TMACOG
Regional ITS Architecture Update

Stakeholder Meeting

April 7, 2016

Agenda

9:00 AM	Welcome, Introductions & Project Overview
9:15 AM	ITS Architecture Overview

- National ITS Architecture Terms and Concepts
- Regional ITS Architecture Overview
- Website Overview

9:45 AM	Review and Update TMACOG Regional ITS Stakeholders and ITS Elements
10:00 AM	Break
10:15 AM	Discussion of Regional ITS Projects
11:00 AM	Service Package Overview/Prioritization

Agenda (2)

11:30 AM	Review and Update ITS Services
	• Travel and Traffic Management
12:00 PM	Lunch
01:00 PM	Review and Update ITS Services (Continued)
	• Transit Management
	• Maintenance and Construction Operations
	• Traveler Information
	• Archived Data Management
	• Emergency Management
02:00 PM	Operational Concepts/ Interagency Agreements
02:30 PM	Use of Regional ITS Architecture
02:45 PM	Next Steps
03:00 PM	Adjourn

Introductions

- Brief Stakeholder Introductions
  - Name
  - Organization
  - Role – in the context of Intelligent Transportation Systems
    - For Yourself
    - For Your Organization

Project Overview – Background, Scope, Schedule

Project Background

- Update the TMACOG Regional ITS Architecture
  - Architecture last revised in 2005. The website is located at http://www.consystec.com/ohio/toledo/toledointro.htm
  - This update will expand upon previous version creating
    - Updated list of ITS Projects
    - Update the regional ITS architecture website
    - Add projects to the architecture website

Project Tasks

1. ITS Architecture Kickoff Meeting – held 2/4/16
2. Stakeholder Interviews
3. Development of Draft Update of ITS Architecture
4. Stakeholder Workshop (Today)
5. Create Project Architectures, ITS Architecture Document, and draft website
6. Stakeholder Webinar to review complete update/ Presentation to Transportation Council
7. Finalize ITS Architecture/ Arch Training

Current Schedule

- Stakeholder Interviews- Complete
- Development of Draft ITS Architecture - Complete
- Stakeholder Workshop- 4/7
- Develop Project Architectures, Document, and Website – 4/25
- Comment Period – 4/26-5/20
- Update Arch based on comments - 5/23-6/3
- Review Webinar/ Transportation Council Brief - June
- Finalize ITS Architecture/ Training – June

ITS Architecture Overview

Intelligent Transportation Systems

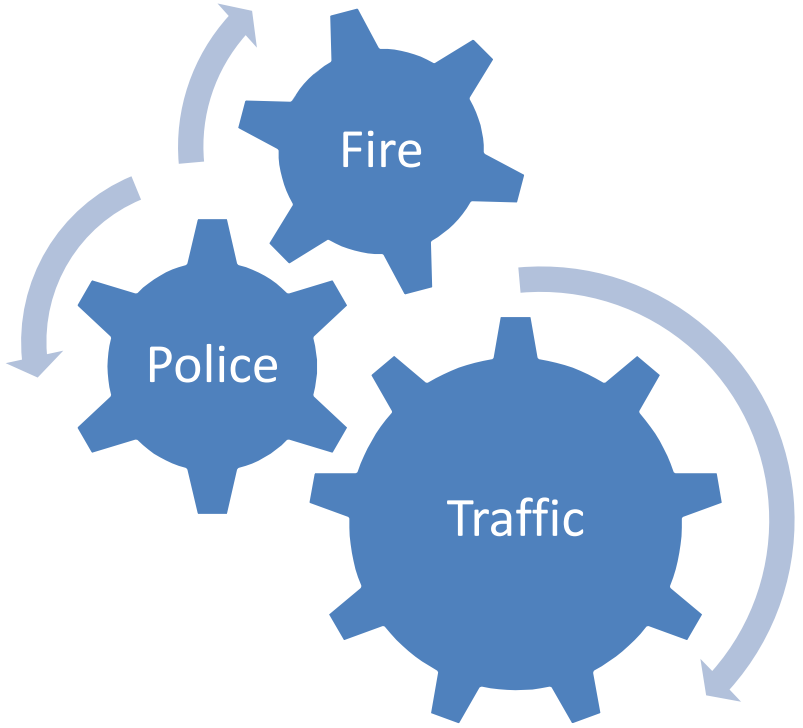
- Definition
  - "The Application of data processing and data communications to surface transportation, to increase safety and efficiency."
- Includes Systems within
  - Traffic Management
  - Transit Management
  - Emergency Management
  - Traveler Information
  - Maintenance Management

History of ITS Architecture

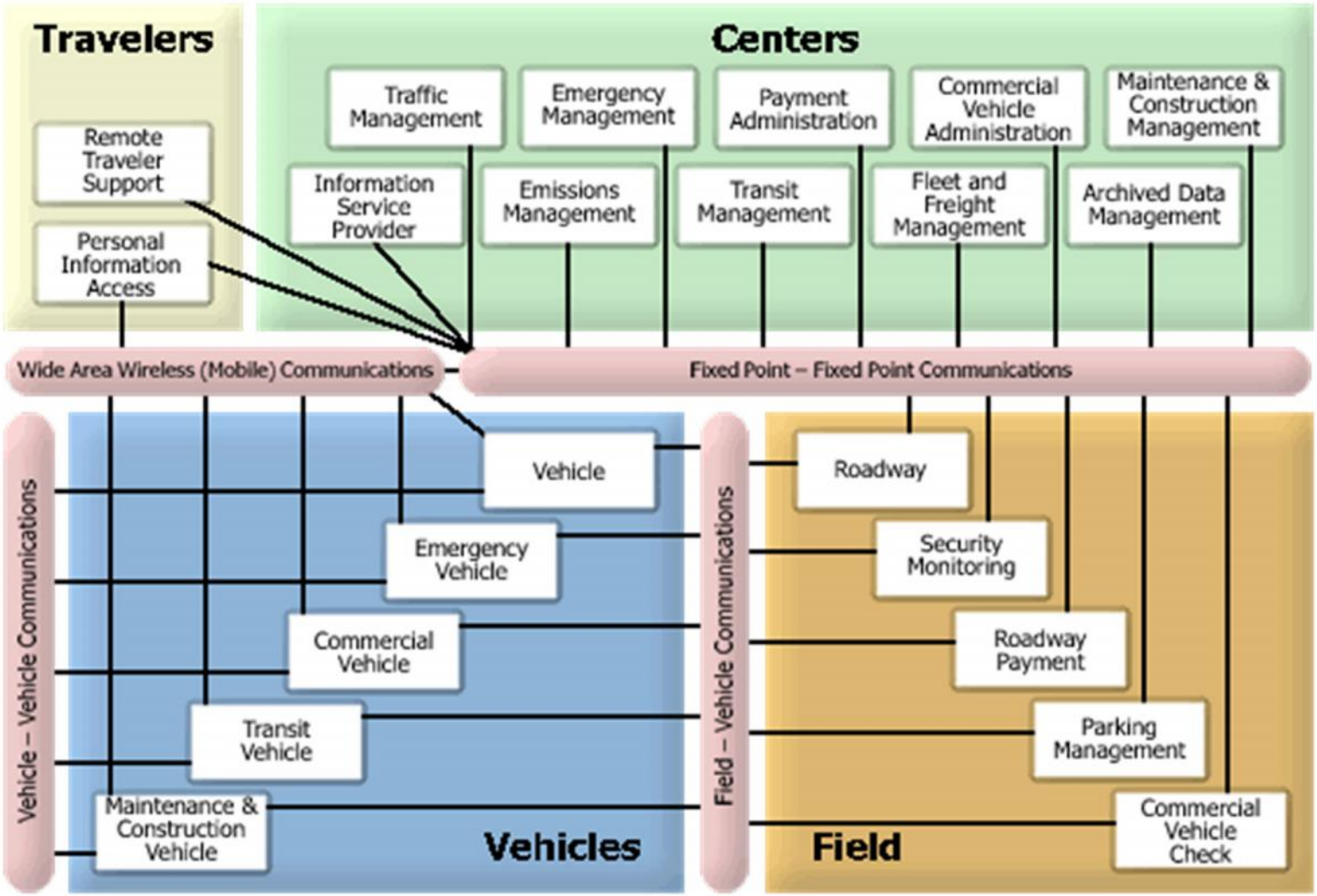
- Broad FHWA funding for regional ITS in early 1990s
- Many systems deployed but data collected was proprietary and systems could not talk to each other
- In 1996, National ITS Architecture established
- In 2001, FHWA issued Rule 940 requiring that ITS architectures be developed for 'regionally significant' ITS projects to be eligible for federal funding

The National ITS Architecture

- National ITS Architecture was developed so that every region would have the same ‘language’
- Process is based on a typical planning process

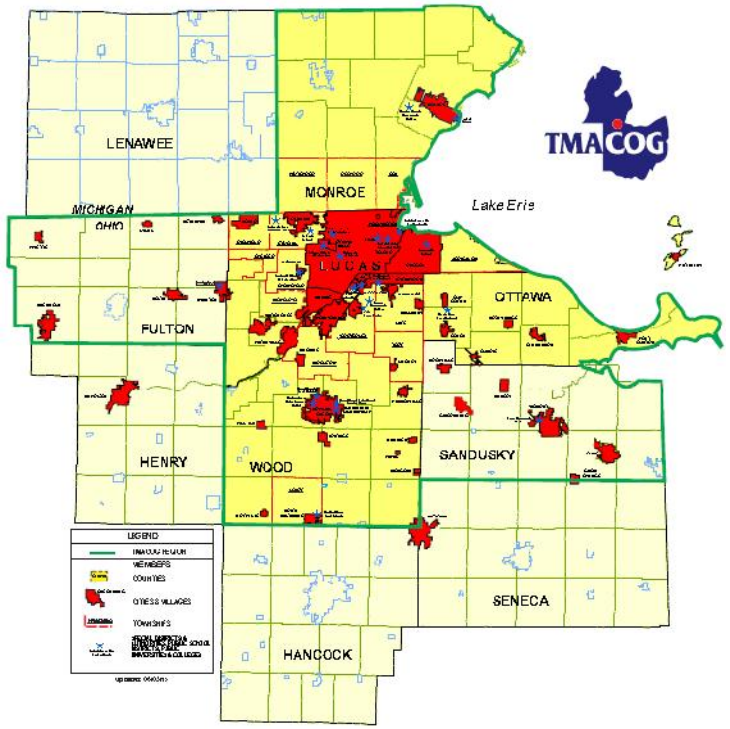


National ITS Architecture – Framework and Template



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

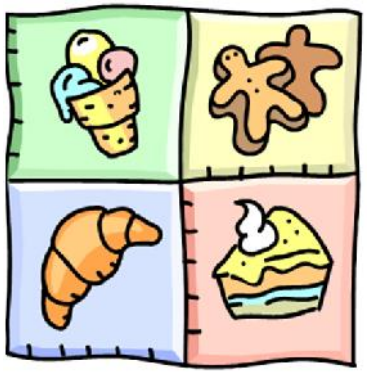


What is Regional ITS Architecture?

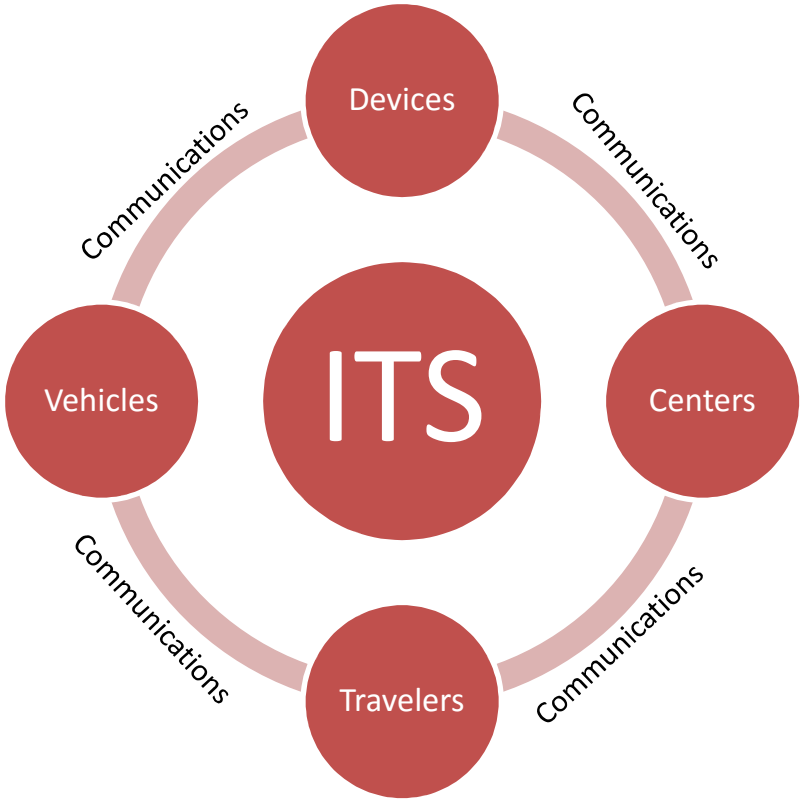
- Does Provide:
  - A blueprint on how ITS systems will work together to satisfy surface transportation needs.
  - Identifies the ITS stakeholders in a region and their elements
  - Identifies the information to be exchanged between stakeholder elements
  - Selects standards for information exchange
- Doesn't Define:
  - Select specific technologies or design
  - Determine how projects are selected or funded

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



Architecture Elements: Subsystems thru Communications



- Field Devices
  - Cameras
  - Electronic Signs
  - Speed Sensors
- Centers
  - Traffic Mgmt Center
  - 911 Dispatch
- Vehicles
  - GPS and AVL tracking
- Travelers

Traffic Information Dissemination

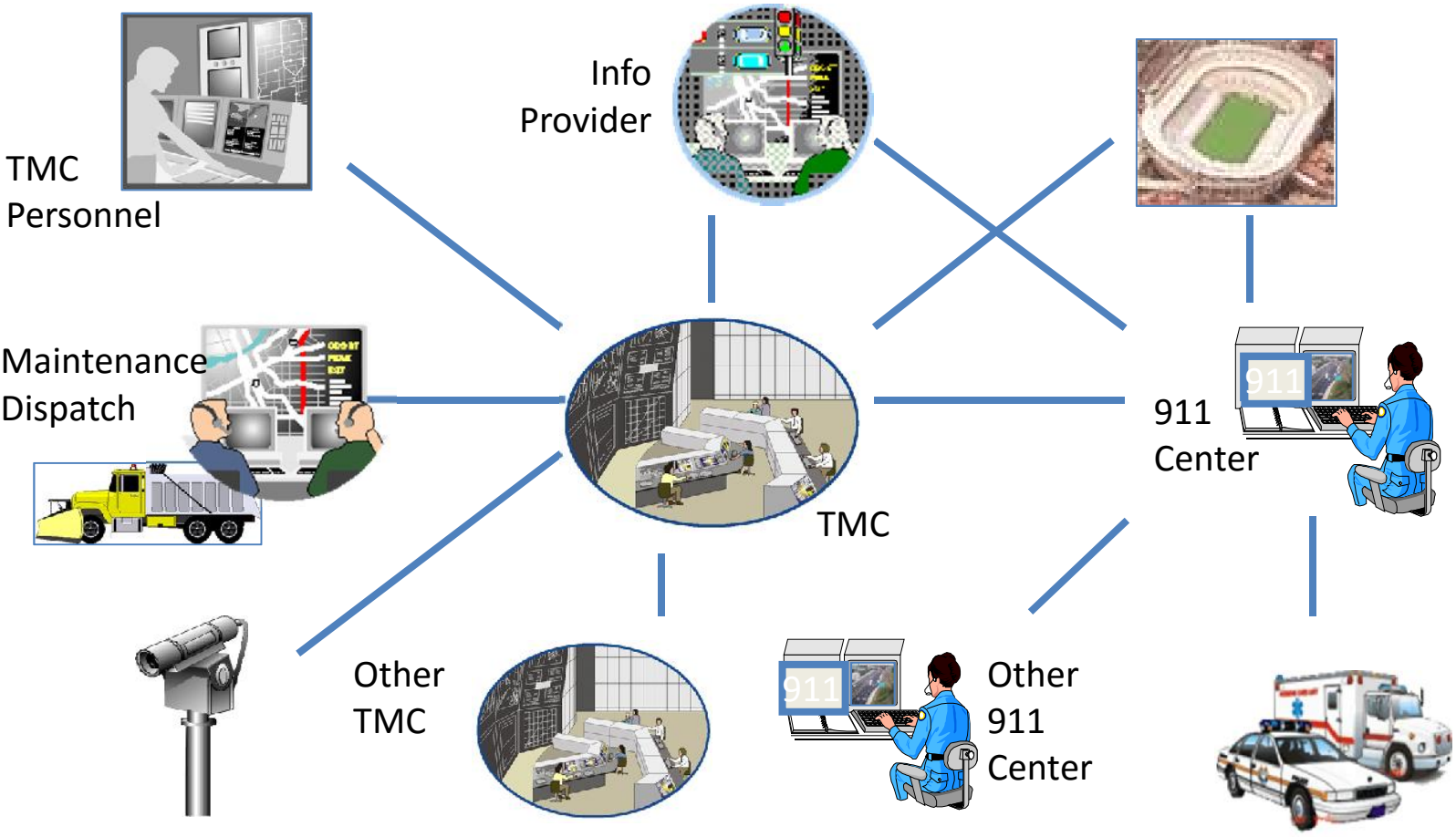
TMC

Dynamic Message Signs

Web Site

Motorist

Incident Management



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 TMACOG Regional 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
  - Understand where we are going with our Intelligent Transportation System
- Find opportunities to work together across multiple jurisdictions and agencies

More Benefits

- 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)
  - Identify open ITS standards: reduce long term risk/cost

Still more Benefits

- Institutional Agreement:
  - The problem: Time consuming when information crosses institutional boundaries
  - Regional ITS Architecture: Establish consensus based foundation for agreements – to get the process started

And finally….

- 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
  - Defines requirements for ITS projects

FHWA Rule/FTA Policy

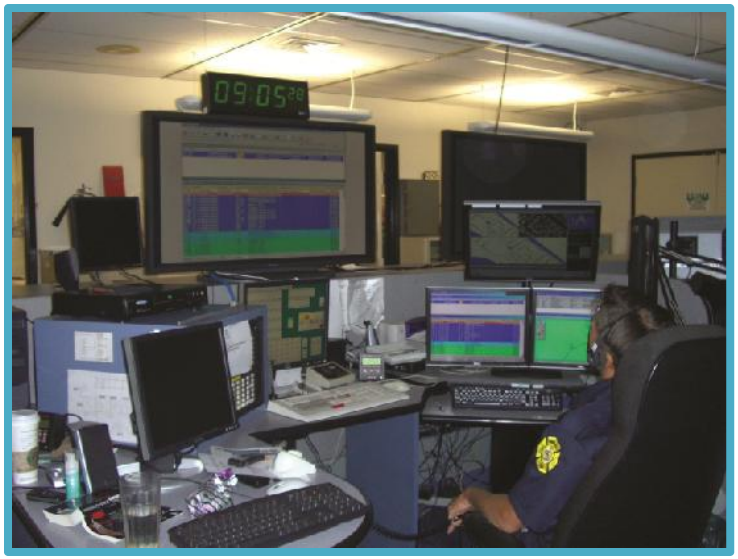
1. Description of the region (Scope)
2. Identification of participating agencies and their systems (Inventory)
3. Operational concept
4. Agreements required for implementation
5. System functional requirements
6. Interface requirements
7. Identification of ITS standards
8. Sequence of projects required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

ITS Projects

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

In Summary…

- To ensure investments in ITS can be leveraged
  - Primary purpose of ITS is to support daily traffic operations, transit and safety
  - Provide additional services as defined
- To be eligible for FHWA funding



Discussion of TMACOG Scope, Stakeholders and Elements

TMACOG Regional ITS Architecture Scope

- Geographic
  - Covers the entire TMACOG boundary.
- Time Frame
  - Existing Today → 20 years in the future, with an emphasis on those ITS activities likely to be implemented in the next 5-10 years
- Scope of Services
  - Traffic management, maintenance and construction operations, incident management, emergency services, transit management, traveler information, and archived data management

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.

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 Stakeholders and Inventory

– Let's review the Stakeholders and 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

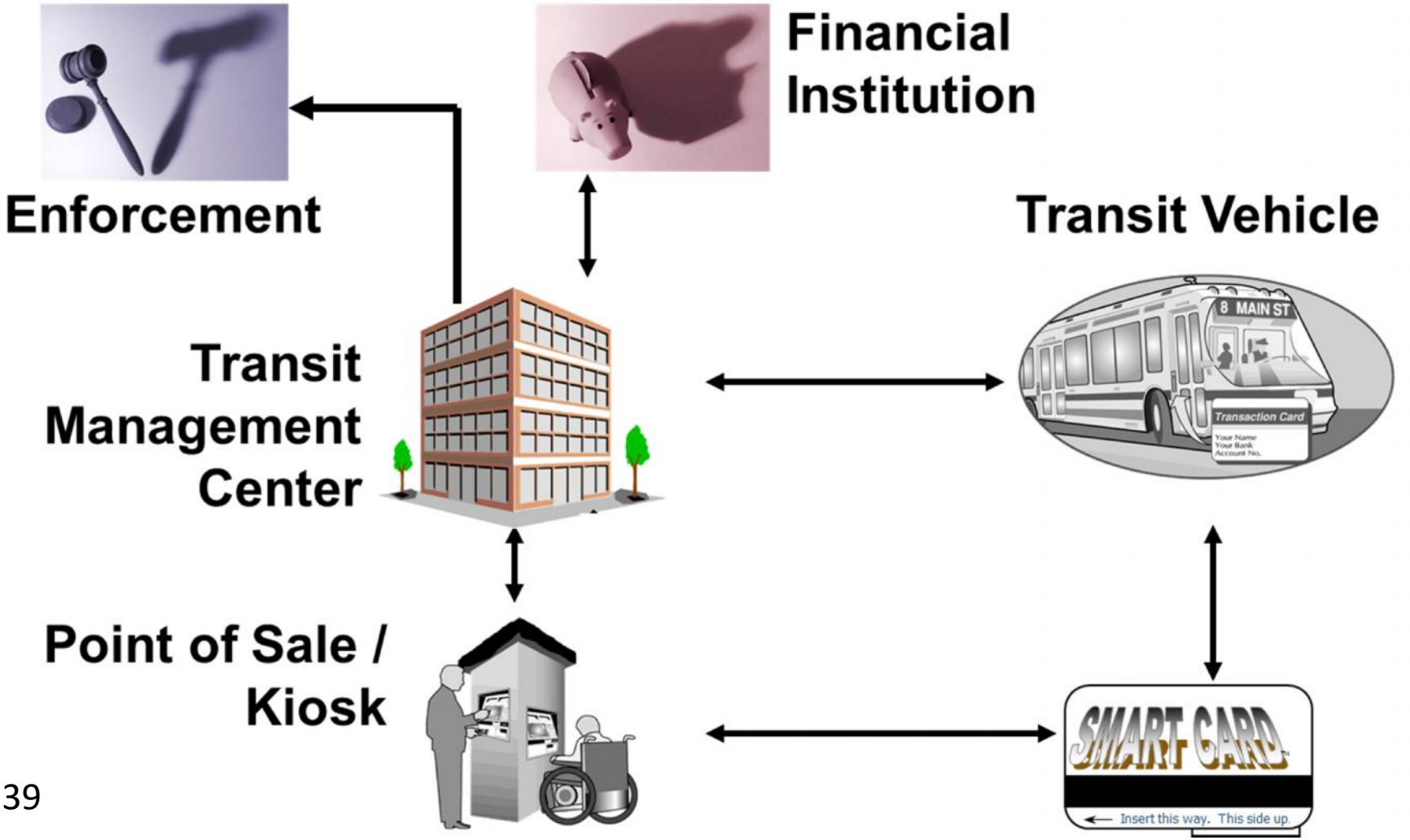
TMC

Dynamic Message Signs

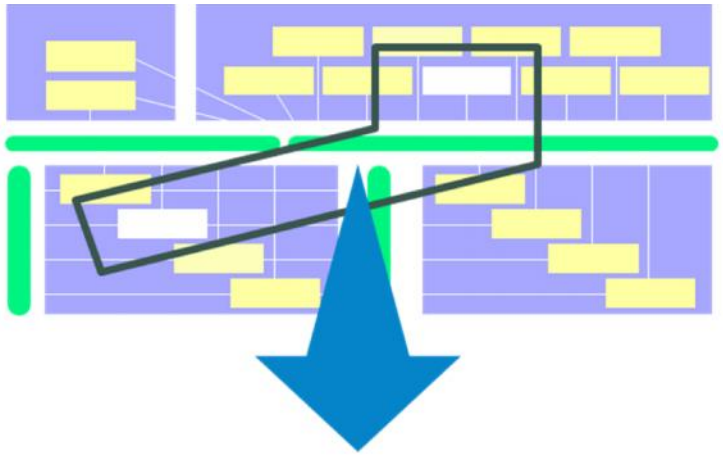
Web Site

Motorist

Automated Transit Fare Payment

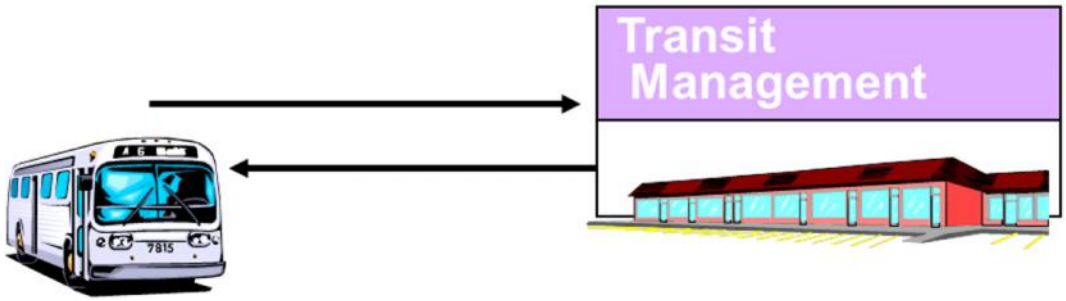


Service Packages = ITS Services



Architecture

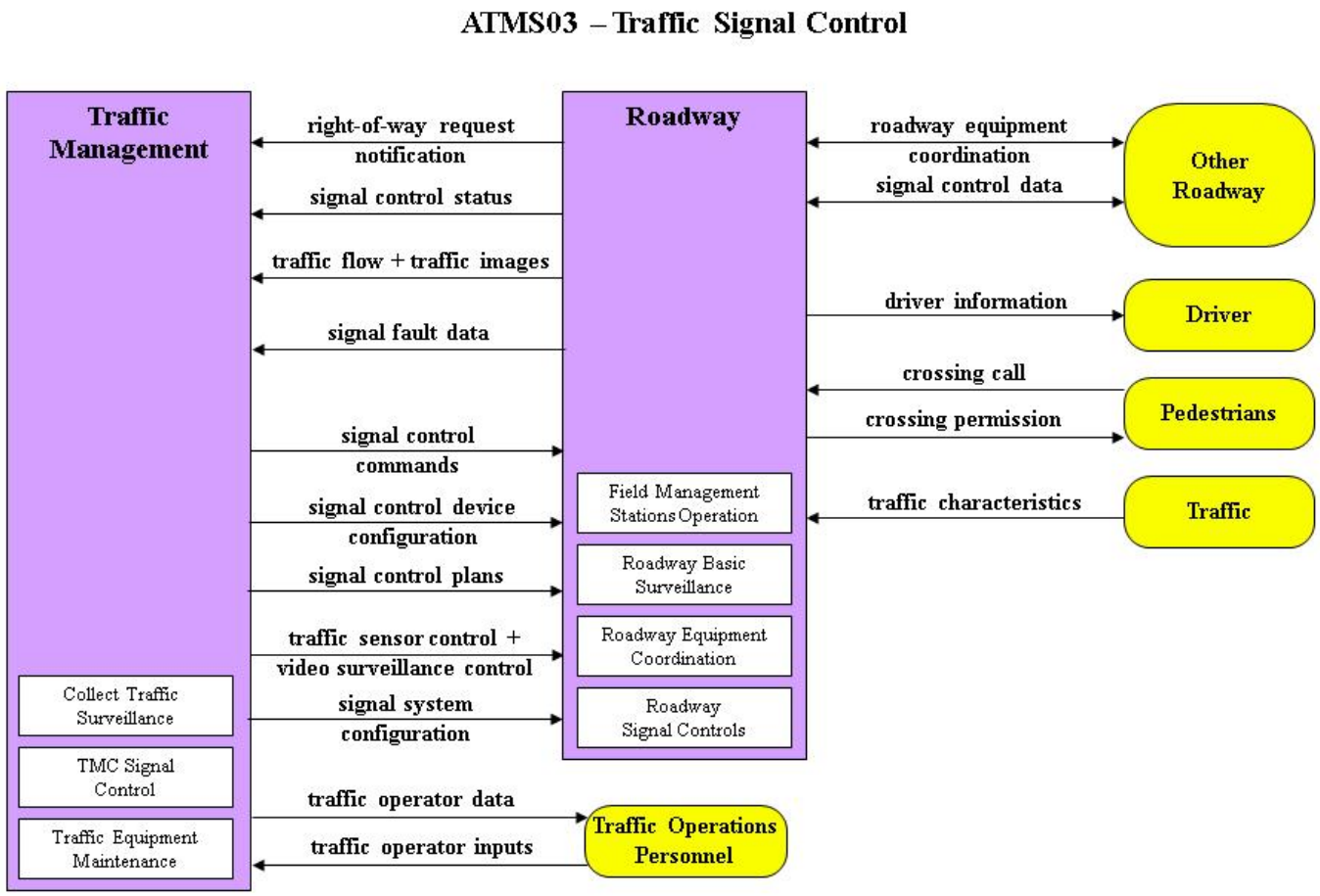
Framework spanning all of ITS



Service Packages

Pieces of the architecture that provide a particular transportation service.

National ITS Architecture Service Package



Customized Service Package Diagrams

- Customize to reflect regional operational concepts

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

- Let's go to the Service Package Diagrams

Operational Concept

Roles and Responsibilities

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

- Organized by Stakeholder then by area
  - Archived Data Management
  - Emergency Management
  - Incident Management
  - Highway Management
  - Traffic Signal Control
  - Transit Management
  - Maintenance Management

- Lets go look at the handout….

Interagency Agreements

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
- Go to Initial list of Agreements

Use of Regional ITS Architecture

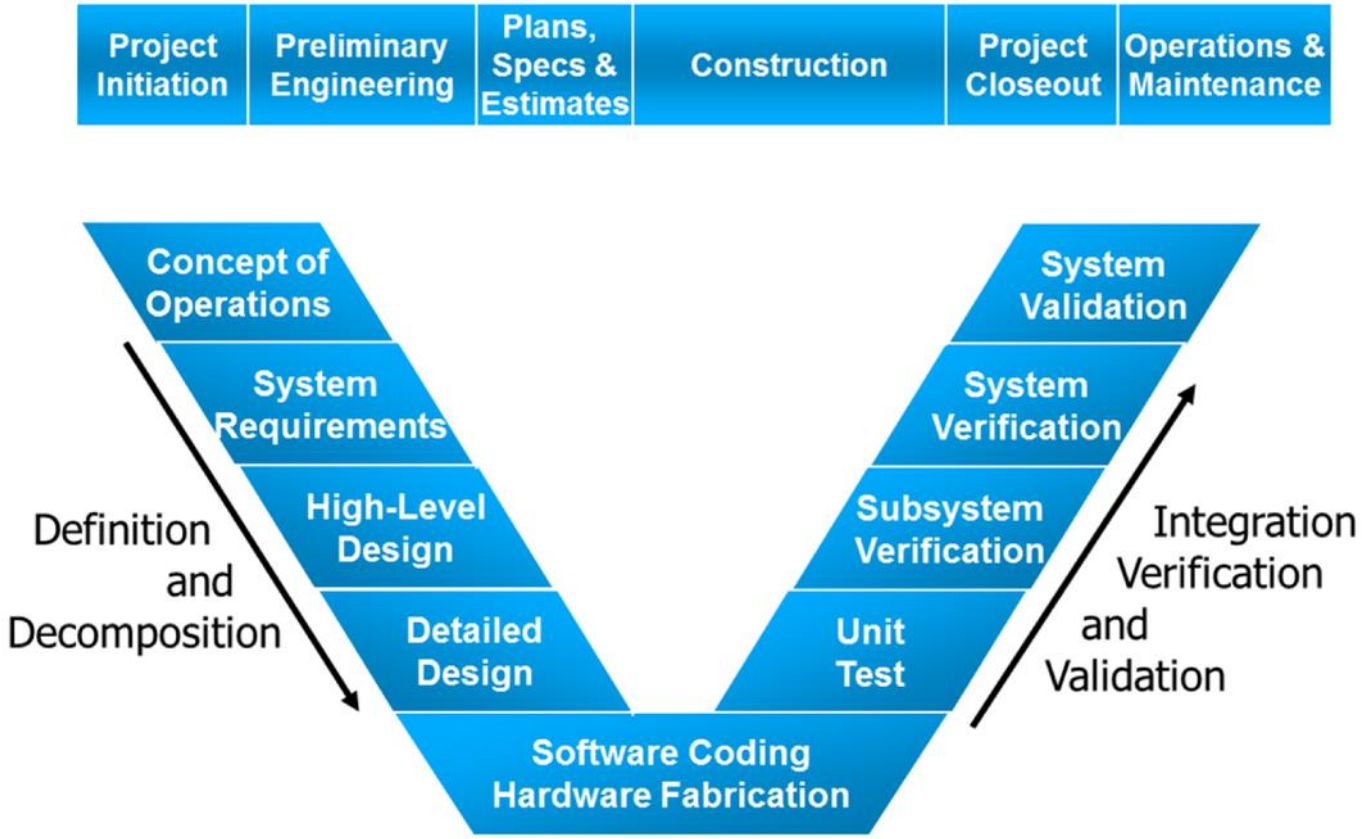
ITS Projects

- 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?

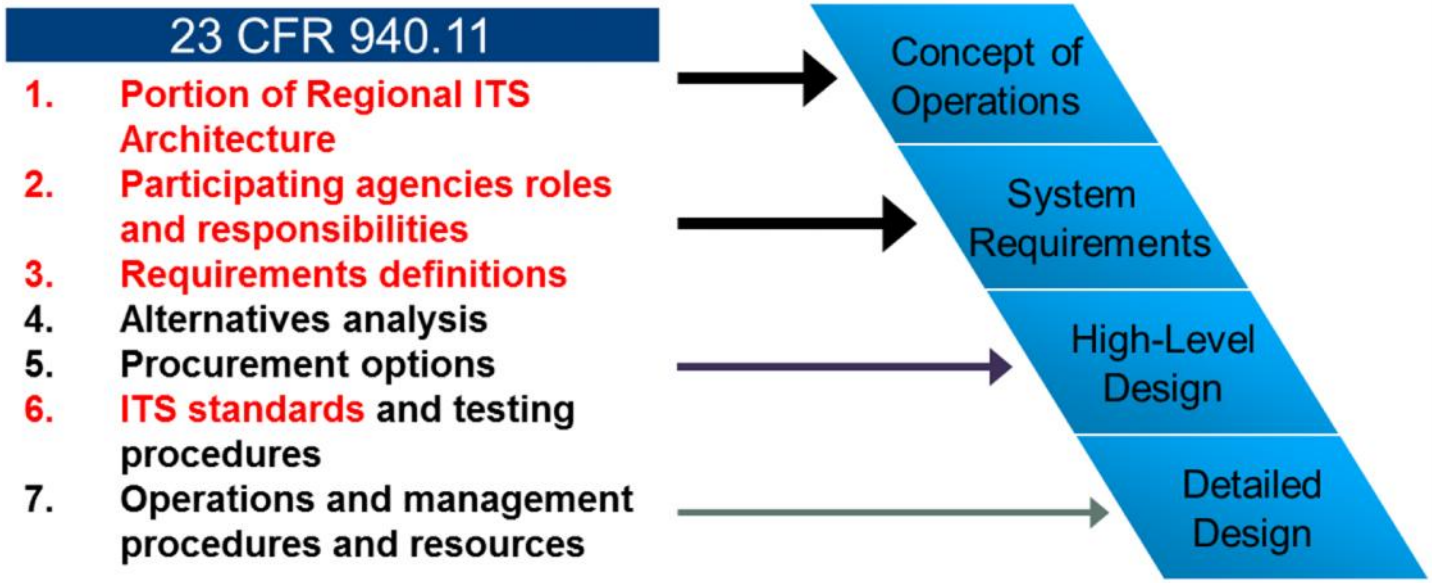
- Reduce Risk
  - Control costs and schedule
  - Satisfy users' needs
- Fulfill the requirements of the Federal Rule

Systems Engineering/Project Development



Systems Engineering Analysis Requirements

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



Using the Architecture- Web based Version

- Short tour of similar web-based Architecture

- How to find project information:
  - 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.

Next Steps

Next Steps

- Complete Draft TMACOG Regional ITS Architecture will be available on the project website
- Email to all stakeholders and attendees with information
- Comments solicited from stakeholders
- Architecture updated after receipt of comments
- Final presentation to stakeholders of Architecture-done by webinar.
- Architecture finalized with any remaining comments