

Appendix D: 2020 Connected Vehicle / Automated Vehicle Update

Background and Purpose

The purpose of this appendix is to inform the ITS stakeholders in the region about changes to the NOACA Regional ITS Architecture. The Connected Vehicle / Automated Vehicle (CV/AV) Update to the NOACA Regional ITS Architecture was performed in late 2020 and early 2021. The CV/AV Update incorporated the Statewide CV/AV Architecture into the regional ITS architecture. The development of the Statewide CV/AV Architecture was a DriveOhio/Ohio DOT-led effort to streamline project planning and development for CV/AV technology in Ohio.

The State of Ohio initiated a Systems Engineering Analysis (SEA) in 2018 to create a statewide framework to guide CV/AV technology deployments across the state. This framework is intended to promote consistency and interoperability amongst the CV/AV technologies and supporting systems implemented through various ongoing, planned, and future projects by a wide range of stakeholders. It also offers users a significant head start in performing systems engineering analyses for individual projects, when needed, along with helpful tools for planning and implementation.

A statewide CV/AV architecture was developed as the first step in the SEA. The Ohio Statewide CV/AV Architecture is a roadmap for the deployment and integration of CV/AV and ITS technologies throughout the state of Ohio for the next fifteen years. The Architecture helps guide the planning, implementation, and integration of ITS and CV/AV technologies deployed and managed by various agencies that provide transportation services in Ohio.

Summary of Changes

Multiple changes were made to the NOACA Regional ITS Architecture, including information on stakeholders, ITS/CV/AV elements, service packages, functional requirements, interfaces and applicable standards. The updated architecture is documented and stored in the electronic RAD-IT database and on the architecture website. Key changes to the architecture are summarized below.

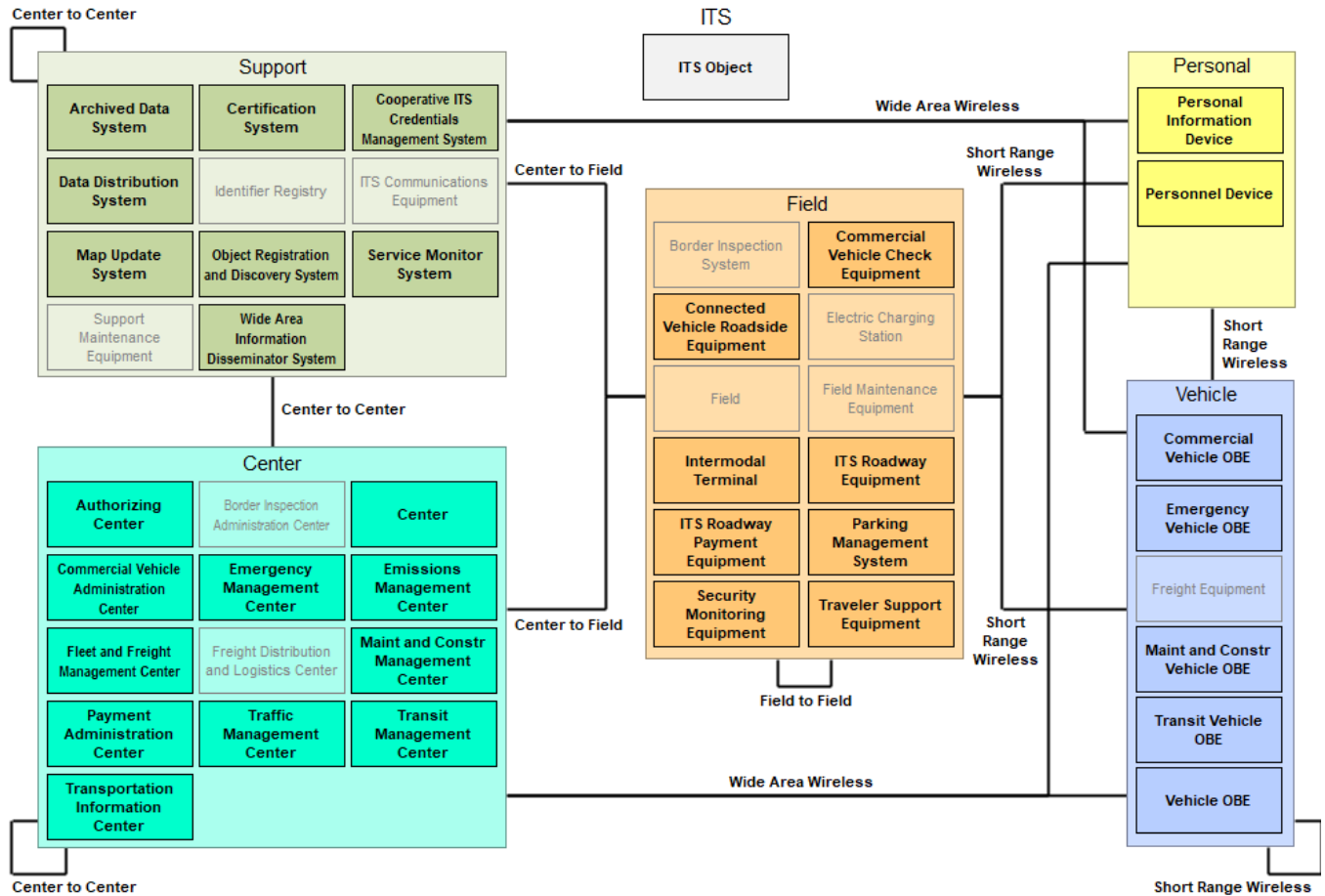
ARC-IT Version

The Regional ITS Architecture was updated using ARC-IT version 8.3 and RAD-IT version 8.3.

Subsystems and Interconnections

The graphic on the next page illustrates the updated architecture subsystems and primary types of interconnections (or communications) between these subsystems. The shaded areas indicate the functions and services do not currently exist or have not been planned in the region.

Regional ITS Architecture Report
 NOACA Regional ITS Architecture Comprehensive Update (2020 CV/AV Update)



Updated NOACA Regional ITS Architecture Physical Object Interconnect Diagram

ITS Inventory Elements

The CV/AV Update introduced several new ITS elements to the region. The new elements are mainly related to technology and systems that enable or support the operation of CV/AV technologies.

ITS Elements Added to the NOACA Regional ITS Architecture

Stakeholder	New ITS Element
City of Cleveland Department of Port Control	<ul style="list-style-type: none"> Regional Airport/Port Authority CV Authorizing Center Regional Airport/Port Authority Connected Vehicle Roadside Equipment Regional Airport/Port Authority CV Service Monitoring Systems
Counties and Cities (Stakeholder Group)	<ul style="list-style-type: none"> County and City CV Authorizing Center County and City Equipment and Fleet Service Facilities County and City CV Service Monitoring Systems
County and City Public Works Departments	<ul style="list-style-type: none"> County and City Connected Vehicle Roadside Equipment
DriveOhio	<ul style="list-style-type: none"> Ohio Mobility Apps
General Public (Stakeholder Group)	<ul style="list-style-type: none"> Basic Vehicles Cyclists Pedestrians Traveler

Stakeholder	New ITS Element
Greater Cleveland Regional Transit Authority (RTA)	<ul style="list-style-type: none"> • RTA Transit Data Archives • RTA Transit Information Displays • RTA Equipment and Fleet Service Facilities
ODOT	<ul style="list-style-type: none"> • Ohio DOT Certification System • Ohio DOT Maintenance and Construction Center Personnel • Ohio DOT Rest Area Truck Parking Availability System • Ohio DOT Traffic Signal Control Systems • Ohio DOT Rest Area Tourist Information Centers
Ohio State University	<ul style="list-style-type: none"> • OSU Center of Automotive Research
Ohio Turnpike and Infrastructure Commission	<ul style="list-style-type: none"> • Ohio Turnpike Service Plaza Truck Parking Management System
Public Agencies (Stakeholder Group)	<ul style="list-style-type: none"> • ITS Communications Equipment
Public Utilities Commission of Ohio (PUCO)	<ul style="list-style-type: none"> • PUCO Commercial Vehicle Registration System
Research Institutes	<ul style="list-style-type: none"> • Transportation Research Centers

Service Packages

The table below shows the service packages that were added to the Regional ITS Architecture as a result of the CV/AV Update.

Service Packages Added to the NOACA Regional ITS Architecture

Service Package	Service Package Name
CVO06	Freight Signal Priority
CVO09	Freight-Specific Dynamic Travel Planning
CVO10	Road Weather Information for Freight Carriers
MC09	Infrastructure Monitoring
PM04	Regional Parking Management
PM06	Loading Zone Management
PS07	Incident Scene Safety Monitoring
PT11	Transit Pedestrian Indication
PT12	Transit Vehicle at Station/Stop Warnings
PT13	Vehicle Turning Right in Front of a Transit Vehicle
PT16	Route ID for the Visually Impaired
PT17	Transit Connection Protection
SU09	Device Certification and Enrollment
TI06	Dynamic Ridesharing and Shared Use Transportation
TM04	Connected Vehicle Traffic Signal System
TM21	Speed Harmonization
VS02	V2V Basic Safety
VS05	Curve Speed Warning
VS06	Stop Sign Gap Assist
VS07	Road Weather Motorist Alert and Warning
VS08	Queue Warning
VS09	Reduced Speed Zone Warning / Lane Closure
VS12	Pedestrian and Cyclist Safety
VS13	Intersection Safety Warning and Collision Avoidance
VS14	Cooperative Adaptive Cruise Control
VS15	Infrastructure Enhanced Cooperative Adaptive Cruise Control

Interfaces

Interfaces to support data exchange, particularly for CV/AV technologies and systems, were added to the Regional ITS Architecture. Details of the updated interfaces were documented in the RAD-IT database and the architecture website.

Architecture Website

The NOACA Regional ITS Architecture website was updated to document and store the latest architecture for the region. The website continues to serve as a one-stop shop for stakeholders to obtain the latest information on the Regional ITS Architecture and the ITS Strategic Plan to support planning, development, deployment and integration of ITS and CV/AV technologies in the region.

With the inclusion of the CV/AV systems in the Regional ITS Architecture, CV/AV projects within the NOACA planning area may utilize the streamlined review and approval process developed by DriveOhio and ODOT.