

ARC-IT Version 9.2 Webinar

December 12, 2023
1:00 – 2:30 pm Est



U.S. Department of Transportation

Intelligent Transportation Systems
Joint Program Office



INTELLIGENT TRANSPORTATION SYSTEMS

PROFESSIONAL CAPACITY BUILDING

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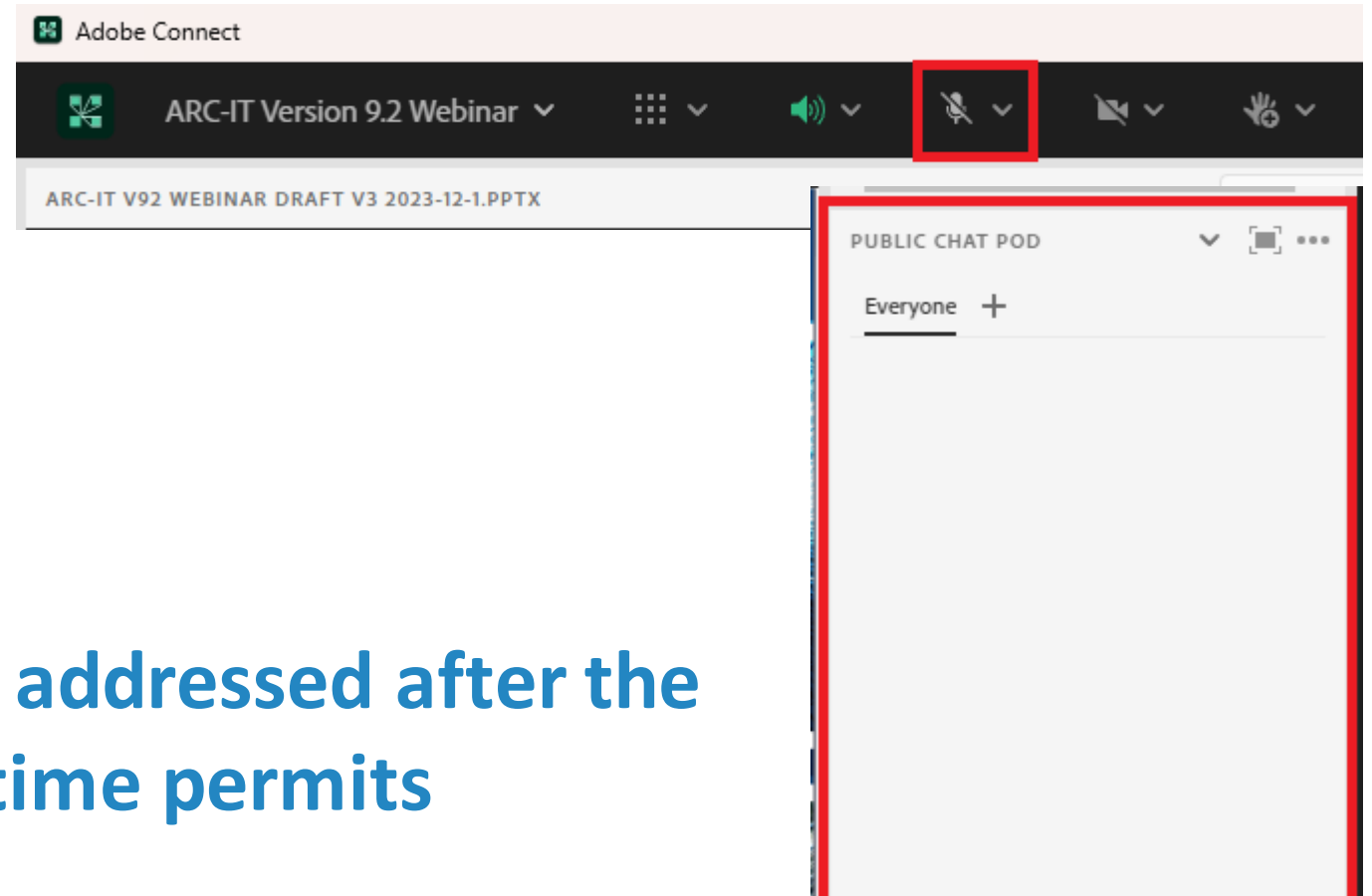
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Ask a Question / Make a Comment

Use the Chat Pod

- Click on the Public Chat square on your screen
- Submit your question or comments in the Chat window

Questions/comments will be addressed after the last presentation, as time permits



Poll Questions



Today's Speakers



Robert Sheehan, PE, PTOE
Program Manager
ITS Joint Program Office



Kingsley Azubike, P.E., PTOE
Transportation Specialist
FHWA Office of Operations



David Binkley
Principal Systems Engineer
Iteris



Cliff Heise
Vice President, Iteris



Andrew Magee
Senior Planner
Indianapolis MPO



**ARC-IT v9.2 – The National ITS
Architecture & Tools**

ARC-IT Discussion Today

- Describe the latest updates to the National ITS Reference Architecture, version 9.2 known as ARC-IT
- Tour the Website
- Describe the tools—what they are, what they are used for, and who should use them in planning for deployment and project implementation
- Discuss how ARC-IT fits into the deployment process and where to find out more

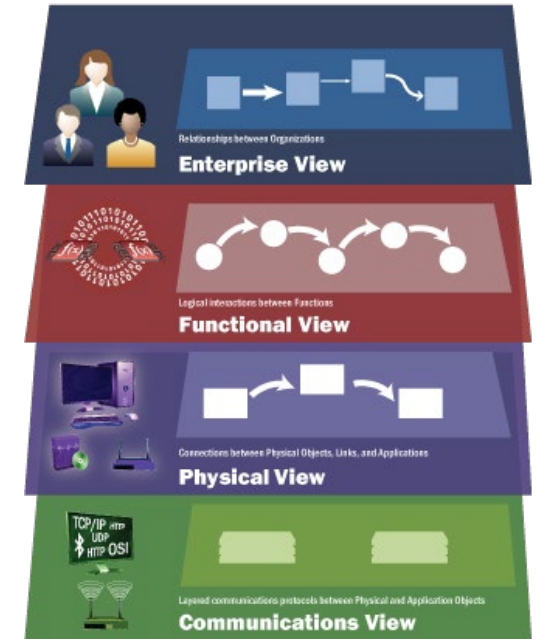
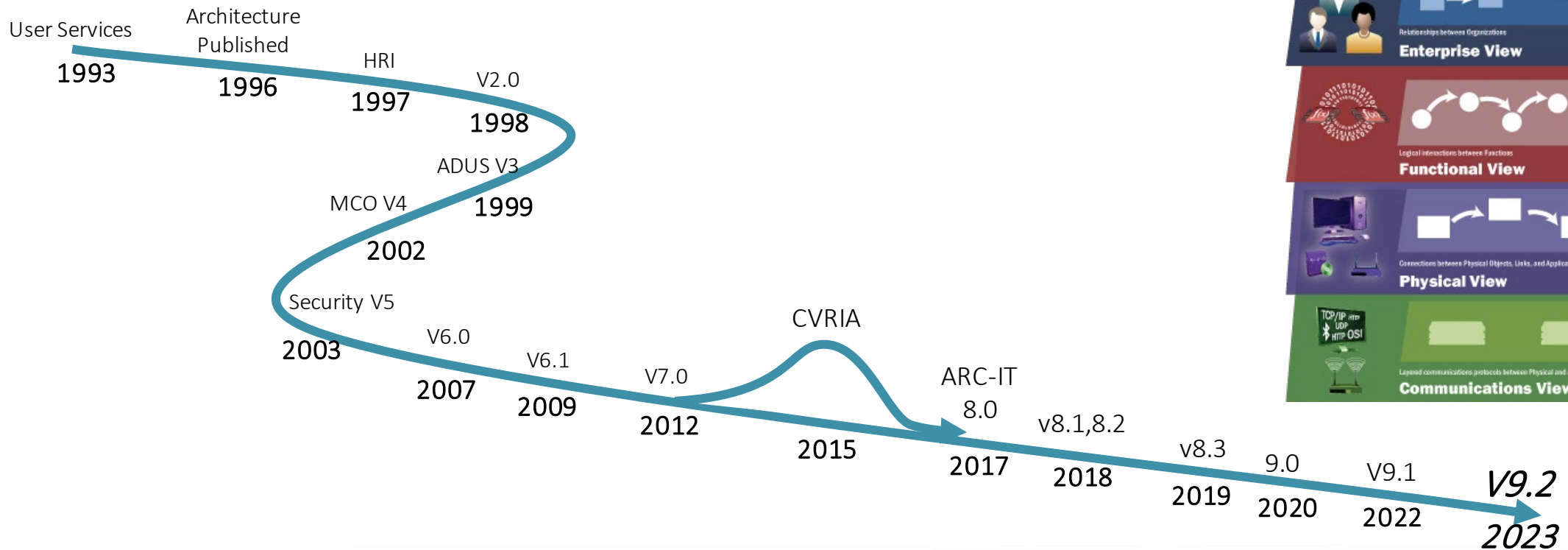
A woman with dark hair, wearing a pink shirt, is shown from the chest up. She has a thoughtful expression, looking upwards and to the right, with her right hand raised to her chin. The background is a solid, muted grey. Overlaid on the image is the text 'ARC-IT Evolution' in a large, white, sans-serif font, and below it, 'How Did We Get Here?' in a smaller, white, sans-serif font.

ARC-IT Evolution

How Did We Get Here?

ARC-IT – The National ITS Reference Architecture is a “Living Document”

- Provides a common framework for planning, defining, and integrating ITS
- Continually evolving & growing



Why Do We Need a National ITS Reference Architecture?

- Provide a national “vision” for ITS
- Guide sound ITS planning and investments at the state and local level
- Support systems engineering analysis for projects deploying ITS
- Identify and scope the needs for standardized interfaces

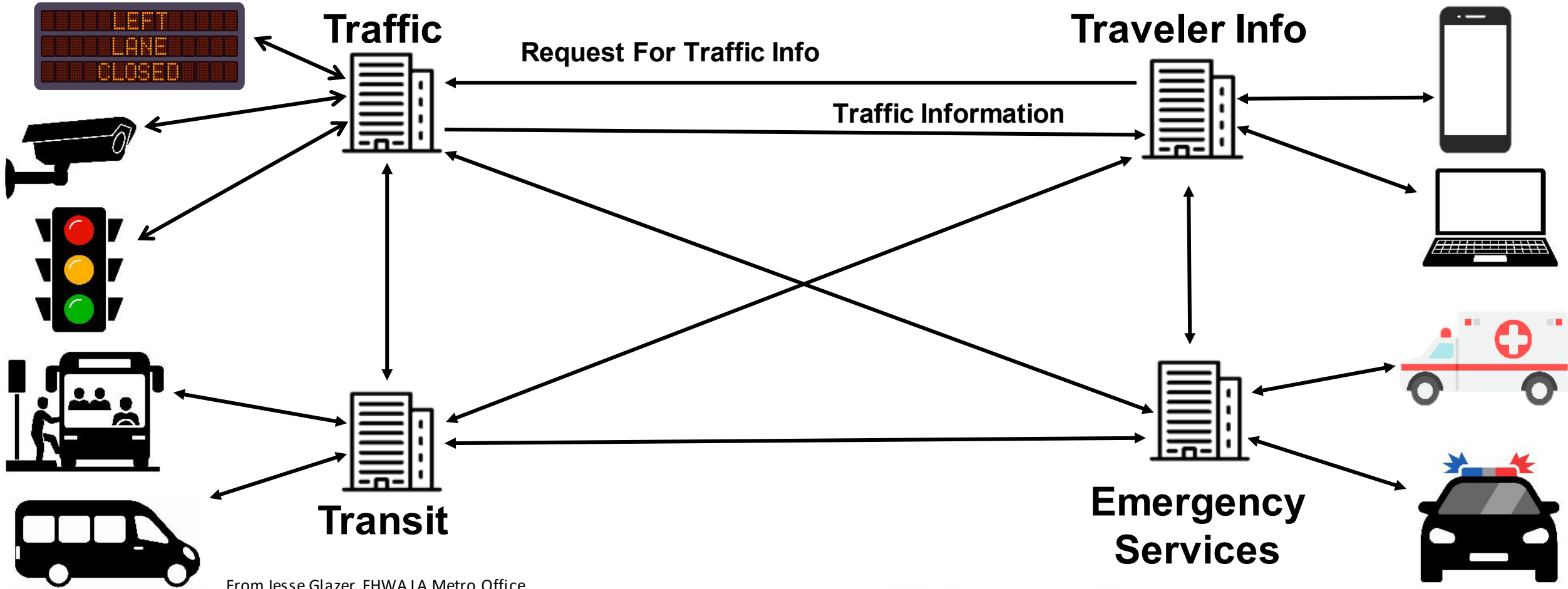


System Architecture for ITS

- Provides a framework for developing integrated transportation systems
- Identifies:
 - Organizations
 - Systems operated
 - Functions performed, services provided
 - Communications required
 - Information exchanged
- **WITHOUT** getting into specific technologies, picking winners/losers
 - Technology Neutral is key



ITS Architecture Includes: Agencies, Systems, Communications, Information Flows




Users and Use Cases Supported

- Regional Planning
- Project Scoping, Project Development
- Standards Investment, Standard scope, standard development



ARC-IT Gives Us a Framework and a Platform

Ask Big Questions

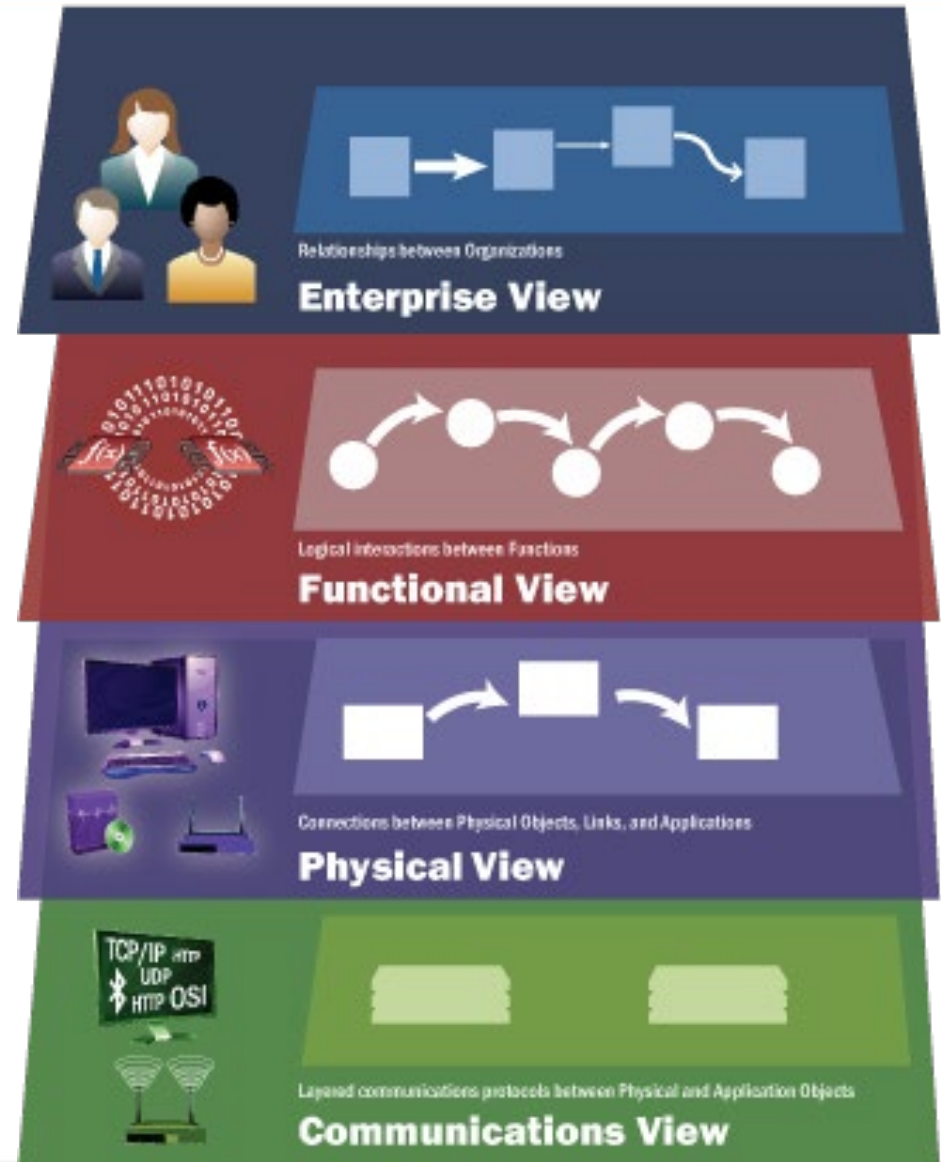
- 
- What is ITS?
 - How do we build and deploy ITS?
 - How do we make ITS deployment more efficient?
 - How do we leverage new communications technologies?
 - How do we balance privacy and public safety?
 - What can we deploy on shared spectrum?

In an Evolving Domain

- Traffic, transit, commercial vehicle, traveler information
- Archived data
- Highway railroad intersections
- Maintenance and construction
- Security
- Connected & automated vehicles
- Multimodal accessible travel
- Intermodal freight
- Robots, aerial mobility and other science fiction

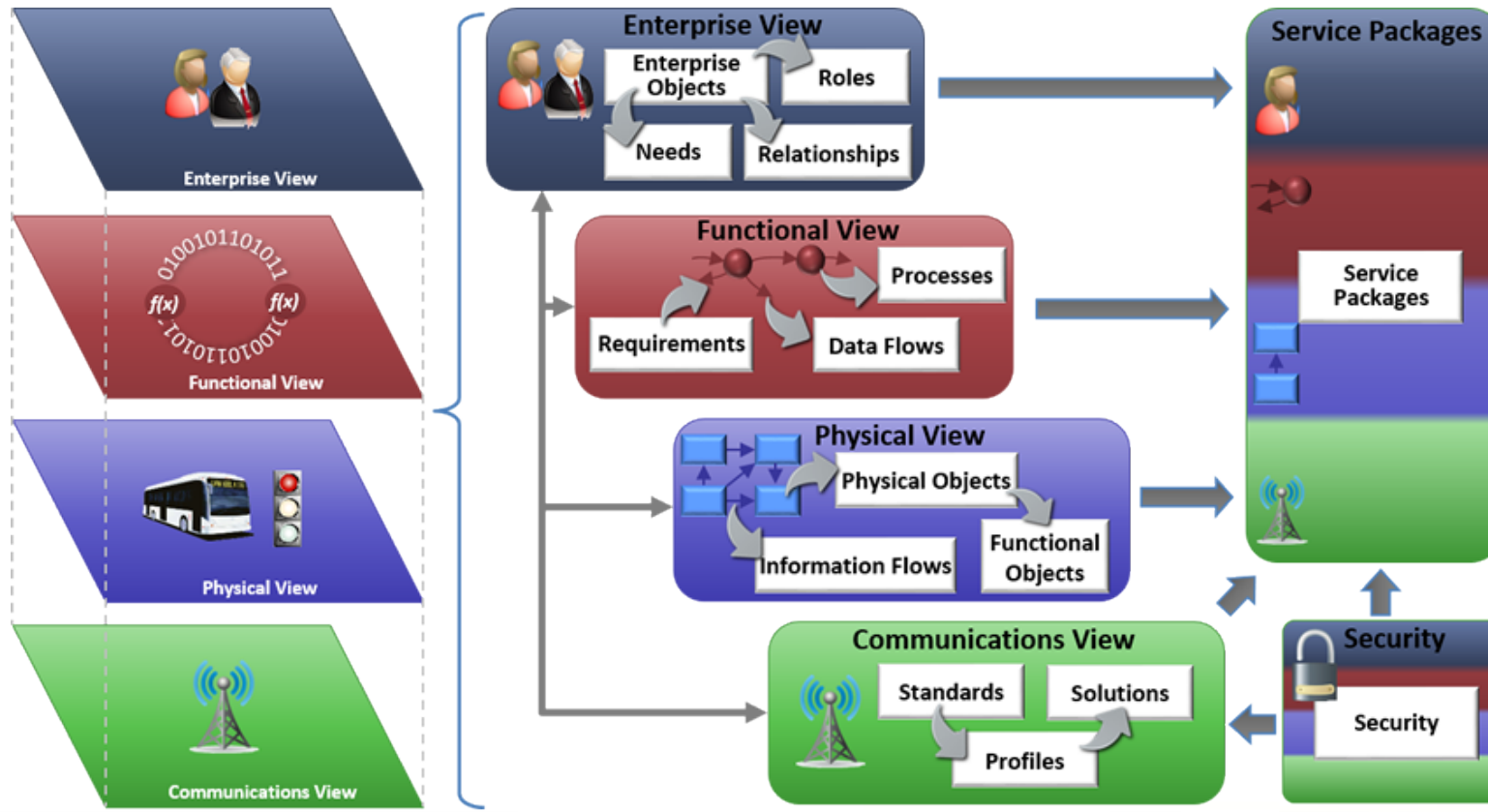
ARC-IT's Structure

How is it Organized and Put Together?



ARC-IT Structure and Organization

- Defined around 4 views, Organized by Service Packages



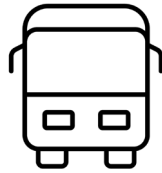
www.arc-it.net

ARC-IT Service Package Areas

Traffic Management



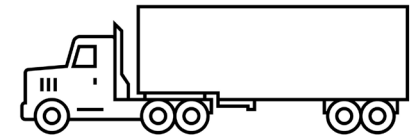
Public Transportation



Maintenance and Construction



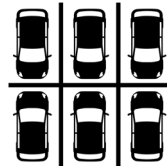
Commercial Vehicle Operations



Public Safety



Parking Management



Vehicle Safety



Traveler Information



Data Management



Support



Sustainable Travel



Weather



What's New for 2023

New Features and Services for version 9.2

ARC-IT V9.2 Changes

- Multimodal Accessible Travel (MAT)
 - Vulnerable Road Users (VRU)
 - Pedestrians
 - Micro Mobility Vehicles (MMV)
 - Wayfinding and Navigation
 - Pathways
 - Indoor and Outdoor
 - Shared Use Fleets
 - Personal mobility fleets such as shared-use cars, ebikes, and scooters plus ride hail/ taxis
 - Payment Integration
 - Across a range of mobility services (e.g. bus, rail, shared use, and micro mobility services)

New 9.2 – more personal devices, especially for Vulnerable Road Users

ARC-IT 9.1



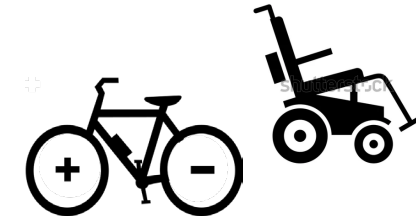
Vehicle On-Board Equipment (OBE)



ARC-IT 9.2



+



Micro Mobility Vehicle (MMV)



Personal Info Device (PID)



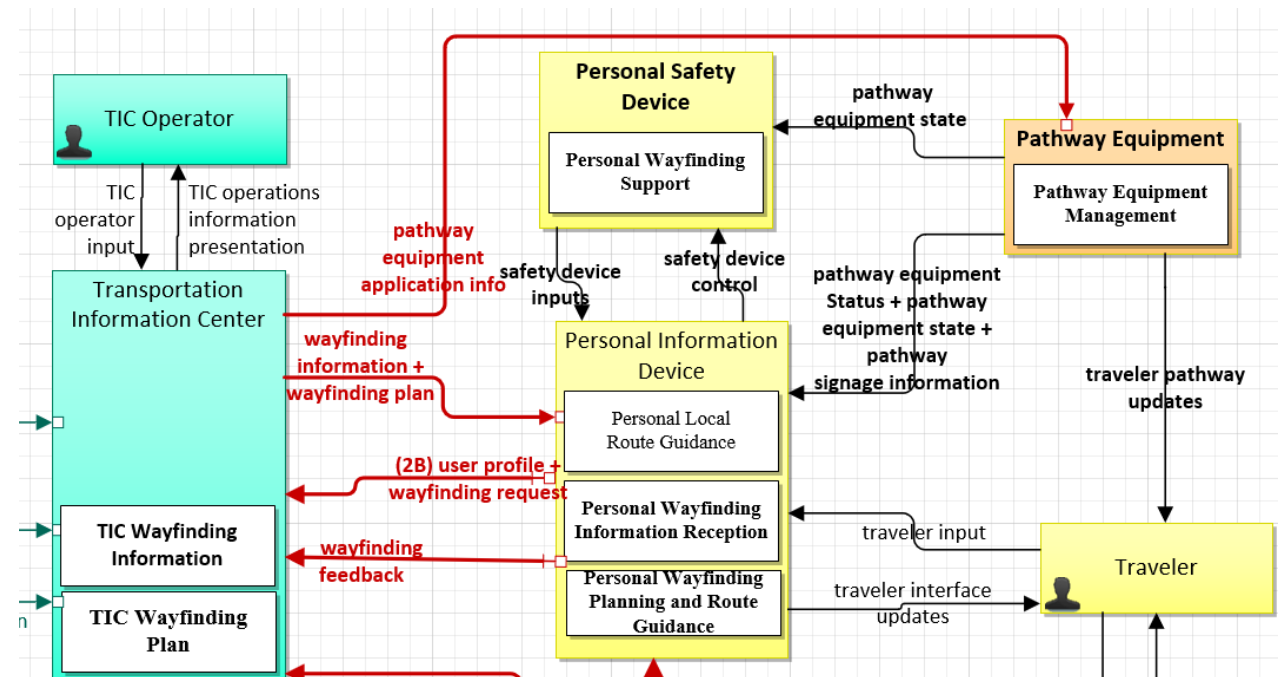
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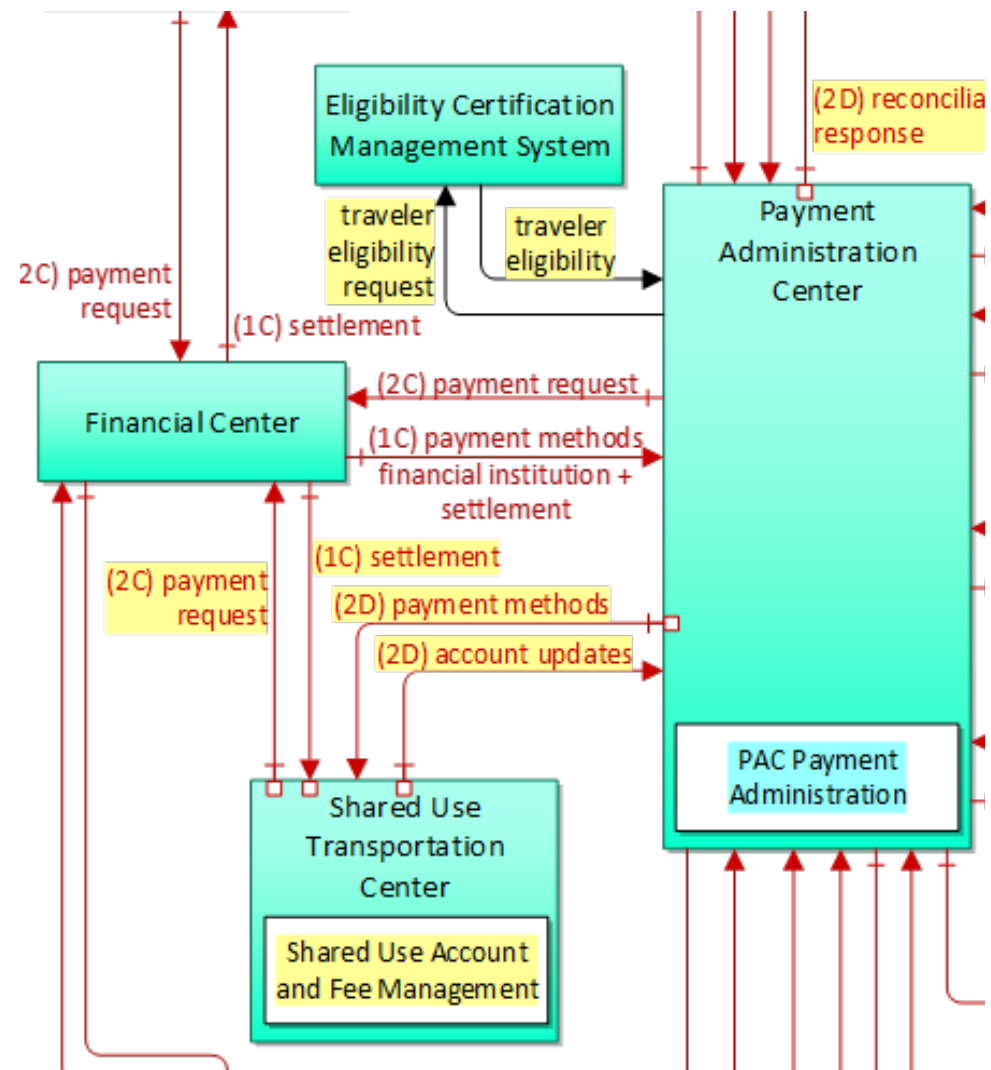
Personal Safety Device (PSD)

ARC-IT Updates for Wayfinding

- New Service Package - **TI08 Personal Wayfinding**
 - Tailored wayfinding information, both pre-trip and real-time guidance
 - Addresses
 - Pathways (sidewalks & bike lanes)
 - Open areas (pedestrian plazas),
 - Indoor facilities, and
 - Crosswalks

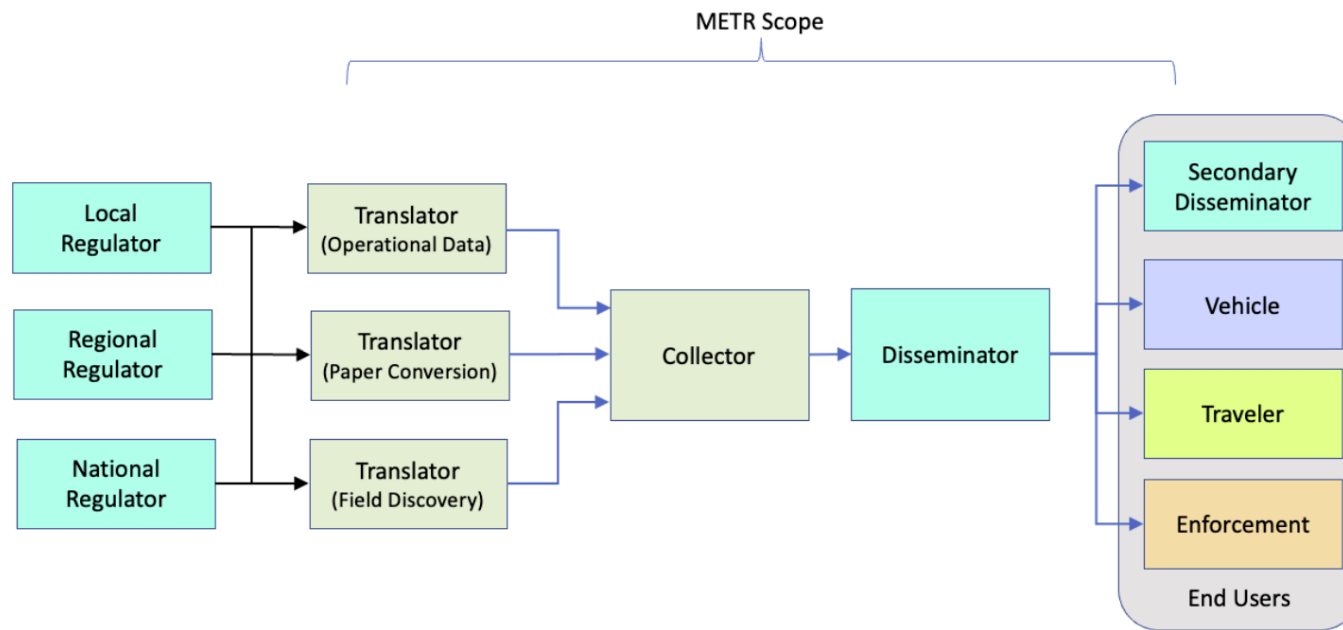


Updates to T105 Integrated Multimodal Electronic Payment

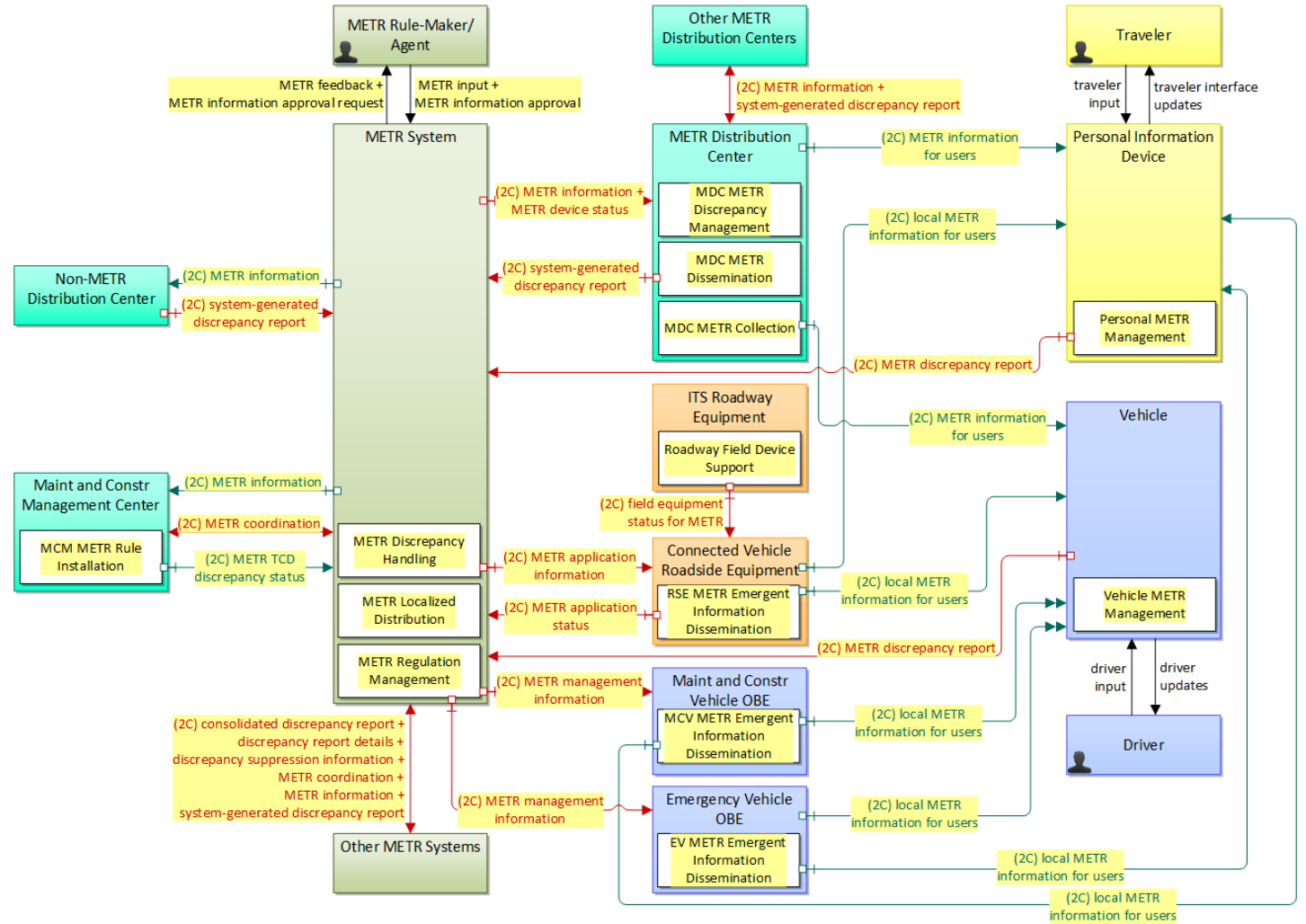


ARC-IT V9.2 Changes, continued

- Management of Electronic Traffic Regulations (METR)
 - Provide a trustworthy way for electronic systems to learn about transport rules
 - ISO Standard in Development



METR in ARC-IT



VS17: Management of Electronic Traffic Regulations (METR)			
6	Physical	Jul 27, 2023	NAT

ARC-IT V9.2 New Service Packages

- MC12: One-Way Convoy Driving
- SU15: Vulnerable Road User Device Transition Support
- TI08: Personal Wayfinding
- VS18: Vulnerable Road User Clustering

- Significant Modifications made to 17 other Service Packages
 - VS12 renamed VRU Safety
 - TI05 Integrated Multimodal Electronic Payment
 - ST05 Electric Charging Stations Management
 - MC07 Work Zone Safety Monitoring

Other New Content

- Physical Objects
 - Vehicle vs Light Vehicle (now a generic Vehicle can be used to model safety and other common functions for any vehicle class)
 - Micromobility Vehicle Onboard Equipment
 - Pathway Equipment
 - Pathway Communications Unit
 - Electric Charging Management Center
 - Shared Use Transportation Center

Version 9.2 Tools Updates

RAD-IT ✓

SET-IT 

- Both RAD-IT & SET-IT are updated
 - Incorporate all of ARC-IT's new services, objects, communications solutions
 - Conversion automates parts of your upgrade process
- Other New Features:
 - Document Settings: RAD-IT remembers settings for document generation; support multiple documents per file
 - Improved Performance
 - Alias: to use your own terminology for information flows and interconnects without losing traceability to ARC-IT
 - Diagram Enhancements: SET-IT diagram generator improved for physical and enterprise context diagrams

Website Tour

Let's take a tour of:
www.arc-it.net

The screenshot shows the homepage of the ARC-IT website. At the top, there is a navigation bar with the United States Department of Transportation logo and the text "ARC-IT Version 9.2 The National ITS Reference Architecture". Below this is a secondary navigation menu with options like "Architecture", "Architecture Use", "Architecture Resources", "Architecture Terminology", and "Contact The Architecture Team". The main heading is "Architecture Reference for Cooperative and Intelligent Transportation". The introductory text explains that ARC-IT is a common framework for planning, defining, and integrating intelligent transportation systems. A list of links provides access to various sections: Architecture, Service Packages, Views, Methodology, Security, Architecture Use, Architecture Resources, and Contact The Architecture Team. The sidebar on the right contains "Latest News" and a vertical stack of navigation buttons for Enterprise View, Functional View, Physical View, and Communications View. The footer includes the date "Last Updated 11/20/2023" and a disclaimer about public domain information.

ARC-IT Website (www.arc-it.net)

United States Department of Transportation

ARC-IT Version 9.2
The National ITS Reference Architecture

Architecture Use Architecture Resources Architecture Terminology Contact The Architecture Team

Home

Architecture Reference for Cooperative and Intelligent Transportation

The Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT) provides a common framework for planning, defining, and integrating intelligent transportation systems. It is a mature product that reflects the contributions of a broad cross-section of the ITS community (transportation practitioners, systems engineers, system developers, technology specialists, consultants, etc.).

ARC-IT is a reference architecture: it provides a common basis for planners and engineers with differing concerns to conceive, design and implement systems using a common language as a basis for delivering ITS, but does not mandate any particular implementation. ARC-IT includes artifacts that answer [concerns](#) relevant to a large variety of [stakeholders](#), and provides [tools](#) intended for transportation planners, regional architects and systems engineers to conceive of and develop regional architectures, and scope and develop projects.

To get started, begin with the menu bar above:

- [Architecture](#) contains links to all of the content inside the architecture, and describes the structure of the architecture. In particular:
 - [Service Packages](#) represent slices of the architecture that address a specific service like traffic signal control and provide the most straightforward entry into ARC-IT content.
 - [Views](#) and its sub-menus provide view-specific content; if for example you are looking for a particular [information flow](#), or a particular [communications profile](#), browse the relevant physical and communications sections here.
 - [Methodology](#) and its sub-menus describe the structure of the architecture: how it is built, how the artifacts within are inter-related.
 - The [Security](#) section describes how security is addressed throughout the architecture and provides links to cross-cutting security content.
- [Architecture Use](#) describes how to use ARC-IT, from the perspective of a regional architect, transportation planner or project systems engineer.
- [Architecture Resources](#) provides access to all ARC-IT content in user-downloadable forms. Notably this also includes access to our tools: RAD-IT and SET-IT, that provide you with means to manipulate the architecture according to models' rules, customizing the reference architecture to your regional or project needs.
- [Architecture Terminology](#) provides those definitions that permeate these pages.
- [Contact the Architecture Team](#) gives you a direct line to the source. We want to hear from you! If you have questions, concerns or find an error (say it isn't so!) we'd like to know about it!

Latest News

ARC-IT includes all views of the National ITS Reference Architecture - Enterprise, Functional, Physical and Communications views; as well as over 150 service packages that present slices of the architecture to show how ITS could be deployed to solve real transportation needs. Version 9.2 focuses on improvements that support Multimodal Accessible Travel (MAT), the Management of Electronic Traffic Regulations (METR) and other new concepts and refinements. [Read more...](#)

November 2023 - The ARC-IT website is updated with enhancements and bug fixes to the RAD-IT & SET-IT software. See below for details.

RAD-IT 9.2.1 includes new document output settings, a new Services Readiness output report, and corrects known performance issues while supporting conversion from previous versions. [Read more...](#)

SET-IT 9.2.1 includes enhancements to the search feature, fixes to the document generator, and fixes for occasional crashes, along with other fixes for known issues and to support conversion from previous versions. [Read more...](#)

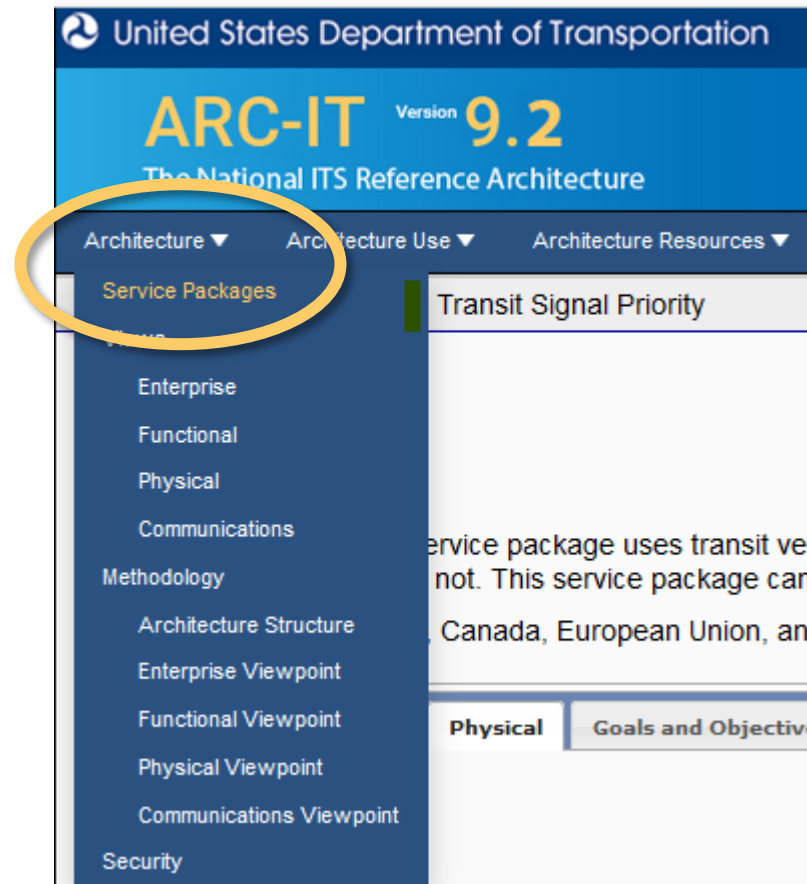
Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT)

- Enterprise View**
Relationships between Organizations
- Functional View**
Logical interactions between Functions
- Physical View**
Connections between Physical Objects
- Communications View**
Layered protocols facilitating data exchange between Physical Objects

Last Updated 11/20/2023

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ARC-IT Website: Architecture Pull-Down



ARC-IT Service Packages Menu

United States Department of Transportation

ARC-IT Version 9.2
The National ITS Reference Architecture

Architecture ▾ Architecture Use ▾ Architecture Resources ▾ Architecture Terminology ▾ Contact The Architecture Team

Home > Service Packages > Transit Signal Priority

<< PT08 : PT09 : PT10 >>

PT09: Transit Signal Priority

The Transit Signal Priority service package uses transit vehicle to infrastructure communications to allow a transit vehicle to request priority at one or a series of intersections. The service package provides feedback to the transit driver if priority has been granted or not. This service package can contribute to improved operating performance of the transit vehicles by reducing the time spent stopped at a red light.

Relevant Regions: Australia, Canada, European Union, and United States

Enterprise Functional **Physical** Goals and Objectives Needs and Requirements Sources Security Standards System Requirements Implementations

Physical

The physical diagram can be viewed in SVG or PNG format and the current format is SVG.
[SVG Diagram](#)
[PNG Diagram](#)

```
graph LR; TMC[Traffic Management Center] --- TMC_SC[TMC Signal Control]; IRE[ITS Roadway Equipment]; CVERE[Connected Vehicle Roadside Equipment]; TMC -- "(2B) right-of-way request notification" --> IRE; IRE -- "(2A) signal priority service request" --> CVERE; CVERE -- "(1A) vehicle location and motion" --> IRE; IRE -- "(2B) intersection management application info" --> TMC; IRE -- "(2B) intersection management application status" --> TMC; TMC -- "(2B) signal control commands" --> IRE; CVERE -- "(2A) local signal priority request" --> IRE;
```


ARC-IT Website: Architecture Use

United States Department of Transportation

ARC-IT 3.2

The National ITS Reference Architecture

Architecture Use

ARC-IT & Planning
Regional Architecture Definition
Regional Architecture Use
Project Development

Architecture Use

ARC-IT is a reference architecture that provides a common basis for planners and engineers with differing concerns to conceive, design and implement systems using a common language as a basis for any particular implementation. The National ITS Architecture was developed over 25 years ago in order to:

- Provide a National "Vision" for ITS
- Guide Sound ITS Planning and Investments at the State and Local Level
- Identify and Scope Need for ITS Standards

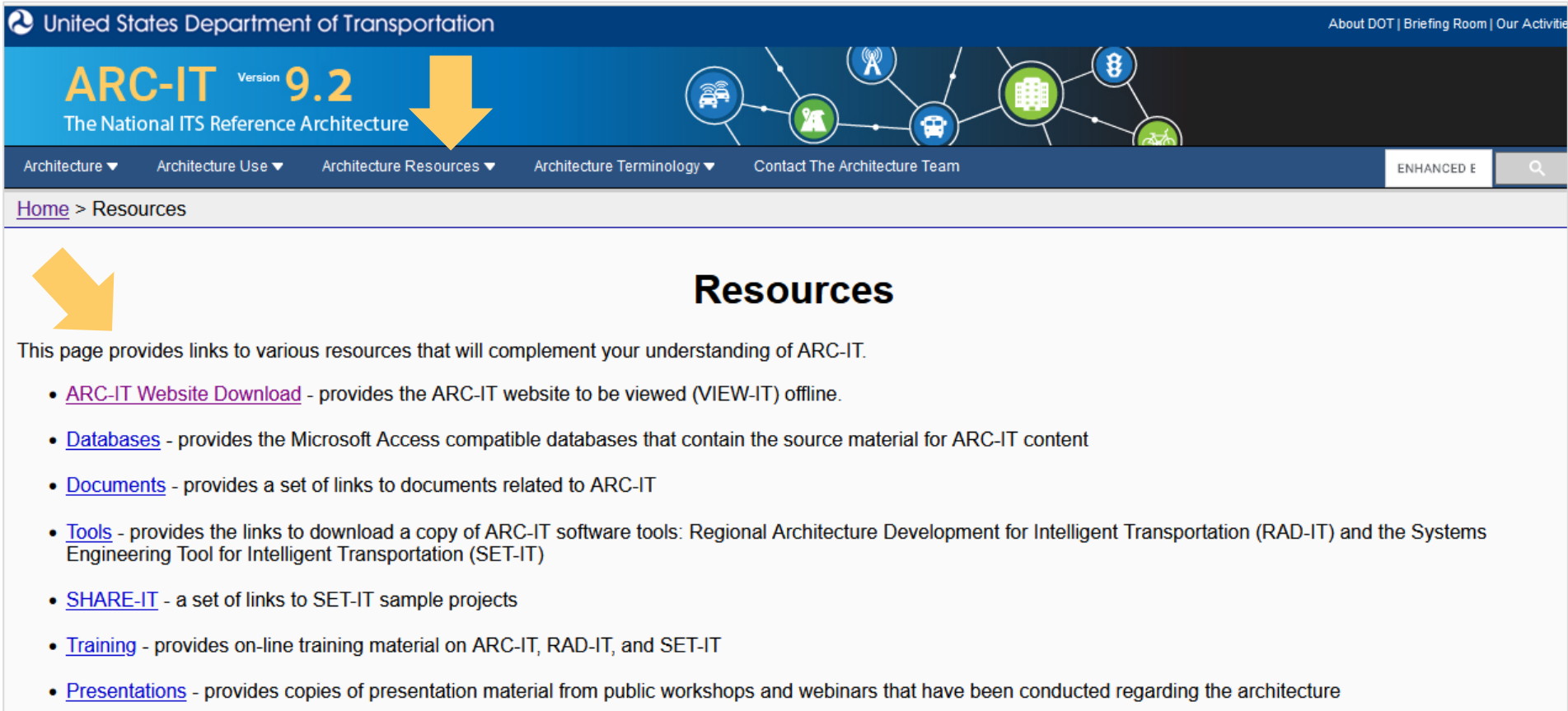
In order to provide a connection between transportation planning and ARC-IT, the website provides a connection defined by the USDOT and the views of ARC-IT. This connection is described on the ARC-IT Connection attributes for which this connection is defined are:

- **Planning Factors:** There are seven planning factors defined by the most recent Transportation authorization (FAST), that metropolitan planning organizations (MPOs) and states should consider when developing their plans.
- **Goals:** Transportation planning begins with a set of broad goals that reflect the desired outcomes and the representative goals included in the ARC-IT mapping to planning are closely tied to the planning factors.
- **Objectives:** Each of the goals in a metropolitan or statewide transportation plan is supported by one or more needs to occur to accomplish the goals. A range of objectives are included in the ARC-IT mapping to planning that reflect the spectrum of objectives that are used in current transportation plans.

In order to guide the investments in ITS at the state and local level, 23 CFR 940 requires the creation of a Regional ITS Architecture defined by the regulation as "a regional framework for ensuring institutional agreement and technical integrity for projects or groups of projects". The definition of the components of a Regional ITS Architecture and an application of these architectures is provided [Regional ITS Architecture Definition and Development](#).

A regional ITS architecture can effectively bridge the gap between strategic planning for an integrated surface transportation system and the implementation of projects that support that strategic vision. The principal value of a regional ITS architecture is that it provides a common language and framework for the development of ITS so that each project can build a piece of a larger system. The regional ITS architecture can be used to ensure that all stakeholders in a region spend their money compatibly instead of competing for funds. Additional information on how the components of ARC-IT support architecture use can be found at: [More Information](#).

ARC-IT Website: Architecture Resources



United States Department of Transportation

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ARC-IT Version **9.2**
The National ITS Reference Architecture

Architecture ▾ Architecture Use ▾ Architecture Resources ▾ Architecture Terminology ▾ Contact The Architecture Team

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[Home](#) > Resources

Resources

This page provides links to various resources that will complement your understanding of ARC-IT.

- [ARC-IT Website Download](#) - provides the ARC-IT website to be viewed (VIEW-IT) offline.
- [Databases](#) - provides the Microsoft Access compatible databases that contain the source material for ARC-IT content
- [Documents](#) - provides a set of links to documents related to ARC-IT
- [Tools](#) - provides the links to download a copy of ARC-IT software tools: Regional Architecture Development for Intelligent Transportation (RAD-IT) and the Systems Engineering Tool for Intelligent Transportation (SET-IT)
- [SHARE-IT](#) - a set of links to SET-IT sample projects
- [Training](#) - provides on-line training material on ARC-IT, RAD-IT, and SET-IT
- [Presentations](#) - provides copies of presentation material from public workshops and webinars that have been conducted regarding the architecture

ARC-IT Website: Architecture Terminology

United States Department of Transportation

ARC-IT Version 9.2
The National ITS Reference Architecture

Architecture Use Architecture Resources Architecture Terminology Contact The Architecture Team

Home > Architecture Terminology > Acronyms

Acronyms
Glossary

Acronyms

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

AAA: American Automobile Assoc
AACN: Advanced Automatic Cras
AADT: Annual Average Daily Traf
AADTT: Annual Average Daily Tru
AASHTO: American Association c

United States Department of Transportation

ARC-IT Version 9.2
The National ITS Reference Architecture

Architecture Use Architecture Resources Architecture Terminology Contact The Architecture Team

Home > Architecture Terminology > Glossary

Glossary

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 0-9

Real-Time Updates
Changes to data reflected in a short enough period of time such that the data appears to reflect reality at the moment the data is examined.

Record of Decision
A record of agreement that a proposed project meets all applicable requirements of the National Environmental Policy Act (NEPA), as issued by the designated lead agency.

Reference Architecture
An architecture that is used to guide the production of other architectures. Note: In this context the word 'architecture' refers to the term 'architecture description' from the ISO/IEC/IEEE 42010 model of a system architecture.

ARC-IT Website: Contact Us Page

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The National ITS Reference Architecture

Architecture ▾ Architecture Use ▾ Architecture Resources ▾ Architecture Terminology ▾ Contact The Architecture Team ENHANCED E 🔍

[Home](#) > Contact The Architecture Team

Contact The Architecture Team

The ARC-IT Team is very interested in input that will help us improve the architecture. We encourage you to provide us with your suggestions or additions to ARC-IT, by filling out the form below with your suggestions or comments.

***Required fields**

*Name:

Organization:

*E-mail:

*Comment:

Architecture Toolset

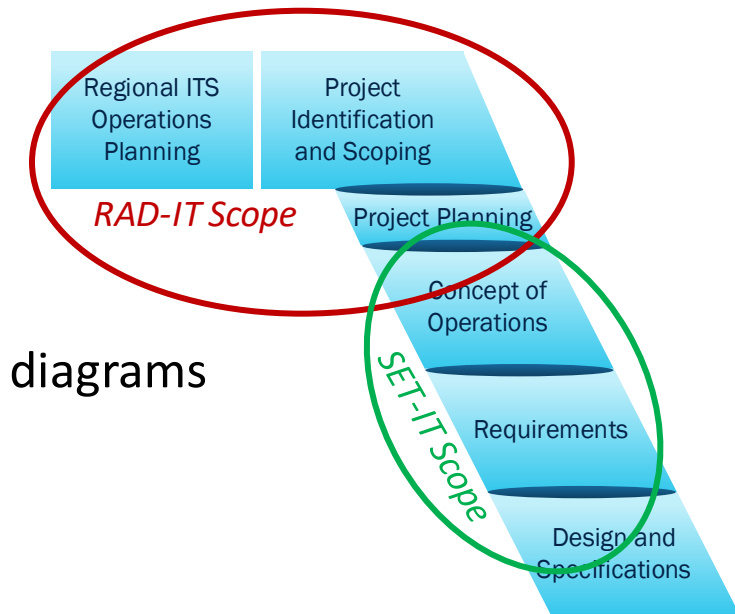
- RAD-IT & SET-IT

RAD-IT ✓

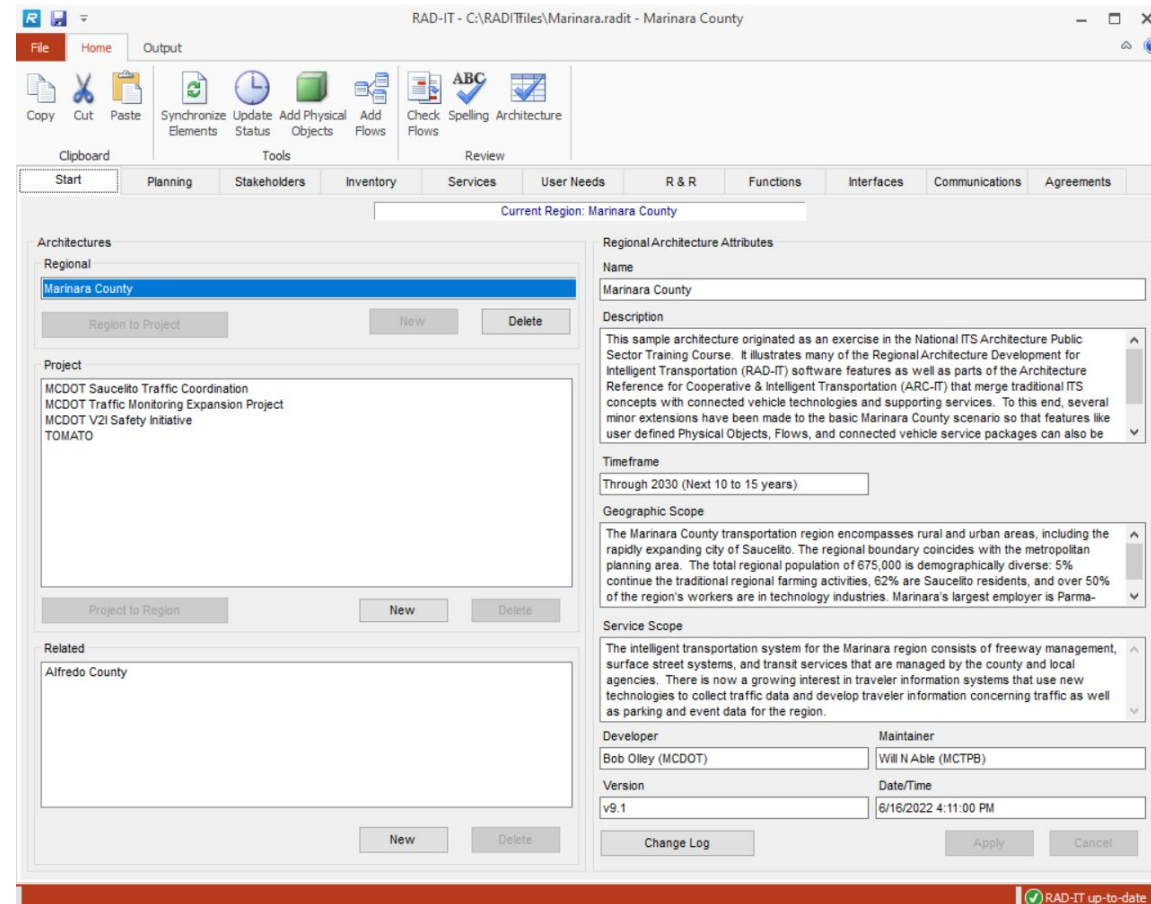
SET-IT 

Scope of Tools

- RAD-IT focuses on regional planning and the development of operational concepts,
 - Stakeholders, Physical Objects, Service Packages, Interfaces for the region
- SET-IT is project-focused
 - scope specified in the regional architecture
 - graphical tool,
 - providing visual feedback and tools to manipulate service package diagrams
 - Identify/Customize Comm solutions
 - Develop Enterprise agreements
 - Outputs – ConOps, diagrams, tables
- Training for both tools available on the ARC-IT website



Regional Architecture Development for Intelligent Transportation (RAD-IT)



Systems Engineering Tool for Intelligent Transportation (SET-IT)

- Originally to support Connected Vehicle project architecture development
- Expanded to include all ITS
- Creation of diagram-based project architectures
- Covering the Physical, Enterprise and Comm Views
- Outputs include Concept of Operations document, project document, Visio drawings.
- Microsoft Visio 2013 or newer



SET-IT Provides Access to All ARC-IT Service Packages

The screenshot displays the SET-IT software interface. The top window title is "SET-IT - C:\SETIT\V2\ Safety Initiative 231130\V2\ Safety Initiative 231130.setit". The interface includes a ribbon with "Project", "Home", "Review", and "Output" tabs, and a "Search" field. Below the ribbon are icons for "Diagram", "Enterprise", "Physical", "Comm", and "Synchronize".

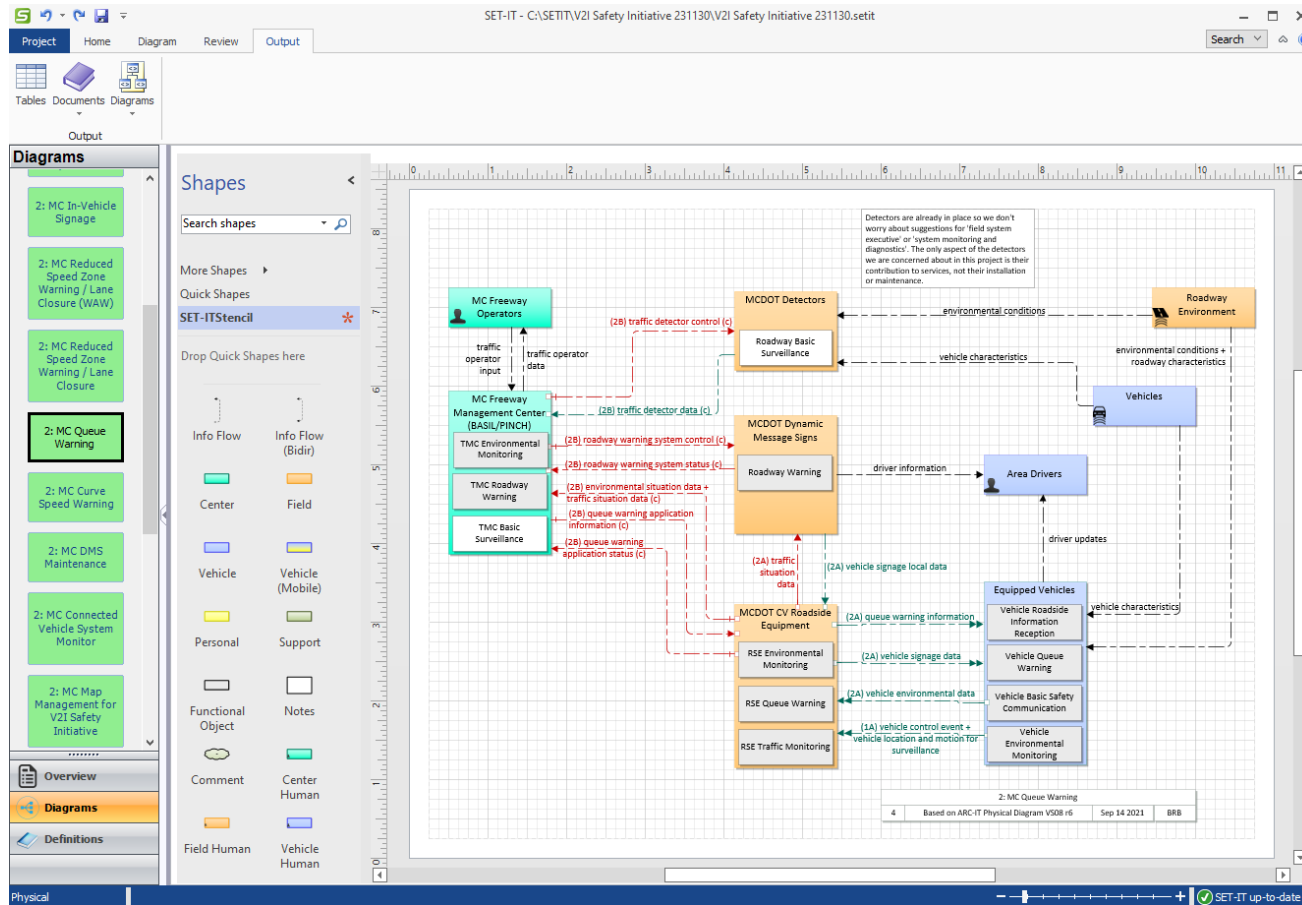
The main area is divided into two panes. The left pane, titled "Overview", contains a table of service packages. The right pane displays a detailed diagram of a traffic control system, showing various components like "Traffic Management Center", "Traffic Signal Control", and "Vehicle-to-Infrastructure (V2I) Communication".

Service Packages Table:

Add	SP	SP #	Imp #	Imp	Service Package
<input type="checkbox"/>	SU12	0	0	SU12	Vehicle Maintenance
<input type="checkbox"/>	SU13	0	0	SU13	Personnel Device Maintenance
<input type="checkbox"/>	SU14	0	0	SU14	Remote Access
<input type="checkbox"/>	SU15	0	0	SU15	Vulnerable Road User Device Transition Support
<input type="checkbox"/>	TI01	0	0	TI01	Broadcast Traveler Information
<input type="checkbox"/>				TI01.1	Wide Area Broadcast
<input type="checkbox"/>				TI01.2	C-TIS Local Broadcast
<input type="checkbox"/>	TI02	0	0	TI02	Personalized Traveler Information
<input type="checkbox"/>	TI03	0	0	TI03	En-Route Guidance
<input type="checkbox"/>	TI04	0	0	TI04	Trip Planning and Payment
<input type="checkbox"/>	TI05	0	0	TI05	Integrated Multi-Modal Electronic Payment
<input type="checkbox"/>				TI05.1	Account-based
<input type="checkbox"/>				TI05.2	Card-based
<input type="checkbox"/>				TI05.4	Account-based, personal transport and shared use
<input type="checkbox"/>				TI05.5	Account-based with all modes
<input type="checkbox"/>				TI05.3	Pay-as-you-go
<input type="checkbox"/>	TI06	0	0	TI06	Shared Use Mobility and Dynamic Ridesharing
<input type="checkbox"/>				TI06.1	Shared Use Mobility
<input type="checkbox"/>				TI06.2	Dynamic Ridesharing
<input type="checkbox"/>	TI08	0	0	TI08	Personal Wayfinding
<input type="checkbox"/>	TI09	0	0	TI09	Travel Services Information and Reservation
<input type="checkbox"/>	TM01	0	0	TM01	Infrastructure-Based Traffic Surveillance
<input type="checkbox"/>				TM01.1	Detector-Based Surveillance
<input type="checkbox"/>				TM01.2	Video Monitoring
<input type="checkbox"/>				TM01.3	Bluetooth Signature Monitoring
<input type="checkbox"/>	TM02	0	0	TM02	Vehicle-Based Traffic Surveillance
<input type="checkbox"/>				TM02.1	Wide-Area Wireless Communications
<input type="checkbox"/>				TM02.2	C-TIS Communications
<input type="checkbox"/>	TM03	0	0	TM03	Traffic Signal Control
<input type="checkbox"/>				TM03.1	Pre-Timed (Fixed Time) Control
<input type="checkbox"/>				TM03.2	Fully Traffic Responsive
<input type="checkbox"/>				TM03.3	Field Master Controlled
<input type="checkbox"/>	TM04	0	0	TM04	Connected Vehicle Traffic Signal System
<input type="checkbox"/>				TM04.1	Pre-Timed (Fixed Time) Control
<input type="checkbox"/>				TM04.2	Fully Traffic Responsive
<input type="checkbox"/>				TM04.3	Field Master Controlled
<input type="checkbox"/>	TM05	0	0	TM05	Traffic Metering
<input type="checkbox"/>	TM06	0	0	TM06	Traffic Information Dissemination
<input type="checkbox"/>				TM06.1	Dynamic Message Signs

The right pane contains a detailed diagram of a traffic control system. It shows various components such as "Traffic Management Center", "Traffic Signal Control", "Vehicle-to-Infrastructure (V2I) Communication", and "Vehicle-to-Vehicle (V2V) Communication". The diagram illustrates the flow of information and control between these components, including data exchange for traffic status, signal control, and vehicle location. A text box above the diagram explains that the service package uses vehicle location and movement information to improve traffic signal control systems and provides related mobility services like Transit Signal Priority and Emergency Vehicle Preemption.

SET-IT User Interface & Output Menus



The "Output Tables" dialog box is used for configuring data output. It features the following sections:

- Select Table:** A tree view showing the project structure:
 - Project / File Info
 - Project Summary
 - Change Log
 - Service Packages
 - Diagram Information
 - Status Values
 - Stakeholders
 - Assumptions and Constraints
 - Needs & Requirements
 - Physical View
 - Enterprise View
 - Communications View
- Select Columns:** Two lists for column selection:
 - Available Columns:** Applicable Regions, Applicable Regions Full Name, Developer, Initials, Maintainer, Procurement Strategy, Operations Resources, Alternatives Considered.
 - Selected Columns:** Name, Description, Start Date, End Date, Geographic Scope, Service Scope, Version, Version Date.
- Select Action:** Radio buttons for "Save to File" (selected) and "Open Application".
- Create Output:** Buttons for "Word", "Excel", and "Text" output formats.

ARC-IT Tools Integration

- SET-IT's Import: connecting regional planning to project definition
 - Take the Regional Architecture content as an input for a project in SET-IT
 - Drive more SE analysis using tools → requirements, ICDs, security, comm standards
- RAD-IT's Import supports feedback from a project back into the regional architecture

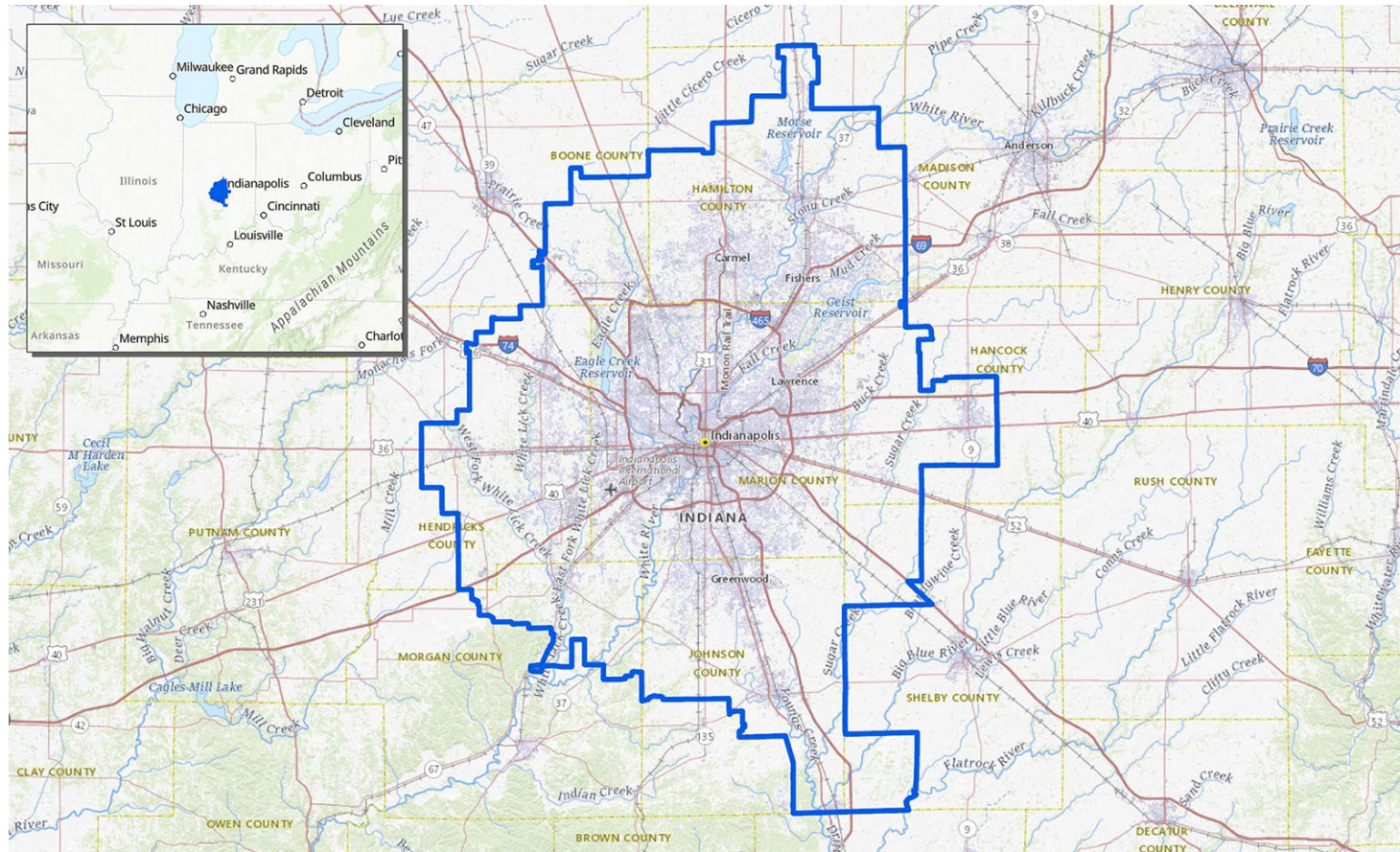


Andrew Magee

Senior Planner
Indianapolis MPO



Indianapolis MPO



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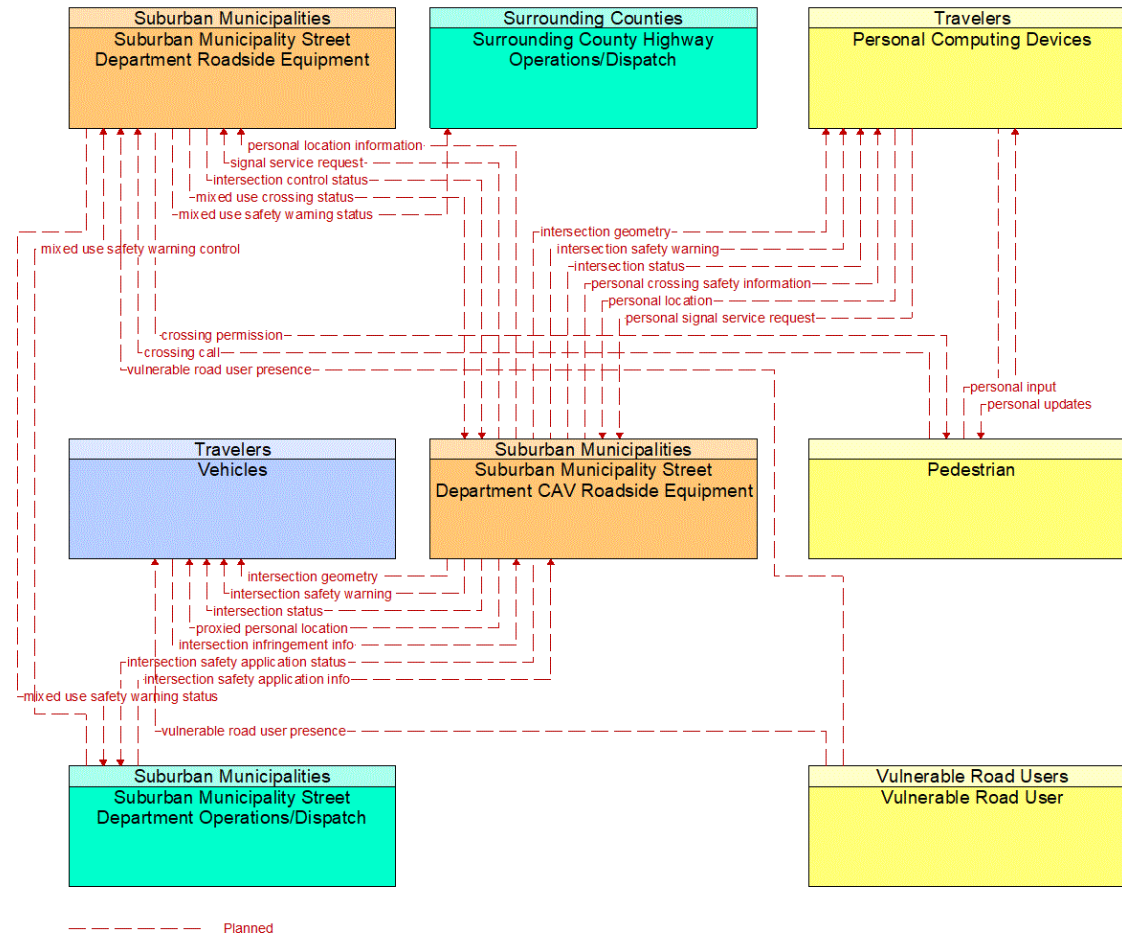
Indianapolis Regional ITS Architecture

- Managed and maintained by Indianapolis MPO
- Representative of ITS across Central Indiana Region
 - Available to all agencies and communities to support ITS planning
 - Reference architecture for entire Region
- Supports Active Transportation Plan
 - Bike, pedestrian, micro-mobility devices such as shared scooters
 - Multimodal Accessible Travel (MAT) through interaction with existing transit systems such as Bus Rapid Transit and local bus service
 - Safety for Vulnerable Road Users
- Architecture Update Project will be completed in January 2024
 - Incorporated VRU Safety and MAT services supporting Active Transportation Plan
 - Developed example projects to facilitate stakeholder engagement
 - Phased approach for MAT: Planning, En-Route Guidance, and Payment Integration



Vulnerable Road User Safety

- Detection of VRU via
 - Roadside devices (cameras)
 - Mobile device (smart phone)
- VRU presence communicated to CAV Roadside Equipment
 - Communication to CAV-equipped vehicles
- Use of “generic” stakeholder Roadside Equipment supports planning as stakeholders are ready



Poll Question



Architecture Deployment Support

ARC-IT Training Available

Topic Area	Web-Based Training	On-Site Training	Workshops
ITS Architecture	ARC-IT Web-Based RA Use & Maintenance Web-Based	ARC-IT 101 / Refresher	Quick-Starting Your RA Update Architecture Development Use & Maintenance Workshop
Software Tools	RAD-IT Web-Based SET-IT Web-Based	RAD-IT SET-IT	---
Systems Engineering	---	Systems Engineering	Systems Engineering for ITS

{Directly from the website}

{Coordinated w FHWA Operations}

Technical Assistance Available from FHWA

- ITS Architecture Assessments
- Process Improvement Reviews
- Tools Assistance

Contact

- FHWA Resource Center/Division Offices
- Kingsley Azubike, FHWA Office of Operations (kingsley.azubike@dot.gov)
- https://ops.fhwa.dot.gov/its_arch_imp/index.htm

1. Architecture Scope and Region		Purple
Description		
<i>General Scope Comments Here</i>		
Question	Answer	Comments
a. Is the region defined geographically? Have boundaries been established such as counties, municipal boundaries, metropolitan areas, statewide, etc.?	Unknown	
b. Has a timeframe for the architecture been defined? (For example, 5 or 10 years into the future, or the TIP/STIP or other Capital Plan planning period)?	Unknown	
c. Has the scope of the regional architecture been defined (i.e. the range of services, institutions, or jurisdictions)? Does the scope seem appropriate given the circumstances?	Unknown	
d. Are adjacent/overlapping ITS architectures identified?	Unknown	

ITS PCB Trainings



ITS BASICS



AUTOMATED VEHICLES



INTEROPERABLE
CONNECTIVITY



DATA MANAGEMENT



PERFORMANCE
MEASUREMENT



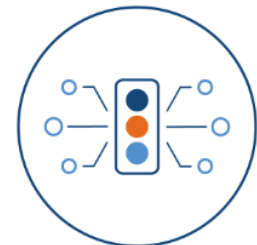
TRANSIT AND
MULTIMODAL



SYSTEMS ENGINEERING



ITS ARCHITECTURE



ITS STANDARDS



CYBERSECURITY



SAFETY AND OPERATIONS



TELECOM AND
NETWORKING

www.pcb.its.dot.gov/itscourses/default.aspx#training

New Web-Based Trainings & In-Person Trainings

Web-based Trainings (WBT)

- ITS: What, Why, and How
- Improving Highway Safety with ITS
- *ITS Cybersecurity**
- *ITS Systems Engineering**



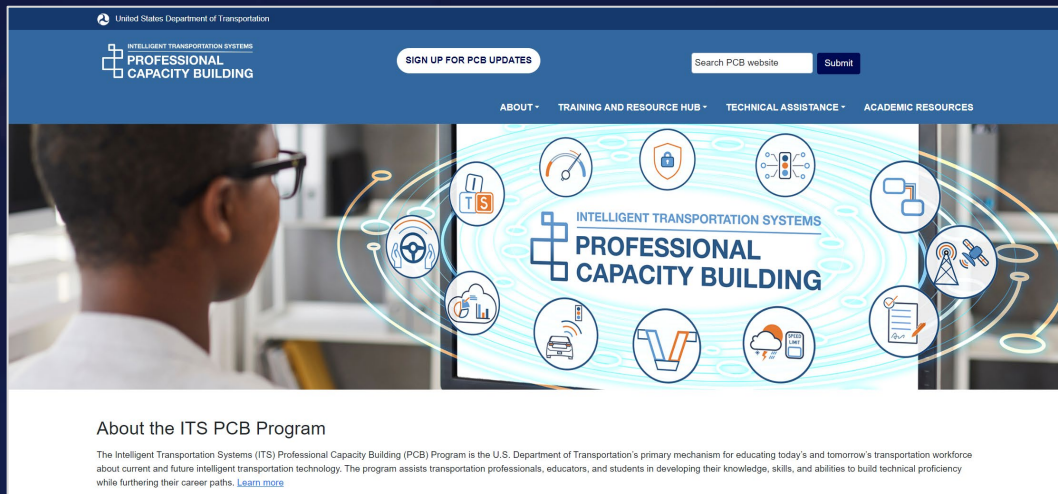
www.nhi.fhwa.dot.gov

In-Person Trainings (Offered to ITS State Chapters)

- Crowdsourcing for Advancing Operations
- Building an ITS Project SOW to Carry Out the Systems Engineering Process
- Applying the NIST Framework to Transportation Systems
- *V2X Foundational Training**

** In Development; available in early 2024*

Thank You for Coming



For more information, visit:

www.pcb.its.dot.gov