

National ITS Architecture Update

**ITS Joint Program Office
Professional Capacity Building Program
Talking Technology and Transportation
(T3) Presentation
October 27, 2009**

**Cliff Heise, Vice President, Federal and Research Programs
Iteris, Inc.**

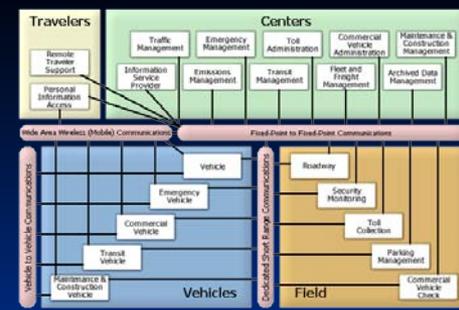
**Emiliano Lopez, ITS Deployment Program Manager
FHWA Headquarters**

**David Binkley, Senior Systems Engineer
Lockheed Martin**

T3 Webinars are brought to you by the ITS Professional Capacity Building Program (ITS PCB) at the U.S. Department of Transportation's (USDOT) ITS Joint Program Office, Research and Innovative Technology Administration (RITA)

Agenda

- National ITS Architecture
 - Overview
 - Version 6.1 update
- Turbo Architecture version 4.1
- Discussion of deployment support and resources available
- Presenters
 - Cliff Heise, Iteris
 - Emiliano Lopez, FHWA

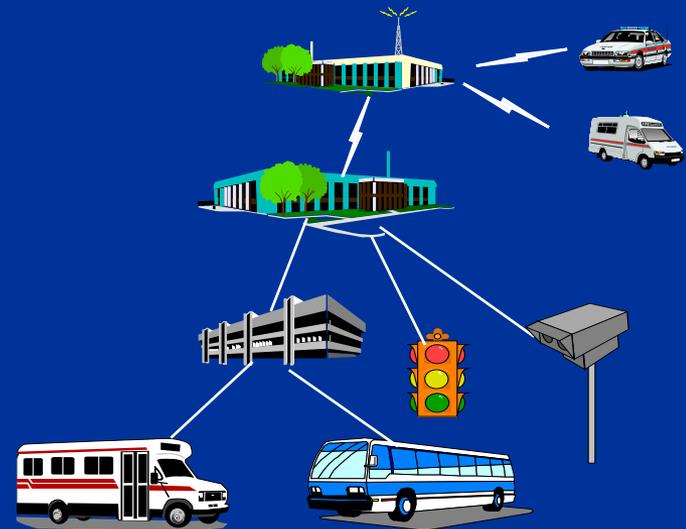


National ITS Architecture Overview



What is ITS?

- Intelligent Transportation Systems (ITS) include the electronics, communications or information processing used singly or integrated to improve the efficiency or safety of surface transportation
- Examples:
 - Traffic signal controllers
 - Traffic Management Centers
 - “511” (traveler information)
 - Electronic toll-tagging

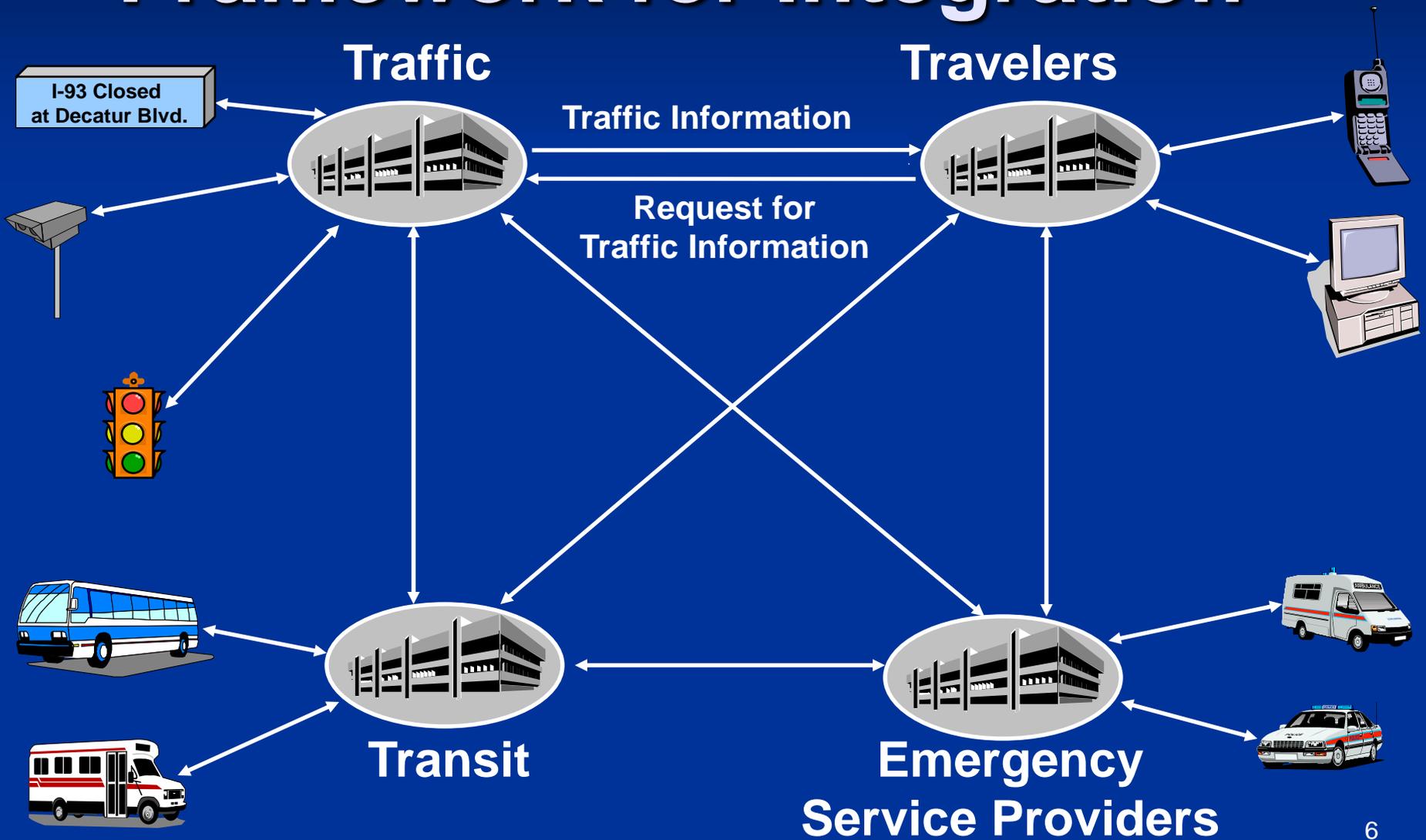


What is an ITS Architecture?

- Framework for Developing Integrated Transportation Systems
- Identifies:
 - Organizations
 - Systems operated
 - Functions performed
 - Communications
 - Information exchanged



ITS Architectures Provide a Framework for Integration

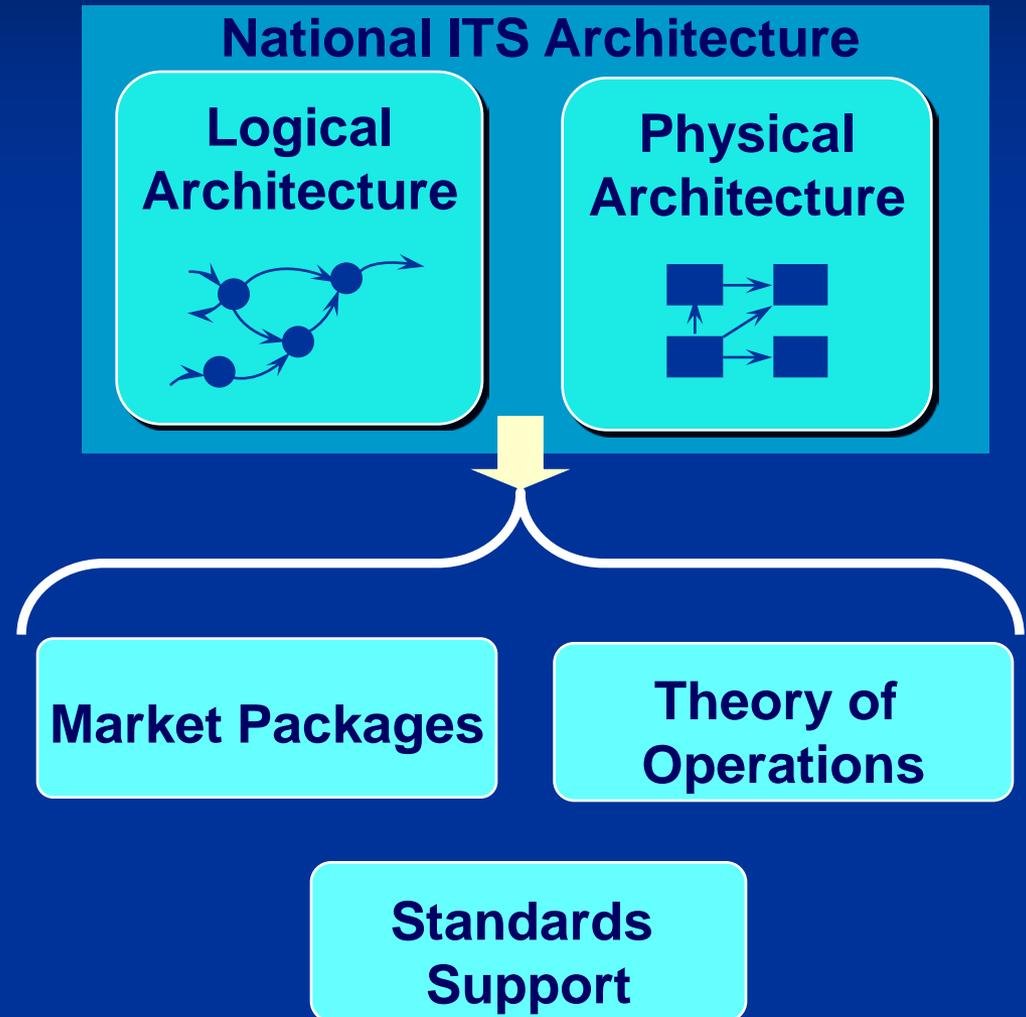


What is the National ITS Architecture?

- HIGH-LEVEL national framework, “blueprint”, used to help guide ITS deployment and transportation planning
- Based on 33 transportation related ITS User Services:
 - Physical Entities – Subsystems/Terminators
 - Logical Architecture – Processes, Data Flow
 - Interfaces – Information Flows
 - Deployment oriented Market Packages

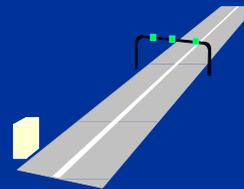
Architecture Products

- Available on
 - CD-ROM
 - Website
- Contains
 - Hypertext
 - PDF docs
 - Databases

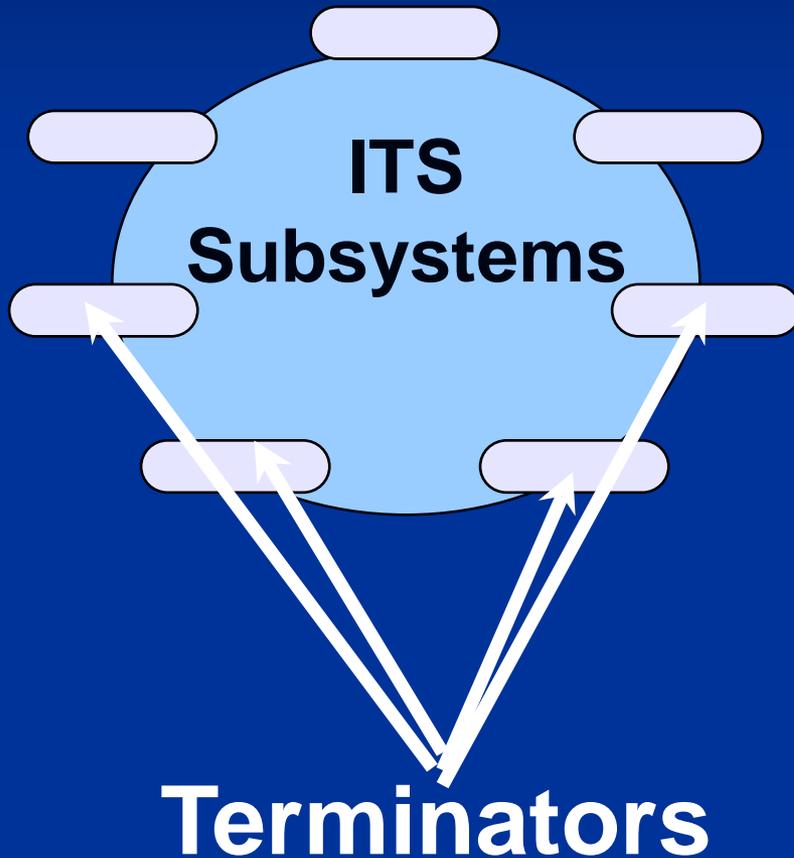


Subsystems

- Part of the overall Intelligent Transportation System
- Identify major systems, functionality
- Identify major interfaces
- Define key standardization points
- 4 Categories
 - Centers
 - Field
 - Vehicles
 - Travelers



Terminators Define the ITS Boundary



- Entities outside of ITS
- Define interfaces but not functionality
- Four types of Terminators
 - Environment
 - Human
 - System
 - Other System

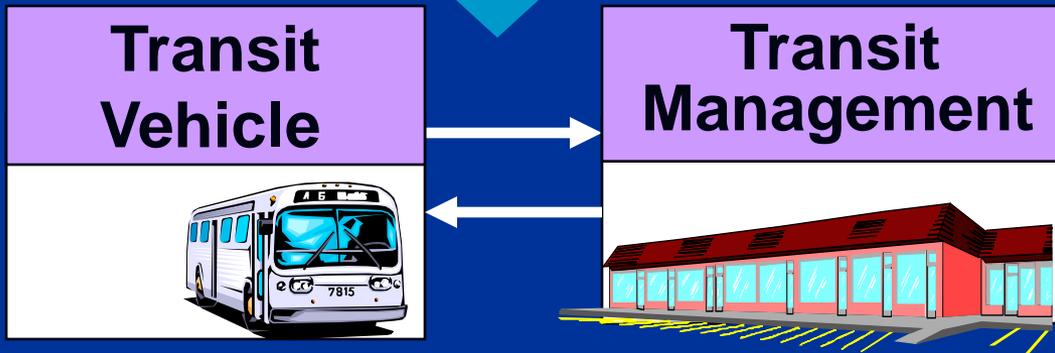
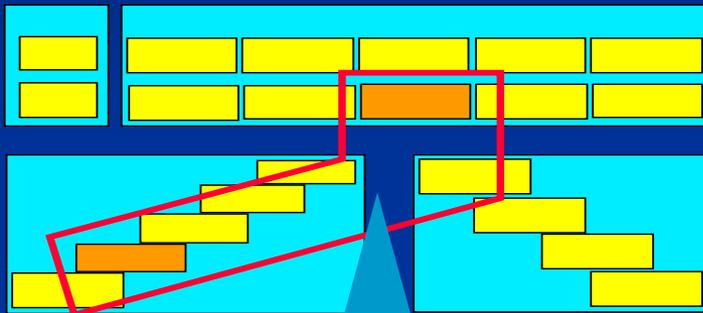
Market Packages

Architecture

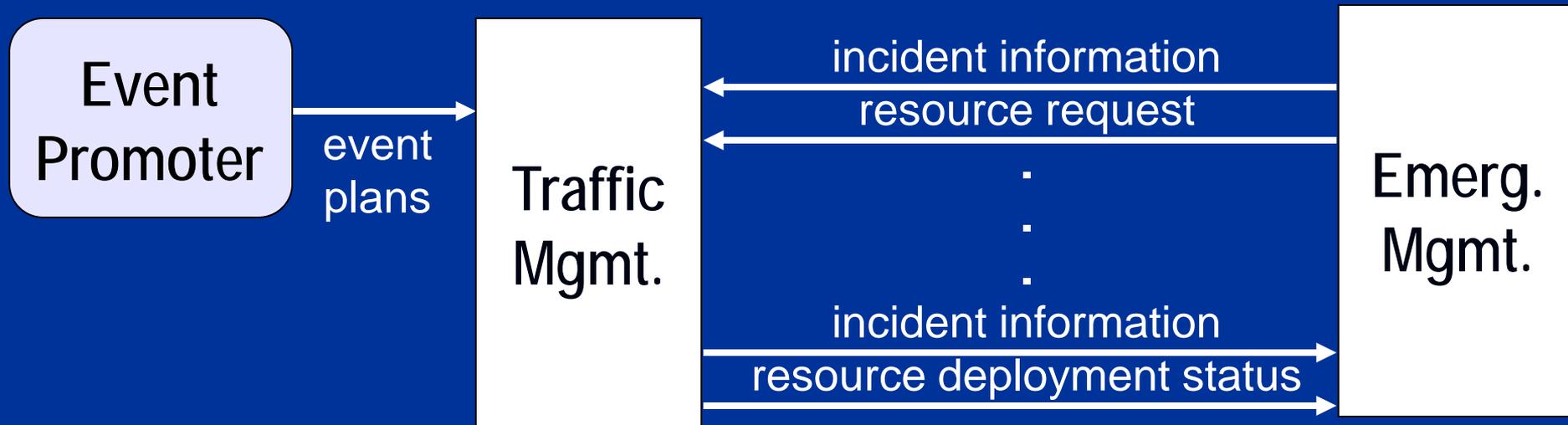
Framework
spanning all of ITS

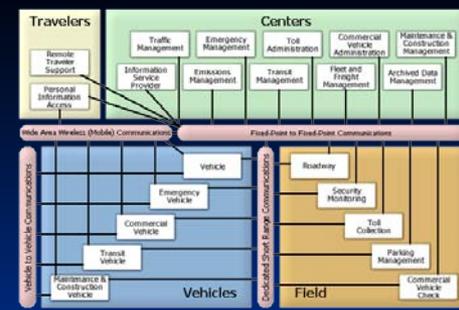
Market Packages

Contain pieces of the
architecture
that provide a
particular
transportation service



“Architecture Flows” Define Information Exchanged



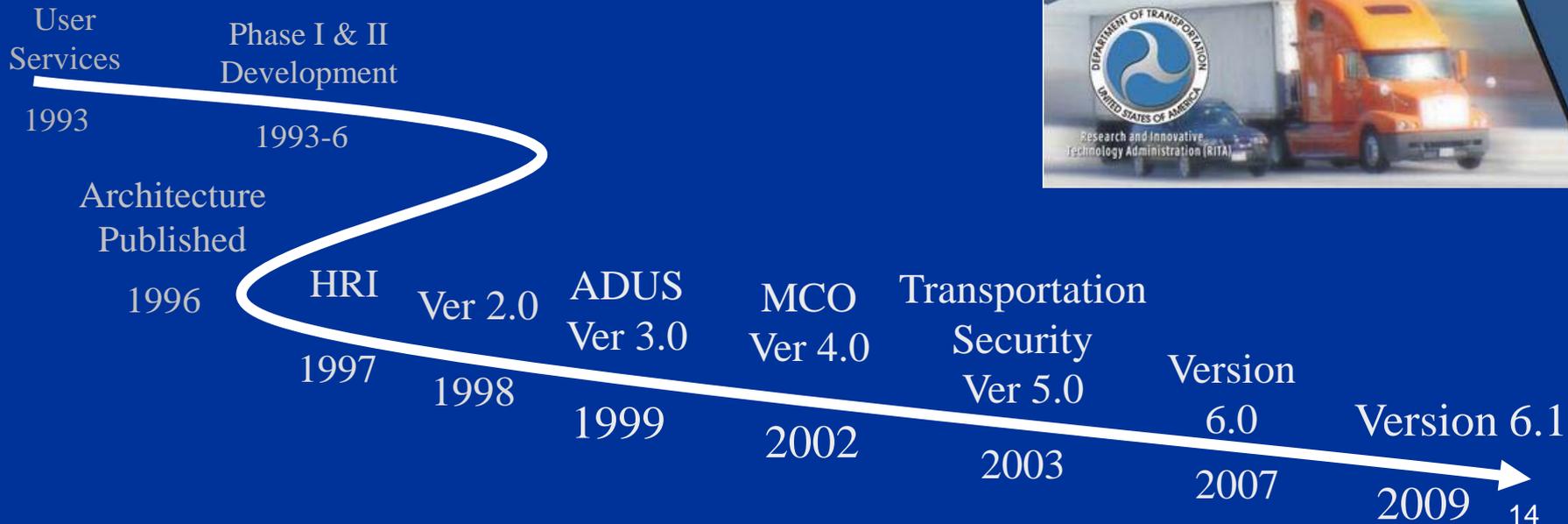


National ITS Architecture Version 6.1 Update



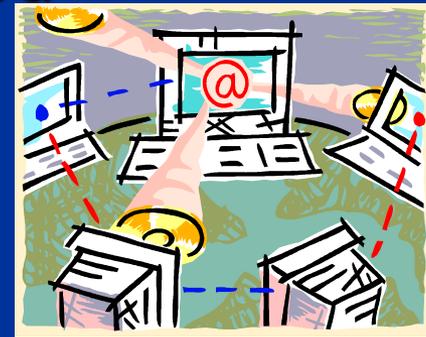
National ITS Architecture is a “Living Document”

- Continuing evolution of the architecture over 13 years
- Version 6.1 continues support for ITS technical evolution and deployment



Architecture Evolution in Step with Industry

- Research and Federal Programs
 - DOT Initiatives
 - Border Information Flow Architecture (BIFA)
 - Commercial Vehicle Information and System Networks (CVISN)
 - IntelliDriveSM
- ITS Standards
- Deployment Lessons Learned



National ITS Architecture
Version 6.1
U.S. Department of Transportation

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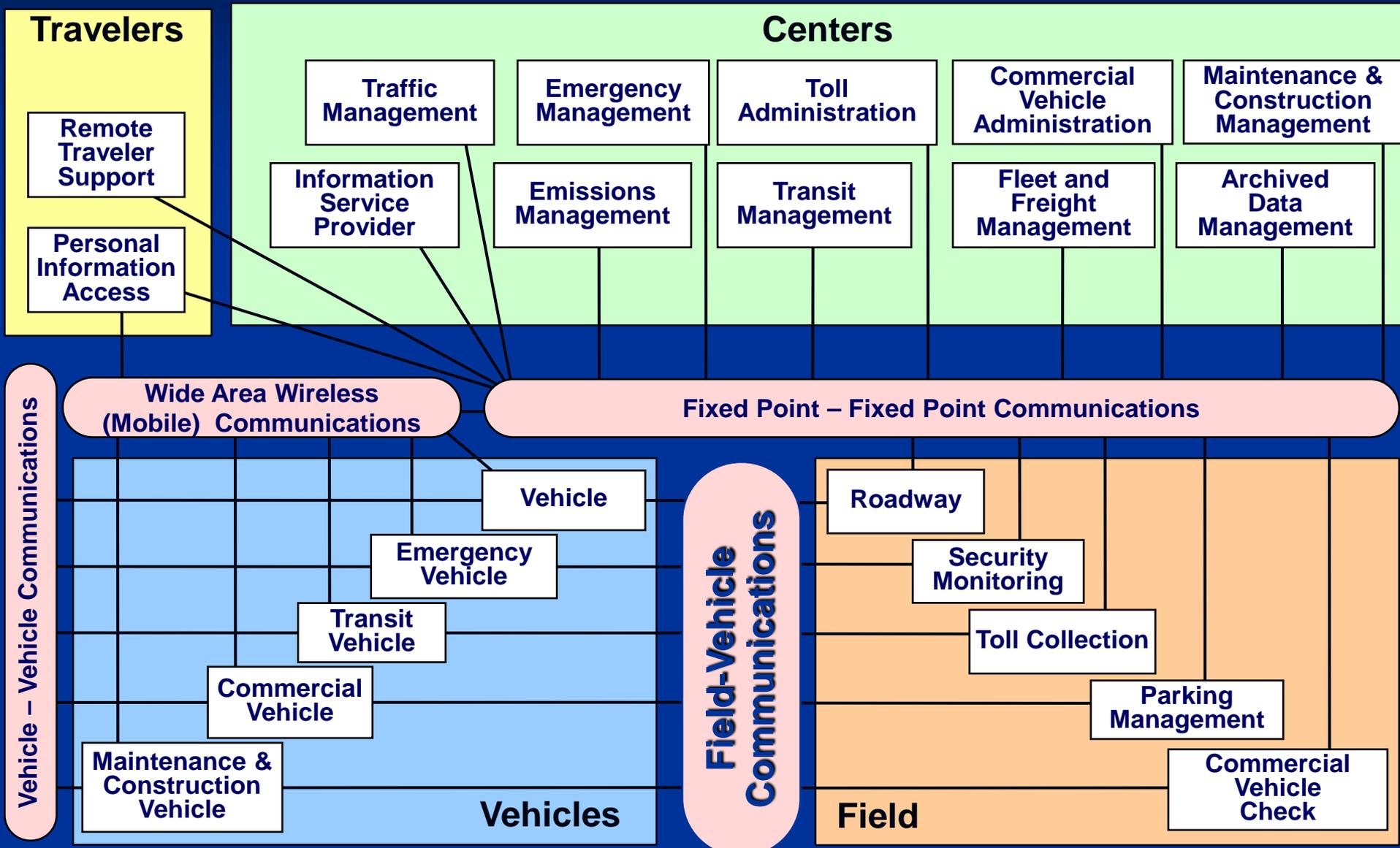
Last updated 1/7/2009

What's New in V6.1



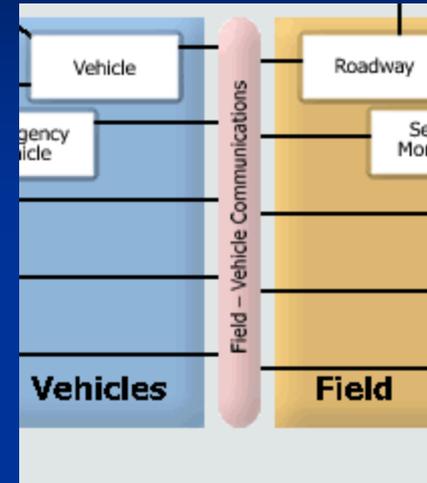
- Refreshing communications paths
- Representing initiatives
- Reflecting standards
- Keeping pace with ITS innovations

V6.1 Subsystems & Communications



V6.1 Communications

- Renamed Dedicated Short Range Communication (DSRC) to “Field-Vehicle Communication”
- Added a new Communications Layer web/hyperlink page



Field - Vehicle Communications

A wireless communications channel used for broadcast and interactive close-proximity communications between vehicles and the immediate infrastructure. It supports location-specific communications for ITS capabilities such as toll collection, transit vehicle management, driver information, and automated commercial vehicle operations as well as Vehicle Infrastructure Integration (VII) applications. This communication channel is supported by technologies such as 5.9 GHz Band Wireless Access in Vehicular Environments (WAVE) / Dedicated Short Range Communications (DSRC), Wi-Fi, WiMAX, and wireless mesh networks.



Initiatives in V6.1

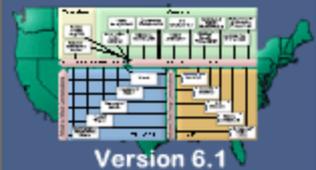
- Formerly known as VII, built on core functions / interfaces added in v6.0:
 - Added support for all appropriate use cases: signing, electronic payment, fleet management, probe data, etc.
- ICM: Decision Support Systems for traffic / transportation management
- Clarus: New traveler “alert” flows, data quality
- Electronic Freight Management: updated interfaces with Intermodal Freight Depot / Shipper

Standards & v6.1

- Updated Mapping between Architecture Flows and Standards activities
 - Used by regional / project architects
- Reflect new messages in SAE 2735: intersection collision avoidance and Signal Phase and Timing (SPAT)
- Synchronize terminology with TMDD v3.0

Other ITS Innovations in v6.1

- Split transit scheduling flows to show differences between Static & Dynamic information
- Transportation Information for Operations: added 2-way exchange between information collectors and operations centers



Version 6.1



U.S. Department of Transportation

Home

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What's New

Hypertext View

Document View

Database View

User Services

Logical Architecture

Physical Architecture

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Standards

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Last updated 1/7/2009

Want more info?

*Required Fields

*First Name:

*Last Name:

Title:

Organization:

*E-mail Address:

Telephone:

Fax:

Street:

City:

State/Province:

Zip Code:

Country:

*Comments:



Version 6.1 Available Now

- On the Web: <http://www.its.dot.gov/arch/index.htm>

RITA RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION
INTELLIGENT TRANSPORTATION SYSTEMS

Home | Printable Version

Architecture

The [National ITS Architecture](#) is the definitive framework that will guide the development of intelligent transportation systems.

National ITS Architecture Version 6.1

The National ITS Architecture website has been updated with new content, including support for IntelliDriveSM (VII) applications and including transportation management, changes from Claris addressing architecture changes to align with the latest TMDD V3.0 standards.

- [National ITS Architecture web site](#)
- [How to Access the National ITS Architecture Documents](#)

Travelers | **Centers**

Travelers: Women's Express Lanes, General Purpose Lanes, Emergency Flankings, etc.

Centers: Traffic Management, Incident Management, etc.

Networks: Backbone, Edge, etc.

Applications: Traffic, Incident, etc.

Standards: IEEE, etc.

Security: etc.

Training: etc.

Turbo Architecture: etc.

Glossary: etc.

Acronyms: etc.

CD Orders: etc.

Contact Us: etc.

Last updated 1/7/2009

National ITS Architecture - Windows Internet Explorer

http://www.its.dot.gov/arch/index.htm

National ITS Architecture Version 6.1

U.S. Department of Transportation

- Home
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What's New

Version 6.1 of the National ITS Architecture includes a host of [new features](#) that enhance the architecture definition and make it easier for you to access the information that you need. The architecture will continue to evolve as new user services are developed, standards activities progress, and more and more ITS implementations put the architecture into action.

Turbo Architecture Version 4.1 is currently available for download from the [Turbo area](#) of this website. Turbo Version 4.1 is compatible with Version 6.1 of the National ITS Architecture and includes a host of new features including a web page creation capability and the ability to define 'communications elements' that represent ITS communications infrastructure.

Where to Start

There are three ways to navigate through the National ITS Architecture:

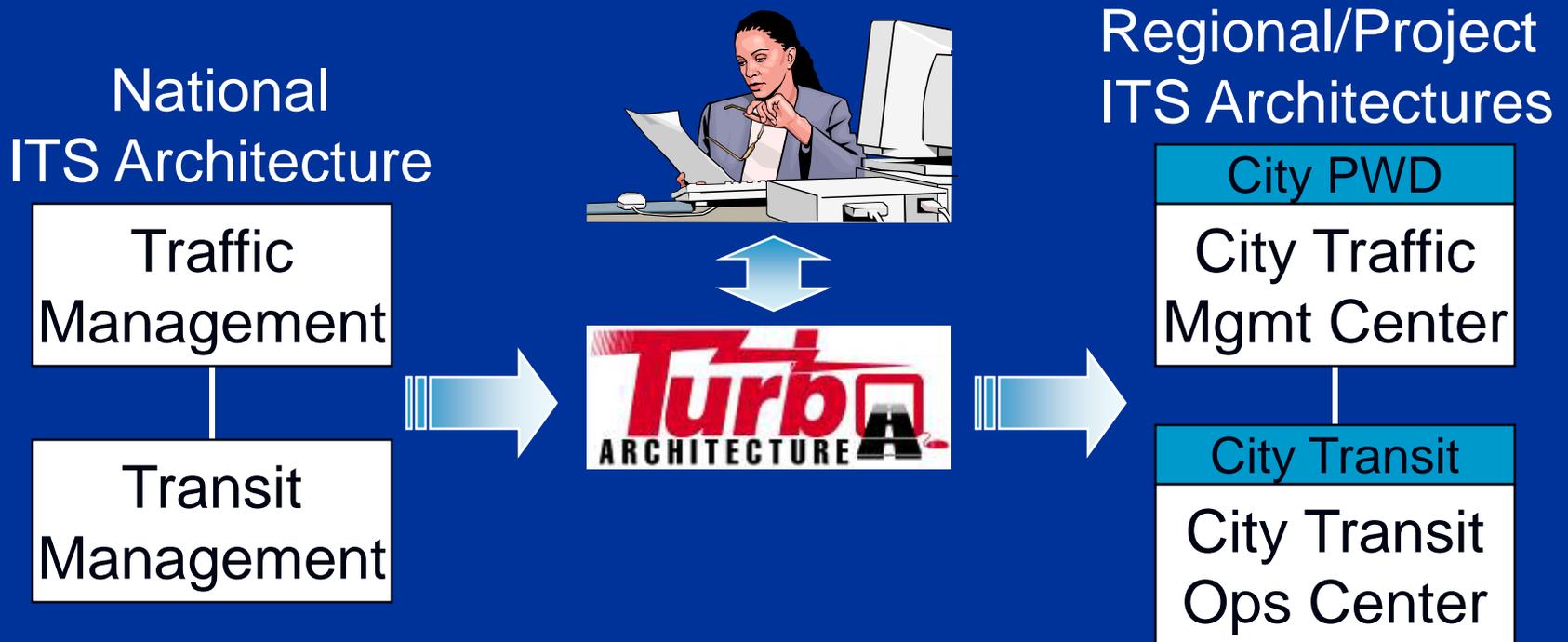
1. The [hypertext view](#) provides immediate, interconnected access to all the elements of the architecture definition.
2. The [document view](#) presents the complete set of architecture documentation as it exists in printed format.
3. The [database view](#) provides developers direct access to the source material for the National ITS Architecture in several connected relational databases.

If you are wondering [which view](#) is best for you, we have a few suggestions.

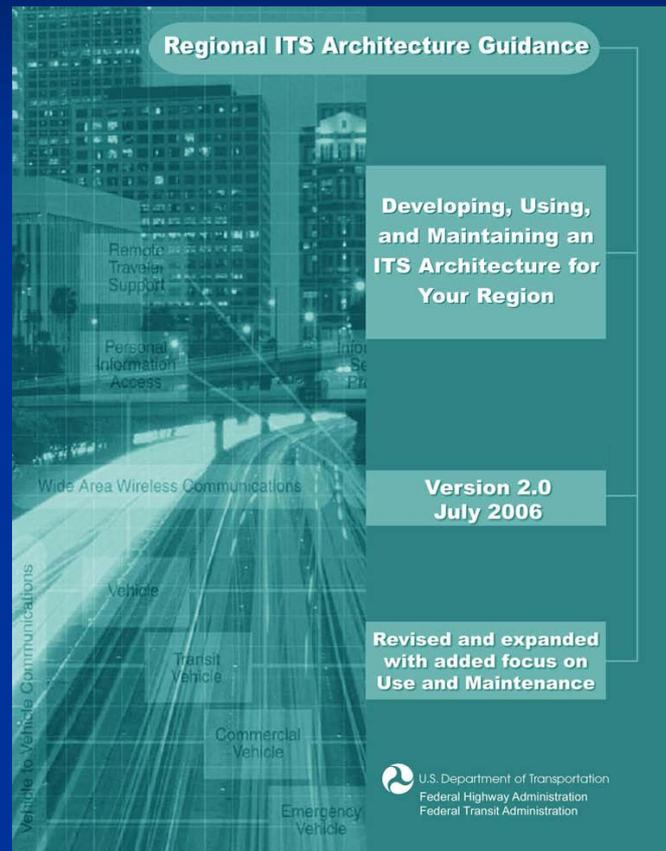
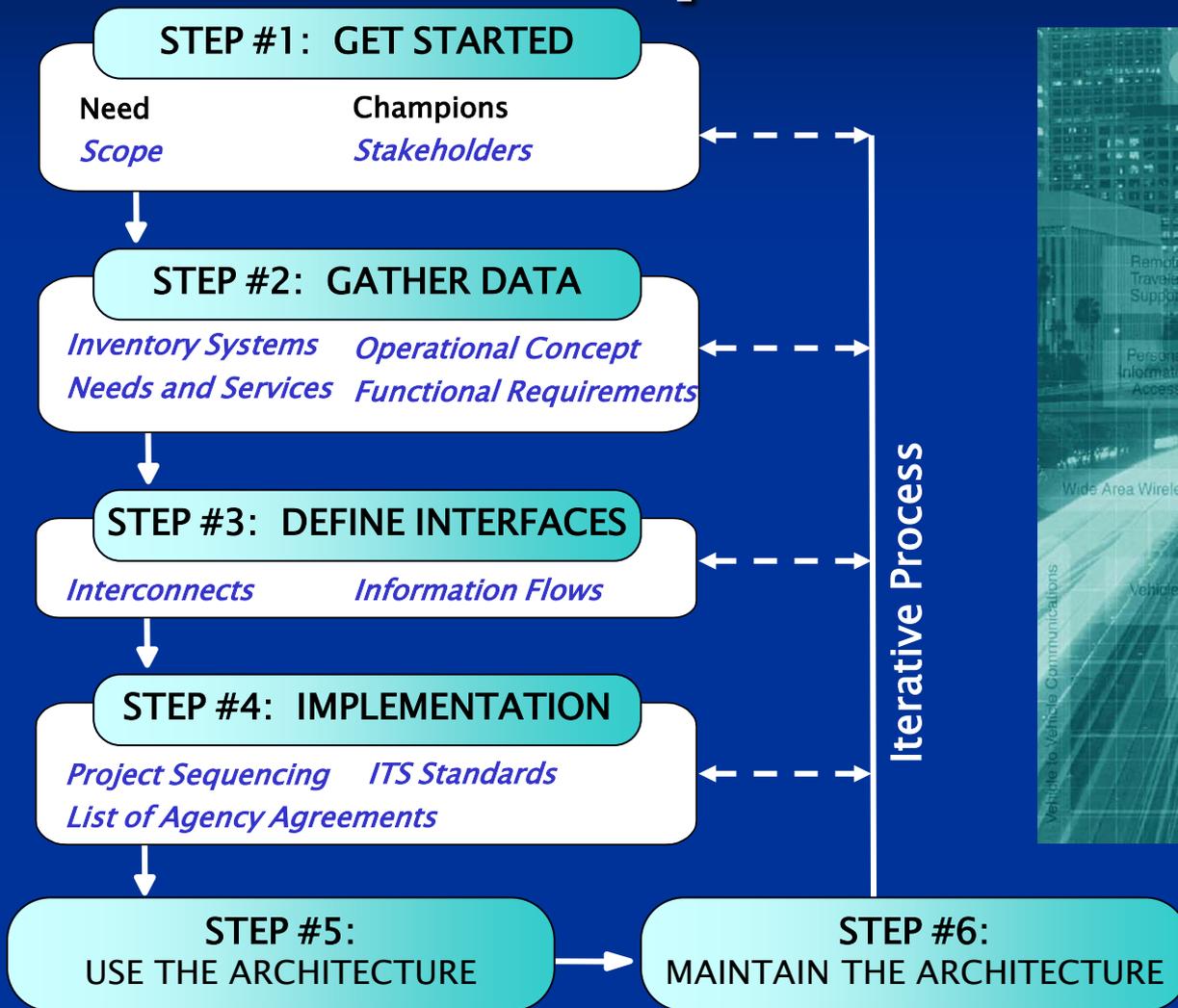
Turbo Architecture Version 4.1 Update

What Turbo Does

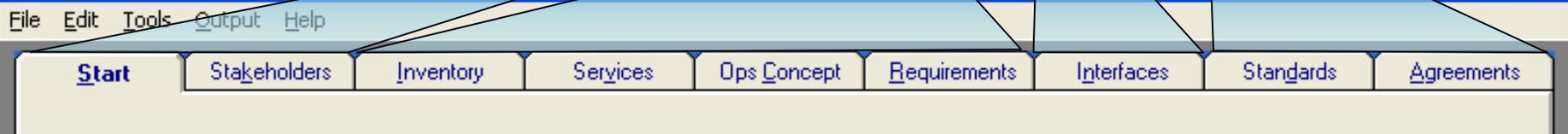
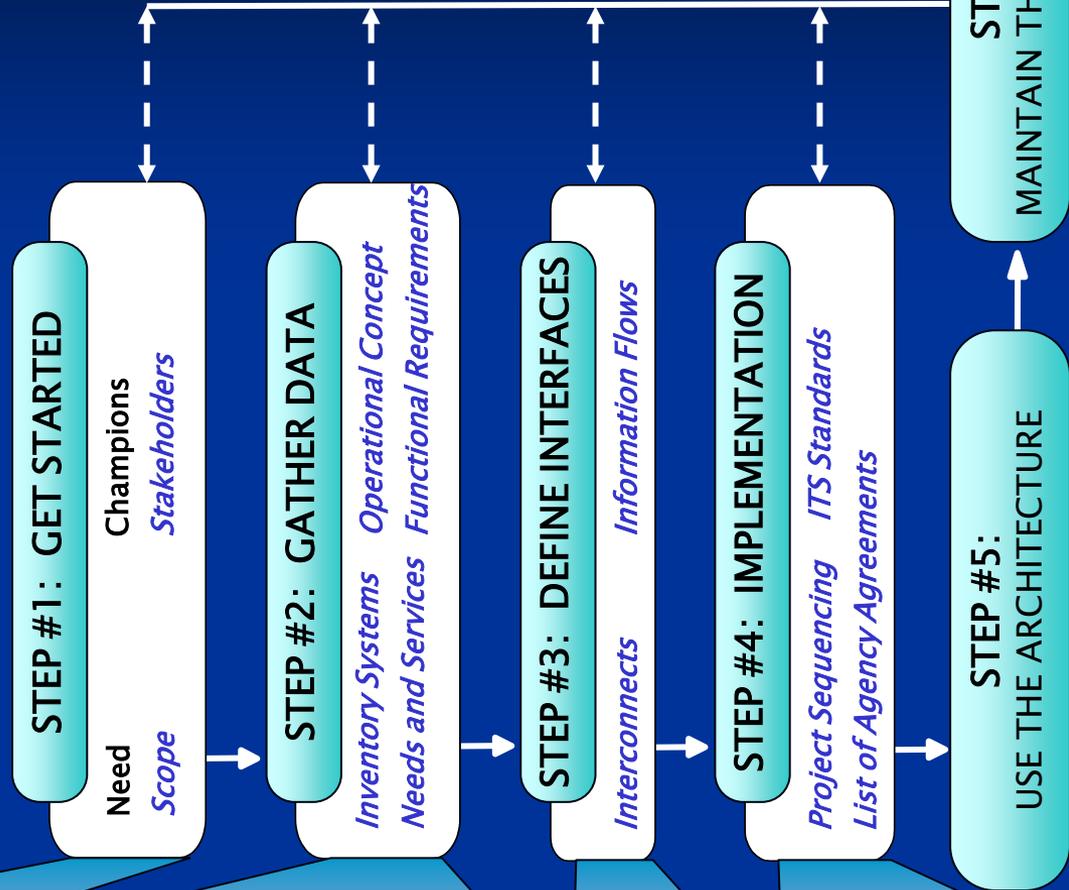
Turbo is a software tool that automates use of the National ITS Architecture.



Turbo Supports ITS Architecture Development Process



Turbo Interface Reflects Development Process



Turbo Version 4.1

■ Released March 2009



- Supports Version 6.1 of the National ITS Architecture

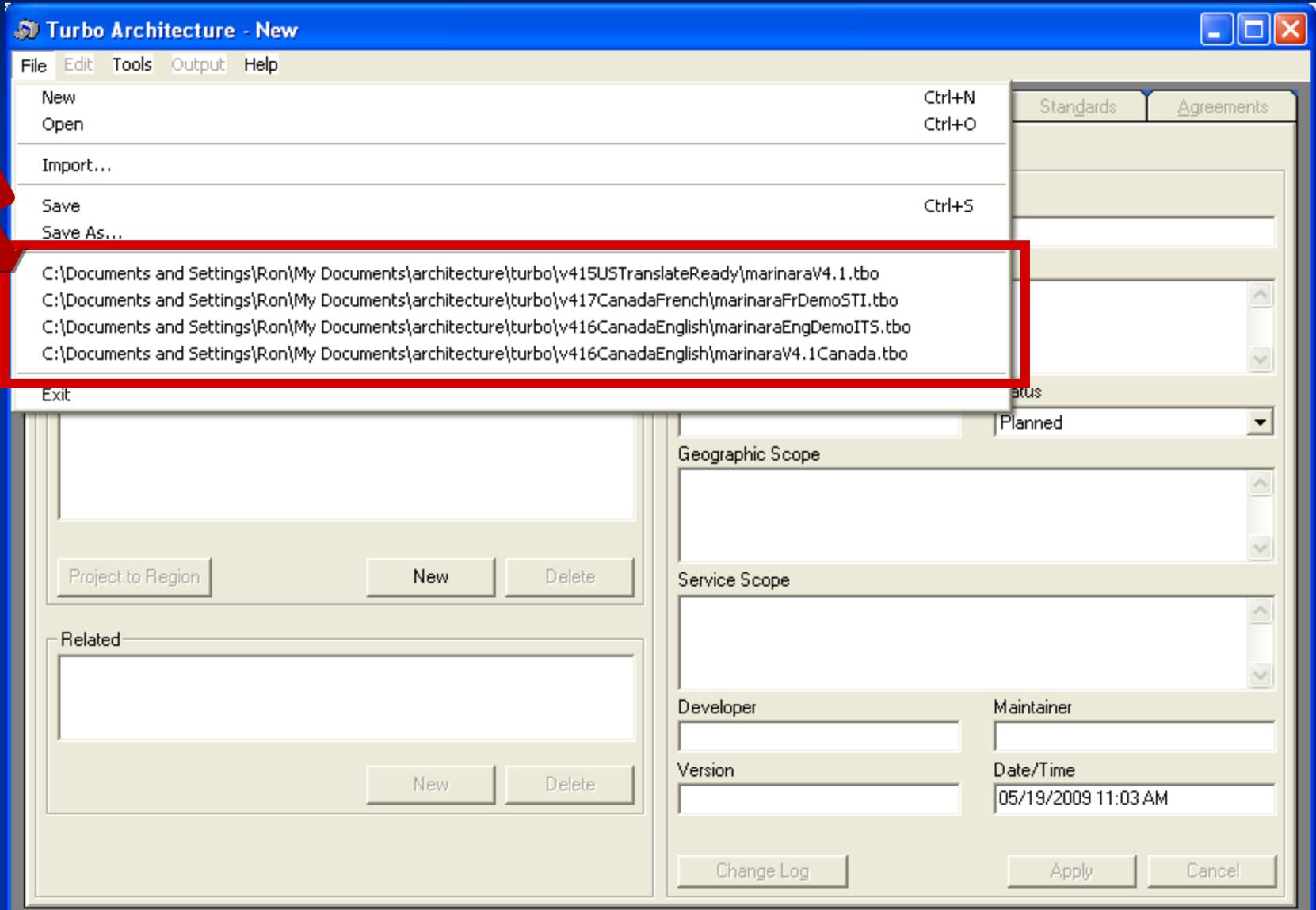


- Enhanced features including communications elements and web page creation



- Bug fixes to ensure trouble-free operation

Most Recently Used Files



Communications Elements

Turbo Architecture - C:\Documents and Settings\Ron\My Documents\architecture\turbo\w415USFinal\ITSA Demo.t...

File Edit Tools Output Help

Start Stakeholders **Inventory** Services Ops Concept Requirements Interfaces Standards Agreements

Current Project: Alert Project Demo

Elements Element Attributes

Project Elements All Elements

New

Name
Marinara County Transportation Communications Network

Type
Communications

Description
This communications gateway provides communications infrastructure for the county, providing the communications network that supports information sharing by all Marinara regional agencies. The initial network

Selected Subsystems/Terminators All Subsystems/Terminators

- Archived Data Management Subsystem (Subsystem)
- Commercial Vehicle Administration (Subsystem)
- Commercial Vehicle Check (Subsystem)
- Commercial Vehicle Subsystem (Subsystem)
- Emergency Management (Subsystem)
- Emergency Vehicle Subsystem (Subsystem)
- Emissions Management (Subsystem)
- Fleet and Freight Management (Subsystem)
- Information Service Provider (Subsystem)
- Maintenance and Construction Management (Subsystem)
- Maintenance and Construction Vehicle (Subsystem)
- Public Management (Subsystem)

Sort By: Element Stakeholder Subsystem/Terminator

New Delete Apply Cancel

Inventory

Elements

- Alfredo County Freeway M
- Bus Operations Center
- City Operations Center
- Communications for Alfredo Network
- County Traveler Kiosk Network
- Digital Map Products
- Event Clearinghouse
- GARLIC Information System
- Internet PC Access via the WWW
- Loops and Controllers
- Marinara County Flood Monitoring System
- Marinara County Freeway Management Center (BASIL and PINCH)
- Marinara County Transportation Communications Network
- Marinara Public Safety Communications and Dispatch Centers
- MCDOT Field Equipment
- Parking lots larger than 200 spaces
- Planning Data Warehouse
- Port Management System
- Saucelito Fire and Rescue Center
- TOMATO Advertisers
- TOMATO Event Parking System

Communications Elements

Turbo Architecture - C:\Documents and Settings\Ron\My Documents\architecture\turbo\415USFinal\ITSA Demo.t...

File Edit Tools Output Help

Start Stakeholders Inventory Services Ops Concept Requirements Interfaces Standards Agreements

Current Project: Alert Project Demo

All

Build Connect Flows Group Sort

Filter Elements Limit New Info Present

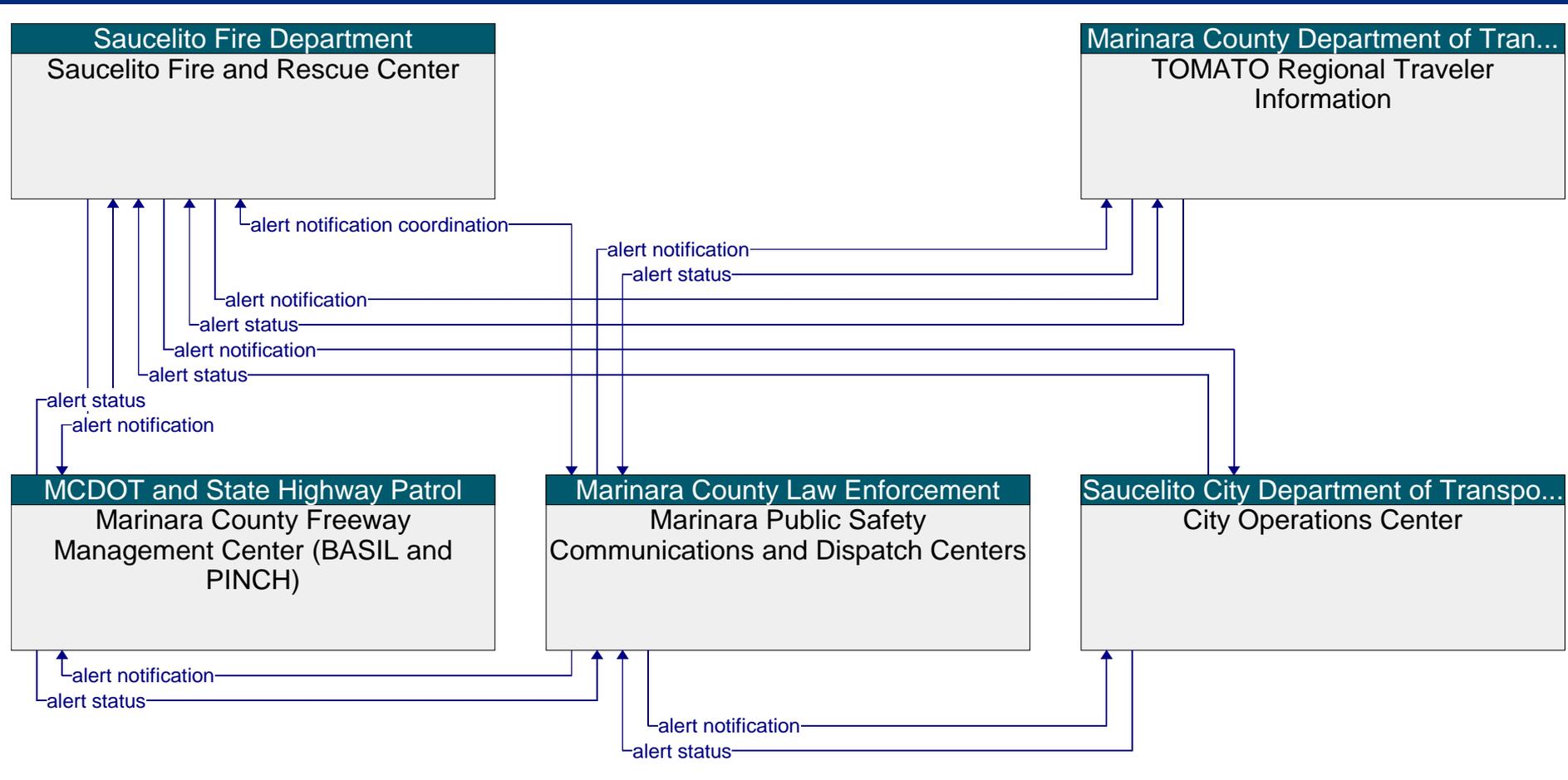
All Interconnections (7 Entries)

Element	In Region	Communications	Include
Marinara Public Safety Communications at Saucelito Fire and Rescue Center	<input type="checkbox"/>	Marinara County Transportation	<input checked="" type="checkbox"/>
Saucelito Fire and Rescue Center	<input checked="" type="checkbox"/>	Not Identified	
Marinara Public Safety Communications at Saucelito Fire and Rescue Center	<input checked="" type="checkbox"/>	Communications for Alfredo Networking and Operations Local	
Saucelito Fire and Rescue Center	<input checked="" type="checkbox"/>	Marinara County Transportation Communications Network	

Include All Clear All Apply Cancel

Communications Elements

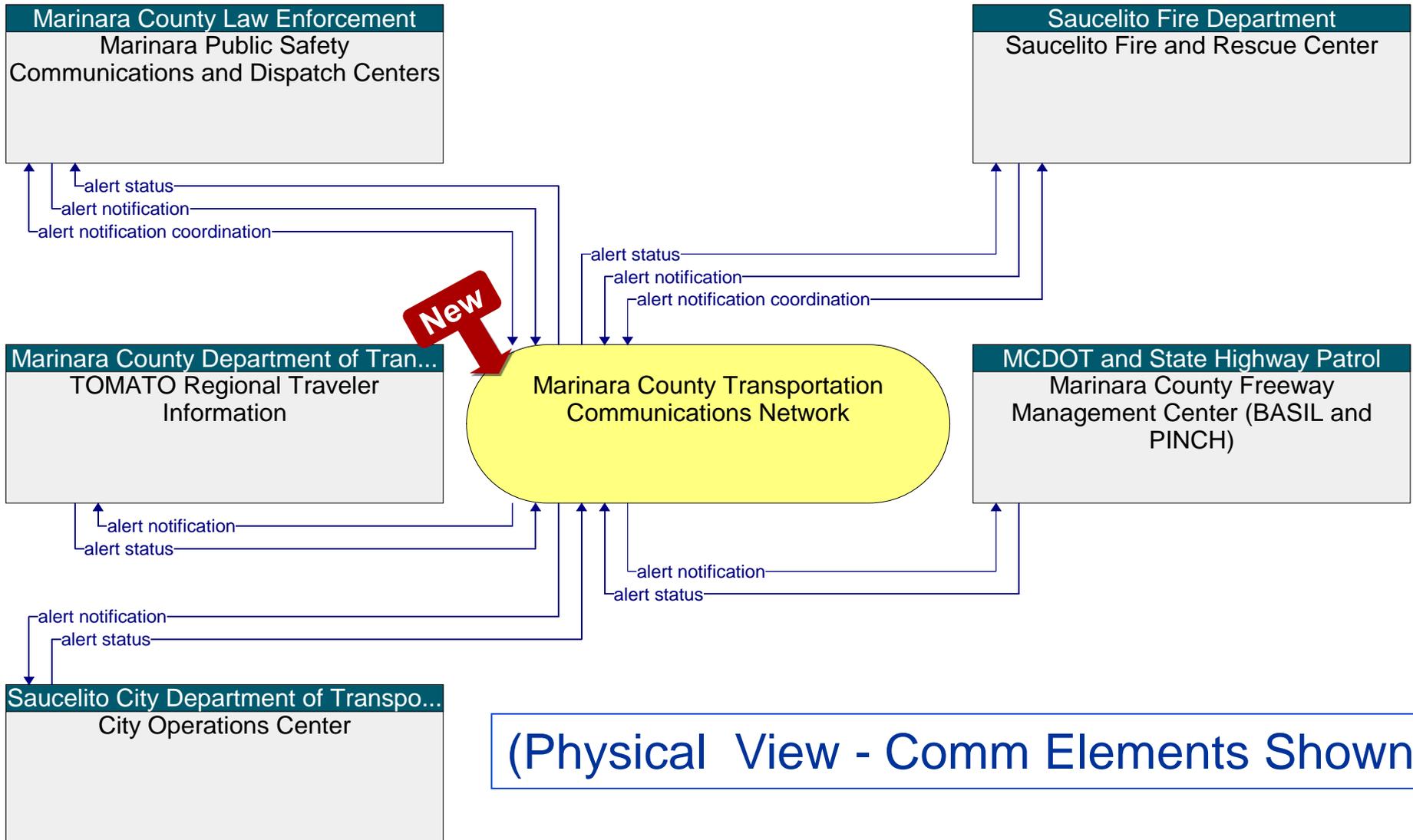
One Architecture – Two Views



(Logical "Point to Point" View – Comm Elements Hidden)

Communications Elements

One Architecture – Two Views



Web Output

Step 1: Select Content

New

Web Pages

Included Web Pages | All Web Pages

- Home
- Scope
- Stakeholders
- Inventory
 - By Entity
 - By Stakeholder
- Services
- Ops Concept
- Requirements
- Interfaces
- Standards
- Agreements
- Projects

New Delete

Web Page Attributes

Order	Menu Name
5	Services

Page Title
Market Packages

Overview Use Template

One of the first steps in developing an architecture is to identify the transportation services that are important to the Region. The following table lists each Market Package and its applicability to the Region. More information about each market package can be obtained by selecting the market package in the table below.

Options

- Include Unselected Market Packages
- Include Description in Detailed Pages
- Include Related Elements in Detailed Pages

Apply Cancel

Web Output

Step 2: Select Colors/Fonts/Images



Web Page Setup

General Content **Style** File Locations

Select Web Page Area

Menu Item
Menu Item
Menu Item
Current Item

Content Title
Introductory text about the page...

Heading	Heading
Normal Row	
Highlighted Row	
Normal Row	
Normal Row	
Normal Row	

footer

Edit Colors

Web Page Banner

Colors

Background

Text

Border

Graphics

Use background graphic

Graphic extension

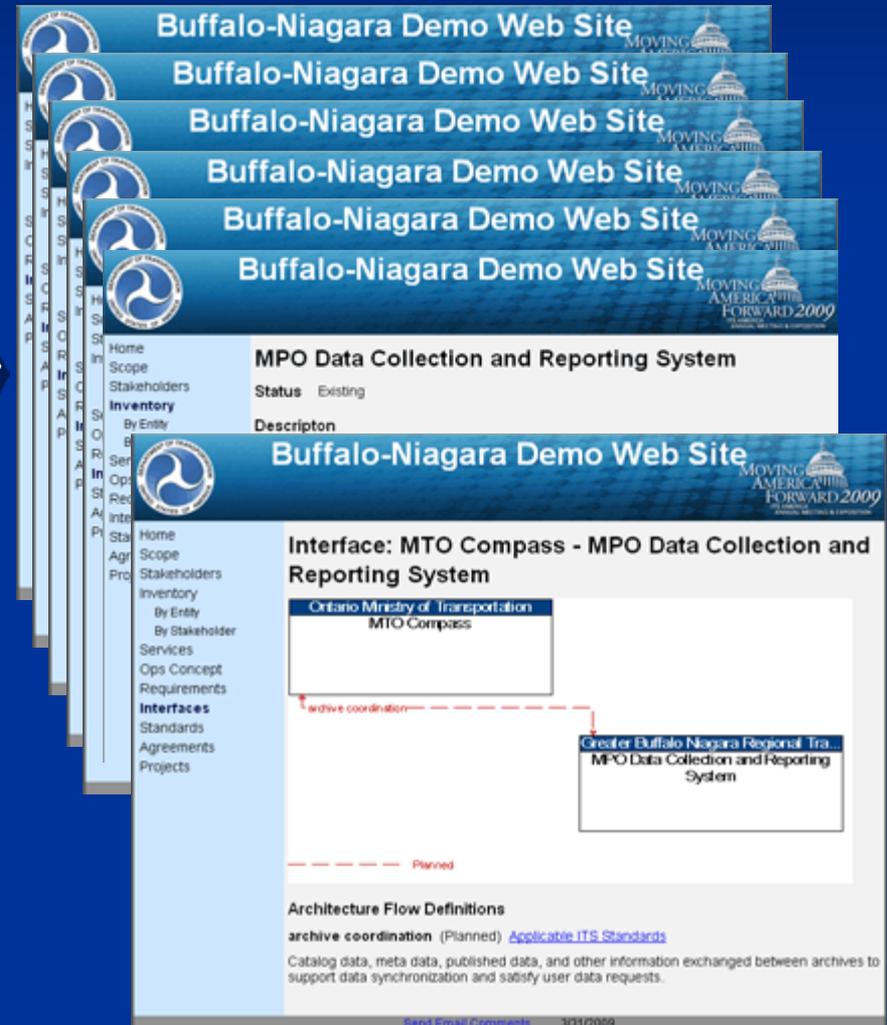
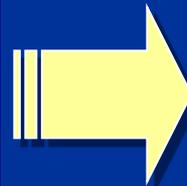
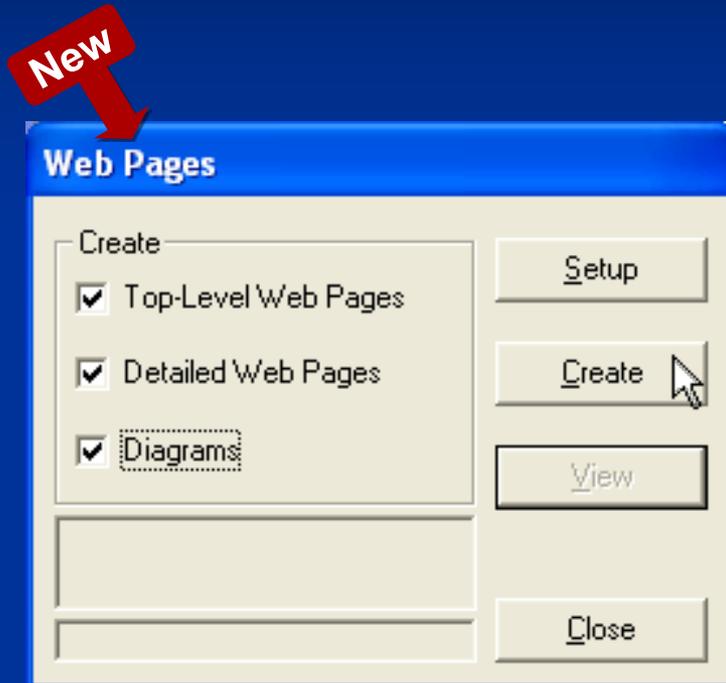
Page Width Font Family

Apply Cancel

Close

Web Output

Step 3: Create Your Web Pages



Sample Web Output

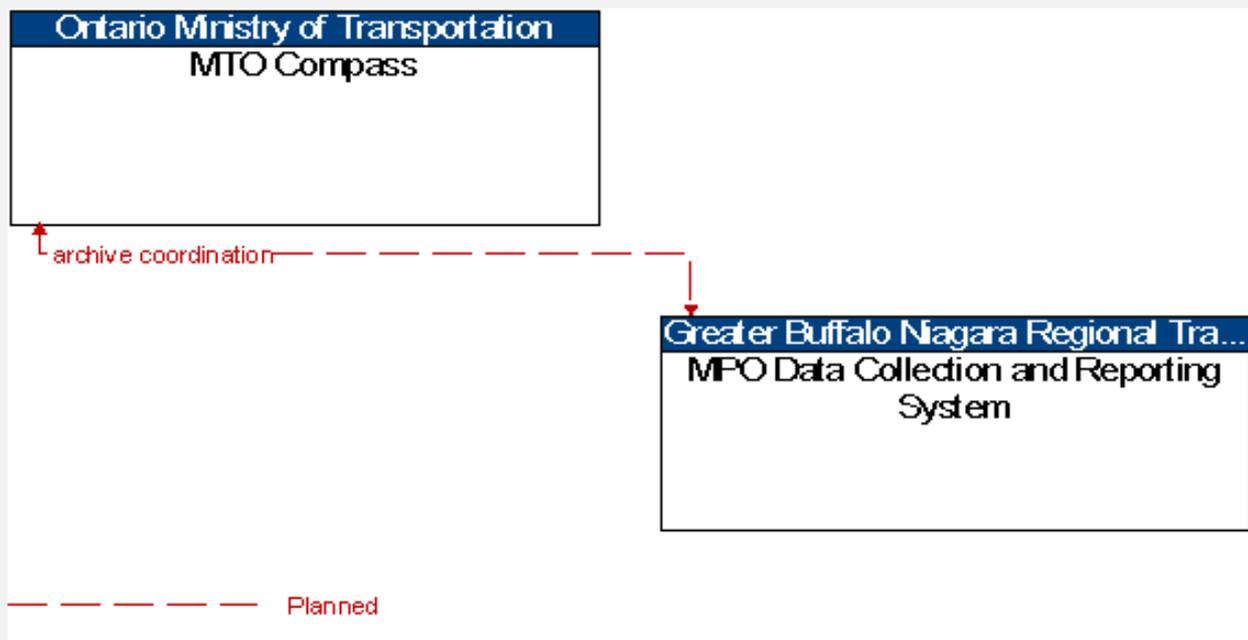


Buffalo-Niagara Demo Web Site



- Home
- Scope
- Stakeholders
- Inventory
 - By Entity
 - By Stakeholder
- Services
- Ops Concept
- Requirements
- Interfaces**
- Standards
- Agreements
- Projects

Interface: MTO Compass - MPO Data Collection and Reporting System



Architecture Flow Definitions

archive coordination (Planned) [Applicable ITS Standards](#)

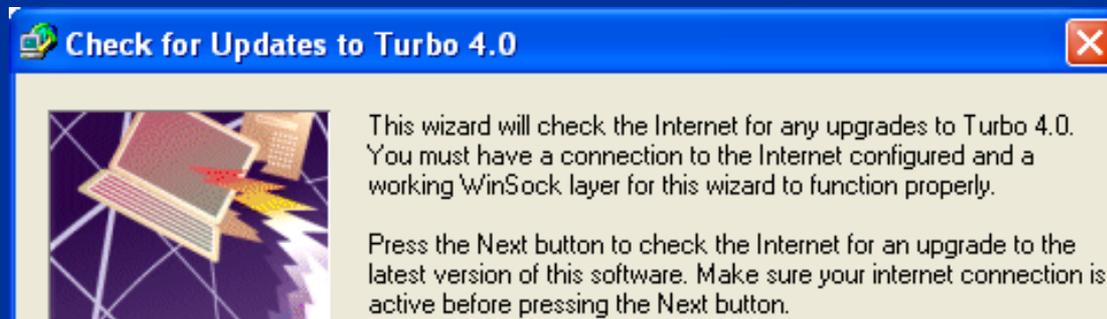
Catalog data, meta data, published data, and other information exchanged between archives to support data synchronization and satisfy user data requests.

Turbo Version 4.1 Availability

- Free download. Follow links from <http://www.its.dot.gov/arch>



- Current users are notified by Turbo



Turbo User Support

- 800 Number (800-260-1001) 
- E-Mail (turbo@iteris.com) 
- Web (www.iteris.com/itsarch) 

Contact Information

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