INDIANAPOLIS REGIONAL ITS ARCHITECTURE UPDATE

ITS ARCHITECTURE UPDATE REPORT

Version 1.0

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Prepared for the Indianapolis Metropolitan Planning Organization

MPO

Prepared by Iteris, Inc.

iteris®

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This plan was prepared in cooperation with the State of Indiana, the Indiana Department of Transportation, and the Federal Highway Administration. This financial assistance notwithstanding, the contents of this document do not necessarily reflect the official view or policies of the funding agencies.

1.0   INTRODUCTION

The Indianapolis Regional Intelligent Transportation Systems (ITS) Architecture was updated under the Indianapolis Regional ITS Architecture Update project. This report documents the changes that were made to the architecture content during the update process.

The architecture was made available for stakeholder review in three formats:

- Hyperlinked website.
- Architecture database file for use with the Regional Architecture Development for Intelligent Transportation (RAD-IT) software.
- Architecture Update document in Adobe Acrobat (PDF) format.

The content for all formats was drawn from the Indianapolis Regional ITS Architecture RAD-IT file so there was consistency across all formats. Following review of the draft architecture update, stakeholder comments were incorporated into the final architecture update.

2.0   ARCHITECTURE UPDATE SUMMARY

The Indianapolis Regional ITS Architecture Update activities addressed the breadth of the architecture providing a revision to the architecture baseline for changes resulting from:

- Conversion to the latest version of the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT) Version 9.1 for the draft architecture and ARC-IT Version 9.2 for the final architecture.
- Stakeholder inputs gathered during the Stakeholder Workshop conducted on May 4, 2023.
- Planning and project information gathered from transportation plans.
- Stakeholder responses through a stakeholder review workbook distributed in conjunction with the Stakeholder Workshop.
- Stakeholder comments received from the Draft Architecture Stakeholder Review conducted between July 11, 2023 and August 1, 2023.
- Architecture analysis conducted at the initiation of the project.

An architecture maintenance log was created to record and track changes incorporated into the architecture. Section 3.0 provides a detailed listing of the primary changes made as part of the architecture update.

Thirteen new projects were added to the architecture, including:

- City of Camel Electric Vehicle Charging
- City of Carmel Fiber Installation
- City of Carmel ITS Traffic Cameras
- City of Carmel Smart Parking

- City of Greenwood Signal and Detection Implementation
- City of Greenwood Signal Preemption
- City of Greenwood Traffic Flow and Queue Mitigation
- IMPO Mobile Data Products
- Indianapolis Transit Signal Priority
- INDOT Automated Work Zone Speed Limit Enforcement
- INDOT I-465 Hard Shoulder Running
- INDOT I-465 Ramp Metering
- INDOT Marion County Signal and CCTV
- INDOT Truck Parking Information Management System (TPIMS)
- INDOT Variable Speed Limit Enforcement
- IndyGo Bus Rapid Transit System

Based on stakeholder comments during discussions in various forums as well as services evolving from the IMPO Active Transportation Plan, project ideas were developed to support further planning discussions. ARC-IT Version 9.2 included services supporting Multimodal Accessible Travel (MAT) and Vulnerable Road User (VRU) Safety which align with the goals of the IMPO Active Transportation Plan. The project ideas are documented as example projects in the architecture. The example projects are intended to support stakeholder engagement and discussion as well as providing a project template for tailoring to meet specific stakeholder needs of any given example project scope. The example projects defined in the architecture include:

- Electric Vehicle Charging Stations (example project)
- Multimodal Accessible Travel En-Route Guidance (example project)
- Multimodal Accessible Travel Payment Integration (example project)
- Multimodal Accessible Travel Planning (example project)
- Roundabout Traffic Surveillance and Analytics (example project)
- Suburban Municipality Intersection CAV (example project)
- Vulnerable Road User Safety (example project)

Roles and responsibilities and functional requirements were defined for all of the projects. Communications solutions were generated based on the services and interfaces defined in the architecture.

Refinements to architecture stakeholders, elements, services were made, such as:

- TrafficWise and 511 systems were combined into the TrafficWise Traveler Information System element.
- INDOT District Level stakeholder was changed to INDOT for the INDOT Arterial Traffic Management System, the INDOT Arterial Traffic Management Roadside Equipment, and the INDOT Hoosier Helper Vehicles elements.

- Numerous services from the original architecture did not contain any interface definitions and in some cases only one element. Those services were properly defined.

The updates are available in the formats noted above and all stakeholders are encouraged to review and provide comments on the revised architecture content using the ITS Architecture Change Request Form provided on the IMPO architecture website.

3.0   ARCHITECTURE UPDATES

Table 1 lists the primary changes made to the Indianapolis Regional ITS Architecture as part of the update process.

TABLE 1 ARCHITECTURE UPDATES

Source	Contact	Change Description	Actions Taken
Stakeholder Workbook	Ed Cox / INDOT	Stakeholders: Change description for Indianapolis Capital Improvements Board as follows - Indianapolis Colts/~~RCA Dome~~ Lucas Oil Stadium/	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Stakeholders: Fix typo in description for Taxi Companies as follows - ~~Indianpoilis~~ region to Indianapolis region.	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change status of 511 Traveler Information from Planned to Existing.	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change element name for 511 Traveler Information to TrafficWise Traveler Information Website and change the description to "The Indiana 511 traveler information system providing telephone and website services."	Combined the TrafficWise Website element with the TrafficWise Traveler Information Website element and rename the TrafficWise Traveler Information Website element as the "TrafficWise Traveler Information System".
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change stakeholder for the INDOT Arterial Traffic Mgmt. System from Indiana Department of Transportation District Level to Indiana Department of Transportation.	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Inventory: The INDOT Arterial Traffic Mgmt._Roadside Equipment needs to be split into 2 elements. 1) The INDOT Arterial Traffic Signals and Detection will have Indiana Department of Transportation District Level as the stakeholder. 2) The INDOT Arterial Cameras and Controllers will have the Indiana Department of Transportation as the stakeholder.	Using a copy of the current INDOT Arterial Traffic Mgmt._Roadside Equipment element Information Flow diagram. Match the information flows as noted in the change request to align with the functions noted. After the changes have been implemented, remove the INDOT Arterial Traffic Mgmt._Roadside Equipment element.
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change the INDOT Hoosier Helper Vehicles element stakeholder from Indiana Department of Transportation District Level to Indiana Department of Transportation.	Revise stakeholder as requested

Source	Contact	Change Description	Actions Taken
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change the INDOT Hoosier Helper Vehicles element description by removing "Also includes one CVS "Good Samaritan" van which operates during the morning and evening peak periods."	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change the INDOT Indianapolis TMC element stakeholder from Indianapolis Department of Transportation District Level to Indianapolis Department of Transportation.	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change the INDOT Indianapolis TMC Roadside Equipment element stakeholder from Indianapolis Department of Transportation District Level to Indianapolis Department of Transportation. Remove HAR from the element description.	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change the INDOT Infrastructure Inventory System element stakeholder from Indianapolis Department of Transportation District Level to Indianapolis Department of Transportation. Change element status from Future to Existing.	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change INDOT MCO Management element description as follows: Maintenance dispatch from the INDOT Indianapolis district maintenance facilities in the Greenfield, Crawfordsville, and Seymour districts.	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change the INDOT Security Monitoring Field Equipment element stakeholder from Indianapolis Department of Transportation District Level to Indianapolis Department of Transportation.	Revise stakeholder as requested

Source	Contact	Change Description	Actions Taken
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change RWIS Sensors element description as follows - "Road weather information system stations (6) located in ~~Marion County~~ the Indianapolis metropolitan area. ~~Four are owned by the City of Indianapolis, two are owned by INDOT. RWIS data is obtained real time using roadside weather information systems and collects data that includes air temperature, wind speed and direction, and pavement temperature via a web-based application in conjunction with MADIS (a National Weather Service protocol). The effort is being initiated as part of the CLARUS project. . INDOT and DPW via their joint sharing of the website make Indiana one of 16 states to be linked to the web-based RWIS monitoring network.~~ Includes atmospheric and pavement monitoring sensors."	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Change the Traffic Data Archive element status from Planned to Existing.	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Inventory: Add new element titled "Ramp Metering System". Add description as "Ramp Metering equipment on I-465 on-ramps controlled from the INDOT Indianapolis TMC."	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Services: Change MC01 Maintenance and Construction Vehicle and Equipment Tracking service status from Planned to Existing	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Services: Change MC08 Maintenance and Construction Activity Coordination (511/Trafficwise) service status from Planned to Existing	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Services: Combine MC08 Maintenance and Construction Activity Coordination (511/Trafficwise) and MC08 Maintenance and Construction Activity Coordination services.	Revise stakeholder as requested

Source	Contact	Change Description	Actions Taken
Stakeholder Workbook	Ed Cox / INDOT	Services: Remove INDOT Hoosier Helper Vehicles element and INDOT Indianapolis TMC element from PS03 Emergency Vehicle Preemption service.	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Services: Change PS14 Disaster Traveler Information (511) service status from Planned to Existing	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Services: Combine PS14 Disaster Traveler Information (511) and PS14 Disaster Traveler Information services.	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Services: Change TI01 Broadcast Traveler Information service status from Planned to Existing. Revise service description as follows - "This service package provides a digital broadcast service that disseminates traveler information to all equipped travelers within range. It collects traffic conditions, advisories, general public transportation, toll and parking information, incident information, roadway maintenance and construction information, air quality and weather information, and broadcasts the information to travelers using technologies such as FM subcarrier, satellite radio, cellular data broadcasts, and Internet streaming technologies. ~~This service package also provides location-specific or situation-relevant information to travelers in vehicles using Dedicated Short-Range Communications (DSRC) infrastructure supporting mobility service packages for connected vehicles. DSRC is used to deliver real-time traveler information including travel times, incident information, road conditions, and emergency traveler information to vehicles as they pass connected vehicle roadside equipment along their route.~~ This service package provides public information that is available to all equipped vehicles in the vicinity of the roadside equipment.	Revise stakeholder as requested

Source	Contact	Change Description	Actions Taken
Stakeholder Workbook	Ed Cox / INDOT	Services: Change TI02 Personalized Traveler Information service status from Planned to Existing	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Services: Change TM05 Traffic Metering service status from Planned to Existing	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Services: Change TM07 Regional Traffic Management service status from Planned to Existing	Revise stakeholder as requested
Stakeholder Workbook	Ed Cox / INDOT	Services: Add TM17 Speed Warning and Enforcement (INDOT Work Zone Speed Enforcement) service with a status of Existing. Include INDOT Indianapolis TMC and add a new inventory element for INDOT Work Zone Speed Enforcement Field Equipment.	Revise stakeholder as requested.
Stakeholder Workbook	Ed Cox / INDOT	Services: Add TM20 Variable Speed Limits service with a status of Existing. Include INDOT Indianapolis TMC and add a new inventory element for INDOT Variable Speed Limits Field Equipment.	Revise stakeholder as requested.
Stakeholder Workbook	Ed Cox / INDOT	Services: Add TM22 Dynamic Lane Management and Shoulder Use service with a status of Existing. Include INDOT Indianapolis TMC and add a new inventory element for INDOT Lane Management Field Equipment.	Revise stakeholder as requested.
Stakeholder Workbook	Ed Cox / INDOT	Projects: Add new project titled - "I-465 Ramp Metering".	Add new project. Added INDOT Indianapolis TMC and INDOT Ramp Metering System elements. Added TM05 Traffic Metering (INDOT I-465 Ramp Metering) service.

Source	Contact	Change Description	Actions Taken
Stakeholder Workbook	Ed Cox / INDOT	Projects: Add new project titled - "Automated Work Zone Speed Limit Enforcement".	Add new project. Added INDOT Indianapolis TMC, INDOT Work Zone Speed Monitoring Field Equipment, INDOT Work Zone Speed Warning Field Equipment, and ISP Dispatch elements. Added MC07 Work Zone Safety Monitoring (INDOT Work Zone Speed Enforcement) and TM17 Speed Warning and Enforcement (INDOT Work Zone Speed Enforcement) services.
Stakeholder Workbook	Ed Cox / INDOT	Projects: Add new project titled - "Variable Speed Limit Enforcement".	Add new project. Added INDOT Indianapolis TMC, INDOT Variable Speed Limits Field Equipment, and ISP Dispatch elements. Added TM17 Speed Warning and Enforcement (INDOT Variable Speed Limit Enforcement) and TM20 Variable Speed Limits (INDOT Variable Speed Limit Enforcement) services.
Stakeholder Workbook	Ed Cox / INDOT	Projects: Add new project titled - "I-465 Hard Shoulder Running".	Add new project. Added INDOT Indianapolis TMC, INDOT Lane Management Field Equipment elements. Added TM22 Dynamic Lane Management and Shoulder Use (INDOT I-465 Hard Shoulder Running) service.

Source	Contact	Change Description	Actions Taken
Analysis	Cliff Heise / Iteris	Downtown parking facilities: There are parking services in the architecture but the services are blank and need to be developed.	Split and completed PM01 Parking Space Management Service into PM01 Parking Space Management (Indianapolis Airport) and PM01 Parking Space Management (Private Parking Service Provider) services. Split and completed PM03 Parking Electronic Payment Service into PM03 Parking Electronic Payment (Indianapolis Airport) and PM03 Parking Electronic Payment (Private Parking Service Provider) services.
Analysis	Cliff Heise / Iteris	Media interfaces: The Media element was apparently mapped as a traveler information physical object, but that mapping was removed resulting in many information exchanges that are not normally associated with Media. These exchanges need to be verified.	Note Media interfaces that are ARC-IT appropriate. Remove Media element. Add Media element and reconnect to ARC-IT appropriate elements/information flows.
Analysis	Cliff Heise / Iteris	TI07 In-vehicle Signage Service: The TI07 In-vehicle Signage service only has DMS connectivity which needs to be revised.	Revise TI07 service for vehicle connectivity.
Analysis	Cliff Heise / Iteris	Change Meridian Environmental Technology stakeholder to DTN.	Revise stakeholder name.
Analysis	Cliff Heise / Iteris	RCA Dome Command Center: Change RCA Dome Command Center element to Lucas Oil Stadium Command Center element.	Revised element as stated
INDOT DM22-16 ITS Update document	Ed Cox / INDOT	Add Truck Parking Information Management System (TPIMS) project.	Add new project. Added INDOT Indianapolis TMC, INDOT TPIMS, and INDOT TPIMS Equipment elements. Added CVO05 Commercial Vehicle Parking (INDOT Truck Parking Information Management System (TPIMS)) service.

Source	Contact	Change Description	Actions Taken
Transportation Policy Committee Memo dated 11/24/2020	Nick Badman / IMPO	Security Monitoring Field Equipment: Connection between Indianapolis EMA Emergency Operations Center and INDOT for Security Monitoring Field Equipment: was previously planned and currently exists. INDOT has equipment that monitors specific assets in the field for security as well as 500 cameras across the state. INDOT has a direct connection with the Emergency Operations Center.	Revise as stated
Transportation Policy Committee Memo dated 11/24/2020	Nick Badman / IMPO	Marion County Signal and CCTV Project: In 2020-2021 in Marion County, INDOT plans to install approximately 10 new CCTV cameras to monitor traffic, approximately 200 existing signals were given GPS cards to ensure property clock synchronization, and approximately 200 existing signals had remote timing control technology added.	Add new project. Added INDOT Arterial TMS and INDOT Arterial Traffic Signals and Detection elements. Added TM01 Infrastructure-Based Traffic Surveillance (INDOT Marion County Signal and CCTV) and TM03 Traffic Signal Control (INDOT Marion County Signal and CCTV) services.

Transportation Policy Committee Memo dated 11/24/2020	Nick Badman / IMPO	The City of Greenwood also submitted some updates to their transportation network:
		o Installed a new signal at Smith Valley Rd and Woodmen Blvd that uses video detection (2014).
		o Conversion from All-Way Stop to a signalized intersection at Main St and Graham Rd. The system uses wireless pucks rather than the detector loop (2017).
		o Signal preemption project on all City-owned (and a few INDOT-owned) signalized intersections within Greenwood (2017).
		o Roundabout project that included some wireless pucks to help control adjacent City-owned traffic signal to try to help control traffic flow and mitigate queuing (2017).
			• Add as new projects:
			  • City of Greenwood Signal and Detection Project
			  • City of Greenwood Signal Implementation Project
			  • City of Greenwood Signal Preemption Project
			  • City of Greenwood Traffic Flow and Queue Mitigation Project
			• Created Greenwood TOC and Greenwood Roadside Equipment elements.

Source	Contact	Change Description	Actions Taken
Analysis	Cliff Heise / Iteris	Add Indianapolis Transit Signal Priority Project with Indianapolis DPW Operations Center, IndyGo Operations Center, and IndyGo Transit Vehicles elements.	Add new project. Added Indianapolis DPW Operations Center, Indianapolis DPW Roadside Equipment, IndyGo Operations Center, and IndyGo Transit Vehicles elements. Added PT09 Transit Signal Priority (Indianapolis Transit Signal Priority) service.
Analysis	Cliff Heise / Iteris	Add Electric Vehicle Charging Stations project with Electric Vehicle Charging Services element.	Add new project. Added Electric Vehicle Charging Stations, Private Traveler Services, TrafficWise Traveler Information System, and Vehicles elements. Added ST05 Electric Charging Stations Management (Electric Vehicle Charging Stations) service.
Analysis	Cliff Heise / Iteris	Add IndyGo Bus Rapid Transit System project with Indianapolis DPW Operations Center, IndyGo Operations Center, and IndyGo Transit Vehicles elements.	Add new project. Added Indianapolis DPW Operations Center, Indianapolis DPW Roadside Equipment, IndyGo Operations Center, and IndyGo Transit Vehicles elements. Added PT09 Transit Signal Priority (IndyGo Bus Rapid Transit System) service.
Stakeholder Workbook	Matt Duffy / IndyGo	Change CICS Website element stakeholder from IndyGo to Central Indiana Regional Transportation Authority.	Revise as stated
Transportation Policy Committee Memo dated 11/24/2020	Nick Badman / IMPO	City of Carmel Fiber Installation Project: The City of Carmel's Information Communications Systems (ICS) group is currently working on installing a fiber loop throughout the City that will connect fire stations and some schools, with the ability to have future connections to ITS devices.	Add new project. Added Carmel Engineering Department, Carmel Roadside Equipment, and Fiber Communication Loop elements. Added TM03 Traffic Signal Control (City of Carmel Fiber Installation) and TM06 Traffic Information Dissemination (City of Carmel Fiber Installation) services.

Source	Contact	Change Description	Actions Taken
Draft Architecture Stakeholder Review Form	Jonathan Sutterer / INDOT	Ramp Metering Roles and Responsibilities: "Owns, operations and maintains DMS" - General comment about spelling/grammar. There were likely a few other locations throughout the architecture website that should be changed/checked just to be sure that things are clear.	Revised Roles and Responsibilities statements to be consistent in grammar.
Draft Architecture Stakeholder Review Form	Jonathan Sutterer / INDOT	Indianapolis TMC element: The Gary TMC should be mentioned with at least the description of the Indianapolis TMC. There is some network redundancy between the Indianapolis TMC and the Gary TMC so that if something did happen to the Indianapolis TMC, the Gary TMC could still continue some of the functionality of the Indianapolis TMC.	Added the Gary TMC to the architecture and added new service TM07 Regional Traffic Management (INDOT Gary TMC) to enable the interface with the Indianapolis TMC reflecting a level of redundant operations.
Draft Architecture Stakeholder Review Form	Jonathan Sutterer / INDOT	INDOT Hoosier Helper Vehicles element: Change element description from INDOT's "Freeway Service Patrol (FSP)" to INDOT's "Safety Service Patrol (SSP)".	Element description revised.
Draft Architecture Stakeholder Review Form	Jonathan Sutterer / INDOT	RWIS Users stakeholder: Regarding the description of the 'RWIS Users' stakeholder, INDOT does not co-own anything with Indianapolis DPW.	Removed Indianapolis DPW from stakeholder description.
Draft Architecture Stakeholder Review Form	Jonathan Sutterer / INDOT	Traveling Motorists stakeholder: Please clarify the role and responsibility regarding in-vehicle secure payment application. What is meant by this? Another responsibility of the traveling motorists should be alerting other stakeholders to incidents on the roadway, not just emergency services.	Revised traveler roles and responsibilities regarding secure payment transactions with electric vehicle charging stations. Added traveler roles and responsibilities regarding incident reporting through crowdsourcing mechanisms or directly to services.

Source	Contact	Change Description	Actions Taken
Draft Architecture Stakeholder Review Form	Jonathan Sutterer / INDOT	INDOT Arterial TMS element: The description of the inventory item 'INDOT Arterial TMS' should be updated to reflect the fact that there are other devices on the arterial roadways besides just traffic signals. A more accurate description may be changing it to include all devices on the arterial roadways instead of just traffic signals.	Element description revised.
Draft Architecture Stakeholder Review Form	Jonathan Sutterer / INDOT	INDOT Infrastructure Inventory System element: We are not sure that this Traffic Data Archive being mentioned actually exists. INDOT has a Traffic Data Archive that we can share internally, but there is not necessarily an archive that is shared among other agencies.	Removed Traffic Data Archive interface with the INDOT Infrastructure Inventory System.
Draft Architecture Stakeholder Review Form	Jonathan Sutterer / INDOT	INDOT Lane Management Field Equipment element: Revise description to remove the I-465 reference. Maybe use the general term of interstates or freeways instead.	Element description revised.
Draft Architecture Stakeholder Review Form	Jonathan Sutterer / INDOT	INDOT Ramp Metering System element: The Arterial TMS should be added on to this or connected in some form of information flows. Considering the ramp metering will have signals associated with them, this might be a good idea.	Added the INDOT Arterial TMS with information flows to the INDOT I-465 Ramp Metering Project.
Draft Architecture Stakeholder Review Form	Jonathan Sutterer / INDOT	INDOT Variable Speed Limits element: INDOT will not be notifying ISP of any speed limit violations with this. There is an aspect of INDOT Variable Speed Limits where there will have to be some form of storage of data and notifications of any time a speed limit changes, what the speed limit was, and how long that speed limit was shown.	Removed violation notification information flow from INDOT Variable Speed Limit Enforcement project.

Source	Contact	Change Description	Actions Taken
Draft Architecture Stakeholder Review Form	Jonathan Sutterer / INDOT	TrafficWise Element: There are some information flows occurring with other stakeholders/elements that we are not actually sure are taking place. We would recommend reaching out to those to other elements/stakeholders to confirm that they are in fact receiving information from TrafficWise and using it.	Revised the interfaces with the TrafficWise element.
Draft Architecture Stakeholder Review Form	Morgan Rinehart / City of Carmel	New Project: City of Carmel ITS Traffic Cameras - After implementing an additional 70 miles of new fiber optic City of Carmel has begun installing Bosch ITS Traffic Cameras. In 2023 35 new cameras have been installed on Keystone Parkway and various roundabouts throughout City. Camera video processing is tracking vehicles, bikes, and pedestrians providing real time analytics to public safety and engineering department. Project partners are Volkswagen, Purdue University, and Aptiv. The city now has 117 dedicated traffic cameras with plans to add 40-50 additional cameras and sensors in 2024.	Added City of Carmel ITS Traffic Cameras project to architecture.
Draft Architecture Stakeholder Review Form	Morgan Rinehart / City of Carmel	New Project: City of Carmel Smart Parking - City of Carmel is researching and implementing smart parking solutions for on street and parking garages. Phase I is identifying available parking (per space) for usage tracking and display to public for open parking wayfinding. Phase II involves researching solutions for nav aids in parking garages allowing for autonomous parking.	Added City of Carmel Smart Parking project to architecture.

Source	Contact	Change Description	Actions Taken
Draft Architecture Stakeholder Review Form	Morgan Rinehart / City of Carmel	New Project: City of Carmel Electric Vehicle Charging - Carmel has deployed 8 public EV Chargers located in 3 public parking garages for testing and research. Electrical infrastructure has been added in 2023 allowing up to 30 dedicated EV charging spots in Civic Square parking garage. City is still in early phase of reviewing on street charging solutions.	Added City of Carmel Electric Vehicle Charging project to architecture.
Stakeholder Input	Andrew Magee / IMPO	The conversion of the Indianapolis Regional ITS Architecture to ARC-IT Version 9.2 made available services that directly support the IMPO's Active Transportation Plan goals for multimodal accessible travel and vulnerable road user safety. These services will support stakeholder engagement and planning activities going forward.	Created example projects to support stakeholder engagement and planning in support of the IMPO's Active Transportation Plan. Added Example Projects for: • Multimodal Accessible Travel En-Route Guidance • Multimodal Accessible Travel Payment Integration • Multimodal Accessible Travel Planning • Vulnerable Road User Safety
Analysis	Cliff Heise / Iteris	Create an Electric Vehicle Charging Stations project to be used as an example or template for stakeholders to plan electric vehicle charging station projects.	Added Electric Vehicle Charging Station example project.
Analysis	Cliff Heise / Iteris	Create a Roundabout Traffic Surveillance and Analytics project to be used as an example or template for stakeholders to plan roundabout traffic surveillance projects.	Added Roundabout Traffic Surveillance and Analytics example project.
Analysis	Cliff Heise / Iteris	Create an Intersection CAV project to be used as an example or template for stakeholders to plan CAV intersection projects.	Added Suburban Municipality Intersection CAV example project.

Source	Contact	Change Description	Actions Taken
Analysis	Cliff Heise / Iteris	Map the goals and objectives of the IMPO's Central Indiana 2050 Metropolitan Transportation Plan to the projects identified in the architecture.	Added the goals and objectives from the IMPO's Central Indiana 2050 Metropolitan Transportation Plan to the RAD-IT database under the Planning tab and mapped them to the projects. Added the mapped goals and objectives into the project webpages on the architecture website.