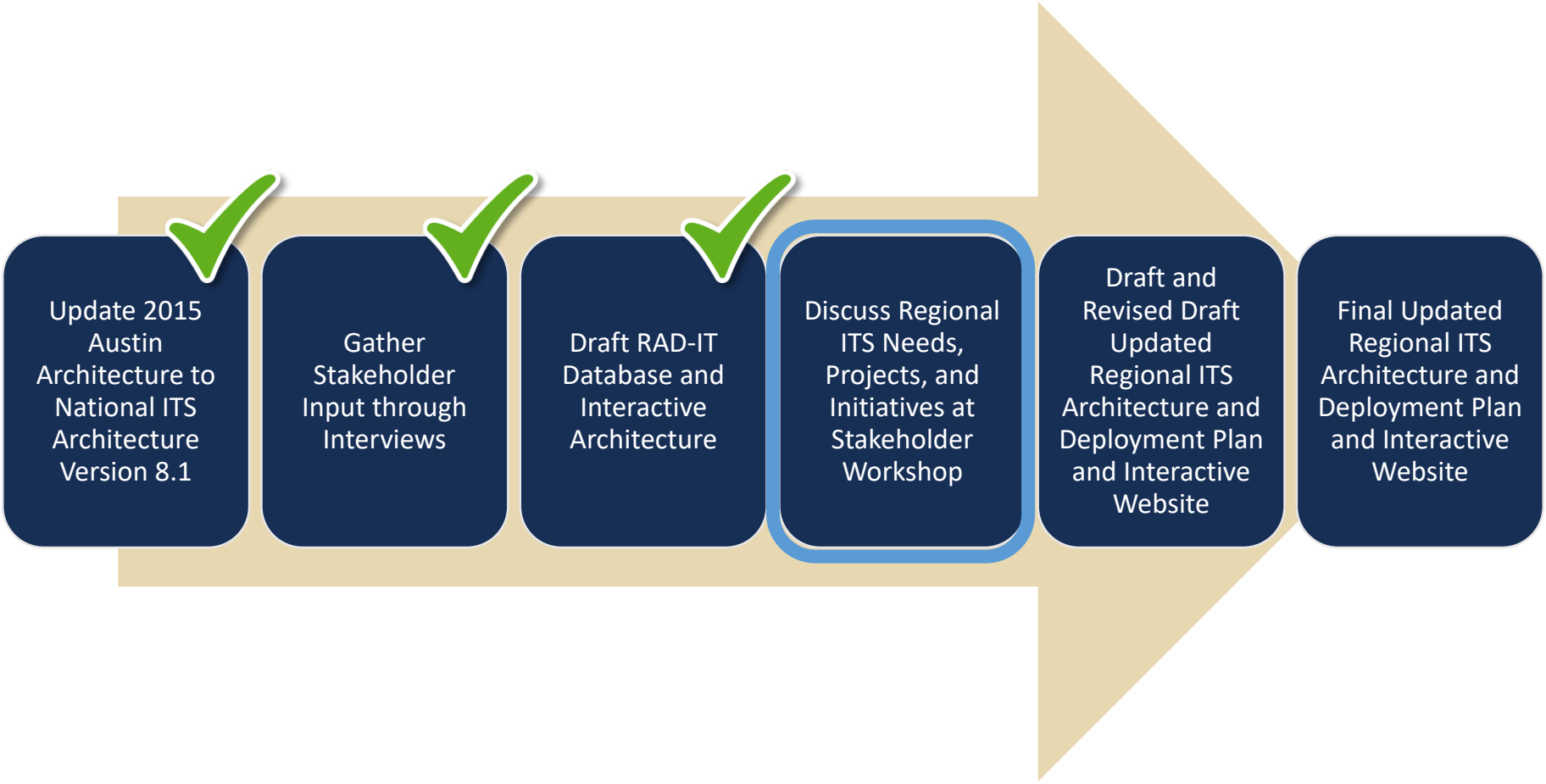
Purpose of the Architecture

- To provide a vision for ITS in the region
- To identify key stakeholders and interagency relationships
- To develop a blueprint for the integration of systems
- To provide a framework for more detailed project design
- To help identify project-level requirements
- To demonstrate conformity for ITS projects using federal funding

History in the Austin Region

- 1996 — Austin Area-Wide Intelligent Vehicle Highway System Plan and IH-35 Corridor Deployment Plan
- 2002 — The first Austin Regional ITS Architecture
- 2007 — Austin Regional ITS Architecture Update
- 2015 — Austin Regional ITS Architecture Update
- 2019 — Current Austin Regional ITS Architecture Update

Architecture Update Process



National ITS Architecture Structure

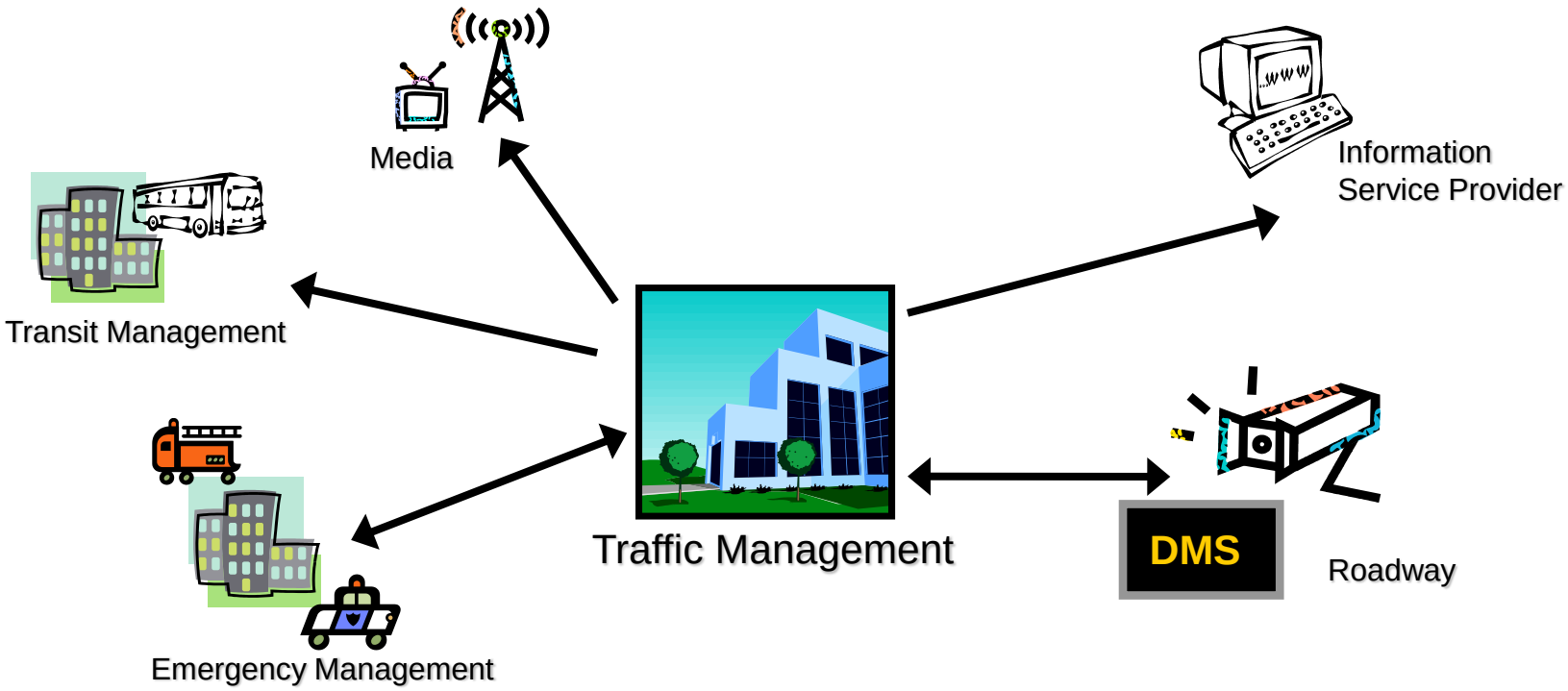
Twelve Service Areas for ITS

- Traffic Management
- Traveler Information
- Public Safety
- Maintenance and Construction
- Commercial Vehicle Operations
- Sustainable Travel
- Public Transportation
- Weather
- Data Management
- Support
- Parking Management
- Vehicle Safety

National ITS Architecture Structure

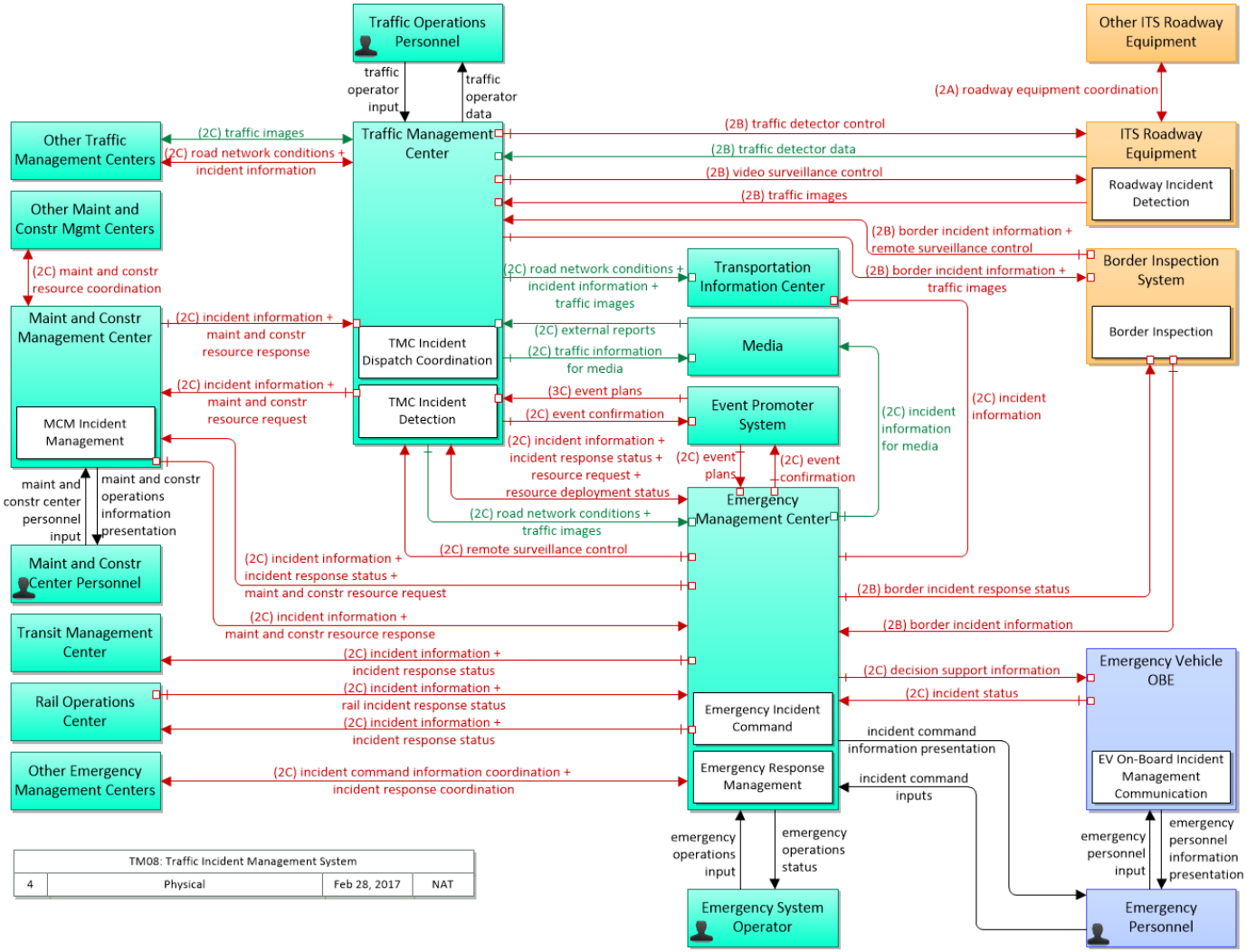
- Each service area includes multiple ITS service packages
- ITS service packages provide a visual representation of how ITS services are deployed and how information is shared
- Total of 139 ITS service packages in the National ITS Architecture (compared to 97 in previous version)
- 89 Service packages selected for Austin (compared to 59 in previous version)

National ITS Architecture Structure



TM08 – Traffic Incident Management
Example ITS Service Package

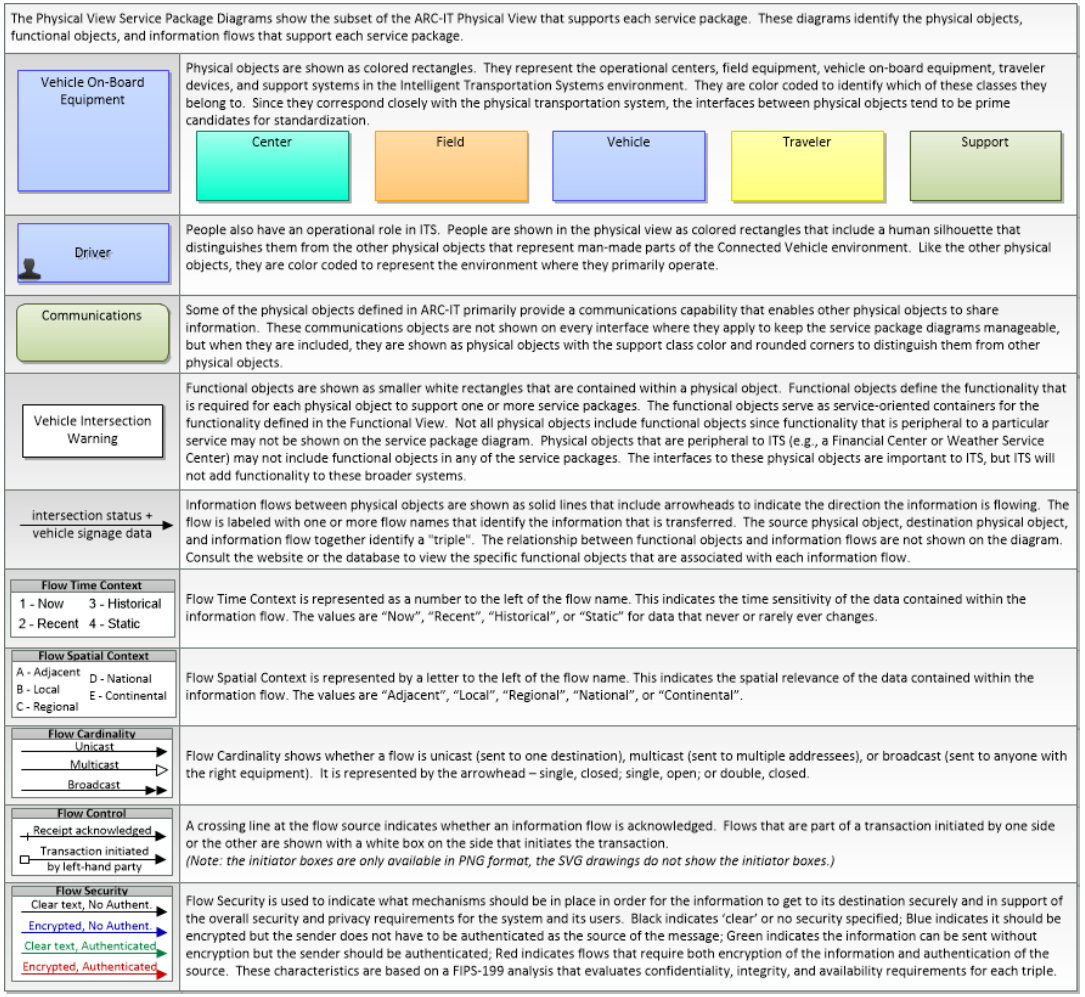
National ITS Architecture Structure



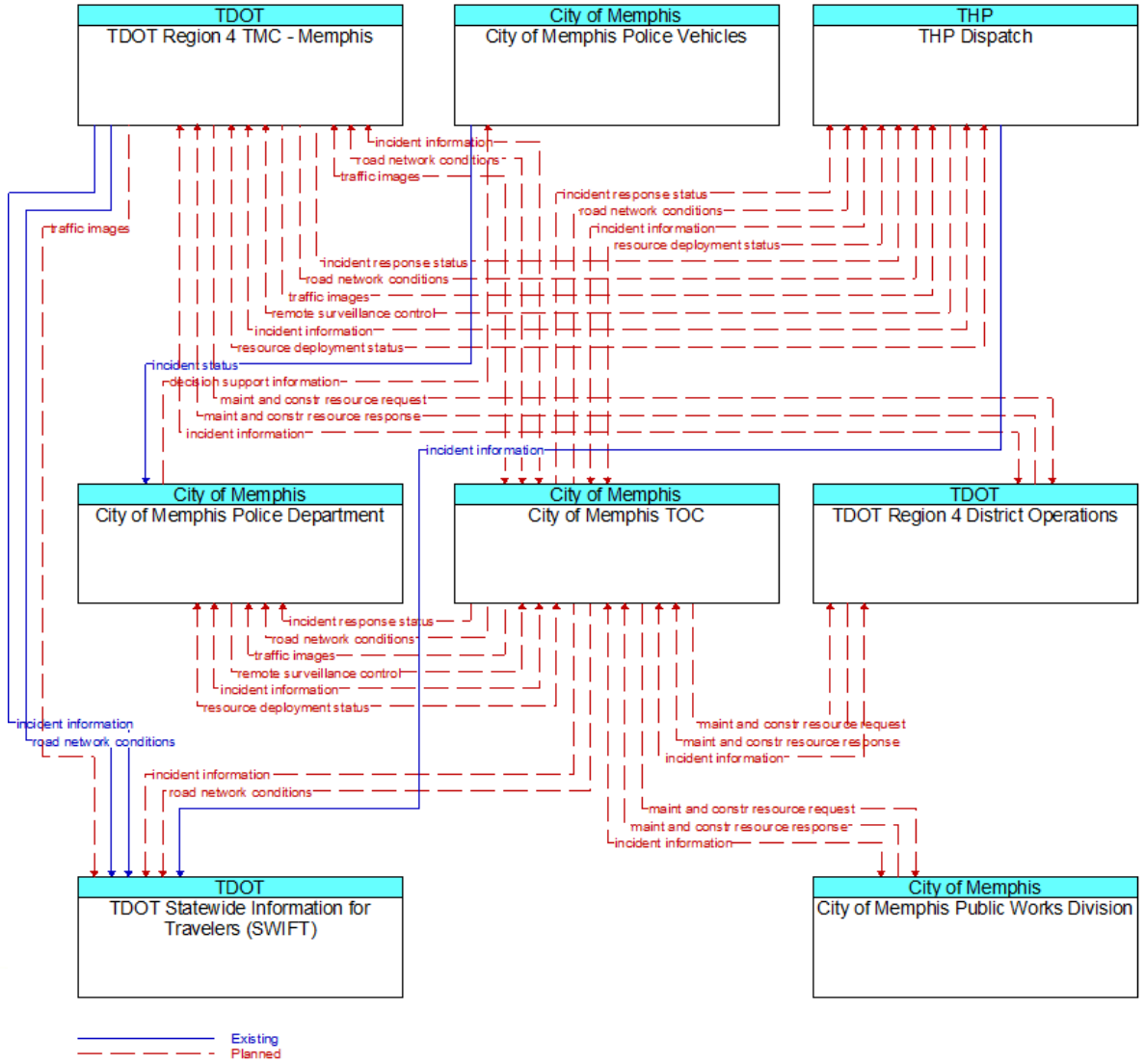
TM08 – Traffic Incident Management Example ITS Service Package

National ITS Architecture Structure

ITS Service Package Legend



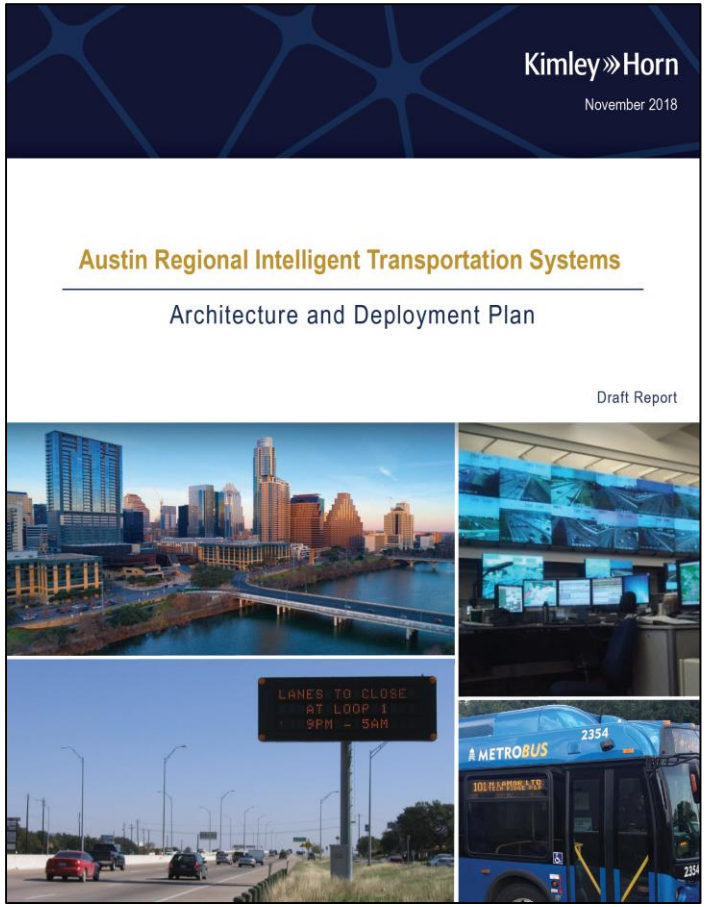
National ITS Architecture Structure



TM08 – Traffic Incident Management
Example ITS Service Package

Key Content of the Regional ITS Architecture and Deployment Plan

- Stakeholder Agencies
- Regional ITS Needs
- Inventory of Existing and Planned Components
- ITS Service Packages
- Standards
- Deployment Plan
- Use and Maintenance



What Have We Heard So Far?

Regional ITS Needs

- Improved coordination and data sharing between agencies, including computer-aided dispatch (CAD) and incident status
- Opportunities for consolidated regional traffic management
- Increased interagency access to ITS resources (e.g., CCTV cameras and Dynamic Message Signs)
- Ability to pay a single fare for a transit trip involving multiple transit providers
- Readiness for industry advancements in Connected and Automated Vehicles
- Expansion of emergency vehicle preemption and freeway safety service patrol

What are our Regional Needs and Level of ITS Deployment?

Service Area 1

Traffic Management

Level of Deployment	High
Level of Interest	High

Example service packages include:

- Traffic Signal Control
- Traffic Incident Management System
- Variable Speed Limit Signs
- Ramp Metering

Service Area 2

Traveler Information

Level of Deployment	Medium
Level of Interest	High

Example service packages include:

- Broadcast Traveler Information
- Dynamic Route Guidance
- In-vehicle Signage

Service Area 3

Public Safety

Level of Deployment	Medium
Level of Interest	High

Example service packages include:

- Emergency Vehicle Preemption
- Roadway Service Patrols
- Disaster Response and Recovery

Service Area 4

Maintenance and Construction

Level of Deployment	Medium
Level of Interest	High

Example service packages include:

- Maintenance Vehicle and Equipment Tracking
- Infrastructure Monitoring
- Roadway Automated Treatment

Service Area 5

Commercial Vehicle Operations

Level of Deployment	Medium
Level of Interest	High

Example service packages include:

- Electronic Clearance
- HAZMAT Management
- Roadside and Virtual Weigh-in-Motion

Service Area 6

Sustainable Travel

Level of Deployment	Low
Level of Interest	Medium

Example service packages include:

- Emissions Monitoring
- Electric Charging Stations Management
- HOV/HOT Lane Management

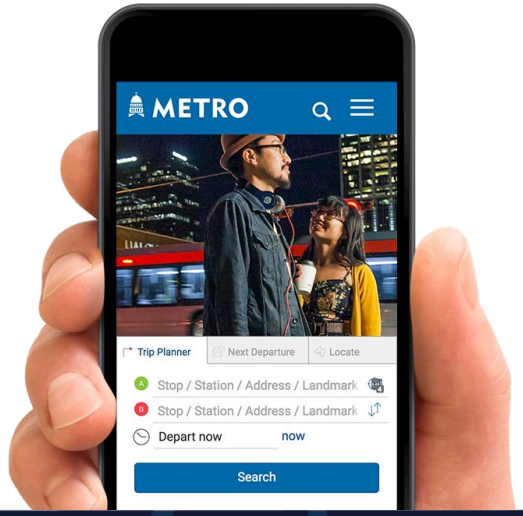
Service Area 7

Public Transportation

Level of Deployment	Medium
Level of Interest	High

Example service packages include:

- Transit Vehicle Tracking
- Transit Traveler Information
- Transit Signal Priority



Service Area 8

Weather

Level of Deployment	Medium
Level of Interest	Medium

Example service packages include:

- Weather Data Collection
- Weather Information Processing and Distribution
- Spot Weather Impact Warning

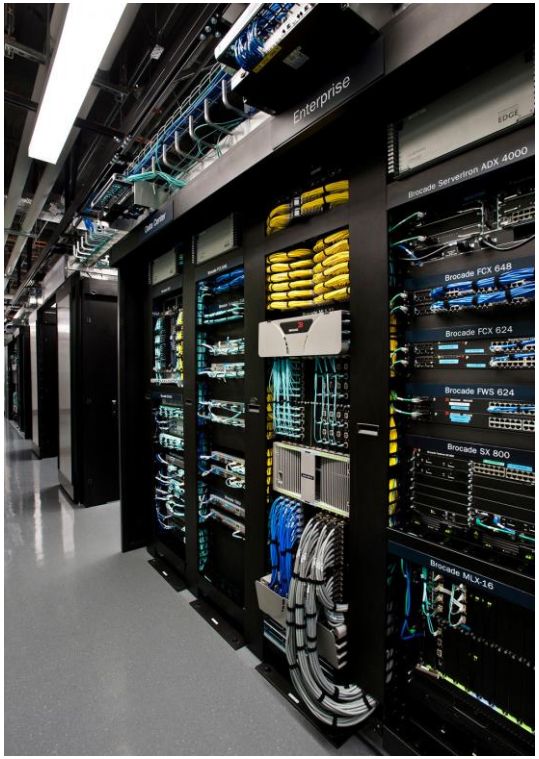
Service Area 9

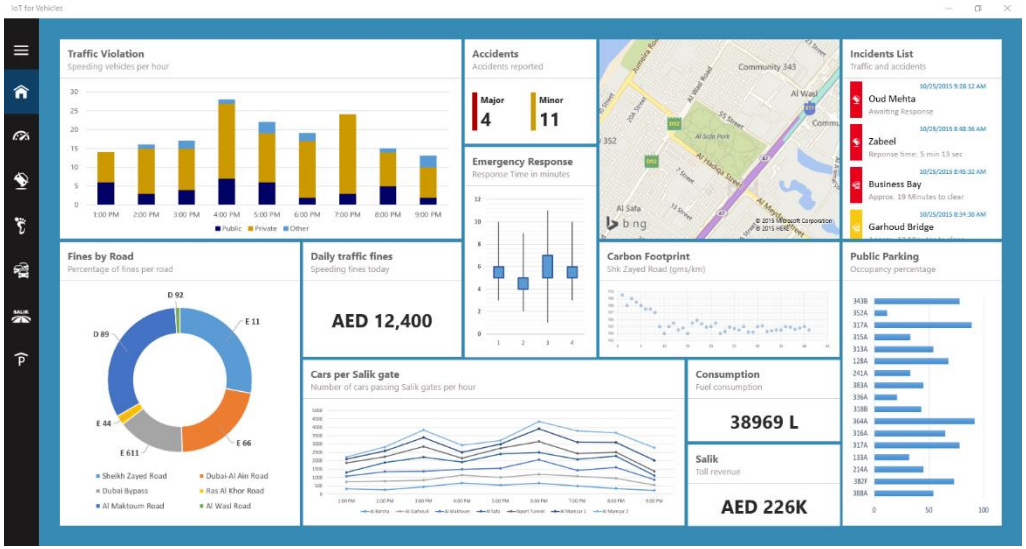
Data Management

Level of Deployment	Low
Level of Interest	High

Example service packages include:

- ITS Data Warehouse
- Performance Monitoring





Service Area 10

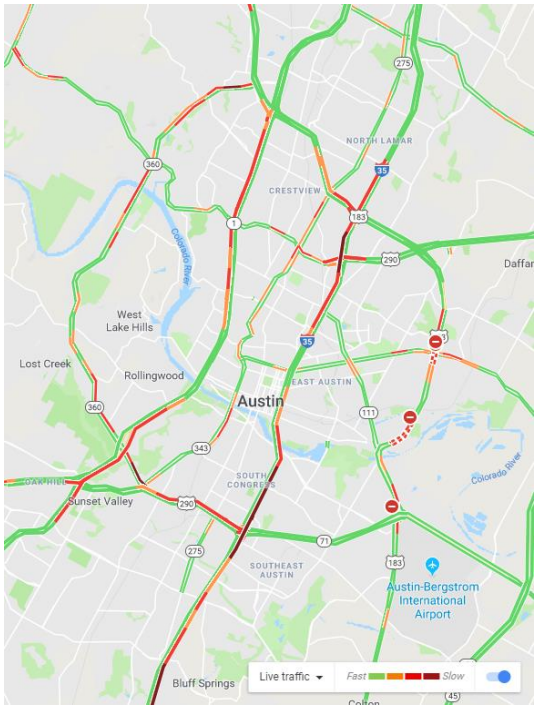
Support

Level of Deployment	Medium
Level of Interest	Medium

Catch-all category for systems supporting transportation operations.

Example service packages include:

- Map Management
- Data Distribution
- Security and Credentials Management



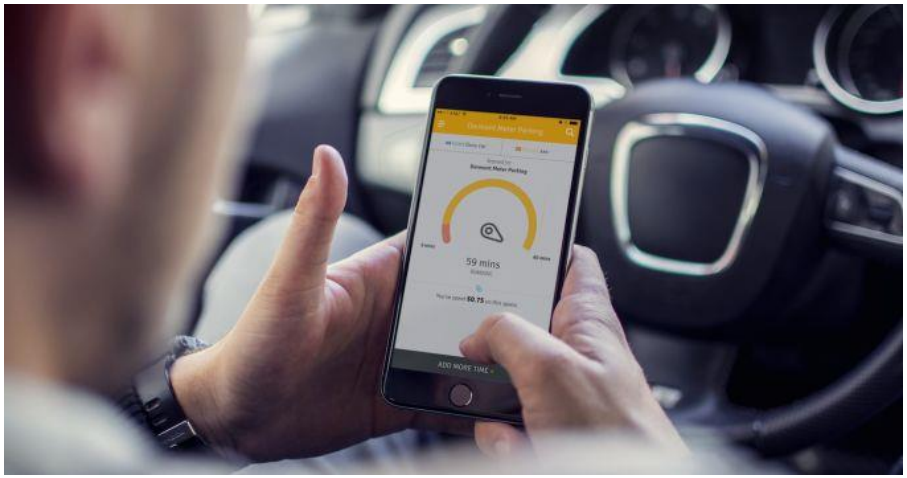
Service Area 11

Parking Management

Level of Deployment	Medium
Level of Interest	Medium

Example service packages include:

- Parking Space Management
- Parking Electronic Payment
- Smart Park and Ride System



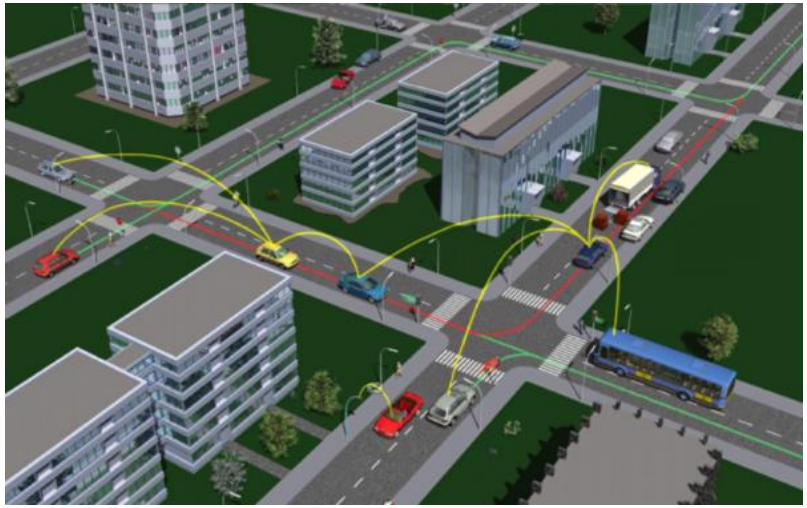
Service Area 12

Vehicle Safety

Level of Deployment	Low
Level of Interest	High

Example service packages include:

- Connected Vehicle Curve Speed Warning
- Connected Vehicle Queue Warning
- Automated Vehicle Operations



Potential Regional ITS Projects and Operations Initiatives

Potential Regional ITS Projects and Operations Initiatives

- Regional Platform for Camera and DMS Sharing
- Regional Platform for Incident Information Sharing
- Integrated Corridor Management
- Regional Traffic Management Center Concepts
  - Travis County
  - Williamson County
- Regional Transit Fare System
- Data Management
- **Other Regional Projects?**

Use and Maintenance

Systems Engineering

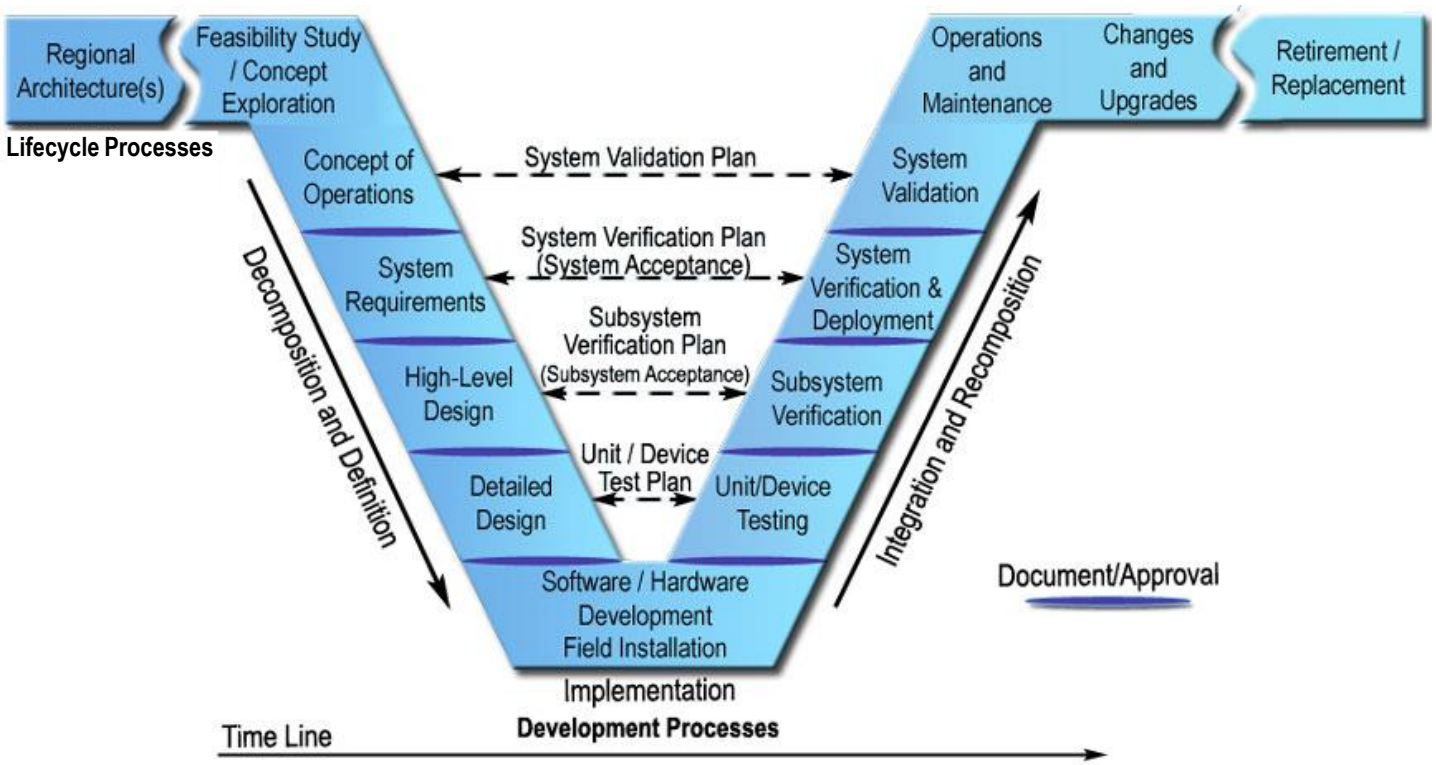
Definition

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.

Systems Engineering



Systems Engineering Analysis

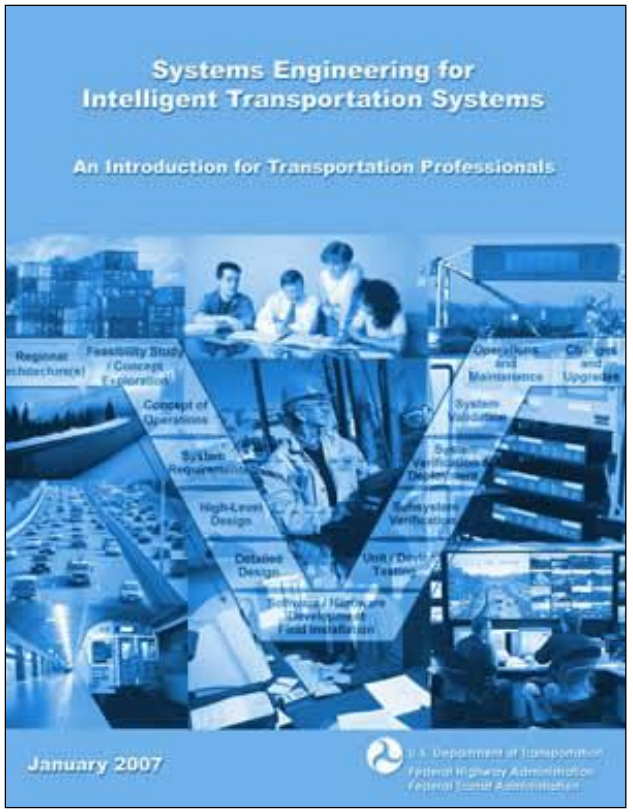
USDOT Systems Engineering Requirements

- Required for all ITS projects funded with highway trust funds
- Scale should be commensurate with the project scope
- Includes:
  - Identification of the part of the ITS architecture being implemented
  - Agencies roles and responsibilities
  - Alternatives analysis
  - Standards

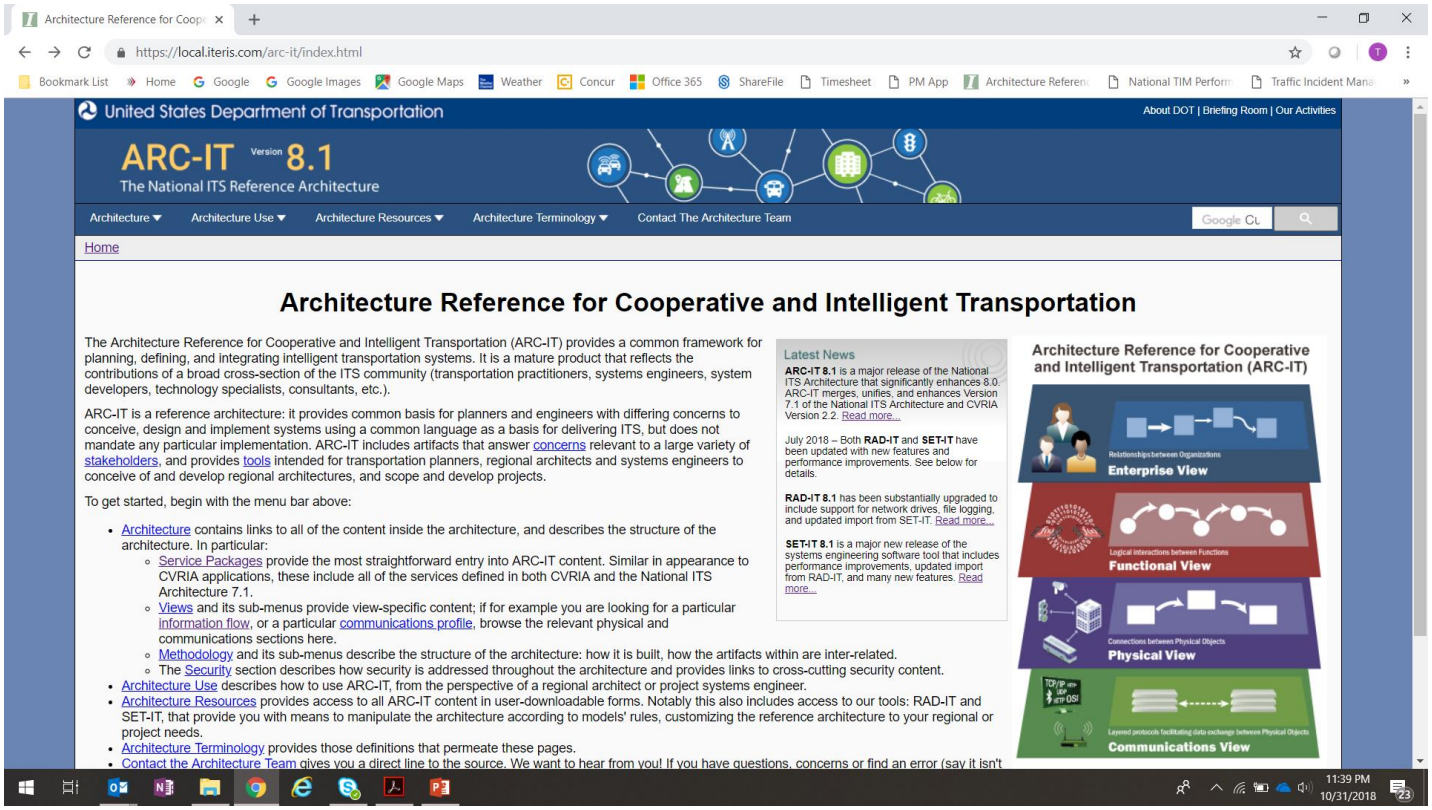
Resources

FHWA Systems Engineering for Intelligent Transportation Systems

An Introduction for Transportation Professionals



Resources



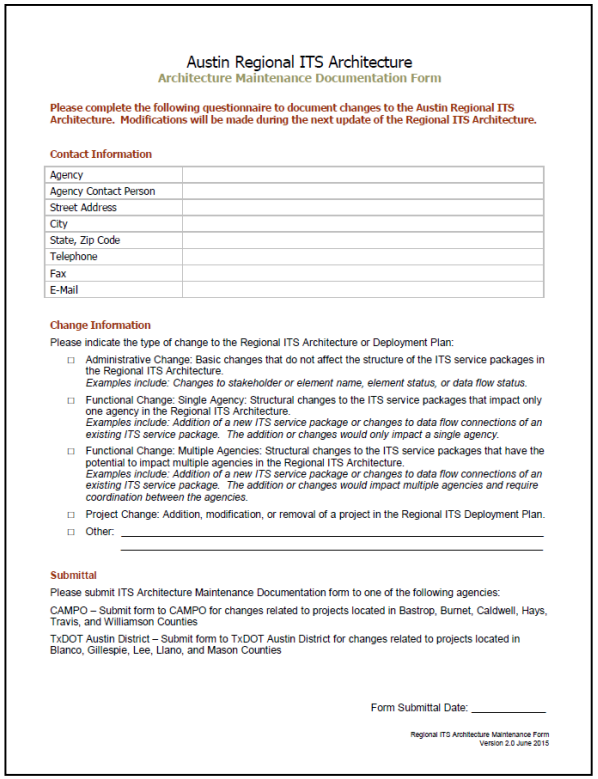
National ITS Architecture Website

Architecture Website and Download for ARC-IT and SET-IT

Use and Maintenance Plan

ITS Architecture Maintenance Procedure Needs to Identify

1. Maintenance Process (Documentation Form)
2. Lead Maintenance Agency
3. Timeframe for Updates



Austin Regional ITS Architecture

Architecture Maintenance Documentation Form

Please complete the following questionnaire to document changes to the Austin Regional ITS Architecture. Modifications will be made during the next update of the Regional ITS Architecture.

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 service 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 service packages that impact only one agency in the Regional ITS Architecture.
  Examples include: Addition of a new ITS service package or changes to data flow connections of an existing ITS service package. The addition or changes would only impact a single agency.
- ☐ Functional Change: Multiple Agencies: Structural changes to the ITS service packages that have the potential to impact multiple agencies in the Regional ITS Architecture.
  Examples include: Addition of a new ITS service package or changes to data flow connections of an existing ITS service package. The addition or changes would impact multiple agencies and require coordination between the agencies.
- ☐ 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 one of the following agencies:

CAMPO – Submit form to CAMPO for changes related to projects located in Bastrop, Burnet, Caldwell, Hays, Travis, and Williamson Counties

TxDOT Austin District – Submit form to TxDOT Austin District for changes related to projects located in Blanco, Gillespie, Lee, Llano, and Mason Counties

Form Submittal Date: _____

Regional ITS Architecture Maintenance Form
Version 2.0 June 2015

Use and Maintenance Plan

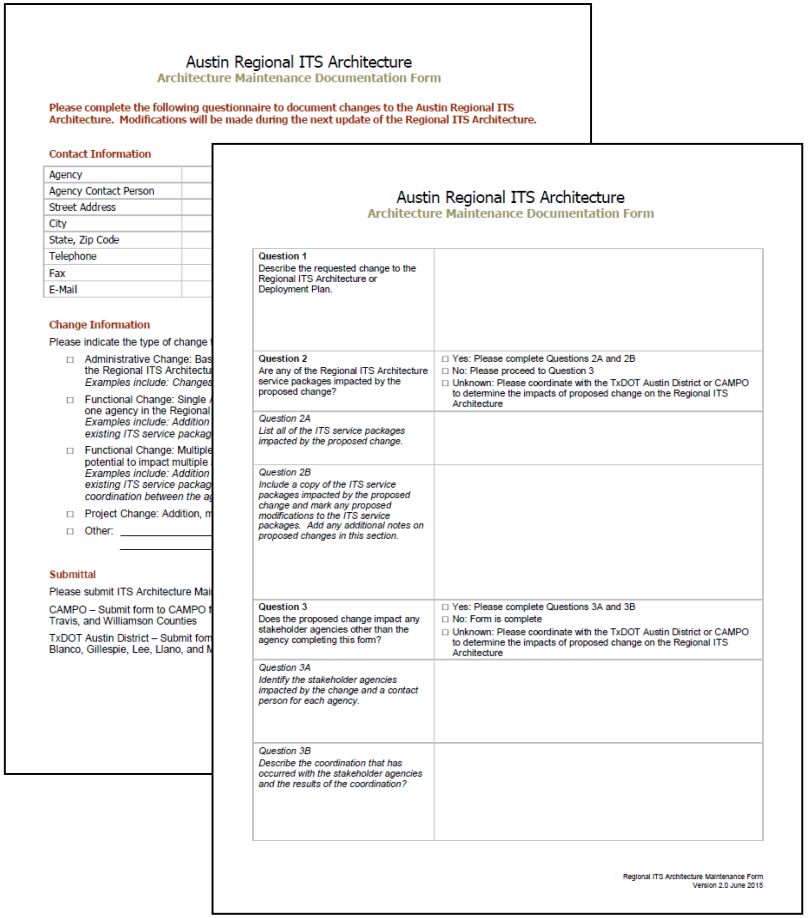
Project Manager Evaluates Conformance to Regional ITS Architecture

↓

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

↓

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



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Agency Contact Person	
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Fax	
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Change Information

Please indicate the type of change

- ☐ Administrative Change: Bas
the Regional ITS Architectu
Examples include: Changes
- ☐ Functional Change: Single
one agency in the Regional
Examples include: Addition
existing ITS service packag
- ☐ Functional Change: Multiple
potential to impact multiple
Examples include: Addition
existing ITS service packag
coordination between the ag
- ☐ Project Change: Addition, m
- ☐ Other: _____

Submittal

Please submit ITS Architecture Mai

CAMPO – Submit form to CAMPO f
Travis, and Williamson Counties

TxDOT Austin District – Submit for
Blanco, Gillespie, Lee, Llano, and M

Austin Regional ITS Architecture
Architecture Maintenance Documentation Form

Question 1 Describe the requested change to the Regional ITS Architecture or Deployment Plan.	
Question 2 Are any of the Regional ITS Architecture service packages impacted by the proposed change?	☐ Yes: Please complete Questions 2A and 2B ☐ No: Please proceed to Question 3 ☐ Unknown: Please coordinate with the TxDOT Austin District or CAMPO to determine the impacts of proposed change on the Regional ITS Architecture
Question 2A *List all of the ITS service packages impacted by the proposed change.*	
Question 2B *Include a copy of the ITS service packages impacted by the proposed change and mark any proposed modifications to the ITS service packages. Add any additional notes on proposed changes in this section.*	
Question 3 Does the proposed change impact any stakeholder agencies other than the agency completing this form?	☐ Yes: Please complete Questions 3A and 3B ☐ No: Form is complete ☐ Unknown: Please coordinate with the TxDOT Austin District or CAMPO to determine the impacts of proposed change on the Regional ITS Architecture
Question 3A *Identify the stakeholder agencies impacted by the change and a contact person for each agency.*	
Question 3B *Describe the coordination that has occurred with the stakeholder agencies and the results of the coordination?*	

Regional ITS Architecture Maintenance Form
Version 2.0 June 2015

Regional ITS Architecture Maintenance Process

Maintenance Details	Regional ITS Architecture and Deployment Plan	
	Modification	**Complete Update**
Timeframe for Updates	As needed	Every 4 years
Scope of Update	Update service packages to satisfy architecture compliance requirements of projects or to document other changes that impact the ITS Architecture	Entire ITS Architecture and Deployment Plan
Lead Agency	TxDOT/CAMPO	TxDOT/CAMPO
Participants	Stakeholders impacted by service package modifications	Entire stakeholder group
Results	Service package or other change(s) documented for next complete update	Updated Austin Regional ITS Architecture document, Appendices, and RAD-IT database

Regional ITS Architecture Website

Regional ITS Architecture Website

www.AustinITSArchitecture.com

Next Steps

Next Steps

Conduct additional outreach for input into the Regional ITS Architecture

Develop Draft Austin Regional ITS Architecture and Deployment Plan and Interactive Website over the next month

Finalize Architecture and Deployment Plan and Interactive Website following stakeholder review

Thank You!

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