Ohio Statewide Intelligent Transportation Systems Architecture

AECOM

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1.0 Introduction

The Ohio Statewide Intelligent Transportation Systems (ITS) Architecture is a roadmap for the deployment and integration of ITS throughout the state of Ohio for the next fifteen years. The geographic boundary of the Architecture covers the entire state of Ohio. The Ohio Statewide ITS Architecture provides a framework for institutional agreements and technical integration of ITS implementation projects in the state. It supports effective and efficient deployment of transportation and ITS projects that address the transportation problems and needs in the state.

1.1 Purpose

The purpose of the Ohio Statewide ITS Architecture is to illustrate and document the integration of ITS systems to allow planning and deployment to occur in an organized and coordinated process. The Architecture helps guide the planning, implementation, and integration of ITS devices deployed and managed by multiple types of agencies that provide transportation services within the state.

The Architecture helps to accomplish the following objectives for ITS deployment in the region:

- Facilitate stakeholder coordination in ITS planning, deployment and operations;
- Reflect the current state of ITS planning and deployment within the state, including coordination and interactions with neighboring states;
- Provide high-level planning for enhancing regional transportation systems using current and future ITS technologies; and
- Conform with the National ITS Architecture and FHWA Final Rule 940 and FTA Final Policy on ITS Architecture and Standards.

1.2 Ohio Statewide ITS Architecture

The Ohio Statewide ITS Architecture describes coordination of overall system operations by defining interfaces between equipment and systems which have been or will be deployed by different organizational or operating agencies in the state. The Architecture identifies the current ITS deployment and how these systems interact and integrate with each other. It also builds on the existing systems, addressing the additional components deemed necessary to grow the ITS systems within the region over the next 15 years to accommodate specific needs and issues of stakeholders.

The Ohio Statewide ITS Architecture has been developed to include ITS stakeholders and technologies that are currently included within Regional ITS Architectures previously developed by Metropolitan Planning Organizations (MPOs), as well as other ITS applications in MPOs, Regional Transportation Planning Organizations (RTPOs), smaller urban areas and rural areas where without a regional ITS architecture. ITS stakeholders and technologies were added into the Ohio Statewide ITS Architecture based on how they were depicted in the regional ITS architectures, but not to the precise level of detail

that MPOs have utilized. The consolidation of regional information into a statewide view reduces the potential of duplicated and sometimes conflicting information being present in the Statewide ITS Architecture.

A high-level interconnect diagram for the Ohio Statewide ITS Architecture, often referred to as a "sausage diagram" as shown below, illustrates the architecture subsystems and primary types of interconnections (or communications) between these subsystems. The sausage diagram was customized to reflect the systems of the Ohio Statewide ITS Architecture.

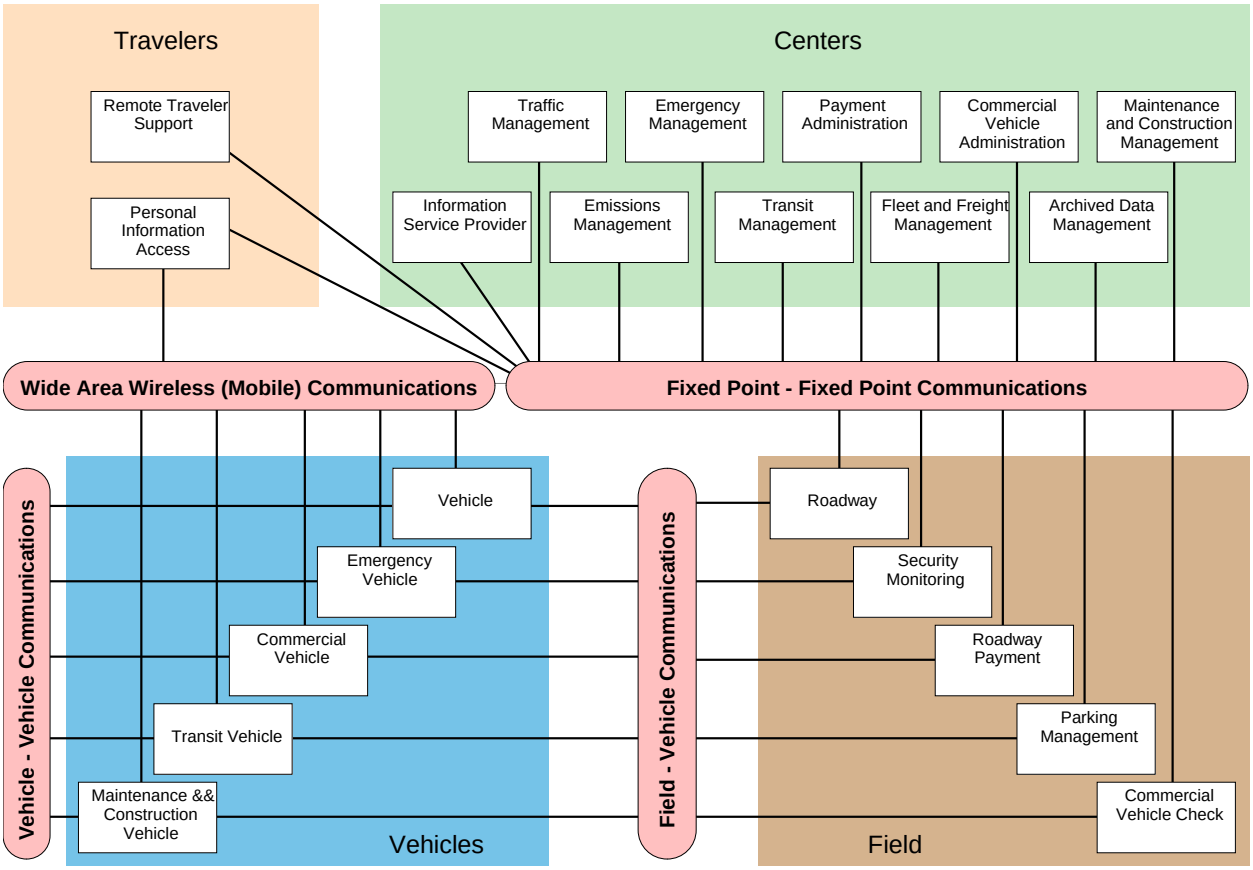


Figure 1. Ohio Statewide ITS Architecture High-Level Interconnect Diagram

1.3 Applicable ITS Standards

ITS standards are fundamental to the establishment of an open ITS environment that achieves the goals originally envisioned by the United States Department of Transportation (USDOT). Standards facilitate deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances and new approaches evolve. Standards can be thought of as the glue that holds the various pieces of architecture together. They define how the communications within an ITS environment take place. Fifty-nine (59) ITS standards were identified as standards supporting current and future ITS applications in the state.

It is important that stakeholders are aware of the importance of ITS standards, especially with respect to cost, risk, and interoperability issues both within the region and when connecting with other regions. These standards can save money in the long run, ensuring that various devices and systems are compatible.

1.4 Recommended ITS Projects and Implementation Sequencing

The Ohio Statewide ITS Architecture identifies a list of ITS projects for consideration and a recommended sequence for implementation. The project implementation sequence is based on a combination of two factors:

1. **Prioritization of projects based on existing conditions and stakeholder needs.** ITS projects were prioritized to reflect a deployment path (sequence) of stakeholder needs. As technology, funding opportunities, and requirements continue to evolve, it is expected that stakeholders will reevaluate and reprioritize projects periodically.

2. **Project dependencies, based on how successive ITS projects can build upon one another.** Project dependencies influence the project sequencing. It is beneficial to identify the information and functional dependencies between projects.

1.5 Documentation of ITS Architecture

The Ohio Statewide ITS Architecture is documented in the following four forms:

1. This report (Ohio Statewide ITS Architecture Report): This report provides a technical-oriented summary regarding various aspects of the Architecture.
2. Architecture website: The architecture website provides detailed architecture outputs in an organized web environment.
3. Turbo Architecture Database: The database prepared using the Turbo Architecture version 7.1, a software tool developed by FHWA for developing ITS architectures.
4. Turbo Architecture Report: This report is a detailed report generated using the Turbo Architecture software and the database for the Ohio Statewide ITS Architecture.

1.6 Architecture Maintenance

By its nature, an ITS architecture is not a static set of outputs. The Ohio Statewide ITS Architecture is a living document and should be modified as plans and priorities change, ITS projects are implemented, and ITS needs and services evolve in the region. An architecture maintenance and use plan is developed as a separate document to address the needs for maintenance and updates. The Ohio Department of Transportation (ODOT) will be responsible for housing and maintaining the ITS Architecture. The architecture maintenance and use plan also recommends that an ITS Committee be established to oversee all ITS activities in the region, including architecture maintenance. The ITS Committee will

consist of regional stakeholders who have implemented or are interested in implementing ITS. The architecture maintenance and use plan outlines the steps for making changes to the architecture.

2.0 Statewide ITS Architecture Overview

An ITS architecture describes the "big picture" for ITS deployment in terms of individual components (i.e. subsystems) that will perform the functions necessary to deliver the desired needs. It describes what is to be deployed but not how those systems are to be deployed. An ITS architecture defines the components and subsystems that must interface with each other, the functions to be performed by those subsystems, and the flow of data between these subsystems.

The region covered by the Ohio Statewide ITS Architecture includes the entire state of Ohio, including the MPO boundaries as illustrated in Figure 2. Some of those MPOs, such Ohio-Kentucky-Indiana Regional Council of Governments (OKI), geographically cover two or three states where agencies coordinate across state boundaries to communicate and control ITS devices in those areas. Table 1 contains a summary of the regional ITS architectures that have been developed by seven MPOs within the state listed in the order of ODOT Districts.

Figure 2. Ohio Statewide ITS Architecture Planning Area Boundary[1]

[1] Source: Ohio Department of Transportation Statewide Transportation Improvement Program, State Fiscal Years 2016-2019. Available at: https://www.dot.state.oh.us/Divisions/Planning/STIP/Current%20STIP%20Project%20List/Current%20STIP.pdf

Table 1. Summary of Regional ITS Architectures Developed for MPOs by Ohio Districts

Ohio MPO's with an ITS Architecture	ODOT District	Developed	Updates	Time Horizon
Toledo Metropolitan Area Council of Governments	District 2	2004	None	15 years
Eastgate Regional Council of Governments	District 4	2003	2011, 2014	15 years
Akron Metropolitan Area Transportation Study	District 4	2003	None	15 years
Mid-Ohio Regional Planning Commission	District 6 (and part of District 5)	1999	2004, 2009	10 years
Miami Valley Regional Planning Commission	District 7 (and part of District 8)	2003	2008, 2013	20 years
OKI Regional Council of Governments	District 8	2001	2007	15 years
Northeast Ohio Areawide Coordinating Agency	District 12 (and part of District 3)	2000	2003, 2009	15 years

The Ohio Statewide ITS Architecture is an open and integrated ITS architecture that is compliant with the Federal Highway Administration (FHWA) Final Rule and Federal Transit Administration (FTA) Policy on ITS Architecture and Standards. The Architecture represents a shared vision of how each stakeholder's systems work together by sharing information and resources to enhance transportation safety, efficiency, capacity, mobility, reliability, and security. The collaboration and information sharing among transportation stakeholders in the state helps illustrate integration options and gain consensus on systematic and cost-effective implementation of ITS technologies and systems in the state.

2.1 Architecture Development Process

The National ITS Architecture is a tool to guide the development of regional ITS architectures. It is a common framework that guides agencies in establishing ITS interoperability and helps them choose the most appropriate strategies for processing transportation information, implementing and integrating ITS components and systems, and improving operations. The Ohio Statewide ITS Architecture is a specific application of the framework specified in the National ITS Architecture, tailored to the needs of the transportation stakeholders in the state of Ohio.

The process used to develop the Ohio Statewide ITS Architecture is illustrated in Figure 3. This figure shows six general steps in the "life-cycle" of an ITS architecture. In the first four steps, the ITS architecture components are developed. These components are used and maintained in steps 5 and 6. The development process begins with basic scope definition and team building and moves through increasingly detailed steps, culminating in specific architecture outputs and documents that will guide the implementation of the ITS architecture.

The key to the ITS architecture development process is to identify stakeholder needs, identify ITS projects to address those needs, and define project sequencing. The project definition outlines the project concepts and the associated details including project title, stakeholder, project scope, costs,

benefits and the service packages defined in the Ohio Statewide ITS Architecture. The project sequencing provides an approximate timeframe in which an ITS project may be implemented based on the understanding of the projects, project dependencies of the project, as well as other existing or planned ITS systems.

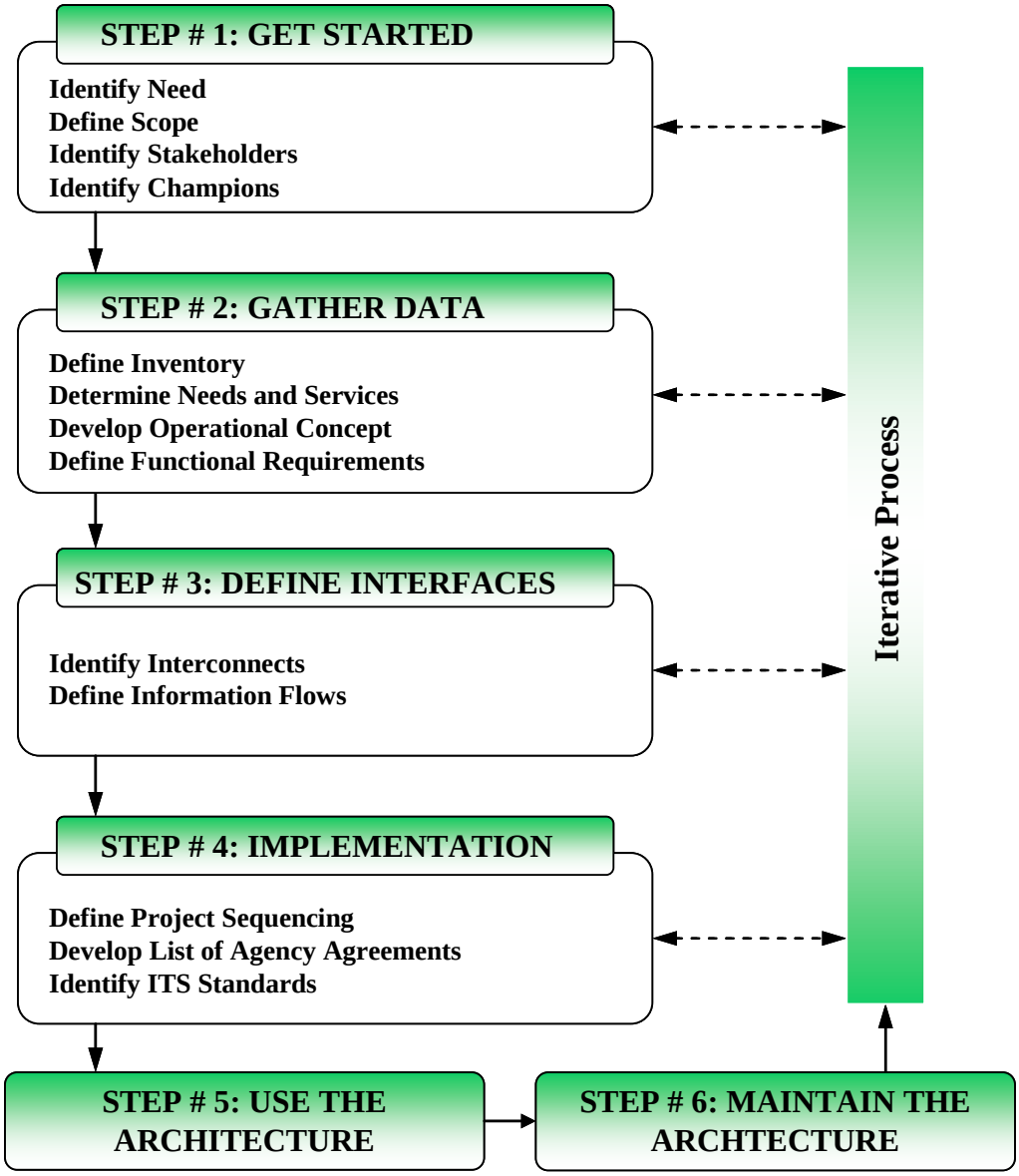


Figure 3. ITS Architecture Development Process

2.2 Systems Engineering

"Systems Engineering" is a phrase used to describe a cyclical process of planning, designing, implementing, testing, operating, and maintaining an ITS system. Essentially, this process covers the entire useful life of the system. Systems engineering is a multi-step process that requires agencies to ask critical questions about how the technical aspects of the system will work together. This is often overlooked in complex systems. Figure 4 graphically illustrates the systems engineering process in what is often referred to as the "Vee" diagram. The purpose of a "V" in the diagram is to show how the final deliverables relate back to the early decisions (the right side relates directly back to the left side). This prevents surprises once the system is delivered. For example, while a system is being designed the various functions are documented as requirements. Then, when the system is being built, these same functional requirements are compared to what was actually delivered.

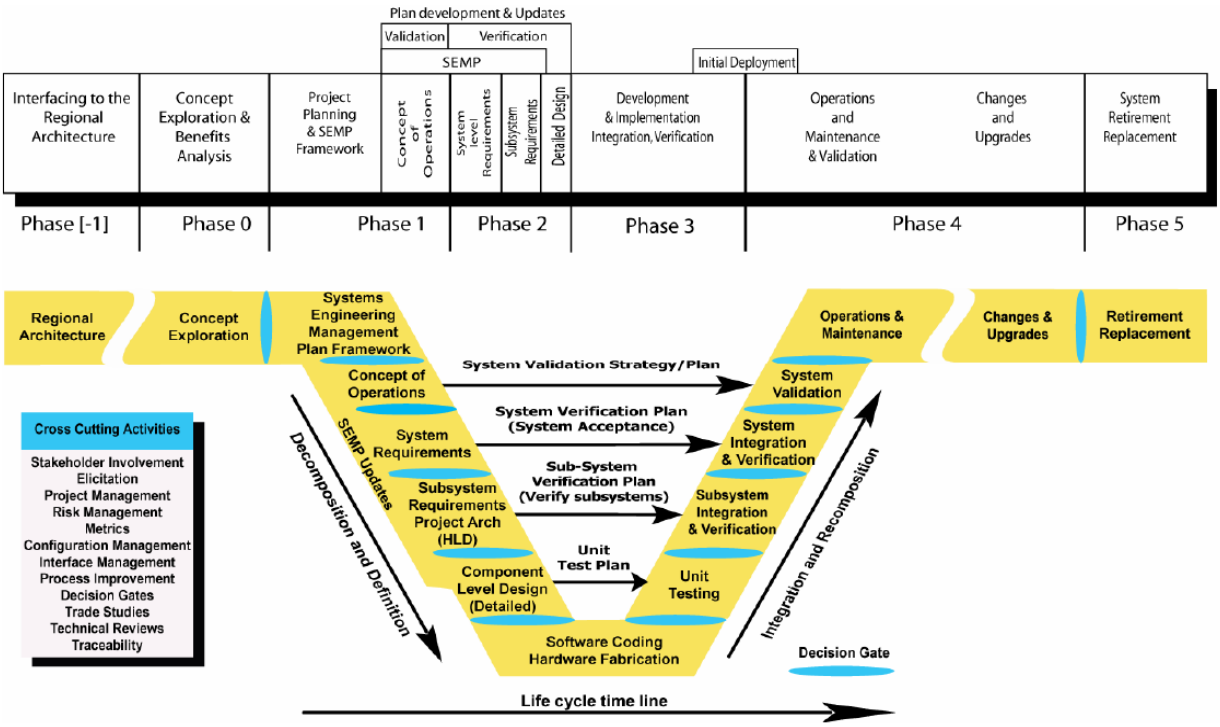


Figure 4. Systems Engineering V-Diagram

The systems engineering process shows how each step of the process builds on the previous one and is reliant on a system of back-checking to ensure that the project is being designed and constructed based on its originally intended purpose. Systems engineering is a risk management tool that sets expectations and then verifies that those expectations are met. It also enables a change management system so that unexpected issues can be incorporated into the process.

2.3 FHWA and FTA Requirements on ITS Architectures

FHWA Rule 940 (http://ops.fhwa.dot.gov/its_arch_imp/docs/20010108.pdf) provides policies and procedures for implementing Section 5206(e) of the Transportation Equity Act for the 21st Century (TEA–21), Public Law 105–178, 112 Stat. 457, pertaining to conformance with the National ITS Architecture and Standards. The rule states, in part, that the final design of all ITS projects funded with Highway Trust Funds must accommodate the interface requirements and information exchanges as specified in the regional ITS architecture. This ITS Architecture and Standards Rule/Policy continues under subsequent federal transportation legislation (i.e. SAFETEA-LU and MAP-21).

For federally funded ITS projects, several steps need to be followed as part of the systems engineering analysis and Rule 940 requirements. Rule 940 states that the systems engineering analysis shall include, at a minimum:

- Identification of portions of the regional ITS architecture being implemented (or if a regional ITS architecture does not exist, the applicable portions of the National ITS architecture)
- Identification of participating agencies roles and responsibilities
- Definitions of high-level functional requirements for ITS systems and devices
- Analysis of alternative system configurations and technology options to meet requirements
- Procurement options
- Identification of applicable ITS standards and testing procedures
- Procedures and resources necessary for operations and management of the system

The rule requirements are applicable for all ITS projects funded through the Highway Trust Fund account. Conformity with the Rule 940 requirements is required for both routine and non-routine projects. However, with routine projects, the effort and the scope of systems engineering analysis should be minimal. For non-routine projects, the scale of the systems engineering analysis depends on the scope of the project.

While the use of the architecture and the systems engineering approach is mandatory for federally funded projects, project developers are encouraged to use this approach for any ITS project using state or local funds, especially for projects that integrate with other systems in the region.

3.0 Stakeholder Involvement

Stakeholders are commonly considered to be those who own or operate ITS systems in the region, as well as those who have an interest in regional transportation issues. Stakeholders provide crucial input regarding the region's transportation investments and ITS deployments; therefore, stakeholder participation and coordination is critical to the success of the ITS architecture development.

The Ohio Statewide ITS Architecture includes a wide range of stakeholders. Key stakeholders were identified early in the architecture development process and include the following:

- County and City Emergency Management Agencies
- County and City Fire Departments
- County and City Law Enforcement Agencies
- County and City Public Safety Agencies
- County and City Public Works Departments
- County and City Transit Operators
- Financial Institutions
- FMCSA
- General Public
- IFTA, Inc.
- IRP, Inc.
- Local Media
- Metropolitan Planning Organizations
- Neighboring State DOTs
- NOAA
- Ohio Bureau of Motor Vehicles
- Ohio Department of Administrative Services
- Ohio Department of Public Safety
- Ohio Department of Transportation
- Ohio Emergency Management Agency
- Ohio Environmental Protection Agency
- Ohio State Highway Patrol
- Ohio Turnpike and Infrastructure Commission
- Private Companies
- Private Fleet and Freight Operators
- Private Rail Operators
- Public Utilities Commission of Ohio (PUCO)
- Regional Airport Authorities
- Regional Event Operators
- Regional Hospital Organizations
- Regional Transit Authorities
- Universities and Colleges

Three regional rural meetings were held during the fall of 2014 in order to gather information on plans to deploy ITS related technologies outside of the major metropolitan areas where ITS had been documented in Regional ITS Architectures. In an effort to reach as many stakeholders as possible, a web based survey was then distributed during the months of November and December of 2014. The survey was distributed to ODOT District traffic personnel, County traffic personnel and municipal public works and/or traffic personnel.

Answers gathered from the survey mirrored the answers that were gathered during the stakeholder outreach meetings in fall 2014. All agencies that responded indicated that they operated interconnected signal systems across jurisdictional boundaries, as well as traffic detection devices and advanced / connected at-grade railroad crossings. All agencies also shared a great interest in investing in AVL systems in the future to manage fleet operations. Many of the agencies had also invested in technology to support communication coordination with other agencies.

Information on current and future ITS deployment was also gathered through an extensive review of MPO's regional ITS architectures. Stakeholders that are identified by name in the Regional ITS Architectures are grouped into more generic titles in the Ohio Statewide ITS Architecture. For example, County and City level public works and traffic departments are grouped under the general name of County and City Public Works Departments. Similarly, the stakeholder Regional Transit Authorities represents all transit authorities throughout the state given similarities in how they are depicted in the Regional ITS Architectures.

4.0 Statewide ITS Architecture Components

This section describes the key components of the Ohio Statewide ITS Architecture. The Ohio Statewide ITS Architecture was developed based on the National ITS Architecture Version 7.1 through the use of Turbo Architecture Software Version 7.1. The Appendix to this report contains the detailed report generated by the Turbo Architecture software.

4.1 Inventory

The inventory of the Ohio Statewide ITS Architecture contains the existing and future elements of ITS technology throughout the state. The inventory of ITS elements was identified through a web based survey distributed during the months of November and December of 2014 to ODOT District traffic personnel, County traffic personnel and municipal public works and/or traffic personnel as described earlier in Section 3. An extensive review of existing Regional ITS Architectures in the state was also performed, as well as a literature search of existing planning and study documents, conference proceedings, professional journals, and agency websites.

ITS elements within the inventory represent the range of ITS devices and systems. Figure 5 displays the four types of inventory elements that can exist within an ITS Architecture (represented by the four colored boxes). ITS elements can exist:

- On vehicles (i.e. fire trucks, police cars, snow plows, etc.)
- In the field (i.e. traffic signals, cameras, etc.)
- At a center (i.e. traffic management centers, 911 dispatch centers, emergency operations centers, etc.)
- In the hands of travelers (i.e. computers, smartphones, etc.)

The technical functions that each of these elements perform are defined by the National ITS Architecture as subsystems, also illustrated in Figure 5.

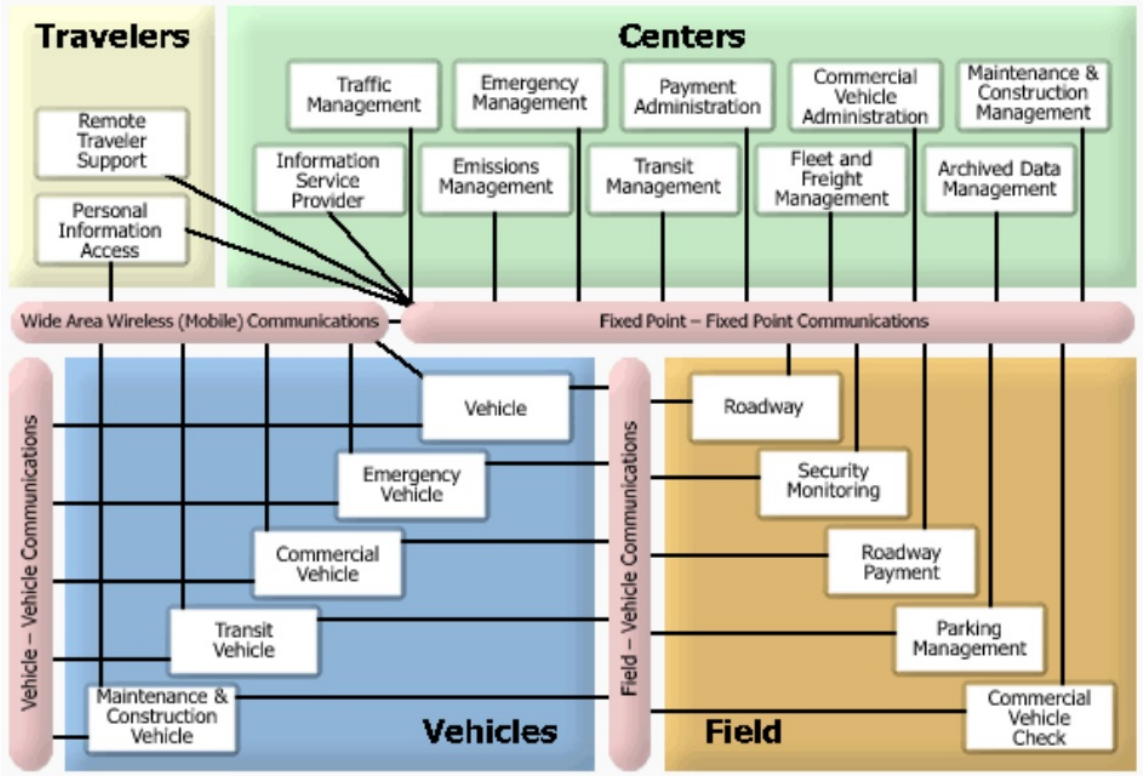


Figure 5. National ITS Architecture Subsystems and Interconnections

In addition to subsystem elements, there are additional elements added to the inventory defined by the National ITS Architecture as "Terminators". These represent the people, systems, and general environment that interface with the subsystem elements. Terminators typically represent the beginning or end of a flow of information in the ITS Architecture. No technical or functional requirements are assigned to terminators because they are the points outside the system boundaries where the architecture "plugs in" to the outside world.

A listing of ITS elements in the Ohio Statewide ITS Architecture is presented in Table 2 and can also be found in Section 4 of the Turbo Architecture Report in the Appendix. Each ITS element is documented at a high level by the associated stakeholder(s), its status (e.g. existing or planned), and a brief description for each element in the ITS inventory.

Table 2. Ohio Statewide ITS Elements

Stakeholder	Element Name	Element Description	Element Status
County and City Emergency Management Agencies	County and City Emergency Operations Centers (EOCs)	Represents County and City Emergency Operations Centers operated throughout the state. EOCs can have a range of emergency operations capabilities, and some can be co-located with local 911 dispatch centers. County EOC's in various sections of the state coordinate response and recovery activities with the Ohio Emergency Management Agency as needed.	Existing
County and City Emergency Management Agencies	County and City Warning Siren Systems	Represents outdoor warning sirens operated and maintained by counties and cities throughout the state that alert residents of an existing emergency.	Existing
County and City Law Enforcement Agencies	County and City Law Enforcement	Represents central office functions of county and city law enforcement agencies throughout the state, including dispatch of law enforcement vehicles.	Existing
County and City Public Safety Agencies	County and City Emergency Vehicles	Represents the ITS equipment, e.g., mobile data terminals and AVL systems, on county and city emergency vehicles dispatched by public safety agencies that provide the sensory, processing, storage, and communications functions necessary to support safe and efficient emergency response.	Existing
County and City Public Safety Agencies	County and City Public Safety Dispatch	Represents the public safety functions, including fire, police and sheriff functions, electronic crash reporting, emergency management, and dispatch of emergency vehicles, at the county and city level.	Existing
County and City Public Works Departments	County and City Lift Bridge Equipment	Represents lift bridge equipment, such as the City of Toledo MLK Lift Bridge Operators Tower, that gets advance notice for operations from large commercial river traffic. River traffic generally has the right-of-way.	Existing
County and City Public Works Departments	County and City Maintenance and Construction Vehicles	Represents the ITS equipment, e.g., mobile data terminals and AVL systems, on snow plows and other maintenance vehicles that are owned and operated by counties and cities throughout the state of Ohio.	Existing
County and City Public Works Departments	County and City Maintenance Dispatch Facilities	Represents maintenance dispatch facilities operated by county and city level public works departments. Facilities dispatch county and city maintenance vehicles that perform a wide variety of functions, from traffic signal and roadway maintenance to snow plow operations in winter months.	Existing
County and City Public Works Departments	County and City Parking Management Systems	Represents parking management ITS equipment operated and maintained by county and city public works departments throughout the state. Integration of payment for parking with E-Z Pass tags is planned functionality in some metro areas.	Existing
County and City Public Works Departments	County and City Roadside ITS Equipment	Represents a variety roadside ITS equipment devices (i.e. traffic signals, Dynamic Message Signs, CCTV cameras, etc...) that are operated and maintained by county and city public works departments throughout the state.	Existing

Stakeholder	Element Name	Element Description	Element Status
County and City Public Works Departments	County and City Traffic Data Archives	Represents traffic data archives operated and maintained by county and city public works departments. Data available for general public and for Ohio DOT District Offices primarily includes traffic counts and accident reports.	Existing
County and City Public Works Departments	County and City Traffic Information Websites	Represents various websites that provide real-time and static information for the public, including traffic and roadway information such as road conditions, traffic, construction, and other activity affecting roadways in counties and cities throughout the state.	Existing
County and City Public Works Departments	County and City Traffic Management Centers	This element represents the individual municipal and county stakeholders that own/operate traffic management/ITS equipment. Many of these stakeholders have a center that receives traffic information and manages the roadway equipment accordingly, as well as coordinates traffic signal control. This element includes the municipal and county public service departments and engineering departments.	Existing
County and City Transit Operators	County and City Transit Operations Centers	Represents transit management centers that operate outside of Regional transit Authorities throughout the state. Centers can operate a mix of fixed-route and demand response transit services. Some coordination of transit services with Regional Transit Authorities exists in regions of the state.	Existing
County and City Transit Operators	County and City Transit Vehicles	Represents fixed route and demand response transit vehicles that are dispatched and monitored by county and city transit operators. AVL systems on vehicles provide vehicle location reporting capabilities. Other on-board systems can include automated passenger counters, electronic fare boxes, and transit signal priority that can request for signal priority at traffic signals that may be operated by Ohio DOT.	Existing
Financial Institutions	Financial Institutions	Represents the financial institutions that handle all electronic fund transfer requests to enable the transfer of funds from the user of a transportation service to the provider of the service.	Existing
FMCSA	FMCSA MCMIS	Motor Carrier Management Information System (MCMIS) is a national system to consolidate and process motor carrier safety data from sources throughout the US. MCMIS contains safety records of active intrastate and interstate motor carriers, safety and compliance reviews, and roadside inspection records and crash records. MCMIS also carries a Safety Fitness Rating based on algorithms that evaluate all of a carrier's safety data. MCMIS also provides technical assistance to new and existing motor carriers in their compliance efforts by providing summaries of key regulations, required forms and other safety-related information.	Planned
General Public	Connected Vehicles	Represents vehicles with the advanced technologies that enable vehicle-to-vehicle and vehicle-to-intersection communications under the Connected Vehicles program. Advanced technologies allow for vehicle safety monitoring and warnings to be issued based on vehicle behavior, as well as for automated vehicle control.	Planned
General Public	Drivers	Represents the private travelers in vehicles.	Existing

Stakeholder	Element Name	Element Description	Element Status
General Public	Potential Obstacles	Represents any object that possesses the potential of being sensed and struck and thus also possesses physical attributes. Potential Obstacles include roadside obstructions, other vehicles, pedestrians, infrastructure elements or any other element which is in a potential path of the vehicle.	Existing
General Public	Traffic	Represents the collective body of vehicles that travel on Ohio DOT interstates and roadways which depicts the vehicle population from which traffic information is collected (average occupancy, average speed, total volume, average delay, etc.), and to which traffic control indicators are applied (intersection signals, stop signs, ramp meters, lane control barriers, variable speed limit indicators, etc.).	Existing
General Public	Traveler	Represents travelers that request for and utilize transportation services provided by the Ohio DOT and other public and private transportation agencies throughout the state of Ohio.	Existing
General Public	Traveler Information Device	This element refers to personal devices used by the traveling public, including mobile computers, pagers, etc.	Existing
General Public	Vehicle	This element refers to vehicles owned by travelers.	Existing
IFTA, Inc.	IFTA Clearinghouse	The IFTA Clearinghouse supports the IFTA base state agreement electronically. The IFTA Clearinghouse coordinates IFTA carrier information and transmittal records between participated jurisdictions.	Existing
IRP, Inc.	IRP Clearinghouse	The IRP Clearinghouse supports the IRP base state agreement electronically. The Clearinghouse supports exchange of motor carrier and financial information between participating jurisdictions.	Existing
Local Media	Media Outlets	Represents the information systems that provide traffic reports, travel conditions, and other transportation-related news services to the traveling public through radio, TV, and other media.	Existing
Metropolitan Planning Organizations	Animal Detection System	Represents an autonomous system of roadside detection and message signs. Roadside sensors are used to detect animals approaching a roadway or highway. Upon possible detection of an animal approaching a roadway or highway, sensors will trigger roadside message signs warning drivers in the surrounding area of possible danger from animals.	Planned
Metropolitan Planning Organizations	MPOs Data Archives	Historical archive of traffic and other types of data within MPO areas throughout the state.	Existing
Neighboring State DOTs	Neighboring State Traffic Management Centers	Represents Traffic Management Centers operated by neighboring state DOTs that coordinate with the Ohio DOT to operate and maintain traffic and roadways in metro areas that cross state lines. These state DOTs include the states of Kentucky and Indiana that coordinate with the Ohio DOT on traffic in the Cincinnati metro area, the Michigan DOT that coordinates with the Ohio DOT traffic in the Toledo metro area, and the Pennsylvania DOT that coordinates with the Ohio DOT on traffic in the Akron & Canton area.	Existing

Stakeholder	Element Name	Element Description	Element Status
Neighboring State DOTs	Neighboring States Roadside ITS Equipment	Represents roadside ITS equipment operated and maintained by neighboring state DOTs that can be monitored and controlled by Ohio DOT Statewide Traffic Management Center that border those respective states.	Existing
NOAA	National Weather Service	Service for national, regional, and local weather information.	Existing
Ohio Bureau of Motor Vehicles	Ohio Motor Carrier Information System (OMCIS)	The Ohio Motor Carrier Information System (OMCIS) is the home to regulatory information for motor carriers in the State of Ohio.	Existing
Ohio Department of Public Safety	Ohio DOT Storage Facilities	This element refers to depots and garages where materials are stored for the Ohio DOT.	Existing
Ohio Department of Public Safety	Ohio DPS Crash Database	This element refers to a statewide database of crash records that is shared with the Ohio DOT, which reviews the number, frequency and severity of accidents that occur on its system. Can be accessed at: https://ext.dps.state.oh.us/CrashRetrieval/OHCrashRetrieval.aspx.	Existing
Ohio Department of Transportation	Ohio DOT 511 Telephone Information Service	Ohio 511 telephone number that provides traveler information on travel times, incidents, and other traveler information made available through the OHGO traveler information website managed by the Ohio Statewide TMC.	Existing
Ohio Department of Transportation	Ohio DOT Automated Gate Closure Systems	Represents automated road closure gates owned and operated by the Ohio DOT used for the remote closure of roads, lanes or ramps. Intended to be for areas where ice or snow or other adverse weather conditions exist on a frequent basis and that cause hazardous conditions for motorists.	Planned
Ohio Department of Transportation	Ohio DOT Automated Roadway Treatment Systems	Roadway treatment devices (deicing equipment, sensors, etc.) owned and operated by the Ohio DOT to treat roads (usually ice, snow, etc.).	Existing
Ohio Department of Transportation	Ohio DOT CCTV Cameras	Closed Circuit Television (CCTV) refers to a surveillance system using cameras that transmits visual information over a closed circuit through an electrically conducting cable or wireless transmitter and receiver. It is both used for security purposes and traffic monitoring along Ohio DOT roads throughout the state.	Existing
Ohio Department of Transportation	Ohio DOT Connected Vehicles Roadside Equipment	This element represents the roadside equipment that provides vehicle-to-infrastructure communications under the Connected Vehicles program. This is used for data collection from Connected Vehicles-equipped vehicles and to provide information to Connected Vehicles-equipped vehicles.	Planned
Ohio Department of Transportation	Ohio DOT District Maintenance Repair Facilities	Represents Ohio DOT District Equipment Repair Facilities within respective Ohio DOT Districts.	Existing

Stakeholder	Element Name	Element Description	Element Status
Ohio Department of Transportation	Ohio DOT District Offices	There are 12 Ohio DOT District Offices throughout the state that are responsible for traffic operations and maintenance of state roadways. District offices operate and maintain a variety of roadside ITS equipment that is not within the jurisdiction of Ohio DOT Freeway Management Centers. District offices dispatch and monitor maintenance vehicles in their respective districts. Communicates with Ohio DOT RWIS Roadside Equipment within each respective District. More information on ODOT District Offices is at: http://www.dot.state.oh.us/districts/Pages/default.aspx.	Existing
Ohio Department of Transportation	Ohio DOT DMS	Represents fixed and portable Dynamic Message Signs (DMS) locations throughout the state. DMS are electronic traffic signs used on roadways to give travelers information about special events. DMS warn of traffic congestion, accidents, incidents, road work zones, or speed limits on a specific highway segment. Ohio DOT operates and maintains DMS along freeways throughout the state to provide accident, work zone and amber alert information.	Existing
Ohio Department of Transportation	Ohio DOT HAR	Highway advisory radios (HAR) are licensed low-power AM radio stations set up by the Ohio DOT to provide information regarding traffic conditions, travel times, construction, road incidents, missing persons, and other information deemed relevant to motorists. Roadside signs for HAR and the correct AM frequency include flashing beacon lights that provide for traffic alerts when the beacons are activated. HAR sites are designed to be automated so that when travel times increase by a pre-determined amount for a particular section of roadway, the HAR will provide travel-time information for that particular section of roadway only.	Existing
Ohio Department of Transportation	Ohio DOT Infrastructure Monitoring Sensors	Infrastructure monitoring equipment including IR, cameras and motion detectors. These sensors and detectors are operated by the Ohio DOT to monitor and protect infrastructure and facilities, and not for traffic monitoring. Planned to communicate with the Ohio Statewide EOC in Columbus.	Existing
Ohio Department of Transportation	Ohio DOT Lane Control Devices	Lane control devices owned and operated by Ohio DOT to manage lanes. These include lane control signals on bridges.	Planned
Ohio Department of Transportation	Ohio DOT Lift Bridge Equipment	Represents lift bridge equipment, such as the Ohio DOT Craig Memorial Lift Bridge Tower in the Toledo region, that gets advance notice for operations from large commercial river traffic. River traffic generally has the right-of-way.	Existing
Ohio Department of Transportation	Ohio DOT Maintenance and Construction Center Personnel	Represents Ohio DOT Maintenance and Construction Center Personnel that manage and control various maintenance subsystems.	Existing

Stakeholder	Element Name	Element Description	Element Status
Ohio Department of Transportation	Ohio DOT Maintenance and Construction Vehicles	Represents the ITS equipment on snow plows and other maintenance vehicles that are owned and operated by the Ohio DOT. Automated Vehicle Locator (AVL) systems are planned for the fleet.	Existing
Ohio Department of Transportation	Ohio DOT OHGO Traveler Information System	Represents the statewide traveler information website for alerts on traffic incidents, construction, travel times, and other information related to roadways throughout the state. Can be accessed at: http://www.ohgo.com/index. Information provided by this site is updated frequently and comes from a variety of sources, such as pavement sensors, monitoring stations, traffic cameras, and through direct input by Ohio DOT personnel.	Existing
Ohio Department of Transportation	Ohio DOT Overheight Vehicle Detection System	Represents a system of Overheight Vehicle Detectors and message signs. Overheight Vehicle Detectors detect overheight vehicles moving toward obstacles such as bridges, tunnels and other overhead structures, and triggers roadside message sign equipment to warn drivers. An audible alarm and/or sign is activated when an overheight vehicle is detected by the system. The infra-red based system, coupled with high intensity signing, offers great reliability in detecting and warning drivers of high vehicles to "DIVERT" or "TURN BACK".	Existing
Ohio Department of Transportation	Ohio DOT Pavement Sensors	Pavement Sensors measure the surface temperature of roads or bridges. The sensors are also designed to sense the amount of salt present on the roadway when the surface is wet. There is usually one sensor installed in a roadway and at least one installed in a bridge deck near the RWIS tower. These pavement sensors are important tools that help forecasters and supervisors make decisions regarding frost, chemical applications, and whether any precipitation on the pavement will freeze or thaw. Ohio DOT has pavement sensors installed on their ROW to help detect surface weather information and report it back to RWIS.	Existing
Ohio Department of Transportation	Ohio DOT Portable Freeway Management System	This system is a "virtual" TMC that allows direct control of freeway field equipment (e.g. variable message signs) from remote locations using simple equipment (e.g. a laptop computer). Can also be used for portable work zone applications.	Planned
Ohio Department of Transportation	Ohio DOT Ramp Meters	Ramp meters are traffic signals at freeway entrance ramps, which use video detection cameras positioned on the ramp and freeway to determine how quickly drivers can safely enter the freeway. Ramp meters also coordinate timings based on input from Ohio DOT Vehicle Detection Devices that measure traffic speed and volume on the freeway, and traffic demand on the ramp.	Existing
Ohio Department of Transportation	Ohio DOT Rest Area Tourist Information Centers	Represents planned Ohio DOT operated tourist information centers. Centers provide remote traveler support in the form of real-time information related to traffic and weather conditions.	Existing

Stakeholder	Element Name	Element Description	Element Status
Ohio Department of Transportation	Ohio DOT Rest Area Truck Parking Availability System	Represents planned parking management systems at rest areas and truck stops to measure parking availability and communicate availability to the public.	Planned
Ohio Department of Transportation	Ohio DOT RWIS Stations	RWIS (Roadway Weather Information System) is operated by the Ohio DOT through 158 weather stations, which provide coverage in all 88 of Ohio's counties. A central service located in Columbus processes the information from each station. Ohio DOT garages use the information collected by the stations to plan their road treatment activities, especially during snow and ice conditions. Ohio DOT also makes road conditions available to the public via a Web server (http://www.ohgo.com/index). The weather stations and sensors are located along interstates, U.S. routes, and state routes. The system comprised 88 wireless weather stations and more than 160 pavement sensors. Two types of weather stations are installed: those located along highways, and those located at county ODOT offices. The stations reported a variety of information, including: Air temperature; Precipitation rate/type; Surface temperature; Sub-surface temperature; Wet/dry surface; Dew point Relative humidity; Wind direction and speed; Traffic speeds and counts; Visibility. Data communications between the weather station and the central server at Ohio DOT Statewide TMC is conducted via cellular service in 5-minute intervals.	Existing
Ohio Department of Transportation	Ohio DOT Safety Patrol Vehicles	Represents the ITS equipment, e.g., mobile data terminals and AVL systems, on vehicles that provide motorist assistance and congestion mitigation. Ohio DOT provides motorist assistance on ODOT roads throughout the state. Safety Patrol currently patrols interstates in six areas of the state: Cleveland, Cincinnati, Dayton, Akron, Columbus, and Toledo.	Existing
Ohio Department of Transportation	Ohio DOT Speed Monitoring Roadside Equipment	Represents the field equipment that monitors vehicle speeds for enforcement purposes or to advise motorists of their current speeds.	Planned
Ohio Department of Transportation	Ohio DOT Statewide TMC	Ohio DOT Statewide Traffic Management Center (TMC) is located in Columbus at the Ohio DOT Central Office. The Statewide TMC operates traffic management and traveler information systems on Ohio's interstates, freeways, expressways, and state highways in each of the State's major metropolitan areas including Akron/Canton, Cincinnati, Cleveland, Columbus, Dayton/Springfield, and Toledo. TMC operators can control cameras and post traveler information messages to Ohio DOT's DMS, HAR, and to the OHGO website. TMC operators can also act as liaisons between the Safety Patrol Vehicles and various other public agencies that respond to the scenes of vehicle incidents.. For redundancy, it is able to remotely operate district traffic management centers. It also communicates with RWIS Roadside Equipment throughout the state.	Existing

Stakeholder	Element Name	Element Description	Element Status
Ohio Department of Transportation	Ohio DOT Traffic Data Archive System	Represents a statewide archive of traffic data that receives inputs from Vehicle Detection Devices installed by Ohio DOT throughout the state.	Existing
Ohio Department of Transportation	Ohio DOT Traffic Signal Systems	Represents traffic signal systems throughout the state ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests.	Existing
Ohio Department of Transportation	Ohio DOT Variable Speed Limit Signs	Variable Speed Limit (VSL) signs are a planned ITS element related to Ohio's Active Traffic and Demand Management (ATDM) program that aims to increase travel time reliability on Ohio DOT roadways in major metro areas. VSL signs in the field would communicate centrally with the Ohio Statewide TMC, and reduced speeds would be implemented either by TMC operators or would be automated based on the level of traffic detected by nearby Ohio DOT Vehicle Detection Devices.	Planned
Ohio Department of Transportation	Ohio DOT Vehicle Detection Devices	Represents roadside devices installed for the purpose of measuring vehicle speed, volume, and occupancy or density. This data can then be used for both the calculation of travel times and incident identification. The conventional form of vehicle detection is side-fired radar detector (SFRD). The main use of SFRD is for ramp metering, where the detectors provide traffic data to both the local ramp meter and central software, and allow for dynamic ramp metering along corridors and localized traffic-responsive ramp metering at spot locations. Vehicle detection devices gather traffic counts along Ohio DOT roadways and report data to the Traffic Data Archive System. The majority of devices exist within major cities, though more are planned for installation throughout the state.	Existing
Ohio Emergency Management Agency	Ohio Emergency Alert System	Formerly the emergency broadcast system, a regional notification system to the general public. Information may include amber alerts, inclement weather, etc.	Existing
Ohio Emergency Management Agency	Ohio Statewide EOC/JDF	The State Emergency Operations Center/Joint Dispatch Facility (EOC / JDF) in Columbus houses the Ohio Emergency Management Agency, Ohio DOT District 6 Headquarters, and the Dispatch Center of the Ohio State Highway Patrol, and communications elements of the Ohio Departments of Natural Resources and Transportation. The facility's purpose is to enhance the state's capabilities to respond to disasters and emergencies, and to improve coordination among state agency partners.	Existing
Ohio Environmental Protection Agency	Ohio EPA Air Quality Database	The Air Quality System (AQS) is EPA's repository of ambient air quality data. AQS stores data from over 10,000 monitors, 5,000 of which are currently active. State and local agencies collect the data and submit it to AQS on a periodic basis. The AQS database contains measurements of air pollutant concentrations in the 50 United States, plus the District of Columbia, Puerto Rico, and the Virgin Islands. The measurements include both criteria air pollutants and hazardous air pollutants.	Existing

Stakeholder	Element Name	Element Description	Element Status
Ohio Environmental Protection Agency	Ohio EPA Air Quality Management System	Represents the central office system that communicates with air quality monitors installed throughout the state that detect air quality.	Existing
Ohio Environmental Protection Agency	Ohio EPA Air Quality Monitors	Air quality monitors are sensors dispersed throughout the state that detect air quality.	Existing
Ohio State Highway Patrol	Ohio State Highway Patrol Posts	Represents dispatch functions for the Ohio State Highway Patrol throughout the state. OSHP unit for motor carrier enforcement is responsible for enforcement of size and weight laws relating to commercial vehicles. The unit has 10 portable scale teams located throughout the state. A scale team consists of a load limit inspector trooper and two load limit inspectors. There are also 11 fixed scale facilities located throughout the state. All interstate scale facilities are equipped with an electronic clearance system known as "PrePass." Commercial motor vehicles equipped with Prepass will receive an electronic in-cab signal informing the driver whether to pull into the scale or permit the driver to bypass the scale facility. The PrePass signal overrides the posted signs for all trucks including hazardous material placarded vehicles.	Existing
Ohio State Highway Patrol	Ohio State Highway Patrol Pre-Pass System	Represents "Pre-Pass" electronic clearance systems located at fixed sites in conjunction with Weigh-in-Motion stations. Commercial motor vehicles equipped with Pre-pass equipment will receive an electronic in-cab signal informing the driver whether to pull into the scale or permit the driver to bypass the scale facility. The PrePass signal overrides the posted signs for all trucks including hazardous material placarded vehicles.	Existing
Ohio State Highway Patrol	Ohio State Highway Patrol State Communications Center	The State Communication Centers is a dispatch facility that connects to Ohio DOT and controls emergency operations. It also provides for joint dispatch to incidents.	Existing
Ohio State Highway Patrol	Ohio State Highway Patrol Vehicles	Represents the ITS equipment, e.g., mobile data terminals and AVL systems, on highway patrol vehicles.	Existing
Ohio State Highway Patrol	Ohio State Highway Patrol Weigh-In-Motion Stations	OSHP operates fixed and mobile Weigh-In-Motion (WIM) stations throughout the state for commercial vehicle enforcement purposes.	Existing
Ohio Turnpike and Infrastructure Commission	Ohio Turnpike CCTV Cameras	Represents CCTV cameras owned and operated by Ohio Turnpike and Infrastructure Commission.	Existing
Ohio Turnpike and Infrastructure Commission	Ohio Turnpike Central Dispatch	Represents the central office for dispatch maintenance and incident management including private tow/wreckers and local/municipal fire/EMS. Co-located with Highway Patrol. Dispatch contractors for construction and sometimes maintenance. Located in Berea, Ohio.	Existing

Stakeholder	Element Name	Element Description	Element Status
Ohio Turnpike and Infrastructure Commission	Ohio Turnpike DMS	Represents both fixed and portable Dynamic Message Signs owned and operated by Ohio Turnpike and Infrastructure Commission. DMS can provide travelers on the Turnpike with warnings of traffic congestion, accidents, incidents, road work zones, as well as information on toll rates throughout the Turnpike.	Existing
Ohio Turnpike and Infrastructure Commission	Ohio Turnpike E-ZPass Tags	Represents E-ZPass vehicle transponders used for electronic payment of tolls along the Ohio Turnpike. E-ZPass tags can be used to pay for parking at Pittsburgh International Airport.	Existing
Ohio Turnpike and Infrastructure Commission	Ohio Turnpike Maintenance and Construction Vehicles	Represents the ITS equipment, e.g., mobile data terminals, on snow plows and other maintenance vehicles that are owned and operated by OTIC.	Existing
Ohio Turnpike and Infrastructure Commission	Ohio Turnpike Maintenance Dispatch Offices	Represents offices along the Ohio Turnpike that provide the dispatch function for turnpike roadway and equipment maintenance vehicles. Provides roadway and equipment maintenance for OTIC assets in the region.	Existing
Ohio Turnpike and Infrastructure Commission	Ohio Turnpike Toll Administration	Represents the back office administration systems for the electronic payment systems, including the customer service centers.	Existing
Ohio Turnpike and Infrastructure Commission	Ohio Turnpike Toll Collection Equipment	Electronic toll collection roadway equipment. E.g., tag readers, toll booth equipment, lane curtains, etc.	Existing
Ohio Turnpike and Infrastructure Commission	Ohio Turnpike Website	Website for the Ohio Turnpike and Infrastructure Commission that provides real-time information on travel along the Ohio Turnpike. General vehicles and commercial vehicle companies can calculate their toll amounts based on entrance and exit points on their trip. Available at: http://www.ohioturnpike.org/.	Existing
Private Companies	Private Towing Dispatch Agencies	Represents the dispatch function for private tow companies throughout the state. Ohio DOT has created a Towing and Recovery Incentive Program (TRIP), where Ohio DOT provides financial incentives to prequalified towing and recovery companies for the timely removal of large vehicle incidents from roadways where traffic operations are impacted. The TRIP program has been implemented in Central Ohio region, with expansion of the program to Cleveland and Cincinnati. Statewide TMC initiates communications with pre-qualified towing and recovery companies.	Existing
Private Companies	Private Traveler Information Systems	Represents the private traveler information providers serving travelers throughout Ohio. This element could, in the future, provide support to the National Traveler Information 511 number since it collects information from a broad array of operating centers. Could also include a website.	Existing
Private Companies	Private Weather Service Systems	Systems that provide customized transportation weather forecasts or road weather information.	Existing

Stakeholder	Element Name	Element Description	Element Status
Private Fleet and Freight Operators	Commercial Vehicles	Represents vehicles that are used to transport goods which are operated by professional drivers, typically administered as part of a larger fleet, and regulated by a Fleet and Freight Management Systems. This classification applies to all such vehicles ranging from small panel vans used in local pick-up and delivery services to large, multi-axle tractor-trailer rigs operating on long haul routes.	Existing
Private Fleet and Freight Operators	Fleet and Freight Management Systems	This element refers to centers that coordinate the operation of freight vehicles (including trucks, rail and planes) and can be connected to other modal systems' operations for efficient movement of commercial goods. Most freight management centers report the movement of commercial good through an Electronic Data Interchange (EDI) system.	Existing
Private Rail Operators	Freight Rail Operations	Freight rail operations coordinate the operation of freight trains and is connected to other modal systems' operations for efficient movement of commercial goods.	Existing
Private Rail Operators	Private Rail Operations Active Warning Roadside Equipment	Represents roadside equipment that alerts motorists of railroad crossings at at-grade intersections. Gates are activated and de-activated as trains are detected approaching and clearing the intersection.	Existing
Private Rail Operators	Private Rail Operations Wayside Equipment	Represents the rail operated equipment at highway rail intersections.	Existing
Public Utilities Commission of Ohio (PUCO)	PUCO Commercial Vehicle Compliance Check	Represents the commercial motor vehicle inspections performed by PUCO in coordination with the Ohio State Highway Patrol. The inspections are conducted by PUCO and violations are communicated with the Ohio State Highway Patrol, who enforces federal motor carrier safety regulations and the hazardous materials regulations. Approximately 80,000 roadside inspections are conducted annually in Ohio.	Existing
Public Utilities Commission of Ohio (PUCO)	PUCO Commercial Vehicle Registration System	Represents an online registration system that provides administrative functions like providing credentials, tax, and safety regulation information to all commercial vehicle operators. The system would issue credentials, collect fees and taxes, and support enforcement of credential requirements.	Existing
Regional Airport Authorities	Regional Airport Authorities	Represents the traffic management aspect of the airports. Also represents the multimodal information available at the airports.	Existing
Regional Airport Authorities	Regional Airport Authorities Parking Management Systems	Represents parking management ITS equipment operated and maintained by regional airports throughout the state. Integration of payment for parking with E-Z Pass tags is planned functionality in some airports.	Existing
Regional Airport Authorities	Regional Airport Authorities Roadside ITS Equipment	Represents a variety roadside ITS equipment devices (i.e. Dynamic Message Signs and CCTV cameras) that are operated and maintained by Regional Airport Authorities throughout the state.	Existing

Stakeholder	Element Name	Element Description	Element Status
Regional Event Operators	Regional Event Operations	This element refers to promoters and sponsors of special events, including Ohio State Buckeye football games. They coordinate with traffic and emergency providers.	Existing
Regional Hospital Organizations	Regional Hospitals and Trauma Centers	Hospitals and trauma centers throughout the state.	Existing
Regional Transit Authorities	Regional Transit Authorities Ticket Vending Machines	Represents ticket vending machines installed by Regional Transit Authorities to facilitate transit fare payments at transit station areas and other outlets where machines are installed.	Existing
Regional Transit Authorities	Regional Transit Authorities Transit Data Archives	Represents transit data archives operated by regional transit authorities throughout the state.	Existing
Regional Transit Authorities	Regional Transit Authorities Transit Information Kiosks	Represents transit information kiosks that provide real-time transit information that is managed and provided by Regional Transit Operations Centers.	Existing
Regional Transit Authorities	Regional Transit Authorities Transit Information Systems	Represents transit traveler information systems operated by Regional Transit Authorities that provide real-time and static information on fixed-route and demand response transit services throughout the state.	Existing
Regional Transit Authorities	Regional Transit Authorities Transit Operations Centers	Represents Regional Transit Operations Centers that operate and maintain fixed-route and demand response transit services in major metro areas throughout the state. Centers are responsible for dispatching, scheduling and transit traveler information systems in their respective regions. Centers utilize Automated Vehicle Locator (AVL) systems to monitor and report on vehicle locations. Centers also coordinate with Ohio DOT District Offices to share information on transit operations and provide feedback on roadway work plans proposed by ODOT District Offices.	Existing
Regional Transit Authorities	Regional Transit Authorities Transit Websites	Represents websites operated by large Regional Transit Authorities that provide real-time and static information on fixed-route and demand response transit services.	Existing
Regional Transit Authorities	Regional Transit Authority Transit Vehicles	Represents fixed route and demand response vehicles that are operated and maintained by Regional Transit Authorities throughout the state. AVL systems on vehicles provide vehicle location reporting capabilities. Other on-board systems can include automated passenger counters, electronic fare boxes, and transit signal priority that can request for signal priority at traffic signals that may be operated by Ohio DOT.	Existing
Regional Transit Authorities	Transit Traveler Cards	Represents a variety of transit fare cards that are used to pay for fixed-route and demand response transit services operated throughout the state. Cards can be simple magnetic fare cards that have stored value. Cards can also be smart touch-based cards that use Electronic Payment System (EPS).	Existing
Universities and Colleges	Archived Data User Systems	Agencies and systems that use archived data provided by transportation agencies.	Existing

Stakeholder	Element Name	Element Description	Element Status
Universities and Colleges	Universities and Colleges Transit Operations Centers	Represents Universities and Colleges Transit Operations Centers that operate and maintain fixed-route transit services on large college campuses throughout the state. Centers are responsible for dispatching, scheduling and transit traveler information systems on their respective campuses. Centers utilize Automated Vehicle Locator (AVL) systems to monitor and report on vehicle locations. Centers coordinate transit schedules and operations with nearby Regional Transit Authorities, and centers also coordinate with Ohio DOT District Offices to share information on transit operations with ODOT District Offices.	Existing
Universities and Colleges	Universities and Colleges Transit Vehicles	Represents fixed route vehicles that are operated and maintained by Universities and Colleges throughout the state. AVL systems on vehicles provide vehicle location reporting capabilities. Other on-board systems can include automated passenger counters, electronic fare boxes, and transit signal priority that can request for signal priority at traffic signals that may be operated by Ohio DOT.	Existing

4.2 Service Packages

The service packages of an ITS Architecture define a "service-oriented" perspective of how an architecture can be structured. Service packages are a convenient way to assemble ITS components to address frequently needed services without having to itemize the components. This can be compared to buying a car. In one purchase you acquire a complex set of systems such as engine, drive train, suspension, cargo handling, etc.) In the same way, service packages present how the ITS elements (and their assigned subsystems and terminators) work together to deliver a given ITS service, as well as the flow of information that connect those ITS elements with other important external systems. They are tailored to fit real world transportation problems and needs. Service packages enable transportation planners and decision makers to select appropriate ITS services that satisfy local and statewide needs.

All 97 service packages in the National ITS Architecture (Version 7.1) were considered for their applicability to the Ohio Statewide ITS Architecture. Table 3 below summarizes the status of ITS deployment with respect to service packages in the region. A detailed list of applicable service packages, as well as associated ITS elements, are presented in Section 5 of the Turbo Architecture Report in the Appendix. They can also be found on the Architecture website (http://www.iteris.com/itsarch/html/mp/mpindex.htm).

Table 3. Service Packages for the Ohio Statewide ITS Architecture

Service Package	Service Package Name	Status
AD1	ITS Data Mart	Existing
AD2	ITS Data Warehouse	Existing
AD3	ITS Virtual Data Warehouse	Planned
APTS01	Transit Vehicle Tracking	Existing
APTS02	Transit Fixed-Route Operations	Existing
APTS03	Demand Response Transit Operations	Existing
APTS04	Transit Fare Collection Management	Existing
APTS05	Transit Security	Existing
APTS06	Transit Fleet Management	Planned
APTS07	Multi-modal Coordination	Existing
APTS08	Transit Traveler Information	Existing
APTS09	Transit Signal Priority	Existing
APTS10	Transit Passenger Counting	Existing
ATIS01	Broadcast Traveler Information	Existing
ATIS02	Interactive Traveler Information	Planned
ATIS09	In Vehicle Signing	Planned
ATIS10	Short Range Communications Traveler Information	Planned
ATMS01	Network Surveillance	Existing
ATMS02	Traffic Probe Surveillance	Planned
ATMS03	Traffic Signal Control	Existing
ATMS04	Traffic Metering	Existing
ATMS06	Traffic Information Dissemination	Existing

Service Package	Service Package Name	Status
ATMS07	Regional Traffic Management	Existing
ATMS08	Traffic Incident Management System	Existing
ATMS09	Transportation Decision Support and Demand Management	Planned
ATMS10	Electronic Toll Collection	Existing
ATMS11	Emissions Monitoring and Management	Existing
ATMS13	Standard Railroad Grade Crossing	Existing
ATMS14	Advanced Railroad Grade Crossing	Existing
ATMS15	Railroad Operations Coordination	Planned
ATMS16	Parking Facility Management	Existing
ATMS17	Regional Parking Management	Planned
ATMS19	Speed Warning and Enforcement	Existing
ATMS20	Drawbridge Management	Existing
ATMS21	Roadway Closure Management	Planned
ATMS22	Variable Speed Limits	Planned
ATMS23	Dynamic Lane Management and Shoulder Use	Planned
ATMS24	Dynamic Roadway Warning	Existing
AVSS01	Vehicle Safety Monitoring	Planned
AVSS03	Longitudinal Safety Warning	Planned
AVSS04	Lateral Safety Warning	Planned
AVSS05	Intersection Safety Warning	Planned
AVSS06	Pre-Crash Restraint Deployment	Planned
AVSS08	Advanced Vehicle Longitudinal Control	Planned
AVSS09	Advanced Vehicle Lateral Control	Planned
AVSS10	Intersection Collision Avoidance	Planned
AVSS11	Automated Vehicle Operations	Planned
AVSS12	Cooperative Vehicle Safety Systems	Planned
CVO01	Carrier Operations and Fleet Management	Existing
CVO02	Freight Administration	Existing
CVO03	Electronic Clearance	Existing
CVO04	CV Administrative Processes	Existing
CVO06	Weigh-In-Motion	Existing
CVO07	Roadside CVO Safety	Existing
CVO10	HAZMAT Management	Existing
EM01	Emergency Call-Taking and Dispatch	Existing
EM02	Emergency Routing	Existing
EM04	Roadway Service Patrols	Existing
EM05	Transportation Infrastructure Protection	Planned
EM06	Wide-Area Alert	Existing
EM07	Early Warning System	Existing
EM08	Disaster Response and Recovery	Existing
EM09	Evacuation and Reentry Management	Planned
EM10	Disaster Traveler Information	Existing
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing

Service Package	Service Package Name	Status
MC02	Maintenance and Construction Vehicle Maintenance	Existing
MC03	Road Weather Data Collection	Existing
MC04	Weather Information Processing and Distribution	Existing
MC05	Roadway Automated Treatment	Existing
MC06	Winter Maintenance	Existing
MC07	Roadway Maintenance and Construction	Existing
MC08	Work Zone Management	Existing
MC09	Work Zone Safety Monitoring	Planned
MC10	Maintenance and Construction Activity Coordination	Existing
MC12	Infrastructure Monitoring	Planned

4.3 Stakeholders' Operational Roles and Responsibilities

An operational concept defines each stakeholder's current and future roles and responsibilities for operating ITS systems in Ohio. Defining the roles and responsibilities of the participating stakeholders is an important step in realizing the common goal of an interoperable ITS system throughout the state.

Stakeholders' operational roles and responsibilities are detailed on the Ohio Statewide ITS Architecture Website, as well as in the Turbo Architecture Database and in Section 6 of the Turbo Architecture Report in the Appendix. These roles and responsibilities have been defined based on the operations of current systems and inputs from the stakeholders (for both current and future systems). Together, these roles and responsibilities define the operational concept for the ITS Architecture, and provide an overview for how ITS services operate within the state.

4.4 Functional Requirements

A "functional requirement" is a task or activity that is currently performed or is planned to be performed by each system in the state to provide the required ITS services. The National ITS Architecture has pre-defined all possible functional areas (i.e. equipment packages).

The process to develop the functional requirements for the Ohio Statewide ITS Architecture began with the mapping of functional areas (equipment packages) to service packages and associated ITS elements. The functional requirements of each equipment package were then tailored to represent the specific local agency functions performed. Turbo Architecture is then used to produce lists and graphics that can be easily interpreted by the end users.

Functional requirements of all ITS inventory elements in the Ohio Statewide ITS Architecture are contained in Section 7 of the Turbo Architecture Report in the Appendix. They can be found on the Regional ITS Architecture Website and the Turbo Architecture Database.

4.5 Interfaces

While it is important to identify the various ITS systems and stakeholders as part of the Architecture, a primary purpose of the Ohio Statewide ITS Architecture is to identify the connectivity between systems. The two ways to describe this connectivity are:

- **Architecture Interconnects** define the connections between equipment and systems which may be deployed by the agencies throughout the region. In other words, it defines which entities interact with each other.
- **Architecture (Information) Flows** define a high level information exchange associated with each interconnect between equipment and systems. In other words, what information is passed along the interconnect paths.

An example of an interconnect diagram is illustrated in Figure 6.

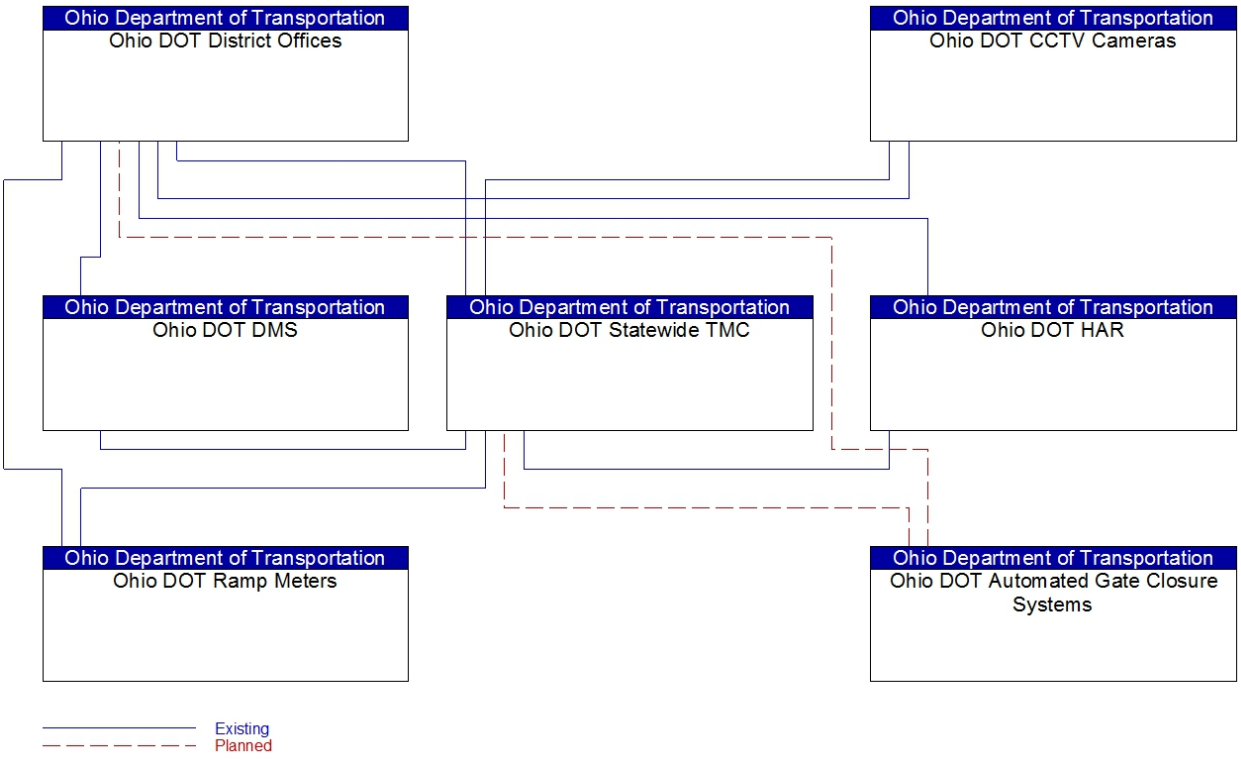


Figure 6. Interconnect Diagram Example: Ohio Statewide TMC and Select Field Devices

Figure 7 illustrates the architecture flow diagram between the Ohio Statewide TMC and selected field devices throughout the state. Architecture (information) flows provide a high-level description of information exchanges associated with each interconnect path between equipment and systems. From these diagrams the stakeholders can easily identify the existing or potential information exchange between agencies and systems. This provides a framework for analyzing how elements are related and

thus identifies the areas for potential coordination and cooperation among agencies. Quite often, from these diagrams, agencies can identify missing communication flows that should occur, leading to refinements during the lifecycle of the system.

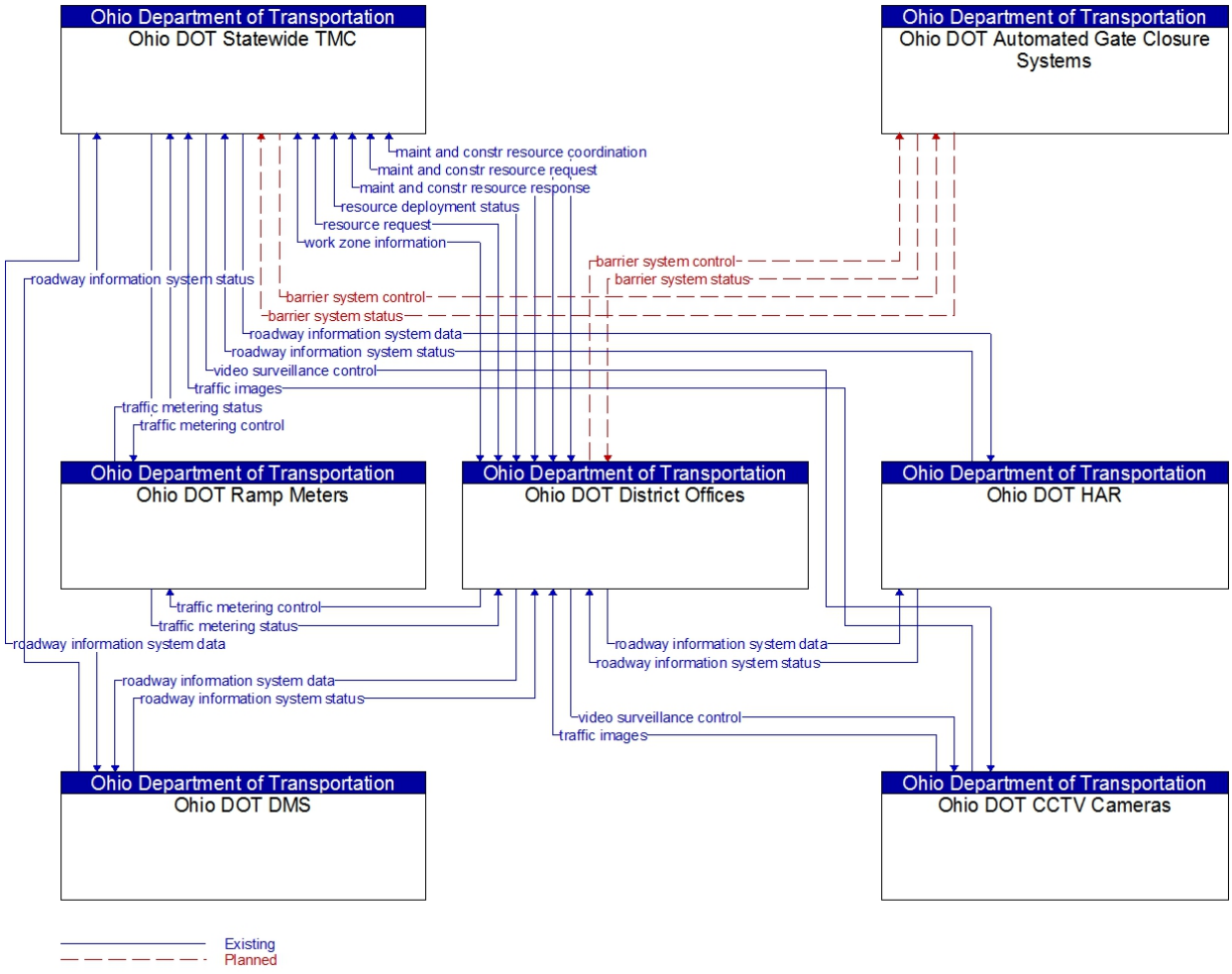


Figure 7. Architecture Flow Diagram: Ohio Statewide TMC and Select Field Devices

The National ITS Architecture provides guidance in identifying potential information to be exchanged between commonly used ITS elements in the inventory, and the Turbo software is used to generate the architecture flow diagrams between ITS elements in the inventory.

A detailed listing of the interconnects and architecture flows of all ITS inventory elements is contained in Section 8 of the Turbo Architecture Report in the Appendix, in the Turbo Architecture Database, and the ITS Architecture website.

4.6 Standards

Identification of ITS technical standards that support interfaces in the Ohio Statewide ITS architecture are often not understood by stakeholders, so the National ITS Architecture was created to provide stakeholders with easy access to appropriate ITS standards that can be specifically applied to an ITS project. It is important that stakeholders are aware of the importance of ITS standards, especially with respect to cost, risk, and interoperability issues both within the region and when connecting with other regions. These standards can save money in the long run and ensure that various devices and systems are compatible and interoperable.

While the Ohio Statewide ITS Architecture includes various ITS applications, it does not cover every conceivable ITS technology. As such, not all ITS standards will be applicable to the existing ITS component and future deployment. Fifty-nine (59) ITS standards were identified as standards supporting current and future ITS applications in the state. A list of ITS Standards applicable to the Ohio Statewide ITS Architecture is contained in Section 9 of the Turbo Architecture Report in the Appendix, the Turbo Architecture Database, and the website.

4.7 Agreements

The Ohio Statewide ITS Architecture also provides an institutional framework for the deployment of ITS in the state. Institutional interoperability involves cooperation and coordination between various agencies and jurisdictions to achieve seamless functionality, regardless of agency boundaries or differences in neighboring agency systems.

Because the statewide architecture identifies systems that require agencies to contribute resources and manpower to operate, inter-agency agreements are often needed to define the roles and responsibilities of each party.

There are several types of arrangements associated with the interfaces identified in the Ohio Statewide ITS Architecture:

- Information sharing and exchanges between systems require knowledge of the transmission protocol and data formats to ensure compatibility.
- Coordinating field device operations owned by different agencies requires defined procedures for submitting message requests and rules governing when such requests can be honored. Such coordination may be done with informal arrangements such as a Memoranda of Understanding (MOU).
- Sharing control of field devices operated by different agencies sometimes involves liability issues, which leads to more formal agreements.
- Coordinated incident response may also require formal agreements, but also requires group training of personnel from various agencies.

In general, agreements may be obtained for data sharing, establishing common procedures, supporting regional operations, cost effective maintenance arrangements, and personnel training.

Some common types of agreements are listed in Table 4. The agreement process may begin with something as simple as a handshake agreement. However, once interconnections and integration of systems begin, agencies may want to have more formalized agreements in place. A documented agreement will aid agencies in planning their operational costs, understanding their respective roles and responsibilities, and build trust for future projects. Formal agreements may be necessary where funding or financial arrangements are defined or participation in large regionally significant projects is required. Formal agreements also provide a means for sustaining the stakeholders' expectations when personnel and administration changes occur.

Table 4. Common Types of Agreements for ITS

Type of Agreement	Description
Handshake Agreement	▪ Early agreement between one or more partners ▪ Not recommended for long term operations.
Memorandum of Understanding (MOU)	▪ Initial agreement used to provide minimal detail and usually demonstrating a general consensus. ▪ Used to expand a more detailed agreement like an Interagency Agreement that may be broad in scope but contains all of the standard contract clauses required by a specific agency. ▪ May serve as a means to modify a much broader Master Funding Agreement, allowing the master agreement to cover various ITS projects throughout the region and the MOUs to specify the scope and differences between the projects.
Interagency Agreement	▪ Between public agencies (i.e., transit authorities, cities, counties, etc.) for operations, services or funding ▪ Documents responsibility, functions and liability at a minimum.
Intergovernmental Agreement	▪ Between governmental agencies (i.e., Agreements between universities and State DOT, MPOs and State DOT, etc.)
Operational Agreement	▪ Between any agency involved in funding, operating, maintaining or using the right of way of another public or private agency. ▪ Identifies respective responsibilities for all activities associated with shared systems being operated and / or maintained.
Funding Agreement	▪ Documents the funding arrangements for ITS projects (and other projects) ▪ Includes at a minimum standard funding clauses, detailed scope, services to be performed, detailed project budgets, etc.

Type of Agreement	Description
Master Agreements	▪ Standard contract and / or legal verbiage for a specific agency and serving as a master agreement by which all business is done. These agreements can be found in the legal department of many public agencies. ▪ Allows states, cities, transit agencies and other public agencies that do business with the same agencies over and over (i.e., cities and counties) to have one Master Agreement that uses smaller agreements (i.e., MOUs, Scope of Work and Budget Modifications, Funding Agreements, Project Agreements, etc.) to modify or expand the boundaries of the larger agreement to include more specific language.

A summary of the ITS Agreements has been documented in the Turbo Architecture database and can be found in Section 10 of the Turbo Architecture Report in the Appendix.

5.0 Recommended ITS Projects and Implementation Sequencing

The ITS projects included in the Ohio Statewide ITS Architecture were identified primarily based on input gathered from stakeholders as listed in Section 3 of this report, and from an extensive review of existing Regional ITS Architectures in the state. A project sequence defines the order in which ITS projects may be implemented. A good sequence is based on a combination of two factors:

- **Prioritization of projects based on existing conditions and stakeholder needs**: The ITS projects were prioritized to reflect a deployment path (sequence). Although the information collected through stakeholder surveys and meetings was the basis of the ITS Architecture, real world conditions of changing technology, funding opportunities and public demand continue to evolve. It is expected that the stakeholders will reevaluate and reprioritize projects frequently to keep up with these imposed changes.

- **Prioritization of projects dependent upon prior projects being completed:** For example, a fiber optic network would need to be in place before a set of detectors are constructed to provide a means to communicate with the detection system. These project dependencies influence the project sequencing. Therefore, it is important to identify these dependencies between projects during the planning stages.

In most cases, the sequence of currently planned projects has already been programmed and can simply be extracted from existing transportation plans. Successive projects will then be added to the sequence based on the project dependencies and other planning factors.

The project timeframes provide a means to position each project along the architectures lifetime. This enables the scheduling of funds and resources to deliver the projects in an appropriate sequence. Three timeframe categories are used and their definitions are described below:

Table 5. Project Implementation Timeframes

Category	Time Frame	Year of Deployment
Short Term	1 – 3 years	2016 – 2019
Medium Term	4 – 6 years	2020 – 2022
Long Term	7 years and beyond	2023 and beyond

The Ohio Statewide ITS Architecture represents a roadmap for transportation systems deployment and integration in the region over the next 15 years (from 2016 to 2030). Through the above process, the recommended ITS project sequencing was determined. The lists were further refined to establish which projects were allocated to short, medium, and long terms. This provided a priority for the list of projects denoting a general order for project implementation.

Table 6. List of Planned ITS Projects

Project Name	Project Description	Timeframe
Ohio DOT Evacuation Route Development	Ohio DOT is currently in the process of developing evacuation routes in large metropolitan areas of the state. Requires emergency plan coordination with first responder agencies throughout the state. Project Source: Ohio DOT Website at the following address: https://www.dot.state.oh.us/Divisions/Operations/Traffic/Documents/Office%20of%20Traffic%20Operations%20Handbook%20Version%20-%204.3.pdf.	Short Term
Ohio DOT Lane Control Devices	Represents a project to install lane control devices operated by Ohio DOT to manage lanes. These include lane control signals on bridges. Project Source: NOACA Regional ITS Architecture.	Short Term
Ohio DOT Speed Monitoring Roadside Equipment	Represents the field equipment that monitors vehicle speeds for enforcement purposes or to advise motorists of their current speeds. Project Source: NOACA Regional ITS Architecture.	Short Term
Ohio DOT OHGO Mobile Application	Project includes the development of a mobile application to present traffic information from the Ohio DOT OHGO Traveler Information System. Project Source: Ohio DOT website at the following address: https://www.dot.state.oh.us/engineering/OTEC/2011%20Presentations/23B-GeorgeSaylor.pdf.	Short Term
Ohio Multi Agency Radio Communication System (MARCS)	The Multi-Agency Radio Communications System ("MARCS") enables Ohio State Highway Patrol troopers and law enforcement personnel serving counties and cities throughout to more effectively communicate with each other. MARCS is an 700/800 MHz radio and data network that utilizes state-of-the-art trunked technology to provide statewide interoperability in digital clarity to its subscribers throughout Ohio and a 10 mile radius outside of Ohio. The MARCS system provides statewide, secure, reliable public service wireless communication for public safety and first responders. The MARCS network operates on three system components: 1) Mobile Voice – operating on the 700/800 MHZ digital trunked technology, 2) Mobile Data – allowing data transmissions, LEADS inquiries, reformatting of data from Mobile Data Terminals (MDT), and 3) Computer Aided Dispatch - providing GPS-based auto vehicle location, resource recommendation and GGM display. There are currently over 47,500 voice units and over 1,800 mobile data units on the MARCS system with over 1200 public safety/public service agencies statewide. This includes local, state and federal agencies. Ohio DAS staff that manage the MARCS system work with emergency responders to get their equipment programmed, activated and deployed efficiently. Project Source: http://das.ohio.gov/Divisions/InformationTechnology/MARCSServices.aspx.	Short Term

Project Name	Project Description	Timeframe
Emergency Vehicle Preemption in Counties and Cities	Emergency Vehicle Pre-emption (EVP) will be expanded to traffic signals operated by counties and cities throughout the state. Projects will require coordination between public works departments and county and city public safety agencies. Project Sources: Reflected in the following Regional ITS Architectures -- AMATS-SCATS, Eastgate, Miami Valley, MORPC, NOACA, OKI, and TMACOG.	Short Term
Regional Evacuation Plan Updates	Represents updates made to evacuation plans by large counties throughout the state. Will require coordination with Ohio Emergency Management Agency and Ohio Department of Transportation. Project Source: NOACA Regional ITS Architecture, Eastgate Regional ITS Architecture.	Short Term
Real-Time Transit Information Systems for Transit Providers	Represents projects to be led by transit providers throughout the state to provide real-time transit information to users of the public transportation system. Project Sources: Reflected in the following Regional ITS Architectures -- AMATS-SCATS, Eastgate, MORPC, NOACA, OKI, and TMACOG.	Short Term
Ohio DOT Freeway Management System Expansion in Metro Areas	Represents expansions of the ITS elements that are included within Freeway Management Systems (FMS) deployed in the major metro areas of Ohio, including Cincinnati, Toledo, Columbus, Cleveland, Dayton, and Akron/Canton. Primary ITS elements that are part of the overall FMS include DMS, CCTV, HAR, and ramp meters.	Short Term
Ohio DOT Safety Service Patrol Expansion	Represents an expansion of the Ohio DOT Safety Service Patrols.	Short Term
Ohio DOT Rest Area Truck Parking Availability System	Represents planned parking management systems at rest areas and truck stops to measure parking availability and communicate availability to the public. Project Source: Eastgate Regional ITS Architecture.	Short Term
Ohio DOT Active Traffic and Demand Management	Represents an Ohio DOT Active Traffic and Demand Management project. Project Source: Ohio DOT website at the following: https://www.dot.state.oh.us/engineering/OTEC/2014%20OTEC%20Presentations/Wednesday,%20Oct.%2029/54-C223-225-830-10/Stargell_Gray.pdf.	Short Term
E-ZPass Integration with Parking Management Systems	Project represents E-ZPass Integration with Parking Management Systems in large metro areas of the state. Project Source: NOACA Regional ITS Architecture.	Medium Term

Project Name	Project Description	Timeframe
Ohio DOT Maintenance Vehicle AVL Upgrades	Represents a planned project to install AVL systems in Ohio DOT Maintenance Vehicles operating in districts throughout the state. Project also includes potential to operate Maintenance Decision Support Systems (MDSS) in Ohio. Project Source: NOACA Regional ITS Architecture, Eastgate Regional ITS Architecture.	Medium Term
Transit Signal Priority in Counties and Cities	Represents Transit Signal Priority (TSP) projects led by County and City Transit Operators. May require coordination with Ohio DOT for TSP operations at traffic signals operated by the Ohio DOT. Project Sources: Reflected in the following Regional ITS Architectures -- Eastgate, Miami Valley, MORPC, NOACA, OKI, and TMACOG.	Medium Term
Ohio DOT Automated Gate Closure Systems	Represents automated road closure gates owned and operated by the Ohio DOT used for the remote closure of roads, lanes or ramps. Intended to be for areas where ice or snow or other adverse weather conditions exist on a frequent basis and that cause hazardous conditions for motorists. Project Source: NOACA Regional ITS Architecture.	Medium Term
Animal Detection Systems	Represents an autonomous system of roadside detection and message signs. Roadside sensors are used to detect animals approaching a roadway or highway. Upon possible detection of an animal approaching a roadway or highway, sensors will trigger roadside message signs warning drivers in the surrounding area of possible danger from animals. Project Source: NOACA Regional ITS Architecture.	Medium Term
Ohio DOT Work Zone Safety Improvements	Represents projects that will improve travel in work zones to reduce collisions. Projects could include deployment of roadside equipment to alert drivers of a construction zone, roadway hazard, or speed change. Project Source: NOACA Regional ITS Architecture.	Medium Term
Expansion of E-ZPass and Toll Operations in Metro Areas	Expansion of E-ZPass and Toll Operations in Metro Areas. Includes potential tolling of the Brent Spence Bridge Corridor in Cincinnati metro area. Project may or may not utilize Ohio Turnpike E-ZPass Tags for project. Project Source: Brent Spence Bridge Corridor project page. Available at: http://www.brentspencebridgecorridor.com/.	Long Term

Project Name	Project Description	Timeframe
Ohio DOT Connected Vehicles Program	Represents Connected Vehicles projects that Ohio DOT could become involved in through the deployment of roadside equipment that provides vehicle-to-infrastructure communications under the Connected Vehicles program. This is used for data collection from Connected Vehicles-equipped vehicles and to provide information to Connected Vehicles-equipped vehicles. Project Source: NOACA Regional ITS Architecture, Eastgate Regional ITS Architecture.	Long Term
Traffic Signal System Upgrades in Counties and Cities	Represents upgrades to traffic signal systems operated by public works departments in counties and cities throughout the state. Project Sources: Reflected in the following Regional ITS Architectures -- Eastgate, MORPC, NOACA, OKI, and TMACOG.	Long Term
Ohio DOT Highway-Rail Intersection Advanced Safety Systems	Represents a project to install advanced highway-rail safety systems at key railroad at-grade crossings. Project Source: NOACA Regional ITS Architecture, Eastgate Regional ITS Architecture.	Long Term

6.0 Architecture Maintenance and Use Plan

The Ohio Statewide ITS Architecture has been created as a consensus view of what ITS systems the stakeholders within the architecture boundary already have in place and what systems they plan to implement in the future. By its nature, the architecture is not a static set of outputs. The Architecture should be modified as plans and priorities change, ITS projects are implemented, and the ITS needs and services evolve in the region. There are many actions that may cause a need to update the architecture, including:

- **Changes in Project Definition.** When actually defined, a project may add, subtract or modify elements, interfaces, or information flows of the ITS Architecture. Because the architecture is meant to describe not only ITS planned, but also the current ITS implementations, it should be updated to correctly reflect the deployed projects.
- **Changes due to Project Addition/Deletion**. Occasionally a project will be added, deleted or modified during the planning process. When this occurs, the aspects of the ITS Architecture associated with the project should be added, deleted or modified.
- **Changes in Project Status.** As projects are deployed, the status of the architecture elements, services and flows that are part of the projects will have to be changed from planned to existing. Elements, services and flows should be considered to exist when they are substantially complete.
- **Changes in Project Priority.** Due to funding constraints, technological changes or other considerations, a project planned may be delayed or accelerated. Such changes should be reflected in the ITS Architecture.
- **Changes in Regional Needs.** Transportation planning is done to address regional transportation needs. Over time these needs change and the corresponding aspects of the ITS Architecture that addresses these needs should be updated.
- **Changes in Participating Stakeholders.** Stakeholder involvement can also change over time. The ITS Architecture should be updated to reflect the participating stakeholder roles in the statewide view of ITS elements, interfaces, and information flows.
- **Changes in Other Architectures.** The Ohio Statewide ITS Architecture includes not only elements and interfaces within the architecture boundary, but also interfaces to elements in adjacent and other areas in Kentucky. Changes to the Regional ITS Architectures in the state may necessitate changes to the Ohio Statewide ITS Architecture to maintain consistency. A Regional ITS Architecture may overlap with the Statewide ITS Architecture, and a change in one architecture may necessitate a change in the other.
- **Changes in National ITS Architecture.** The National ITS Architecture will be expanded and evolved from time to time to include new user services or refine existing services. These changes should be considered as the ITS Architecture is updated. Updates to the National ITS Architecture and Turbo will be publicized on the ITS Joint Program Office (JPO) Architecture website: http://www.its.dot.gov/arch/.

6.1 Architecture Maintenance Plan

6.1.1 Who Is Responsible for Architecture Maintenance?

Responsibility for maintaining the ITS Architecture will lie with the ODOT Office of Traffic Operations (OTO). Given the statewide scale of the ITS Architecture, it is recommended that an ITS Working Group be developed, whose members could oversee all ITS activities in the state, including planning, architecture, design, implementation, operations, and maintenance, etc. The working group should coordinate the maintenance activities and be the point of contact, including collecting, reviewing and evaluating change requests, tracking change requests, requesting additional information from stakeholders, distributing documentation, as well as calling meetings, making meeting arrangements, assembling an agenda, leading the meetings, and approving minutes. The working group can also make approved changes to the ITS Architecture, and notify stakeholders of the changes.

It is proposed that the ITS Working Group consist of the agencies listed in Table 7 below, with the ODOT OTO as the lead agency to gather input on updates to the Statewide ITS Architecture. Proposed members cover a majority of the state and include representatives from each of the MPO's that have developed their own Regional ITS Architectures independent of the Statewide ITS Architecture. Those agencies can provide a status on various aspects of ITS deployment that could be reflected as updates to the Statewide ITS Architecture. Additional agencies could be added to the ITS Working Group as deemed necessary by the Ohio DOT OTO and the ITS Working Group.

Table 7. Proposed ITS Working Group Member Agencies

ITS Working Group Agency Members	**Notes**
1. Ohio DOT Office of Traffic Operations (OTO)	Lead Agency of ITS Working Group
2. Ohio Turnpike and Infrastructure Commission	Can provide on toll equipment upgrades and other ITS equipment used on the Turnpike
3. Ohio State Highway Patrol	Represents Highway Patrol statewide; works with commercial vehicle enforcement
4. Ohio MPO's with a Regional ITS Architecture	
Toledo Metropolitan Area Council of Governments	Covers the Toledo Metro Area
Eastgate Regional Council of Governments	Covers the Youngstown Metro Area
Akron Metropolitan Area Transportation Study	Covers the Akron Metro Area
Mid-Ohio Regional Planning Commission	Covers the Columbus Metro Area
Miami Valley Regional Planning Commission	Covers the Dayton Metro Area
OKI Regional Council of Governments	Covers the Cincinnati Metro Area
Northeast Ohio Areawide Coordinating Agency	Covers the Cleveland Metro Area

6.1.2 What Will Be Maintained?

The following should be reviewed and updated at regular intervals:

- Description of the region
- Participating agencies and other stakeholders, including key contact information
- Inventory of existing and planned ITS systems in the region
- Operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems
- Agreements for operations and interoperability
- System functional requirements
- Interface requirements and information exchanges with planned and existing systems and subsystems
- Applicable ITS standards supporting regional and national interoperability
- Sequence of projects for implementation

There are several different components that make up the ITS Architecture. Some may require more frequent updates than others, but the entire architecture will need periodic review to ensure that it is consistent with the regional goals. The current version (version 1.0) of the Ohio Statewide ITS Architecture shall be the baseline architecture upon which future revisions are conducted as necessary.

The Ohio Statewide ITS Architecture was created based on the National ITS Architecture Version 7.1 using Turbo Architecture Software Version 7.1. The Architecture was documented and stored in the following forms:

- Ohio Statewide ITS Architecture Report
- Ohio Statewide ITS Architecture Website
- Electronic Turbo Architecture database

The Turbo Architecture database can generate a set of outputs including various reports, tables, diagrams, and the architecture webpages. Such outputs include interconnect and architecture flow diagrams, inventory lists, stakeholders lists, service package lists, functional requirements, and other diagrams and reports. A generic ITS architecture report can also be generated directly from the Turbo Architecture, which is contained as an Appendix to this report. At a minimum, the architecture should be maintained through updates in the database using Turbo Architecture.

6.1.3 How Changes Are Identified

Changes to the ITS Architecture may be identified by two channels. One is that stakeholders submit a request, and the second channel is actively soliciting changes from each stakeholder on an annual basis.

Stakeholders can contact the Ohio DOT OTO to propose changes to the ITS Architecture. The working group will perform an initial assessment of the proposed change for the impact to the ITS Architecture

and/or the affected documentation. If the proposed change has an impact on other stakeholders, the working group should contact those stakeholders to confirm their agreement with the proposed modification.

The second channel is for the state to distribute an annual survey to stakeholders to actively solicit the need for updating the architecture. This survey will contain a few basic questions for stakeholders to answer. A sample survey can be found in Table 8. If additional information is needed, the working group can contact the stakeholder/s to identify the need for updating the architecture.

Table 8. Sample Architecture Maintenance Survey Questionnaire

Ohio Statewide ITS Architecture Maintenance Survey Questionnaire

1. Did your agency implement (including upgrade) any technology and communications related projects for transportation systems or emergency management in the past 12 months?

   ☐ Yes ☐ No

If YES, please describe the project(s) and/or provide project name(s) and available documentation source(s).

_____

_____

_____

_____

_____

_____

2. Do you plan to implement any technology or communications related projects in the next 5 years?

   ☐ Yes ☐ No

If YES, please describe the project(s) and/or provide project name(s) and available documentation source(s).

_____

_____

_____

_____

_____

3. Please provide your contact information:

Name: _____

Agency: _____

Phone: _____

Email: _____

Please submit this form to: XXXXXXXX, Email: XXXX, Phone: XXXX, Fax: XXXX. Thank you!

6.1.4 How Often Changes Are Made

A comprehensive, formal update of the ITS Architecture baseline should be performed concurrently with updates to the Statewide Transportation Plan updates to ensure the architecture continues to accurately represent the regional goals. It is recommended that a comprehensive update of the architecture baseline is performed within 6 months prior to or in conjunction with the larger statewide plan update.

Between major updates of the architecture, minor or informal modifications may be made at the discretion of the working group. The working group will solicit changes from stakeholders of needed updates. The working group will contact stakeholders, via e-mail, written correspondence, and/or by telephone, and inquire if the stakeholder has any changes to the ITS Architecture. The change requests will be collected and reviewed by the working group for consideration in the next minor update.

In addition, this Maintenance Plan should also be reviewed and evaluated periodically for required changes to the maintenance process. The actual maintenance process and procedures may differ from those anticipated during the initial development of this Maintenance Plan. Revising the Maintenance Plan will ensure both an effective architecture maintenance process and a change management process.

6.1.5 Change Review, Implementation and Release

The general steps in the change management process are described below and illustrated in Figure 8 below:

1. Stakeholders identify changes, notify the Ohio DOT OTO of changes, (or complete the annual survey), and submit it to the working group.
2. The ODOT OTO coordinates with the Ohio DOT OTO to review the proposed changes, offer comments, and/or ask for additional information.
3. The working group, in coordination with the appropriate stakeholders affected by the proposed changes, evaluates the changes and determine what impact they may have on the Architecture and/or associated documentation.

4. Upon its evaluation, the working group makes a decision to accept the change, reject it, or ask for additional information.
5. If the decision is to accept the change, then the appropriate portions of the architecture baseline are updated by a designated member of the working group.
6. Once the ITS Architecture has been modified, the Ohio DOT OTO publishes the updated architecture documentation, database and website.
7. The Ohio DOT OTO also notifies all stakeholders of architecture updates and provides information on how to obtain the latest version of the Architecture.

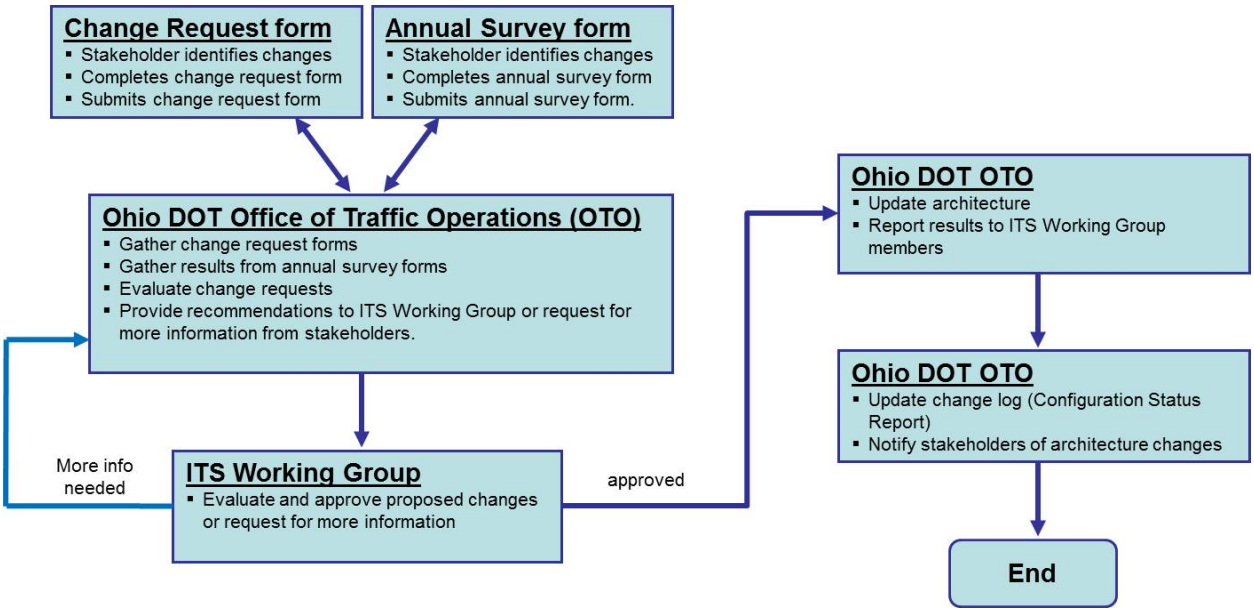


Figure 8. Maintenance Process Diagram for Changes to Ohio Statewide ITS Architecture

6.2 Architecture Use Plan

6.2.1 Project Planning

The Ohio DOT will be responsible for housing and maintaining the Ohio Statewide ITS Architecture. Being responsible for the architecture requires the Ohio DOT to be able to deliver a subset of the Statewide ITS Architecture that relates to specific projects. In other words, they must be able to produce a project architecture when a local agency is pursuing an ITS project. Typically a project architecture can be created as an extract from the Statewide ITS Architecture if the elements were included in the Statewide ITS Architecture. Depending on types and locations of the project, regional ITS architectures developed by MPOs could be an alternative source for a more detailed, agency-specific project level architecture.

In order to produce a project architecture, the first step is to identify the type of service package(s) (e.g. transit, traveler information, emergency management, etc.) that are related to the project. Depending

on the scope of the project, multiple types of service packages could be relevant and all should be identified. For example, for a project involving the installation of dynamic message signs, the relevant service package types would be traveler information and emergency management. After service package types are identified, the specific service package(s) that describe the project must be identified. In continuing the example, the specific service packages that relate to dynamic message sign installation would be ATMS06 Traffic Information Dissemination, EM06 Wide-Area Alert, and MC08 Work Zone Management.

Once specific service packages have been identified, the service package diagrams must be reviewed for accuracy and there is no duplication of functionality with another service package. For each project, the following items should be considered and inputted into Turbo:

- Ensure all specific service packages that relate to the project are identified (i.e. ATMS06, EM06, MC08, etc.);
- A specific service package may be relevant to multiple agencies. In this case, create multiple instances of that service package (i.e. an ATMS06 for Ohio DOT, and ATMS06 for Ohio Turnpike, etc.);
- Select the appropriate inventory items that are related to each specific service package;
- Identify the appropriate stakeholder that owns the inventory item; and
- Verify whether the data flow is planned or existing.

Following review of the service package diagrams, the updated diagrams should be passed along to the agencies who are implementing the project to ensure all appropriate stakeholders are involved and they have the information needed to determine any potential impact on other projects.

6.2.2 Project Programming

An up-to-date Statewide ITS Architecture is important because projects must be aligned with the state's regional ITS architectures to receive federal funds. This section discusses how stakeholders can determine if a project is consistent with the architecture.

In order to use the Ohio Statewide ITS Architecture to support project development, the agency must identify how the project contributes to or aligns with a portion of the architecture. This is a key step when using the architecture because it requires the agency to view the ITS project in the broader context of the entire architecture. Having an agency consider the wider architecture while the project's scope is being defined, enables them to consider the services, functionality, and integration opportunities that are envisioned by the region as a whole. This step is also required to meet the FHWA Architecture Rule/FTA Architecture Policy.

The ITS Architecture should be used as early in the project development lifecycle as possible to fully consider integration opportunities. The architecture should be reviewed before firm project cost

estimates are established to allow opportunity to adjust the scope to accommodate regional functionality and interfaces identified. This opportunity may occur before or after programming/budgeting, depending on how the ITS project is defined in the programming/budget documents.

6.2.3 Funding for ITS Projects

In addition to staffing availability, standard adoption, and technical resources, funding availability is the backbone for successful ITS project integration and implementation. Adequate funding ensures that proposed projects are deployed effectively and in a timely fashion, to allow this plan to remain useful in the future.

ITS funding will be needed in the following activities in order to successfully implement, operate, maintain, and integrate ITS elements in the Ohio:

- Planning and design of new ITS elements
- Capital investment for ITS infrastructure
- System operations and maintenance
- Staff training

6.2.3.1 Federal Funds

ITS projects proposed for the state of Ohio would qualify for several categories of federal highway and transit funding, such as: National Highway Performance Program (NHPP), Surface Transportation Program (STP), Highway Safety Improvement Program (HSIP), and FTA Section 5307.

6.2.3.2 Local Funds

Local jurisdictions may also utilize taxes collected from property, sales, and/or other financial mechanisms (e.g. tax increment financing or TIF) to fund and/or provide local match to the implementation of the transportation program. Similar to state funds, this income may be combined into a general use fund to be used for various purposes.

6.2.3.3 State Funds

Similar to local jurisdictions, the state of Ohio may also utilize taxes collected from property, sales, and/or other financial mechanisms to fund and/or provide local match to the implementation of the transportation program. Similar to local funds, this income may be combined into a general use fund to be used for various purposes.

6.2.3.4 Partnerships

A public/private partnership is a business relationship between the public and private sectors. Both entities, to a specific degree, share responsibilities and the costs, risks, and rewards associated with delivering goods and/or services. From a transportation standpoint, a public/private partnership is a form of service delivery with a collaborative approach based on reallocating traditional responsibilities, costs, risks, and rewards between the public agency and private entities.

6.2.3.5 Homeland Security Grants

The U.S. Department of Homeland Security administers grant funds to enhance the ability of states, local and tribal jurisdictions, and other regional authorities in the preparation, prevention, and response to terrorist attacks and other disasters. These grants include, but are not limited to areas of:

- Critical Infrastructure Protection
- Regional and Local Transit Systems
- Equipment and Training for First Responders
- Homeland Security Grants
- Port Security

These grants can be used to fund projects with security applications, such as surveillance cameras, security/threat sensors and detectors, communication devices, and training for supporting emergency and threat response activities.

6.2.4 Project Design Concerns

When designing a project, functionality and ITS standards provide guidance and criteria to identify how the ITS project will relate to the state's overall operations. As projects grow in size, the functions and standards become complex and sometimes require agreements between agencies. It is beneficial to identify the agencies involved and the type(s) of agreement(s) needed early on in the project design.

6.2.4.1 How ITS components are shown in the architecture

The National ITS Architecture uses service packages to depict the current and future functions of ITS systems. Entities that represent sources of information are called "subsystems", which are grouped into four classes: centers, fields, vehicles, and travelers (as shown in Table 9). Also depicted in Table 6 are descriptions from the National ITS Architecture for each subsystem and examples of those subsystems in the region.

Table 9. Subsystem Definitions

Subsystem	Definition	Examples in Ohio Statewide ITS Architecture
Center	Provides management, administrative, and support functions for the transportation system. The center subsystems each communicate with other centers to enable coordination between modes and across jurisdictions.	Ohio Statewide TMC, Ohio Statewide EOC / JDF, County and City Public Safety Agencies
Field	Intelligent infrastructure distributed along the transportation network which perform surveillance, information gathering, and information dissemination and whose operation is governed by the center subsystem.	Ohio DOT Traffic Signal Systems, Ohio DOT CCTV Cameras, Ohio DOT Dynamic Message Signs

Subsystem	Definition	Examples in Ohio Statewide ITS Architecture
Vehicle	Covers ITS related elements on vehicle platforms such as automatic vehicle location equipment and operations capabilities for portable field equipment.	Maintenance and Construction Vehicles, County and City Public Safety Vehicles, Ohio DOT Safety Service Patrol Vehicles
Traveler	Equipment used by travelers to access ITS services prior to a trip, including information service providers.	Transit Bus Arrival/Departure Signs, Smartphones, Tablets, Personal Computers

6.2.4.2 How to find general functional requirements related to a proposed project

Functional requirements explain how an inventory item provides the services described in their equipment packages. Equipment packages group inventory items together based on the overall function they serve and are listed in deployment-sized pieces (for example: emergency dispatch, roadway basic surveillance, traffic data collection, and transit center fixed-route operations).

The functional requirements can be found on the National ITS Architecture website (http://www.iteris.com/itsarch). The following process should be followed to access requirements for specific inventory items:

- Select "Architecture" in the top left corner of the Home Page of the National ITS Architecture website
- Then select "Physical Architecture"
- Then select the "Physical Entities" link in the text of the Physical Architecture web page
- From the two tables on the Physical Entities web page, select the subsystem or terminator for which you are seeking functional requirements
- A list of functionalities will be identified for each relevant equipment package.

6.2.4.3 How to obtain specific functional requirements from the Ohio Statewide ITS Architecture

The need to obtain specific functional requirements from the Ohio Statewide ITS Architecture related to a specific project can be found on the Statewide ITS Architecture website.

A complete listing of functional requirements for the Ohio Statewide ITS Architecture can be found in Section 7 of the Turbo Architecture Report.

6.2.4.4 How to select communication standards that apply to the project

ITS standards define how system components interact within the overall framework of the National ITS Architecture. The use of standards ensures interoperability amongst various functions of an ITS project so that components or technologies from various vendors, at different scales (local, regional, and national), are still compatible. Standards also facilitate innovation in technology development without

necessitating replacement of the hardware or software systems needed to operate the new technology. Other purposes for ITS standards include:

- ITS standards used in a deployment can greatly reduce component development costs;
- ITS standards are open and non-proprietary, helping state and local transportation managers avoid costly single-source procurements and locked-in maintenance relationships with vendors;
- ITS standards support the deployment of interoperable ITS systems, helping agencies link together different types of ITS technologies and making system expansions easier to plan and implement; and
- ITS standards are being developed for many different types of ITS technologies and their use in project deployment is a key aspect of conformity with the FHWA Final Rule 940.

New standards that are developed go through an approval process before they are included in documents as formalized standards. Existing standards are amended and modified as needed based on new standards development or new technology development. Several national and international standards organizations are working toward developing ITS standards for communications, field infrastructure, messages and data dictionaries, and other areas. The organizations participating in ITS standards activities include:

- AASHTO (American Association of State Highway and Transportation Officials)
- ANSI (American National Standards Institute)
- APTA (American Public Transportation Association)
- ASTM (American Society for Testing and Materials)
- IEEE (Institute of Electrical and Electronics Engineers)
- ITE (Institute of Transportation Engineers)
- NEMA (National Electrical Manufacturers Association)
- SAE (Society of Automotive Engineers)

A listing of ITS standards that are pertinent to the Ohio Statewide ITS Architecture is contained in Section 9 of the Turbo Architecture Report and on the Statewide ITS Architecture Website.

6.3 How to Navigate the Architecture Website

The purpose of the Ohio Statewide ITS Architecture website is to organize the details of the architecture into a form that is more readily accessible to stakeholders. It provides a method for stakeholders to access the architecture information in order to encourage use of the architecture in both transportation planning and project implementation. The Ohio Statewide ITS Architecture website will be accessible via the Ohio DOT website.

The menu bar at the left of the Ohio Statewide ITS Architecture website provides access to different pages of the architecture. The pages to which each of these buttons leads are described below.

Home: This button takes the user to the homepage for the Ohio Statewide ITS Architectures. The homepage describes the purpose of the architecture.

Scope: This page provides the geographic scope and service scope of the architecture. It also provides the planning time frame for the architecture.

Stakeholders: This page presents the full list of regional stakeholders, along with descriptions for each.

Inventory: This page presents the inventory of ITS elements along with a brief description of each. The inventory of ITS elements is arranged in an alphabetic order. The list of inventory can also be viewed by entity (subsystems and terminators as defined by the National ITS Architecture) or by stakeholder.

Inventory by Entity: This page presents the inventory of ITS elements arranged by entity (subsystems and terminators). This allows all elements with related functions to be viewed simultaneously. Clicking on an element name opens a detail page that provides more information about the element, including a listing of all interfacing elements.

Inventory by Stakeholder: This page presents the inventory of ITS elements arranged by stakeholder. This allows all the elements owned by a single stakeholder to be viewed simultaneously. Clicking on an element name leads to a detail page that provides more information about the element, including a listing of all interfacing elements.

Services: This page presents a list of relevant service packages for the region and their deployment status. Clicking on the service package name links to the definition of the service package, its deployment status in the region, and a list of ITS elements associated with the service package.

Ops Concept: This page presents a table of relevant ITS service areas for the region. Clicking on a service area links to a detailed page with a list of stakeholders providing the service and their roles and responsibilities in the operations of the relevant ITS systems in the region.

Requirements: The page presents a list of ITS functional areas for the region. Clicking on a functional area leads to a detailed page that provides a description of the functional area, a list of regional ITS elements supporting the functions, and a list of functional requirements.

Interfaces: This page presents a table that identifies interfaces among ITS elements for the region. Clicking on an element in the “Element” column leads to a context diagram that shows how the element interfaces with other elements in the region. Clicking on an element in the “Interfacing Element” column brings up a detailed page that shows an interface diagram between the two elements, along with the definitions of the architecture/information flows.

Standards: This page provides a list of ITS standards that are applicable to the region. Clicking on the title of a standard opens a page that identifies how the standard can be applied to facilitate communications and electronic information exchanges in the region.

Projects: This page presents a list of potential ITS projects for the region, along with recommended implementation time frame and brief project descriptions. Clicking on a project title opens a detailed page that provides additional information on the project.

7.0 Glossary

Advanced Public Transportation System (APTS): A variety of technology applications that make public transportation more efficient and convenient. Some examples include automated fare payment systems, enunciators to inform people inside and outside the transit vehicles, smart phone APP's to track bus arrival times, and many other applications.

Advanced Traffic Management System (ATMS): A broad category of systems that collect and process information from sensors and CCTV cameras along major roadways. Once processed, the information is then used to manage traffic control devices such as ramp meters, traffic signals and other control devices. These systems are also the source of much of the data used to inform motorists through the Advanced Traveler Information Systems listed below.

Advanced Traveler Information System (ATIS): A system, which distributes information to the traveling public over a variety of methods such as variable-message sign, kiosks, Internet, cable television, personal hand-held devices, etc.

Architecture Flow: Architecture Flows (also referred to as "information flows") refer to information that moves between the components of the physical architecture view of the National ITS Architecture. Architecture flows are the primary tool that is used to define the Regional ITS Architecture interfaces. These architecture flows define what types of information is transferred and how that transfer should occur. For example, one architecture flow would be a dispatcher communicating information to an emergency vehicle responding to an incident.

Architecture Interconnect: Interconnects are communications paths that carry information between components of the physical architecture view of the National ITS Architecture. Several different types of interconnects are defined in the National ITS Architecture to reflect the range of interface requirements in ITS. Some common examples are vehicle to vehicle, point to point, and roadside to vehicle links.

Automatic Vehicle Location (AVL): AVL systems track the approximate location of vehicles moving within a transportation network. The most common applications of AVL technology are for dispatching emergency vehicles, tracking transit vehicles and providing passengers with arrival time estimations through information displays.

Dynamic Message Sign (DMS): Electronic signs that display traffic conditions, alerts or other useful information to motorists or pedestrians. The term is used interchangeably with previous terminology such as variable message signs (VMS) and changeable message signs (CMS).

Element: This is the basic building block of Regional and Project ITS Architectures. It is the name used by stakeholders to describe a system or piece of a system.

Emergency Vehicle Preemption (EVP): This technology allows emergency vehicles (police, fire trucks, ambulances, etc.) to get priority treatment as they approach traffic signals. These systems can sense the

location of the emergency vehicles and adjust the green times so they arrive at the incident sites faster and safer.

Equipment Package: Equipment packages are the building blocks of the physical architecture subsystems. Equipment Packages group similar processes of a particular subsystem together into an "implementable" package making it easier for the end users to select as they build the architecture or define a project. The grouping takes into account how the processes must function.

Incident Detection: Incident Detection provides the capability for traffic managers to detect and verify that incidents have occurred. This includes analyzing data from traffic surveillance equipment, monitoring alerts from external reporting systems, collecting special event information, and responding to reports from their agency personnel in the field.

Incident/Emergency Management: Incident/Emergency Management enables communities to quickly identify any conditions that interrupt normal traffic flow such as crashes, vehicle breakdowns and debris in the roadway. The system also supports agency coordination to minimize clean-up and medical response time.

Intelligent Transportation Systems (ITS): ITS applies state-of-the-art and emerging technologies to provide more efficient and effective solutions to current multimodal transportation problems. Some examples of ITS are dynamic message signs, closed-circuit television monitoring systems, and traffic signal systems.

ITS Architecture: A common framework for planning, defining, and integrating intelligent transportation systems. An architecture functionally defines what the pieces of the system are and the information that is exchanged between those pieces. Architecture is defined functionally and does not prescribe particular technologies. This allows the architecture to remain effective over time as technologies evolve. It defines "what must be done," not "how it will be done."

Maintenance and Construction Operations (MCO): These are functions that support monitoring, operating, maintaining, improving and managing the physical condition of roadways, roadside equipment, and required resources.

Ops Concept or Operational Concept: An Operational Concept describes the roles and responsibilities of stakeholders in providing the ITS services included in the ITS Architecture. For example, one of the roles and responsibilities of the Ohio DOT is to operate and maintain the state-operated traffic signal systems.

Physical Architecture: The physical architecture is the part of the National ITS Architecture that provides agencies with a physical representation (though not a detailed design) of the important ITS interfaces and major system components. It provides a high-level structure to support the processes and data flows defined in the logical architecture.

Regional ITS Architecture: A local version of the ITS National Architecture that is tailored for a specific region. It can be used to produce project architecture reports for specific federally funded projects.

Road Weather Information System (RWIS): A system consisting of roadside meteorological components strategically located to provide information about weather issues affecting transportation. The principal components of RWIS include pavement sensors, atmospheric sensors, remote processing units (RPU), and central processing units (CPU).

Security Sensors and Surveillance Equipment: This technology includes cameras and sensors to monitor transportation infrastructure (e.g., bridges, tunnels and management centers) to detect potential threats. Such equipment includes acoustic, environmental threat (nuclear, explosive, chemical), motion and object sensors, and video and audio surveillance devices.

Service Package: Service packages are a combination of ITS architecture components tailored to provide a specific ITS service. For example, the Traffic Incident Management System Service Package combines incident detection systems, roadside surveillance devices, and coordination of traffic management centers to fulfill a number of useful needs related to the rapid clearing of incidents.

Standards: Documented technical specifications sponsored by a Standards Development Organization (SDO) to be used consistently as rules, guidelines, or definitions of characteristics for data transactions.

Subsystem: The principle elements of the physical architecture view of the National ITS Architecture. Subsystems are individual pieces of the Intelligent Transportation System defined by the National ITS Architecture. Subsystems are grouped into four classes: Centers, Field, Vehicles, and Travelers.

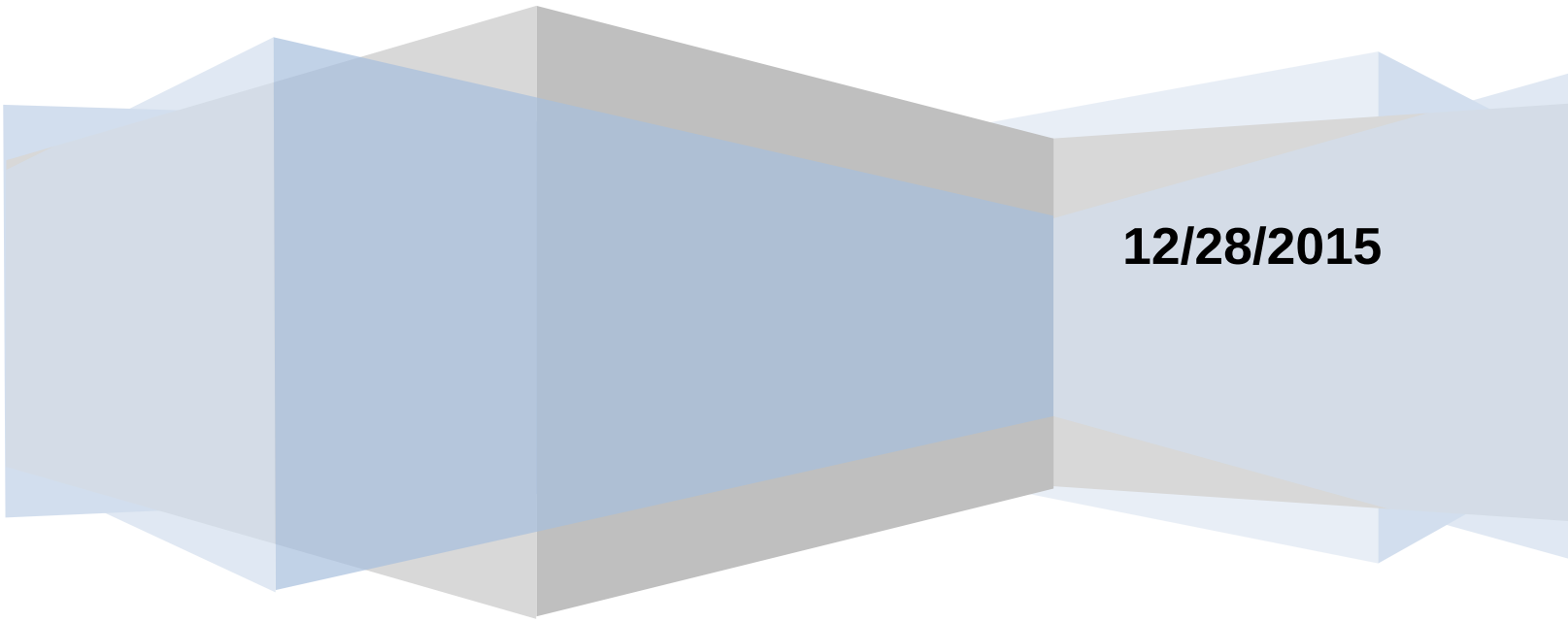
Terminator: Terminators define the boundary of an architecture. The National ITS Architecture terminators represent the people, systems, and general environment that connect to Intelligent Transportation Systems.

Turbo Architecture: An automated software tool used to build and maintain an ITS Architecture. It provides a means to input and manage system inventory, service packages, architecture flows and interconnects with regard to a Regional ITS Architecture and/or multiple Project ITS Architectures.

Appendix – Turbo Architecture Report

Ohio Statewide ITS Architecture

Turbo Architecture Report



12/28/2015

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1 Introduction

The Ohio Statewide Intelligent Transportation Systems (ITS) Architecture is a roadmap for the deployment and integration of ITS in the state of Ohio for the next fifteen years. The Ohio Statewide ITS Architecture provides a framework for institutional agreements and technical integration of ITS implementation projects in the state. It describes the “big picture” for ITS deployment in terms of individual ITS components that will perform the functions necessary to deliver the desired needs. It supports effective and efficient deployment of transportation and ITS projects that address the transportation problems and needs in the state.

The Ohio Statewide ITS Architecture is an open and integrated ITS architecture that is compliant with the Federal Highway Administration (FHWA) Final Rule and Federal Transit Administration (FTA) Policy on ITS Architecture and Standards. The Architecture has been developed to reflect the current status of ITS deployment in urban and rural areas of the state. It represents a shared vision of how systems operated by multiple agencies in the state of Ohio work together by sharing information and resources to enhance transportation safety, efficiency, capacity, mobility, reliability, and security.

The Ohio Statewide ITS Architecture describes coordination of overall system operations by defining interfaces between equipment and systems which have been or will be deployed by different organizational or operating agencies in the state. The Architecture identifies the current ITS deployment and how these systems interact and integrate with each other. It also builds on the existing systems and addresses the additional components deemed necessary to grow the ITS systems in the state over the next 15 years to accommodate specific needs and issues of participating stakeholders.

The Ohio Statewide ITS Architecture is documented in the following four forms:

1. Turbo Architecture Report (this report): The Turbo Architecture Report is a detailed report generated using the Turbo Architecture software and the database for the Ohio Statewide ITS Architecture.

2. Ohio Statewide ITS Architecture Report: This report provides a technical oriented summary regarding various aspects of the Architecture.

3. Architecture website: The architecture website provides detailed architecture outputs in an organized web environment.

4. Turbo Architecture Database: The database prepared using the Turbo Architecture version 7.1, a software tool developed by FHWA for developing ITS architectures.

By its nature, an ITS architecture is not a static set of outputs. The Ohio Statewide ITS Architecture is a living document and should be modified as plans and priorities

change, ITS projects are implemented, and ITS needs and services evolve in the state. An architecture maintenance and use plan is contained in the Ohio Statewide ITS Architecture Report, which addresses the needs for maintenance and updates. The Ohio DOT Office of Traffic Operations (OTO) will be responsible for housing and maintaining the ITS Architecture. The general steps for architecture maintenance are:

1. Stakeholders identify changes, notify the Ohio DOT OTO of changes, (or complete the annual survey), and submit it to the working group.
2. The ODOT OTO coordinates with the Ohio DOT OTO to review the proposed changes, offer comments, and/or ask for additional information.
3. The working group, in coordination with the appropriate stakeholders affected by the proposed changes, evaluates the changes and determine what impact they may have on the Architecture and/or associated documentation.
4. Upon its evaluation, the working group makes a decision to accept the change, reject it, or ask for additional information.
5. If the decision is to accept the change, then the appropriate portions of the architecture baseline are updated by a designated member of the working group.
6. Once the ITS Architecture has been modified, the Ohio DOT OTO publishes the updated architecture documentation, database and website.
7. The Ohio DOT OTO also notifies all stakeholders of architecture updates and provides information on how to obtain the latest version of the Architecture.

2 Scope of Ohio Statewide ITS Architecture

The Ohio DOT Statewide ITS Architecture is a roadmap for transportation systems integration. The Architecture has been developed to reflect the current status of ITS deployment in urban and rural areas of the state, covering all modes and all roads in the state. It represents a shared vision of how systems operated by multiple agencies in the state of Ohio will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in the state.

The architecture provides an overarching framework that spans all of the state's transportation organizations and individual transportation projects. Using the architecture, each transportation project can be viewed as an element of the overall transportation system, providing visibility into the relationship between individual transportation projects and ways to cost-effectively build an integrated transportation system over time. This chapter establishes the scope of the architecture in terms of its geographic breadth, the scope of services that are covered, and the time horizon that is addressed.

Description

The Ohio Statewide Intelligent Transportation Systems (ITS) Architecture is a roadmap for the deployment and integration of ITS throughout the state of Ohio for the next fifteen years. The geographic boundary of the Architecture covers the entire state of Ohio. The Ohio Statewide ITS Architecture provides a framework for institutional agreements and technical integration of ITS implementation projects in the state. It supports effective and efficient deployment of transportation and ITS projects that address the transportation problems and needs in the state

Timeframe

15 Years (2015 - 2030)

Geographic Scope

The Architecture helps guide the planning, implementation, and integration of ITS devices deployed and managed by multiple types of agencies that provide transportation services within the state.

Service Scope

Archived Data Management, Advanced Public Transportation Systems, Advanced Traveler Information Services, Advanced Traffic Management Systems, Advanced

Vehicle Safety Systems, Commercial Vehicle Operations, Emergency Management, Maintenance and Construction Management.

Developer

AECOM

Maintainer

Ohio DOT

Version

1.0

3 Stakeholders

Identifying stakeholders is an important task in ITS architecture development since effective ITS involves the integration of multiple stakeholders and their transportation systems. This section describes the stakeholders who either participated in the creation of the Ohio Statewide ITS Architecture or whom the participating stakeholders felt were needed to be included in the architecture. Some stakeholders have been grouped in order to better reflect mutual participation or involvement in transportation services and elements. Every stakeholder in this section is related to one or more of the transportation inventory elements described in the next chapter, either as an individual stakeholder or as a member of a stakeholder group.

Table 1: Stakeholders

Stakeholder Name	Stakeholder Description
County and City Emergency Management Agencies	Represents county and city emergency management agencies throughout the state that provide emergency response and recovery services, as well as those agencies that coordinate with the Ohio Emergency Management Agency during large scale emergencies and natural disasters.
County and City Fire Departments	Represents county and city-level fire departments throughout the state that respond to emergencies at the county and city level.
County and City Law Enforcement Agencies	Represents county and city level law enforcement agencies throughout the state.
County and City Public Safety Agencies	Represents public safety agencies at the county and city level, including fire and rescue departments throughout the state.
County and City Public Works Departments	Represents County and City Public Works Departments, including county and city engineering departments, throughout the state.
County and City Transit Operators	Represents all other public transit operators in the state of Ohio that provide either fixed-route or demand response transit service to areas outside of those covered by larger Regional Transit Authorities.
Financial Institutions	Represents the financial institutions that handle all electronic fund transfer requests to enable the transfer of funds from the user of a transportation service to the provider of the service.
FMCSA	Federal Motor Carrier Safety Administration (FMCSA) is a federal agency responsible for the administration of safety-related initiatives and programs for the motor carrier industry.
General Public	Represents the collection of all end-users of the transportation system within the state of Ohio.
IFTA, Inc.	The IFTA, Inc. (International Fuel Tax Association) administers the International Fuel Tax Agreement.
IRP, Inc.	The International Registration Plan (IRP) is a registration reciprocity agreement among states of the United States, the District of Columbia and provinces of Canada providing for payment of license fees on the basis of fleet distance operated in various jurisdictions. Under the provisions of the IRP, motor carriers can operate on an inter-jurisdictional basis in any IRP member jurisdiction displayed on the cab card, provided they have obtained proper operating authority.
Local Media	Represents all local media outlets, including TV, radio, and all other media outlets that provide information to the general public on the transportation system.

Stakeholder Name	Stakeholder Description
Metropolitan Planning Organizations	Represents MPOs throughout the state of Ohio, including those that are responsible for maintaining Regional ITS Architectures. MPOs with a Regional ITS Architecture include the Toledo Metropolitan Area Council of Governments (TMACOG), Eastgate Regional Council of Governments, Akron Metropolitan Area Transportation Study and Stark County Area Transportation Study (AMATS-SCATS), Mid-Ohio Regional Planning Commission (MORPC), Miami Valley Regional Planning Commission (MVRPC), Ohio-Kentucky-Indiana (OKI) Regional Council of Governments, and the Northeast Ohio Areawide Coordinating Agency (NOACA). MPO's without a Regional ITS Architecture include the Lima-Allen County Regional Planning Commission (Ohio DOT District 1), Erie County Regional Planning Commission (Ohio DOT District 3), Richland County Regional Planning Commission (Ohio DOT District 3), Licking County Area Transportation Study (Ohio DOT District 5), Clark County-Springfield Transportation Coordinating Committee (Ohio DOT District 7), KYOVA MPO (Ohio DOT District 9), Wood-Washington-Wirt Interstate Planning Commission (WWW) (Ohio DOT District 10), Brooke-Hancock-Jefferson Metropolitan Planning Commission (Ohio DOT District 11), and the Belomar Regional Council (Ohio DOT District 11). These MPOs coordinate with Regional Transportation Planning Organizations (RTPOs) that represent large rural areas of the state on various transportation projects as needed.
Neighboring State DOTs	Other State Departments of Transportation with which the Ohio DOT works to monitor traffic operations across state lines. These include the Pennsylvania DOT, the Kentucky Transportation Cabinet, the Indiana DOT, and the Michigan DOT.
NOAA	National Oceanic and Atmospheric Administration, which includes the National Weather Service.
Ohio Bureau of Motor Vehicles	Ohio Bureau of Motor Vehicles
Ohio Department of Administrative Services	The Ohio Department of Administrative Services (DAS) provides centralized services, specialized support and innovative solutions to state agencies, boards and commissions as well as local governments and state universities. The department procures goods and services, delivers information technology, and performs a variety of other services, including administering the Multi Agency Radio Communications System (MARCS) throughout the state of Ohio.
Ohio Department of Public Safety	The Ohio Department of Public Safety serves and protects the safety and security of Ohioans through six divisions: Bureau of Motor Vehicles, Emergency Management Agency, Emergency Medical Services, Homeland Security, Highway Patrol, and Office of Criminal Justice Services. One of their tasks includes obtaining all crash data for the State of Ohio.
Ohio Department of Transportation	Ohio Department of Transportation is responsible for developing and maintaining all state and federal roadways in the state of Ohio with exception of the Ohio Turnpike. In addition to highways, the department also helps develop public transportation and public aviation programs. The Ohio DOT is headquartered in Columbus and has divided the state into 12 districts in order to facilitate regional development. Each district is responsible for the planning, design, construction, and maintenance of the state and federal highways in their district.
Ohio Emergency Management Agency	A division of the Ohio Department of Public Safety, the Ohio Emergency Management Agency coordinates activities to mitigate, prepare for, respond to and recover from disasters, both natural and man-made. The agency interfaces with local, state and federal agencies in an effort to bring resources of recovery and support to Ohioans impacted by the disaster. Ohio EMA agency activities, in addition to disaster response and recovery include: education, training, planning, preparedness, strengthening Ohio's first responder capabilities and improving communication across the state. Ohio EMA's current staffing roster includes nine field liaison positions, each responsible for liaison with and assistance to approximately nine county emergency management agencies. The state is separated geographically into the following sections: northwest, west north central, west central, southwest, central, northeast, north central, east central, southeast and south central.
Ohio Environmental Protection Agency	The Ohio Environmental Protection Agency is a state agency whose goal is to protect the environment and public health by ensuring compliance with environmental laws. Ohio EPA establishes and enforces standards for air, water, waste management and cleanup of sites contaminated with hazardous substances. They also provide financial assistance to businesses and communities; environmental education programs for businesses and the public; and pollution prevention assistance to help businesses minimize their waste at the source.
Ohio State Highway Patrol	The Ohio State Highway Patrol is an internationally accredited agency whose mission is to protect life and property, promote traffic safety and provide professional public safety services with respect, compassion, and unbiased professionalism. The Patrol offers statewide emergency response services, investigates criminal activities on state-owned property, and provides security for the Governor and other dignitaries. The Ohio State Highway Patrol is comprised of 8 offices: Field Operations, Finance and Logistic Services, Licensing and Commercial Standards, Technology and Communication Services, Recruitment and Training, Strategic Services, Investigative Services, and Human Resource Management.

Stakeholder Name	Stakeholder Description
Ohio Turnpike and Infrastructure Commission	Represents the agency responsible for operation and maintenance of the 241-mile Ohio Toll Road. Agency is a separate organization from the Ohio DOT.
Private Companies	Represents private companies that provide various transportation information and services to the Ohio DOT and the general public traveling along state roadways. Including towing and recovery service providers throughout the state, including those involved in the Towing and Recovery Incentive Program (TRIP) developed by the Ohio DOT.
Private Fleet and Freight Operators	Private owners of commercial vehicles that carry goods throughout the region.
Private Rail Operators	Represents private railroad companies that operate and maintain railroad systems in the state of Ohio.
Public Utilities Commission of Ohio (PUCO)	Public Utilities Commission of Ohio (PUCO) regulates providers of all kinds of utility services, including rail and trucking companies. The PUCO and the Ohio State Highway Patrol work to ensure that commercial vehicles are traveling safely throughout Ohio. PUCO inspectors regularly conduct roadside safety inspections on CMVs and follow a thorough process to make sure both the driver and vehicle are compliant with state and federal regulations.
Regional Airport Authorities	Regional Airport Authorities are responsible for the administration and control of airports throughout the state.
Regional Event Operators	Represents event operators in Ohio that provide event information to the Ohio DOT and transportation and public safety agencies throughout the state to manage travel around major events.
Regional Hospital Organizations	Represents Regional Hospital Organizations that coordinate with emergency management agencies during emergencies throughout the state.
Regional Transit Authorities	Represents Regional Transit Authorities that operate and maintain large public transportation systems throughout the state and coordinate transit operations with the Ohio DOT and County and City Traffic Management Centers as needed. Regional Transit Authorities include the following: Central Ohio Transit Authority (COTA) operating in the Columbus area, the Greater Cleveland Regional Transit Authority (RTA), the Greater Dayton Regional Transit Authority (GDRTA), the Southwest Ohio Regional Transit Authority (SORTA), the Toledo Area Regional Transit Authority (TARTA), Akron METRO Regional Transit Authority, Portage Area Regional Transportation Authority (PARTA), Stark Area Regional Transportation Authority (SARTA), and the Western Reserve Transit Authority (WRTA).
Universities and Colleges	This stakeholder represents universities and colleges throughout the state that provide transportation services, coordinate transit schedules with Regional Transit Authorities, and coordinate transit operations with the Ohio DOT and County and City Traffic Management Centers during special events that impact traffic on roadways around university and college campuses. This stakeholder includes, but is not limited to, the following: Kent State University, Youngstown State University, University of Akron, Cleveland State University, Ohio State University, University of Cincinnati, Bowling Green State University, and University of Toledo.

4 ITS Inventory

An inventory of existing and planned transportation systems is the basis for the Ohio Statewide ITS Architecture. The transportation system inventory was developed based on input from stakeholders throughout the state. The inventory includes a list of ITS elements and the associated stakeholder responsible for system operation.

This section describes every surface transportation inventory element for the state. A transportation element can be either a center, vehicle, traveler or field equipment. Each transportation element listed below has one or more stakeholders associated with it. In order to reduce the complexity of the architecture, some transportation elements with like functionality have been grouped together. Each transportation inventory element is mapped to at least one National ITS Architecture entity.

Table 2: ITS Inventory

Element Name	Element Description	Stakeholder	Element Status
Archived Data User Systems	Agencies and systems that use archived data provided by transportation agencies.	Universities and Colleges	Existing
Commercial Vehicles	Represents vehicles that are used to transport goods which are operated by professional drivers, typically administered as part of a larger fleet, and regulated by a Fleet and Freight Management Systems. This classification applies to all such vehicles ranging from small panel vans used in local pick-up and delivery services to large, multi-axle tractor-trailer rigs operating on long haul routes.	Private Fleet and Freight Operators	Existing
Connected Vehicles	Represents vehicles with the advanced technologies that enable vehicle-to-vehicle and vehicle-to-intersection communications under the Connected Vehicles program. Advanced technologies allow for vehicle safety monitoring and warnings to be issued based on vehicle behavior, as well as for automated vehicle control.	General Public	Planned
County and City Emergency Operations Centers (EOCs)	Represents County and City Emergency Operations Centers operated throughout the state. EOCs can have a range of emergency operations capabilities, and some can be co-located with local 911 dispatch centers. County EOC's in various sections of the state coordinate response and recovery activities with the Ohio Emergency Management Agency as needed.	County and City Emergency Management Agencies	Existing
County and City Emergency Vehicles	Represents the ITS equipment, e.g., mobile data terminals and AVL systems, on county and city emergency vehicles dispatched by public safety agencies that provide the sensory, processing, storage, and communications functions necessary to support safe and efficient emergency response.	County and City Public Safety Agencies	Existing
County and City Law Enforcement	Represents central office functions of county and city law enforcement agencies throughout the state, including dispatch of law enforcement vehicles.	County and City Law Enforcement Agencies	Existing
County and City Lift Bridge Equipment	Represents lift bridge equipment, such as the City of Toledo MLK Lift Bridge Operators Tower, that gets advance notice for operations from large commercial river traffic. River traffic generally has the right-of-way.	County and City Public Works Departments	Existing
County and City Maintenance and Construction Vehicles	Represents the ITS equipment, e.g., mobile data terminals and AVL systems, on snow plows and other maintenance vehicles that are owned and operated by counties and cities throughout the state of Ohio.	County and City Public Works Departments	Existing

Element Name	Element Description	Stakeholder	Element Status
County and City Maintenance Dispatch Facilities	Represents maintenance dispatch facilities operated by county and city level public works departments. Facilities dispatch county and city maintenance vehicles that perform a wide variety of functions, from traffic signal and roadway maintenance to snow plow operations in winter months.	County and City Public Works Departments	Existing
County and City Parking Management Systems	Represents parking management ITS equipment operated and maintained by county and city public works departments throughout the state. Integration of payment for parking with E-Z Pass tags is planned functionality in some metro areas.	County and City Public Works Departments	Existing
County and City Public Safety Dispatch	Represents the public safety functions, including fire, police and sheriff functions, electronic crash reporting, emergency management, and dispatch of emergency vehicles, at the county and city level.	County and City Public Safety Agencies	Existing
County and City Roadside ITS Equipment	Represents a variety roadside ITS equipment devices (i.e. traffic signals, Dynamic Message Signs, CCTV cameras, etc...) that are operated and maintained by county and city public works departments throughout the state.	County and City Public Works Departments	Existing
County and City Traffic Data Archives	Represents traffic data archives operated and maintained by county and city public works departments. Data available for general public and for Ohio DOT District Offices primarily includes traffic counts and accident reports.	County and City Public Works Departments	Existing
County and City Traffic Information Websites	Represents various websites that provide real-time and static information for the public, including traffic and roadway information such as road conditions, traffic, construction, and other activity affecting roadways in counties and cities throughout the state.	County and City Public Works Departments	Existing
County and City Traffic Management Centers	This element represents the individual municipal and county stakeholders that own/operate traffic management/ITS equipment. Many of these stakeholders have a center that receives traffic information and manages the roadway equipment accordingly, as well as coordinates traffic signal control. This element includes the municipal and county public service departments and engineering departments.	County and City Public Works Departments	Existing
County and City Transit Operations Centers	Represents transit management centers that operate outside of Regional transit Authorities throughout the state. Centers can operate a mix of fixed-route and demand response transit services. Some coordination of transit services with Regional Transit Authorities exists in regions of the state.	County and City Transit Operators	Existing
County and City Transit Vehicles	Represents fixed route and demand response transit vehicles that are dispatched and monitored by county and city transit operators. AVL systems on vehicles provide vehicle location reporting capabilities. Other on-board systems can include automated passenger counters, electronic fare boxes, and transit signal priority that can request for signal priority at traffic signals that may be operated by Ohio DOT.	County and City Transit Operators	Existing
County and City Warning Siren Systems	Represents outdoor warning sirens operated and maintained by counties and cities throughout the state that alert residents of an existing emergency.	County and City Emergency Management Agencies	Existing
Drivers	Represents the private travelers in vehicles.	General Public	Existing
Financial Institutions	Represents the financial institutions that handle all electronic fund transfer requests to enable the transfer of funds from the user of a transportation service to the provider of the service.	Financial Institutions	Existing
Fleet and Freight Management Systems	This element refers to centers that coordinate the operation of freight vehicles (including trucks, rail and planes) and can be connected to other modal systems' operations for efficient movement of commercial goods. Most freight management centers report the movement of commercial good through an Electronic Data Interchange (EDI) system.	Private Fleet and Freight Operators	Existing

Element Name	Element Description	Stakeholder	Element Status
FMCSA MCMIS	Motor Carrier Management Information System (MCMIS) is a national system to consolidate and process motor carrier safety data from sources throughout the US. MCMIS contains safety records of active intrastate and interstate motor carriers, safety and compliance reviews, and roadside inspection records and crash records. MCMIS also carries a Safety Fitness Rating based on algorithms that evaluate all of a carrier's safety data. MCMIS also provides technical assistance to new and existing motor carriers in their compliance efforts by providing summaries of key regulations, required forms and other safety-related information.	FMCSA	Planned
Freight Rail Operations	Freight rail operations coordinate the operation of freight trains and is connected to other modal systems' operations for efficient movement of commercial goods.	Private Rail Operators	Existing
IFTA Clearinghouse	The IFTA Clearinghouse supports the IFTA base state agreement electronically. The IFTA Clearinghouse coordinates IFTA carrier information and transmittal records between participated jurisdictions.	IFTA, Inc.	Existing
IRP Clearinghouse	The IRP Clearinghouse supports the IRP base state agreement electronically. The Clearinghouse supports exchange of motor carrier and financial information between participating jurisdictions.	IRP, Inc.	Existing
Media Outlets	Represents the information systems that provide traffic reports, travel conditions, and other transportation-related news services to the traveling public through radio, TV, and other media.	Local Media	Existing
MPOs Data Archives	Historical archive of traffic and other types of data within MPO areas throughout the state.	Metropolitan Planning Organizations	Existing
National Weather Service	Service for national, regional, and local weather information.	NOAA	Existing
Neighboring State Traffic Management Centers	Represents Traffic Management Centers operated by neighboring state DOTs that coordinate with the Ohio DOT to operate and maintain traffic and roadways in metro areas that cross state lines. These state DOTs include the states of Kentucky and Indiana that coordinate with the Ohio DOT on traffic in the Cincinnati metro area, the Michigan DOT that coordinates with the Ohio DOT traffic in the Toledo metro area, and the Pennsylvania DOT that coordinates with the Ohio DOT on traffic in the Akron & Canton area.	Neighboring State DOTs	Existing
Neighboring States Roadside ITS Equipment	Represents roadside ITS equipment operated and maintained by neighboring state DOTs that can be monitored and controlled by Ohio DOT Statewide Traffic Management Center that border those respective states.	Neighboring State DOTs	Existing
Ohio DOT 511 Telephone Information Service	Ohio 511 telephone number that provides traveler information on travel times, incidents, and other traveler information made available through the OHGO traveler information website managed by the Ohio Statewide TMC.	Ohio Department of Transportation	Existing
Ohio DOT Animal Detection System	Represents an autonomous system of roadside detection and message signs. Roadside sensors are used to detect animals approaching a roadway or highway. Upon possible detection of an animal approaching a roadway or highway, sensors will trigger roadside message signs warning drivers in the surrounding area of possible danger from animals.	Ohio Department of Transportation	Planned
Ohio DOT Automated Gate Closure Systems	Represents automated road closure gates owned and operated by the Ohio DOT used for the remote closure of roads, lanes or ramps. Intended to be for areas where ice or snow or other adverse weather conditions exist on a frequent basis and that cause hazardous conditions for motorists.	Ohio Department of Transportation	Planned
Ohio DOT Automated Roadway Treatment Systems	Roadway treatment devices (deicing equipment, sensors, etc.) owned and operated by the Ohio DOT to treat roads (usually ice, snow, etc.).	Ohio Department of Transportation	Existing
Ohio DOT CCTV Cameras	Closed Circuit Television (CCTV) refers to a surveillance system using cameras that transmits visual information over a closed circuit through an electrically conducting cable or wireless transmitter and receiver. It is both used for security purposes and traffic monitoring along Ohio DOT roads throughout the state.	Ohio Department of Transportation	Existing

Element Name	Element Description	Stakeholder	Element Status
Ohio DOT Connected Vehicles Roadside Equipment	This element represents the roadside equipment that provides vehicle-to-infrastructure communications under the Connected Vehicles program. This is used for data collection from Connected Vehicles-equipped vehicles and to provide information to Connected Vehicles-equipped vehicles.	Ohio Department of Transportation	Planned
Ohio DOT District Maintenance Repair Facilities	Represents Ohio DOT District Equipment Repair Facilities within respective Ohio DOT Districts.	Ohio Department of Transportation	Existing
Ohio DOT District Offices	There are 12 Ohio DOT District Offices throughout the state that are responsible for traffic operations and maintenance of state roadways. District offices operate and maintain a variety of roadside ITS equipment that is not within the jurisdiction of Ohio DOT Freeway Management Centers. District offices dispatch and monitor maintenance vehicles in their respective districts. Communicates with Ohio DOT RWIS Roadside Equipment within each respective District. More information on ODOT District Offices is at: http://www.dot.state.oh.us/districts/Pages/default.aspx.	Ohio Department of Transportation	Existing
Ohio DOT DMS	Represents fixed and portable Dynamic Message Signs (DMS) locations throughout the state. DMS are electronic traffic signs used on roadways to give travelers information about special events. DMS warn of traffic congestion, accidents, incidents, road work zones, or speed limits on a specific highway segment. Ohio DOT operates and maintains DMS along freeways throughout the state to provide accident, work zone and amber alert information.	Ohio Department of Transportation	Existing
Ohio DOT HAR	Highway advisory radios (HAR) are licensed low-power AM radio stations set up by the Ohio DOT to provide information regarding traffic conditions, travel times, construction, road incidents, missing persons, and other information deemed relevant to motorists. Roadside signs for HAR and the correct AM frequency include flashing beacon lights that provide for traffic alerts when the beacons are activated. HAR sites are designed to be automated so that when travel times increase by a pre-determined amount for a particular section of roadway, the HAR will provide travel-time information for that particular section of roadway only.	Ohio Department of Transportation	Existing
Ohio DOT Infrastructure Monitoring Sensors	Infrastructure monitoring equipment including IR, cameras and motion detectors. These sensors and detectors are operated by the Ohio DOT to monitor and protect infrastructure and facilities, and not for traffic monitoring. Planned to communicate with the Ohio Statewide EOC in Columbus.	Ohio Department of Transportation	Planned
Ohio DOT Lane Control Devices	Lane control devices owned and operated by Ohio DOT to manage lanes. These include lane control signals on bridges.	Ohio Department of Transportation	Planned
Ohio DOT Lift Bridge Equipment	Represents lift bridge equipment, such as the Ohio DOT Craig Memorial Lift Bridge Tower in the Toledo region, that gets advance notice for operations from large commercial river traffic. River traffic generally has the right-of-way.	Ohio Department of Transportation	Existing
Ohio DOT Maintenance and Construction Center Personnel	Represents Ohio DOT Maintenance and Construction Center Personnel that manage and control various maintenance subsystems.	Ohio Department of Transportation	Existing
Ohio DOT Maintenance and Construction Vehicles	Represents the ITS equipment on snow plows and other maintenance vehicles that are owned and operated by the Ohio DOT. Automated Vehicle Locator (AVL) systems are planned for the fleet.	Ohio Department of Transportation	Existing
Ohio DOT OHGO Traveler Information System	Represents the statewide traveler information website for alerts on traffic incidents, construction, travel times, and other information related to roadways throughout the state. Can be accessed at: http://www.ohgo.com/index. Information provided by this site is updated frequently and comes from a variety of sources, such as pavement sensors, monitoring stations, traffic cameras, and through direct input by Ohio DOT personnel.	Ohio Department of Transportation	Existing

Element Name	Element Description	Stakeholder	Element Status
Ohio DOT Overheight Vehicle Detection System	Represents a system of Overheight Vehicle Detectors and message signs. Overheight Vehicle Detectors detect overheight vehicles moving toward obstacles such as bridges, tunnels and other overhead structures, and triggers roadside message sign equipment to warn drivers. An audible alarm and/or sign is activated when an overheight vehicle is detected by the system. The infra-red based system, coupled with high intensity signing, offers great reliability in detecting and warning drivers of high vehicles to "DIVERT" or "TURN BACK".	Ohio Department of Transportation	Planned
Ohio DOT Ramp Meters	Ramp meters are traffic signals at freeway entrance ramps, which use video detection cameras positioned on the ramp and freeway to determine how quickly drivers can safely enter the freeway. Ramp meters also coordinate timings based on input from Ohio DOT Vehicle Detection Devices that measure traffic speed and volume on the freeway, and traffic demand on the ramp.	Ohio Department of Transportation	Existing
Ohio DOT Rest Area Tourist Information Centers	Represents planned Ohio DOT operated tourist information centers. Centers provide remote traveler support in the form of real-time information related to traffic and weather conditions.	Ohio Department of Transportation	Planned
Ohio DOT Rest Area Truck Parking Availability System	Represents planned parking management systems at rest areas and truck stops to measure parking availability and communicate availability to the public.	Ohio Department of Transportation	Planned
Ohio DOT RWIS Stations	RWIS (Roadway Weather Information System) is operated by the Ohio DOT through 158 weather stations, which provide coverage in all 88 of Ohio's counties. A central service located in Columbus processes the information from each station. Ohio DOT garages use the information collected by the stations to plan their road treatment activities, especially during snow and ice conditions. Ohio DOT also makes road conditions available to the public via a Web server (http://www.ohgo.com/index). The weather stations and sensors are located along interstates, U.S. routes, and state routes. The system comprised 88 wireless weather stations and more than 160 pavement sensors. Two types of weather stations are installed: those located along highways, and those located at county ODOT offices. The stations reported a variety of information, including: Air temperature; Precipitation rate/type; Surface temperature; Sub-surface temperature; Wet/dry surface; Dew point Relative humidity; Wind direction and speed; Traffic speeds and counts; Visibility. Data communications between the weather station and the central server at Ohio DOT Statewide TMC is conducted via cellular service in 5-minute intervals.	Ohio Department of Transportation	Existing
Ohio DOT Safety Patrol Vehicles	Represents the ITS equipment, e.g., mobile data terminals and AVL systems, on vehicles that provide motorist assistance and congestion mitigation. Ohio DOT provides motorist assistance on ODOT roads throughout the state. Safety Patrol currently patrols interstates in six areas of the state: Cleveland, Cincinnati, Dayton, Akron, Columbus, and Toledo.	Ohio Department of Transportation	Existing
Ohio DOT Speed Monitoring Roadside Equipment	Represents the field equipment that monitors vehicle speeds for enforcement purposes or to advise motorists of their current speeds.	Ohio Department of Transportation	Planned
Ohio DOT Statewide TMC	Ohio DOT Statewide Traffic Management Center (TMC) is located in Columbus at the Ohio DOT Central Office. The Statewide TMC operates traffic management and traveler information systems on Ohio's interstates, freeways, expressways, and state highways in each of the State's major metropolitan areas including Akron/Canton, Cincinnati, Cleveland, Columbus, Dayton/Springfield, and Toledo. TMC operators can control cameras and post traveler information messages to Ohio DOT's DMS, HAR, and to the OHGO website. TMC operators can also act as liaisons between the Safety Patrol Vehicles and various other public agencies that respond to the scenes of vehicle incidents. For redundancy, it is able to remotely operate district traffic management centers. It also communicates with RWIS Roadside Equipment throughout the state.	Ohio Department of Transportation	Existing

Element Name	Element Description	Stakeholder	Element Status
Ohio DOT Storage Facilities	This element refers to depots and garages where materials are stored for the Ohio DOT.	Ohio Department of Transportation	Existing
Ohio DOT Traffic Data Archive System	Represents a statewide archive of traffic data that receives inputs from Vehicle Detection Devices installed by Ohio DOT throughout the state.	Ohio Department of Transportation	Existing
Ohio DOT Traffic Signal Systems	Represents traffic signal systems throughout the state ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests.	Ohio Department of Transportation	Existing
Ohio DOT Variable Speed Limit Signs	Variable Speed Limit (VSL) signs are a planned ITS element related to Ohio's Active Traffic and Demand Management (ATDM) program that aims to increase travel time reliability on Ohio DOT roadways in major metro areas. VSL signs in the field would communicate centrally with the Ohio Statewide TMC, and reduced speeds would be implemented either by TMC operators or would be automated based on the level of traffic detected by nearby Ohio DOT Vehicle Detection Devices.	Ohio Department of Transportation	Planned
Ohio DOT Vehicle Detection Devices	Represents roadside devices installed for the purpose of measuring vehicle speed, volume, and occupancy or density. This data can then be used for both the calculation of travel times and incident identification. The conventional form of vehicle detection is side-fired radar detector (SFRD). The main use of SFRD is for ramp metering, where the detectors provide traffic data to both the local ramp meter and central software, and allow for dynamic ramp metering along corridors and localized traffic-responsive ramp metering at spot locations. Vehicle detection devices gather traffic counts along Ohio DOT roadways and report data to the Traffic Data Archive System. The majority of devices exist within major cities, though more are planned for installation throughout the state.	Ohio Department of Transportation	Existing
Ohio DPS Crash Database	This element refers to a statewide database of crash records that is shared with the Ohio DOT, which reviews the number, frequency and severity of accidents that occur on its system. Can be accessed at: https://ext.dps.state.oh.us/CrashRetrieval/OHCrashRetrieval.aspx.	Ohio Department of Public Safety	Existing
Ohio Emergency Alert System	Formerly the emergency broadcast system, a regional notification system to the general public. Information may include amber alerts, inclement weather, etc.	Ohio Emergency Management Agency	Existing
Ohio EPA Air Quality Database	The Air Quality System (AQS) is EPA's repository of ambient air quality data. AQS stores data from over 10,000 monitors, 5,000 of which are currently active. State and local agencies collect the data and submit it to AQS on a periodic basis. The AQS database contains measurements of air pollutant concentrations in the 50 United States, plus the District of Columbia, Puerto Rico, and the Virgin Islands. The measurements include both criteria air pollutants and hazardous air pollutants.	Ohio Environmental Protection Agency	Existing
Ohio EPA Air Quality Management System	Represents the central office system that communicates with air quality monitors installed throughout the state that detect air quality.	Ohio Environmental Protection Agency	Existing
Ohio EPA Air Quality Monitors	Air quality monitors are sensors dispersed throughout the state that detect air quality.	Ohio Environmental Protection Agency	Existing
Ohio Motor Carrier Information System (OMCIS)	The Ohio Motor Carrier Information System (OMCIS) is the home to regulatory information for motor carriers in the State of Ohio.	Ohio Bureau of Motor Vehicles	Existing

Element Name	Element Description	Stakeholder	Element Status
Ohio State Highway Patrol Posts	Represents dispatch functions for the Ohio State Highway Patrol throughout the state. OSHP unit for motor carrier enforcement is responsible for enforcement of size and weight laws relating to commercial vehicles. The unit has 10 portable scale teams located throughout the state. A scale team consists of a load limit inspector trooper and two load limit inspectors. There are also 11 fixed scale facilities located throughout the state. All interstate scale facilities are equipped with an electronic clearance system known as "PrePass." Commercial motor vehicles equipped with Prepass will receive an electronic in-cab signal informing the driver whether to pull into the scale or permit the driver to bypass the scale facility. The PrePass signal overrides the posted signs for all trucks including hazardous material placarded vehicles.	Ohio State Highway Patrol	Existing
Ohio State Highway Patrol Pre-Pass System	Represents "Pre-Pass" electronic clearance systems located at fixed sites in conjunction with Weigh-in-Motion stations. Commercial motor vehicles equipped with Pre-pass equipment will receive an electronic in-cab signal informing the driver whether to pull into the scale or permit the driver to bypass the scale facility. The PrePass signal overrides the posted signs for all trucks including hazardous material placarded vehicles.	Ohio State Highway Patrol	Existing
Ohio State Highway Patrol State Communications Center	The State Communication Centers is a dispatch facility that connects to Ohio DOT and controls emergency operations. It also provides for joint dispatch to incidents.	Ohio State Highway Patrol	Existing
Ohio State Highway Patrol Vehicles	Represents the ITS equipment, e.g., mobile data terminals and AVL systems, on highway patrol vehicles.	Ohio State Highway Patrol	Existing
Ohio State Highway Patrol Weigh-In-Motion Stations	OSHP operates fixed and mobile Weigh-In-Motion (WIM) stations throughout the state for commercial vehicle enforcement purposes.	Ohio State Highway Patrol	Existing
Ohio Statewide EOC/JDF	The State Emergency Operations Center/Joint Dispatch Facility (EOC / JDF) in Columbus houses the Ohio Emergency Management Agency, Ohio DOT District 6 Headquarters, and the Dispatch Center of the Ohio State Highway Patrol, and communications elements of the Ohio Departments of Natural Resources and Transportation. The facility's purpose is to enhance the state's capabilities to respond to disasters and emergencies, and to improve coordination among state agency partners.	Ohio Emergency Management Agency	Existing
Ohio Turnpike CCTV Cameras	Represents CCTV cameras owned and operated by Ohio Turnpike and Infrastructure Commission.	Ohio Turnpike and Infrastructure Commission	Existing
Ohio Turnpike Central Dispatch	Represents the central office for dispatch maintenance and incident management including private tow/wreckers and local/municipal fire/EMS. Co-located with Highway Patrol. Dispatch contractors for construction and sometimes maintenance. Located in Berea, Ohio.	Ohio Turnpike and Infrastructure Commission	Existing
Ohio Turnpike DMS	Represents both fixed and portable Dynamic Message Signs owned and operated by Ohio Turnpike and Infrastructure Commission. DMS can provide travelers on the Turnpike with warnings of traffic congestion, accidents, incidents, road work zones, as well as information on toll rates throughout the Turnpike.	Ohio Turnpike and Infrastructure Commission	Existing
Ohio Turnpike E-ZPass Tags	Represents E-ZPass vehicle transponders used for electronic payment of tolls along the Ohio Turnpike. E-ZPass tags can be used to pay for parking at Pittsburgh International Airport.	Ohio Turnpike and Infrastructure Commission	Existing
Ohio Turnpike Maintenance and Construction Vehicles	Represents the ITS equipment, e.g., mobile data terminals, on snow plows and other maintenance vehicles that are owned and operated by OTIC.	Ohio Turnpike and Infrastructure Commission	Existing

Element Name	Element Description	Stakeholder	Element Status
Ohio Turnpike Maintenance Dispatch Offices	Represents offices along the Ohio Turnpike that provide the dispatch function for turnpike roadway and equipment maintenance vehicles. Provides roadway and equipment maintenance for OTIC assets in the region.	Ohio Turnpike and Infrastructure Commission	Existing
Ohio Turnpike Toll Administration	Represents the back office administration systems for the electronic payment systems, including the customer service centers.	Ohio Turnpike and Infrastructure Commission	Existing
Ohio Turnpike Toll Collection Equipment	Electronic toll collection roadway equipment. E.g., tag readers, toll booth equipment, lane curtains, etc.	Ohio Turnpike and Infrastructure Commission	Existing
Ohio Turnpike Website	Website for the Ohio Turnpike and Infrastructure Commission that provides real-time information on travel along the Ohio Turnpike. General vehicles and commercial vehicle companies can calculate their toll amounts based on entrance and exit points on their trip. Available at: http://www.ohioturnpike.org/.	Ohio Turnpike and Infrastructure Commission	Existing
Potential Obstacles	Represents any object that possesses the potential of being sensed and struck and thus also possesses physical attributes. Potential Obstacles include roadside obstructions, other vehicles, pedestrians, infrastructure elements or any other element which is in a potential path of the vehicle.	General Public	Existing
Private Rail Operations Active Warning Roadside Equipment	Represents roadside equipment that alerts motorists of railroad crossings at at-grade intersections. Gates are activated and de-activated as trains are detected approaching and clearing the intersection.	Private Rail Operators	Existing
Private Rail Operations Wayside Equipment	Represents the rail operated equipment at highway rail intersections.	Private Rail Operators	Existing
Private Towing Dispatch Agencies	Represents the dispatch function for private tow companies throughout the state. Ohio DOT has created a Towing and Recovery Incentive Program (TRIP), where Ohio DOT provides financial incentives to prequalified towing and recovery companies for the timely removal of large vehicle incidents from roadways where traffic operations are impacted. The TRIP program has been implemented in Central Ohio region, with expansion of the program to Cleveland and Cincinnati. Statewide TMC initiates communications with pre-qualified towing and recovery companies.	Private Companies	Existing
Private Traveler Information Systems	Represents the private traveler information providers serving travelers throughout Ohio. This element could, in the future, provide support to the National Traveler Information 511 number since it collects information from a broad array of operating centers. Could also include a website.	Private Companies	Existing
Private Weather Service Systems	Systems that provide customized transportation weather forecasts or road weather information.	Private Companies	Existing
PUCO Commercial Vehicle Compliance Check	Represents the commercial motor vehicle inspections performed by PUCO in coordination with the Ohio State Highway Patrol. The inspections are conducted by PUCO and violations are communicated with the Ohio State Highway Patrol, who enforces federal motor carrier safety regulations and the hazardous materials regulations. Approximately 80,000 roadside inspections are conducted annually in Ohio.	Public Utilities Commission of Ohio (PUCO)	Existing
PUCO Commercial Vehicle Registration System	Represents an online registration system that provides administrative functions like providing credentials, tax, and safety regulation information to all commercial vehicle operators. The system would issue credentials, collect fees and taxes, and support enforcement of credential requirements.	Public Utilities Commission of Ohio (PUCO)	Existing
Regional Airport Authorities	Represents the traffic management aspect of the airports. Also represents the multimodal information available at the airports.	Regional Airport Authorities	Existing

Element Name	Element Description	Stakeholder	Element Status
Regional Airport Authorities Parking Management Systems	Represents parking management ITS equipment operated and maintained by regional airports throughout the state. Integration of payment for parking with E-Z Pass tags is planned functionality in some airports.	Regional Airport Authorities	Existing
Regional Airport Authorities Roadside ITS Equipment	Represents a variety roadside ITS equipment devices (i.e. Dynamic Message Signs and CCTV cameras) that are operated and maintained by Regional Airport Authorities throughout the state.	Regional Airport Authorities	Existing
Regional Event Operations	This element refers to promoters and sponsors of special events, including Ohio State Buckeye football games. They coordinate with traffic and emergency providers.	Regional Event Operators	Existing
Regional Hospitals and Trauma Centers	Hospitals and trauma centers throughout the state.	Regional Hospital Organizations	Existing
Regional Transit Authorities Ticket Vending Machines	Represents ticket vending machines installed by Regional Transit Authorities to facilitate transit fare payments at transit station areas and other outlets where machines are installed.	Regional Transit Authorities	Existing
Regional Transit Authorities Transit Data Archives	Represents transit data archives operated by regional transit authorities throughout the state.	Regional Transit Authorities	Existing
Regional Transit Authorities Transit Information Kiosks	Represents transit information kiosks that provide real-time transit information that is managed and provided by Regional Transit Operations Centers.	Regional Transit Authorities	Existing
Regional Transit Authorities Transit Information Systems	Represents transit traveler information systems operated by Regional Transit Authorities that provide real-time and static information on fixed-route and demand response transit services throughout the state.	Regional Transit Authorities	Existing
Regional Transit Authorities Transit Operations Centers	Represents Regional Transit Operations Centers that operate and maintain fixed-route and demand response transit services in major metro areas throughout the state. Centers are responsible for dispatching, scheduling and transit traveler information systems in their respective regions. Centers utilize Automated Vehicle Locator (AVL) systems to monitor and report on vehicle locations. Centers also coordinate with Ohio DOT District Offices to share information on transit operations and provide feedback on roadway work plans proposed by ODOT District Offices.	Regional Transit Authorities	Existing
Regional Transit Authorities Transit Websites	Represents websites operated by large Regional Transit Authorities that provide real-time and static information on fixed-route and demand response transit services.	Regional Transit Authorities	Existing
Regional Transit Authority Transit Vehicles	Represents fixed route and demand response vehicles that are operated and maintained by Regional Transit Authorities throughout the state. AVL systems on vehicles provide vehicle location reporting capabilities. Other on-board systems can include automated passenger counters, electronic fare boxes, and transit signal priority that can request for signal priority at traffic signals that may be operated by Ohio DOT.	Regional Transit Authorities	Existing
Traffic	Represents the collective body of vehicles that travel on Ohio DOT interstates and roadways which depicts the vehicle population from which traffic information is collected (average occupancy, average speed, total volume, average delay, etc.), and to which traffic control indicators are applied (intersection signals, stop signs, ramp meters, lane control barriers, variable speed limit indicators, etc.).	General Public	Existing

Element Name	Element Description	Stakeholder	Element Status
Transit Traveler Cards	Represents a variety of transit fare cards that are used to pay for fixed-route and demand response transit services operated throughout the state. Cards can be simple magnetic fare cards that have stored value. Cards can also be smart touch-based cards that use Electronic Payment System (EPS).	Regional Transit Authorities	Existing
Traveler	Represents travelers that request for and utilize transportation services provided by the Ohio DOT and other public and private transportation agencies throughout the state of Ohio.	General Public	Existing
Traveler Information Device	This element refers to personal devices used by the traveling public, including mobile computers, pagers, etc.	General Public	Existing
Universities and Colleges Transit Operations Centers	Represents Universities and Colleges Transit Operations Centers that operate and maintain fixed-route transit services on large college campuses throughout the state. Centers are responsible for dispatching, scheduling and transit traveler information systems on their respective campuses. Centers utilize Automated Vehicle Locator (AVL) systems to monitor and report on vehicle locations. Centers coordinate transit schedules and operations with nearby Regional Transit Authorities, and centers also coordinate with Ohio DOT District Offices to share information on transit operations with ODOT District Offices.	Universities and Colleges	Existing
Universities and Colleges Transit Vehicles	Represents fixed route vehicles that are operated and maintained by Universities and Colleges throughout the state. AVL systems on vehicles provide vehicle location reporting capabilities. Other on-board systems can include automated passenger counters, electronic fare boxes, and transit signal priority that can request for signal priority at traffic signals that may be operated by Ohio DOT.	Universities and Colleges	Existing

5 ITS Service Packages

ITS services describe what can be done to improve the efficiency, safety, and convenience of the regional transportation system through better information, advanced systems and new technologies. Some services are specific to one primary stakeholder while others require broad stakeholder participation. This section describes the ITS services that meet the transportation needs in the state.

Table 3: ITS Service Packages

Service Package	Service Package Name	Service Package Status	Included Elements
AD1	ITS Data Mart	Existing	Archived Data User Systems
AD1	ITS Data Mart	Existing	County and City Roadside ITS Equipment
AD1	ITS Data Mart	Existing	County and City Traffic Data Archives
AD1	ITS Data Mart	Existing	County and City Traffic Management Centers
AD1	ITS Data Mart	Existing	Ohio DOT Statewide TMC
AD1	ITS Data Mart	Existing	Ohio DOT Traffic Data Archive System
AD1	ITS Data Mart	Existing	Ohio DOT Vehicle Detection Devices
AD1	ITS Data Mart	Existing	Ohio EPA Air Quality Database
AD1	ITS Data Mart	Existing	Ohio EPA Air Quality Management System
AD1	ITS Data Mart	Existing	Ohio EPA Air Quality Monitors
AD1	ITS Data Mart	Existing	Regional Transit Authorities Transit Data Archives
AD1	ITS Data Mart	Existing	Regional Transit Authorities Transit Operations Centers
AD2	ITS Data Warehouse	Existing	Archived Data User Systems
AD2	ITS Data Warehouse	Existing	County and City Law Enforcement
AD2	ITS Data Warehouse	Existing	County and City Public Safety Dispatch
AD2	ITS Data Warehouse	Existing	County and City Roadside ITS Equipment
AD2	ITS Data Warehouse	Existing	County and City Traffic Management Centers
AD2	ITS Data Warehouse	Existing	MPOs Data Archives
AD2	ITS Data Warehouse	Existing	Ohio DOT District Offices
AD2	ITS Data Warehouse	Existing	Ohio DOT Statewide TMC
AD2	ITS Data Warehouse	Existing	Ohio DOT Traffic Data Archive System
AD2	ITS Data Warehouse	Existing	Ohio DOT Vehicle Detection Devices
AD2	ITS Data Warehouse	Existing	Ohio DPS Crash Database
AD2	ITS Data Warehouse	Existing	Ohio State Highway Patrol Posts
AD3	ITS Virtual Data Warehouse	Planned	Archived Data User Systems
AD3	ITS Virtual Data Warehouse	Planned	MPOs Data Archives
AD3	ITS Virtual Data Warehouse	Planned	Ohio DOT Traffic Data Archive System
AD3	ITS Virtual Data Warehouse	Planned	Regional Transit Authorities Transit Data Archives
APTS01	Transit Vehicle Tracking	Existing	County and City Transit Operations Centers
APTS01	Transit Vehicle Tracking	Existing	County and City Transit Vehicles
APTS01	Transit Vehicle Tracking	Existing	Regional Transit Authorities Transit Operations Centers

Service Package	Service Package Name	Service Package Status	Included Elements
APTS01	Transit Vehicle Tracking	Existing	Regional Transit Authority Transit Vehicles
APTS01	Transit Vehicle Tracking	Existing	Universities and Colleges Transit Operations Centers
APTS01	Transit Vehicle Tracking	Existing	Universities and Colleges Transit Vehicles
APTS02	Transit Fixed-Route Operations	Existing	County and City Transit Operations Centers
APTS02	Transit Fixed-Route Operations	Existing	County and City Transit Vehicles
APTS02	Transit Fixed-Route Operations	Existing	Regional Transit Authorities Transit Operations Centers
APTS02	Transit Fixed-Route Operations	Existing	Regional Transit Authority Transit Vehicles
APTS02	Transit Fixed-Route Operations	Existing	Universities and Colleges Transit Operations Centers
APTS02	Transit Fixed-Route Operations	Existing	Universities and Colleges Transit Vehicles
APTS03	Demand Response Transit Operations	Existing	County and City Transit Operations Centers
APTS03	Demand Response Transit Operations	Existing	County and City Transit Vehicles
APTS03	Demand Response Transit Operations	Existing	Regional Transit Authorities Transit Operations Centers
APTS03	Demand Response Transit Operations	Existing	Regional Transit Authority Transit Vehicles
APTS03	Demand Response Transit Operations	Existing	Universities and Colleges Transit Operations Centers
APTS03	Demand Response Transit Operations	Existing	Universities and Colleges Transit Vehicles
APTS04	Transit Fare Collection Management	Existing	County and City Transit Operations Centers
APTS04	Transit Fare Collection Management	Existing	County and City Transit Vehicles
APTS04	Transit Fare Collection Management	Existing	Financial Institutions
APTS04	Transit Fare Collection Management	Existing	Regional Transit Authorities Ticket Vending Machines
APTS04	Transit Fare Collection Management	Existing	Regional Transit Authorities Transit Operations Centers
APTS04	Transit Fare Collection Management	Existing	Regional Transit Authority Transit Vehicles
APTS04	Transit Fare Collection Management	Existing	Transit Traveler Cards
APTS04	Transit Fare Collection Management	Existing	Traveler
APTS04	Transit Fare Collection Management	Existing	Universities and Colleges Transit Operations Centers
APTS04	Transit Fare Collection Management	Existing	Universities and Colleges Transit Vehicles
APTS05	Transit Security	Existing	County and City Transit Operations Centers
APTS05	Transit Security	Existing	County and City Transit Vehicles
APTS05	Transit Security	Existing	Media Outlets
APTS05	Transit Security	Existing	Regional Transit Authorities Transit Operations Centers
APTS05	Transit Security	Existing	Regional Transit Authority Transit Vehicles
APTS05	Transit Security	Existing	Universities and Colleges Transit Operations Centers
APTS05	Transit Security	Existing	Universities and Colleges Transit Vehicles
APTS06	Transit Fleet Management	Planned	Regional Transit Authorities Transit Operations Centers

Service Package	Service Package Name	Service Package Status	Included Elements
APTS06	Transit Fleet Management	Planned	Regional Transit Authority Transit Vehicles
APTS07	Multi-modal Coordination	Existing	County and City Transit Operations Centers
APTS07	Multi-modal Coordination	Existing	County and City Transit Vehicles
APTS07	Multi-modal Coordination	Existing	Regional Airport Authorities
APTS07	Multi-modal Coordination	Existing	Regional Event Operations
APTS07	Multi-modal Coordination	Existing	Regional Transit Authorities Transit Operations Centers
APTS07	Multi-modal Coordination	Existing	Regional Transit Authority Transit Vehicles
APTS07	Multi-modal Coordination	Existing	Universities and Colleges Transit Operations Centers
APTS07	Multi-modal Coordination	Existing	Universities and Colleges Transit Vehicles
APTS08	Transit Traveler Information	Existing	County and City Traffic Information Websites
APTS08	Transit Traveler Information	Existing	County and City Transit Operations Centers
APTS08	Transit Traveler Information	Existing	Regional Transit Authorities Transit Information Kiosks
APTS08	Transit Traveler Information	Existing	Regional Transit Authorities Transit Information Systems
APTS08	Transit Traveler Information	Existing	Regional Transit Authorities Transit Operations Centers
APTS08	Transit Traveler Information	Existing	Regional Transit Authorities Transit Websites
APTS08	Transit Traveler Information	Existing	Regional Transit Authority Transit Vehicles
APTS08	Transit Traveler Information	Existing	Traveler
APTS08	Transit Traveler Information	Existing	Traveler Information Device
APTS08	Transit Traveler Information	Existing	Universities and Colleges Transit Operations Centers
APTS09	Transit Signal Priority	Existing	County and City Roadside ITS Equipment
APTS09	Transit Signal Priority	Existing	County and City Traffic Management Centers
APTS09	Transit Signal Priority	Existing	County and City Transit Vehicles
APTS09	Transit Signal Priority	Existing	Ohio DOT Statewide TMC
APTS09	Transit Signal Priority	Existing	Ohio DOT Traffic Signal Systems
APTS09	Transit Signal Priority	Existing	Regional Transit Authority Transit Vehicles
APTS09	Transit Signal Priority	Existing	Universities and Colleges Transit Vehicles
APTS10	Transit Passenger Counting	Existing	County and City Transit Operations Centers
APTS10	Transit Passenger Counting	Existing	County and City Transit Vehicles
APTS10	Transit Passenger Counting	Existing	Regional Transit Authorities Transit Operations Centers
APTS10	Transit Passenger Counting	Existing	Regional Transit Authority Transit Vehicles
APTS10	Transit Passenger Counting	Existing	Traveler
APTS10	Transit Passenger Counting	Existing	Universities and Colleges Transit Operations Centers
APTS10	Transit Passenger Counting	Existing	Universities and Colleges Transit Vehicles

Service Package	Service Package Name	Service Package Status	Included Elements
ATIS01	Broadcast Traveler Information	Existing	County and City Traffic Information Websites
ATIS01	Broadcast Traveler Information	Existing	Media Outlets
ATIS01	Broadcast Traveler Information	Existing	National Weather Service
ATIS01	Broadcast Traveler Information	Existing	Ohio DOT 511 Telephone Information Service
ATIS01	Broadcast Traveler Information	Existing	Ohio DOT District Offices
ATIS01	Broadcast Traveler Information	Existing	Ohio DOT OHGO Traveler Information System
ATIS01	Broadcast Traveler Information	Existing	Ohio DOT Rest Area Tourist Information Centers
ATIS01	Broadcast Traveler Information	Existing	Ohio DOT Rest Area Truck Parking Availability System
ATIS01	Broadcast Traveler Information	Existing	Ohio DOT Statewide TMC
ATIS01	Broadcast Traveler Information	Existing	Private Traveler Information Systems
ATIS01	Broadcast Traveler Information	Existing	Private Weather Service Systems
ATIS01	Broadcast Traveler Information	Existing	Traveler
ATIS01	Broadcast Traveler Information	Existing	Traveler Information Device
ATIS02	Interactive Traveler Information	Planned	Ohio DOT 511 Telephone Information Service
ATIS02	Interactive Traveler Information	Planned	Ohio DOT District Offices
ATIS02	Interactive Traveler Information	Planned	Ohio DOT OHGO Traveler Information System
ATIS02	Interactive Traveler Information	Planned	Ohio DOT Rest Area Tourist Information Centers
ATIS02	Interactive Traveler Information	Planned	Ohio DOT Statewide TMC
ATIS02	Interactive Traveler Information	Planned	Traveler
ATIS02	Interactive Traveler Information	Planned	Traveler Information Device
ATIS06	Transportation Operations Data Sharing	Planned	Ohio DOT District Offices
ATIS06	Transportation Operations Data Sharing	Planned	Ohio DOT OHGO Traveler Information System
ATIS06	Transportation Operations Data Sharing	Planned	Ohio DOT Statewide TMC
ATIS09	In Vehicle Signing	Planned	Drivers
ATIS09	In Vehicle Signing	Planned	Ohio DOT Connected Vehicles Roadside Equipment
ATIS09	In Vehicle Signing	Planned	Ohio DOT Statewide TMC
ATIS10	Short Range Communications Traveler Information	Planned	Drivers
ATIS10	Short Range Communications Traveler Information	Planned	Ohio DOT Connected Vehicles Roadside Equipment
ATIS10	Short Range Communications Traveler Information	Planned	Ohio DOT OHGO Traveler Information System
ATIS10	Short Range Communications Traveler Information	Planned	Ohio DOT Statewide TMC
ATMS01	Network Surveillance	Existing	County and City Roadside ITS Equipment
ATMS01	Network Surveillance	Existing	County and City Traffic Management Centers
ATMS01	Network Surveillance	Existing	Neighboring States Roadside ITS Equipment

Service Package	Service Package Name	Service Package Status	Included Elements
ATMS01	Network Surveillance	Existing	Ohio DOT CCTV Cameras
ATMS01	Network Surveillance	Existing	Ohio DOT District Offices
ATMS01	Network Surveillance	Existing	Ohio DOT Statewide TMC
ATMS01	Network Surveillance	Existing	Ohio DOT Vehicle Detection Devices
ATMS01	Network Surveillance	Existing	Ohio Turnpike CCTV Cameras
ATMS02	Traffic Probe Surveillance	Planned	Ohio DOT Statewide TMC
ATMS02	Traffic Probe Surveillance	Planned	Regional Transit Authorities Transit Operations Centers
ATMS03	Traffic Signal Control	Existing	County and City Roadside ITS Equipment
ATMS03	Traffic Signal Control	Existing	County and City Traffic Management Centers
ATMS03	Traffic Signal Control	Existing	Ohio DOT District Offices
ATMS03	Traffic Signal Control	Existing	Ohio DOT Statewide TMC
ATMS03	Traffic Signal Control	Existing	Ohio DOT Traffic Signal Systems
ATMS04	Traffic Metering	Existing	Drivers
ATMS04	Traffic Metering	Existing	Ohio DOT District Offices
ATMS04	Traffic Metering	Existing	Ohio DOT Ramp Meters
ATMS04	Traffic Metering	Existing	Ohio DOT Statewide TMC
ATMS04	Traffic Metering	Existing	Ohio DOT Vehicle Detection Devices
ATMS06	Traffic Information Dissemination	Existing	County and City Roadside ITS Equipment
ATMS06	Traffic Information Dissemination	Existing	County and City Traffic Management Centers
ATMS06	Traffic Information Dissemination	Existing	Neighboring States Roadside ITS Equipment
ATMS06	Traffic Information Dissemination	Existing	Ohio DOT District Offices
ATMS06	Traffic Information Dissemination	Existing	Ohio DOT DMS
ATMS06	Traffic Information Dissemination	Existing	Ohio DOT HAR
ATMS06	Traffic Information Dissemination	Existing	Ohio DOT Statewide TMC
ATMS06	Traffic Information Dissemination	Existing	Ohio Turnpike Central Dispatch
ATMS06	Traffic Information Dissemination	Existing	Ohio Turnpike DMS
ATMS06	Traffic Information Dissemination	Existing	Regional Airport Authorities
ATMS06	Traffic Information Dissemination	Existing	Regional Airport Authorities Roadside ITS Equipment
ATMS07	Regional Traffic Management	Existing	Neighboring State Traffic Management Centers
ATMS07	Regional Traffic Management	Existing	Neighboring States Roadside ITS Equipment
ATMS07	Regional Traffic Management	Existing	Ohio DOT CCTV Cameras
ATMS07	Regional Traffic Management	Existing	Ohio DOT District Offices
ATMS07	Regional Traffic Management	Existing	Ohio DOT Statewide TMC

Service Package	Service Package Name	Service Package Status	Included Elements
ATMS07	Regional Traffic Management	Existing	Ohio DOT Vehicle Detection Devices
ATMS08	Traffic Incident Management System	Existing	County and City Emergency Vehicles
ATMS08	Traffic Incident Management System	Existing	County and City Public Safety Dispatch
ATMS08	Traffic Incident Management System	Existing	County and City Traffic Management Centers
ATMS08	Traffic Incident Management System	Existing	Freight Rail Operations
ATMS08	Traffic Incident Management System	Existing	Media Outlets
ATMS08	Traffic Incident Management System	Existing	Neighboring State Traffic Management Centers
ATMS08	Traffic Incident Management System	Existing	Ohio DOT CCTV Cameras
ATMS08	Traffic Incident Management System	Existing	Ohio DOT District Offices
ATMS08	Traffic Incident Management System	Existing	Ohio DOT Safety Patrol Vehicles
ATMS08	Traffic Incident Management System	Existing	Ohio DOT Statewide TMC
ATMS08	Traffic Incident Management System	Existing	Ohio State Highway Patrol Posts
ATMS08	Traffic Incident Management System	Existing	Ohio State Highway Patrol State Communications Center
ATMS08	Traffic Incident Management System	Existing	Ohio State Highway Patrol Vehicles
ATMS08	Traffic Incident Management System	Existing	Ohio Turnpike CCTV Cameras
ATMS08	Traffic Incident Management System	Existing	Ohio Turnpike Central Dispatch
ATMS08	Traffic Incident Management System	Existing	Private Towing Dispatch Agencies
ATMS08	Traffic Incident Management System	Existing	Regional Airport Authorities
ATMS08	Traffic Incident Management System	Existing	Regional Event Operations
ATMS09	Transportation Decision Support and Demand Management	Planned	County and City Roadside ITS Equipment
ATMS09	Transportation Decision Support and Demand Management	Planned	County and City Traffic Management Centers
ATMS09	Transportation Decision Support and Demand Management	Planned	Ohio DOT District Offices
ATMS09	Transportation Decision Support and Demand Management	Planned	Ohio DOT OHGO Traveler Information System
ATMS09	Transportation Decision Support and Demand Management	Planned	Ohio DOT Statewide TMC
ATMS09	Transportation Decision Support and Demand Management	Planned	Ohio DOT Vehicle Detection Devices
ATMS09	Transportation Decision Support and Demand Management	Planned	Ohio EPA Air Quality Management System
ATMS10	Electronic Toll Collection	Existing	Financial Institutions
ATMS10	Electronic Toll Collection	Existing	Fleet and Freight Management Systems
ATMS10	Electronic Toll Collection	Existing	Ohio State Highway Patrol Posts
ATMS10	Electronic Toll Collection	Existing	Ohio Turnpike E-ZPass Tags
ATMS10	Electronic Toll Collection	Existing	Ohio Turnpike Toll Administration
ATMS10	Electronic Toll Collection	Existing	Ohio Turnpike Toll Collection Equipment
ATMS10	Electronic Toll Collection	Existing	Ohio Turnpike Website

Service Package	Service Package Name	Service Package Status	Included Elements
ATMS11	Emissions Monitoring and Management	Existing	Media Outlets
ATMS11	Emissions Monitoring and Management	Existing	National Weather Service
ATMS11	Emissions Monitoring and Management	Existing	Ohio EPA Air Quality Management System
ATMS11	Emissions Monitoring and Management	Existing	Ohio EPA Air Quality Monitors
ATMS13	Standard Railroad Grade Crossing	Existing	Drivers
ATMS13	Standard Railroad Grade Crossing	Existing	Private Rail Operations Active Warning Roadside Equipment
ATMS13	Standard Railroad Grade Crossing	Existing	Private Rail Operations Wayside Equipment
ATMS14	Advanced Railroad Grade Crossing	Existing	Drivers
ATMS14	Advanced Railroad Grade Crossing	Existing	Private Rail Operations Active Warning Roadside Equipment
ATMS14	Advanced Railroad Grade Crossing	Existing	Private Rail Operations Wayside Equipment
ATMS15	Railroad Operations Coordination	Planned	Freight Rail Operations
ATMS15	Railroad Operations Coordination	Planned	Ohio DOT District Offices
ATMS15	Railroad Operations Coordination	Planned	Ohio DOT Traffic Signal Systems
ATMS16	Parking Facility Management	Existing	Commercial Vehicles
ATMS16	Parking Facility Management	Existing	County and City Parking Management Systems
ATMS16	Parking Facility Management	Existing	Drivers
ATMS16	Parking Facility Management	Existing	Financial Institutions
ATMS16	Parking Facility Management	Existing	Ohio DOT Rest Area Truck Parking Availability System
ATMS16	Parking Facility Management	Existing	Ohio Turnpike E-ZPass Tags
ATMS16	Parking Facility Management	Existing	Regional Airport Authorities Parking Management Systems
ATMS17	Regional Parking Management	Planned	County and City Parking Management Systems
ATMS17	Regional Parking Management	Planned	Ohio DOT District Offices
ATMS17	Regional Parking Management	Planned	Regional Airport Authorities Parking Management Systems
ATMS17	Regional Parking Management	Planned	Regional Transit Authorities Transit Operations Centers
ATMS19	Speed Warning and Enforcement	Existing	County and City Law Enforcement
ATMS19	Speed Warning and Enforcement	Existing	County and City Roadside ITS Equipment
ATMS19	Speed Warning and Enforcement	Existing	Drivers
ATMS19	Speed Warning and Enforcement	Existing	Ohio DOT Speed Monitoring Roadside Equipment
ATMS19	Speed Warning and Enforcement	Existing	Ohio State Highway Patrol Posts
ATMS20	Drawbridge Management	Existing	County and City Lift Bridge Equipment
ATMS20	Drawbridge Management	Existing	County and City Roadside ITS Equipment
ATMS20	Drawbridge Management	Existing	County and City Traffic Management Centers
ATMS20	Drawbridge Management	Existing	Drivers

Service Package	Service Package Name	Service Package Status	Included Elements
ATMS20	Drawbridge Management	Existing	Ohio DOT Lift Bridge Equipment
ATMS20	Drawbridge Management	Existing	Ohio DOT Traffic Signal Systems
ATMS21	Roadway Closure Management	Planned	Drivers
ATMS21	Roadway Closure Management	Planned	Ohio DOT Automated Gate Closure Systems
ATMS21	Roadway Closure Management	Planned	Ohio DOT CCTV Cameras
ATMS21	Roadway Closure Management	Planned	Ohio DOT District Offices
ATMS21	Roadway Closure Management	Planned	Ohio DOT DMS
ATMS21	Roadway Closure Management	Planned	Ohio DOT Statewide TMC
ATMS22	Variable Speed Limits	Planned	Drivers
ATMS22	Variable Speed Limits	Planned	Ohio DOT Statewide TMC
ATMS22	Variable Speed Limits	Planned	Ohio DOT Variable Speed Limit Signs
ATMS22	Variable Speed Limits	Planned	Ohio DOT Vehicle Detection Devices
ATMS22	Variable Speed Limits	Planned	Traffic
ATMS23	Dynamic Lane Management and Shoulder Use	Planned	Drivers
ATMS23	Dynamic Lane Management and Shoulder Use	Planned	Ohio DOT CCTV Cameras
ATMS23	Dynamic Lane Management and Shoulder Use	Planned	Ohio DOT District Offices
ATMS23	Dynamic Lane Management and Shoulder Use	Planned	Ohio DOT Lane Control Devices
ATMS23	Dynamic Lane Management and Shoulder Use	Planned	Ohio DOT Statewide TMC
ATMS23	Dynamic Lane Management and Shoulder Use	Planned	Ohio DOT Vehicle Detection Devices
ATMS24	Dynamic Roadway Warning	Existing	Commercial Vehicles
ATMS24	Dynamic Roadway Warning	Existing	Drivers
ATMS24	Dynamic Roadway Warning	Existing	Ohio DOT Animal Detection System
ATMS24	Dynamic Roadway Warning	Existing	Ohio DOT Overheight Vehicle Detection System
ATMS24	Dynamic Roadway Warning	Existing	Potential Obstacles
AVSS01	Vehicle Safety Monitoring	Planned	Connected Vehicles
AVSS01	Vehicle Safety Monitoring	Planned	Drivers
AVSS03	Longitudinal Safety Warning	Planned	Connected Vehicles
AVSS03	Longitudinal Safety Warning	Planned	Drivers
AVSS03	Longitudinal Safety Warning	Planned	Potential Obstacles
AVSS04	Lateral Safety Warning	Planned	Connected Vehicles
AVSS04	Lateral Safety Warning	Planned	Drivers
AVSS04	Lateral Safety Warning	Planned	Potential Obstacles
AVSS05	Intersection Safety Warning	Planned	Connected Vehicles

Service Package	Service Package Name	Service Package Status	Included Elements
AVSS05	Intersection Safety Warning	Planned	Drivers
AVSS05	Intersection Safety Warning	Planned	Ohio DOT Connected Vehicles Roadside Equipment
AVSS05	Intersection Safety Warning	Planned	Potential Obstacles
AVSS05	Intersection Safety Warning	Planned	Traffic
AVSS06	Pre-Crash Restraint Deployment	Planned	Connected Vehicles
AVSS06	Pre-Crash Restraint Deployment	Planned	Potential Obstacles
AVSS08	Advanced Vehicle Longitudinal Control	Planned	Connected Vehicles
AVSS08	Advanced Vehicle Longitudinal Control	Planned	Drivers
AVSS08	Advanced Vehicle Longitudinal Control	Planned	Potential Obstacles
AVSS09	Advanced Vehicle Lateral Control	Planned	Connected Vehicles
AVSS09	Advanced Vehicle Lateral Control	Planned	Drivers
AVSS09	Advanced Vehicle Lateral Control	Planned	Potential Obstacles
AVSS10	Intersection Collision Avoidance	Planned	Connected Vehicles
AVSS10	Intersection Collision Avoidance	Planned	Drivers
AVSS10	Intersection Collision Avoidance	Planned	Ohio DOT Connected Vehicles Roadside Equipment
AVSS10	Intersection Collision Avoidance	Planned	Potential Obstacles
AVSS10	Intersection Collision Avoidance	Planned	Traffic
AVSS11	Automated Vehicle Operations	Planned	Connected Vehicles
AVSS11	Automated Vehicle Operations	Planned	Drivers
AVSS11	Automated Vehicle Operations	Planned	Ohio DOT Connected Vehicles Roadside Equipment
AVSS11	Automated Vehicle Operations	Planned	Ohio DOT Statewide TMC
AVSS11	Automated Vehicle Operations	Planned	Potential Obstacles
AVSS12	Cooperative Vehicle Safety Systems	Planned	Connected Vehicles
AVSS12	Cooperative Vehicle Safety Systems	Planned	Drivers
AVSS12	Cooperative Vehicle Safety Systems	Planned	Ohio DOT Connected Vehicles Roadside Equipment
CVO01	Carrier Operations and Fleet Management	Existing	Commercial Vehicles
CVO01	Carrier Operations and Fleet Management	Existing	Fleet and Freight Management Systems
CVO02	Freight Administration	Existing	Commercial Vehicles
CVO02	Freight Administration	Existing	Fleet and Freight Management Systems
CVO03	Electronic Clearance	Existing	Commercial Vehicles
CVO03	Electronic Clearance	Existing	FMCSA MCMIS
CVO03	Electronic Clearance	Existing	IFTA Clearinghouse
CVO03	Electronic Clearance	Existing	IRP Clearinghouse

Service Package	Service Package Name	Service Package Status	Included Elements
CVO03	Electronic Clearance	Existing	Ohio State Highway Patrol Posts
CVO03	Electronic Clearance	Existing	Ohio State Highway Patrol Pre-Pass System
CVO03	Electronic Clearance	Existing	PUCO Commercial Vehicle Registration System
CVO04	CV Administrative Processes	Existing	Fleet and Freight Management Systems
CVO04	CV Administrative Processes	Existing	FMCSA MCMIS
CVO04	CV Administrative Processes	Existing	IFTA Clearinghouse
CVO04	CV Administrative Processes	Existing	IRP Clearinghouse
CVO04	CV Administrative Processes	Existing	Ohio Motor Carrier Information System (OMCIS)
CVO04	CV Administrative Processes	Existing	Ohio State Highway Patrol Posts
CVO04	CV Administrative Processes	Existing	PUCO Commercial Vehicle Registration System
CVO06	Weigh-In-Motion	Existing	Commercial Vehicles
CVO06	Weigh-In-Motion	Existing	Ohio State Highway Patrol Posts
CVO06	Weigh-In-Motion	Existing	Ohio State Highway Patrol Weigh-In-Motion Stations
CVO06	Weigh-In-Motion	Existing	PUCO Commercial Vehicle Registration System
CVO07	Roadside CVO Safety	Existing	Commercial Vehicles
CVO07	Roadside CVO Safety	Existing	Fleet and Freight Management Systems
CVO07	Roadside CVO Safety	Existing	FMCSA MCMIS
CVO07	Roadside CVO Safety	Existing	Ohio Motor Carrier Information System (OMCIS)
CVO07	Roadside CVO Safety	Existing	Ohio State Highway Patrol Posts
CVO07	Roadside CVO Safety	Existing	PUCO Commercial Vehicle Compliance Check
CVO07	Roadside CVO Safety	Existing	PUCO Commercial Vehicle Registration System
CVO10	HAZMAT Management	Existing	Commercial Vehicles
CVO10	HAZMAT Management	Existing	County and City Emergency Operations Centers (EOCs)
CVO10	HAZMAT Management	Existing	County and City Public Safety Dispatch
CVO10	HAZMAT Management	Existing	Fleet and Freight Management Systems
CVO10	HAZMAT Management	Existing	Ohio State Highway Patrol Posts
CVO10	HAZMAT Management	Existing	Ohio State Highway Patrol State Communications Center
CVO10	HAZMAT Management	Existing	Ohio Statewide EOC/JDF
EM01	Emergency Call-Taking and Dispatch	Existing	County and City Emergency Vehicles
EM01	Emergency Call-Taking and Dispatch	Existing	County and City Law Enforcement
EM01	Emergency Call-Taking and Dispatch	Existing	County and City Public Safety Dispatch
EM01	Emergency Call-Taking and Dispatch	Existing	Ohio State Highway Patrol Posts
EM01	Emergency Call-Taking and Dispatch	Existing	Ohio State Highway Patrol State Communications Center

Service Package	Service Package Name	Service Package Status	Included Elements
EM01	Emergency Call-Taking and Dispatch	Existing	Ohio State Highway Patrol Vehicles
EM02	Emergency Routing	Existing	County and City Emergency Vehicles
EM02	Emergency Routing	Existing	County and City Roadside ITS Equipment
EM02	Emergency Routing	Existing	County and City Traffic Management Centers
EM02	Emergency Routing	Existing	Ohio DOT District Offices
EM02	Emergency Routing	Existing	Ohio DOT Statewide TMC
EM02	Emergency Routing	Existing	Ohio DOT Traffic Signal Systems
EM02	Emergency Routing	Existing	Regional Hospitals and Trauma Centers
EM04	Roadway Service Patrols	Existing	Ohio DOT District Offices
EM04	Roadway Service Patrols	Existing	Ohio DOT Safety Patrol Vehicles
EM04	Roadway Service Patrols	Existing	Ohio DOT Statewide TMC
EM05	Transportation Infrastructure Protection	Planned	County and City Emergency Operations Centers (EOCs)
EM05	Transportation Infrastructure Protection	Planned	Ohio DOT District Offices
EM05	Transportation Infrastructure Protection	Planned	Ohio DOT Infrastructure Monitoring Sensors
EM05	Transportation Infrastructure Protection	Planned	Ohio DOT Statewide TMC
EM05	Transportation Infrastructure Protection	Planned	Ohio Statewide EOC/JDF
EM06	Wide-Area Alert	Existing	County and City Emergency Operations Centers (EOCs)
EM06	Wide-Area Alert	Existing	County and City Public Safety Dispatch
EM06	Wide-Area Alert	Existing	County and City Warning Siren Systems
EM06	Wide-Area Alert	Existing	Drivers
EM06	Wide-Area Alert	Existing	Neighboring States Roadside ITS Equipment
EM06	Wide-Area Alert	Existing	Ohio DOT DMS
EM06	Wide-Area Alert	Existing	Ohio DOT HAR
EM06	Wide-Area Alert	Existing	Ohio DOT Statewide TMC
EM06	Wide-Area Alert	Existing	Ohio Emergency Alert System
EM06	Wide-Area Alert	Existing	Ohio State Highway Patrol Posts
EM06	Wide-Area Alert	Existing	Ohio State Highway Patrol State Communications Center
EM06	Wide-Area Alert	Existing	Ohio Statewide EOC/JDF
EM06	Wide-Area Alert	Existing	Regional Airport Authorities
EM06	Wide-Area Alert	Existing	Regional Airport Authorities Roadside ITS Equipment
EM06	Wide-Area Alert	Existing	Traveler
EM07	Early Warning System	Existing	County and City Emergency Operations Centers (EOCs)
EM07	Early Warning System	Existing	County and City Traffic Management Centers

Service Package	Service Package Name	Service Package Status	Included Elements
EM07	Early Warning System	Existing	National Weather Service
EM07	Early Warning System	Existing	Ohio DOT Statewide TMC
EM07	Early Warning System	Existing	Ohio Emergency Alert System
EM07	Early Warning System	Existing	Ohio State Highway Patrol Posts
EM07	Early Warning System	Existing	Ohio State Highway Patrol State Communications Center
EM07	Early Warning System	Existing	Ohio Statewide EOC/JDF
EM07	Early Warning System	Existing	Private Weather Service Systems
EM07	Early Warning System	Existing	Regional Airport Authorities
EM08	Disaster Response and Recovery	Existing	County and City Emergency Operations Centers (EOCs)
EM08	Disaster Response and Recovery	Existing	County and City Maintenance Dispatch Facilities
EM08	Disaster Response and Recovery	Existing	Freight Rail Operations
EM08	Disaster Response and Recovery	Existing	Ohio DOT District Offices
EM08	Disaster Response and Recovery	Existing	Ohio DOT Statewide TMC
EM08	Disaster Response and Recovery	Existing	Ohio State Highway Patrol Posts
EM08	Disaster Response and Recovery	Existing	Ohio State Highway Patrol State Communications Center
EM08	Disaster Response and Recovery	Existing	Ohio Statewide EOC/JDF
EM08	Disaster Response and Recovery	Existing	Regional Transit Authorities Transit Operations Centers
EM09	Evacuation and Reentry Management	Planned	County and City Emergency Operations Centers (EOCs)
EM09	Evacuation and Reentry Management	Planned	County and City Public Safety Dispatch
EM09	Evacuation and Reentry Management	Planned	County and City Traffic Management Centers
EM09	Evacuation and Reentry Management	Planned	Ohio DOT Statewide TMC
EM09	Evacuation and Reentry Management	Planned	Ohio Statewide EOC/JDF
EM09	Evacuation and Reentry Management	Planned	Ohio Turnpike Central Dispatch
EM10	Disaster Traveler Information	Existing	County and City Emergency Operations Centers (EOCs)
EM10	Disaster Traveler Information	Existing	Media Outlets
EM10	Disaster Traveler Information	Existing	Ohio DOT OHGO Traveler Information System
EM10	Disaster Traveler Information	Existing	Ohio Statewide EOC/JDF
EM10	Disaster Traveler Information	Existing	Traveler
EM10	Disaster Traveler Information	Existing	Traveler Information Device
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing	County and City Maintenance and Construction Vehicles
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing	County and City Maintenance Dispatch Facilities
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing	Ohio DOT District Offices
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing	Ohio DOT Maintenance and Construction Vehicles

Service Package	Service Package Name	Service Package Status	Included Elements
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing	Ohio Turnpike Maintenance and Construction Vehicles
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing	Ohio Turnpike Maintenance Dispatch Offices
MC02	Maintenance and Construction Vehicle Maintenance	Existing	County and City Maintenance and Construction Vehicles
MC02	Maintenance and Construction Vehicle Maintenance	Existing	County and City Maintenance Dispatch Facilities
MC02	Maintenance and Construction Vehicle Maintenance	Existing	Ohio DOT District Maintenance Repair Facilities
MC02	Maintenance and Construction Vehicle Maintenance	Existing	Ohio DOT District Offices
MC02	Maintenance and Construction Vehicle Maintenance	Existing	Ohio DOT Maintenance and Construction Vehicles
MC02	Maintenance and Construction Vehicle Maintenance	Existing	Ohio Turnpike Maintenance and Construction Vehicles
MC02	Maintenance and Construction Vehicle Maintenance	Existing	Ohio Turnpike Maintenance Dispatch Offices
MC03	Road Weather Data Collection	Existing	National Weather Service
MC03	Road Weather Data Collection	Existing	Ohio DOT District Offices
MC03	Road Weather Data Collection	Existing	Ohio DOT RWIS Stations
MC03	Road Weather Data Collection	Existing	Ohio DOT Statewide TMC
MC03	Road Weather Data Collection	Existing	Private Traveler Information Systems
MC03	Road Weather Data Collection	Existing	Private Weather Service Systems
MC04	Weather Information Processing and Distribution	Existing	National Weather Service
MC04	Weather Information Processing and Distribution	Existing	Ohio DOT District Offices
MC04	Weather Information Processing and Distribution	Existing	Ohio DOT Maintenance and Construction Center Personnel
MC04	Weather Information Processing and Distribution	Existing	Ohio DOT Statewide TMC
MC05	Roadway Automated Treatment	Existing	Ohio DOT Automated Roadway Treatment Systems
MC05	Roadway Automated Treatment	Existing	Ohio DOT District Offices
MC05	Roadway Automated Treatment	Existing	Ohio DOT Maintenance and Construction Center Personnel
MC06	Winter Maintenance	Existing	County and City Maintenance and Construction Vehicles
MC06	Winter Maintenance	Existing	County and City Maintenance Dispatch Facilities
MC06	Winter Maintenance	Existing	National Weather Service
MC06	Winter Maintenance	Existing	Ohio DOT District Offices
MC06	Winter Maintenance	Existing	Ohio DOT Maintenance and Construction Vehicles
MC06	Winter Maintenance	Existing	Ohio DOT Statewide TMC
MC06	Winter Maintenance	Existing	Ohio DOT Storage Facilities
MC06	Winter Maintenance	Existing	Private Weather Service Systems
MC07	Roadway Maintenance and Construction	Existing	Ohio DOT District Offices
MC07	Roadway Maintenance and Construction	Existing	Ohio DOT Maintenance and Construction Vehicles
MC07	Roadway Maintenance and Construction	Existing	Ohio DOT Statewide TMC

Service Package	Service Package Name	Service Package Status	Included Elements
MC07	Roadway Maintenance and Construction	Existing	Ohio DOT Storage Facilities
MC08	Work Zone Management	Existing	County and City Roadside ITS Equipment
MC08	Work Zone Management	Existing	County and City Traffic Management Centers
MC08	Work Zone Management	Existing	Drivers
MC08	Work Zone Management	Existing	Media Outlets
MC08	Work Zone Management	Existing	Ohio DOT CCTV Cameras
MC08	Work Zone Management	Existing	Ohio DOT District Offices
MC08	Work Zone Management	Existing	Ohio DOT DMS
MC08	Work Zone Management	Existing	Ohio DOT HAR
MC08	Work Zone Management	Existing	Ohio DOT Statewide TMC
MC09	Work Zone Safety Monitoring	Planned	County and City Maintenance and Construction Vehicles
MC09	Work Zone Safety Monitoring	Planned	County and City Roadside ITS Equipment
MC09	Work Zone Safety Monitoring	Planned	Drivers
MC09	Work Zone Safety Monitoring	Planned	Ohio DOT Maintenance and Construction Vehicles
MC09	Work Zone Safety Monitoring	Planned	Traffic
MC10	Maintenance and Construction Activity Coordination	Existing	County and City Maintenance Dispatch Facilities
MC10	Maintenance and Construction Activity Coordination	Existing	Freight Rail Operations
MC10	Maintenance and Construction Activity Coordination	Existing	Media Outlets
MC10	Maintenance and Construction Activity Coordination	Existing	Ohio DOT District Offices
MC12	Infrastructure Monitoring	Planned	Ohio DOT District Offices
MC12	Infrastructure Monitoring	Planned	Ohio DOT Infrastructure Monitoring Sensors
MC12	Infrastructure Monitoring	Planned	Ohio DOT Statewide TMC

6 Operational Concepts

The Operational Concept lists the roles and responsibilities that each participating agency must take on to provide the ITS services included in the Ohio Statewide ITS Architecture. Changing needs may arise that will require an agreement to be formed between all affected parties that defines new or additional roles. Defining the roles and responsibilities of the participating stakeholders in the state and the willingness of agencies to accept their roles and responsibilities is an important step in realizing the common goal of an interoperable ITS system throughout the state.

Table 4: Operational Concepts

RR Area Name	Stakeholder	RR Description	RR Status
Archived Data Systems for Ohio Statewide ITS Architecture	County and City Public Works Departments	Collect and archive traffic data from traffic signal system sensors, including traffic volumes, speeds and occupancy.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide traffic data to metropolitan planning organizations and universities and colleges.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	County and City Transit Operators	Provide transit data to metropolitan planning organizations.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	Metropolitan Planning Organizations	Collect and archive transit data from transit agencies.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	Metropolitan Planning Organizations	Collect and archive incident data from regional public safety providers.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	Metropolitan Planning Organizations	Collect and archive traffic and traveler data from county and city public works departments and the Ohio DOT.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	Ohio Department of Public Safety	Operate and maintain statewide database of crash records.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	Ohio Department of Public Safety	Provide crash database access to authorized users of the database.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Collect and archive traffic information from traffic sensors, including traffic volumes, speeds and occupancy.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Share archived traffic and traveler information with metropolitan planning organizations and universities and colleges for research.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	Ohio Environmental Protection Agency	Collect and archive air quality information in EPA Air Quality Database.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Collect and archive crash and incident information in the state crash records database.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	Regional Transit Authorities	Collect and archive transit information, such as transit fare information, passenger information, transit services, transit vehicle maintenance data, etc.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Archived Data Systems for Ohio Statewide ITS Architecture	Regional Transit Authorities	Share archived transit information with metropolitan planning organizations.	Existing
Archived Data Systems for Ohio Statewide ITS Architecture	Universities and Colleges	Collect and archive traffic data and traveler information from county and city public works departments and the Ohio DOT.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	County and City Emergency Management Agencies	Coordinate incident response for HAZMAT spills with county and city fire departments and/or county and city law enforcement agencies.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	County and City Emergency Management Agencies	Receive spill notification for hazardous materials (HAZMAT) from private fleet and freight operators.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	County and City Fire Departments	Coordinate incident response for HAZMAT spills with county and city emergency management agencies and/or county and city law enforcement agencies.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	County and City Law Enforcement Agencies	Receive spill notification for hazardous materials (HAZMAT) from private fleet and freight operators.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	County and City Law Enforcement Agencies	Coordinate incident response for HAZMAT spills with county and city fire departments and/or county and city emergency management agencies.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Coordinate incident response for HAZMAT spills with county and city fire departments and/or county and city emergency management agencies.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Receive spill notification for hazardous materials (HAZMAT) from private fleet and freight operators.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Coordinate incident response for HAZMAT spills with Ohio Emergency Management Agency and Ohio State Highway Patrol.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	Ohio Emergency Management Agency	Coordinate incident response for HAZMAT spills with Ohio DOT and Ohio State Highway Patrol.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Receive spill notification for hazardous materials (HAZMAT) from private fleet and freight operators.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Responsible for enforcement of size and weight laws relating to commercial vehicles.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Responsible for operating fixed and portable Weigh-in-Motion stations in Ohio.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Coordinate incident response for HAZMAT spills with Ohio Emergency Management Agency and/or County and City Law Enforcement Agencies.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	Private Fleet and Freight Operators	Send hazmat spill information to public safety agencies.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	Public Utilities Commission of Ohio (PUCO)	Responsible for performing roadside commercial motor vehicle inspections.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	Public Utilities Commission of Ohio (PUCO)	Communicate violations to Ohio State Highway Patrol for enforcement of motor vehicle carriers.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	Public Utilities Commission of Ohio (PUCO)	Provide administrative functions like providing credentials, tax, and safety regulation information to all commercial vehicle operators.	Existing
Commercial Vehicle Operations for Ohio Statewide ITS Architecture	Public Utilities Commission of Ohio (PUCO)	Issue credentials, collect fees and taxes, and support enforcement of credential requirements.	Existing
Electronic Toll Collection for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Operate a customer service center to process toll transactions and handle violations processing.	Planned
Electronic Toll Collection for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Operate toll collection equipment on toll roads	Planned
Electronic Toll Collection for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide customer account information via a customer service information portal (e.g., a website).	Planned
Electronic Toll Collection for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Provide customer account information using a Web site.	Existing
Electronic Toll Collection for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Coordinate with the Ohio Department of Motor Vehicles and county courts to collect tolls from violators.	Existing
Electronic Toll Collection for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Operate a customer service center to process toll transactions and handle violations processing.	Existing
Electronic Toll Collection for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Operate toll collection equipment on toll roads	Existing
Electronic Toll Collection for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Provide electronic fare payment capabilities with other regional agencies.	Existing
Electronic Toll Collection for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Provide smart card fare capabilities and coordinate with other regional agencies.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Emergency Management Agencies	Coordinate emergency plans, emergency transit schedules, and the status of emergency transit systems with local transit agencies.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Emergency Management Agencies	Coordinate emergency plans and maintenance resources with local maintenance and construction agencies.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Emergency Management for Ohio Statewide ITS Architecture	County and City Emergency Management Agencies	Provide evacuation and incident information to regional ISPs and the media for travelers in the region.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Emergency Management Agencies	Coordinate incident and threat information as part of an early warning system with regional emergency management agencies; maintenance and construction agencies; transit agencies; and ISPs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Emergency Management Agencies	Responsible for operating county and city EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Emergency Management Agencies	Coordinate wide area alert notifications with regional traffic management agencies; regional emergency management agencies; regional maintenance and construction agencies; and the regional transit agencies.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Emergency Management Agencies	Monitor and detect potential, looming, and actual disasters including natural disasters and man-made disasters.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Emergency Management Agencies	Develop and coordinate county/regional emergency plans; evacuation and re-entry plans; and disaster management plans with regional emergency and transportation management agencies.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Fire Departments	Dispatch public safety vehicles to incidents in the region.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Fire Departments	Suggest routes to public safety vehicles in response to emergencies and track public safety vehicles to the incidents.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Fire Departments	Share incident report information with county and city public safety agencies.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Law Enforcement Agencies	Dispatch public safety vehicles to incidents in the region.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Law Enforcement Agencies	Suggest routes to public safety vehicles in response to emergencies and track public safety vehicles to the incidents.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Law Enforcement Agencies	Share incident report information with county and city public safety agencies.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Coordinate evacuation and re-entry plans with county and city EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Coordinate incident and threat information as part of an early warning system with regional emergency management agencies; maintenance and construction agencies; transit agencies; and ISPs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Coordinate emergency response with county and city EOCs, the highway patrol, and other public safety agencies.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Coordinate wide area alert notifications with regional agencies responsible for traffic management, emergency management maintenance and construction, and transit operations.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Emergency Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Coordinate with regional medical centers regarding the status of the care facility.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Coordinate emergency plans and responses with County and City EOCs. Includes adjusting signal timing patterns and managing municipal roads in response to and under the direction of the County and City EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Coordinate evacuation and re-entry plans with County and City EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Transit Operators	Coordinate emergency plans, emergency transit schedules, and the status of emergency transit systems with County and City EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	County and City Transit Operators	Provide emergency transit services for evacuations, fires, and disasters, including re-entry services.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Coordinate evacuation and re-entry plans with County and City EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Dispatch Safety Patrol Vehicles that monitor roads that aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Coordinate emergency plans and emergency responses with County and City EOCs. Includes managing highways and state arterials in response to and under the direction of County and City EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide emergency information to the public. Emergency information may include evacuation zones, times, instructions, routes, and available transit services.	Planned
Emergency Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Monitor its transportation infrastructure (e.g., bridges, tunnels and operations centers) for potential threats using sensors and surveillance equipment and inform the appropriate emergency management agencies.	Planned
Emergency Management for Ohio Statewide ITS Architecture	Ohio Emergency Management Agency	Coordinate activities to mitigate, prepare for, respond to and recover from disasters, both natural and man-made.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio Emergency Management Agency	Coordinate and liaison with select County and City Emergency Management Agencies during disaster events in Ohio.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio Emergency Management Agency	Provide education, training, planning, and preparedness activities for first responders operating in Ohio.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio Emergency Management Agency	Coordinate with local, state and federal agencies in an effort to bring resources for recovery and support to citizens impacted by disasters in Ohio.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio Environmental Protection Agency	Operate and maintain air quality monitors throughout the state.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio Environmental Protection Agency	Provide air quality information to the Ohio Emergency Management Agency during emergencies related to air quality.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Issue Amber Alerts and other wide area alert information to County and City Public Safety Agencies and traffic management agencies (Ohio DOT and county and city public works departments).	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Emergency Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Coordinate evacuation and re-entry plans with county and city EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Coordinate emergency response with county and city EOCs and county and city law enforcement agencies.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Receive Amber Alert and other wide area alert information from the county and city EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Coordinate regional emergency plans, incident responses, evacuation and re-entry plans, and disaster management plans with county and city EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Dispatch highway patrol vehicles to incidents in the region.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Suggest routes to Safety Patrol Vehicles in response to emergencies and track public safety vehicles to the incidents.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Respond to potential threats to the transportation infrastructure.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Share incident report information with county and city public safety agencies.	Planned
Emergency Management for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Coordinate evacuation and re-entry plans with county and city EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Coordinate evacuation and re-entry plans with Ohio DOT.	Planned
Emergency Management for Ohio Statewide ITS Architecture	Private Companies	Remove large disabled vehicles from roadways impacting traffic as instructed by Ohio DOT.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Regional Airport Authorities	Coordinate emergency plans and responses with county and city EOCs. Includes adjusting signal timing patterns and managing municipal roads in response to and under the direction of the county and city EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Regional Airport Authorities	Coordinate evacuation and re-entry plans with county and city EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Regional Airport Authorities	Coordinate emergency plans, emergency transit schedules, and the status of emergency transit systems with county and city EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Regional Airport Authorities	Provide emergency transit services for evacuations, fires, and disasters, including re-entry services.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Regional Hospital Organizations	Coordinate with county and city public safety agencies regarding the status of care facilities during emergencies.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide emergency transit services for evacuations, fires, and disasters, including re-entry services.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Regional Transit Authorities	Coordinate emergency plans, emergency transit schedules, and the status of emergency transit systems with county and city EOCs.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Emergency Management for Ohio Statewide ITS Architecture	Universities and Colleges	Coordinate evacuation and re-entry plans with county and city EOCs.	Existing
Emergency Management for Ohio Statewide ITS Architecture	Universities and Colleges	Coordinate emergency plans and responses with county and city EOCs.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Operate traffic information devices, such as dynamic message signs and highway advisory radios.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide traffic information reports to other traffic management agencies.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide traffic information to travelers via information service providers and the media.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide traffic information, such as road network conditions, information to transit agencies.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Perform network surveillance for incident detection and verification, and send traffic/incident information and traffic images to local and county public safety agencies and County and City EOCs.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Collect traffic data from highway system sensors.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Monitor highway surveillance cameras.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide traffic information, such as road network conditions, to information service providers.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Suggest a safe driving speed for vehicles traveling on the highway or state-owned arterials.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide traffic information in a coordinated effort to the statewide TMC, state traveler information system and other traffic management agencies.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide traffic information, such as road network conditions, to maintenance and construction agencies.	Existing
Freeway Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide traffic information, such as road network conditions, to public safety agencies.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Monitor highway surveillance CCTV cameras.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide traffic information, such as road network conditions, information to transit agencies.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Monitor and control traffic information devices of other traffic management agencies, such as dynamic message signs, during certain agreed upon conditions, such as specific hours or during specific emergencies.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide traffic information, such as road network conditions, to information service providers.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Perform network surveillance for incident detection and verification, and send traffic/incident information and traffic images to county and city public safety agencies and county and city EOCs.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Collect traffic data from highway system sensors.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Monitor and control highway traffic with traffic sensors, ramp meters and lane control signals.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide traffic information, such as road network conditions, to public safety agencies.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Suggest a safe driving speed for vehicles traveling on the highway or state-owned arterials.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Operate traffic information devices, such as dynamic message signs and highway advisory radios.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Monitor the speeds of vehicles traveling on the highway or state-owned arterials.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Operate and maintain animal detection systems to alert drivers of animals on the roadway.	Planned
Freeway Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Operate and maintain overheight vehicle detection equipment to alert commercial vehicles of low-clearance bridges ahead.	Planned
Freeway Management for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Operate traffic information devices, such as dynamic message signs and highway advisory radios.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Close roadways via automatic or remotely controlled gates or barriers to vehicular traffic when driving conditions are unsafe, maintenance must be performed, or access to the roadway must be prohibited.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Provide traffic information in a coordinated effort to the state traveler information system, OHGO traffic website and other traffic management agencies.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Provide traffic information to travelers via traffic information devices on state-owned roadways (e.g., DMS and HAR equipment), and through local ISPs and web sites.	Existing
Freeway Management for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Provide traffic information, such as road network conditions, to public safety agencies.	Planned
Freeway Management for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Provide traffic information, such as road network conditions, to information service providers.	Planned
Freeway Management for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Provide traffic information, such as road network conditions, to maintenance and construction agencies.	Planned
Incident Management for Ohio Statewide ITS Architecture	County and City Emergency Management Agencies	Coordinate incident response for incidents on or adjacent to roadways with public safety agencies, and EOCs in surrounding counties and cities, including response for scheduled events.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Incident Management for Ohio Statewide ITS Architecture	County and City Fire Departments	Coordinate incident response for incidents on or adjacent to roadways with public safety agencies, and EOCs in surrounding counties and cities, including response for scheduled events.	Existing
Incident Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Receive maintenance resource requests for incident response from traffic management agencies.	Existing
Incident Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Respond to transit incidents and transit emergencies.	Existing
Incident Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Dispatch public safety vehicles to incidents in counties and cities.	Existing
Incident Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Coordinate maintenance resources in response to incidents with county and city public works departments; and the Ohio DOT District Offices that perform maintenance activities.	Existing
Incident Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Coordinate incident response with county and city public safety agencies; traffic management agencies; and the Ohio DOT, as appropriate.	Existing
Incident Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Receive emergency calls from counties and cities in the jurisdiction of individual communication centers.	Existing
Incident Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Coordinate operations with traffic management agencies during scheduled events.	Existing
Incident Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Perform incident detection and verification for all streets within its jurisdiction, and provide this information to traffic management and other public safety agencies.	Existing
Incident Management for Ohio Statewide ITS Architecture	County and City Public Safety Agencies	Coordinate incident response for incidents on or adjacent to roadways with public safety agencies, and EOCs in surrounding counties and cities, including response for scheduled events.	Planned
Incident Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide incident information to other traffic management and public safety agencies.	Planned
Incident Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Receive maintenance resource requests for incident response from county fire/EMS/sheriff, local police/fire/EMS, the state highway patrol, and 911 emergency call centers.	Planned
Incident Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Coordinate maintenance resources for incidents with other municipal and county maintenance and construction systems as well as Ohio DOT maintenance and construction operations.	Planned
Incident Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide maintenance resources in response to incidents on arterials.	Planned
Incident Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide maintenance resources in response to incidents on highways and state-operated arterials.	Existing
Incident Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide incident information to other traffic management and public safety agencies.	Existing
Incident Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Coordinate maintenance resources for incidents with other regional maintenance and construction operations, and other Ohio DOT maintenance and construction districts.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Incident Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Coordinate incident response for incidents on or adjacent to highways and state-operated roads with public safety agencies, and EOCs in surrounding counties and municipalities, including response for scheduled events.	Existing
Incident Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Receive maintenance resource requests for incident response from county and city public safety agencies, the state highway patrol, and 911 emergency call centers.	Existing
Incident Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Receive maintenance resource requests for incident response from the Ohio Statewide TMC.	Existing
Incident Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Contact private towing companies for removal of large disabled vehicles that impact traffic flow on major roadways.	Existing
Incident Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Receive emergency calls from cell phones for incidents in the region.	Existing
Incident Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Dispatch highway patrol vehicles to incidents within its jurisdiction.	Existing
Incident Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Coordinate incident response with county and municipal public safety agencies; traffic management agencies; and Ohio DOT, as appropriate.	Existing
Incident Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Perform incident detection and verification for all state-operated roadways in the region, and provide this information to traffic management and other public safety agencies.	Existing
Incident Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Coordinate operations with traffic management agencies during scheduled events.	Existing
Incident Management for Ohio Statewide ITS Architecture	Ohio State Highway Patrol	Coordinate maintenance resources in response to incidents with the county and local public works department; and the Ohio DOT maintenance section.	Existing
Incident Management for Ohio Statewide ITS Architecture	Private Companies	Dispatch tow vehicles to remove large disabled vehicles from roadways impacting traffic as instructed by Ohio DOT.	Existing
Incident Management for Ohio Statewide ITS Architecture	Private Rail Operators	Provide incident information related to private rail operations that impact general traffic to county and city public works departments and Ohio DOT.	Existing
Incident Management for Ohio Statewide ITS Architecture	Regional Airport Authorities	Coordinate incident response with Ohio DOT, county and city public safety agencies, and county and city public works departments as appropriate.	Existing
Incident Management for Ohio Statewide ITS Architecture	Regional Event Operators	Provide event information to Ohio DOT, county and city public safety agencies, and county and city public works departments as appropriate.	Existing
Incident Management for Ohio Statewide ITS Architecture	Regional Transit Authorities	Coordinate incident response with Ohio DOT, County and City Public Safety Agencies, and County and City Public Works Departments as appropriate.	Existing
Incident Management for Ohio Statewide ITS Architecture	Universities and Colleges	Coordinate incident response with Ohio DOT, county and city public safety agencies, and county and city public works departments as appropriate.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	County and City Public Works Departments	Perform maintenance for ITS field equipment owned by the agency.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	County and City Public Works Departments	Coordinate with county and city maintenance and construction systems, as well as the Ohio DOT maintenance and construction sections.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Maintenance and Construction for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide vehicle maintenance status information to the local maintenance dispatch and equipment repair facility.	Planned
Maintenance and Construction for Ohio Statewide ITS Architecture	County and City Public Works Departments	Manage work zones for all local maintenance and construction activities, and monitor work zone safety with local field devices and vehicles.	Planned
Maintenance and Construction for Ohio Statewide ITS Architecture	County and City Public Works Departments	Distribute work zone information to local transit agencies, local emergency management agencies, private rail operations, the media, and multimodal service providers.	Planned
Maintenance and Construction for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide maintenance and construction information through portable DMS devices to the traveling public	Planned
Maintenance and Construction for Ohio Statewide ITS Architecture	County and City Public Works Departments	Receive automatic vehicle location (AVL) information from maintenance and construction vehicles.	Planned
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Department of Public Safety	Operate and maintain depots and garages where materials are stored for the Ohio DOT.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide environmental data to public and private weather service providers.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Receive automatic vehicle location (AVL) information from Ohio DOT maintenance vehicles.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Manage work zones for all Ohio DOT maintenance and construction activities, and monitor work zone safety with Ohio DOT field devices and vehicles.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Collect environmental information from Ohio DOT RWIS Stations, and from public and private weather service providers	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Perform maintenance for ITS field equipment owned by the Ohio DOT.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Distribute environmental data to private weather providers, regional emergency management agencies, regional transit agencies, and county and city public works departments.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Coordinate with county and city public works departments, as well as Ohio DOT District Offices responsible for maintenance and construction.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Distribute work zone information to local transit agencies, local emergency management agencies, private rail operations, the media, and multimodal service providers.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide maintenance and construction information through portable DMS devices to the general public.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide vehicle maintenance status information to the Ohio DOT maintenance dispatch and equipment repair facility.	Planned
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Coordinate with Ohio DOT and County and City Public Safety Agencies on maintenance and construction activities.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Perform maintenance for ITS field equipment owned by the Ohio Turnpike.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Distribute work zone information to the Ohio DOT, County and City-level agencies, private rail operations, the media, and multimodal service providers.	Existing
Maintenance and Construction for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Provide maintenance and construction information through portable DMS devices to the general public.	Existing
Parking Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Establish relationships with financial institutions for smart card payments.	Planned
Parking Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Coordinate parking information between parking providers.	Planned
Parking Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Operate, monitor and manage parking facilities. Collect current parking status information and share with county and city public works departments and information service providers.	Planned
Parking Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide regional smart card and transponder tag capabilities at facilities.	Planned
Parking Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide parking information to County and City Transit Operations Centers.	Planned
Parking Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide parking lot information such as parking space availability to the public via traveler information devices such as dynamic message signs.	Planned
Parking Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide parking information to drivers via on-board vehicle information systems.	Planned
Parking Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide parking information and parking lot reservation capabilities to the regional traveler information system.	Planned
Parking Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Receive parking lot input from other Parking Management Systems for traffic coordination at parking facilities.	Planned
Parking Management for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Provide regional smart card and transponder tag capabilities at facilities.	Planned
Parking Management for Ohio Statewide ITS Architecture	Regional Airport Authorities	Establish relationships with financial institutions for smart card payments.	Planned

RR Area Name	Stakeholder	RR Description	RR Status
Parking Management for Ohio Statewide ITS Architecture	Regional Airport Authorities	Operate, monitor and manage parking facilities. Collect current parking status information and share with local TMC and information service providers.	Planned
Parking Management for Ohio Statewide ITS Architecture	Regional Airport Authorities	Provide regional smart card and transponder tag capabilities at facilities.	Planned
Parking Management for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide transit information to traffic operations centers.	Planned
Parking Management for Ohio Statewide ITS Architecture	Regional Transit Authorities	Establish relationships with financial institutions for smart card payments.	Planned
Parking Management for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide regional smart card and transponder tag capabilities at facilities.	Planned
Surface Street Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Operate and maintain traffic signal systems on county and city-owned roadways throughout the state.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Monitor the speeds of vehicles traveling through on the arterials.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Collect traffic data from the traffic signal system sensors.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Perform network surveillance for incident detection and verification, and send traffic/incident information and traffic images to local and county public safety agencies and EOCs.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Coordinate traffic signals at rail-intersection grade crossings.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Adjust signal timing patterns in response to incidents.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Operate and monitor County and City Roadside ITS Equipment, such as dynamic message signs and highway advisory radios.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide traffic information, such as road network conditions, to private traveler information systems and the media.	Planned
Surface Street Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide signal preemption for emergency vehicles.	Planned
Surface Street Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide signal priority for transit vehicles.	Planned

RR Area Name	Stakeholder	RR Description	RR Status
Surface Street Management for Ohio Statewide ITS Architecture	County and City Public Works Departments	Provide traffic information, such as road network conditions, to County and City Public Safety Agencies.	Planned
Surface Street Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Coordinate with Private Rail Operators on highway-rail intersection with special safety needs.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Collect traffic data from the traffic signal system sensors.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide signal preemption for emergency vehicles.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Operate and maintain traffic signal systems on state-owned roadways throughout the state.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide signal priority for transit vehicles.	Planned
Surface Street Management for Ohio Statewide ITS Architecture	Private Rail Operators	Coordinate with Ohio DOT on highway-rail intersection with special safety needs.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	Universities and Colleges	Operate traffic signal systems on local arterials and streets owned and operated by the municipality.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	Universities and Colleges	Adjust signal timing patterns in response to incidents.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	Universities and Colleges	Collect traffic data from the traffic signal system sensors.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	Universities and Colleges	Perform network surveillance for incident detection and verification, and send traffic/incident information and traffic images to County and City Public Safety Agencies and County and City EOCs.	Existing
Surface Street Management for Ohio Statewide ITS Architecture	Universities and Colleges	Provide maintenance information to travelers via the City of Columbus Paving the Way Website and private traveler information systems.	Planned
Surface Street Management for Ohio Statewide ITS Architecture	Universities and Colleges	Monitor arterial surveillance cameras.	Planned
Transit Services for Ohio Statewide ITS Architecture	County and City Public Works Departments	Coordinate with County and City Transit Operators and with Regional Transit Authorities for transit signal priority.	Existing
Transit Services for Ohio Statewide ITS Architecture	County and City Transit Operators	Provide a demand-responsive transit plan to users/travelers via customer information systems.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Transit Services for Ohio Statewide ITS Architecture	County and City Transit Operators	Provide operator instructions and receive schedule performance information from transit vehicles while in service.	Existing
Transit Services for Ohio Statewide ITS Architecture	County and City Transit Operators	Provide automated dispatch and scheduling for the demand-responsive or paratransit system.	Existing
Transit Services for Ohio Statewide ITS Architecture	County and City Transit Operators	Coordinate transit schedules with Regional Transit Authorities, particularly for transit connections at transit transfer points.	Existing
Transit Services for Ohio Statewide ITS Architecture	County and City Transit Operators	Provide automated dispatch and scheduling for the fixed-route system.	Existing
Transit Services for Ohio Statewide ITS Architecture	County and City Transit Operators	Provide transit security on transit vehicles through silent alarms and on-board video surveillance.	Existing
Transit Services for Ohio Statewide ITS Architecture	County and City Transit Operators	Coordinate with County and City Public Works Departments and Ohio DOT for transit signal priority.	Existing
Transit Services for Ohio Statewide ITS Architecture	County and City Transit Operators	Coordinate transit security incidents with County and City Public Safety Agencies.	Existing
Transit Services for Ohio Statewide ITS Architecture	County and City Transit Operators	Provide transit traveler information on paratransit vehicles.	Planned
Transit Services for Ohio Statewide ITS Architecture	County and City Transit Operators	Provide transit traveler information on fixed route transit vehicles.	Planned
Transit Services for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Coordinate with County and City Transit Operators and with Regional Transit Authorities for transit signal priority.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide transit passenger electronic fare payment capabilities on all transit vehicles.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Coordinate transit schedules with County and City Transit Operators and with Universities and Colleges, particularly for transit connections at transit transfer points.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Count the number of passengers entering and exiting a transit vehicle using sensors mounted on the vehicle and communicate the collected passenger data back to the operations center.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Coordinate with County and City Public Works Departments and Ohio DOT for traffic signal priority.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Coordinate transit security incidents with County and City Public Safety Agencies.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide transit security on transit vehicles through silent alarms and on-board video surveillance.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Monitor transit facilities for safety and security purposes using video surveillance and through transit user activated alarms.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide operator instructions and receive schedule performance information from transit vehicles while in service.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide automated dispatch and scheduling for the fixed-route system.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Track the location of transit vehicles.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Track and evaluate schedule performance on all fixed-route transit vehicles.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide operator instructions and receive schedule performance information from transit vehicles while in service.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide automated dispatch and scheduling for the demand-responsive or paratransit system.	Existing
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide smart card fare coordination with other regional transit agencies.	Planned
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Coordinate with multimodal transportation agencies, including Regional Airport Authorities.	Planned
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide a demand-responsive transit plan to users/travelers via customer information systems.	Planned
Transit Services for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide automated transit maintenance scheduling through automated vehicle condition.	Planned
Transit Services for Ohio Statewide ITS Architecture	Universities and Colleges	Coordinate transit schedules with Regional Transit Authorities, particularly for transit connections at transit transfer points.	Existing
Transit Services for Ohio Statewide ITS Architecture	Universities and Colleges	Monitor transit facilities for safety and security purposes using video surveillance and through transit user activated alarms.	Existing
Transit Services for Ohio Statewide ITS Architecture	Universities and Colleges	Provide automated dispatch and scheduling for the fixed-route system on university and college campuses.	Planned
Transit Services for Ohio Statewide ITS Architecture	Universities and Colleges	Track the location of transit vehicles.	Planned
Transit Services for Ohio Statewide ITS Architecture	Universities and Colleges	Track and evaluate schedule performance on all fixed-route transit vehicles.	Planned
Transit Services for Ohio Statewide ITS Architecture	Universities and Colleges	Provide smart card fare coordination with other regional transit agencies.	Planned
Traveler Information for Ohio Statewide ITS Architecture	County and City Transit Operators	Provide transit traveler information on the agency's transit and traveler information systems.	Existing
Traveler Information for Ohio Statewide ITS Architecture	Local Media	Provide traveler information received from Ohio DOT and other agencies to the general public.	Existing
Traveler Information for Ohio Statewide ITS Architecture	Neighboring State DOTs	Coordinate with Ohio DOT on providing traveler information in bi-state metro areas.	Existing
Traveler Information for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide alerts on traffic incidents, construction, travel times, and other information related to roadways throughout the state through OHGO traveler information website.	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Traveler Information for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide information on construction projects through Ohio DOT website.	Existing
Traveler Information for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide traffic information, such as road network conditions, information to transit agencies.	Existing
Traveler Information for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide traffic information, such as road network conditions, to information service providers.	Existing
Traveler Information for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide traffic information, such as road network conditions, to public safety agencies.	Existing
Traveler Information for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Coordinate with Neighboring State DOTs on providing traveler information in bi-state metro areas.	Existing
Traveler Information for Ohio Statewide ITS Architecture	Ohio Department of Transportation	Provide remote traveler support in the form of real-time information related to traffic and weather conditions at rest area tourist information centers.	Planned
Traveler Information for Ohio Statewide ITS Architecture	Ohio Turnpike and Infrastructure Commission	Provides real-time information on travel and tolls along the Ohio Turnpike for general vehicles and commercial vehicles based on entrance and exit points on their trip.	Existing
Traveler Information for Ohio Statewide ITS Architecture	Private Companies	Provide interactive traveler information, including trip planning services, through websites available to the general public.	Existing
Traveler Information for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide transit traveler information on the agency's traveler information systems.	Existing
Traveler Information for Ohio Statewide ITS Architecture	Regional Transit Authorities	Provide transit schedule and fare information to Private Traveler Information Systems.	Planned

7 Functional Requirements

Each ITS system operated by the stakeholders must perform certain functions to effectively deliver the ITS services desired by the state. The primary functions that each system needs to perform are broadly defined in the Ohio Statewide ITS Architecture. The high-level requirements are grouped into functional areas that identify requirements associated with each selected ITS service.

Table 5: Functional Requirements

Element Name	Entity Name	Functional Area	Functional Area Description
Archived Data User Systems	Archived Data User Systems		
Commercial Vehicles	Commercial Vehicle	On-board CV Electronic Data	On-board systems exchanging information between the vehicle and the roadside facility with the information such as status of driver, vehicle, carrier IDs and cargo information identified via an electronic tag.
Commercial Vehicles	Commercial Vehicle	On-board CV Safety and Security	On-board systems collect and process on-board vehicle and driver safety and security information; exchanging information with roadside and remote facilities at mainline speeds and while stopped for inspections.
Commercial Vehicles	Commercial Vehicle	On-board Trip Monitoring	On-board systems to provide automatic vehicle location and automated mileage and fuel reporting and auditing. In addition, monitors the planned route and notifies the fleet and freight management center of any deviations.
Commercial Vehicles	Location Data Source		
Commercial Vehicles	Vehicle Characteristics		
Connected Vehicles	Vehicle	Vehicle Automated Operations	In-vehicle systems to support operation on the automated portion of the highway system including the longitudinal control, lateral control for lane change/merge and roadway departure, regulating the vehicle speed and steering control.
Connected Vehicles	Vehicle	Vehicle Intersection Control	On-board systems to detect an impending collision in an intersection prior to crash impact and automatically avoid the intersection collision. May also take input from devices in the infrastructure.
Connected Vehicles	Vehicle	Vehicle Intersection Safety Warning	On-board systems to detect an impending collision in an intersection prior to crash impact and notify the driver of the presence of potentially hazardous situations and need for immediate collision avoidance action. May also take input from devices in the infrastructure.
Connected Vehicles	Vehicle	Vehicle Lateral Control	On-board systems to provide lateral control to allow "hands off" driving, automating the steering control function. Sensors to detect lanes, obstacles or vehicles to the sides of the vehicle with controls initiated by steering actuators.
Connected Vehicles	Vehicle	Vehicle Lateral Warning System	On-board sensors to monitor the areas to the sides of the vehicle and present warnings to the driver about potential hazards.
Connected Vehicles	Vehicle	Vehicle Location Determination	Receives current location of the vehicle from GPS or other positioning technology and provides this information to other in-vehicle functions.

Element Name	Entity Name	Functional Area	Functional Area Description
Connected Vehicles	Vehicle	Vehicle Longitudinal Control	On-board systems to provide longitudinal control to allow "feet off" driving, automating the function of speed control, acceleration, and braking. Sensors to detect obstacles or vehicles in the longitudinal path of the vehicle with controls initiated by accelerator and/or brake actuators.
Connected Vehicles	Vehicle	Vehicle Longitudinal Warning System	On-board sensors to monitor the areas in front of and behind the vehicle and present warnings to the driver about potential hazards.
Connected Vehicles	Vehicle	Vehicle Pre-Crash Safety Systems	On-board systems to monitor the vehicle's local environment, determine collision probability and deploy a pre-crash safety system.
Connected Vehicles	Vehicle	Vehicle Safety Monitoring System	On-board systems to diagnose critical components of the vehicle and warn the driver of potential dangers, including steering, braking, acceleration, emissions, fuel economy, engine performance, etc.
Connected Vehicles	Vehicle	Vehicle Warning System	On-board system that shares location information with nearby vehicles and warns the driver if there is a possibility of collision. It also receives location information from emergency vehicles and warns the driver of approaching emergency vehicles.
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Early Warning System	Monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies in order to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other ITS centers to notify the traveling public.
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Evacuation Support	Evacuation planning and coordination to manage evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety.
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.
County and City Emergency Operations Centers (EOCs)	Emergency Management	Incident Command	Tactical decision support, resource coordination, and communications integration among emergency management agencies for Incident Commands that are established by first responders to support local management of an incident.
County and City Emergency Operations Centers (EOCs)	Other Emergency Management		
County and City Emergency Vehicles	Emergency Vehicle	On-board EV En Route Support	On-board systems for gathering of dispatch and routing information for emergency vehicle personnel, vehicle tracking, communications with care facilities, and signal preemption via short range communication directly with traffic control equipment at the roadside.
County and City Law Enforcement	Emergency Management	Emergency Dispatch	Dispatch emergency vehicles to incidents, tracking their location and status. Pertinent incident information is gathered and relayed to the responding units.
County and City Law Enforcement	Enforcement Agency		
County and City Lift Bridge Equipment	Multimodal Crossings		
County and City Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Location Tracking	On-board systems to track vehicle location and reports the position and timestamp information to the dispatch center.

Element Name	Entity Name	Functional Area	Functional Area Description
County and City Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Safety Monitoring	On-board systems to detect vehicle intrusions and warn crew workers and drivers of imminent encroachment. Crew movements are monitored so that the crew can be warned of movement beyond the designated safe zone. Used for stationary work zones or in mobile applications where a safe zone is maintained around the moving vehicle.
County and City Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Winter Maintenance	On-board systems that support snow plow operations and other roadway treatments (e.g., salt spraying and other material applications). Supports information sharing between snow plows.
County and City Maintenance Dispatch Facilities	Maintenance and Construction Management	MCM Vehicle Tracking	Remotely tracks the location of maintenance and construction vehicles and other equipment; presented to the center personnel.
County and City Maintenance Dispatch Facilities	Maintenance and Construction Management	MCM Winter Maintenance Management	Manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying and other material applications) based on weather information.
County and City Maintenance Dispatch Facilities	Maintenance and Construction Management	MCM Work Activity Coordination	Disseminates work activity schedules and current asset restrictions to other agencies. Work schedules are coordinated, factoring in the needs and activities of other agencies and adjacent jurisdictions.
County and City Parking Management Systems	Parking Management	Parking Coordination	Coordination between parking facilities and between parking facilities and traffic, transit, and traveler information systems. Includes sharing of hours of operation, charging strategies, lot sizes, current parking availability, and parking reservations.
County and City Parking Management Systems	Parking Management	Parking Electronic Payment	Parking payment collection using in-vehicle equipment (tags) or contact or proximity traveler cards used for electronic payment. Includes field elements and back-office functionality.
County and City Parking Management Systems	Parking Management	Parking Management	Monitor vehicles and current parking availability within parking facilities. Use driver information systems (e.g., DMS) to provide parking availability and other parking facility information to drivers. Support local traffic control coordination around the parking facility.
County and City Public Safety Dispatch	Emergency Management	Emergency Call-Taking	Provides interface to the emergency call-taking systems such as the Emergency Telecommunications System (e.g., 911) that correlate call information with emergencies reported by transit agencies, commercial vehicle operators, or other public safety agencies. Allows the operator to verify the incident and forward the information to the responding agencies.
County and City Public Safety Dispatch	Emergency Management	Emergency Dispatch	Dispatch emergency vehicles to incidents, tracking their location and status. Pertinent incident information is gathered and relayed to the responding units.
County and City Roadside ITS Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.
County and City Roadside ITS Equipment	Roadway	Roadway Signal Controls	Field elements including traffic signal controllers for use at signalized intersections; also supports pedestrian crossings.
County and City Roadside ITS Equipment	Roadway	Roadway Signal Preemption	Field elements that receive signal preemption requests from approaching emergency vehicles and overrides the current operation of the traffic signals
County and City Roadside ITS Equipment	Roadway	Roadway Signal Priority	Field elements that provide the capability to receive transit vehicle signal priority requests and control traffic signals accordingly.

Element Name	Entity Name	Functional Area	Functional Area Description
County and City Roadside ITS Equipment	Roadway	Roadway Speed Monitoring and Warning	Vehicle speed sensors that detect excessive vehicle speeds, optionally based on conditions and vehicle type, informing drivers, centers and/or enforcement agencies of speed violations.
County and City Roadside ITS Equipment	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).
County and City Roadside ITS Equipment	Roadway	Roadway Work Zone Traffic Control	Field elements in maintenance and construction areas including CCTV cameras, driver information systems (such as DMS), and gates/barriers that monitor and control traffic and provide information directly to drivers in affected areas.
County and City Traffic Data Archives	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.
County and City Traffic Data Archives	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.
County and City Traffic Data Archives	Archived Data Management	Traffic and Roadside Data Archival	Collects and archives traffic and environmental information directly from the roadside for use in off-line planning, research, and analysis.
County and City Traffic Information Websites	Information Service Provider	Basic Information Broadcast	Broadcast dissemination of traffic, transit, maintenance and construction, event, and weather information to traveler interface systems and vehicles.
County and City Traffic Information Websites	Information Service Provider	Infrastructure Provided Trip Planning	Generation of pre-trip and enroute trip plans for travelers (and vehicles) based on current traffic conditions, work zones, weather, and travelers constraints and preferences. Includes end-to-end trips using multiple modes, such as bicycle, transit, etc.
County and City Traffic Management Centers	Other Traffic Management		
County and City Traffic Management Centers	Traffic Management	Collect Traffic Surveillance	Management of traffic sensors and surveillance (CCTV) equipment, collection of current traffic conditions, and distribution of the collected information to other centers and operators.
County and City Traffic Management Centers	Traffic Management	TMC Multimodal Crossing Management	Remotely monitors and manages multimodal crossings, such as draw bridges and other crossings between highway traffic and other modes; does not include highway-rail intersection.
County and City Traffic Management Centers	Traffic Management	TMC Signal Control	Remotely controls traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, emergency vehicle preemptions, pedestrian crossings, etc.
County and City Traffic Management Centers	Traffic Management	TMC Traffic Information Dissemination	Controls dissemination of traffic-related data to other centers, the media, and travelers via the driver information systems (DMS, HAR) that it operates.
County and City Transit Operations Centers	Transit Management	Transit Center Fare Management	Management of fare collection at the center - includes setting and distributing fare information, central processing of fares for transit as well as other ITS services, links to financial institutions and enforcement agencies.
County and City Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	Management of fixed route transit operations. Planning, scheduling, and dispatch associated with fixed and flexible route transit services. Updates customer service operator systems, and provides current vehicle schedule adherence and optimum scenarios for schedule adjustment.

Element Name	Entity Name	Functional Area	Functional Area Description
County and City Transit Operations Centers	Transit Management	Transit Center Information Services	Provide interactive traveler information to travelers (on-board transit vehicles, at stops/stations, using personal devices), traveler information service providers, media, and other transit organizations. Includes routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events.
County and City Transit Operations Centers	Transit Management	Transit Center Paratransit Operations	Management of demand response transit services, including paratransit. Planning and scheduling of these services. Supports automated vehicle dispatch and automatically updates customer service operator systems.
County and City Transit Operations Centers	Transit Management	Transit Center Passenger Counting	Receives and processes transit vehicle loading data using two-way communications from equipped transit vehicles.
County and City Transit Operations Centers	Transit Management	Transit Center Security	Monitor transit vehicle operator or traveler activated alarms; authenticate transit vehicle operators; remotely disable a transit vehicle; alert operators, travelers, and police to potential incidents identified by these security features.
County and City Transit Operations Centers	Transit Management	Transit Center Vehicle Tracking	Monitoring transit vehicle locations via interactions with on-board systems. Furnish users with real-time transit schedule information and maintain interface with digital map providers.
County and City Transit Vehicles	Basic Transit Vehicle		
County and City Transit Vehicles	Transit Vehicle	On-board Paratransit Operations	On-board systems to manage paratransit and flexible-route dispatch requests, including multi-stop runs. Passenger data is collected and provided to the center.
County and City Transit Vehicles	Transit Vehicle	On-board Passenger Counting	On-board systems collect transit vehicle loading data and make it available to the center.
County and City Transit Vehicles	Transit Vehicle	On-board Schedule Management	Collecting of data for schedule generation and adjustment on-board a transit vehicle. Supports communication between the vehicle, operator, and center.
County and City Transit Vehicles	Transit Vehicle	On-board Transit Fare Management	On-board systems provide fare collection using a travelers non-monetary fare medium. Collected fare data are made available to the center.
County and City Transit Vehicles	Transit Vehicle	On-board Transit Security	On-board video/audio surveillance systems, threat sensors, and object detection sensors to enhance security and safety on-board a transit vehicles. Also includes silent alarms activated by transit user or vehicle operator, operator authentication, and remote vehicle disabling.
County and City Transit Vehicles	Transit Vehicle	On-board Transit Signal Priority	On-board systems request signal priority through short range communication directly with traffic control equipment at the roadside (intersections, ramps, interchanges, etc.).
County and City Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	Support fleet management with automatic vehicle location (AVL) and automated mileage and fuel reporting and auditing.
County and City Warning Siren Systems	Alerting and Advisory Systems		
Drivers	Driver		
Financial Institutions	Financial Institution		

Element Name	Entity Name	Functional Area	Functional Area Description
Fleet and Freight Management Systems	Fleet and Freight Management	Fleet Administration	Commercial vehicle fleet tracking, dispatch, and reporting - includes interfaces to state/federal commercial vehicle administration, toll administration, emergency management, and traveler information service providers. Supports pre-hiring checks and performance monitoring for drivers.
Fleet and Freight Management Systems	Fleet and Freight Management	Fleet HAZMAT Management	Notification of hazardous materials (HAZMAT) shipments to emergency management centers for commercial vehicles managed by the center - includes information on the nature of the cargo, the vehicle, and its expected route.
Fleet and Freight Management Systems	Fleet and Freight Management	Freight Administration and Management	Management of the movement of cargo from source to destination via links to intermodal freight shippers, government agencies, and depots as well as links out to the freight equipment.
Fleet and Freight Management Systems	Intermodal Freight Depot		
FMCSA MCMIS	Other CVAS		
Freight Rail Operations	Rail Operations		
IFTA Clearinghouse	Other CVAS		
IRP Clearinghouse	Other CVAS		
Media Outlets	Media		
MPOs Data Archives	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.
MPOs Data Archives	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.
National Weather Service	Weather Service		
Neighboring State Traffic Management Centers	Other Traffic Management		
Neighboring States Roadside ITS Equipment	Other Roadway		
Neighboring States Roadside ITS Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.
Neighboring States Roadside ITS Equipment	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).
Ohio DOT 511 Telephone Information Service	Information Service Provider	Basic Information Broadcast	Broadcast dissemination of traffic, transit, maintenance and construction, event, and weather information to traveler interface systems and vehicles.
Ohio DOT 511 Telephone Information Service	Telecommunications System for Traveler Information		
Ohio DOT Animal Detection System	Roadway	Roadway Warning	Field elements used to warn drivers approaching hazards including adverse road weather conditions, traffic conditions including queues, and obstacles or animals in the road.
Ohio DOT Automated Gate Closure Systems	Roadway	Field Barrier System Control	Field elements that control barrier systems such as gates and other systems that manage entry to roadways, transportation facilities and infrastructure.

Element Name	Entity Name	Functional Area	Functional Area Description
Ohio DOT Automated Roadway Treatment Systems	Roadway	Roadway Automated Treatment	Field elements that activate automated roadway treatment systems (to disperse anti-icing chemicals, etc.) based on environmental or atmospheric conditions, or under center control.
Ohio DOT CCTV Cameras	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Intersection Safety Warning	Field elements that determine the probability of a collision in an intersection or at a railroad crossing and inform approaching vehicles using short-range wireless communications to the vehicles and traffic signal controls.
Ohio DOT District Maintenance Repair Facilities	Equipment Repair Facility		
Ohio DOT District Offices	Emergency Management	Service Patrol Management	Dispatch and communication with roadway service patrol vehicles that monitor roads to aid motorists, offering rapid response to minor incidents.
Ohio DOT District Offices	Maintenance and Construction Management	MCM Maintenance Decision Support	Maintenance Decision Support Systems recommend courses of action based on current and forecast environmental and road conditions (filtered and fused for specific time horizons) and additional application specific information. Recommendations and dispatch instructions are generated based on this integrated information.
Ohio DOT District Offices	Maintenance and Construction Management	MCM Vehicle Tracking	Remotely tracks the location of maintenance and construction vehicles and other equipment; presented to the center personnel.
Ohio DOT District Offices	Traffic Management	Barrier System Management	Remotely controls barrier systems such as gates and other systems that manage entry to roadways, transportation facilities and infrastructure.
Ohio DOT DMS	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).
Ohio DOT HAR	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).
Ohio DOT Infrastructure Monitoring Sensors	Roadway	Roadway Infrastructure Monitoring	Sensors that monitor the condition of pavement, bridges, tunnels, associated hardware, and other transportation-related infrastructure (e.g., culverts), under maintenance center and maintenance vehicle control.
Ohio DOT Infrastructure Monitoring Sensors	Security Monitoring		
Ohio DOT Lane Control Devices	Roadway	Roadway Dynamic Lane Management and Shoulder Use	Field elements including physical overhead lane signs and associated control electronics that are used to manage and control specific lanes, including temporary use of shoulders as travel lanes.
Ohio DOT Lift Bridge Equipment	Multimodal Crossings		
Ohio DOT Maintenance and Construction Center Personnel	Maintenance and Construction Center Personnel		

Element Name	Entity Name	Functional Area	Functional Area Description
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Roadway Maintenance and Construction	On-board systems that support routine non-winter maintenance on the roadway or right-of-way. Includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of equipment on the roadway.
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Location Tracking	On-board systems to track vehicle location and reports the position and timestamp information to the dispatch center.
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Safety Monitoring	On-board systems to detect vehicle intrusions and warn crew workers and drivers of imminent encroachment. Crew movements are monitored so that the crew can be warned of movement beyond the designated safe zone. Used for stationary work zones or in mobile applications where a safe zone is maintained around the moving vehicle.
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle System Monitoring and Diagnostics	On-board sensors capable of monitoring the condition of each of the vehicle systems and diagnostics that can be used to support vehicle maintenance.
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Winter Maintenance	On-board systems that support snow plow operations and other roadway treatments (e.g., salt spraying and other material applications). Supports information sharing between snow plows.
Ohio DOT OHGO Traveler Information System	Information Service Provider	Interactive Infrastructure Information	Personalized dissemination of traffic, transit, maintenance and construction, multimodal, event, and weather information to traveler interface systems and vehicles, upon request.
Ohio DOT Overheight Vehicle Detection System	Roadway	Roadway Warning	Field elements used to warn drivers approaching hazards including adverse road weather conditions, traffic conditions including queues, and obstacles or animals in the road.
Ohio DOT Ramp Meters	Roadway	Roadway Traffic Metering	Control equipment including ramp, interchange, and mainline meters and the dynamic message signs that provide information about the meters and any special bypass lanes.
Ohio DOT Rest Area Tourist Information Centers	Remote Traveler Support	Remote Basic Information Reception	Public traveler interface, such as a kiosk, that provides formatted traffic advisories, transit, event, and other traveler information, as well as broadcast alerts.
Ohio DOT Rest Area Tourist Information Centers	Remote Traveler Support	Remote Interactive Information Reception	Public traveler interface, such as a kiosk, that provides traffic, transit, yellow pages, special event, and other personalized traveler information services upon request.
Ohio DOT Rest Area Truck Parking Availability System	Parking Management	Parking Management	Monitor vehicles and current parking availability within parking facilities. Use driver information systems (e.g., DMS) to provide parking availability and other parking facility information to drivers. Support local traffic control coordination around the parking facility.
Ohio DOT RWIS Stations	Roadway	Roadway Environmental Monitoring	Environmental sensors, surface and sub-surface, that collect weather and road surface information. Weather conditions measured include temperature, wind, humidity, precipitation, and visibility. Sensors measure road surface temperature, moisture, icing, salinity, etc.
Ohio DOT Safety Patrol Vehicles	Emergency Vehicle	On-board EV En Route Support	On-board systems for gathering of dispatch and routing information for emergency vehicle personnel, vehicle tracking, communications with care facilities, and signal preemption via short range communication directly with traffic control equipment at the roadside.

Element Name	Entity Name	Functional Area	Functional Area Description
Ohio DOT Speed Monitoring Roadside Equipment	Roadway	Roadway Speed Monitoring and Warning	Vehicle speed sensors that detect excessive vehicle speeds, optionally based on conditions and vehicle type, informing drivers, centers and/or enforcement agencies of speed violations.
Ohio DOT Statewide TMC	Emergency Management	Service Patrol Management	Dispatch and communication with roadway service patrol vehicles that monitor roads to aid motorists, offering rapid response to minor incidents.
Ohio DOT Statewide TMC	Maintenance and Construction Management	MCM Environmental Information Processing	Processes current and forecast weather data, road condition information, local environmental data, and uses internal models to develop specialized detailed forecasts of local weather and surface conditions. Disseminates road weather information to other agencies and centers.
Ohio DOT Statewide TMC	Maintenance and Construction Management	MCM Vehicle Tracking	Remotely tracks the location of maintenance and construction vehicles and other equipment; presented to the center personnel.
Ohio DOT Statewide TMC	Traffic Management	Barrier System Management	Remotely controls barrier systems such as gates and other systems that manage entry to roadways, transportation facilities and infrastructure.
Ohio DOT Statewide TMC	Traffic Management	TMC Automated Vehicle Operations	Remotely controls Automated Highway Systems (AHS) in the field by providing AHS use and lane-changing parameters; could also be used for automated vehicle control through work zones.
Ohio DOT Statewide TMC	Traffic Management	TMC Dynamic Lane Management and Shoulder Use	Remotely monitors and controls dynamically managed travel lanes, including temporary use of shoulders. It monitors conditions and determines and manages lane configuration changes. Includes intersection reconfiguration, special designated lanes, temporary shoulder use, and lane use restrictions.
Ohio DOT Statewide TMC	Traffic Management	TMC Evacuation Support	Development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. Interfaces with emergency management and other traffic management centers.
Ohio DOT Statewide TMC	Traffic Management	TMC Regional Traffic Management	Coordination between traffic management centers in order to share traffic information between centers as well as control of traffic management field equipment. This may be used during incidents and special events and during day-to-day operations.
Ohio DOT Statewide TMC	Traffic Management	TMC Signal Control	Remotely controls traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, emergency vehicle preemptions, pedestrian crossings, etc.
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Information Dissemination	Controls dissemination of traffic-related data to other centers, the media, and travelers via the driver information systems (DMS, HAR) that it operates.
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Management Decision Support	Recommends courses of action to the traffic operator based on current and forecast road and traffic conditions. Recommended actions may include predefined incident response plans, signal timing plan changes, DMS/HAR messages, lane control strategies, metering strategies, etc.
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Metering	Remotely controls ramp meters, interchange connector meters, and mainline meters, covering all types of metering as well as management of bypass lanes.

Element Name	Entity Name	Functional Area	Functional Area Description
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Network Performance Evaluation	Measures performance and predicts travel demand patterns to support traffic flow optimization, demand management, and incident management. Collects data from surveillance equipment as well as input from other management centers including emissions, event promoters, and other TMCs.
Ohio DOT Statewide TMC	Traffic Management	Traffic Data Collection	Collection and storage of traffic management data. For use by operations personnel or data archives in the region.
Ohio DOT Storage Facilities	Storage Facility		
Ohio DOT Traffic Data Archive System	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.
Ohio DOT Traffic Data Archive System	Archived Data Management	On-Line Analysis and Mining	Advanced data analysis and mining features to support discovery of information, patterns, and correlations in large ITS archives.
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Controls	Field elements including traffic signal controllers for use at signalized intersections; also supports pedestrian crossings.
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Preemption	Field elements that receive signal preemption requests from approaching emergency vehicles and overrides the current operation of the traffic signals
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Priority	Field elements that provide the capability to receive transit vehicle signal priority requests and control traffic signals accordingly.
Ohio DOT Variable Speed Limit Signs	Roadway	Roadway Variable Speed Limits	Field elements including physical overhead lane signs and associated monitoring, communications, and control electronics that are used to manage and control variable speed limits systems.
Ohio DOT Vehicle Detection Devices	Roadway	Roadway Data Collection	Field elements to collect traffic, road, and environmental conditions information for use in transportation planning, research, and other off-line applications. Includes the sensors, supporting roadside infrastructure, and communications equipment.
Ohio DPS Crash Database	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.
Ohio DPS Crash Database	Archived Data Management	On-Line Analysis and Mining	Advanced data analysis and mining features to support discovery of information, patterns, and correlations in large ITS archives.
Ohio Emergency Alert System	Alerting and Advisory Systems		
Ohio EPA Air Quality Database	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.
Ohio EPA Air Quality Database	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.
Ohio EPA Air Quality Management System	Emissions Management	Emissions Data Management	Assimilation and storage of air quality measures and roadside collected emissions data; distribution for general traveler information or for use in demand management programs.
Ohio EPA Air Quality Monitors	Roadway	Roadway Emissions Monitoring	Emissions and air quality sensors that collect vehicular emissions and area-wide air quality data.

Element Name	Entity Name	Functional Area	Functional Area Description
Ohio Motor Carrier Information System (OMCIS)	DMV		
Ohio Motor Carrier Information System (OMCIS)	Other CVAS		
Ohio State Highway Patrol Posts	Emergency Management	Emergency Call-Taking	Provides interface to the emergency call-taking systems such as the Emergency Telecommunications System (e.g., 911) that correlate call information with emergencies reported by transit agencies, commercial vehicle operators, or other public safety agencies. Allows the operator to verify the incident and forward the information to the responding agencies.
Ohio State Highway Patrol Posts	Emergency Management	Emergency Dispatch	Dispatch emergency vehicles to incidents, tracking their location and status. Pertinent incident information is gathered and relayed to the responding units.
Ohio State Highway Patrol Posts	Enforcement Agency		
Ohio State Highway Patrol Pre-Pass System	Commercial Vehicle Check	Roadside Electronic Screening	Roadside check facility equipment to communicate with commercial vehicles at mainline speeds - reading tag data, identification, weight and vehicle characteristics, and credential checking. Determines whether a pull-in message should be generated, allowing for inspectors to override.
Ohio State Highway Patrol State Communications Center	Emergency Management	Emergency Dispatch	Dispatch emergency vehicles to incidents, tracking their location and status. Pertinent incident information is gathered and relayed to the responding units.
Ohio State Highway Patrol State Communications Center	Emergency Management	Emergency Evacuation Support	Evacuation planning and coordination to manage evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety.
Ohio State Highway Patrol State Communications Center	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.
Ohio State Highway Patrol State Communications Center	Emergency Management	Incident Command	Tactical decision support, resource coordination, and communications integration among emergency management agencies for Incident Commands that are established by first responders to support local management of an incident.
Ohio State Highway Patrol Vehicles	Emergency Vehicle	On-board EV En Route Support	On-board systems for gathering of dispatch and routing information for emergency vehicle personnel, vehicle tracking, communications with care facilities, and signal preemption via short range communication directly with traffic control equipment at the roadside.
Ohio State Highway Patrol Weigh-In-Motion Stations	Commercial Vehicle Check	Roadside WIM	Roadside check facility equipment to detect and measure the weight commercial vehicles at high speed. Can include an interface to the credential checking or it can be a stand alone package with display.
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	Monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies in order to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other ITS centers to notify the traveling public.
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	Evacuation planning and coordination to manage evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety.

Element Name	Entity Name	Functional Area	Functional Area Description
Ohio Statewide EOC/JDF	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.
Ohio Statewide EOC/JDF	Emergency Management	Incident Command	Tactical decision support, resource coordination, and communications integration among emergency management agencies for Incident Commands that are established by first responders to support local management of an incident.
Ohio Turnpike CCTV Cameras	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.
Ohio Turnpike Central Dispatch	Traffic Management	Collect Traffic Surveillance	Management of traffic sensors and surveillance (CCTV) equipment, collection of current traffic conditions, and distribution of the collected information to other centers and operators.
Ohio Turnpike Central Dispatch	Traffic Management	TMC Traffic Information Dissemination	Controls dissemination of traffic-related data to other centers, the media, and travelers via the driver information systems (DMS, HAR) that it operates.
Ohio Turnpike DMS	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).
Ohio Turnpike E-ZPass Tags	Vehicle	Vehicle Toll/Parking Interface	On-board systems to support paying toll without stopping and pay for parking without the use of cash through the use of an active tag interface and debit/credit card interface.
Ohio Turnpike Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Location Tracking	On-board systems to track vehicle location and reports the position and timestamp information to the dispatch center.
Ohio Turnpike Maintenance Dispatch Offices	Maintenance and Construction Management	MCM Vehicle Tracking	Remotely tracks the location of maintenance and construction vehicles and other equipment; presented to the center personnel.
Ohio Turnpike Toll Administration	Payment Administration	Toll Administration	Management of toll collection for private and commercial vehicles, dynamic pricing, payment reconciliation with financial institutions, and violation notification to enforcement agencies.
Ohio Turnpike Toll Collection Equipment	Roadway Payment	Toll Plaza Toll Collection	Roadside collection of tolls from vehicle toll tags and violation identification.
Ohio Turnpike Website	Information Service Provider	Basic Information Broadcast	Broadcast dissemination of traffic, transit, maintenance and construction, event, and weather information to traveler interface systems and vehicles.
Ohio Turnpike Website	Information Service Provider	Interactive Infrastructure Information	Personalized dissemination of traffic, transit, maintenance and construction, multimodal, event, and weather information to traveler interface systems and vehicles, upon request.
Potential Obstacles	Potential Obstacles		
Private Rail Operations Active Warning Roadside Equipment	Roadway	Advanced Rail Crossing	Field elements at highway-rail intersections (HRIs) where operational requirements demand advanced features (e.g., where rail operational speeds are greater than 80 miles per hour). Capabilities from the Standard Rail Crossing plus systems which preclude entrance into the intersection when the barriers are activated, additional arriving train information, and detection of blocked intersections.

Element Name	Entity Name	Functional Area	Functional Area Description
Private Rail Operations Active Warning Roadside Equipment	Roadway	Standard Rail Crossing	Field elements at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Includes traditional HRI warning systems augmented with other standard traffic management devices.
Private Rail Operations Wayside Equipment	Wayside Equipment		
Private Towing Dispatch Agencies	Other Emergency Management		
Private Traveler Information Systems	Information Service Provider	Interactive Infrastructure Information	Personalized dissemination of traffic, transit, maintenance and construction, multimodal, event, and weather information to traveler interface systems and vehicles, upon request.
Private Weather Service Systems	Surface Transportation Weather Service		
PUCO Commercial Vehicle Compliance Check	Commercial Vehicle Check	Citation and Accident Electronic Recording	Roadside check facility equipment records results of roadside inspections and forwards information to the commercial vehicle administration center. Includes accident reports, violations, citations, and the daily site activity data.
PUCO Commercial Vehicle Compliance Check	Commercial Vehicle Check	Roadside Safety and Security Inspection	Roadside check facility equipment to provide the capabilities to automate the roadside safety inspection process including wireless roadside inspections and use of hand held devices to rapidly inspect the vehicle and driver.
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Data Collection	Collects and stores information related to Commercial Vehicle Operations. For use by operations personnel or data archives in the region.
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Information Exchange	Exchange information concerning safety, credentialing, and operations of commercial vehicles between the center and the roadside check stations, across jurisdictions, with fleet operators and other information requestors.
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Safety and Security Administration	Provides commercial vehicle safety and security criteria to roadside check facilities, collects and reviews safety and security data from the field, conducts wireless roadside inspections, and distributes safety and security information to other centers, carriers, and enforcement agencies.
Regional Airport Authorities	Multimodal Transportation Service Provider		
Regional Airport Authorities	Traffic Management	Collect Traffic Surveillance	Management of traffic sensors and surveillance (CCTV) equipment, collection of current traffic conditions, and distribution of the collected information to other centers and operators.
Regional Airport Authorities	Traffic Management	TMC Traffic Information Dissemination	Controls dissemination of traffic-related data to other centers, the media, and travelers via the driver information systems (DMS, HAR) that it operates.
Regional Airport Authorities Parking Management Systems	Parking Management	Parking Coordination	Coordination between parking facilities and between parking facilities and traffic, transit, and traveler information systems. Includes sharing of hours of operation, charging strategies, lot sizes, current parking availability, and parking reservations.
Regional Airport Authorities Parking Management Systems	Parking Management	Parking Electronic Payment	Parking payment collection using in-vehicle equipment (tags) or contact or proximity traveler cards used for electronic payment. Includes field elements and back-office functionality.

Element Name	Entity Name	Functional Area	Functional Area Description
Regional Airport Authorities Parking Management Systems	Parking Management	Parking Management	Monitor vehicles and current parking availability within parking facilities. Use driver information systems (e.g., DMS) to provide parking availability and other parking facility information to drivers. Support local traffic control coordination around the parking facility.
Regional Airport Authorities Roadside ITS Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.
Regional Airport Authorities Roadside ITS Equipment	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).
Regional Event Operations	Event Promoters		
Regional Hospitals and Trauma Centers	Care Facility		
Regional Transit Authorities Ticket Vending Machines	Remote Traveler Support	Remote Transit Fare Management	Public traveler interface, such as a kiosk, that provides the capability for the traveler to use a common fare medium for transit fares, tolls, and/or parking lot charges, to calculate the amount due and identify payment problems.
Regional Transit Authorities Transit Data Archives	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.
Regional Transit Authorities Transit Data Archives	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.
Regional Transit Authorities Transit Information Kiosks	Remote Traveler Support	Remote Transit Information Services	Public traveler interface that provides real-time travel-related information at transit stops and multi-modal transfer points, including general annunciation, display of imminent arrival information, the latest available information on transit routes, schedules, transfer options, available services, fares, and real-time schedule adherence.
Regional Transit Authorities Transit Information Systems	Information Service Provider		
Regional Transit Authorities Transit Information Systems	Remote Traveler Support	Remote Transit Information Services	Public traveler interface that provides real-time travel-related information at transit stops and multi-modal transfer points, including general annunciation, display of imminent arrival information, the latest available information on transit routes, schedules, transfer options, available services, fares, and real-time schedule adherence.
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fare Management	Management of fare collection at the center - includes setting and distributing fare information, central processing of fares for transit as well as other ITS services, links to financial institutions and enforcement agencies.
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	Management of fixed route transit operations. Planning, scheduling, and dispatch associated with fixed and flexible route transit services. Updates customer service operator systems, and provides current vehicle schedule adherence and optimum scenarios for schedule adjustment.

Element Name	Entity Name	Functional Area	Functional Area Description
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Information Services	Provide interactive traveler information to travelers (on-board transit vehicles, at stops/stations, using personal devices), traveler information service providers, media, and other transit organizations. Includes routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events.
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Paratransit Operations	Management of demand response transit services, including paratransit. Planning and scheduling of these services. Supports automated vehicle dispatch and automatically updates customer service operator systems.
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Passenger Counting	Receives and processes transit vehicle loading data using two-way communications from equipped transit vehicles.
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Security	Monitor transit vehicle operator or traveler activated alarms; authenticate transit vehicle operators; remotely disable a transit vehicle; alert operators, travelers, and police to potential incidents identified by these security features.
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Vehicle Tracking	Monitoring transit vehicle locations via interactions with on-board systems. Furnish users with real-time transit schedule information and maintain interface with digital map providers.
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Garage Maintenance	Collect operational and maintenance data from transit vehicles, manage vehicle service histories, automatically generate preventative maintenance schedules, and provide information to service personnel.
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Vehicle Assignment	Assigns individual transit vehicles to vehicle blocks and downloads this information to the transit vehicle, updating assignments as necessitated by changes. It also provides an inventory management function that stores attributes about each of the transit vehicles.
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Vehicle Operator Assignment	Assignment of transit operators to runs in a fair manner while minimizing labor and overtime services, considering operator preferences, qualifications, accumulated work hours, and other information about each operator.
Regional Transit Authorities Transit Websites	Information Service Provider	Infrastructure Provided Trip Planning	Generation of pre-trip and enroute trip plans for travelers (and vehicles) based on current traffic conditions, work zones, weather, and travelers constraints and preferences. Includes end-to-end trips using multiple modes, such as bicycle, transit, etc.
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Maintenance	On-board systems to collect and process transit vehicle maintenance data including mileage and vehicle operating conditions for use in scheduling future vehicle maintenance.
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Paratransit Operations	On-board systems to manage paratransit and flexible-route dispatch requests, including multi-stop runs. Passenger data is collected and provided to the center.
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Passenger Counting	On-board systems collect transit vehicle loading data and make it available to the center.
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Schedule Management	Collecting of data for schedule generation and adjustment on-board a transit vehicle. Supports communication between the vehicle, operator, and center.

Element Name	Entity Name	Functional Area	Functional Area Description
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Fare Management	On-board systems provide fare collection using a travelers non-monetary fare medium. Collected fare data are made available to the center.
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Information Services	On-board systems to furnish next-stop annunciation as well as interactive travel-related information, including routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, non-motorized transportation services, and special events.
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Security	On-board video/audio surveillance systems, threat sensors, and object detection sensors to enhance security and safety on-board a transit vehicles. Also includes silent alarms activated by transit user or vehicle operator, operator authentication, and remote vehicle disabling.
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Signal Priority	On-board systems request signal priority through short range communication directly with traffic control equipment at the roadside (intersections, ramps, interchanges, etc.).
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	Support fleet management with automatic vehicle location (AVL) and automated mileage and fuel reporting and auditing.
Traffic	Traffic		
Transit Traveler Cards	Traveler Card		
Traveler	Traveler		
Traveler Information Device	Personal Information Access	Personal Basic Information Reception	Personal traveler interface that provides formatted traffic advisories, transit, event, and other traveler information, as well as broadcast alerts. Devices include personal computers and personal portable devices such as PDAs and pagers.
Traveler Information Device	Personal Information Access	Personal Interactive Information Reception	Personal traveler interface that provides traffic, transit, yellow pages, event, and trip planning information, and other personalized traveler information services upon request. Devices include personal computers and personal portable devices such as PDAs.
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Fare Management	Management of fare collection at the center - includes setting and distributing fare information, central processing of fares for transit as well as other ITS services, links to financial institutions and enforcement agencies.
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	Management of fixed route transit operations. Planning, scheduling, and dispatch associated with fixed and flexible route transit services. Updates customer service operator systems, and provides current vehicle schedule adherence and optimum scenarios for schedule adjustment.
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Information Services	Provide interactive traveler information to travelers (on-board transit vehicles, at stops/stations, using personal devices), traveler information service providers, media, and other transit organizations. Includes routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events.
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Security	Monitor transit vehicle operator or traveler activated alarms; authenticate transit vehicle operators; remotely disable a transit vehicle; alert operators, travelers, and police to potential incidents identified by these security features.

Element Name	Entity Name	Functional Area	Functional Area Description
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Vehicle Tracking	Monitoring transit vehicle locations via interactions with on-board systems. Furnish users with real-time transit schedule information and maintain interface with digital map providers.
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Schedule Management	Collecting of data for schedule generation and adjustment on-board a transit vehicle. Supports communication between the vehicle, operator, and center.
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Transit Fare Management	On-board systems provide fare collection using a travelers non-monetary fare medium. Collected fare data are made available to the center.
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Transit Security	On-board video/audio surveillance systems, threat sensors, and object detection sensors to enhance security and safety on-board a transit vehicles. Also includes silent alarms activated by transit user or vehicle operator, operator authentication, and remote vehicle disabling.
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Transit Signal Priority	On-board systems request signal priority through short range communication directly with traffic control equipment at the roadside (intersections, ramps, interchanges, etc.).
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	Support fleet management with automatic vehicle location (AVL) and automated mileage and fuel reporting and auditing.

8 Interfaces Between Systems

The interfaces of the transportation systems in Ohio Statewide ITS Architecture are based on the National ITS Architecture and tailored to reflect the plan for the state. Architecture diagrams display the transportation systems in the Ohio Statewide ITS Architecture, and more importantly, how these systems are and will be connected with one another so information can be exchanged and transportation services can be coordinated. Stakeholders may use these diagrams to identify integration opportunities. Each system is represented with two types of diagrams, a context diagram and an architecture flow diagram.

A context diagram shows a particular system and all other systems with which it shares information. Interconnects are represented as single lines and indicate information sharing without specifying the type of information being shared or the direction of the information movement.

Following each interconnect context diagram are a series of architecture flow diagrams showing the information (i.e. architecture flows) movement between the various systems. Descriptions of the architecture flows are included at the end of the chapter.

Information about the interfaces of the systems is contained in the Turbo Architecture™ database. Turbo Architecture™ can be used to create tailored interconnect and architecture flow diagrams for any system in the database.

Table 6: Interconnects

Element 1	Element 2	Communications	Status
Archived Data User Systems	County and City Traffic Data Archives	Not identified	Existing
Archived Data User Systems	MPOs Data Archives	Not identified	Existing
Archived Data User Systems	Ohio DOT Traffic Data Archive System	Not identified	Existing
Archived Data User Systems	Ohio DPS Crash Database	Not identified	Existing
Archived Data User Systems	Ohio EPA Air Quality Database	Not identified	Existing
Archived Data User Systems	Regional Transit Authorities Transit Data Archives	Not identified	Existing
Commercial Vehicles	Fleet and Freight Management Systems	Not identified	Existing
Commercial Vehicles	Ohio DOT Overheight Vehicle Detection System	Not identified	Planned
Commercial Vehicles	Ohio DOT Rest Area Truck Parking Availability System	Not identified	Planned
Commercial Vehicles	Ohio State Highway Patrol Pre-Pass System	Not identified	Existing

Element 1	Element 2	Communications	Status
Commercial Vehicles	Ohio State Highway Patrol Weigh-In-Motion Stations	Not identified	Existing
Commercial Vehicles	PUCO Commercial Vehicle Compliance Check	Not identified	Existing
Connected Vehicles	Drivers	Not identified	Planned
Connected Vehicles	Ohio DOT Connected Vehicles Roadside Equipment	Not identified	Planned
Connected Vehicles	Potential Obstacles	Not identified	Planned
County and City Emergency Operations Centers (EOCs)	County and City Maintenance Dispatch Facilities	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	County and City Public Safety Dispatch	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	County and City Traffic Management Centers	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	County and City Transit Operations Centers	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	County and City Warning Siren Systems	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Fleet and Freight Management Systems	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Freight Rail Operations	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Media Outlets	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	National Weather Service	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Ohio DOT District Offices	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Ohio DOT Statewide TMC	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Ohio Emergency Alert System	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Ohio State Highway Patrol Posts	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Ohio State Highway Patrol State Communications Center	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Ohio Statewide EOC/JDF	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Private Weather Service Systems	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Regional Airport Authorities	Not identified	Existing
County and City Emergency Operations Centers (EOCs)	Regional Transit Authorities Transit Operations Centers	Not identified	Existing

Element 1	Element 2	Communications	Status
County and City Emergency Operations Centers (EOCs)	Universities and Colleges Transit Operations Centers	Not identified	Existing
County and City Emergency Vehicles	County and City Public Safety Dispatch	Not identified	Existing
County and City Emergency Vehicles	County and City Roadside ITS Equipment	Not identified	Existing
County and City Emergency Vehicles	Ohio DOT Traffic Signal Systems	Not identified	Existing
County and City Emergency Vehicles	Regional Hospitals and Trauma Centers	Not identified	Existing
County and City Law Enforcement	County and City Public Safety Dispatch	Not identified	Existing
County and City Law Enforcement	MPOs Data Archives	Not identified	Planned
County and City Law Enforcement	Ohio DOT Speed Monitoring Roadside Equipment	Not identified	Planned
County and City Law Enforcement	Ohio DPS Crash Database	Not identified	Planned
County and City Law Enforcement	Ohio State Highway Patrol Posts	Not identified	Existing
County and City Law Enforcement	Ohio State Highway Patrol State Communications Center	Not identified	Existing
County and City Lift Bridge Equipment	County and City Roadside ITS Equipment	Not identified	Existing
County and City Lift Bridge Equipment	County and City Traffic Management Centers	Not identified	Existing
County and City Lift Bridge Equipment	Ohio DOT Traffic Signal Systems	Not identified	Existing
County and City Maintenance and Construction Vehicles	County and City Maintenance Dispatch Facilities	Not identified	Existing
County and City Maintenance and Construction Vehicles	County and City Roadside ITS Equipment	Not identified	Planned
County and City Maintenance and Construction Vehicles	Traffic	Not identified	Planned
County and City Maintenance Dispatch Facilities	County and City Public Safety Dispatch	Not identified	Existing
County and City Maintenance Dispatch Facilities	County and City Traffic Information Websites	Not identified	Existing
County and City Maintenance Dispatch Facilities	County and City Traffic Management Centers	Not identified	Existing
County and City Maintenance Dispatch Facilities	County and City Transit Operations Centers	Not identified	Existing
County and City Maintenance Dispatch Facilities	Media Outlets	Not identified	Existing

Element 1	Element 2	Communications	Status
County and City Maintenance Dispatch Facilities	National Weather Service	Not identified	Existing
County and City Maintenance Dispatch Facilities	Ohio DOT District Offices	Not identified	Existing
County and City Maintenance Dispatch Facilities	Ohio DOT Statewide TMC	Not identified	Existing
County and City Maintenance Dispatch Facilities	Ohio State Highway Patrol Posts	Not identified	Existing
County and City Maintenance Dispatch Facilities	Ohio State Highway Patrol State Communications Center	Not identified	Existing
County and City Maintenance Dispatch Facilities	Ohio Statewide EOC/JDF	Not identified	Existing
County and City Maintenance Dispatch Facilities	Private Weather Service Systems	Not identified	Existing
County and City Maintenance Dispatch Facilities	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
County and City Parking Management Systems	Drivers	Not identified	Existing
County and City Parking Management Systems	Financial Institutions	Not identified	Existing
County and City Parking Management Systems	Ohio DOT District Offices	Not identified	Planned
County and City Parking Management Systems	Ohio Turnpike E-ZPass Tags	Not identified	Planned
County and City Parking Management Systems	Regional Airport Authorities Parking Management Systems	Not identified	Planned
County and City Public Safety Dispatch	County and City Traffic Management Centers	Not identified	Existing
County and City Public Safety Dispatch	County and City Warning Siren Systems	Not identified	Existing
County and City Public Safety Dispatch	Fleet and Freight Management Systems	Not identified	Existing
County and City Public Safety Dispatch	Media Outlets	Not identified	Existing
County and City Public Safety Dispatch	MPOs Data Archives	Not identified	Planned
County and City Public Safety Dispatch	Ohio DOT Statewide TMC	Not identified	Existing
County and City Public Safety Dispatch	Ohio DPS Crash Database	Not identified	Planned
County and City Public Safety Dispatch	Ohio Emergency Alert System	Not identified	Existing
County and City Public Safety Dispatch	Ohio State Highway Patrol Posts	Not identified	Existing

Element 1	Element 2	Communications	Status
County and City Public Safety Dispatch	Ohio State Highway Patrol State Communications Center	Not identified	Existing
County and City Public Safety Dispatch	Ohio Statewide EOC/JDF	Not identified	Existing
County and City Public Safety Dispatch	Regional Airport Authorities	Not identified	Existing
County and City Public Safety Dispatch	Regional Event Operations	Not identified	Existing
County and City Roadside ITS Equipment	County and City Traffic Data Archives	Not identified	Existing
County and City Roadside ITS Equipment	County and City Traffic Management Centers	Not identified	Existing
County and City Roadside ITS Equipment	County and City Transit Vehicles	Not identified	Existing
County and City Roadside ITS Equipment	Drivers	Not identified	Existing
County and City Roadside ITS Equipment	MPOs Data Archives	Not identified	Planned
County and City Roadside ITS Equipment	Ohio DOT Lift Bridge Equipment	Not identified	Existing
County and City Roadside ITS Equipment	Ohio DOT Traffic Data Archive System	Not identified	Planned
County and City Roadside ITS Equipment	Ohio DPS Crash Database	Not identified	Planned
County and City Roadside ITS Equipment	Ohio State Highway Patrol Vehicles	Not identified	Existing
County and City Roadside ITS Equipment	Regional Transit Authority Transit Vehicles	Not identified	Existing
County and City Roadside ITS Equipment	Traffic	Not identified	Planned
County and City Roadside ITS Equipment	Universities and Colleges Transit Vehicles	Not identified	Planned
County and City Traffic Data Archives	County and City Traffic Management Centers	Not identified	Existing
County and City Traffic Data Archives	Ohio DOT Vehicle Detection Devices	Not identified	Existing
County and City Traffic Information Websites	County and City Traffic Management Centers	Not identified	Existing
County and City Traffic Information Websites	County and City Transit Operations Centers	Not identified	Existing
County and City Traffic Information Websites	Private Traveler Information Systems	Not identified	Existing
County and City Traffic Information Websites	Regional Transit Authorities Transit Information Systems	Not identified	Existing

Element 1	Element 2	Communications	Status
County and City Traffic Information Websites	Regional Transit Authorities Transit Websites	Not identified	Existing
County and City Traffic Information Websites	Traveler Information Device	Not identified	Existing
County and City Traffic Management Centers	Media Outlets	Not identified	Existing
County and City Traffic Management Centers	MPOs Data Archives	Not identified	Planned
County and City Traffic Management Centers	National Weather Service	Not identified	Existing
County and City Traffic Management Centers	Ohio DOT District Offices	Not identified	Existing
County and City Traffic Management Centers	Ohio DOT Lift Bridge Equipment	Not identified	Existing
County and City Traffic Management Centers	Ohio DOT Statewide TMC	Not identified	Existing
County and City Traffic Management Centers	Ohio DOT Traffic Data Archive System	Not identified	Planned
County and City Traffic Management Centers	Ohio Emergency Alert System	Not identified	Existing
County and City Traffic Management Centers	Ohio State Highway Patrol Posts	Not identified	Existing
County and City Traffic Management Centers	Ohio State Highway Patrol State Communications Center	Not identified	Existing
County and City Traffic Management Centers	Ohio Statewide EOC/JDF	Not identified	Existing
County and City Traffic Management Centers	Regional Event Operations	Not identified	Existing
County and City Transit Operations Centers	County and City Transit Vehicles	Not identified	Existing
County and City Transit Operations Centers	Financial Institutions	Not identified	Existing
County and City Transit Operations Centers	Media Outlets	Not identified	Existing
County and City Transit Operations Centers	Regional Airport Authorities	Not identified	Existing
County and City Transit Operations Centers	Regional Transit Authorities Transit Information Systems	Not identified	Existing
County and City Transit Operations Centers	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
County and City Transit Operations Centers	Traveler Information Device	Not identified	Existing
County and City Transit Vehicles	Ohio DOT Traffic Signal Systems	Not identified	Existing
County and City Transit Vehicles	Transit Traveler Cards	Not identified	Existing

Element 1	Element 2	Communications	Status
County and City Transit Vehicles	Traveler	Not identified	Existing
Drivers	Neighboring States Roadside ITS Equipment	Not identified	Existing
Drivers	Ohio DOT Animal Detection System	Not identified	Planned
Drivers	Ohio DOT Automated Gate Closure Systems	Not identified	Planned
Drivers	Ohio DOT Connected Vehicles Roadside Equipment	Not identified	Planned
Drivers	Ohio DOT DMS	Not identified	Existing
Drivers	Ohio DOT HAR	Not identified	Existing
Drivers	Ohio DOT Lane Control Devices	Not identified	Planned
Drivers	Ohio DOT Overheight Vehicle Detection System	Not identified	Planned
Drivers	Ohio DOT Ramp Meters	Not identified	Existing
Drivers	Ohio DOT Rest Area Truck Parking Availability System	Not identified	Planned
Drivers	Ohio DOT Speed Monitoring Roadside Equipment	Not identified	Planned
Drivers	Ohio DOT Variable Speed Limit Signs	Not identified	Planned
Drivers	Ohio Turnpike DMS	Not identified	Existing
Drivers	Private Rail Operations Active Warning Roadside Equipment	Not identified	Existing
Drivers	Regional Airport Authorities Parking Management Systems	Not identified	Existing
Drivers	Regional Airport Authorities Roadside ITS Equipment	Not identified	Existing
Financial Institutions	Ohio Turnpike Toll Administration	Not identified	Existing
Financial Institutions	Regional Airport Authorities Parking Management Systems	Not identified	Existing
Financial Institutions	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
Financial Institutions	Universities and Colleges Transit Operations Centers	Not identified	Existing
Fleet and Freight Management Systems	Ohio State Highway Patrol Posts	Not identified	Existing
Fleet and Freight Management Systems	Ohio State Highway Patrol State Communications Center	Not identified	Existing
Fleet and Freight Management Systems	Ohio Statewide EOC/JDF	Not identified	Existing
Fleet and Freight Management Systems	Ohio Turnpike Website	Not identified	Existing

Element 1	Element 2	Communications	Status
Fleet and Freight Management Systems	PUCO Commercial Vehicle Registration System	Not identified	Existing
FMCSA MCMIS	PUCO Commercial Vehicle Registration System	Not identified	Existing
Freight Rail Operations	Ohio DOT District Offices	Not identified	Existing
Freight Rail Operations	Ohio DOT Statewide TMC	Not identified	Existing
Freight Rail Operations	Ohio State Highway Patrol Posts	Not identified	Existing
Freight Rail Operations	Ohio State Highway Patrol State Communications Center	Not identified	Existing
Freight Rail Operations	Ohio Statewide EOC/JDF	Not identified	Existing
IFTA Clearinghouse	PUCO Commercial Vehicle Registration System	Not identified	Existing
IRP Clearinghouse	PUCO Commercial Vehicle Registration System	Not identified	Existing
Media Outlets	Ohio DOT District Offices	Not identified	Existing
Media Outlets	Ohio DOT Statewide TMC	Not identified	Existing
Media Outlets	Ohio EPA Air Quality Management System	Not identified	Existing
Media Outlets	Ohio State Highway Patrol State Communications Center	Not identified	Existing
Media Outlets	Ohio Statewide EOC/JDF	Not identified	Existing
Media Outlets	Ohio Turnpike Central Dispatch	Not identified	Existing
Media Outlets	Private Traveler Information Systems	Not identified	Existing
Media Outlets	Regional Airport Authorities	Not identified	Existing
Media Outlets	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
Media Outlets	Universities and Colleges Transit Operations Centers	Not identified	Existing
MPOs Data Archives	Ohio DOT Vehicle Detection Devices	Not identified	Existing
National Weather Service	Ohio DOT District Offices	Not identified	Existing
National Weather Service	Ohio DOT Statewide TMC	Not identified	Existing
National Weather Service	Ohio EPA Air Quality Management System	Not identified	Existing
National Weather Service	Ohio State Highway Patrol State Communications Center	Not identified	Existing
National Weather Service	Ohio Statewide EOC/JDF	Not identified	Existing
National Weather Service	Ohio Turnpike Central Dispatch	Not identified	Existing
National Weather Service	Ohio Turnpike Maintenance Dispatch Offices	Not identified	Existing
National Weather Service	Private Traveler Information Systems	Not identified	Existing

Element 1	Element 2	Communications	Status
Neighboring State Traffic Management Centers	Ohio DOT District Offices	Not identified	Existing
Neighboring State Traffic Management Centers	Ohio DOT Statewide TMC	Not identified	Existing
Neighboring States Roadside ITS Equipment	Ohio DOT District Offices	Not identified	Existing
Neighboring States Roadside ITS Equipment	Ohio DOT Statewide TMC	Not identified	Existing
Ohio DOT 511 Telephone Information Service	Ohio DOT OHGO Traveler Information System	Not identified	Planned
Ohio DOT 511 Telephone Information Service	Traveler Information Device	Not identified	Existing
Ohio DOT Animal Detection System	Potential Obstacles	Not identified	Planned
Ohio DOT Automated Gate Closure Systems	Ohio DOT District Offices	Not identified	Planned
Ohio DOT Automated Gate Closure Systems	Ohio DOT Statewide TMC	Not identified	Planned
Ohio DOT Automated Roadway Treatment Systems	Ohio DOT District Offices	Not identified	Existing
Ohio DOT CCTV Cameras	Ohio DOT District Offices	Not identified	Existing
Ohio DOT CCTV Cameras	Ohio DOT Statewide TMC	Not identified	Existing
Ohio DOT Connected Vehicles Roadside Equipment	Ohio DOT Statewide TMC	Not identified	Planned
Ohio DOT Connected Vehicles Roadside Equipment	Traffic	Not identified	Planned
Ohio DOT District Maintenance Repair Facilities	Ohio DOT District Offices	Not identified	Existing
Ohio DOT District Maintenance Repair Facilities	Ohio DOT Maintenance and Construction Vehicles	Not identified	Existing
Ohio DOT District Offices	Ohio DOT Infrastructure Monitoring Sensors	Not identified	Planned
Ohio DOT District Offices	Ohio DOT Lane Control Devices	Not identified	Planned
Ohio DOT District Offices	Ohio DOT Maintenance and Construction Center Personnel	Not identified	Existing
Ohio DOT District Offices	Ohio DOT Maintenance and Construction Vehicles	Not identified	Existing
Ohio DOT District Offices	Ohio DOT OHGO Traveler Information System	Not identified	Existing
Ohio DOT District Offices	Ohio DOT Ramp Meters	Not identified	Existing
Ohio DOT District Offices	Ohio DOT RWIS Stations	Not identified	Existing
Ohio DOT District Offices	Ohio DOT Statewide TMC	Not identified	Existing
Ohio DOT District Offices	Ohio DOT Storage Facilities	Not identified	Planned

Element 1	Element 2	Communications	Status
Ohio DOT District Offices	Ohio DOT Traffic Data Archive System	Not identified	Existing
Ohio DOT District Offices	Ohio DOT Traffic Signal Systems	Not identified	Existing
Ohio DOT District Offices	Ohio DOT Vehicle Detection Devices	Not identified	Existing
Ohio DOT District Offices	Ohio EPA Air Quality Management System	Not identified	Planned
Ohio DOT District Offices	Ohio State Highway Patrol Posts	Not identified	Existing
Ohio DOT District Offices	Ohio State Highway Patrol State Communications Center	Not identified	Existing
Ohio DOT District Offices	Ohio Statewide EOC/JDF	Not identified	Existing
Ohio DOT District Offices	Ohio Turnpike Central Dispatch	Not identified	Existing
Ohio DOT District Offices	Private Towing Dispatch Agencies	Not identified	Planned
Ohio DOT District Offices	Private Traveler Information Systems	Not identified	Existing
Ohio DOT District Offices	Private Weather Service Systems	Not identified	Existing
Ohio DOT District Offices	Regional Airport Authorities	Not identified	Existing
Ohio DOT District Offices	Regional Airport Authorities Parking Management Systems	Not identified	Planned
Ohio DOT District Offices	Regional Event Operations	Not identified	Existing
Ohio DOT District Offices	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
Ohio DOT DMS	Ohio DOT Statewide TMC	Not identified	Existing
Ohio DOT HAR	Ohio DOT Statewide TMC	Not identified	Existing
Ohio DOT Infrastructure Monitoring Sensors	Ohio DOT Statewide TMC	Not identified	Planned
Ohio DOT Infrastructure Monitoring Sensors	Ohio Statewide EOC/JDF	Not identified	Planned
Ohio DOT Lane Control Devices	Ohio DOT Statewide TMC	Not identified	Planned
Ohio DOT Lift Bridge Equipment	Ohio DOT Traffic Signal Systems	Not identified	Existing
Ohio DOT Maintenance and Construction Center Personnel	Ohio Turnpike Maintenance Dispatch Offices	Not identified	Existing
Ohio DOT Maintenance and Construction Vehicles	Traffic	Not identified	Planned
Ohio DOT OHGO Traveler Information System	Ohio DOT Rest Area Tourist Information Centers	Not identified	Planned
Ohio DOT OHGO Traveler Information System	Ohio DOT Rest Area Truck Parking Availability System	Not identified	Planned
Ohio DOT OHGO Traveler Information System	Ohio DOT Statewide TMC	Not identified	Existing
Ohio DOT OHGO Traveler Information System	Traveler Information Device	Not identified	Existing

Element 1	Element 2	Communications	Status
Ohio DOT Overheight Vehicle Detection System	Potential Obstacles	Not identified	Planned
Ohio DOT Ramp Meters	Ohio DOT Statewide TMC	Not identified	Existing
Ohio DOT Ramp Meters	Ohio DOT Vehicle Detection Devices	Not identified	Existing
Ohio DOT Rest Area Tourist Information Centers	Private Traveler Information Systems	Not identified	Planned
Ohio DOT Rest Area Tourist Information Centers	Traveler	Not identified	Planned
Ohio DOT Rest Area Truck Parking Availability System	Ohio DOT Statewide TMC	Not identified	Planned
Ohio DOT Rest Area Truck Parking Availability System	Ohio Turnpike Website	Not identified	Planned
Ohio DOT Rest Area Truck Parking Availability System	Private Traveler Information Systems	Not identified	Planned
Ohio DOT RWIS Stations	Ohio DOT Statewide TMC	Not identified	Existing
Ohio DOT Safety Patrol Vehicles	Ohio DOT Statewide TMC	Not identified	Existing
Ohio DOT Speed Monitoring Roadside Equipment	Ohio State Highway Patrol Posts	Not identified	Planned
Ohio DOT Statewide TMC	Ohio DOT Traffic Data Archive System	Not identified	Existing
Ohio DOT Statewide TMC	Ohio DOT Traffic Signal Systems	Not identified	Existing
Ohio DOT Statewide TMC	Ohio DOT Variable Speed Limit Signs	Not identified	Planned
Ohio DOT Statewide TMC	Ohio DOT Vehicle Detection Devices	Not identified	Existing
Ohio DOT Statewide TMC	Ohio DPS Crash Database	Not identified	Existing
Ohio DOT Statewide TMC	Ohio Emergency Alert System	Not identified	Existing
Ohio DOT Statewide TMC	Ohio EPA Air Quality Management System	Not identified	Planned
Ohio DOT Statewide TMC	Ohio State Highway Patrol Posts	Not identified	Existing
Ohio DOT Statewide TMC	Ohio State Highway Patrol State Communications Center	Not identified	Existing
Ohio DOT Statewide TMC	Ohio Statewide EOC/JDF	Not identified	Existing
Ohio DOT Statewide TMC	Ohio Turnpike Central Dispatch	Not identified	Existing
Ohio DOT Statewide TMC	Private Towing Dispatch Agencies	Not identified	Existing
Ohio DOT Statewide TMC	Private Traveler Information Systems	Not identified	Existing
Ohio DOT Statewide TMC	Private Weather Service Systems	Not identified	Existing
Ohio DOT Statewide TMC	Regional Airport Authorities	Not identified	Existing
Ohio DOT Statewide TMC	Regional Event Operations	Not identified	Existing

Element 1	Element 2	Communications	Status
Ohio DOT Statewide TMC	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
Ohio DOT Traffic Data Archive System	Ohio DOT Vehicle Detection Devices	Not identified	Existing
Ohio DOT Traffic Signal Systems	Regional Transit Authority Transit Vehicles	Not identified	Existing
Ohio DOT Traffic Signal Systems	Universities and Colleges Transit Vehicles	Not identified	Planned
Ohio DOT Variable Speed Limit Signs	Ohio DOT Vehicle Detection Devices	Not identified	Planned
Ohio DPS Crash Database	Ohio State Highway Patrol Posts	Not identified	Existing
Ohio DPS Crash Database	Ohio State Highway Patrol State Communications Center	Not identified	Existing
Ohio Emergency Alert System	Ohio State Highway Patrol Posts	Not identified	Existing
Ohio Emergency Alert System	Ohio State Highway Patrol State Communications Center	Not identified	Existing
Ohio Emergency Alert System	Ohio Statewide EOC/JDF	Not identified	Existing
Ohio Emergency Alert System	Regional Airport Authorities	Not identified	Existing
Ohio EPA Air Quality Database	Ohio EPA Air Quality Management System	Not identified	Existing
Ohio EPA Air Quality Database	Ohio EPA Air Quality Monitors	Not identified	Existing
Ohio EPA Air Quality Management System	Ohio EPA Air Quality Monitors	Not identified	Existing
Ohio Motor Carrier Information System (OMCIS)	PUCO Commercial Vehicle Registration System	Not identified	Existing
Ohio State Highway Patrol Posts	Ohio State Highway Patrol Pre-Pass System	Not identified	Existing
Ohio State Highway Patrol Posts	Ohio State Highway Patrol State Communications Center	Not identified	Existing
Ohio State Highway Patrol Posts	Ohio State Highway Patrol Vehicles	Not identified	Existing
Ohio State Highway Patrol Posts	Ohio State Highway Patrol Weigh-In-Motion Stations	Not identified	Existing
Ohio State Highway Patrol Posts	Ohio Statewide EOC/JDF	Not identified	Existing
Ohio State Highway Patrol Posts	Ohio Turnpike Central Dispatch	Not identified	Existing
Ohio State Highway Patrol Posts	Ohio Turnpike Toll Administration	Not identified	Existing
Ohio State Highway Patrol Posts	Private Weather Service Systems	Not identified	Existing
Ohio State Highway Patrol Posts	PUCO Commercial Vehicle Compliance Check	Not identified	Existing
Ohio State Highway Patrol Posts	PUCO Commercial Vehicle Registration System	Not identified	Existing
Ohio State Highway Patrol Posts	Regional Airport Authorities	Not identified	Existing
Ohio State Highway Patrol Posts	Regional Event Operations	Not identified	Existing

Element 1	Element 2	Communications	Status
Ohio State Highway Patrol Pre-Pass System	PUCO Commercial Vehicle Registration System	Not identified	Existing
Ohio State Highway Patrol State Communications Center	Ohio State Highway Patrol Vehicles	Not identified	Existing
Ohio State Highway Patrol State Communications Center	Ohio Statewide EOC/JDF	Not identified	Existing
Ohio State Highway Patrol State Communications Center	Ohio Turnpike Central Dispatch	Not identified	Existing
Ohio State Highway Patrol State Communications Center	Private Weather Service Systems	Not identified	Existing
Ohio State Highway Patrol Weigh-In-Motion Stations	PUCO Commercial Vehicle Registration System	Not identified	Existing
Ohio Statewide EOC/JDF	Ohio Turnpike Central Dispatch	Not identified	Existing
Ohio Statewide EOC/JDF	Private Weather Service Systems	Not identified	Existing
Ohio Statewide EOC/JDF	Regional Airport Authorities	Not identified	Existing
Ohio Statewide EOC/JDF	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
Ohio Turnpike CCTV Cameras	Ohio Turnpike Central Dispatch	Not identified	Existing
Ohio Turnpike Central Dispatch	Ohio Turnpike DMS	Not identified	Existing
Ohio Turnpike Central Dispatch	Ohio Turnpike Maintenance Dispatch Offices	Not identified	Existing
Ohio Turnpike E-ZPass Tags	Ohio Turnpike Toll Collection Equipment	Not identified	Existing
Ohio Turnpike E-ZPass Tags	Regional Airport Authorities Parking Management Systems	Not identified	Planned
Ohio Turnpike Maintenance and Construction Vehicles	Ohio Turnpike Maintenance Dispatch Offices	Not identified	Existing
Ohio Turnpike Toll Administration	Ohio Turnpike Toll Collection Equipment	Not identified	Existing
Ohio Turnpike Toll Administration	Ohio Turnpike Website	Not identified	Existing
Ohio Turnpike Website	Traveler Information Device	Not identified	Existing
Private Rail Operations Active Warning Roadside Equipment	Private Rail Operations Wayside Equipment	Not identified	Existing
Private Traveler Information Systems	Private Weather Service Systems	Not identified	Existing
Private Traveler Information Systems	Traveler Information Device	Not identified	Existing
PUCO Commercial Vehicle Compliance Check	PUCO Commercial Vehicle Registration System	Not identified	Existing
Regional Airport Authorities	Regional Airport Authorities Roadside ITS Equipment	Not identified	Existing
Regional Airport Authorities	Regional Event Operations	Not identified	Existing
Regional Airport Authorities	Regional Transit Authorities Transit Operations Centers	Not identified	Existing

Element 1	Element 2	Communications	Status
Regional Event Operations	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
Regional Transit Authorities Ticket Vending Machines	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
Regional Transit Authorities Ticket Vending Machines	Transit Traveler Cards	Not identified	Existing
Regional Transit Authorities Ticket Vending Machines	Traveler	Not identified	Existing
Regional Transit Authorities Transit Data Archives	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
Regional Transit Authorities Transit Information Kiosks	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
Regional Transit Authorities Transit Information Kiosks	Traveler	Not identified	Existing
Regional Transit Authorities Transit Information Systems	Regional Transit Authorities Transit Operations Centers	Not identified	Existing
Regional Transit Authorities Transit Information Systems	Regional Transit Authorities Transit Websites	Not identified	Existing
Regional Transit Authorities Transit Information Systems	Traveler	Not identified	Existing
Regional Transit Authorities Transit Operations Centers	Regional Transit Authorities Transit Websites	Not identified	Existing
Regional Transit Authorities Transit Operations Centers	Regional Transit Authority Transit Vehicles	Not identified	Existing
Regional Transit Authorities Transit Operations Centers	Universities and Colleges Transit Operations Centers	Not identified	Existing
Regional Transit Authorities Transit Websites	Traveler Information Device	Not identified	Existing
Regional Transit Authority Transit Vehicles	Transit Traveler Cards	Not identified	Existing
Regional Transit Authority Transit Vehicles	Traveler	Not identified	Existing
Traveler	Traveler Information Device	Not identified	Existing
Traveler	Universities and Colleges Transit Vehicles	Not identified	Existing
Universities and Colleges Transit Operations Centers	Universities and Colleges Transit Vehicles	Not identified	Existing

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9 ITS Standards

Standardizing the flow of information between the systems is essential to cost-effectively integrating ITS throughout the state. ITS standards are fundamental to the establishment of an open ITS environment that achieves the goal of interoperability for ITS. Standards facilitate deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances and new approaches evolve.

Establishing standards for exchanging information among ITS systems is important not only from an interoperability point of view; it also provides interchangeability and expandability thereby reducing risk and cost. Since an agency using standardized interfaces can select among multiple vendors for products and applications, competition is maintained and prices are lower in the long term.

Standards Development Organizations (SDO) are developing ITS standards that support interoperability and interchangeability. Several of the communication standards overlap in applicability. This provides flexibility in the design of ITS systems allowing agencies to choose the most applicable standard for their needs. Before systems are designed, all stakeholders involved in the applicable ITS service(s) should decide upon the standards and their specifics that will be used. Once a decision is made, all future systems should use the agreed upon standards.

Table 7: ITS Standards

SDO	Document ID	Standard Title	Standard Type
AASHTO/ITE	ITE TMDD	Traffic Management Data Dictionary (TMDD) and Message Sets for External Traffic Management Center Communications (MS/ETMCC)	Message/Data
AASHTO/ITE/NEMA	NTCIP 1201	Global Object Definitions	Message/Data
AASHTO/ITE/NEMA	NTCIP 1202	Object Definitions for Actuated Traffic Signal Controller (ASC) Units	Message/Data
AASHTO/ITE/NEMA	NTCIP 1203	Object Definitions for Dynamic Message Signs (DMS)	Message/Data
AASHTO/ITE/NEMA	NTCIP 1204	Object Definitions for Environmental Sensor Stations (ESS)	Message/Data
AASHTO/ITE/NEMA	NTCIP 1205	Object Definitions for Closed Circuit Television (CCTV) Camera Control	Message/Data
AASHTO/ITE/NEMA	NTCIP 1206	Object Definitions for Data Collection and Monitoring (DCM) Devices	Message/Data
AASHTO/ITE/NEMA	NTCIP 1207	Object Definitions for Ramp Meter Control (RMC) Units	Message/Data
AASHTO/ITE/NEMA	NTCIP 1208	Object Definitions for Closed Circuit Television (CCTV) Switching	Message/Data
AASHTO/ITE/NEMA	NTCIP 1209	Data Element Definitions for Transportation Sensor Systems (TSS)	Message/Data
AASHTO/ITE/NEMA	NTCIP 1210	Field Management Stations (FMS) - Part 1: Object Definitions for Signal System Masters	Message/Data
AASHTO/ITE/NEMA	NTCIP 1211	Object Definitions for Signal Control and Prioritization (SCP)	Message/Data
AASHTO/ITE/NEMA	NTCIP 1214	Object Definitions for Conflict Monitor Units (CMU)	Message/Data
AASHTO/ITE/NEMA	NTCIP C2C	NTCIP Center-to-Center Standards Group	Group

SDO	Document ID	Standard Title	Standard Type
AASHTO/ITE/NEMA	NTCIP C2F	NTCIP Center-to-Field Standards Group	Group
ANSI	ANSI TS813	Electronic Filing of Tax Return Data	Message/Data
APTA	APTA TCIP-S-001 3.0.4	Standard for Transit Communications Interface Profiles	Message/Data
ASTM	ASTM E2468-05	Standard Practice for Metadata to Support Archived Data Management Systems	Other
ASTM	ASTM E2665-08	Standard Specifications for Archiving ITS-Generated Traffic Monitoring Data	Message/Data
ASTM	DSRC 915MHz	Dedicated Short Range Communication at 915 MHz Standards Group	Group
ASTM/IEEE/SAE	DSRC 5GHz	Dedicated Short Range Communication at 5.9 GHz Standards Group	Group
IEEE	IEEE 1455-1999	Standard for Message Sets for Vehicle/Roadside Communications	Message/Data
IEEE	IEEE 1570-2002	Standard for the Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection	Message/Data
IEEE	IEEE IM	Incident Management Standards Group	Group
SAE	ATIS General Use	Advanced Traveler Information Systems (ATIS) General Use Standards Group	Group
SAE	ATIS Low Bandwidth	Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group	Group
SAE	SAE J2395	ITS In-Vehicle Message Priority	Other
SAE	SAE J2396	Definitions and Experimental Measures Related to the Specification of Driver Visual Behavior Using Video Based Techniques	Other
SAE	SAE J2399	Adaptive Cruise Control (ACC) Operating Characteristics and User Interface	Other
SAE	SAE J2400	Human Factors in Forward Collision Warning Systems: Operating Characteristics and User Interface Requirements	Other
SAE	SAE J2735	Dedicated Short Range Communications (DSRC) Message Set Dictionary	Message/Data

10 Agreements

This section identifies the list of existing and future agreements between each of the stakeholder organizations whose ITS systems will be exchanging information was generated prior to implementing relevant projects. This list identifies the agreements that should be established but does not define the agreements themselves.

Table 8: Agreements

Agreement Number	Agreement Title	Agreement Status	Description	Lead Stakeholder	Associated Stakeholders
01	Ohio DOT Cooperative Purchasing Program	Existing	Program allows political subdivisions to purchase machinery, materials, supplies or other articles from the Ohio Department of Transportation (ODOT) purchasing contracts (Exception: ODOT contracts for services). It is the intent of ODOT to establish and operate the ODOT Cooperative Purchasing Program for that purpose. Ohio Turnpike has used this program to purchase portable DMS for operation along the Ohio Turnpike.	Ohio Department of Transportation	Ohio Turnpike and Infrastructure Commission
02	Ohio Turnpike Patrol Agreement	Existing	Under a contract between the Ohio Turnpike and the OSHP, the Ohio Turnpike utilizes toll revenue to reimburse the patrol for all costs of operating on the Turnpike.	Ohio Turnpike and Infrastructure Commission	Ohio State Highway Patrol
03	Multi-Agency Radio Communication System Agreement	Existing	MARCS (Multi-Agency Radio Communication System) is an 700/800 MHz radio and data network that utilizes state-of-the-art trunked technology to provide statewide interoperability in digital clarity to its subscribers throughout Ohio and a 10 mile radius outside of Ohio. The MARCS system provides statewide, secure, reliable public service wireless communication for public safety and first responders. The MARCS network operates on three system components: 1) Mobile Voice – operating on the 700/800 MHZ digital trunked technology, 2) Mobile Data – allowing data transmissions, LEADS inquiries, reformatting of data from Mobile Data Terminals (MDT), and 3) Computer Aided Dispatch - providing GPS-based auto vehicle location, resource recommendation and GGM display. There are currently over 47,500 voice units and over 1,800 mobile data units on the MARCS system with over 1200 public safety/public service agencies statewide. This includes local, state and federal agencies. Ohio DAS staff that manage the MARCS system work with emergency responders to get their equipment programmed, activated and deployed efficiently.	Ohio Department of Administrative Services	County and City Emergency Management Agencies County and City Fire Departments County and City Law Enforcement Agencies County and City Public Safety Agencies Ohio State Highway Patrol
04	Towing and Recovery Incentive Payment (TRIP) Program	Existing	The Towing & Recovery Incentive Payment (TRIP) Program pays prequalified heavy-duty towing and recovery companies incentives for the quick clearance of large commercial vehicle incidents on selected, high-importance Ohio roadways. As of July 2015, approximately 1,000 miles of interstates, state routes, and US routes across every region of Ohio are covered by the TRIP program.	Ohio Department of Transportation	Private Companies

Agreement Number	Agreement Title	Agreement Status	Description	Lead Stakeholder	Associated Stakeholders
05	Ohio QuickClear Program	Existing	Through a joint partnership, the Ohio Departments of Transportation, Public Safety and Commerce (specifically the State Fire Marshall) have developed a statewide traffic incident management program known as "Ohio QuickClear." This program was initially intended as a way to protect our first responders by providing training on traffic control at highway incident scenes. It has become an all-encompassing incident management system that not only provides for the safety of responders and motorists but adds economic benefit by keeping traffic and commerce moving. Further enhancements to the program's effectiveness are being served by the Federal Highway Safety Administration's implementation of a nationally standardized training program for all response agencies with certified TIM instructors.	Ohio Department of Transportation	County and City Emergency Management Agencies County and City Fire Departments County and City Law Enforcement Agencies County and City Public Safety Agencies Ohio Department of Public Safety Ohio State Highway Patrol
06	TSP Standard Operating Procedures Agreement	Planned	Agreement to describe the standard operating procedures for Transit Signal Priority (TSP). Transit agency responsible for project will need to define roles and responsibilities for operation and maintenance of equipment installed on buses and at intersections owned by the appropriate jurisdiction responsible for traffic signal operations, which could be county and city public works departments or the Ohio Department of Transportation. Agreement could involve sharing of intersection equipment that facilitates emergency vehicle pre-emption operations by county and city fire departments, law enforcement agencies, and emergency management agencies.	Regional Transit Authorities	County and City Emergency Management Agencies County and City Fire Departments County and City Law Enforcement Agencies County and City Public Works Departments County and City Transit Operators Ohio Department of Transportation
07	E-ZPass Operations at Parking Management Facilities	Planned	Agreement to define how E-ZPass tags would be utilized for payment of parking at regional airports throughout the state.	Ohio Turnpike and Infrastructure Commission	Regional Airport Authorities
08	Inter-State AMBER Alert Agreement	Existing	Addresses AMBER Alert plan operational issues across state borders. Additional information on the current AMBER Alert coordination that occurs within the state of Ohio can be found at: http://www.ohioamberplan.org/.	Ohio Department of Transportation	Neighboring State DOTs

Agreement Number	Agreement Title	Agreement Status	Description	Lead Stakeholder	Associated Stakeholders
08	Inter-State AMBER Alert Agreement	Existing	Addresses AMBER Alert plan operational issues across state borders. Additional information on the current AMBER Alert coordination that occurs within the state of Ohio can be found at: http://www.ohioamberplan.org/.	Ohio Department of Transportation	Ohio Department of Public Safety Ohio Emergency Management Agency Ohio State Highway Patrol
09	Inter-State Data Sharing Agreement	Planned	Addresses the exchange of information between the Ohio DOT and Neighboring State DOTs. Data includes traffic and road conditions information on major roads in large metro areas that cross state boundaries.	Ohio Department of Transportation	Neighboring State DOTs
10	Inter-State Operations Agreement	Existing	Addresses system integration, equipment operation coordination, equipment maintenance, and exchange of operational information between the Ohio DOT and Neighboring State DOTs. Equipment includes DMS, CCTV, HAR, and other roadside ITS equipment installed along inter-state roadways that cross state boundaries.	Ohio Department of Transportation	Neighboring State DOTs
11	Inter-Agency Operations Agreement	Existing	Addresses equipment operation coordination, equipment maintenance, and exchange of operational information between the Ohio DOT and County and City Public Works Departments and County and City Public Safety Agencies. Equipment includes DMS, CCTV, HAR, and other roadside ITS equipment installed along state roadways.	Ohio Department of Transportation	County and City Public Safety Agencies County and City Public Works Departments
12	Inter-Agency Incident Response Coordination Agreement	Existing	Agreement that documents the roles and responsibilities of Ohio DOT related to incident response during large scale emergencies that may require evacuation from affected areas and state-level assistance to local agencies. More detail on the agreement can be found in the State of Ohio Emergency Operations Plan at: http://ema.ohio.gov/Documents/Ohio_EOP/esf_1.pdf.	Ohio Department of Transportation	County and City Emergency Management Agencies County and City Public Works Departments Ohio Emergency Management Agency Ohio State Highway Patrol
13	Ohio DOT Fiber Sharing Agreement	Existing	Agreement that outlines how fiber-optic cable for communications to ITS field elements is shared between the Ohio DOT and other traffic management agencies. Ohio DOT currently has an agreement in place with the City of Columbus for shared use of fiber-optic cable.	Ohio Department of Transportation	County and City Public Works Departments
14	Public Private Partnership Agreements	Existing	Agreements between the Ohio DOT and Private Companies that are established to support transportation operations related to the use of ITS technologies. Examples of agreements include the operation of the Safety Service Patrol, whose vehicles are dispatched from the Ohio DOT Statewide TMC, which is sponsored by State Farm Insurance.	Ohio Department of Transportation	Private Companies

11 ITS Projects in Ohio Statewide ITS Architecture

The Ohio DOT Statewide ITS Architecture is ultimately implemented one ITS project at a time. This chapter lists the projects that have been identified as part of the Ohio Statewide ITS Architecture definition. Additional detail for each of these ITS projects is included in the Turbo Architecture database.

Table 9: ITS Projects in Ohio Statewide ITS Architecture

Name	Description	Status	Timeframe
Emergency Vehicle Preemption in Counties and Cities	Emergency Vehicle Pre-emption (EVP) will be expanded to traffic signals operated by counties and cities throughout the state. Projects will require coordination between public works departments and county and city public safety agencies. Project Sources: Reflected in the following Regional ITS Architectures -- AMATS-SCATS, Eastgate, Miami Valley, MORPC, NOACA, OKI, and TMACOG.	Planned	Short Term
Expansion of E-ZPass and Toll Operations in Metro Areas	Expansion of E-ZPass and Toll Operations in Metro Areas. Includes potential tolling of the Brent Spence Bridge Corridor in Cincinnati metro area. Project may or may not utilize Ohio Turnpike E-ZPass Tags for project. Project Source: Brent Spence Bridge Corridor project page. Available at: http://www.brentspencebridgecorridor.com/.	Planned	Long Term
E-ZPass Integration with Parking Management Systems	Project represents E-ZPass Integration with Parking Management Systems in large metro areas of the state. Project Source: NOACA Regional ITS Architecture.	Planned	Medium Term
Ohio DOT Active Traffic and Demand Management	Represents an Ohio DOT Active Traffic and Demand Management project. Project Source: Ohio DOT website at the following: https://www.dot.state.oh.us/engineering/OTEC/2014%20OTEC%20Presentations/Wednesday,%20Oct.%2029/54-C223-225-830-10/Stargell_Gray.pdf.	Planned	Short Term
Ohio DOT Animal Detection Systems	Represents an autonomous system of roadside detection and message signs. Roadside sensors are used to detect animals approaching a roadway or highway. Upon possible detection of an animal approaching a roadway or highway, sensors will trigger roadside message signs warning drivers in the surrounding area of possible danger from animals. Project Source: NOACA Regional ITS Architecture.	Planned	Medium Term
Ohio DOT Automated Gate Closure Systems	Represents automated road closure gates owned and operated by the Ohio DOT used for the remote closure of roads, lanes or ramps. Intended to be for areas where ice or snow or other adverse weather conditions exist on a frequent basis and that cause hazardous conditions for motorists. Project Source: NOACA Regional ITS Architecture.	Planned	Medium Term
Ohio DOT Connected Vehicles Program	Represents Connected Vehicles projects that Ohio DOT could become involved in through the deployment of roadside equipment that provides vehicle-to-infrastructure communications under the Connected Vehicles program. This is used for data collection from Connected Vehicles-equipped vehicles and to provide information to Connected Vehicles-equipped vehicles. Project Source: NOACA Regional ITS Architecture, Eastgate Regional ITS Architecture.	Planned	Long Term

Name	Description	Status	Timeframe
Ohio DOT Evacuation Route Development	Ohio DOT is currently in the process of developing evacuation routes in large metropolitan areas of the state. Requires emergency plan coordination with first responder agencies throughout the state. Project Source: Ohio DOT Website at the following address: https://www.dot.state.oh.us/Divisions/Operations/Traffic/Documents/Office%20of%20Traffic%20Operations%20Handbook%20Version%20-%204.3.pdf.	Planned	Short Term
Ohio DOT Freeway Management System Expansion in Metro Areas	Represents expansions of the ITS elements that are included within Freeway Management Systems (FMS) deployed in the major metro areas of Ohio, including Cincinnati, Toledo, Columbus, Cleveland, Dayton, and Akron/Canton. Primary ITS elements that are part of the overall FMS include DMS, CCTV, HAR, and ramp meters.	Planned	Short Term
Ohio DOT Highway-Rail Intersection Advanced Safety Systems	Represents a project to install advanced highway-rail safety systems at key railroad at-grade crossings. Project Source: NOACA Regional ITS Architecture, Eastgate Regional ITS Architecture.	Planned	Long Term
Ohio DOT Lane Control Devices	Represents a project to install lane control devices operated by Ohio DOT to manage lanes. These include lane control signals on bridges. Project Source: NOACA Regional ITS Architecture.	Planned	Short Term
Ohio DOT Maintenance Vehicle AVL Upgrades	Represents a planned project to install AVL systems in Ohio DOT Maintenance Vehicles operating in districts throughout the state. Project also includes potential to operate Maintenance Decision Support Systems (MDSS) in Ohio. Project Source: NOACA Regional ITS Architecture, Eastgate Regional ITS Architecture.	Planned	Medium Term
Ohio DOT OHGO Mobile Application	Project includes the development of a mobile application to present traffic information from the Ohio DOT OHGO Traveler Information System. Project Source: Ohio DOT website at the following address: https://www.dot.state.oh.us/engineering/OTEC/2011%20Presentations/23B-GeorgeSaylor.pdf.	Planned	Short Term
Ohio DOT Rest Area Truck Parking Availability System	Represents planned parking management systems at rest areas and truck stops to measure parking availability and communicate availability to the public. Project Source: Eastgate Regional ITS Architecture.	Planned	Short Term
Ohio DOT Safety Service Patrol Expansion	Represents an expansion of the Ohio DOT Safety Service Patrols.	Planned	Short Term
Ohio DOT Speed Monitoring Roadside Equipment	Represents the field equipment that monitors vehicle speeds for enforcement purposes or to advise motorists of their current speeds. Project Source: NOACA Regional ITS Architecture.	Planned	Short Term
Ohio DOT Work Zone Safety Improvements	Represents projects that will improve travel in work zones to reduce collisions. Projects could include deployment of roadside equipment to alert drivers of a construction zone, roadway hazard, or speed change. Project Source: NOACA Regional ITS Architecture.	Planned	Medium Term

Name	Description	Status	Timeframe
Ohio Multi Agency Radio Communication System (MARCS)	The Multi-Agency Radio Communications System ("MARCS") enables Ohio State Highway Patrol troopers and law enforcement personnel serving counties and cities throughout to more effectively communicate with each other. MARCS is an 700/800 MHz radio and data network that utilizes state-of-the-art trunked technology to provide statewide interoperability in digital clarity to its subscribers throughout Ohio and a 10 mile radius outside of Ohio. The MARCS system provides statewide, secure, reliable public service wireless communication for public safety and first responders. The MARCS network operates on three system components: 1) Mobile Voice – operating on the 700/800 MHZ digital trunked technology, 2) Mobile Data – allowing data transmissions, LEADS inquiries, reformatting of data from Mobile Data Terminals (MDT), and 3) Computer Aided Dispatch - providing GPS-based auto vehicle location, resource recommendation and GGM display. There are currently over 47,500 voice units and over 1,800 mobile data units on the MARCS system with over 1200 public safety/public service agencies statewide. This includes local, state and federal agencies. Ohio DAS staff that manage the MARCS system work with emergency responders to get their equipment programmed, activated and deployed efficiently. Project Source: http://das.ohio.gov/Divisions/InformationTechnology/MARCSServices.aspx.	Existing	Short Term
Real-Time Transit Information Systems for Transit Providers	Represents projects to be led by transit providers throughout the state to provide real-time transit information to users of the public transportation system. Project Sources: Reflected in the following Regional ITS Architectures -- AMATS-SCATS, Eastgate, MORPC, NOACA, OKI, and TMACOG.	Planned	Short Term
Regional Evacuation Plan Updates	Represents updates made to evacuation plans by large counties throughout the state. Will require coordination with Ohio Emergency Management Agency and Ohio Department of Transportation. Project Source: NOACA Regional ITS Architecture, Eastgate Regional ITS Architecture.	Planned	Short Term
Traffic Signal System Upgrades in Counties and Cities	Represents upgrades to traffic signal systems operated by public works departments in counties and cities throughout the state. Project Sources: Reflected in the following Regional ITS Architectures -- Eastgate, MORPC, NOACA, OKI, and TMACOG.	Planned	Long Term
Transit Signal Priority in Counties and Cities	Represents Transit Signal Priority (TSP) projects led by County and City Transit Operators. May require coordination with Ohio DOT for TSP operations at traffic signals operated by the Ohio DOT. Project Sources: Reflected in the following Regional ITS Architectures -- Eastgate, Miami Valley, MORPC, NOACA, OKI, and TMACOG.	Planned	Medium Term

Appendix A. ITS Service Packages

ITS services describe what can be done to improve the efficiency, safety, and convenience of the regional transportation system through better information, advanced systems and new technologies. Some services are specific to one primary stakeholder while others require broad stakeholder participation. This appendix provides additional detail for the ITS service packages that have been selected for the Ohio Statewide ITS Architecture.

Service Package	Service Package Name	Service Package Description	Service Package Status
AD1	ITS Data Mart	This service package provides a focused archive that houses data collected and owned by a single agency, district, private sector provider, research institution, or other organization. This focused archive typically includes data covering a single transportation mode and one jurisdiction that is collected from an operational data store and archived for future use. It provides the basic data quality, data privacy, and meta data management common to all ITS archives and provides general query and report access to archive data users.	Existing
AD2	ITS Data Warehouse	This service package includes all the data collection and management capabilities provided by the ITS Data Mart, and adds the functionality and interface definitions that allow collection of data from multiple agencies and data sources spanning across modal and jurisdictional boundaries. It performs the additional transformations and provides the additional meta data management features that are necessary so that all this data can be managed in a single repository with consistent formats. The potential for large volumes of varied data suggests additional on-line analysis and data mining features that are also included in this service package in addition to the basic query and reporting user access features offered by the ITS Data Mart.	Existing
AD3	ITS Virtual Data Warehouse	This service package provides the same broad access to multimodal, multidimensional data from varied data sources as in the ITS Data Warehouse service package, but provides this access using enhanced interoperability between physically distributed ITS archives that are each locally managed. Requests for data that are satisfied by access to a single repository in the ITS Data Warehouse service package are parsed by the local archive and dynamically translated to requests to remote archives which relay the data necessary to satisfy the request.	Planned
APTS01	Transit Vehicle Tracking	This service package monitors current transit vehicle location using an Automated Vehicle Location System. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time. Vehicle position may be determined either by the vehicle (e.g., through GPS) and relayed to the infrastructure or may be determined directly by the communications infrastructure. A two-way wireless communication link with the Transit Management Subsystem is used for relaying vehicle position and control measures. Fixed route transit systems may also employ beacons along the route to enable position determination and facilitate communications with each vehicle at fixed intervals. The Transit Management Subsystem processes this information, updates the transit schedule and makes real-time schedule information available to the Information Service Provider.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
APTS02	Transit Fixed-Route Operations	This service package performs automated dispatch and system monitoring for fixed-route and flexible-route transit services. This service performs scheduling activities including the creation of schedules, blocks and runs, as well as operator assignment. This service determines the transit vehicle trip performance against the schedule using AVL data and provides information displays at the Transit Management Subsystem. Static and real time transit data is exchanged with Information Service Providers where it is integrated with that from other transportation modes (e.g. rail, ferry, air) to provide the public with integrated and personalized dynamic schedules.	Existing
APTS03	Demand Response Transit Operations	This service package performs automated dispatch and system monitoring for demand responsive transit services. This service performs scheduling activities as well as operator assignment. In addition, this service package performs similar functions to support dynamic features of flexible-route transit services. This package monitors the current status of the transit fleet and supports allocation of these fleet resources to service incoming requests for transit service while also considering traffic conditions. The Transit Management Subsystem provides the necessary data processing and information display to assist the transit operator in making optimal use of the transit fleet. This service includes the capability for a traveler request for personalized transit services to be made through the Information Service Provider (ISP) Subsystem. The ISP may either be operated by a transit management center or be independently owned and operated by a separate service provider. In the first scenario, the traveler makes a direct request to a specific paratransit service. In the second scenario, a third party service provider determines that the paratransit service is a viable means of satisfying a traveler request and makes a reservation for the traveler.	Existing
APTS04	Transit Fare Collection Management	This service package manages transit fare collection on-board transit vehicles and at transit stops using electronic means. It allows transit users to use a traveler card or other electronic payment device. Readers located either in the infrastructure or on-board the transit vehicles enable electronic fare payment. Data is processed, stored, and displayed on the transit vehicle and communicated as needed to the Transit Management Subsystem. Two other service packages, ATMS10: Electronic Toll Collection and ATMS16: Parking Facility Management, also provide electronic payment services. These three service packages in combination provide an integrated electronic payment system for transportation services.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
APTS05	Transit Security	This service package provides for the physical security of transit passengers and transit vehicle operators. On-board equipment is deployed to perform surveillance and sensor monitoring in order to warn of potentially hazardous situations. The surveillance equipment includes video (e.g., CCTV cameras), audio systems and/or event recorder systems. The sensor equipment includes threat sensors (e.g., chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors (e.g., metal detectors). Transit user or transit vehicle operator activated alarms are provided on-board. Public areas (e.g., transit stops, park and ride lots, stations) are also monitored with similar surveillance and sensor equipment and provided with transit user activated alarms. In addition this service package provides surveillance and sensor monitoring of non-public areas of transit facilities (e.g., transit yards) and transit infrastructure such as bridges, tunnels, and transit railways or bus rapid transit (BRT) guideways. The surveillance equipment includes video and/or audio systems. The sensor equipment includes threat sensors and object detection sensors as described above as well as, intrusion or motion detection sensors and infrastructure integrity monitoring (e.g., rail track continuity checking or bridge structural integrity monitoring). The surveillance and sensor information is transmitted to the Emergency Management Subsystem, as are transit user activated alarms in public secure areas. On-board alarms, activated by transit users or transit vehicle operators are transmitted to both the Emergency Management Subsystem and the Transit Management Subsystem, indicating two possible approaches to implementing this service package. In addition the service package supports remote transit vehicle disabling by the Transit Management Subsystem and transit vehicle operator authentication.	Existing
APTS06	Transit Fleet Management	This service package supports automatic transit maintenance scheduling and monitoring. On-board condition sensors monitor system status and transmit critical status information to the Transit Management Subsystem. Hardware and software in the Transit Management Subsystem processes this data and schedules preventative and corrective maintenance. The service package also supports the day to day management of the transit fleet inventory, including the assignment of specific transit vehicles to blocks.	Planned
APTS07	Multi-modal Coordination	This service package establishes two way communications between multiple transit and traffic agencies to improve service coordination. Multimodal coordination between transit agencies can increase traveler convenience at transit transfer points and clusters (a collection of stops, stations, or terminals where transfers can be made conveniently) and also improve operating efficiency. Transit transfer information is shared between Multimodal Transportation Service Providers and Transit Agencies.	Existing
APTS08	Transit Traveler Information	This service package provides transit users at transit stops and on-board transit vehicles with ready access to transit information. The information services include transit stop annunciation, imminent arrival signs, and real-time transit schedule displays that are of general interest to transit users. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by this service package.	Existing
APTS09	Transit Signal Priority	This service package determines the need for transit priority on routes and at certain intersections and requests transit vehicle priority at these locations. The signal priority may result from limited local coordination between the transit vehicle and the individual intersection for signal priority or may result from coordination between transit management and traffic management centers. Coordination between traffic and transit management is intended to improve on-time performance of the transit system to the extent that this can be accommodated without degrading overall performance of the traffic network.	Existing
APTS10	Transit Passenger Counting	This service package counts the number of passengers entering and exiting a transit vehicle using sensors mounted on the vehicle and communicates the collected passenger data back to the management center. The collected data can be used to calculate reliable ridership figures and measure passenger load information at particular stops.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
ATIS01	Broadcast Traveler Information	This service package 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 web casts. The information may be provided directly to travelers or provided to merchants and other traveler service providers so that they can better inform their customers of travel conditions. Different from the service package ATMS06 - Traffic Information Dissemination, which provides localized HAR and DMS information capabilities, ATIS01 provides a wide area digital broadcast service. Successful deployment of this service package relies on availability of real-time traveler information from roadway instrumentation, probe vehicles or other sources.	Existing
ATIS02	Interactive Traveler Information	This service package provides tailored information in response to a traveler request. Both real-time interactive request/response systems and information systems that "push" a tailored stream of information to the traveler based on a submitted profile are supported. The traveler can obtain current information regarding traffic conditions, roadway maintenance and construction, transit services, ride share/ride match, parking management, detours and pricing information. Although the Internet is the predominate network used for traveler information dissemination, a range of two-way wide-area wireless and fixed-point to fixed-point communications systems may be used to support the required data communications between the traveler and Information Service Provider. A variety of interactive devices may be used by the traveler to access information prior to a trip or en route including phone via a 511-like portal and web pages via kiosk, personal digital assistant, personal computer, and a variety of in-vehicle devices. This service package also allows value-added resellers to collect transportation information that can be aggregated and be available to their personal devices or remote traveler systems to better inform their customers of transportation conditions. Successful deployment of this service package relies on availability of real-time transportation data from roadway instrumentation, transit, probe vehicles or other means. A traveler may also input personal preferences and identification information via a “traveler card” that can convey information to the system about the traveler as well as receive updates from the system so the card can be updated over time.	Planned
ATIS06	Transportation Operations Data Sharing	This service package makes real-time transportation operations data available to transportation system operators. The Information Service Provider collects, processes, and stores current information on traffic and travel conditions and other information about the current state of the transportation network and makes this information available to transportation system operators, facilitating the exchange of qualified, real-time information between agencies. Using the provided information, transportation system operators can manage their individual systems based on an overall view of the regional transportation system. The regional transportation operations data resource represented by the Information Service Provider may be implemented as a web application that provides a web-based access to system operators, an enterprise database that provides a network interface to remote center applications, or any implementation that supports regional sharing of real-time transportation operations data.	Planned
ATIS09	In Vehicle Signing	This service package augments regulatory, warning, and informational signs and signals by providing information directly to drivers through in-vehicle devices. The information provided would include static sign information (e.g., stop, curve warning, guide signs, service signs, and directional signs) and dynamic information (e.g., current signal states including highway intersection and highway-rail intersection status and local conditions warnings identified by local environmental sensors). It includes short range communications between field equipment and the vehicle and connections to the Traffic Management Subsystem for monitoring and control. This service package also includes the capability for maintenance and construction, transit, and emergency vehicles to transmit sign information to vehicles in the vicinity so that in vehicle signing can be used without fixed infrastructure in work zones, around incidents, and in areas where transit operations impacts traffic.	Planned

Service Package	Service Package Name	Service Package Description	Service Package Status
ATIS10	Short Range Communications Traveler Information	This service package provides location-specific or situation-relevant information to travelers in vehicles using Dedicated Short Range Communications (DSRC) infrastructure supporting mobility applications 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 DSRC 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.	Planned
ATMS01	Network Surveillance	This service package includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the Traffic Management Subsystem. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Traffic Management Subsystem). The data generated by this service package enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users and the Information Service Provider Subsystem.	Existing
ATMS02	Traffic Probe Surveillance	This service package provides an alternative approach for surveillance of the roadway network. Two general implementation paths are supported by this service package: 1) wide-area wireless communications between the vehicle and center is used to communicate vehicle operational information and status directly to the center, and 2) dedicated short range communications between passing vehicles and the roadside is used to provide equivalent information to the center. The first approach leverages wide area communications equipment that may already be in the vehicle to support personal safety and advanced traveler information services. The second approach utilizes vehicle equipment that supports toll collection, in-vehicle signing, and other short range communications applications identified within the architecture. The service package enables transportation operators and traveler information providers to monitor road conditions, identify incidents, analyze and reduce the collected data, and make it available to users and private information providers. It requires one of the communications options identified above, on-board equipment, data reduction software, and fixed-point to fixed-point links between centers to share the collected information. Both “Opt out” and “Opt in” strategies are available to ensure the user has the ability to turn off the probe functions to ensure individual privacy. Due to the large volume of data collected by probes, data reduction techniques are required, such as the ability to identify and filter out-of-bounds or extreme data reports.	Planned
ATMS03	Traffic Signal Control	This service package provides the central control and monitoring equipment, communication links, and the signal control equipment that support traffic control at signalized intersections. A range of traffic signal control systems are represented by this service package ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests. This service package is generally an intra-jurisdictional package. Systems that achieve coordination across jurisdictions by using a common time base or other strategies that do not require real time coordination would also be represented by this package. Coordination of traffic signal systems using real-time communications is covered in the ATMS07-Regional Traffic Management service package. This service package is consistent with typical traffic signal control systems.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
ATMS04	Traffic Metering	This service package provides central monitoring and control, communications, and field equipment that support metering of traffic. It supports the complete range of metering strategies including ramp, interchange, and mainline metering. This package incorporates the instrumentation included in the Network Surveillance service package (traffic sensors are used to measure traffic flow and queues) to support traffic monitoring so responsive and adaptive metering strategies can be implemented. Also included is configurable field equipment to provide information to drivers approaching a meter, such as advance warning of the meter, its operational status (whether it is currently on or not, how many cars per green are allowed, etc.), lane usage at the meter (including a bypass lane for HOVs) and existing queue at the meter.	Existing
ATMS06	Traffic Information Dissemination	This service package provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, travel restrictions, incident information, and emergency alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information. This package also covers the equipment and interfaces that provide traffic information from a traffic management center to the media (for instance via a direct tie-in between a traffic management center and radio or television station computer systems), Transit Management, Emergency Management, and Information Service Providers. A link to the Maintenance and Construction Management subsystem allows real time information on road/bridge closures and restrictions due to maintenance and construction activities to be disseminated. The sharing of transportation operations data described in this service package also supports other services like ATMS09-Traffic Decision Support and Demand Management.	Existing
ATMS07	Regional Traffic Management	This service package provides for the sharing of traffic information and control among traffic management centers to support regional traffic management strategies. Regional traffic management strategies that are supported include inter-jurisdictional, real-time coordinated traffic signal control systems and coordination between freeway operations and traffic signal control within a corridor. This service package advances the ATMS03-Traffic Signal Control and ATMS04-Traffic Metering service packages by adding the communications links and integrated control strategies that enable integrated, interjurisdictional traffic management. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. This package relies principally on roadside instrumentation supported by the Traffic Signal Control and Traffic Metering service packages and adds hardware, software, and fixed-point to fixed-point communications capabilities to implement traffic management strategies that are coordinated between allied traffic management centers. Several levels of coordination are supported from sharing of information through sharing of control between traffic management centers.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
ATMS08	Traffic Incident Management System	This service package manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. The service package includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and through regional coordination with other traffic management, maintenance and construction management and emergency management centers as well as rail operations and event promoters. Information from these diverse sources is collected and correlated by this service package to detect and verify incidents and implement an appropriate response. This service package supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications or resource coordination between center subsystems. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination service package and dissemination of incident information to travelers through the Broadcast Traveler Information or Interactive Traveler Information service packages. The roadside equipment used to detect and verify incidents also allows the operator to monitor incident status as the response unfolds. The coordination with emergency management might be through a CAD system or through other communication with emergency field personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel.	Existing
ATMS09	Transportation Decision Support and Demand Management	This service package recommends courses of action to traffic operations personnel based on an assessment of current and forecast road network performance. Recommendations may include predefined incident response plans and regional surface street and freeway control strategies that correct network imbalances. Where applicable, this service package also recommends transit, parking, and toll strategies to influence traveler route and mode choices to support travel demand management (TDM) programs and policies managing both traffic and the environment. TDM recommendations are coordinated with transit, parking, and toll administration centers to support regional implementation of TDM strategies. Incident response and congestion management recommendations are implemented by the local traffic management center and coordinated with other regional centers by other service packages (see ATMS07-Regional Traffic Management and ATMS08-Traffic Incident Management). All recommendations are based on historical evaluation, real-time assessment, and forecast of the roadway network performance based on predicted travel demand patterns. Traffic data is collected from sensors and surveillance equipment as well as other transportation management centers (see ATIS06-Transportation Operations Data Sharing). Forecasted traffic loads are derived from historical data and route plans supplied by the Information Service Provider Subsystem. This service package also collects air quality, parking availability, transit usage, and vehicle occupancy data to support TDM, where applicable.	Planned
ATMS10	Electronic Toll Collection	This service package provides toll operators with the ability to collect tolls electronically and detect and process violations. The fees that are collected may be adjusted to implement demand management strategies. Field-Vehicle Communication between the roadway equipment and the vehicle is required as well as Fixed Point-Fixed Point interfaces between the toll collection equipment and transportation authorities and the financial infrastructure that supports fee collection. Toll violations are identified and electronically posted to vehicle owners. Standards, inter-agency coordination, and financial clearinghouse capabilities enable regional, and ultimately national interoperability for these services. Two other service packages, APTS04: Transit Fare Collection Management and ATMS16: Parking Facility Management also provide electronic payment services. These three service packages in combination provide an integrated electronic payment system for transportation services. The vehicle equipment and roadside readers that these systems utilize can also be used to collect road use statistics for highway authorities. This data can be collected as a natural by-product of the toll collection process or collected by separate readers that are dedicated to probe data collection.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
ATMS11	Emissions Monitoring and Management	This service package monitors individual vehicle emissions and provides general air quality monitoring using distributed sensors to collect the data. The collected information is transmitted to the emissions management subsystem for processing. Both area wide air quality monitoring and point emissions monitoring are supported by this service package. For area wide monitoring, this service package measures air quality, identifies sectors that are non-compliant with air quality standards, and collects, stores and reports supporting statistical data. For point emissions monitoring, this service package collects data from on-board diagnostic systems and measures tail pipe emissions to identify vehicles that exceed emissions standards and/or clean vehicles that could be released from standard emissions tests, depending on policy and regulations. Summary emissions information or warnings can also be displayed to drivers. The gathered information can be used to implement environmentally sensitive TDM programs, policies, and regulations.	Existing
ATMS13	Standard Railroad Grade Crossing	This service package manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate more advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Both passive (e.g., the crossbuck sign) and active warning systems (e.g., flashing lights and gates) are supported. (Note that passive systems exercise only the single interface between the roadway subsystem and the driver in the architecture definition.) These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification by interfaced wayside equipment of an approaching train. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported to both highway and railroad officials through wayside interfaces and interfaces to the traffic management subsystem.	Existing
ATMS14	Advanced Railroad Grade Crossing	This service package manages highway traffic at highway-rail intersections (HRIs) where operational requirements demand advanced features (e.g., where rail operational speeds are greater than 80 miles per hour). This service package includes all capabilities from the Standard Railroad Grade Crossing service package and augments these with additional safety features to mitigate the risks associated with higher rail speeds. The active warning systems supported by this service package include positive barrier systems that preclude entrance into the intersection when the barriers are activated. Like the Standard package, the HRI equipment is activated on notification by wayside interface equipment which detects, or communicates with the approaching train. In this service package, the wayside equipment provides additional information about the arriving train so that the train's direction of travel, estimated time of arrival, and estimated duration of closure may be derived. This enhanced information may be conveyed to the driver prior to, or in context with, warning system activation. This service package also includes additional detection capabilities that enable it to detect an entrapped or otherwise immobilized vehicle within the HRI and provide an immediate notification to highway and railroad officials.	Existing
ATMS15	Railroad Operations Coordination	This service package provides an additional level of strategic coordination between freight rail operations and traffic management centers. Rail operations provides train schedules, maintenance schedules, and any other forecast events that will result in highway-rail intersection (HRI) closures. This information is used to develop forecast HRI closure times and durations that may be used in advanced traffic control strategies or to enhance the quality of traveler information.	Planned

Service Package	Service Package Name	Service Package Description	Service Package Status
ATMS16	Parking Facility Management	This service package provides enhanced monitoring and management of parking facilities. It assists in the management of parking operations, coordinates with transportation authorities, and supports electronic collection of parking fees. This service package collects current parking status, shares this data with Information Service Providers and Traffic Management, and collects parking fees using the same in-vehicle equipment utilized for electronic toll collection or contact or proximity traveler cards used for electronic payment. Two other service packages, APTS04: Transit Fare Collection Management and ATMS10: Electronic Toll Collection also provide electronic payment services. These three service packages in combination provide an integrated electronic payment system for transportation services.	Existing
ATMS17	Regional Parking Management	This service package supports communication and coordination between equipped parking facilities and also supports regional coordination between parking facilities and traffic and transit management systems. This service package also shares information with transit management systems and information service providers to support multimodal travel planning, including parking reservation capabilities. Information including current parking availability, system status, and operating strategies are shared to enable local parking facility management that supports regional transportation strategies.	Planned
ATMS19	Speed Warning and Enforcement	This service package monitors vehicle speeds and supports warning drivers when their speed is excessive. Also the service includes notifications to an enforcement agency to enforce the speed limit of the roadway. Speed monitoring can be made via spot speed or average speed measurements. Roadside equipment can display the speed of passing vehicles and/or suggest a safe driving speed. Environmental conditions and vehicle characteristics may be monitored and factored into the safe speed advisories that are provided to the motorist. For example, warnings can be generated recognizing the limitations of a given vehicle for the geometry of the roadway such as rollover risk for tall vehicles. This service focuses on monitoring of vehicle speeds and enforcement of the speed limit while the variable speed limits service (covered in ATMS22-Variable Speed Limits service package) focuses on varying the posted speed limits to create more uniform speeds along a roadway, to promote safer driving during adverse conditions (such as fog) and/or to reduce air pollution.	Existing
ATMS20	Drawbridge Management	This service package supports systems that manage drawbridges at rivers and canals and other multimodal crossings (other than railroad grade crossings which are specifically covered by other service packages). The equipment managed by this service package includes control devices (e.g., gates, warning lights, dynamic message signs) at the drawbridge as well as the information systems that are used to keep travelers apprised of current and forecasted drawbridge status.	Existing
ATMS21	Roadway Closure Management	This service package closes roadways to vehicular traffic when driving conditions are unsafe, maintenance must be performed, and other scenarios where access to the roadway must be prohibited. The service package includes automatic or remotely controlled gates or barriers that control access to roadway segments including ramps and traffic lanes. Remote control systems allow the gates to be controlled from a central location or from a vehicle at the gate/barrier location, improving system efficiency and reducing personnel exposure to unsafe conditions during severe weather and other situations where roads must be closed. Surveillance systems allow operating personnel to visually verify the safe activation of the closure system and driver information systems (e.g., DMS) provide closure information to motorists in the vicinity of the closure. The equipment managed by this service package includes the control and monitoring systems, the field devices (e.g., gates, warning lights, DMS, CCTV cameras) at the closure location(s), and the information systems that notify other systems of a closure. This service package covers general road closure applications; specific closure systems that are used at railroad grade crossings, drawbridges, reversible lanes, etc. are covered by other ATMS service packages.	Planned

Service Package	Service Package Name	Service Package Description	Service Package Status
ATMS22	Variable Speed Limits	This service package sets variable speed limits along a roadway to create more uniform speeds, to promote safer driving during adverse conditions (such as fog), and/or to reduce air pollution. Also known as speed harmonization, this service monitors traffic and environmental conditions along the roadway. Based on the measured data, the system calculates and sets suitable speed limits, usually by lane. Equipment over and along the roadway displays the speed limits and additional information such as basic safety rules and current traffic information. The system can be centrally monitored and controlled by a traffic management center or it can be autonomous. This service establishes variable speed limits and communicates the speed limits to drivers. Speed warnings and enforcement of speeds limits, including variable speed limits, is covered in the ATMS19-Automated Speed Warning and Enforcement service package. Variable speed limits are an Active Traffic Management (ATM) strategy and are typically used in conjunction with other ATM strategies (such as ATMS23-Dynamic Lane Management and Shoulder Use and ATMS24-Dynamic Roadway Warning).	Planned
ATMS23	Dynamic Lane Management and Shoulder Use	This service package provides for active management of travel lanes along a roadway. The package includes the field equipment, physical overhead lane signs and associated control electronics that are used to manage and control specific lanes and/or the shoulders. This equipment can be used to change the lane configuration on the roadway according to traffic demand and lane destination along a typical roadway section or on approach to or access from a border crossing, multimodal crossing or intermodal freight depot. This package can be used to allow temporary or interim use of shoulders as travel lanes. The equipment can be used to electronically reconfigure intersections and interchanges and manage right-of-way dynamically including merges. Also, lanes can be designated for use by special vehicles only, such as buses, high occupancy vehicles (HOVs), vehicles attending a special event, etc. Prohibitions or restrictions of types of vehicles from using particular lanes can be implemented. The lane management system can be centrally monitored and controlled by a traffic management center or it can be autonomous. This service also can include automated enforcement equipment that notifies the enforcement agency of violators of the lane controls. Dynamic lane management and shoulder use is an Active Traffic Management (ATM) strategy and is typically used in conjunction with other ATM strategies (such as ATMS22-Variable Speed Limits and ATMS24-Dynamic Roadway Warning).	Planned
ATMS24	Dynamic Roadway Warning	This service package includes systems that dynamically warn drivers approaching hazards on a roadway. Such hazards include roadway weather conditions, road surface conditions, traffic conditions including queues, obstacles or animals in the roadway and any other transient event that can be sensed. These dynamic roadway warning systems can alert approaching drivers via warning signs, flashing lights, in-vehicle messages, etc. Such systems can increase the safety of a roadway by reducing the occurrence of incidents. The system can be centrally monitored and controlled by a traffic management center or it can be autonomous. Speed warnings that consider the limitations of a given vehicle for the geometry of the roadway (e.g., rollover risk for tall vehicles) are not included in this service package but are covered by the ATMS19 – Speed Warning and Enforcement service package. Roadway warning systems, especially queue warning systems are an Active Traffic Management (ATM) strategy and are typically used in conjunction with other ATM strategies (such as ATMS22-Variable Speed Limits and ATMS23-Dynamic Lane Management and Shoulder Use).	Existing
AVSS01	Vehicle Safety Monitoring	This service package will diagnose critical components of the vehicle and warn the driver of potential dangers. On-board sensors will determine the vehicle's condition, performance, on-board safety data, and display information.	Planned

Service Package	Service Package Name	Service Package Description	Service Package Status
AVSS03	Longitudinal Safety Warning	This service package allows for longitudinal warning. It utilizes safety sensors and collision sensors. It requires on-board sensors to monitor the areas in front of and behind the vehicle and present warnings to the driver about potential hazards.	Planned
AVSS04	Lateral Safety Warning	This service package allows for lateral warning. It utilizes safety sensors and collision sensors. It requires on-board sensors to monitor the areas to the sides of the vehicle and present warnings to the driver about potential hazards.	Planned
AVSS05	Intersection Safety Warning	This service package monitors vehicles approaching an intersection and warns drivers when hazardous conditions are detected. The service package detects impending violations (e.g., red-light violations) and potential conflicts between vehicles occupying or approaching the intersection (e.g., situations where a left turn would be unsafe because of approaching traffic). When a potentially hazardous condition is detected, a warning is communicated to the involved vehicles using short range communications and/or signs/signals in the intersection.	Planned
AVSS06	Pre-Crash Restraint Deployment	This service package provides in-vehicle sensors and on-board communications to monitor the vehicle's local environment, determine collision probability and deploy a pre-crash safety system. It will include on-board sensors to measure lateral and longitudinal gaps and together with weather and roadway conditions will determine lateral and longitudinal collision probability. It will exchange messages with other equipped vehicles to determine the precise location of surrounding vehicles. It will deploy a pre-crash safety system when a crash is imminent.	Planned
AVSS08	Advanced Vehicle Longitudinal Control	This service package automates the speed and headway control functions on board the vehicle. It utilizes safety sensors and collision sensors combined with vehicle dynamics processing to control the throttle and brakes. It requires on-board sensors to measure longitudinal gaps and a processor for controlling the vehicle speed.	Planned
AVSS09	Advanced Vehicle Lateral Control	This service package automates the steering control on board the vehicle. It utilizes safety sensors and collision sensors combined with vehicle dynamics processing to control the steering. It requires on-board sensors to measure lane position and lateral deviations and a processor for controlling the vehicle steering.	Planned
AVSS10	Intersection Collision Avoidance	This service package will determine the probability of an intersection collision and provide timely warnings to approaching vehicles so that avoidance actions can be taken. This service package builds on the Intersection Safety Warning field and in-vehicle equipment and adds equipment in the vehicle that can take control of the vehicle to avoid intersection violations and potential collisions. The same sensors and communications equipment in the roadway infrastructure are used to assess vehicle locations and speeds near an intersection. This information is determined and communicated to the approaching vehicle using a short range communications system. The vehicle uses this information to develop control actions which alter the vehicle's speed and steering control and potentially activate its pre-crash safety system.	Planned
AVSS11	Automated Vehicle Operations	This service package enables "hands-off" operation of the vehicle on automated portions of the highway system. Implementation requires lateral lane holding, vehicle speed and steering control. Communications between vehicles and between the vehicles and supporting infrastructure equipment supports cooperative check-in to the automated portion of the system and transition to automated mode, coordination of maneuvers between vehicles in automated mode, and checkout from the automated system as the driver resumes control of the vehicle.	Planned

Service Package	Service Package Name	Service Package Description	Service Package Status
AVSS12	Cooperative Vehicle Safety Systems	This service package enhances the on-board longitudinal and lateral warning stand-alone systems by exchanging messages with other surrounding vehicles and roadside equipment. Vehicles send out information concerning their location, speed, and direction to surrounding vehicles. The roadside equipment provides information about potential safety hazards in the vehicle path such as stalled (unequipped) vehicles, wrong-way drivers, debris, or water hazards. The on-board systems can then process this information and present warnings to the driver including headway warnings, merge warnings, unsafe passing warnings, and warnings about hazards detected in the vehicle path. Special messages from approaching emergency vehicles may also be received and processed.	Planned
CVO01	Carrier Operations and Fleet Management	This service package provides the capabilities to manage a fleet of commercial vehicles. The Fleet and Freight Management subsystem provides the route for a commercial vehicle by either utilizing an in-house routing software package or an Information Service Provider. Routes generated by either approach are constrained by hazardous materials and other restrictions (such as height or weight). Any such restricted areas are determined by the Commercial Vehicle Administration. A route would be electronically sent to the Commercial Vehicle with any appropriate dispatch instructions. The location of the Commercial Vehicle can be monitored by the Fleet and Freight Management subsystem and routing changes can be made depending on current road network conditions. Once a route has been assigned, changes must be coordinated between the Fleet and Freight Management subsystem and the Commercial Vehicle. Commercial Vehicle Drivers would be alerted to any changes in route from the planned route and given an opportunity to justify a rerouting. Any unauthorized or unexpected route changes by the Commercial Vehicle will register a route deviation alert with the Fleet and Freight Management subsystem. The Fleet and Freight Management subsystem can also notify local public safety agencies of the route deviation when appropriate (e.g., if there is safety sensitive HAZMAT being carried), by sending an alarm to the Emergency Management subsystem.	Existing
CVO02	Freight Administration	This service package tracks the movement of cargo and monitors the cargo condition. Interconnections are provided to intermodal freight shippers and intermodal freight depots for tracking of cargo from source to destination. In addition to the usual cargo monitoring required to insure that cargo gets from origin to destination, the Fleet and Freight Management subsystem monitors shipments to make sure that no tampering or breach of security occurs to the cargo on commercial vehicles. Any such tampering will be reported to the Fleet and Freight Management subsystem. In addition to exceptions (e.g., alerts) that are reported, on-going indications of the state of the various freight equipment are reported to the Fleet and Freight Management subsystem. The commercial vehicle driver is also alerted of any tampering or breach of cargo security. Freight managers may decide to take further action on the alerts and/or provide responses that explain that the alerts are false alarms. If no explanation is received, the Fleet and Freight Management subsystem may notify the Emergency Management subsystem. Commercial vehicle and freight security breaches may also be sent to the Commercial Vehicle Check subsystem.	Existing
CVO03	Electronic Clearance	This service package provides for automated clearance at roadside check facilities. The roadside check facility communicates with the Commercial Vehicle Administration subsystem to retrieve infrastructure snapshots of critical carrier, vehicle, and driver data to be used to sort passing vehicles. This allows a good driver/vehicle/carrier to pass roadside facilities at highway speeds using transponders and Field-Vehicle Communications to the roadside. Results of roadside clearance activities will be passed on to the Commercial Vehicle Administration. The roadside check facility may be equipped with Automated Vehicle Identification (AVI), weighing sensors, transponder read/write devices and computer workstations.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
CVO04	CV Administrative Processes	This service package supports program administration and enrollment and provides for electronic application, processing, fee collection, issuance, and distribution of CVO credential and tax filing. Through this process, carriers, drivers, and vehicles may be enrolled in a variety of programs including electronic clearance and wireless inspection programs which allow commercial vehicles to be screened at mainline speeds. Through this enrollment process, current profile databases are maintained in the Commercial Vehicle Administration subsystem and snapshots of this data are made available to the roadside check facilities. Current program status is maintained and made available to carriers, drivers, and other authorized users of the data. Enrolled carriers are provided the option to review and challenge the collected data. Commercial Vehicle Administration subsystems can share current program status and credential information with other Commercial Vehicle Administration subsystems, so that it is possible for any Commercial Vehicle Administration subsystem to have access to all credentials, credential fees, credentials status and safety status information. In addition, it is possible for one Commercial Vehicle Administration subsystem to collect HAZMAT route restrictions information from other Commercial Vehicle Administration subsystems and then act as a clearinghouse for this route restrictions information for Information Service Providers, Map Update Providers, and Fleet and Freight Management subsystems.	Existing
CVO06	Weigh-In-Motion	This service package provides for high speed weigh-in-motion with or without Automated Vehicle Identification (AVI) capabilities. This service package provides the roadside equipment that could be used as a stand-alone system or to augment the Electronic Clearance (CVO03) service package. It also supports virtual weigh station configurations that do not require continuous staffing and are monitored from another location. These sites may include a variety of sensor components to collect data in addition to the weigh-in-motion sensors and include a camera system and communications with the remote monitoring location.	Existing
CVO07	Roadside CVO Safety	This service package provides for automated roadside safety monitoring and reporting. It automates commercial vehicle safety inspections at the roadside check locations. The capabilities for performing the safety inspection are shared between this service package and the On-board CVO and Freight Safety & Security (CVO08) service package which enables a variety of implementation options. The basic option, directly supported by this service package, facilitates safety inspection of vehicles that have been pulled off the highway, perhaps as a result of the automated screening process provided by the Electronic Clearance (CVO03) service package. In this scenario, only basic identification data and status information is read from the electronic tag on the commercial vehicle. The identification data from the tag enables access to additional safety data maintained in the infrastructure which is used to support the safety inspection, and may also inform the pull-in decision if system timing requirements can be met. More advanced implementations, supported by the On-board CVO and Freight Safety & Security (CVO08) service package, utilize additional on-board vehicle safety monitoring and reporting capabilities in the commercial vehicle to augment the roadside safety check.	Existing
CVO10	HAZMAT Management	This service package integrates incident management capabilities with commercial vehicle tracking to assure effective treatment of HAZMAT material and incidents. HAZMAT tracking is performed by the Fleet and Freight Management Subsystem. The Emergency Management subsystem is notified by the Commercial Vehicle if an incident occurs and coordinates the response. The response is tailored based on information that is provided as part of the original incident notification or derived from supplemental information provided by the Fleet and Freight Management Subsystem. The latter information can be provided prior to the beginning of the trip or gathered following the incident depending on the selected policy and implementation.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
EM01	Emergency Call-Taking and Dispatch	This service package provides basic public safety call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Emergency Management Subsystems supports emergency notification between agencies. Wide area wireless communications between the Emergency Management Subsystem and an Emergency Vehicle supports dispatch and provision of information to responding personnel.	Existing
EM02	Emergency Routing	This service package supports automated vehicle location and dynamic routing of emergency vehicles. Traffic information, road conditions, and suggested routing information are provided to enhance emergency vehicle routing. Special priority or other specific emergency traffic control strategies can be coordinated to improve the safety and time-efficiency of responding vehicle travel on the selected route(s). The Emergency Management Subsystem provides the routing for the emergency fleet based on real-time conditions and has the option of requesting a route from the Traffic Management subsystem. The Emergency Vehicle may also be equipped with dedicated short range communications for local signal preemption and the transmission of alerts to surrounding vehicles. The service provides for information exchange between care facilities and both the Emergency Management Subsystem and emergency vehicles.	Existing
EM04	Roadway Service Patrols	This service package supports roadway service patrol vehicles that monitor roads that aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. If problems are detected, the roadway service patrol vehicles will provide assistance to the motorist (e.g., push a vehicle to the shoulder or median). The service package monitors service patrol vehicle locations and supports vehicle dispatch to identified incident locations. Incident information collected by the service patrol is shared with traffic, maintenance and construction, and traveler information systems.	Existing
EM05	Transportation Infrastructure Protection	This service package includes the monitoring of transportation infrastructure (e.g., bridges, tunnels and management centers) for potential threats using sensors and surveillance equipment and barrier and safeguard systems to control access, preclude an incident, and mitigate the impact of an incident if it occurs. Threats can result from acts of nature (e.g., hurricanes, earthquakes), terrorist attacks or other incidents causing damage to the infrastructure (e.g., stray barge hitting a bridge support). Infrastructure may be monitored with acoustic, environmental threat (such as nuclear, biological, chemical, and explosives), infrastructure condition and integrity, motion and object sensors and video and audio surveillance equipment. Data from such sensors and surveillance equipment may be processed in the field or sent to a center for processing. The data enables operators at the center to detect and verify threats. When a threat is detected, agencies are notified. Detected threats or advisories received from other agencies result in an increased level of system preparedness. In response to threats, barrier and safeguard systems may be activated by Traffic Management Subsystems to deter an incident, control access to an area or mitigate the impact of an incident. Barrier systems include gates, barriers and other automated and remotely controlled systems that manage entry to transportation infrastructure. Safeguard systems include blast shields, exhaust systems and other automated and remotely controlled systems that mitigate impact of an incident.	Planned

Service Package	Service Package Name	Service Package Description	Service Package Status
EM06	Wide-Area Alert	This service package uses ITS driver and traveler information systems to alert the public in emergency situations such as child abductions, severe weather events, civil emergencies, and other situations that pose a threat to life and property. The alert includes information and instructions for transportation system operators and the traveling public, improving public safety and enlisting the public's help in some scenarios. The ITS technologies will supplement and support other emergency and homeland security alert systems such as the Emergency Alert System (EAS). When an emergency situation is reported and verified and the terms and conditions for system activation are satisfied, a designated agency broadcasts emergency information to traffic agencies, transit agencies, information service providers, toll operators, and others that operate ITS systems. The ITS systems, in turn, provide the alert information to transportation system operators and the traveling public using ITS technologies such as dynamic message signs, highway advisory radios, in-vehicle displays, transit displays, 511 traveler information systems, and traveler information web sites.	Existing
EM07	Early Warning System	This service package monitors and detects potential, looming, and actual disasters including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and acts of terrorism including nuclear, chemical, biological, and radiological weapons attacks). The service package monitors alerting and advisory systems, ITS sensors and surveillance systems, field reports, and emergency call-taking systems to identify emergencies and notifies all responding agencies of detected emergencies.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
EM08	Disaster Response and Recovery	This service package enhances the ability of the surface transportation system to respond to and recover from disasters. It addresses the most severe incidents that require an extraordinary response from outside the local community. All types of disasters are addressed including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and national security emergencies such as nuclear, chemical, biological, and radiological weapons attacks). The service package supports coordination of emergency response plans, including general plans developed before a disaster as well as specific tactical plans with short time horizon that are developed as part of a disaster response. The service package provides enhanced access to the scene for response personnel and resources, provides better information about the transportation system in the vicinity of the disaster, and maintains situation awareness regarding the disaster itself. In addition, this service package tracks and coordinates the transportation resources - the transportation professionals, equipment, and materials - that constitute a portion of the disaster response. The service package identifies the key points of integration between transportation systems and the public safety, emergency management, public health, and other allied organizations that form the overall disaster response. In this service package, the Emergency Management subsystem represents the federal, regional, state, and local Emergency Operations Centers and the Incident Commands that are established to respond to the disaster. The interface between the Emergency Management Subsystem and the other center subsystems provides situation awareness and resource coordination among transportation and other allied response agencies. In its role, traffic management implements special traffic control strategies and detours and restrictions to effectively manage traffic in and around the disaster. Maintenance and construction provides damage assessment of road network facilities and manages service restoration. Transit management provides a similar assessment of status for transit facilities and modifies transit operations to meet the special demands of the disaster. As immediate public safety concerns are addressed and disaster response transitions into recovery, this service package supports transition back to normal transportation system operation, recovering resources, managing on-going transportation facility repair, supporting data collection and revised plan coordination, and other recovery activities. This service package builds on the basic traffic incident response service that is provided by ATMS08, the Traffic Incident Management service package. This service package addresses the additional complexities and coordination requirements that are associated with the most severe incidents that warrant an extraordinary response from outside the local jurisdictions and require special measures such as the activation of one or more emergency operations centers. Many users of the National ITS Architecture will want to consider both ATMS08 and this service package since every region is concerned with both day-to-day management of traffic-related incidents and occasional management of disasters that require extraordinary response. Disaster Response and Recovery is also supported by EM10, the "Disaster Traveler Information" service package that keeps the public informed during a disaster response. See that service package for more information.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
EM09	Evacuation and Reentry Management	This service package supports evacuation of the general public from a disaster area and manages subsequent reentry to the disaster area. The service package addresses evacuations for all types of disasters, including disasters like hurricanes that are anticipated and occur slowly, allowing a well-planned orderly evacuation, as well as disasters like terrorist acts that occur rapidly, without warning, and allow little or no time for preparation or public warning. This service package supports coordination of evacuation plans among the federal, state, and local transportation, emergency, and law enforcement agencies that may be involved in a large-scale evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. Information is shared with traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes. Reversible lanes, shoulder use, closures, special signal control strategies, and other special strategies may be implemented to maximize capacity along the evacuation routes. Transit resources play an important role in an evacuation, removing many people from an evacuated area while making efficient use of limited capacity. Additional shared transit resources may be added and managed in evacuation scenarios. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. Evacuations are also supported by EM10, the "Disaster Traveler Information" service package, which keeps the public informed during evacuations. See that service package for more information.	Planned
EM10	Disaster Traveler Information	This service package uses ITS to provide disaster-related traveler information to the general public, including evacuation and reentry information and other information concerning the operation of the transportation system during a disaster. This service package collects information from multiple sources including traffic, transit, public safety, emergency management, shelter provider, and travel service provider organizations. The collected information is processed and the public is provided with real-time disaster and evacuation information using ITS traveler information systems. A disaster will stress the surface transportation system since it may damage transportation facilities at the same time that it places unique demands on these facilities to support public evacuation and provide access for emergency responders. Similarly, a disaster may interrupt or degrade the operation of many traveler information systems at the same time that safety-critical information must be provided to the traveling public. This service package keeps the public informed in these scenarios, using all available means to provide information about the disaster area including damage to the transportation system, detours and closures in effect, special traffic restrictions and allowances, special transit schedules, and real-time information on traffic conditions and transit system performance in and around the disaster. This service package also provides emergency information to assist the public with evacuations when necessary. Information on mandatory and voluntary evacuation zones, evacuation times, and instructions are provided. Available evacuation routes and destinations and current and anticipated travel conditions along those routes are provided so evacuees are prepared and know their destination and preferred evacuation route. Information on available transit services and traveler services (shelters, medical services, hotels, restaurants, gas stations, etc.) is also provided. In addition to general evacuation information, this service package provides specific evacuation trip planning information that is tailored for the evacuee based on origin, selected destination, and evacuee-specified evacuation requirements and route parameters. This service package augments the ATIS service packages that provide traveler information on a day-to-day basis for the surface transportation system. This service package provides focus on the special requirements for traveler information dissemination in disaster situations.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
MC01	Maintenance and Construction Vehicle and Equipment Tracking	This service package will track the location of maintenance and construction vehicles and other equipment to ascertain the progress of their activities. These activities can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations.	Existing
MC02	Maintenance and Construction Vehicle Maintenance	This service package performs vehicle maintenance scheduling and manages both routine and corrective maintenance activities on vehicles and other maintenance and construction equipment. It includes on-board sensors capable of automatically performing diagnostics for maintenance and construction vehicles, and the systems that collect this diagnostic information and use it to schedule and manage vehicle maintenance.	Existing
MC03	Road Weather Data Collection	This service package collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway (or guideway in the case of transit related rail systems). In addition to fixed sensor stations at the roadside, sensing of the roadway environment can also occur from sensor systems located on Maintenance and Construction Vehicles. The collected environmental data is used by the Weather Information Processing and Distribution service package to process the information and make decisions on operations. The collected environmental data may be aggregated, combined with data attributes and sent to meteorological systems for data qualification and further data consolidation. The service package may also request and receive qualified data sets from meteorological systems.	Existing
MC04	Weather Information Processing and Distribution	This service package processes and distributes the environmental information collected from the Road Weather Data Collection service package. This service package uses the environmental data to detect environmental hazards such as icy road conditions, high winds, dense fog, etc. so system operators and decision support systems can make decision on corrective actions to take. The continuing updates of road condition information and current temperatures can be used by system operators to more effectively deploy road maintenance resources, issue general traveler advisories, issue location specific warnings to drivers using the Traffic Information Dissemination service package, and aid operators in scheduling work activity.	Existing
MC05	Roadway Automated Treatment	This service package automatically treats a roadway section based on environmental or atmospheric conditions. Treatments include fog dispersion, anti-icing chemicals, etc. The service package includes the environmental sensors that detect adverse conditions, the automated treatment system itself, and driver information systems (e.g., dynamic message signs) that warn drivers when the treatment system is activated.	Existing
MC06	Winter Maintenance	This service package supports winter road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), and other snow and ice control activities. This package monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.	Existing
MC07	Roadway Maintenance and Construction	This service package supports numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way. Maintenance services would include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, CCTV, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling maintenance and construction activities.	Existing

Service Package	Service Package Name	Service Package Description	Service Package Status
MC08	Work Zone Management	This service package manages work zones, controlling traffic in areas of the roadway where maintenance, construction, and utility work activities are underway. Traffic conditions are monitored using CCTV cameras and controlled using dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers. Work zone information is coordinated with other groups (e.g., ISP, traffic management, other maintenance and construction centers). Work zone speeds and delays are provided to the motorist prior to the work zones. This service package provides control of field equipment in all maintenance and construction areas, including fixed, portable, and truck-mounted devices supporting both stationary and mobile work zones.	Existing
MC09	Work Zone Safety Monitoring	This service package includes systems that improve work crew safety and reduce collisions between the motoring public and maintenance and construction vehicles. This service package detects vehicle intrusions in work zones and warns crew workers and drivers of imminent encroachment or other potential safety hazards. Crew movements are also monitored so that the crew can be warned of movement beyond the designated safe zone. The service package supports both stationary and mobile work zones. The intrusion detection and alarm systems may be collocated or distributed, allowing systems that detect safety issues far upstream from a work zone (e.g., detection of over dimension vehicles before they enter the work zone).	Planned
MC10	Maintenance and Construction Activity Coordination	This service package supports the dissemination of maintenance and construction activity to centers that can utilize it as part of their operations, or to the Information Service Providers who can provide the information to travelers.	Existing
MC12	Infrastructure Monitoring	This service package monitors the condition of pavement, bridges, tunnels, associated hardware, and other transportation-related infrastructure (e.g., culverts) using both fixed and vehicle-based infrastructure monitoring sensors. Fixed sensors monitor vibration, stress, temperature, continuity, and other parameters and mobile sensors and data logging devices collect information on current infrastructure condition. This service package also monitors vehicle probes for vertical acceleration data and other probe data that may be used to determine current pavement condition.	Planned

Appendix B. Functional Requirements Details

Each ITS system operated by the stakeholders must perform certain functions to effectively deliver the ITS services for the state. The primary functions that each system needs to perform are broadly defined in the Ohio Statewide ITS Architecture. The high-level requirements are grouped into functional areas that identify requirements associated with each selected ITS service.

Table 10: Functional Requirements Details

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Archived Data User Systems	Archived Data User Systems				
Commercial Vehicles	Commercial Vehicle	On-board CV Electronic Data	1	The commercial vehicle shall receive pass/pull-in messages from the roadside check facilities and present them to the driver in either audible or visual forms.	Existing
Commercial Vehicles	Commercial Vehicle	On-board CV Electronic Data	2	The commercial vehicle shall respond to requests to provide data accumulated on-board the vehicle to roadside check facilities for inspection including driver logs, electronic identifiers, credentials, border clearance data, and other screening data such as cargo status, hazmat identifiers, out of service status, vehicle axle weight, vehicle weight, and time.	Existing
Commercial Vehicles	Commercial Vehicle	On-board CV Electronic Data	3	The commercial vehicle shall respond to requests to provide the identity, status and other information from the electronic cargo lock tag, if so equipped, to roadside check facilities, including border crossings.	Existing
Commercial Vehicles	Commercial Vehicle	On-board CV Safety and Security	1	The commercial vehicle shall receive pass/pull-in messages from the roadside check facilities and present them to the driver in either audible or visual forms.	Existing
Commercial Vehicles	Commercial Vehicle	On-board CV Safety and Security	2	The commercial vehicle shall respond to requests to provide on-board safety inspection data to roadside check facilities including vehicle identification, driver logs, and characteristics data for initiating safety and security checking. Results of the inspection are read back into the on-board equipment.	Existing
Commercial Vehicles	Commercial Vehicle	On-board Trip Monitoring	1	The commercial vehicle shall compute the location of the commercial vehicle and its freight equipment based on inputs from commercial vehicle measures (e.g. identity, distance traveled, etc.) and a positioning system.	Existing
Commercial Vehicles	Commercial Vehicle	On-board Trip Monitoring	2	The commercial vehicle shall provide details of the route input from the commercial vehicle fleet management center.	Existing
Commercial Vehicles	Commercial Vehicle	On-board Trip Monitoring	3	The commercial vehicle shall provide warnings to the driver and the commercial vehicle fleet management center when the vehicle's location has deviated from its planned route.	Existing
Commercial Vehicles	Location Data Source				
Commercial Vehicles	Vehicle Characteristics				
Connected Vehicles	Vehicle	Vehicle Automated Operations	1	The vehicle shall provide the capability for a driver to request access to automated vehicle lanes.	Planned
Connected Vehicles	Vehicle	Vehicle Automated Operations	2	The vehicle shall request usage of automated lanes for all or part of an overall route; including sending vehicle conditions to the roadside to determine eligibility.	Planned
Connected Vehicles	Vehicle	Vehicle Automated Operations	3	The vehicle shall collect and monitor data concerning the safety of the vehicle while on automated lanes including conditions of the brakes, drive train, forward/rear/side sensors, steering condition, fuel level, tire wear and pressure, and the status of vehicle processors and communications.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Connected Vehicles	Vehicle	Vehicle Automated Operations	4	The vehicle shall monitor the area surrounding vehicle in an automated lane to determine the proximity of other objects to the vehicle. Obstacles could include animals, other vehicles, pedestrians, debris in roadway etc.	Planned
Connected Vehicles	Vehicle	Vehicle Automated Operations	5	The vehicle shall evaluate the likelihood of a collision between two vehicles or a vehicle and a stationary object, based on the proximity of other objects to the vehicle, conditions of the roadway and environment, and the current speed and direction of the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Automated Operations	6	The vehicle shall deploy a pre-crash safety system either to avoid the accident or to reduce the accident severity, once it has determined the probability of a collision with the other vehicle or obstacle to be high.	Planned
Connected Vehicles	Vehicle	Vehicle Automated Operations	7	The vehicle shall receive automated highway system status, warnings and collision avoidance data (intersection congestion, approaching vehicles, potential collision hazards, etc.) from the roadway field equipment.	Planned
Connected Vehicles	Vehicle	Vehicle Automated Operations	8	The vehicle shall send appropriate control actions to the vehicle's accelerator, braking and steering actuators when operating in an automated lane.	Planned
Connected Vehicles	Vehicle	Vehicle Automated Operations	9	The vehicle shall exchange data with other vehicles in the platoon to share vehicle status information, roadway condition data, and initiate vehicle actuator controls to maintain safe following distances.	Planned
Connected Vehicles	Vehicle	Vehicle Automated Operations	10	The vehicle shall provide warnings to the driver of potential dangers based on sensor input and analysis concerning the safety of the vehicle operating in an automated lane.	Planned
Connected Vehicles	Vehicle	Vehicle Automated Operations	11	The vehicle shall present information to the driver in audible or visual forms without impairing the driver's ability to control the vehicle in a safe manner.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Control	1	The vehicle shall monitor the area surrounding the vehicle as it approaches an intersection to determine the proximity of other objects to the vehicle. Obstacles could include animals, other vehicles, pedestrians, debris in roadway etc.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Control	2	The vehicle shall evaluate the likelihood of a collision between two vehicles or a vehicle and a stationary object, based on the proximity of other objects to the vehicle and the current speed and direction of the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Control	3	The vehicle shall monitor its approach to the intersection and determine if it is approaching the intersection with excessive speed or in an unsafe manner.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Control	4	The vehicle shall send its current position, velocity, acceleration, direction, and intended turning movement to the roadway field equipment.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Control	5	The vehicle shall receive warnings and collision avoidance data (intersection congestion, approaching vehicles, potential collision hazards, etc.) from the roadway field equipment.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Control	6	The vehicle shall provide warnings to the driver about the presence of potentially hazardous situations and need for immediate action.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Connected Vehicles	Vehicle	Vehicle Intersection Control	7	The vehicle shall send appropriate control actions to the vehicle's braking and steering actuators.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Control	8	The vehicle shall deploy a pre-crash safety system either to avoid the accident or to reduce the accident severity, once it has determined the probability of a collision to be high.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Control	9	The vehicle shall present information to the driver in audible or visual forms without impairing the driver's ability to control the vehicle in a safe manner.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Safety Warning	1	The vehicle shall monitor the area surrounding the vehicle as it approaches an intersection to determine the proximity of other objects to the vehicle. Obstacles could include animals, other vehicles, pedestrians, debris in roadway etc.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Safety Warning	2	The vehicle shall evaluate the likelihood of a collision between two vehicles or a vehicle and a stationary object, based on the proximity of other objects to the vehicle and the current speed and direction of the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Safety Warning	3	The vehicle shall monitor its approach to the intersection and determine if it is approaching the intersection with excessive speed or in an unsafe manner.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Safety Warning	4	The vehicle shall send its current position, velocity, acceleration, direction, and intended turning movement to the roadway field equipment.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Safety Warning	5	The vehicle shall receive warnings and collision avoidance data (intersection congestion, approaching vehicles, potential collision hazards, etc.) from the roadway field equipment.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Safety Warning	6	The vehicle shall provide warnings to the driver about the presence of potentially hazardous situations and need for immediate action.	Planned
Connected Vehicles	Vehicle	Vehicle Intersection Safety Warning	7	The vehicle shall present information to the driver in audible or visual forms without impairing the driver's ability to control the vehicle in a safe manner.	Planned
Connected Vehicles	Vehicle	Vehicle Lateral Control	1	The vehicle shall monitor the area to the sides of the vehicle to determine the proximity of other objects to the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Lateral Control	2	The vehicle shall evaluate the likelihood of a collision between two vehicles or a vehicle and a stationary object, based on the proximity of other objects to the vehicle, roadway characteristics, and the current speed and direction of the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Lateral Control	3	The vehicle shall provide position warnings to the driver when an object gets close enough to the vehicle to become a hazard if no action is taken by the driver.	Planned
Connected Vehicles	Vehicle	Vehicle Lateral Control	4	The vehicle shall provide an interface through which a vehicle driver can initiate, monitor and terminate automatic control of the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Lateral Control	5	The vehicle shall send appropriate control actions to the vehicle's steering actuators.	Planned
Connected Vehicles	Vehicle	Vehicle Lateral Control	6	The vehicle shall present information to the driver in audible or visual forms without impairing the driver's ability to control the vehicle in a safe manner.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Connected Vehicles	Vehicle	Vehicle Lateral Warning System	1	The vehicle shall monitor the area to the sides of the vehicle to determine the proximity of other objects to the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Lateral Warning System	2	The vehicle shall evaluate the likelihood of a collision between two vehicles or a vehicle and a stationary object, based on the proximity of other objects to the vehicle, roadway characteristics, and the current speed and direction of the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Lateral Warning System	3	The vehicle shall provide position warnings to the driver when an object gets close enough to the vehicle to become a hazard if no action is taken by the driver.	Planned
Connected Vehicles	Vehicle	Vehicle Lateral Warning System	4	The vehicle shall present information to the driver in audible or visual forms without impairing the driver's ability to control the vehicle in a safe manner.	Planned
Connected Vehicles	Vehicle	Vehicle Location Determination	1	The vehicle shall provide the vehicle's current location to other in-vehicle functions.	Planned
Connected Vehicles	Vehicle	Vehicle Location Determination	2	The vehicle shall calculate the location from one or more data sources including positioning systems such as GPS, sensors that track vehicle movement, and maps used to determine the likely vehicle route.	Planned
Connected Vehicles	Vehicle	Vehicle Longitudinal Control	1	The vehicle shall monitor the area behind and in front of the vehicle to determine the proximity of other objects to the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Longitudinal Control	2	The vehicle shall evaluate the likelihood of a collision between two vehicles or a vehicle and a stationary object, based on the proximity of other objects to the vehicle and the current speed and direction of the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Longitudinal Control	3	The vehicle shall provide position warnings to the driver when an object gets close enough to the vehicle to become a hazard if no action is taken by the driver.	Planned
Connected Vehicles	Vehicle	Vehicle Longitudinal Control	4	The vehicle shall provide an interface through which a vehicle driver can initiate, monitor and terminate automatic control of the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Longitudinal Control	5	The vehicle shall send appropriate control actions (acceleration, braking, or maintaining speed) to the vehicle's accelerator and/or brake actuators.	Planned
Connected Vehicles	Vehicle	Vehicle Longitudinal Control	6	The vehicle shall present information to the driver in audible or visual forms without impairing the driver's ability to control the vehicle in a safe manner.	Planned
Connected Vehicles	Vehicle	Vehicle Longitudinal Warning System	1	The vehicle shall monitor the area behind and in front of the vehicle to determine the proximity of other objects to the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Longitudinal Warning System	2	The vehicle shall evaluate the likelihood of a collision between two vehicles or a vehicle and a stationary object, based on the proximity of other objects to the vehicle and the current speed and direction of the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Longitudinal Warning System	3	The vehicle shall provide position warnings to the driver when an object gets close enough to the vehicle to become a hazard if no action is taken by the driver.	Planned
Connected Vehicles	Vehicle	Vehicle Longitudinal Warning System	4	The vehicle shall present information to the driver in audible or visual forms without impairing the driver's ability to control the vehicle in a safe manner.	Planned
Connected Vehicles	Vehicle	Vehicle Pre-Crash Safety Systems	1	The vehicle shall monitor the area around the vehicle to determine the proximity of other objects to the vehicle.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Connected Vehicles	Vehicle	Vehicle Pre-Crash Safety Systems	2	The vehicle shall send and receive current vehicle location and trajectory information and use this information to determine the proximity of other vehicles and closing rates.	Planned
Connected Vehicles	Vehicle	Vehicle Pre-Crash Safety Systems	3	The vehicle shall evaluate the likelihood of a collision between two vehicles or a vehicle and a stationary object, based on the proximity of other objects to the vehicle, conditions of the roadway and environment, and the current speed and direction of the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Pre-Crash Safety Systems	4	The vehicle shall deploy a pre-crash safety system either to avoid the accident or to reduce the accident severity, once it has determined the probability of a collision with the other vehicle or obstacle to be high.	Planned
Connected Vehicles	Vehicle	Vehicle Safety Monitoring System	1	The vehicle shall collect and monitor data concerning the safety of the vehicle - including, steering, braking, acceleration, emissions, fuel economy, engine performance, etc.	Planned
Connected Vehicles	Vehicle	Vehicle Safety Monitoring System	2	The vehicle shall determine the status of the vehicle in terms of its continued ability to operate in a safe manner.	Planned
Connected Vehicles	Vehicle	Vehicle Safety Monitoring System	3	The vehicle shall provide warnings to the driver of potential dangers based on sensor input and analysis concerning the safety of the vehicle.	Planned
Connected Vehicles	Vehicle	Vehicle Safety Monitoring System	4	The vehicle shall present information to the driver in audible or visual forms without impairing the driver's ability to control the vehicle in a safe manner.	Planned
Connected Vehicles	Vehicle	Vehicle Warning System	1	The vehicle shall receive vehicle location, speed, and direction information from surrounding vehicles.	Planned
Connected Vehicles	Vehicle	Vehicle Warning System	2	The vehicle shall determine vehicle proximity and closing rates and determine the likelihood of a collision.	Planned
Connected Vehicles	Vehicle	Vehicle Warning System	3	The vehicle shall warn the driver if the driver should take action to avoid a collision.	Planned
Connected Vehicles	Vehicle	Vehicle Warning System	4	The vehicle shall warn the driver of approaching emergency vehicles.	Planned
Connected Vehicles	Vehicle	Vehicle Warning System	5	The vehicle shall provide its location, speed, direction, and other information to surrounding vehicles.	Planned
Connected Vehicles	Vehicle	Vehicle Warning System	6	The vehicle shall provide its location, speed, direction, and other information to field elements.	Planned
Connected Vehicles	Vehicle	Vehicle Warning System	7	The vehicle shall receive warnings from field elements.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Early Warning System	3	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Early Warning System	4	The center shall broadcast wide-area alerts and advisories to transit management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Early Warning System	5	The center shall broadcast wide-area alerts and advisories to toll administration centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Early Warning System	7	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Early Warning System	8	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Early Warning System	11	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Evacuation Support	6	The center shall request resources from transit agencies as needed to support the evacuation.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Planned
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Planned
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Evacuation Support	11	The center shall submit evacuation information to toll administration centers along with requests for changes in the toll services or fee collection during an evacuation.	Planned
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders to support local management of an incident.	Existing
County and City Emergency Operations Centers (EOCs)	Emergency Management	Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Emergency Operations Centers (EOCs)	Other Emergency Management				
County and City Emergency Vehicles	Emergency Vehicle	On-board EV En Route Support	1	The emergency vehicle, including roadway service patrols, shall track its current location.	Existing
County and City Emergency Vehicles	Emergency Vehicle	On-board EV En Route Support	2	The emergency vehicle, including roadway service patrols, shall send the vehicle's location and operational data to the center for emergency management and dispatch.	Existing
County and City Emergency Vehicles	Emergency Vehicle	On-board EV En Route Support	5	The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.	Existing
County and City Law Enforcement	Emergency Management	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
County and City Law Enforcement	Emergency Management	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
County and City Law Enforcement	Emergency Management	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
County and City Law Enforcement	Emergency Management	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
County and City Law Enforcement	Emergency Management	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
County and City Law Enforcement	Enforcement Agency				
County and City Lift Bridge Equipment	Multimodal Crossings				
County and City Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Location Tracking	1	The maintenance and construction vehicle shall track its current location.	Existing
County and City Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Location Tracking	2	The maintenance and construction vehicle shall send the time stamped vehicle location to the controlling center.	Existing
County and City Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Safety Monitoring	1	The maintenance and construction vehicle shall detect that a vehicle has intruded upon the boundary of a work zone. The boundary of the work zone represents an area around the maintenance and construction vehicle, which may be stationary or moving.	Planned
County and City Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Safety Monitoring	2	The maintenance and construction vehicle shall receive work zone warnings from the field equipment at the roadside, other maintenance and construction vehicles.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Winter Maintenance	1	The maintenance and construction vehicle shall track the location and status of safety systems on-board the vehicle.	Existing
County and City Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Winter Maintenance	3	The maintenance and construction vehicle shall monitor materials information including remaining quantity and current application rate of materials on the vehicle.	Existing
County and City Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Winter Maintenance	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
County and City Maintenance Dispatch Facilities	Maintenance and Construction Management	MCM Vehicle Tracking	1	The center shall monitor the locations of all maintenance and construction vehicles and other equipment under its jurisdiction.	Existing
County and City Maintenance Dispatch Facilities	Maintenance and Construction Management	MCM Vehicle Tracking	2	The center shall present location data to center personnel for the fleet of maintenance and construction vehicles and other equipment.	Existing
County and City Maintenance Dispatch Facilities	Maintenance and Construction Management	MCM Vehicle Tracking	3	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for maintenance and construction vehicle tracking.	Existing
County and City Maintenance Dispatch Facilities	Maintenance and Construction Management	MCM Winter Maintenance Management	1	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other winter roadway maintenance.	Existing
County and City Maintenance Dispatch Facilities	Maintenance and Construction Management	MCM Winter Maintenance Management	5	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for the scheduling of winter maintenance activities.	Existing
County and City Maintenance Dispatch Facilities	Maintenance and Construction Management	MCM Work Activity Coordination	1	The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Existing
County and City Maintenance Dispatch Facilities	Maintenance and Construction Management	MCM Work Activity Coordination	2	The center shall provide status information about scheduled maintenance and construction activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, multimodal transportation providers, rail operations, and the media.	Existing
County and City Maintenance Dispatch Facilities	Maintenance and Construction Management	MCM Work Activity Coordination	6	The center shall exchange rail schedules and work plans with rail operations centers.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Parking Management Systems	Parking Management	Parking Coordination	1	The parking element shall exchange parking management data with other parking facilities including location, hours, availability, status, lot usage, operating strategies, and charging information.	Planned
County and City Parking Management Systems	Parking Management	Parking Coordination	2	The parking element shall provide parking management data to traffic management centers upon request as part of the implementation of demand management programs in the region. This could include changes to hours of operation or pricing.	Planned
County and City Parking Management Systems	Parking Management	Parking Coordination	4	The parking element shall distribute parking lot information upon request to transit management centers for park and ride facilities, parking shuttle services, and other applications that integrate transit and parking services.	Planned
County and City Parking Management Systems	Parking Management	Parking Electronic Payment	1	The parking element shall detect and classify vehicles entering and exiting a parking facility (vehicle size, type, identifiable features, etc.).	Planned
County and City Parking Management Systems	Parking Management	Parking Electronic Payment	2	The parking element shall read data from the traveler card / payment instrument carried on-board the vehicle or by the traveler.	Planned
County and City Parking Management Systems	Parking Management	Parking Electronic Payment	6	The parking element shall process the financial requests and manage an interface to a Financial Institution.	Planned
County and City Parking Management Systems	Parking Management	Parking Management	1	The parking element shall maintain parking lot information including static information such as hours of operation, rates, location, entrance locations, capacity, type, and constraints; as well as dynamic information such as current state of the lot, occupancy, arrival rates, and departure rates.	Existing
County and City Parking Management Systems	Parking Management	Parking Management	3	The parking element shall manage local dynamic message signs that display messages to travelers such as the parking lot state, number of spaces available, location of entrances, and current charges.	Existing
County and City Public Safety Dispatch	Emergency Management	Emergency Call-Taking	1	The center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Existing
County and City Public Safety Dispatch	Emergency Management	Emergency Call-Taking	2	The center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing
County and City Public Safety Dispatch	Emergency Management	Emergency Call-Taking	5	The center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
County and City Public Safety Dispatch	Emergency Management	Emergency Call-Taking	6	The center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator.	Existing
County and City Public Safety Dispatch	Emergency Management	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
County and City Public Safety Dispatch	Emergency Management	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Public Safety Dispatch	Emergency Management	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
County and City Public Safety Dispatch	Emergency Management	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
County and City Public Safety Dispatch	Emergency Management	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Basic Surveillance	4	The field element shall return sensor and CCTV system operational status to the controlling center.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Signal Controls	1	The field element shall control traffic signals under center control.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Signal Controls	2	The field element shall respond to pedestrian crossing requests by accommodating the pedestrian crossing.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Signal Controls	4	The field element shall report the current signal control information to the center.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Signal Controls	6	The field element shall return traffic signal controller operational status to the center.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Signal Preemption	1	The field element shall respond to signal preemption requests from emergency vehicles.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Signal Priority	1	The field element shall respond to signal priority requests from transit vehicles.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Speed Monitoring and Warning	1	The field element shall include sensors to detect vehicle speeds, under traffic or maintenance center control.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Speed Monitoring and Warning	3	If the speed detected by vehicle speed sensors is determined to be excessive, the field element shall provide a safe speed advisory to passing drivers via a driver information system (such as portable messages signs, field to vehicle communications to in-vehicle signing systems, etc.).	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Roadside ITS Equipment	Roadway	Roadway Traffic Information Dissemination	1	The field element shall include dynamic messages signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Traffic Information Dissemination	4	The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Work Zone Traffic Control	1	The field element shall collect, process, and send work zone images to the center for further analysis and distribution, under center control.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Work Zone Traffic Control	3	Under the control of field personnel within maintenance vehicles, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around a work zone through which they are currently passing.	Existing
County and City Roadside ITS Equipment	Roadway	Roadway Work Zone Traffic Control	5	The field element shall provide operational status for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center.	Existing
County and City Traffic Data Archives	Archived Data Management	Government Reporting Systems Support	1	The center shall provide data from an ITS archive to federal, state, or local government reporting systems.	Existing
County and City Traffic Data Archives	Archived Data Management	Government Reporting Systems Support	2	The center shall provide the capability to select data from an ITS archive for use in government reports.	Existing
County and City Traffic Data Archives	Archived Data Management	Government Reporting Systems Support	3	The center shall provide the capability to format data from an ITS archive suitable for input into government reports.	Existing
County and City Traffic Data Archives	Archived Data Management	Government Reporting Systems Support	4	The center shall support requests for ITS archived data from Government Reporting Systems.	Planned
County and City Traffic Data Archives	Archived Data Management	Government Reporting Systems Support	5	The center shall provide the applicable meta-data for any ITS archived data to satisfy government reporting system requests. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.	Planned
County and City Traffic Data Archives	Archived Data Management	ITS Data Repository	1	The center shall collect data to be archived from one or more data sources.	Existing
County and City Traffic Data Archives	Archived Data Management	ITS Data Repository	2	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Traffic Data Archives	Archived Data Management	ITS Data Repository	3	The center shall store the archived data in a focused repository that is suited to a particular set of ITS data users.	Existing
County and City Traffic Data Archives	Archived Data Management	ITS Data Repository	7	The center shall support a broad range of archived data management implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region.	Existing
County and City Traffic Data Archives	Archived Data Management	Traffic and Roadside Data Archival	1	The center shall manage the collection of archive data directly from collection equipment located at the roadside.	Existing
County and City Traffic Data Archives	Archived Data Management	Traffic and Roadside Data Archival	2	The center shall collect traffic sensor information from roadside devices.	Existing
County and City Traffic Information Websites	Information Service Provider	Basic Information Broadcast	1	The center shall disseminate traffic and highway condition information to travelers, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.	Existing
County and City Traffic Information Websites	Information Service Provider	Basic Information Broadcast	2	The center shall disseminate maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities.	Existing
County and City Traffic Information Websites	Information Service Provider	Basic Information Broadcast	3	The center shall disseminate transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information to travelers.	Existing
County and City Traffic Information Websites	Information Service Provider	Basic Information Broadcast	4	The center shall disseminate parking information to travelers, including location, availability, and fees.	Existing
County and City Traffic Information Websites	Information Service Provider	Infrastructure Provided Trip Planning	1	The center shall provide the capability to provide specific pre-trip and enroute directions to travelers (and drivers), including costs, arrival times, and transfer points.	Existing
County and City Traffic Management Centers	Other Traffic Management				
County and City Traffic Management Centers	Traffic Management	Collect Traffic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Existing
County and City Traffic Management Centers	Traffic Management	Collect Traffic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.	Existing
County and City Traffic Management Centers	Traffic Management	Collect Traffic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each)	Existing
County and City Traffic Management Centers	Traffic Management	Collect Traffic Surveillance	7	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for traffic data.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Traffic Management Centers	Traffic Management	TMC Multimodal Crossing Management	1	The center shall receive requests from non-highway traffic to cross at multimodal crossings for specified durations (such as draw bridges and miscellaneous other interference crossings between highway traffic and other modes such as river traffic, aircraft, etc.)	Existing
County and City Traffic Management Centers	Traffic Management	TMC Multimodal Crossing Management	2	The center shall remotely control traffic signal controllers for use at major multimodal crossings.	Existing
County and City Traffic Management Centers	Traffic Management	TMC Multimodal Crossing Management	4	The center shall collect operational status for the equipment at multimodal crossings.	Existing
County and City Traffic Management Centers	Traffic Management	TMC Multimodal Crossing Management	5	The center shall collect fault data for the equipment at multimodal crossings for repair.	Existing
County and City Traffic Management Centers	Traffic Management	TMC Signal Control	1	The center shall remotely control traffic signal controllers.	Existing
County and City Traffic Management Centers	Traffic Management	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.	Existing
County and City Traffic Management Centers	Traffic Management	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.	Existing
County and City Traffic Management Centers	Traffic Management	TMC Signal Control	5	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.	Existing
County and City Traffic Management Centers	Traffic Management	TMC Signal Control	6	The center shall implement control plans to coordinate signalized intersections based on data from sensors.	Planned
County and City Traffic Management Centers	Traffic Management	TMC Signal Control	7	The center shall manage boundaries of the control sections used within the signal system.	Planned
County and City Traffic Management Centers	Traffic Management	TMC Signal Control	8	The center shall maintain traffic signal coordination including synchronizing clocks throughout the system.	Existing
County and City Traffic Management Centers	Traffic Management	TMC Traffic Information Dissemination	1	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers.	Existing
County and City Traffic Management Centers	Traffic Management	TMC Traffic Information Dissemination	3	The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.).	Existing
County and City Traffic Management Centers	Traffic Management	TMC Traffic Information Dissemination	4	The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Transit Operations Centers	Transit Management	Transit Center Fare Management	1	The center shall manage the actual value of transit fares for each segment of each regular transit route, including the transmission of the information to transit vehicles and transit stops or stations.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Fare Management	2	The center shall provide the capability for a system operator to manage the transit fares and control the exchange of transit fare information.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Fare Management	3	The center shall process the financial requests from the transit vehicles or roadside and manage an interface to a Financial Institution.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Fare Management	4	The center shall support the payment of transit fare transactions using data provided by the traveler cards / payment instruments.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	1	The center shall generate transit routes and schedules based on such factors as parameters input by the system operator, road network conditions, incident information, operational data on current routes and schedules, and digitized map data.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	2	The center shall provide the interface to the system operator to control the generation of new routes and schedules (transit services) including the ability to review and update the parameters used by the routes and schedules generation processes and to initiate these processes	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	4	The center shall dispatch fixed route or flexible route transit vehicles	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	5	The center shall collect transit operational data for use in the generation of routes and schedules.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Information Services	1	The center shall provide travelers using public transportation with traffic and advisory information upon request. Such information may include transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, and special events.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Information Services	2	The center shall provide transit information to the media including details of deviations from schedule of regular transit services.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Information Services	3	The center shall exchange transit schedules, real-time arrival information, fare schedules, and general transit service information with other transit organizations to support transit traveler information systems.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Paratransit Operations	1	The center shall process trip requests for demand responsive transit services, i.e. paratransit. Sources of the requests may include traveler information service providers.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Transit Operations Centers	Transit Management	Transit Center Paratransit Operations	2	The center shall monitor the operational status of the demand response vehicles including status of passenger pick-up and drop-off.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Paratransit Operations	3	The center shall generate demand response transit (including paratransit) routes and schedules based on such factors as parameters input by the system operator, what other demand responsive transit schedules have been planned, the availability and location of vehicles, the relevance of any fixed transit routes and schedules, road network information, and incident information.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Paratransit Operations	4	The center shall dispatch demand response (paratransit) transit vehicles.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Passenger Counting	1	The center shall collect passenger count information from each transit vehicle.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Passenger Counting	2	The center shall calculate transit ridership data by route, route segment, transit stop, time of day, and day of week based on the collected passenger count information.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Passenger Counting	3	The center shall make the compiled ridership data available to the system operator and other applications.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Security	1	The center shall monitor transit vehicle operational data to determine if the transit vehicle is off-route and assess whether a security incident is occurring.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Security	2	The center shall receive reports of emergencies on-board transit vehicles entered directly be the transit vehicle operator or from a traveler through interfaces such as panic buttons or alarm switches.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Vehicle Tracking	1	The center shall monitor the locations of all transit vehicles within its network.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Vehicle Tracking	2	The center shall determine adherence of transit vehicles to their assigned schedule.	Existing
County and City Transit Operations Centers	Transit Management	Transit Center Vehicle Tracking	3	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for transit tracking and dispatch.	Existing
County and City Transit Vehicles	Basic Transit Vehicle				
County and City Transit Vehicles	Transit Vehicle	On-board Paratransit Operations	1	The transit vehicle shall manage data input to sensor(s) on-board a transit vehicle to determine the vehicle's availability for use in demand responsive and flexible-route transit services based on identity, type, and passenger capacity.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Transit Vehicles	Transit Vehicle	On-board Paratransit Operations	2	The transit vehicle shall receive the status of demand responsive or flexible-route transit schedules and passenger loading from the transit vehicle operator.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Paratransit Operations	3	The transit vehicle shall provide the transit vehicle operator instructions about the demand responsive or flexible-route transit schedule that has been confirmed from the center.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Passenger Counting	1	The transit vehicle shall count passengers boarding and alighting.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Passenger Counting	2	The passenger counts shall be related to location to support association of passenger counts with routes, route segments, or bus stops.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Passenger Counting	3	The passenger counts shall be timestamped so that ridership can be measured by time of day and day of week.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Passenger Counting	4	The transit vehicle shall send the collected passenger count information to the transit center.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Schedule Management	1	The transit vehicle shall receive a vehicle assignment including transit route information, transit service instructions, traffic information, road conditions, and other information for the operator.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Schedule Management	2	The transit vehicle shall use the route information and its current location to determine the deviation from the predetermined schedule.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Schedule Management	3	The transit vehicle shall calculate the estimated times of arrival (ETA) at transit stops.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Transit Fare Management	1	The transit vehicle shall read data from the traveler card / payment instrument presented by boarding passengers.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Transit Fare Management	10	The transit vehicle shall provide fare statistics data to the center.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Transit Security	1	The transit vehicle shall perform video and audio surveillance inside of transit vehicles and output raw video or audio data for either local monitoring (for processing or direct output to the transit vehicle operator), remote monitoring or for local storage (e.g., in an event recorder).	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Transit Security	2	The transit vehicle shall perform local monitoring of video or audio surveillance data collected inside of transit vehicles, and identify potential incidents or threats based on received processing parameters.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Transit Signal Priority	1	The transit vehicle shall determine the schedule deviation and estimated times of arrival (ETA) at transit stops.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Transit Signal Priority	2	The transit vehicle shall send priority requests to traffic signal controllers at intersections, pedestrian crossings, and multimodal crossings on the roads (surface streets) and freeway (ramp controls) network that enable a transit vehicle schedule deviation to be corrected.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
County and City Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	1	The transit vehicle shall track the current location of the transit vehicle.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	3	The transit vehicle shall record transit trip monitoring data including vehicle mileage and fuel usage.	Existing
County and City Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	5	The transit vehicle shall send the transit vehicle trip monitoring data to center-based trip monitoring functions.	Existing
County and City Warning Siren Systems	Alerting and Advisory Systems				
Drivers	Driver				
Financial Institutions	Financial Institution				
Fleet and Freight Management Systems	Fleet and Freight Management	Fleet Administration	1	The center shall send data concerning enrollment of commercial vehicles for electronic clearance and tax filing to the appropriate commercial vehicle administration center. The data may include driver and vehicle identification, safety inspections/status, carrier credentials, related citations, and accident information.	Existing
Fleet and Freight Management Systems	Fleet and Freight Management	Fleet Administration	2	The center shall obtain and manage commercial vehicle routes for its fleet of vehicles, taking into account route restrictions, advance payment of tolls, HAZMAT restrictions, current traffic and road conditions, and incident information provided by traveler information systems.	Existing
Fleet and Freight Management Systems	Fleet and Freight Management	Fleet Administration	3	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as the background for commercial vehicle fleet administration - includes commercial vehicle specific data such as route or HAZMAT restrictions.	Existing
Fleet and Freight Management Systems	Fleet and Freight Management	Fleet Administration	4	The center shall monitor the locations and progress of commercial vehicles against their planned routes and raise appropriate warnings based on route monitoring parameters.	Existing
Fleet and Freight Management Systems	Fleet and Freight Management	Fleet Administration	5	The center shall coordinate the response to security incidents and the sharing of security threat information involving commercial vehicles with other agencies including emergency management centers and alerting/advisory systems.	Existing
Fleet and Freight Management Systems	Fleet and Freight Management	Fleet HAZMAT Management	1	The center shall track the routing and cargo information, including the manifest data plus the chemical characteristics of a hazardous materials (HAZMAT) load being carried by its fleet of commercial vehicles.	Existing
Fleet and Freight Management Systems	Fleet and Freight Management	Fleet HAZMAT Management	2	The center shall provide information concerning commercial vehicles carrying hazardous materials (HAZMAT) upon request from an emergency management center. The information includes the nature of the cargo being carried, identity of the vehicle and unloading instructions.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Fleet and Freight Management Systems	Fleet and Freight Management	Freight Administration and Management	1	The center shall collect data from the commercial vehicles carrying freight or from the freight equipment itself. Includes container, trailer, or chassis information regarding identity, type, location, brake wear data, mileage, seal number/type, door open/close status, chassis bare/covered status, tethered / untethered status, bill of lading, and sensor status.	Existing
Fleet and Freight Management Systems	Fleet and Freight Management	Freight Administration and Management	2	The center shall provide the interface with intermodal freight shippers to setup transportation for freight equipment. Inputs to this include information about the shipper, consignee, commodities, pick-up and drop-off locations for freight equipment. Outputs include information about the driver and commercial vehicle that will be transporting the freight.	Existing
Fleet and Freight Management Systems	Fleet and Freight Management	Freight Administration and Management	3	The center shall coordinate the shipment of cargo using freight equipment with intermodal freight depots. Information to be coordinated includes information regarding a freight transportation booking and the assigned driver and vehicle scheduled to transport the freight along with cargo movement logs, routing information, and cargo ID's.	Existing
Fleet and Freight Management Systems	Fleet and Freight Management	Freight Administration and Management	4	The center shall track the progress of freight equipment as it moves from source to destination based on inputs from the commercial vehicles, the freight equipment, intermodal freight depots, shippers, and commercial vehicle administration centers that provide border clearance status information.	Existing
Fleet and Freight Management Systems	Intermodal Freight Depot				
FMCSA MCMIS	Other CVAS				
Freight Rail Operations	Rail Operations				
IFTA Clearinghouse	Other CVAS				
IRP Clearinghouse	Other CVAS				
Media Outlets	Media				
MPOs Data Archives	Archived Data Management	Government Reporting Systems Support	1	The center shall provide data from an ITS archive to federal, state, or local government reporting systems.	Existing
MPOs Data Archives	Archived Data Management	Government Reporting Systems Support	2	The center shall provide the capability to select data from an ITS archive for use in government reports.	Existing
MPOs Data Archives	Archived Data Management	Government Reporting Systems Support	5	The center shall provide the applicable meta-data for any ITS archived data to satisfy government reporting system requests. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.	Existing
MPOs Data Archives	Archived Data Management	ITS Data Repository	1	The center shall collect data to be archived from one or more data sources.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
MPOs Data Archives	Archived Data Management	ITS Data Repository	2	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).	Existing
MPOs Data Archives	Archived Data Management	ITS Data Repository	3	The center shall store the archived data in a focused repository that is suited to a particular set of ITS data users.	Existing
MPOs Data Archives	Archived Data Management	ITS Data Repository	4	The center shall include capabilities for performing quality checks on the incoming archived data.	Existing
MPOs Data Archives	Archived Data Management	ITS Data Repository	7	The center shall support a broad range of archived data management implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region.	Existing
MPOs Data Archives	Archived Data Management	ITS Data Repository	10	The center shall respond to requests from the administrator interface function to maintain the archive data.	Existing
National Weather Service	Weather Service				
Neighboring State Traffic Management Centers	Other Traffic Management				
Neighboring States Roadside ITS Equipment	Other Roadway				
Neighboring States Roadside ITS Equipment	Roadway	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Existing
Neighboring States Roadside ITS Equipment	Roadway	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Existing
Neighboring States Roadside ITS Equipment	Roadway	Roadway Traffic Information Dissemination	1	The field element shall include dynamic messages signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Existing
Ohio DOT 511 Telephone Information Service	Information Service Provider	Basic Information Broadcast	1	The center shall disseminate traffic and highway condition information to travelers, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.	Existing
Ohio DOT 511 Telephone Information Service	Information Service Provider	Basic Information Broadcast	2	The center shall disseminate maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT 511 Telephone Information Service	Information Service Provider	Basic Information Broadcast	10	The center shall provide the capability for a system operator to control the type and update frequency of broadcast traveler information.	Existing
Ohio DOT 511 Telephone Information Service	Telecommunications System for Traveler Information				
Ohio DOT Animal Detection System	Roadway	Roadway Warning	3	The field element shall monitor for debris, animals, or other objects in the travel lanes.	Planned
Ohio DOT Animal Detection System	Roadway	Roadway Warning	5	The field element shall autonomously identify potentially hazardous conditions and activate warning signs to approaching motorists.	Planned
Ohio DOT Automated Gate Closure Systems	Roadway	Field Barrier System Control	1	The field element shall activate barrier systems for transportation facilities and infrastructure under center control. Barrier systems include automated or remotely controlled gates, barriers and other systems that manage entry to roadways.	Planned
Ohio DOT Automated Gate Closure Systems	Roadway	Field Barrier System Control	2	The field element shall return barrier system operational status to the controlling center.	Planned
Ohio DOT Automated Gate Closure Systems	Roadway	Field Barrier System Control	3	The field element shall return barrier system fault data to the maintenance center for repair.	Planned
Ohio DOT Automated Gate Closure Systems	Roadway	Field Barrier System Control	4	The field element shall receive requests for access from approaching vehicles using field-vehicle communications and validate and authenticate the requests.	Planned
Ohio DOT Automated Gate Closure Systems	Roadway	Field Barrier System Control	5	The field element shall grant access only to qualified vehicles.	Planned
Ohio DOT Automated Roadway Treatment Systems	Roadway	Roadway Automated Treatment	1	The field element shall activate automated roadway treatment systems based on environmental or atmospheric conditions. Treatments can be in the form of fog dispersion, anti-icing chemicals, etc.	Existing
Ohio DOT Automated Roadway Treatment Systems	Roadway	Roadway Automated Treatment	3	The field element shall return automated roadway treatment system and associated environmental sensor operational status to the maintenance center.	Existing
Ohio DOT CCTV Cameras	Roadway	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Existing
Ohio DOT CCTV Cameras	Roadway	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Existing
Ohio DOT CCTV Cameras	Roadway	Roadway Basic Surveillance	4	The field element shall return sensor and CCTV system operational status to the controlling center.	Existing
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Equipment Coordination	1	The field element shall include sensors that provide data and status information to other field element devices, without center control.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Equipment Coordination	2	The field element shall include sensors that receive configuration data from other field element devices, without center control.	Planned
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Equipment Coordination	3	The field element shall include devices that provide data and status information to other field element devices without center control.	Planned
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Equipment Coordination	4	The field element shall include devices that receive configuration data from other field element devices, without center control.	Planned
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Intersection Safety Warning	1	The field element shall utilize traffic sensors to monitor vehicles approaching and occupying an intersection.	Planned
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Intersection Safety Warning	2	The field element shall monitor the operational state, signal timing, and current phase of the traffic signal.	Planned
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Intersection Safety Warning	3	The field element shall monitor road conditions on approaches to, and within, the intersection.	Planned
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Intersection Safety Warning	4	The field element shall communicate with approaching vehicles to determine vehicle position, velocity, acceleration, direction, and intended turning movement.	Planned
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Intersection Safety Warning	5	The field element shall detect potentially hazardous conditions including impending red-light or stop sign violations and potential conflicts between approaching vehicles.	Planned
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Intersection Safety Warning	6	The field element shall provide intersection status and warnings to approaching vehicles using field-vehicle communications.	Planned
Ohio DOT Connected Vehicles Roadside Equipment	Roadway	Roadway Intersection Safety Warning	7	The field element shall update signs or signals to warn the driver of potentially hazardous situations.	Planned
Ohio DOT District Maintenance Repair Facilities	Equipment Repair Facility				
Ohio DOT District Offices	Emergency Management	Service Patrol Management	1	The center shall dispatch roadway service patrol vehicles to identified incident locations.	Existing
Ohio DOT District Offices	Emergency Management	Service Patrol Management	2	The center shall store the current status of all service patrol vehicles available for dispatch and those that have been dispatched.	Existing
Ohio DOT District Offices	Emergency Management	Service Patrol Management	3	The center shall share incident information collected by the service patrol with traffic, maintenance and construction, and traveler information centers for incident management, incident notification to travelers, and incident cleanup.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT District Offices	Emergency Management	Service Patrol Management	4	The center shall track the location and status of service patrol vehicles.	Existing
Ohio DOT District Offices	Maintenance and Construction Management	MCM Maintenance Decision Support	1	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.	Planned
Ohio DOT District Offices	Maintenance and Construction Management	MCM Maintenance Decision Support	2	The center shall tailor the decision support information to include filtering (selection from a large amount of external information), error reduction ('smoothing' the information), fusion (combination of disparate information to match the decision needs), and analysis (creating the decision).	Planned
Ohio DOT District Offices	Maintenance and Construction Management	MCM Maintenance Decision Support	3	The center shall provide an interface to the center personnel to input control parameters for the decision support process and receive decisions or information presentation.	Planned
Ohio DOT District Offices	Maintenance and Construction Management	MCM Maintenance Decision Support	4	The center shall provide dispatch information to maintenance and construction vehicles based on the outputs of the decision support system, including recommended roadway treatment actions.	Planned
Ohio DOT District Offices	Maintenance and Construction Management	MCM Vehicle Tracking	1	The center shall monitor the locations of all maintenance and construction vehicles and other equipment under its jurisdiction.	Planned
Ohio DOT District Offices	Maintenance and Construction Management	MCM Vehicle Tracking	2	The center shall present location data to center personnel for the fleet of maintenance and construction vehicles and other equipment.	Planned
Ohio DOT District Offices	Maintenance and Construction Management	MCM Vehicle Tracking	3	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for maintenance and construction vehicle tracking.	Planned
Ohio DOT District Offices	Traffic Management	Barrier System Management	1	The center shall remotely control barrier systems for transportation facilities and infrastructure. Barrier systems include automated or remotely controlled gates, barriers and other systems that manage entry to roadways.	Planned
Ohio DOT District Offices	Traffic Management	Barrier System Management	2	The center shall collect barrier system operational status.	Planned
Ohio DOT District Offices	Traffic Management	Barrier System Management	3	The center shall collect barrier system fault data and send to the maintenance center for repair.	Planned
Ohio DOT District Offices	Traffic Management	Barrier System Management	4	The center shall accept requests for barrier system activation from other centers and from center personnel to support emergency response and detours.	Planned
Ohio DOT DMS	Roadway	Roadway Traffic Information Dissemination	1	The field element shall include dynamic messages signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT DMS	Roadway	Roadway Traffic Information Dissemination	4	The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center.	Existing
Ohio DOT DMS	Roadway	Roadway Traffic Information Dissemination	5	The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair.	Existing
Ohio DOT HAR	Roadway	Roadway Traffic Information Dissemination	2	The field element shall include driver information systems that communicate directly from a center to the vehicle radio (such as Highway Advisory Radios) for dissemination of traffic and other information to drivers, under center control.	Existing
Ohio DOT HAR	Roadway	Roadway Traffic Information Dissemination	4	The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center.	Existing
Ohio DOT HAR	Roadway	Roadway Traffic Information Dissemination	5	The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair.	Existing
Ohio DOT Infrastructure Monitoring Sensors	Roadway	Roadway Infrastructure Monitoring	1	The field element shall include infrastructure condition monitoring sensors that monitor the condition of pavement, bridges, tunnels, associated hardware, and other transportation-related infrastructure (e.g., culverts), under maintenance center control.	Planned
Ohio DOT Infrastructure Monitoring Sensors	Roadway	Roadway Infrastructure Monitoring	3	The field element shall provide operational status for the infrastructure condition monitoring sensors to the maintenance center.	Planned
Ohio DOT Infrastructure Monitoring Sensors	Roadway	Roadway Infrastructure Monitoring	5	The field element shall provide fault data for the infrastructure condition monitoring sensors to the maintenance center for repair.	Planned
Ohio DOT Infrastructure Monitoring Sensors	Security Monitoring				
Ohio DOT Lane Control Devices	Roadway	Roadway Dynamic Lane Management and Shoulder Use	3	The field element shall receive lane management control information from the controlling center.	Planned
Ohio DOT Lane Control Devices	Roadway	Roadway Dynamic Lane Management and Shoulder Use	9	The field element shall monitor operational status of the dynamic lane control equipment and report operational status to the controlling center.	Planned
Ohio DOT Lane Control Devices	Roadway	Roadway Dynamic Lane Management and Shoulder Use	10	The field element shall identify and report fault conditions to the controlling center.	Planned
Ohio DOT Lift Bridge Equipment	Multimodal Crossings				

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT Maintenance and Construction Center Personnel	Maintenance and Construction Center Personnel				
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Roadway Maintenance and Construction	1	The maintenance and construction vehicle shall track the location and status of safety systems on-board the vehicle.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Roadway Maintenance and Construction	2	The maintenance and construction vehicle shall respond to control information from the center to allow remote operation of the on-board vehicle systems. These systems include routine maintenance equipment for cutting, repairs, hazard removal, etc.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Roadway Maintenance and Construction	3	The maintenance and construction vehicle shall monitor materials information including remaining quantity and current application rate of materials on the vehicle.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Roadway Maintenance and Construction	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Roadway Maintenance and Construction	5	The maintenance and construction vehicle shall send operational data to the center including the operational state of the maintenance equipment (e.g., blade up/down, spreader pattern), types and quantities of materials used for construction and maintenance activities, and a record of the actual work performed.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Location Tracking	1	The maintenance and construction vehicle shall track its current location.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Location Tracking	2	The maintenance and construction vehicle shall send the time stamped vehicle location to the controlling center.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Safety Monitoring	1	The maintenance and construction vehicle shall detect that a vehicle has intruded upon the boundary of a work zone. The boundary of the work zone represents an area around the maintenance and construction vehicle, which may be stationary or moving.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Safety Monitoring	2	The maintenance and construction vehicle shall receive work zone warnings from the field equipment at the roadside, other maintenance and construction vehicles.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle System Monitoring and Diagnostics	1	The maintenance and construction vehicle shall collect vehicle diagnostics and operating status data from the maintenance vehicle platform including engine temperature, mileage, tire wear, brake wear, belt wear, and other operational status measures as well as the status of maintenance and construction-specific systems on the vehicle.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle System Monitoring and Diagnostics	3	The maintenance and construction vehicle shall the vehicle diagnostic and safety information to an equipment repair facility.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle System Monitoring and Diagnostics	4	The maintenance and construction vehicle shall send the vehicle diagnostic and safety information to the controlling maintenance center.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Winter Maintenance	1	The maintenance and construction vehicle shall track the location and status of safety systems on-board the vehicle.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Winter Maintenance	2	The maintenance and construction vehicle shall respond to control information from the center to allow remote operation of the on-board vehicle systems. These systems include winter maintenance equipment for plowing, treating, and anti-icing.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Winter Maintenance	3	The maintenance and construction vehicle shall monitor materials information including remaining quantity and current application rate of materials on the vehicle.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Winter Maintenance	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Planned
Ohio DOT Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Winter Maintenance	5	The maintenance and construction vehicle shall send operational data to the center including the operational state of the maintenance equipment (e.g., blade up/down, spreader pattern), types and quantities of materials used for construction and maintenance activities, and a record of the actual work performed.	Planned
Ohio DOT OHGO Traveler Information System	Information Service Provider	Interactive Infrastructure Information	1	The center shall disseminate customized traffic and highway condition information to travelers, including incident information, detours and road closures, recommended routes, and current speeds on specific routes upon request.	Existing
Ohio DOT OHGO Traveler Information System	Information Service Provider	Interactive Infrastructure Information	2	The center shall disseminate customized maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities upon request.	Existing
Ohio DOT OHGO Traveler Information System	Information Service Provider	Interactive Infrastructure Information	6	The center shall disseminate customized weather information to travelers upon request.	Existing
Ohio DOT OHGO Traveler Information System	Information Service Provider	Interactive Infrastructure Information	15	The center shall manage updates of digitized map data and provide updates to traveler interface systems upon request.	Existing
Ohio DOT Overheight Vehicle Detection System	Roadway	Roadway Warning	3	The field element shall monitor for debris, animals, or other objects in the travel lanes.	Planned
Ohio DOT Overheight Vehicle Detection System	Roadway	Roadway Warning	5	The field element shall autonomously identify potentially hazardous conditions and activate warning signs to approaching motorists.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT Ramp Meters	Roadway	Roadway Traffic Metering	1	The field element shall regulate the flow of traffic on ramps, interchanges, and the mainline, under center control.	Existing
Ohio DOT Ramp Meters	Roadway	Roadway Traffic Metering	2	The field element shall monitor operation of ramp, interchange, and mainline meters and report to the center any conflicts between received control plans and current system operation.	Existing
Ohio DOT Ramp Meters	Roadway	Roadway Traffic Metering	3	The field element shall return ramp, interchange, and mainline meter operational status to the controlling center.	Existing
Ohio DOT Ramp Meters	Roadway	Roadway Traffic Metering	4	The field element shall provide indications to the driver that the metering system is active and provide safe transitions between active and inactive status.	Existing
Ohio DOT Rest Area Tourist Information Centers	Remote Traveler Support	Remote Basic Information Reception	1	The public interface for travelers shall receive traffic information from a center and present it to the traveler.	Existing
Ohio DOT Rest Area Tourist Information Centers	Remote Traveler Support	Remote Basic Information Reception	5	The public interface for travelers shall receive wide-area alerts and present it to the traveler.	Existing
Ohio DOT Rest Area Tourist Information Centers	Remote Traveler Support	Remote Basic Information Reception	6	The public interface for travelers shall provide the capability for digitized map data to act as the background to the information presented to the traveler.	Existing
Ohio DOT Rest Area Tourist Information Centers	Remote Traveler Support	Remote Basic Information Reception	8	The public interface for travelers shall present information to the traveler in audible or visual forms consistent with a kiosk, including those that are suitable for travelers with hearing or vision physical disabilities.	Existing
Ohio DOT Rest Area Tourist Information Centers	Remote Traveler Support	Remote Interactive Information Reception	1	The public interface for travelers shall receive traffic information from a center and present it to the traveler upon request.	Existing
Ohio DOT Rest Area Tourist Information Centers	Remote Traveler Support	Remote Interactive Information Reception	6	The public interface for travelers shall receive wide-area alerts and present it to the traveler.	Existing
Ohio DOT Rest Area Tourist Information Centers	Remote Traveler Support	Remote Interactive Information Reception	11	The public interface for travelers shall provide digitized map data to act as the background to the information presented to the traveler.	Existing
Ohio DOT Rest Area Tourist Information Centers	Remote Traveler Support	Remote Interactive Information Reception	13	The public interface for travelers shall present information to the traveler in audible or visual forms consistent with a kiosk, including those that are suitable for travelers with hearing or vision physical disabilities.	Existing
Ohio DOT Rest Area Truck Parking Availability System	Parking Management	Parking Management	1	The parking element shall maintain parking lot information including static information such as hours of operation, rates, location, entrance locations, capacity, type, and constraints; as well as dynamic information such as current state of the lot, occupancy, arrival rates, and departure rates.	Planned
Ohio DOT Rest Area Truck Parking Availability System	Parking Management	Parking Management	2	The parking element shall share information with a traffic management center to identify queues at entrances, exits that should be used, and other information that supports coordinated local traffic control in and around the parking facility.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT Rest Area Truck Parking Availability System	Parking Management	Parking Management	3	The parking element shall manage local dynamic message signs that display messages to travelers such as the parking lot state, number of spaces available, location of entrances, and current charges.	Planned
Ohio DOT Rest Area Truck Parking Availability System	Parking Management	Parking Management	4	The parking element shall provide the capability to detect, count, and classify vehicles at entrances, exits, and designated locations within a parking facility.	Planned
Ohio DOT RWIS Stations	Roadway	Roadway Environmental Monitoring	1	The field element shall include surface and sub-surface environmental sensors that measure road surface temperature, moisture, icing, salinity, and other measures.	Existing
Ohio DOT RWIS Stations	Roadway	Roadway Environmental Monitoring	2	The field element shall include environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.	Existing
Ohio DOT RWIS Stations	Roadway	Roadway Environmental Monitoring	3	The field element's environmental sensors shall be remotely controlled by a maintenance center.	Existing
Ohio DOT RWIS Stations	Roadway	Roadway Environmental Monitoring	4	The field element's environmental sensors shall be remotely controlled by a traffic management center.	Existing
Ohio DOT RWIS Stations	Roadway	Roadway Environmental Monitoring	10	The field element shall provide weather and road surface condition data to centers.	Existing
Ohio DOT Safety Patrol Vehicles	Emergency Vehicle	On-board EV En Route Support	1	The emergency vehicle, including roadway service patrols, shall track its current location.	Existing
Ohio DOT Safety Patrol Vehicles	Emergency Vehicle	On-board EV En Route Support	2	The emergency vehicle, including roadway service patrols, shall send the vehicle's location and operational data to the center for emergency management and dispatch.	Existing
Ohio DOT Safety Patrol Vehicles	Emergency Vehicle	On-board EV En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
Ohio DOT Speed Monitoring Roadside Equipment	Roadway	Roadway Speed Monitoring and Warning	3	If the speed detected by vehicle speed sensors is determined to be excessive, the field element shall provide a safe speed advisory to passing drivers via a driver information system (such as portable messages signs, field to vehicle communications to in-vehicle signing systems, etc.).	Planned
Ohio DOT Speed Monitoring Roadside Equipment	Roadway	Roadway Speed Monitoring and Warning	5	The field element shall monitor notify an enforcement agency when a speed violation is detected.	Planned
Ohio DOT Statewide TMC	Emergency Management	Service Patrol Management	1	The center shall dispatch roadway service patrol vehicles to identified incident locations.	Existing
Ohio DOT Statewide TMC	Emergency Management	Service Patrol Management	2	The center shall store the current status of all service patrol vehicles available for dispatch and those that have been dispatched.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT Statewide TMC	Emergency Management	Service Patrol Management	3	The center shall share incident information collected by the service patrol with traffic, maintenance and construction, and traveler information centers for incident management, incident notification to travelers, and incident cleanup.	Existing
Ohio DOT Statewide TMC	Emergency Management	Service Patrol Management	4	The center shall track the location and status of service patrol vehicles.	Existing
Ohio DOT Statewide TMC	Maintenance and Construction Management	MCM Environmental Information Processing	2	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services) and local environmental sensor data.	Existing
Ohio DOT Statewide TMC	Maintenance and Construction Management	MCM Environmental Information Processing	3	The center shall use the various data inputs of environmental sensors and road weather data to develop a view of current and predicted road weather and road conditions.	Existing
Ohio DOT Statewide TMC	Maintenance and Construction Management	MCM Environmental Information Processing	4	The center shall disseminate current and forecasted road weather and road condition information to weather service providers (such as the National Weather Service and value-added sector specific meteorological services) as well as other agencies including traffic, emergency, and transit management, traveler information providers, rail operations centers, media, and other maintenance management centers.	Existing
Ohio DOT Statewide TMC	Maintenance and Construction Management	MCM Vehicle Tracking	1	The center shall monitor the locations of all maintenance and construction vehicles and other equipment under its jurisdiction.	Planned
Ohio DOT Statewide TMC	Maintenance and Construction Management	MCM Vehicle Tracking	2	The center shall present location data to center personnel for the fleet of maintenance and construction vehicles and other equipment.	Planned
Ohio DOT Statewide TMC	Maintenance and Construction Management	MCM Vehicle Tracking	3	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for maintenance and construction vehicle tracking.	Planned
Ohio DOT Statewide TMC	Traffic Management	Barrier System Management	1	The center shall remotely control barrier systems for transportation facilities and infrastructure. Barrier systems include automated or remotely controlled gates, barriers and other systems that manage entry to roadways.	Existing
Ohio DOT Statewide TMC	Traffic Management	Barrier System Management	2	The center shall collect barrier system operational status.	Existing
Ohio DOT Statewide TMC	Traffic Management	Barrier System Management	3	The center shall collect barrier system fault data and send to the maintenance center for repair.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Automated Vehicle Operations	1	The center shall remotely control automated vehicle system field elements, by providing lane changing parameters, parameters for determination of vehicle suitability for particular automated lanes, and other control information required for automated highway operation.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT Statewide TMC	Traffic Management	TMC Automated Vehicle Operations	2	The center shall maintain a log of all automated vehicle check-in and check-out transactions received from the field elements regardless of whether they are successful or not.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Dynamic Lane Management and Shoulder Use	1	The center shall remotely monitor and control dynamically managed travel lanes.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Dynamic Lane Management and Shoulder Use	8	The center shall support temporary use of shoulders as travel lanes.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Dynamic Lane Management and Shoulder Use	11	The center shall activate lane management field equipment that is used to dynamically manage specific lanes and shoulders.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Evacuation Support	1	The center shall coordinate planning for evacuation with emergency management centers - including pre-planning activities such as establishing routes, areas to be evacuated, timing, etc.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Evacuation Support	2	The center shall support requests from emergency management centers to preempt the current traffic control strategy, activate traffic control and closure systems such as gates and barriers, activate safeguard systems, or use driver information systems to support evacuation traffic control plans.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Evacuation Support	3	The center shall coordinate information and controls with other traffic management centers.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Evacuation Support	4	The center shall coordinate execution of evacuation strategies with emergency management centers - including activities such as setting closures and detours, establishing routes, updating areas to be evacuated, timing the process, etc.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Regional Traffic Management	1	The center shall exchange traffic information with other traffic management centers including incident information, congestion data, traffic data, signal timing plans, and real-time signal control information.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Regional Traffic Management	2	The center shall exchange traffic control information with other traffic management centers to support remote monitoring and control of traffic management devices (e.g. signs, sensors, signals, cameras, etc.).	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Signal Control	1	The center shall remotely control traffic signal controllers.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Signal Control	8	The center shall maintain traffic signal coordination including synchronizing clocks throughout the system.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Information Dissemination	1	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Information Dissemination	2	The center shall remotely control driver information systems that communicate directly from a center to the vehicle radio (such as Highway Advisory Radios) for dissemination of traffic and other information to drivers.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Information Dissemination	3	The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.).	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Information Dissemination	4	The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Information Dissemination	6	The center shall distribute traffic data to maintenance and construction centers, transit centers, emergency management centers, and traveler information providers.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Information Dissemination	7	The center shall distribute traffic data to the media; the capability to provide the information in both data stream and graphical display shall be supported.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Management Decision Support	1	The center shall provide center personnel with an integrated regional view of current and forecast road and traffic conditions including traffic incidents, special events, maintenance activities and other events or conditions that impact capacity or demand.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Management Decision Support	2	The center shall identify network imbalances and potential courses of action.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Management Decision Support	3	The center shall compare the impact of potential courses of action and make recommendations to the operator.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Management Decision Support	4	The recommended actions shall include predefined incident response plans, signal timing plan changes, DMS/HAR messages, lane control strategies and freeway control strategies including ramp metering, interchange metering, and mainline metering.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Metering	1	The center shall remotely control systems to manage use of the freeways, including ramp, interchange, and mainline metering.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Metering	2	The center shall collect operational status from ramp meters, interchange meters, and mainline meters and compare against the control information sent by the center.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Metering	3	The center shall collect fault data from ramp meters, interchange meters, and mainline meters.	Existing
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Metering	4	The center shall implement control strategies, under control of center personnel, on some or all of the freeway network devices (e.g. ramp meters, interchange meters, and mainline meters), based on data from sensors monitoring traffic conditions upstream, downstream, and queue data on the approaches to the meters.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Network Performance Evaluation	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center to support overall network performance evaluations.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Network Performance Evaluation	2	The center shall collect wide-area pollution data from emissions management centers to support overall network performance evaluations.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Network Performance Evaluation	3	The center shall collect and store plans from event promoters for major future events possibly impacting traffic to support overall network performance evaluations.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Network Performance Evaluation	4	The center shall collect and store anticipated route information from information service providers to support overall network performance evaluations and predictions.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Network Performance Evaluation	6	The center shall exchange traffic information with other traffic management centers, including incidents, congestion data, traffic data, signal timing plans, and real-time signal control information to support overall network performance evaluations.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Network Performance Evaluation	7	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for network performance evaluations.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Network Performance Evaluation	8	The center shall provide an interface to the archive data repository to enable the operator to retrieve historical operating data for use in planning to predict future traffic patterns and conditions.	Planned
Ohio DOT Statewide TMC	Traffic Management	TMC Traffic Network Performance Evaluation	9	This center shall use the collected information to measure overall current and forecast network performance and predict travel demand patterns.	Planned
Ohio DOT Statewide TMC	Traffic Management	Traffic Data Collection	2	The center shall assign quality control metrics and meta-data to be stored along with the data. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.	Existing
Ohio DOT Storage Facilities	Storage Facility				
Ohio DOT Traffic Data Archive System	Archived Data Management	ITS Data Repository	1	The center shall collect data to be archived from one or more data sources.	Existing
Ohio DOT Traffic Data Archive System	Archived Data Management	ITS Data Repository	2	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).	Existing
Ohio DOT Traffic Data Archive System	Archived Data Management	ITS Data Repository	3	The center shall store the archived data in a focused repository that is suited to a particular set of ITS data users.	Existing
Ohio DOT Traffic Data Archive System	Archived Data Management	On-Line Analysis and Mining	1	The center shall support the interface with Archive Data User Systems for requests for analysis of the archive data.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT Traffic Data Archive System	Archived Data Management	On-Line Analysis and Mining	2	The center shall provide the capability to perform activities such as data mining, data fusion, summarizations, aggregations, and recreation from archive data. This may include multidimensional analysis, selective summarization and expansion of data details, and many other advanced analysis services.	Existing
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Controls	1	The field element shall control traffic signals under center control.	Existing
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Controls	2	The field element shall respond to pedestrian crossing requests by accommodating the pedestrian crossing.	Existing
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Controls	3	The field element shall provide the capability to notify the traffic management center of pedestrian calls and pedestrian accommodations.	Existing
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Controls	4	The field element shall report the current signal control information to the center.	Existing
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Controls	5	The field element shall report current preemption status to the center.	Existing
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Controls	6	The field element shall return traffic signal controller operational status to the center.	Existing
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Controls	7	The field element shall return traffic signal controller fault data to the center.	Existing
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Controls	8	The field element shall report current transit priority status to the center.	Existing
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Preemption	1	The field element shall respond to signal preemption requests from emergency vehicles.	Existing
Ohio DOT Traffic Signal Systems	Roadway	Roadway Signal Priority	1	The field element shall respond to signal priority requests from transit vehicles.	Existing
Ohio DOT Variable Speed Limit Signs	Roadway	Roadway Variable Speed Limits	1	The field element shall monitor traffic and environmental conditions along the roadway.	Planned
Ohio DOT Variable Speed Limit Signs	Roadway	Roadway Variable Speed Limits	2	The field element shall autonomously calculate and set variable speed limits based on current conditions by lane.	Planned
Ohio DOT Variable Speed Limit Signs	Roadway	Roadway Variable Speed Limits	3	The field element shall receive commands from the controlling center that establish speed limits by lane.	Planned
Ohio DOT Variable Speed Limit Signs	Roadway	Roadway Variable Speed Limits	4	The field element shall display the current speed limits per lane to drivers.	Planned
Ohio DOT Variable Speed Limit Signs	Roadway	Roadway Variable Speed Limits	5	The field element shall display additional information such as basic safety rules and current traffic information to drivers.	Planned
Ohio DOT Variable Speed Limit Signs	Roadway	Roadway Variable Speed Limits	6	The field element shall collect operational status of the variable speed limit field equipment and report the operational status to the controlling center.	Planned
Ohio DOT Variable Speed Limit Signs	Roadway	Roadway Variable Speed Limits	7	The field element shall monitor and report faults to the controlling center.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio DOT Vehicle Detection Devices	Roadway	Roadway Data Collection	1	The field element shall collect traffic, road, and environmental conditions information.	Existing
Ohio DOT Vehicle Detection Devices	Roadway	Roadway Data Collection	2	The field element shall include the sensors and supporting roadside devices that sense, collect, and send traffic, road, and environmental conditions information to a center for archival.	Existing
Ohio DOT Vehicle Detection Devices	Roadway	Roadway Data Collection	3	The field element shall collect sensor status and sensor faults from roadside equipment and send it along with the recorded data to a center for archival.	Existing
Ohio DPS Crash Database	Archived Data Management	ITS Data Repository	1	The center shall collect data to be archived from one or more data sources.	Existing
Ohio DPS Crash Database	Archived Data Management	ITS Data Repository	2	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).	Existing
Ohio DPS Crash Database	Archived Data Management	ITS Data Repository	3	The center shall store the archived data in a focused repository that is suited to a particular set of ITS data users.	Existing
Ohio DPS Crash Database	Archived Data Management	ITS Data Repository	4	The center shall include capabilities for performing quality checks on the incoming archived data.	Existing
Ohio DPS Crash Database	Archived Data Management	ITS Data Repository	5	The center shall include capabilities for error notification on the incoming archived data.	Existing
Ohio DPS Crash Database	Archived Data Management	ITS Data Repository	6	The center shall include capabilities for archive to archive coordination.	Existing
Ohio DPS Crash Database	Archived Data Management	ITS Data Repository	7	The center shall support a broad range of archived data management implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region.	Existing
Ohio DPS Crash Database	Archived Data Management	ITS Data Repository	8	The center shall perform quality checks on received data.	Existing
Ohio DPS Crash Database	Archived Data Management	On-Line Analysis and Mining	1	The center shall support the interface with Archive Data User Systems for requests for analysis of the archive data.	Existing
Ohio DPS Crash Database	Archived Data Management	On-Line Analysis and Mining	2	The center shall provide the capability to perform activities such as data mining, data fusion, summarizations, aggregations, and recreation from archive data. This may include multidimensional analysis, selective summarization and expansion of data details, and many other advanced analysis services.	Existing
Ohio DPS Crash Database	Archived Data Management	On-Line Analysis and Mining	3	The center shall receive the user's systems requests and develop the request to retrieve the data from the archive.	Existing
Ohio DPS Crash Database	Archived Data Management	On-Line Analysis and Mining	4	The center shall respond to users systems requests for a catalog of the archived data analysis products available.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio Emergency Alert System	Alerting and Advisory Systems				
Ohio EPA Air Quality Database	Archived Data Management	Government Reporting Systems Support	1	The center shall provide data from an ITS archive to federal, state, or local government reporting systems.	Existing
Ohio EPA Air Quality Database	Archived Data Management	Government Reporting Systems Support	2	The center shall provide the capability to select data from an ITS archive for use in government reports.	Existing
Ohio EPA Air Quality Database	Archived Data Management	Government Reporting Systems Support	3	The center shall provide the capability to format data from an ITS archive suitable for input into government reports.	Existing
Ohio EPA Air Quality Database	Archived Data Management	Government Reporting Systems Support	5	The center shall provide the applicable meta-data for any ITS archived data to satisfy government reporting system requests. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.	Existing
Ohio EPA Air Quality Database	Archived Data Management	ITS Data Repository	1	The center shall collect data to be archived from one or more data sources.	Existing
Ohio EPA Air Quality Database	Archived Data Management	ITS Data Repository	2	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).	Existing
Ohio EPA Air Quality Database	Archived Data Management	ITS Data Repository	3	The center shall store the archived data in a focused repository that is suited to a particular set of ITS data users.	Existing
Ohio EPA Air Quality Database	Archived Data Management	ITS Data Repository	4	The center shall include capabilities for performing quality checks on the incoming archived data.	Existing
Ohio EPA Air Quality Database	Archived Data Management	ITS Data Repository	5	The center shall include capabilities for error notification on the incoming archived data.	Existing
Ohio EPA Air Quality Database	Archived Data Management	ITS Data Repository	7	The center shall support a broad range of archived data management implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region.	Existing
Ohio EPA Air Quality Database	Archived Data Management	ITS Data Repository	8	The center shall perform quality checks on received data.	Existing
Ohio EPA Air Quality Management System	Emissions Management	Emissions Data Management	1	The center shall collect, analyze, and store vehicle emissions data collected from roadside sensors.	Existing
Ohio EPA Air Quality Management System	Emissions Management	Emissions Data Management	2	The center shall collect, analyze, and store wide area pollution data collected from sensors that may the general (wide area) environment.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio EPA Air Quality Management System	Emissions Management	Emissions Data Management	3	The center shall configure and control emissions and air quality sensors located in the field.	Existing
Ohio EPA Air Quality Management System	Emissions Management	Emissions Data Management	4	The center shall maintain a database of pollution reference data including acceptable and tolerable emissions and pollution levels for the area served by the center.	Existing
Ohio EPA Air Quality Management System	Emissions Management	Emissions Data Management	5	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for emissions.	Existing
Ohio EPA Air Quality Management System	Emissions Management	Emissions Data Management	6	The center shall establish violation parameters, detect emissions violators, obtain the vehicle registration data from the appropriate State Department of Motor Vehicles (DMV) office, and then provide the capability to send violation information to a law enforcement agency.	Existing
Ohio EPA Air Quality Management System	Emissions Management	Emissions Data Management	7	The center shall distribute air quality information to the media, traveler information service providers, and traffic management centers. This information may be used for information to travelers or part of demand management programs.	Existing
Ohio EPA Air Quality Monitors	Roadway	Roadway Emissions Monitoring	1	The field element shall include emissions sensors that detect levels of emissions from individual vehicles, under center control.	Existing
Ohio EPA Air Quality Monitors	Roadway	Roadway Emissions Monitoring	2	The field element shall include air quality sensors, often distributed geographically, that detect area-wide levels of pollution, under center control.	Existing
Ohio EPA Air Quality Monitors	Roadway	Roadway Emissions Monitoring	3	The field element shall analyze collected vehicle emissions data against reference data to determine whether or not a vehicle is violating the acceptable levels of emissions, and shall return this analysis to a center for possible enforcement action.	Existing
Ohio EPA Air Quality Monitors	Roadway	Roadway Emissions Monitoring	4	If the emissions level detected by the emissions sensor indicates a vehicle is violating the acceptable levels of emissions, the field element shall provide the capability to display summary emissions information or warnings to passing drivers via a driver information system (such as portable messages signs, field to vehicle communications to in-vehicle signing systems, etc.).	Existing
Ohio EPA Air Quality Monitors	Roadway	Roadway Emissions Monitoring	5	The field element shall provide emissions sensor equipment operational status to the center.	Existing
Ohio EPA Air Quality Monitors	Roadway	Roadway Emissions Monitoring	6	The field element shall provide emissions sensor equipment fault indication to the center for repair.	Existing
Ohio EPA Air Quality Monitors	Roadway	Roadway Emissions Monitoring	7	The field element shall provide area-wide pollution sensor equipment operational status to the center.	Existing
Ohio EPA Air Quality Monitors	Roadway	Roadway Emissions Monitoring	8	The field element shall provide area-wide pollution sensor equipment fault indication to the center for repair.	Existing
Ohio Motor Carrier Information System (OMCIS)	DMV				

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio Motor Carrier Information System (OMCIS)	Other CVAS				
Ohio State Highway Patrol Posts	Emergency Management	Emergency Call-Taking			
Ohio State Highway Patrol Posts	Emergency Management	Emergency Dispatch			
Ohio State Highway Patrol Posts	Enforcement Agency				
Ohio State Highway Patrol Pre-Pass System	Commercial Vehicle Check	Roadside Electronic Screening	1	The roadside check facility equipment shall detect the presence of commercial vehicles and freight equipment approaching a facility. Sensors can differentiate between different types of vehicles and determine the number of axles, gross vehicle weight, and the identification of the vehicle and its cargo.	Existing
Ohio State Highway Patrol Pre-Pass System	Commercial Vehicle Check	Roadside Electronic Screening	2	The roadside check facility equipment shall receive the credential and credentials status information (e.g. snapshots) from the commercial vehicle administration center to maintain an up to date list of which vehicles have been cleared (enrolled) to potentially pass through without stopping.	Existing
Ohio State Highway Patrol Pre-Pass System	Commercial Vehicle Check	Roadside Electronic Screening	3	The roadside check facility equipment shall receive commercial vehicle violation records and carriers, vehicles, and drivers of interest from appropriate law enforcement agencies.	Existing
Ohio State Highway Patrol Pre-Pass System	Commercial Vehicle Check	Roadside Electronic Screening	4	The roadside check facility equipment shall provide an interface to inspectors in the field to allow them to monitor and if necessary override the pull-in decisions made by the system.	Existing
Ohio State Highway Patrol Pre-Pass System	Commercial Vehicle Check	Roadside Electronic Screening	5	The roadside check facility equipment shall request and input electronic screening data from the commercial vehicle's electronic tag data.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio State Highway Patrol State Communications Center	Emergency Management	Emergency Dispatch	9	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders to support local management of an incident.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Ohio State Highway Patrol State Communications Center	Emergency Management	Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio State Highway Patrol Vehicles	Emergency Vehicle	On-board EV En Route Support	1	The emergency vehicle, including roadway service patrols, shall track its current location.	Existing
Ohio State Highway Patrol Vehicles	Emergency Vehicle	On-board EV En Route Support	2	The emergency vehicle, including roadway service patrols, shall send the vehicle's location and operational data to the center for emergency management and dispatch.	Existing
Ohio State Highway Patrol Vehicles	Emergency Vehicle	On-board EV En Route Support	5	The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.	Existing
Ohio State Highway Patrol Weigh-In-Motion Stations	Commercial Vehicle Check	Roadside WIM	1	The roadside check facility equipment shall detect the presence of commercial vehicles and freight equipment approaching a facility. Sensors can differentiate between different types of vehicles and determine the number of axles, gross vehicle weight, weight per axle, and the identification of the vehicle and its cargo.	Existing
Ohio State Highway Patrol Weigh-In-Motion Stations	Commercial Vehicle Check	Roadside WIM	2	The roadside check facility equipment shall request and input electronic screening data from the commercial vehicle's electronic tag data.	Existing
Ohio State Highway Patrol Weigh-In-Motion Stations	Commercial Vehicle Check	Roadside WIM	3	The roadside check facility equipment shall send a pass/pull-in notification to the commercial vehicle and its driver based on the information received from the vehicle and the measurements taken. The message may be sent to the on-board equipment in the commercial vehicle or transmitted to the driver using equipment such as dynamic message signs, red-green lights, flashing signs, etc.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	2	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	3	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	4	The center shall broadcast wide-area alerts and advisories to transit management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	5	The center shall broadcast wide-area alerts and advisories to toll administration centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	7	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	8	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	9	The center shall broadcast wide-area alerts and advisories to commercial vehicle administration centers and roadside check facilities for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	10	The center shall process status information from each of the centers that have been sent the wide-area alert.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	11	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Early Warning System	14	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	6	The center shall request resources from transit agencies as needed to support the evacuation.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Planned
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Evacuation Support	11	The center shall submit evacuation information to toll administration centers along with requests for changes in the toll services or fee collection during an evacuation.	Planned
Ohio Statewide EOC/JDF	Emergency Management	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Response Management	14	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Response Management	15	The center shall collect information about the status of the recovery efforts for the infrastructure during disasters.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Emergency Response Management	16	The center shall provide the overall status of infrastructure recovery efforts to traveler information providers and media.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders to support local management of an incident.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio Statewide EOC/JDF	Emergency Management	Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Ohio Statewide EOC/JDF	Emergency Management	Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Ohio Turnpike CCTV Cameras	Roadway	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Existing
Ohio Turnpike CCTV Cameras	Roadway	Roadway Basic Surveillance	4	The field element shall return sensor and CCTV system operational status to the controlling center.	Existing
Ohio Turnpike CCTV Cameras	Roadway	Roadway Basic Surveillance	5	The field element shall return sensor and CCTV system fault data to the controlling center for repair.	Existing
Ohio Turnpike Central Dispatch	Traffic Management	Collect Traffic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.	Existing
Ohio Turnpike Central Dispatch	Traffic Management	TMC Traffic Information Dissemination	1	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers.	Existing
Ohio Turnpike Central Dispatch	Traffic Management	TMC Traffic Information Dissemination	3	The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.).	Existing
Ohio Turnpike Central Dispatch	Traffic Management	TMC Traffic Information Dissemination	4	The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair.	Existing
Ohio Turnpike DMS	Roadway	Roadway Traffic Information Dissemination	1	The field element shall include dynamic messages signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Existing
Ohio Turnpike DMS	Roadway	Roadway Traffic Information Dissemination	4	The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center.	Existing
Ohio Turnpike DMS	Roadway	Roadway Traffic Information Dissemination	5	The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair.	Existing
Ohio Turnpike E-ZPass Tags	Vehicle	Vehicle Toll/Parking Interface	1	The vehicle shall respond to requests from toll collection equipment for credit identity, stored value card cash, etc.	Existing
Ohio Turnpike E-ZPass Tags	Vehicle	Vehicle Toll/Parking Interface	2	The vehicle shall respond to request from parking field equipment for credit identity, stored value card cash, etc.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio Turnpike Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Location Tracking	1	The maintenance and construction vehicle shall track its current location.	Planned
Ohio Turnpike Maintenance and Construction Vehicles	Maintenance and Construction Vehicle	MCV Vehicle Location Tracking	2	The maintenance and construction vehicle shall send the time stamped vehicle location to the controlling center.	Planned
Ohio Turnpike Maintenance Dispatch Offices	Maintenance and Construction Management	MCM Vehicle Tracking	1	The center shall monitor the locations of all maintenance and construction vehicles and other equipment under its jurisdiction.	Planned
Ohio Turnpike Maintenance Dispatch Offices	Maintenance and Construction Management	MCM Vehicle Tracking	2	The center shall present location data to center personnel for the fleet of maintenance and construction vehicles and other equipment.	Planned
Ohio Turnpike Maintenance Dispatch Offices	Maintenance and Construction Management	MCM Vehicle Tracking	3	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for maintenance and construction vehicle tracking.	Planned
Ohio Turnpike Toll Administration	Payment Administration	Toll Administration	1	The center shall manage toll transactions, including maintaining a log of all transactions and toll pricing structure information.	Existing
Ohio Turnpike Toll Administration	Payment Administration	Toll Administration	3	For electronic toll payments requiring financial payment, the center shall process the financial information from toll plazas and manage an interface to a Financial Institution.	Existing
Ohio Turnpike Toll Administration	Payment Administration	Toll Administration	4	The center shall manage a local billing database for toll customers.	Existing
Ohio Turnpike Toll Administration	Payment Administration	Toll Administration	5	The center shall manage the details of toll payment violations based on vehicle information from the toll plaza, registration information from the Department of Motor Vehicles, invalid payment information from a Financial Institution, and previous violation information stored locally, and report such violations to appropriate law enforcement agencies.	Existing
Ohio Turnpike Toll Administration	Payment Administration	Toll Administration	8	The center shall exchange data with other toll agencies to coordinate toll transactions and pricing.	Planned
Ohio Turnpike Toll Administration	Payment Administration	Toll Administration	11	The center shall support toll transactions by commercial fleet operators.	Existing
Ohio Turnpike Toll Collection Equipment	Roadway Payment	Toll Plaza Toll Collection	1	The field element shall read data from passing vehicles to support toll payment transactions.	Existing
Ohio Turnpike Toll Collection Equipment	Roadway Payment	Toll Plaza Toll Collection	3	The field element shall update the stored value after debiting the toll amount and send a record of the transaction to a center.	Existing
Ohio Turnpike Toll Collection Equipment	Roadway Payment	Toll Plaza Toll Collection	4	The field element shall read the credit identity from the passing vehicle and send that identity and the amount to be debited to a center.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Ohio Turnpike Toll Collection Equipment	Roadway Payment	Toll Plaza Toll Collection	6	In the case of closed toll systems, the field element shall update the vehicle on-board data with the system entry point, and upon toll system exit, use the stored data in the calculation of the toll.	Existing
Ohio Turnpike Toll Collection Equipment	Roadway Payment	Toll Plaza Toll Collection	7	The field element shall control roadside displays indicating success or failure of the toll transaction to the driver.	Existing
Ohio Turnpike Toll Collection Equipment	Roadway Payment	Toll Plaza Toll Collection	9	The field element shall respond to changes in tolls from the Toll Operator.	Existing
Ohio Turnpike Website	Information Service Provider	Basic Information Broadcast	5	The center shall disseminate toll fee information to travelers.	Existing
Ohio Turnpike Website	Information Service Provider	Interactive Infrastructure Information	5	The center shall disseminate customized toll fee information to travelers upon request.	Existing
Ohio Turnpike Website	Information Service Provider	Interactive Infrastructure Information	10	The center shall provide all traveler information based on the traveler's current location or a specific location identified by the traveler, and filter or customize the provided information accordingly.	Existing
Potential Obstacles	Potential Obstacles				
Private Rail Operations Active Warning Roadside Equipment	Roadway	Advanced Rail Crossing	1	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Existing
Private Rail Operations Active Warning Roadside Equipment	Roadway	Advanced Rail Crossing	2	The field element shall determine whether the highway-rail intersection (HRI) is blocked by traffic in the roadway or some other obstruction.	Existing
Private Rail Operations Active Warning Roadside Equipment	Roadway	Advanced Rail Crossing	3	The field element shall notify the traffic management center and the rail wayside equipment of any intersection blockages, including trapped vehicles or other obstructions.	Existing
Private Rail Operations Active Warning Roadside Equipment	Roadway	Advanced Rail Crossing	4	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Existing
Private Rail Operations Active Warning Roadside Equipment	Roadway	Advanced Rail Crossing	5	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the rail wayside equipment.	Existing
Private Rail Operations Active Warning Roadside Equipment	Roadway	Advanced Rail Crossing	10	The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.	Existing
Private Rail Operations Active Warning Roadside Equipment	Roadway	Standard Rail Crossing	1	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Private Rail Operations Active Warning Roadside Equipment	Roadway	Standard Rail Crossing	2	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Existing
Private Rail Operations Active Warning Roadside Equipment	Roadway	Standard Rail Crossing	3	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the rail wayside equipment.	Existing
Private Rail Operations Active Warning Roadside Equipment	Roadway	Standard Rail Crossing	4	The field element shall receive track status from the rail wayside equipment that can be passed on to the traffic management center. This may include the current status of the tracks and whether a train is approaching.	Existing
Private Rail Operations Wayside Equipment	Wayside Equipment				
Private Towing Dispatch Agencies	Other Emergency Management				
Private Traveler Information Systems	Information Service Provider	Interactive Infrastructure Information	1	The center shall disseminate customized traffic and highway condition information to travelers, including incident information, detours and road closures, recommended routes, and current speeds on specific routes upon request.	Existing
Private Traveler Information Systems	Information Service Provider	Interactive Infrastructure Information	3	The center shall disseminate customized transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information to travelers upon request.	Existing
Private Traveler Information Systems	Information Service Provider	Interactive Infrastructure Information	4	The center shall disseminate customized parking information to travelers, including location, availability, and fees upon request.	Existing
Private Traveler Information Systems	Information Service Provider	Interactive Infrastructure Information	6	The center shall disseminate customized weather information to travelers upon request.	Existing
Private Traveler Information Systems	Information Service Provider	Interactive Infrastructure Information	10	The center shall provide all traveler information based on the traveler's current location or a specific location identified by the traveler, and filter or customize the provided information accordingly.	Existing
Private Weather Service Systems	Surface Transportation Weather Service				
PUCO Commercial Vehicle Compliance Check	Commercial Vehicle Check	Citation and Accident Electronic Recording	1	The roadside check facility equipment shall record the results of roadside inspections carried using an inspector's hand held terminal interface.	Existing
PUCO Commercial Vehicle Compliance Check	Commercial Vehicle Check	Citation and Accident Electronic Recording	2	The roadside check facility equipment shall provide an interface for an inspector to add comments to the inspection results.	Existing
PUCO Commercial Vehicle Compliance Check	Commercial Vehicle Check	Citation and Accident Electronic Recording	3	The roadside check facility equipment shall forward results of the roadside inspections to the commercial vehicle administration center either as needed or on a periodic basis. These reports include accident reports, violation notifications, citations, and daily site activity logs.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
PUCO Commercial Vehicle Compliance Check	Commercial Vehicle Check	Citation and Accident Electronic Recording	4	The roadside check facility equipment shall receive driver records from the commercial vehicle administration center to support driver identification and collection of driver credentials and history information.	Existing
PUCO Commercial Vehicle Compliance Check	Commercial Vehicle Check	Roadside Safety and Security Inspection	1	The roadside check facility equipment shall receive information concerning commercial vehicles and freight equipment approaching a facility that are being pulled in for safety and security inspections.	Existing
PUCO Commercial Vehicle Compliance Check	Commercial Vehicle Check	Roadside Safety and Security Inspection	2	The roadside check facility equipment shall receive the safety and security inspection and status information from the commercial vehicle administration center to include information such as safety ratings, inspection summaries, and violation summaries. Corresponds to the safety portion of CVISN "snapshots."	Existing
PUCO Commercial Vehicle Compliance Check	Commercial Vehicle Check	Roadside Safety and Security Inspection	3	The roadside check facility equipment shall provide an interface to inspectors in the field to allow them to safety inspection data including overrides to the pull-in decisions made by the system.	Existing
PUCO Commercial Vehicle Compliance Check	Commercial Vehicle Check	Roadside Safety and Security Inspection	4	The roadside check facility equipment shall request and input electronic safety data from the commercial vehicle's electronic tag data. This includes driver logs, on-board safety data, safety inspection records, commercial vehicle breach information, as well as freight equipment information.	Existing
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Data Collection			
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Information Exchange			
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Safety and Security Administration	1	The center shall provide commercial vehicle safety and security data to roadside check facilities.	Existing
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Safety and Security Administration	2	The center shall collect and review safety inspection reports and violations from the roadside check facilities and pass on appropriate portions to other commercial vehicle administrative centers and commercial vehicle fleet operators.	Existing
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Safety and Security Administration	3	The center shall notify enforcement agencies of commercial vehicle safety violations by individual commercial vehicles, drivers, or carriers.	Existing
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Safety and Security Administration	4	The center shall monitor alerting and advisory systems for security alerts and advisories.	Existing
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Safety and Security Administration	5	The center shall provide commercial vehicle accident reports to enforcement agencies.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Safety and Security Administration	6	The center shall receive citation records from roadside check facilities.	Existing
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Safety and Security Administration	7	The center shall manage the citation records and provide the citations to enforcement agencies and the commercial fleet management center.	Existing
PUCO Commercial Vehicle Registration System	Commercial Vehicle Administration	CV Safety and Security Administration	8	The center shall provide the capability for the commercial fleet management center to report required commercial vehicle repairs and other corrections of identified deficiencies.	Existing
Regional Airport Authorities	Multimodal Transportation Service Provider				
Regional Airport Authorities	Traffic Management	Collect Traffic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.	Existing
Regional Airport Authorities	Traffic Management	TMC Traffic Information Dissemination	1	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers.	Existing
Regional Airport Authorities	Traffic Management	TMC Traffic Information Dissemination	3	The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.).	Existing
Regional Airport Authorities	Traffic Management	TMC Traffic Information Dissemination	4	The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair.	Existing
Regional Airport Authorities Parking Management Systems	Parking Management	Parking Coordination	1	The parking element shall exchange parking management data with other parking facilities including location, hours, availability, status, lot usage, operating strategies, and charging information.	Planned
Regional Airport Authorities Parking Management Systems	Parking Management	Parking Coordination	2	The parking element shall provide parking management data to traffic management centers upon request as part of the implementation of demand management programs in the region. This could include changes to hours of operation or pricing.	Planned
Regional Airport Authorities Parking Management Systems	Parking Management	Parking Coordination	4	The parking element shall distribute parking lot information upon request to transit management centers for park and ride facilities, parking shuttle services, and other applications that integrate transit and parking services.	Planned
Regional Airport Authorities Parking Management Systems	Parking Management	Parking Electronic Payment	1	The parking element shall detect and classify vehicles entering and exiting a parking facility (vehicle size, type, identifiable features, etc.).	Planned
Regional Airport Authorities Parking Management Systems	Parking Management	Parking Electronic Payment	2	The parking element shall read data from the traveler card / payment instrument carried on-board the vehicle or by the traveler.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Regional Airport Authorities Parking Management Systems	Parking Management	Parking Electronic Payment	6	The parking element shall process the financial requests and manage an interface to a Financial Institution.	Planned
Regional Airport Authorities Parking Management Systems	Parking Management	Parking Management	1	The parking element shall maintain parking lot information including static information such as hours of operation, rates, location, entrance locations, capacity, type, and constraints; as well as dynamic information such as current state of the lot, occupancy, arrival rates, and departure rates.	Existing
Regional Airport Authorities Parking Management Systems	Parking Management	Parking Management	3	The parking element shall manage local dynamic message signs that display messages to travelers such as the parking lot state, number of spaces available, location of entrances, and current charges.	Existing
Regional Airport Authorities Roadside ITS Equipment	Roadway	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Existing
Regional Airport Authorities Roadside ITS Equipment	Roadway	Roadway Basic Surveillance	4	The field element shall return sensor and CCTV system operational status to the controlling center.	Existing
Regional Airport Authorities Roadside ITS Equipment	Roadway	Roadway Basic Surveillance	5	The field element shall return sensor and CCTV system fault data to the controlling center for repair.	Existing
Regional Airport Authorities Roadside ITS Equipment	Roadway	Roadway Traffic Information Dissemination	1	The field element shall include dynamic messages signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Existing
Regional Airport Authorities Roadside ITS Equipment	Roadway	Roadway Traffic Information Dissemination	4	The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center.	Existing
Regional Airport Authorities Roadside ITS Equipment	Roadway	Roadway Traffic Information Dissemination	5	The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair.	Existing
Regional Event Operations	Event Promoters				
Regional Hospitals and Trauma Centers	Care Facility				
Regional Transit Authorities Ticket Vending Machines	Remote Traveler Support	Remote Transit Fare Management	1	The public interface for travelers shall accept and process current transit passenger fare collection information.	Existing
Regional Transit Authorities Ticket Vending Machines	Remote Traveler Support	Remote Transit Fare Management	3	The public interface for travelers shall provide an interface to a transit user traveler card in support of payment for transit fares, tolls, and/or parking lot charges. The stored credit value data from the card shall be collected and updated based on the fare or other charges, or the credit identity shall be collected.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Regional Transit Authorities Ticket Vending Machines	Remote Traveler Support	Remote Transit Fare Management	4	The public interface for travelers shall provide information to the center for financial authorization and transaction processing.	Existing
Regional Transit Authorities Transit Data Archives	Archived Data Management	Government Reporting Systems Support	1	The center shall provide data from an ITS archive to federal, state, or local government reporting systems.	Existing
Regional Transit Authorities Transit Data Archives	Archived Data Management	Government Reporting Systems Support	2	The center shall provide the capability to select data from an ITS archive for use in government reports.	Existing
Regional Transit Authorities Transit Data Archives	Archived Data Management	Government Reporting Systems Support	3	The center shall provide the capability to format data from an ITS archive suitable for input into government reports.	Existing
Regional Transit Authorities Transit Data Archives	Archived Data Management	Government Reporting Systems Support	5	The center shall provide the applicable meta-data for any ITS archived data to satisfy government reporting system requests. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.	Existing
Regional Transit Authorities Transit Data Archives	Archived Data Management	ITS Data Repository	1	The center shall collect data to be archived from one or more data sources.	Existing
Regional Transit Authorities Transit Data Archives	Archived Data Management	ITS Data Repository	2	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).	Existing
Regional Transit Authorities Transit Data Archives	Archived Data Management	ITS Data Repository	3	The center shall store the archived data in a focused repository that is suited to a particular set of ITS data users.	Existing
Regional Transit Authorities Transit Data Archives	Archived Data Management	ITS Data Repository	4	The center shall include capabilities for performing quality checks on the incoming archived data.	Existing
Regional Transit Authorities Transit Data Archives	Archived Data Management	ITS Data Repository	7	The center shall support a broad range of archived data management implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region.	Existing
Regional Transit Authorities Transit Information Kiosks	Remote Traveler Support	Remote Transit Information Services	1	The public interface for travelers shall collect and provide real-time travel-related information at transit stops, multi-modal transfer points, and other public transportation areas.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Regional Transit Authorities Transit Information Kiosks	Remote Traveler Support	Remote Transit Information Services	2	The public interface for travelers shall collect and present to the transit traveler information on transit routes, schedules, and real-time schedule adherence.	Existing
Regional Transit Authorities Transit Information Kiosks	Remote Traveler Support	Remote Transit Information Services	3	The public interface for travelers shall provide support for general annunciation and/or display of imminent arrival information and other information of general interest to transit users.	Existing
Regional Transit Authorities Transit Information Systems	Information Service Provider				
Regional Transit Authorities Transit Information Systems	Remote Traveler Support	Remote Transit Information Services	1	The public interface for travelers shall collect and provide real-time travel-related information at transit stops, multi-modal transfer points, and other public transportation areas.	Existing
Regional Transit Authorities Transit Information Systems	Remote Traveler Support	Remote Transit Information Services	2	The public interface for travelers shall collect and present to the transit traveler information on transit routes, schedules, and real-time schedule adherence.	Existing
Regional Transit Authorities Transit Information Systems	Remote Traveler Support	Remote Transit Information Services	3	The public interface for travelers shall provide support for general annunciation and/or display of imminent arrival information and other information of general interest to transit users.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fare Management	1	The center shall manage the actual value of transit fares for each segment of each regular transit route, including the transmission of the information to transit vehicles and transit stops or stations.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fare Management	2	The center shall provide the capability for a system operator to manage the transit fares and control the exchange of transit fare information.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fare Management	3	The center shall process the financial requests from the transit vehicles or roadside and manage an interface to a Financial Institution.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fare Management	4	The center shall support the payment of transit fare transactions using data provided by the traveler cards / payment instruments.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	1	The center shall generate transit routes and schedules based on such factors as parameters input by the system operator, road network conditions, incident information, operational data on current routes and schedules, and digitized map data.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	2	The center shall provide the interface to the system operator to control the generation of new routes and schedules (transit services) including the ability to review and update the parameters used by the routes and schedules generation processes and to initiate these processes	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	4	The center shall dispatch fixed route or flexible route transit vehicles	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	5	The center shall collect transit operational data for use in the generation of routes and schedules.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	10	The center shall disseminate up-to-date schedules and route information to other centers for fixed and flexible route services.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	11	The center shall provide an interface to the archive data repository to enable the operator to retrieve historical operating data for use in planning transit routes and schedules.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Information Services	1	The center shall provide travelers using public transportation with traffic and advisory information upon request. Such information may include transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, and special events.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Paratransit Operations	1	The center shall process trip requests for demand responsive transit services, i.e. paratransit. Sources of the requests may include traveler information service providers.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Paratransit Operations	2	The center shall monitor the operational status of the demand response vehicles including status of passenger pick-up and drop-off.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Paratransit Operations	3	The center shall generate demand response transit (including paratransit) routes and schedules based on such factors as parameters input by the system operator, what other demand responsive transit schedules have been planned, the availability and location of vehicles, the relevance of any fixed transit routes and schedules, road network information, and incident information.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Paratransit Operations	4	The center shall dispatch demand response (paratransit) transit vehicles.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Paratransit Operations	6	The center shall disseminate up-to-date schedules and route information to other centers for demand responsive transit services (paratransit).	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Passenger Counting	1	The center shall collect passenger count information from each transit vehicle.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Passenger Counting	2	The center shall calculate transit ridership data by route, route segment, transit stop, time of day, and day of week based on the collected passenger count information.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Security	1	The center shall monitor transit vehicle operational data to determine if the transit vehicle is off-route and assess whether a security incident is occurring.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Security	2	The center shall receive reports of emergencies on-board transit vehicles entered directly be the transit vehicle operator or from a traveler through interfaces such as panic buttons or alarm switches.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Security	3	The center shall support the back-office portion of functionality to authenticate transit vehicle operators.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Vehicle Tracking	1	The center shall monitor the locations of all transit vehicles within its network.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Vehicle Tracking	2	The center shall determine adherence of transit vehicles to their assigned schedule.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Vehicle Tracking	3	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for transit tracking and dispatch.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Center Vehicle Tracking	4	The center shall provide transit operational data to traveler information service providers.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Garage Maintenance	1	The center shall collect operational and maintenance data from transit vehicles.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Garage Maintenance	2	The center shall monitor the condition of a transit vehicle to analyze brake, drive train, sensors, fuel, steering, tire, processor, communications equipment, and transit vehicle mileage to identify mileage based maintenance, out-of-specification or imminent failure conditions.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Garage Maintenance	3	The center shall generate transit vehicle maintenance schedules that identify the maintenance or repair to be performed and when the work is to be done.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Garage Maintenance	4	The center shall generate transit vehicle availability listings, current and forecast, to support transit vehicle assignment planning based, in part, on the transit vehicle maintenance schedule.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Garage Maintenance	5	The center shall assign technicians to a transit vehicle maintenance schedule, based upon such factors as personnel eligibility, work assignments, preferences and seniority.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Garage Maintenance	6	The center shall verify that the transit vehicle maintenance activities were performed correctly, using the transit vehicle's status, the maintenance personnel's work assignment, and the transit maintenance schedules.	Planned

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Garage Maintenance	7	The center shall generate a time-stamped maintenance log of all maintenance activities performed on a transit vehicle.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Garage Maintenance	8	The center shall provide transit operations personnel with the capability to update transit vehicle maintenance information and receive reports on all transit vehicle operations data.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Vehicle Assignment	1	The center shall assign individual transit vehicles to transit blocks.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Vehicle Assignment	2	The center shall download vehicle assignments to the transit vehicle prior to the start of the day's operations.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Vehicle Assignment	3	The center shall provide an exception handling process for the vehicle assignment function. This process shall generate new supplemental vehicle assignments as required due to change events which occur during the operating day.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Vehicle Assignment	4	The center shall provide an inventory management function for the transit facility that stores functional attributes about each vehicle owned by the transit operator. The functional attributes permit the planning and assignment functions to match vehicles with routes based on suitability for the types of service required by the particular routes.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Vehicle Assignment	5	The center shall generate transit vehicle availability listings, current and forecast, to support transit vehicle assignment planning.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Vehicle Assignment	6	The center shall provide transit operations personnel with the capability to update transit vehicle assignments and receive reports on transit vehicle inventory status.	Planned
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Vehicle Operator Assignment	1	The center shall maintain records of a transit vehicle operator's performance. This may be done utilizing standardized performance evaluation criteria set forth by governmental regulations and transit operating company policies, assessing the transit vehicle operator's driving history, and assessing comments from the transit vehicle operator's supervisor(s) as well as noting any moving violations or accidents, supervisor comments, government regulations, and company policies.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Vehicle Operator Assignment	2	The center shall assess the transit vehicle operator's availability based on previous work assignments, accumulated hours, plus health and vacation commitments.	Existing
Regional Transit Authorities Transit Operations Centers	Transit Management	Transit Vehicle Operator Assignment	3	The center shall assign transit vehicle operators to transit schedules based on their eligibility, route preferences, seniority, and transit vehicle availability.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Regional Transit Authorities Transit Websites	Information Service Provider	Infrastructure Provided Trip Planning	1	The center shall provide the capability to provide specific pre-trip and enroute directions to travelers (and drivers), including costs, arrival times, and transfer points.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Maintenance	1	The transit vehicle shall collect and process vehicle mileage data available to sensors on-board.	Planned
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Maintenance	2	The transit vehicle shall collect and process the transit vehicle's operating conditions such as engine temperature, oil pressure, brake wear, internal lighting, environmental controls, etc.	Planned
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Maintenance	3	The transit vehicle shall transmit vehicle maintenance data to the center to be used for scheduling future vehicle maintenance.	Planned
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Paratransit Operations	1	The transit vehicle shall manage data input to sensor(s) on-board a transit vehicle to determine the vehicle's availability for use in demand responsive and flexible-route transit services based on identity, type, and passenger capacity.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Paratransit Operations	2	The transit vehicle shall receive the status of demand responsive or flexible-route transit schedules and passenger loading from the transit vehicle operator.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Paratransit Operations	3	The transit vehicle shall provide the transit vehicle operator instructions about the demand responsive or flexible-route transit schedule that has been confirmed from the center.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Paratransit Operations	4	The transit vehicle shall provide the capability to log passenger boardings and alightings and make passenger use data available to the transit center.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Passenger Counting	1	The transit vehicle shall count passengers boarding and alighting.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Passenger Counting	2	The passenger counts shall be related to location to support association of passenger counts with routes, route segments, or bus stops.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Passenger Counting	3	The passenger counts shall be timestamped so that ridership can be measured by time of day and day of week.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Passenger Counting	4	The transit vehicle shall send the collected passenger count information to the transit center.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Schedule Management	1	The transit vehicle shall receive a vehicle assignment including transit route information, transit service instructions, traffic information, road conditions, and other information for the operator.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Schedule Management	2	The transit vehicle shall use the route information and its current location to determine the deviation from the predetermined schedule.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Schedule Management	3	The transit vehicle shall calculate the estimated times of arrival (ETA) at transit stops.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Fare Management	1	The transit vehicle shall read data from the traveler card / payment instrument presented by boarding passengers.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Fare Management	10	The transit vehicle shall provide fare statistics data to the center.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Information Services	1	The transit vehicle shall enable traffic and travel advisory information to be requested and output to the traveler. Such information may include transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, and special events.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Information Services	3	The transit vehicle shall broadcast advisories about the imminent arrival of the transit vehicle at the next stop via an on-board automated annunciation system.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Security	1	The transit vehicle shall perform video and audio surveillance inside of transit vehicles and output raw video or audio data for either local monitoring (for processing or direct output to the transit vehicle operator), remote monitoring or for local storage (e.g., in an event recorder).	Planned
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Signal Priority	1	The transit vehicle shall determine the schedule deviation and estimated times of arrival (ETA) at transit stops.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Signal Priority	2	The transit vehicle shall send priority requests to traffic signal controllers at intersections, pedestrian crossings, and multimodal crossings on the roads (surface streets) and freeway (ramp controls) network that enable a transit vehicle schedule deviation to be corrected.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	1	The transit vehicle shall track the current location of the transit vehicle.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	2	The transit vehicle shall support the computation of the location of a transit vehicle using on-board sensors to augment the location determination function. This may include proximity to the transit stops or other known reference points as well as recording trip length.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	3	The transit vehicle shall record transit trip monitoring data including vehicle mileage and fuel usage.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	4	The transit vehicle shall record transit trip monitoring data including operational status information such as doors open/closed, running times, etc.	Existing
Regional Transit Authority Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	5	The transit vehicle shall send the transit vehicle trip monitoring data to center-based trip monitoring functions.	Existing
Traffic	Traffic				
Transit Traveler Cards	Traveler Card				
Traveler	Traveler				
Traveler Information Device	Personal Information Access	Personal Basic Information Reception	1	The personal traveler interface shall receive traffic information from a center and present it to the traveler.	Existing
Traveler Information Device	Personal Information Access	Personal Basic Information Reception	2	The personal traveler interface shall receive transit information from a center and present it to the traveler.	Existing
Traveler Information Device	Personal Information Access	Personal Basic Information Reception	3	The personal traveler interface shall receive event information from a center and present it to the traveler.	Existing
Traveler Information Device	Personal Information Access	Personal Basic Information Reception	4	The personal traveler interface shall receive evacuation information from a center and present it to the traveler.	Existing
Traveler Information Device	Personal Information Access	Personal Basic Information Reception	5	The personal traveler interface shall receive wide-area alerts and present it to the traveler.	Existing
Traveler Information Device	Personal Information Access	Personal Interactive Information Reception	1	The personal traveler interface shall receive traffic information from a center and present it to the traveler upon request.	Existing
Traveler Information Device	Personal Information Access	Personal Interactive Information Reception	2	The personal traveler interface shall receive transit information from a center and present it to the traveler upon request.	Existing
Traveler Information Device	Personal Information Access	Personal Interactive Information Reception	3	The personal traveler interface shall receive traveler services information (such as lodging, restaurants, theaters, bicycle facilities, and other tourist activities) from a center and present it to the traveler upon request.	Existing
Traveler Information Device	Personal Information Access	Personal Interactive Information Reception	4	The personal traveler interface shall receive event information from a center and present it to the traveler upon request.	Existing
Traveler Information Device	Personal Information Access	Personal Interactive Information Reception	5	The personal traveler interface shall receive evacuation information from a center and present it to the traveler.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Traveler Information Device	Personal Information Access	Personal Interactive Information Reception	10	The personal traveler interface shall base requests from the traveler on the traveler's current location or a specific location identified by the traveler, and filter the provided information accordingly.	Existing
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Fare Management	2	The center shall provide the capability for a system operator to manage the transit fares and control the exchange of transit fare information.	Existing
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Fare Management	4	The center shall support the payment of transit fare transactions using data provided by the traveler cards / payment instruments.	Existing
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	2	The center shall provide the interface to the system operator to control the generation of new routes and schedules (transit services) including the ability to review and update the parameters used by the routes and schedules generation processes and to initiate these processes	Existing
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Fixed-Route Operations	4	The center shall dispatch fixed route or flexible route transit vehicles	Existing
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Information Services	1	The center shall provide travelers using public transportation with traffic and advisory information upon request. Such information may include transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, and special events.	Existing
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Information Services	3	The center shall exchange transit schedules, real-time arrival information, fare schedules, and general transit service information with other transit organizations to support transit traveler information systems.	Existing
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Security	2	The center shall receive reports of emergencies on-board transit vehicles entered directly be the transit vehicle operator or from a traveler through interfaces such as panic buttons or alarm switches.	Existing
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Security	3	The center shall support the back-office portion of functionality to authenticate transit vehicle operators.	Existing
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Security	5	The center shall receive information pertaining to a wide-area alert such as weather alerts, disaster situations, or child abductions. This information may come from Emergency Management or from other Alerting and Advisory Systems.	Existing
Universities and Colleges Transit Operations Centers	Transit Management	Transit Center Vehicle Tracking	1	The center shall monitor the locations of all transit vehicles within its network.	Existing
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Schedule Management	2	The transit vehicle shall use the route information and its current location to determine the deviation from the predetermined schedule.	Existing

Element Name	Entity Name	Functional Area	Req. ID	Requirement	Status
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Schedule Management	3	The transit vehicle shall calculate the estimated times of arrival (ETA) at transit stops.	Existing
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Transit Fare Management	1	The transit vehicle shall read data from the traveler card / payment instrument presented by boarding passengers.	Existing
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Transit Fare Management	10	The transit vehicle shall provide fare statistics data to the center.	Existing
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Transit Security	1	The transit vehicle shall perform video and audio surveillance inside of transit vehicles and output raw video or audio data for either local monitoring (for processing or direct output to the transit vehicle operator), remote monitoring or for local storage (e.g., in an event recorder).	Planned
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Transit Signal Priority	1	The transit vehicle shall determine the schedule deviation and estimated times of arrival (ETA) at transit stops.	Planned
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Transit Signal Priority	2	The transit vehicle shall send priority requests to traffic signal controllers at intersections, pedestrian crossings, and multimodal crossings on the roads (surface streets) and freeway (ramp controls) network that enable a transit vehicle schedule deviation to be corrected.	Planned
Universities and Colleges Transit Vehicles	Transit Vehicle	On-board Transit Trip Monitoring	1	The transit vehicle shall track the current location of the transit vehicle.	Existing

Appendix C. Interfaces Details

The interfaces of the transportation systems in the Ohio Statewide ITS Architecture are based on the National ITS Architecture and tailored to reflect the plan for the state. Architecture diagrams display the transportation systems in the Ohio Statewide ITS Architecture, and more importantly, how these systems are and will be connected with one another so information can be exchanged and transportation services can be coordinated. Stakeholders may use these diagrams to identify integration opportunities. Each system is represented with two types of diagrams, a context diagram and an architecture flow diagram.

A context diagram shows a particular system and all other systems with which it shares information. Interconnects are represented as single lines and indicate information sharing without specifying the type of information being shared or the direction of the information movement.

Following each interconnect context diagram are a series of architecture flow diagrams showing the information (i.e. architecture flows) movement between the various systems. Descriptions of the architecture flows are included at the end of the chapter.

Information about the interfaces of the systems is contained in the Turbo Architecture™ database. Turbo Architecture™ can be used to create tailored interconnect and architecture flow diagrams for any system in the database.

Ohio DOT Statewide ITS Architecture Interface Diagrams

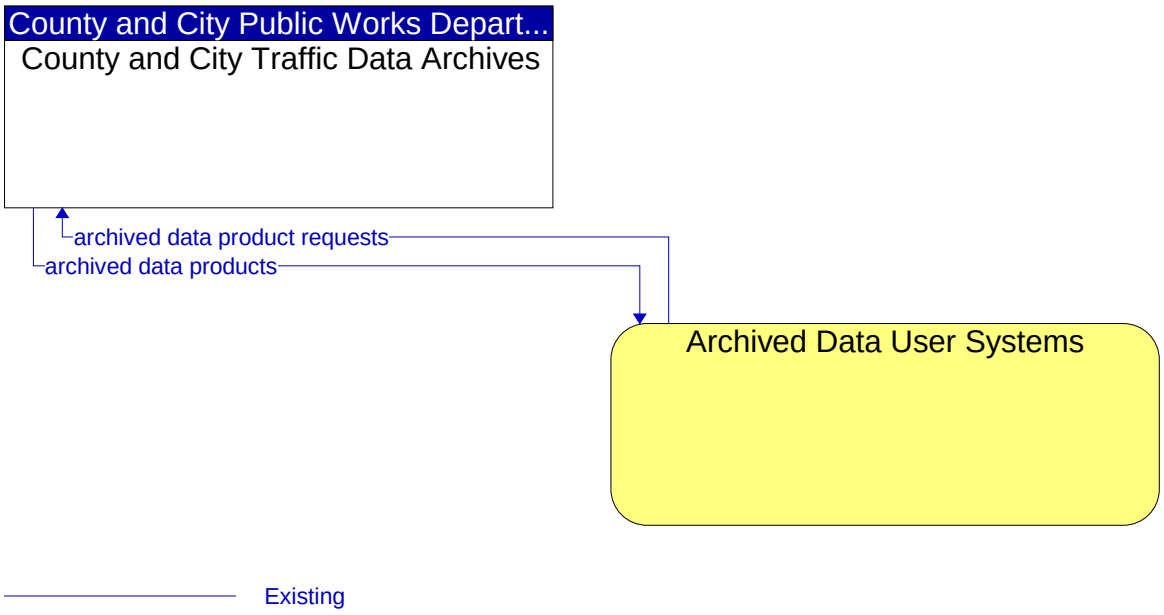

Figure 1: Archived Data User Systems - County and City Traffic Data Archives Interface

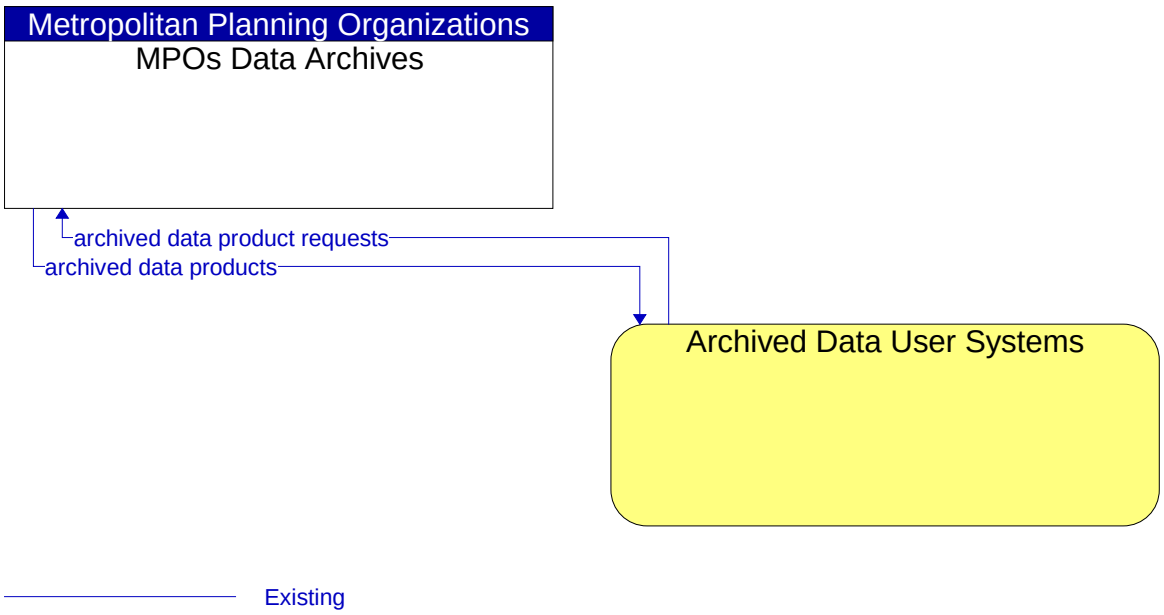

Figure 2: Archived Data User Systems - MPOs Data Archives Interface

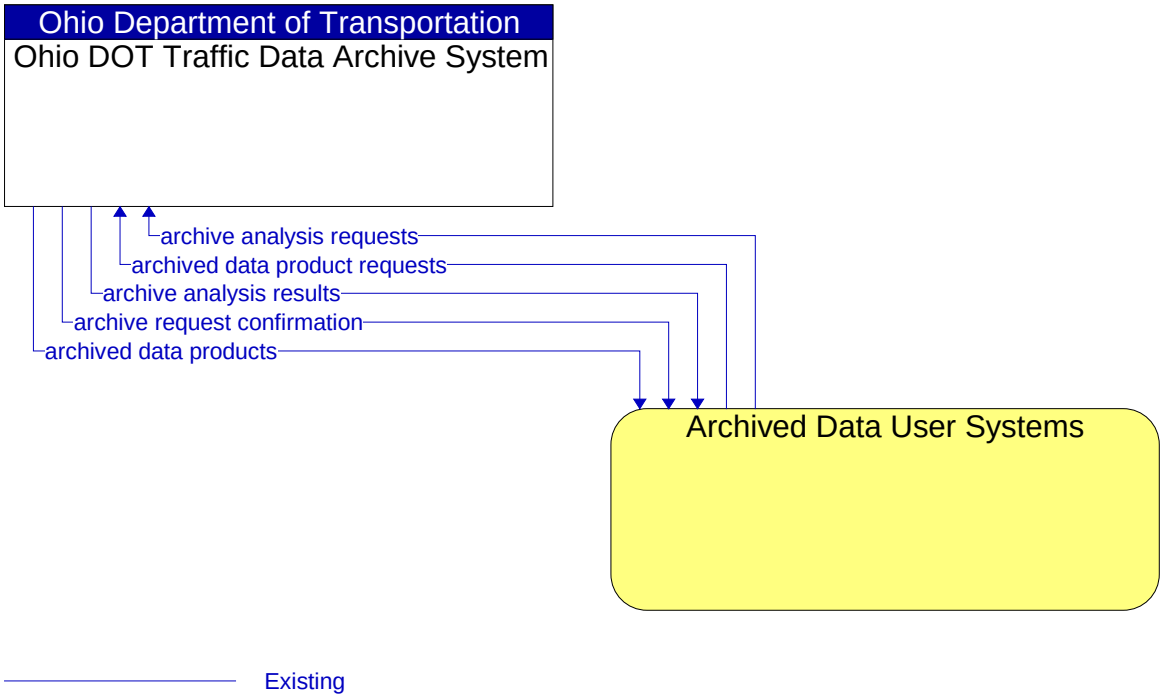

Figure 3: Archived Data User Systems - Ohio DOT Traffic Data Archive System Interface

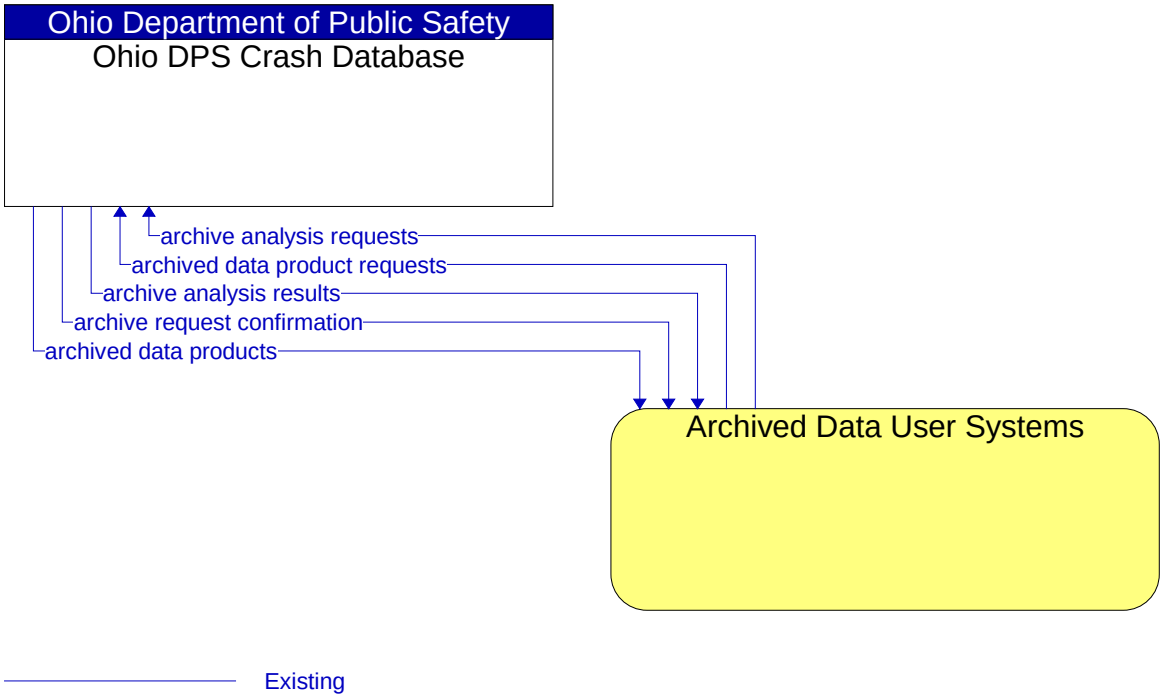

Figure 4: Archived Data User Systems - Ohio DPS Crash Database Interface

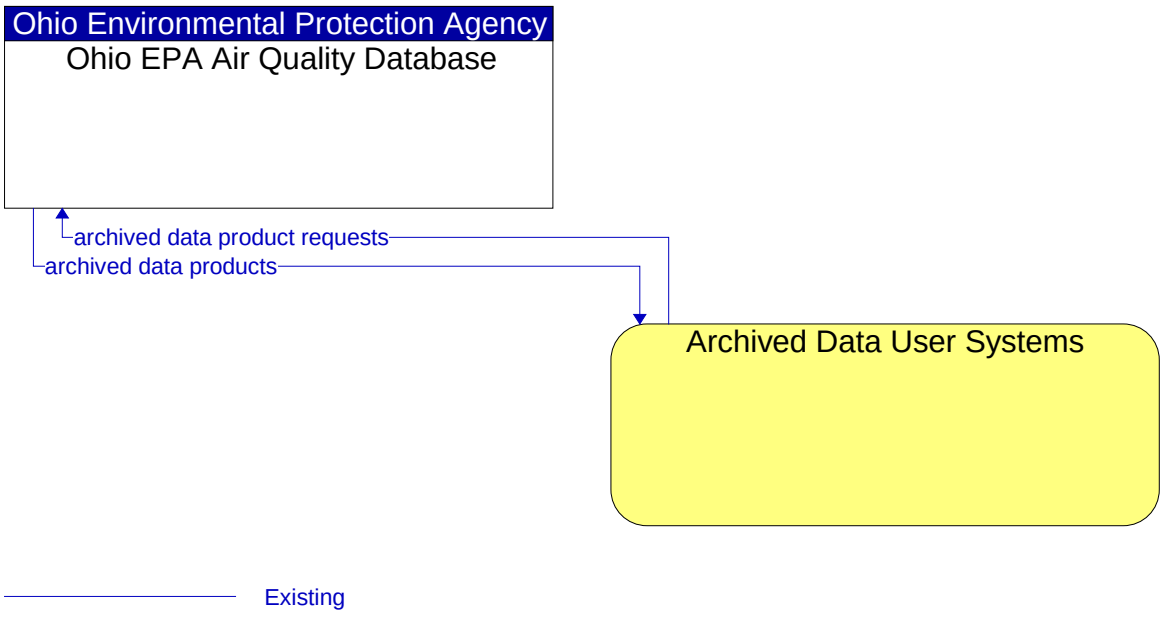

Figure 5: Archived Data User Systems - Ohio EPA Air Quality Database Interface

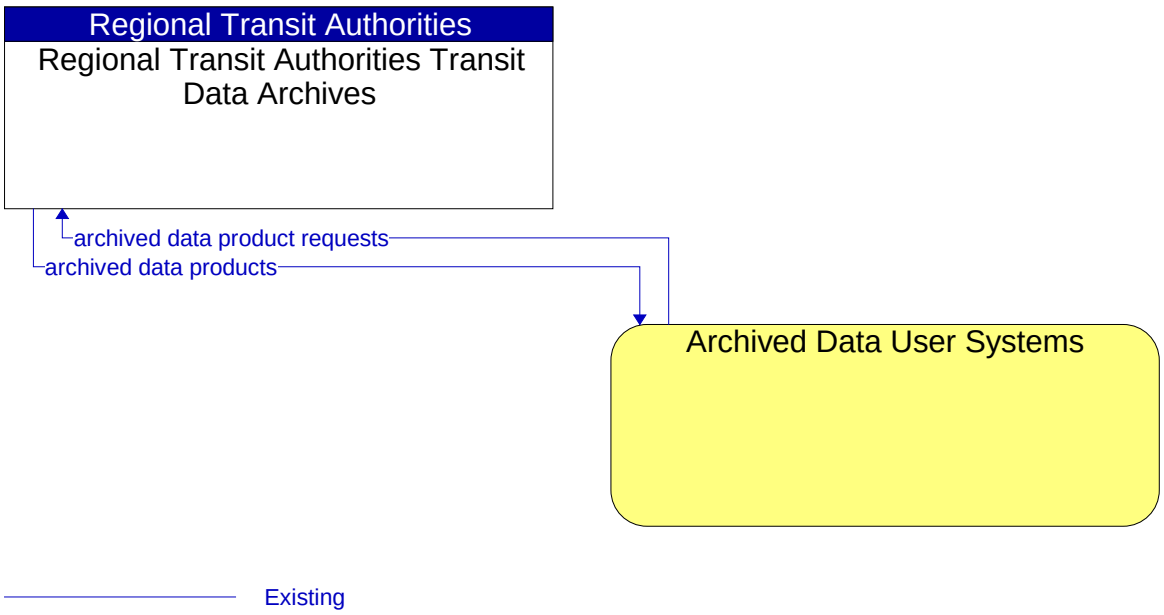

Figure 6: Archived Data User Systems - Regional Transit Authorities Transit Data Archives Interface

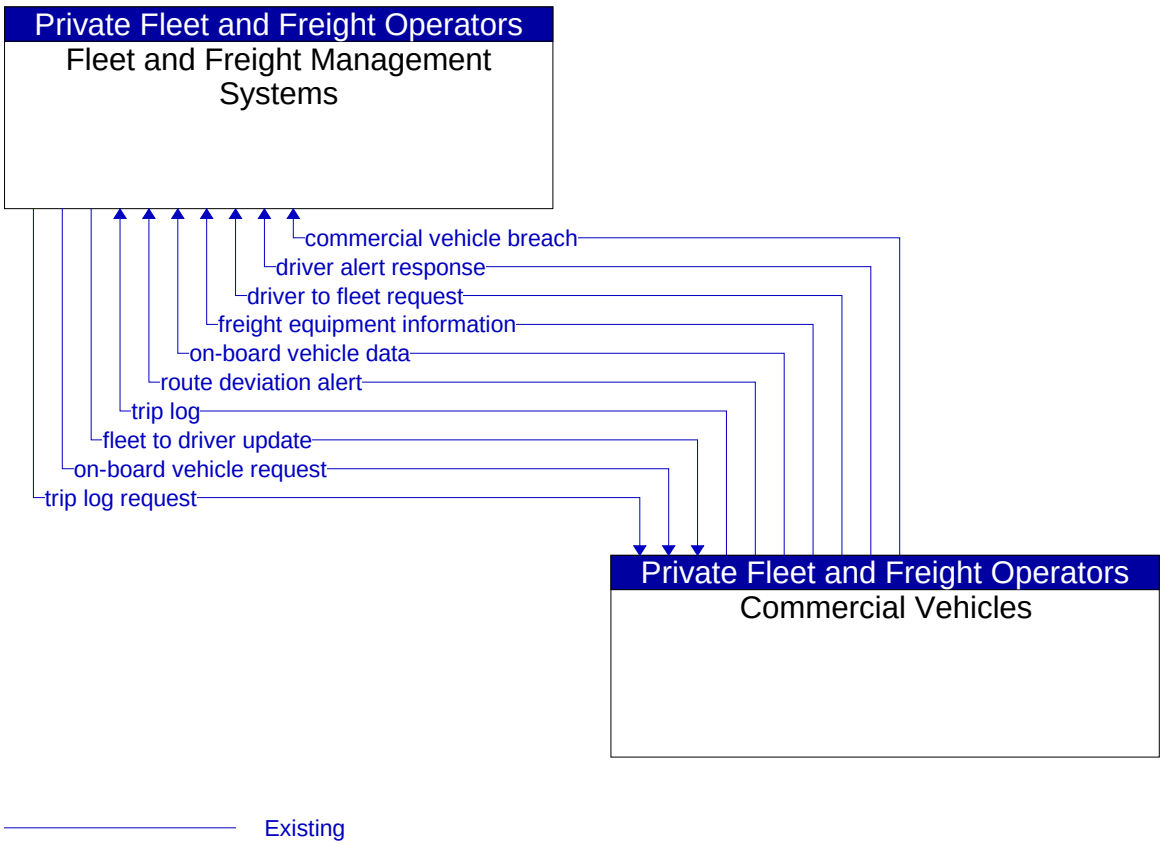

Figure 7: Commercial Vehicles - Fleet and Freight Management Systems Interface

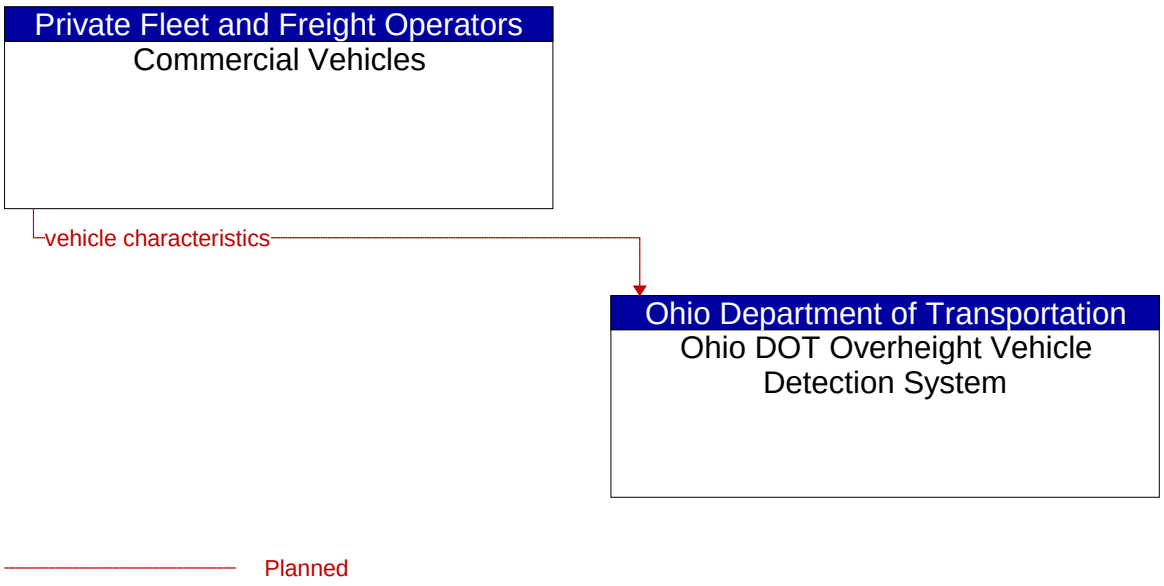

Figure 8: Commercial Vehicles - Ohio DOT Overheight Vehicle Detection System Interface

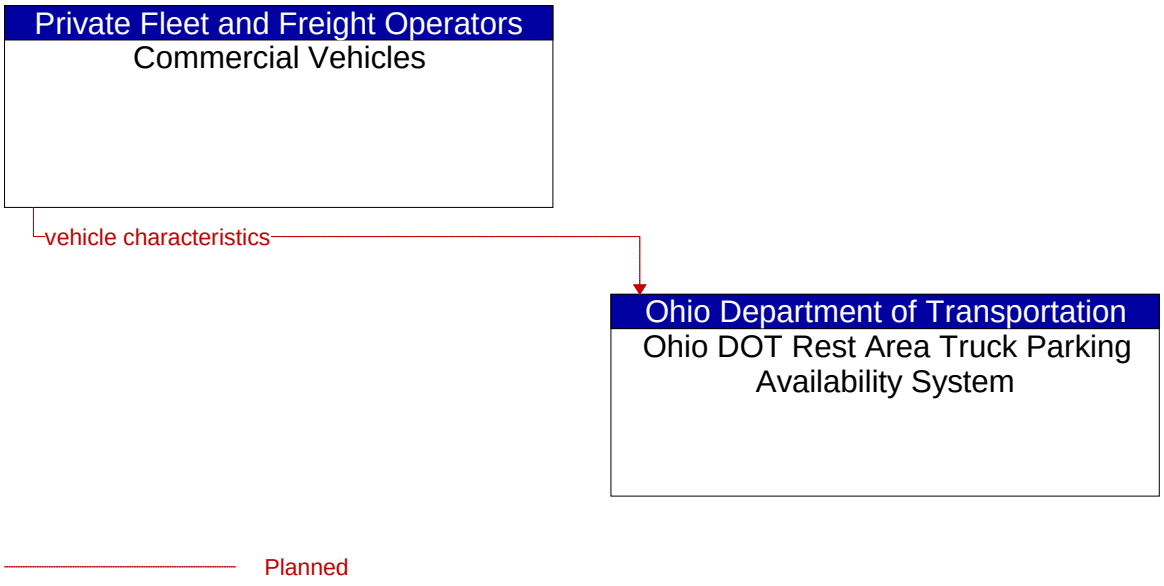

Figure 9: Commercial Vehicles - Ohio DOT Rest Area Truck Parking Availability System Interface

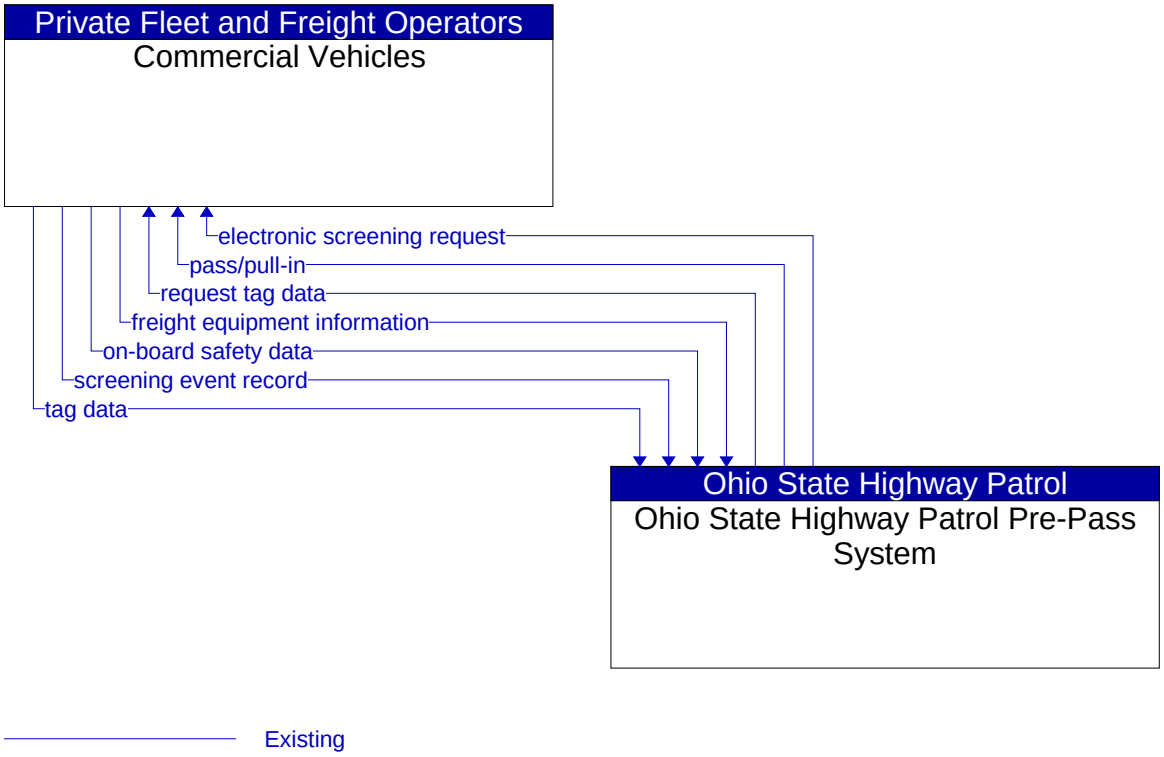

Figure 10: Commercial Vehicles - Ohio State Highway Patrol Pre-Pass System Interface

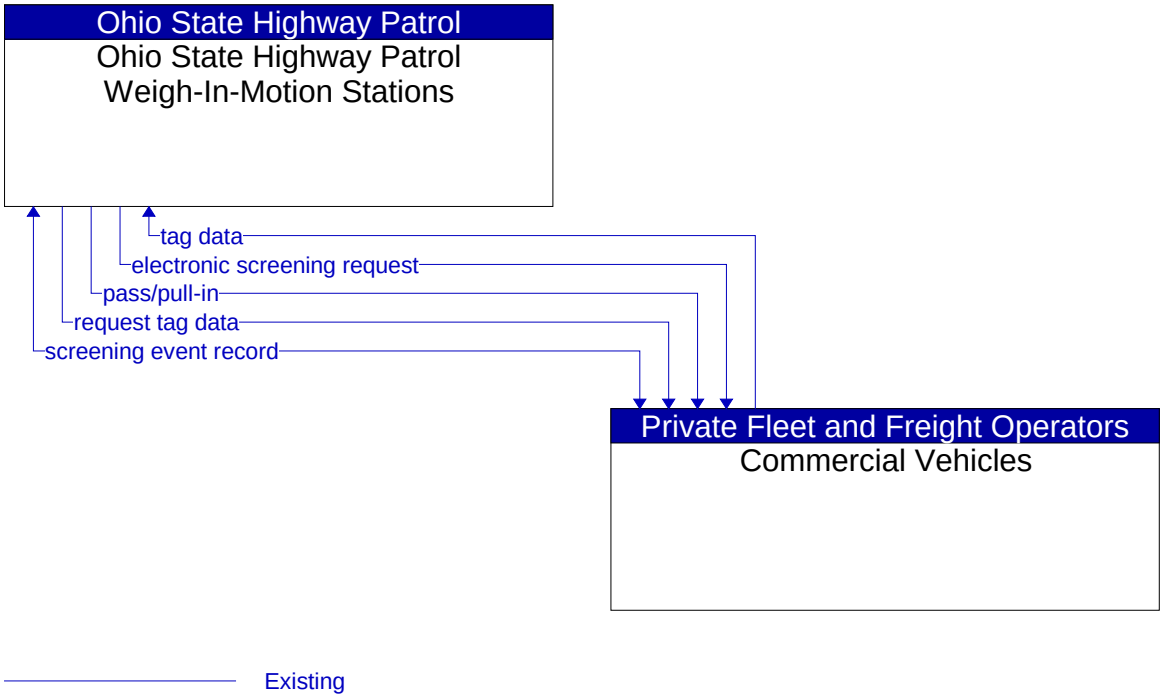

Figure 11: Commercial Vehicles - Ohio State Highway Patrol Weigh-In-Motion Stations Interface

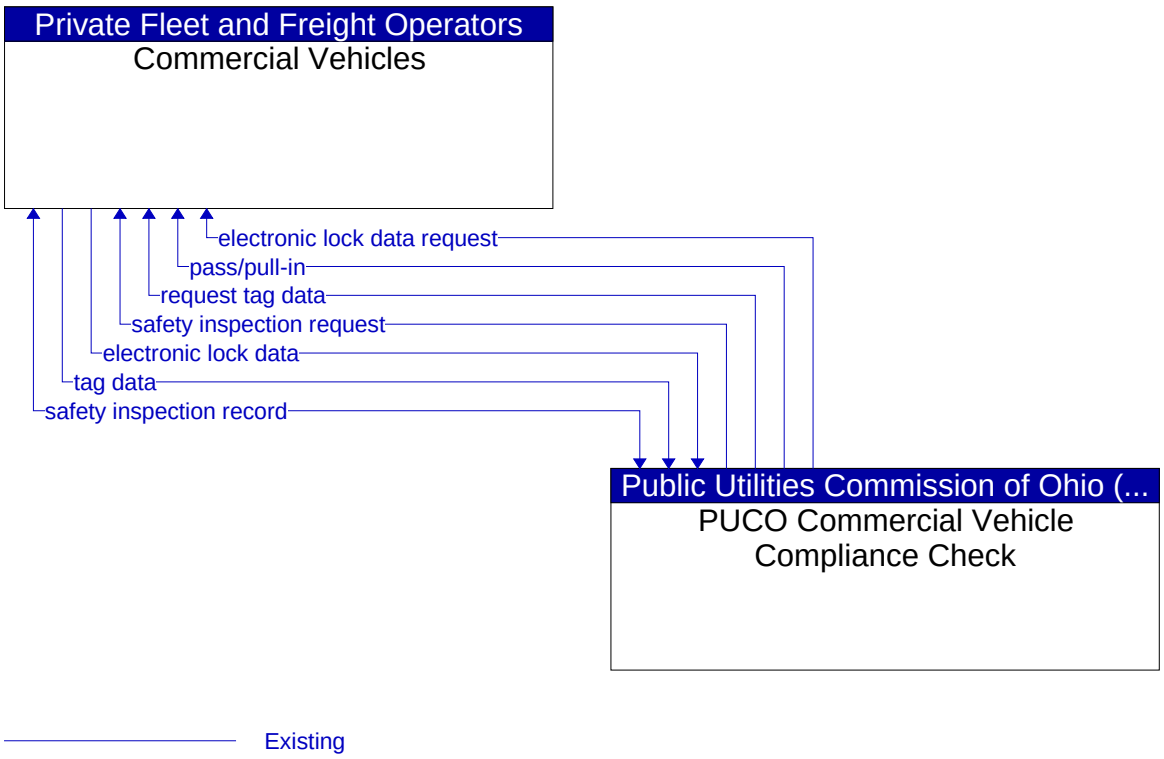

Figure 12: Commercial Vehicles - PUCO Commercial Vehicle Compliance Check Interface

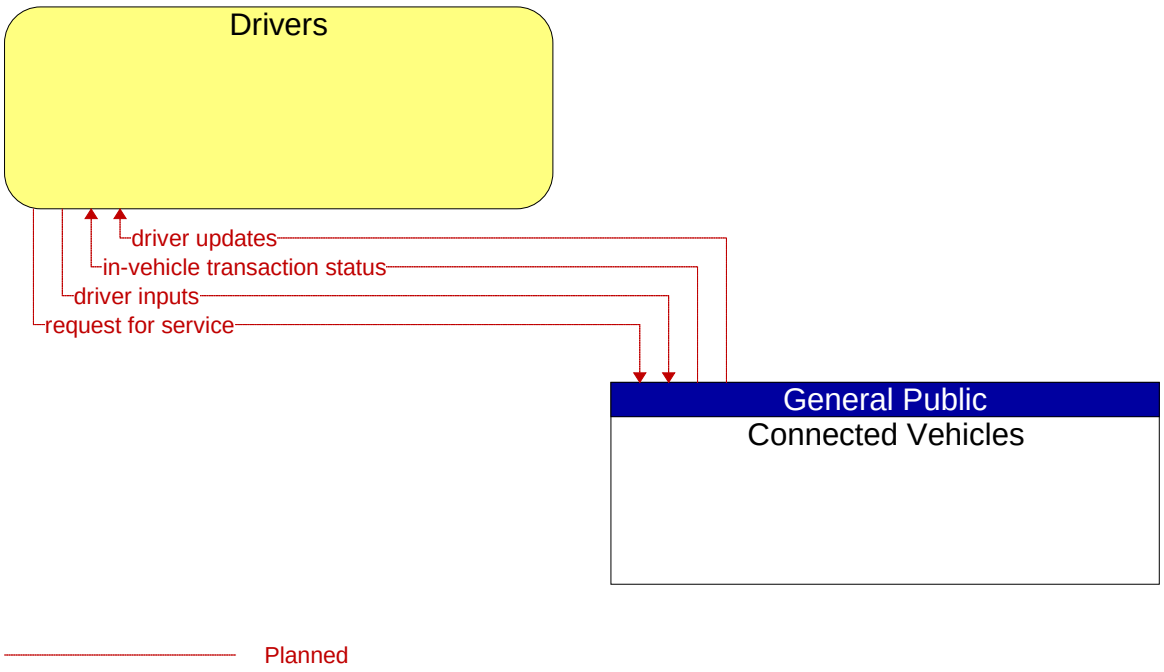

Figure 13: Connected Vehicles - Drivers Interface

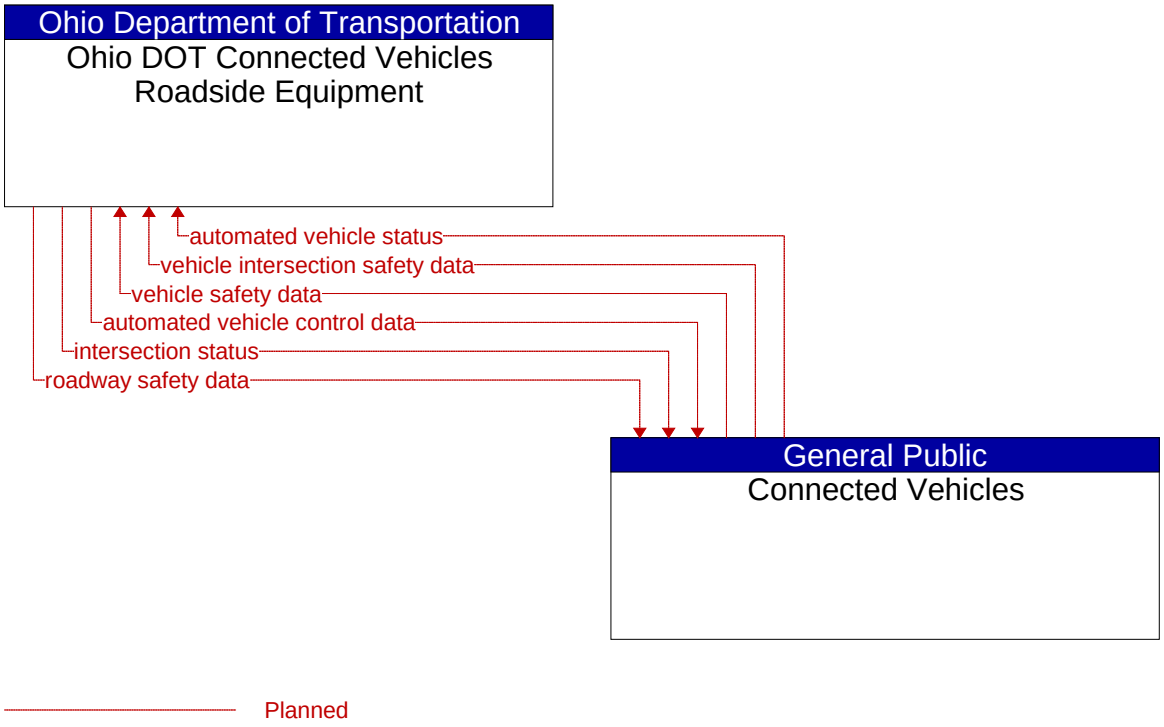

Figure 14: Connected Vehicles - Ohio DOT Connected Vehicles Roadside Equipment Interface

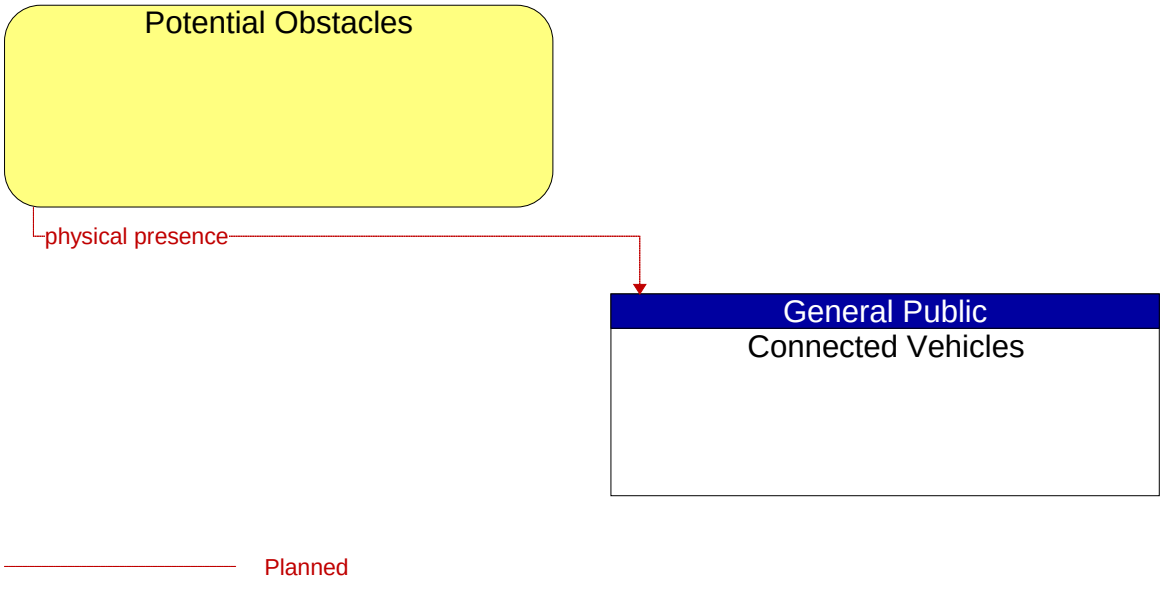

Figure 15: Connected Vehicles - Potential Obstacles Interface

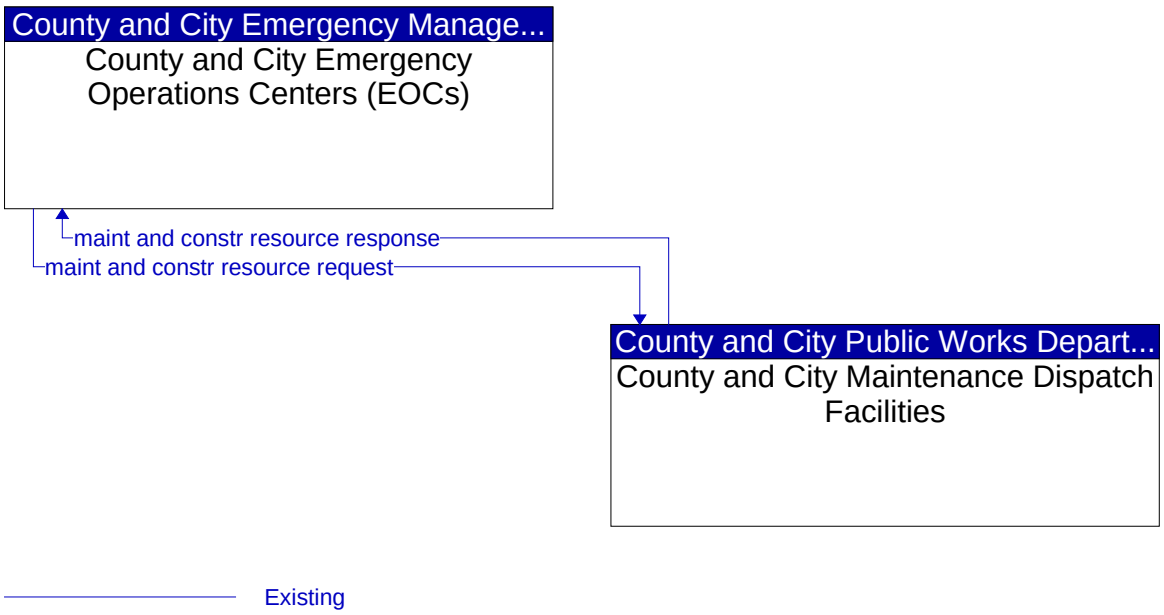

Figure 16: County and City Emergency Operations Centers (EOCs) - County and City Maintenance Dispatch Facilities Interface

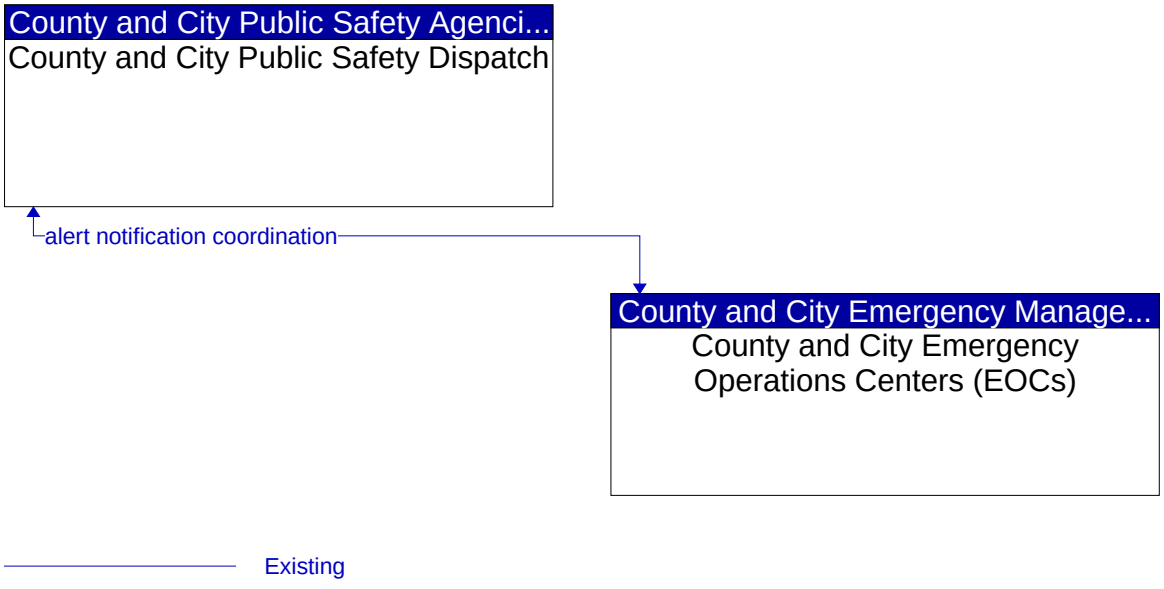

Figure 17: County and City Emergency Operations Centers (EOCs) - County and City Public Safety Dispatch Interface

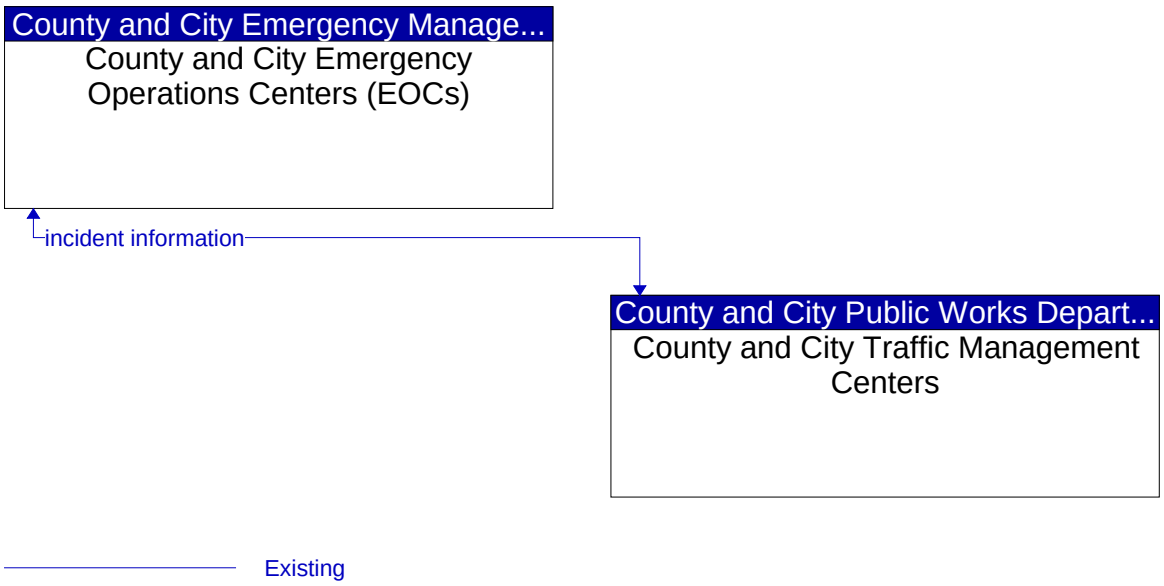

Figure 18: County and City Emergency Operations Centers (EOCs) - County and City Traffic Management Centers Interface

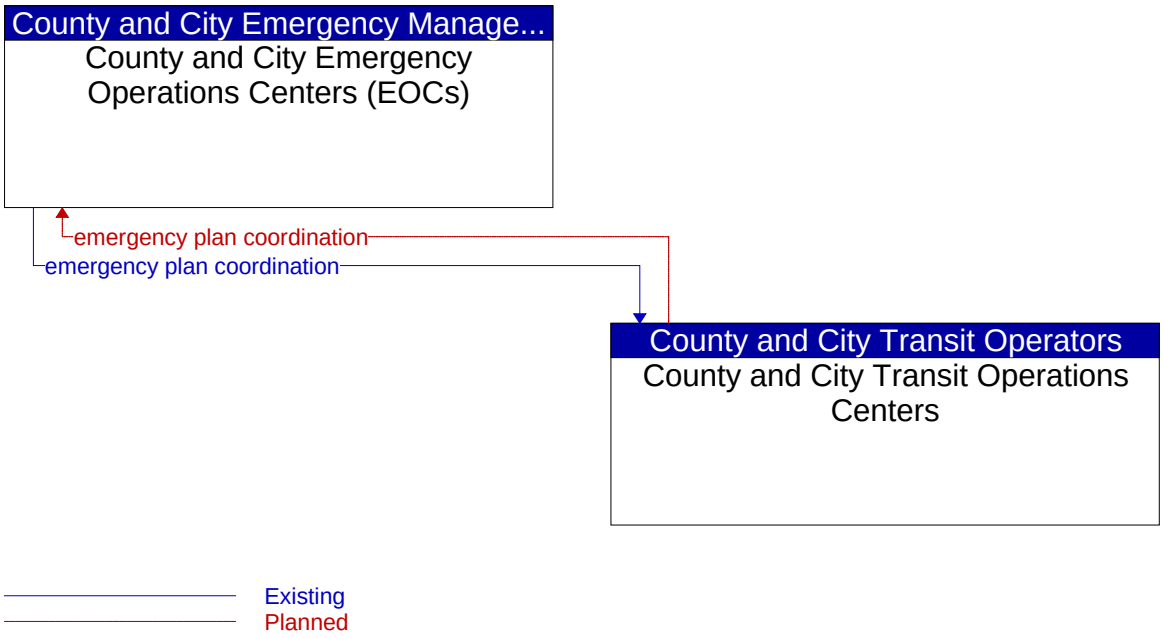

Figure 19: County and City Emergency Operations Centers (EOCs) - County and City Transit Operations Centers Interface

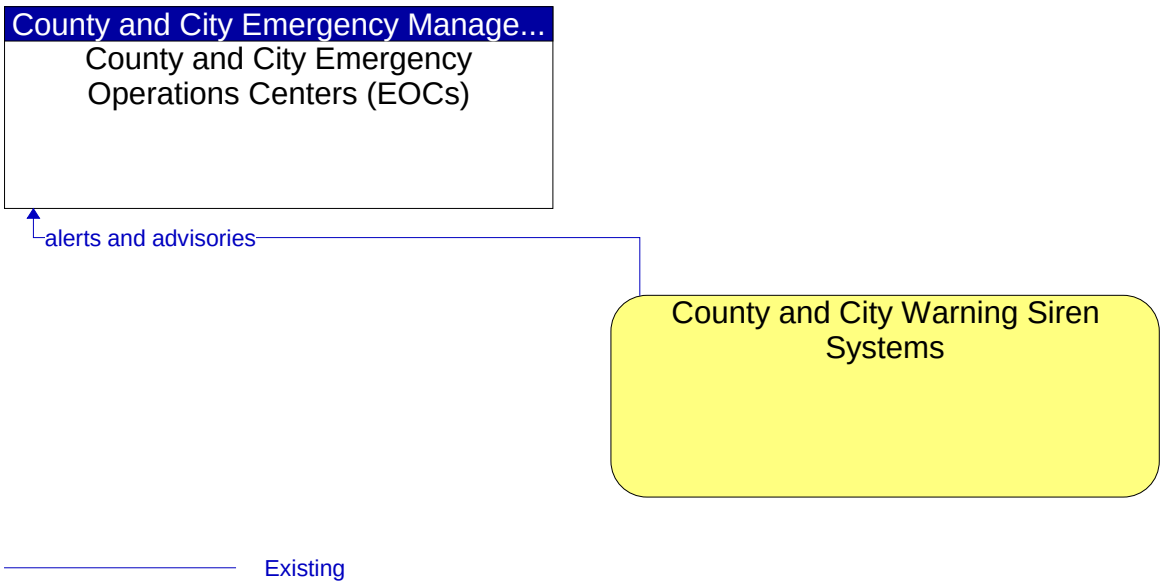

Figure 20: County and City Emergency Operations Centers (EOCs) - County and City Warning Siren Systems Interface

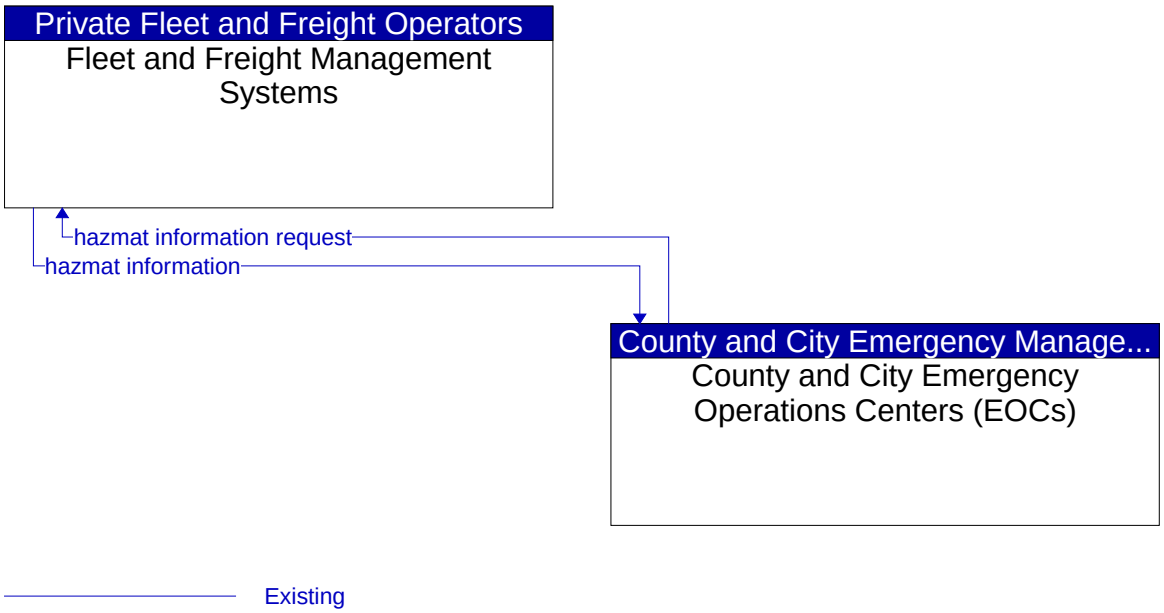

Figure 21: County and City Emergency Operations Centers (EOCs) - Fleet and Freight Management Systems Interface

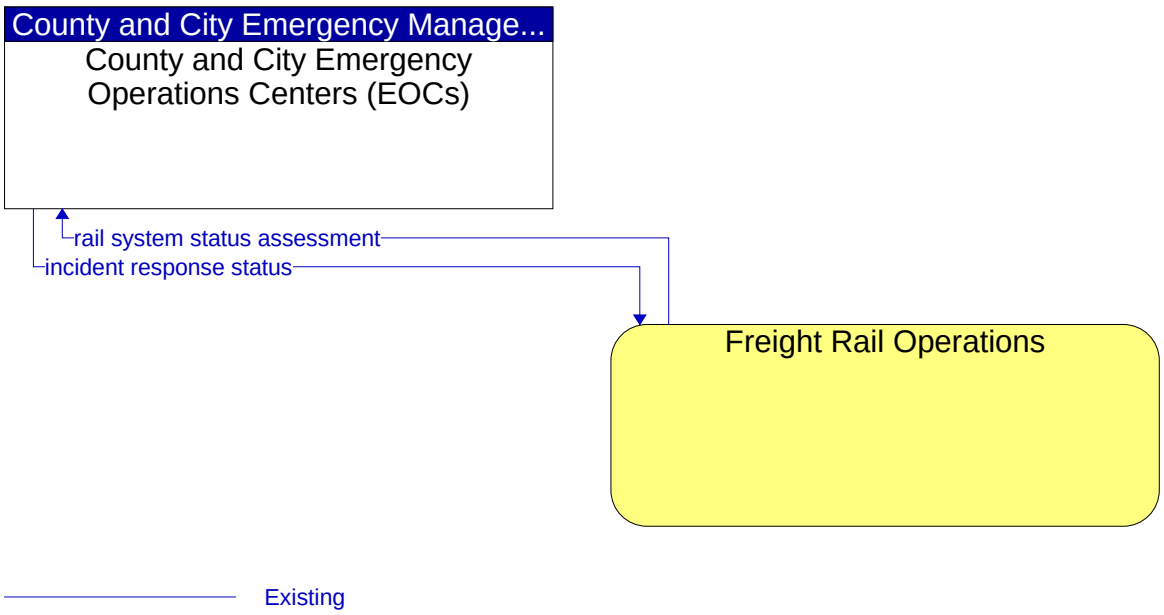

Figure 22: County and City Emergency Operations Centers (EOCs) - Freight Rail Operations Interface

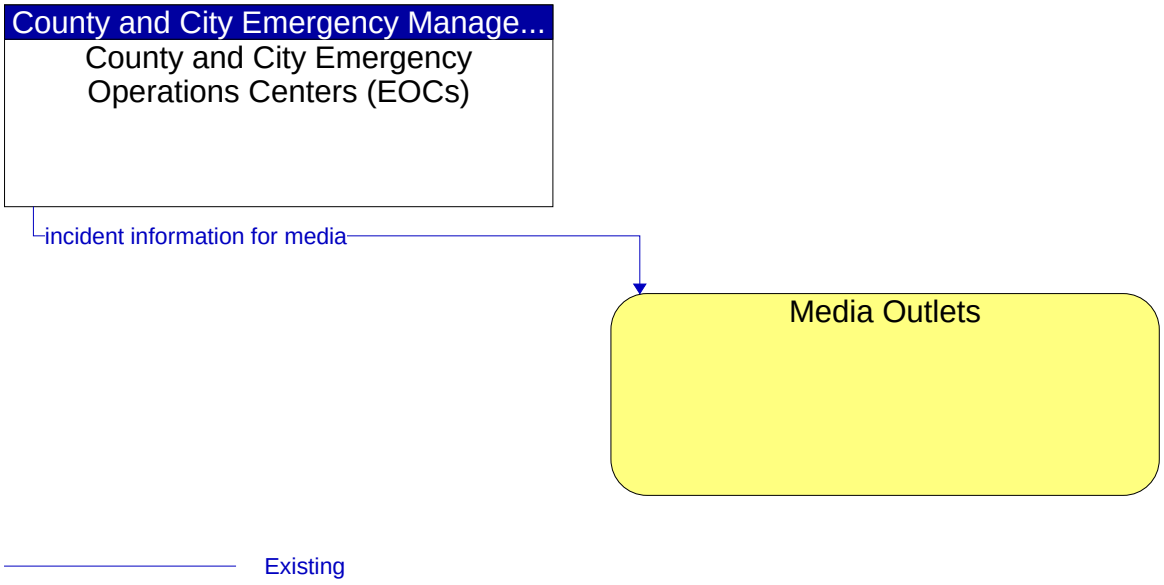

Figure 23: County and City Emergency Operations Centers (EOCs) - Media Outlets Interface

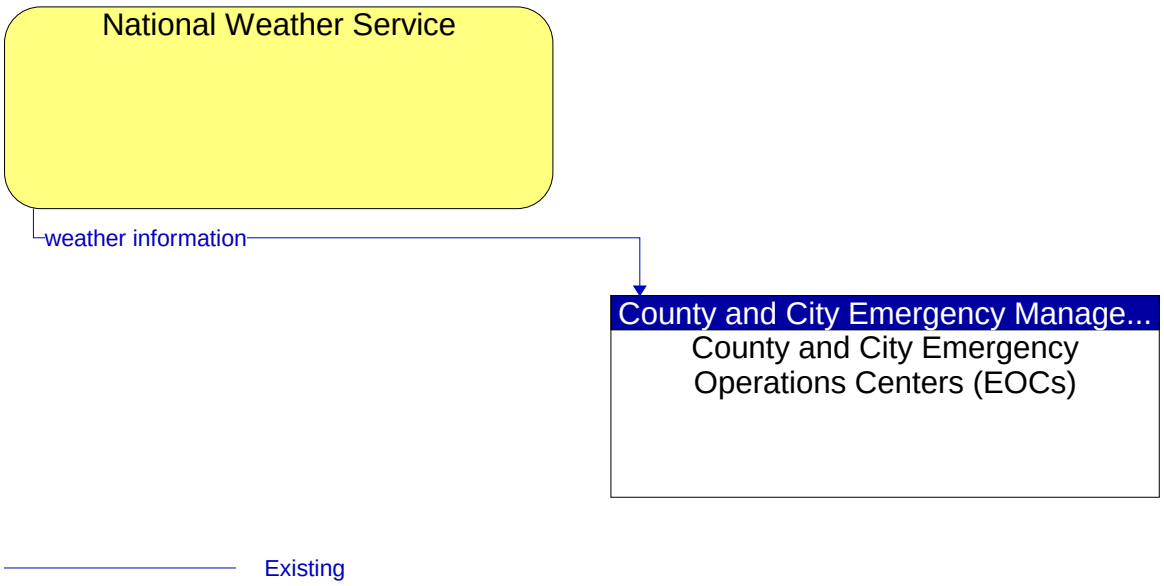

Figure 24: County and City Emergency Operations Centers (EOCs) - National Weather Service Interface

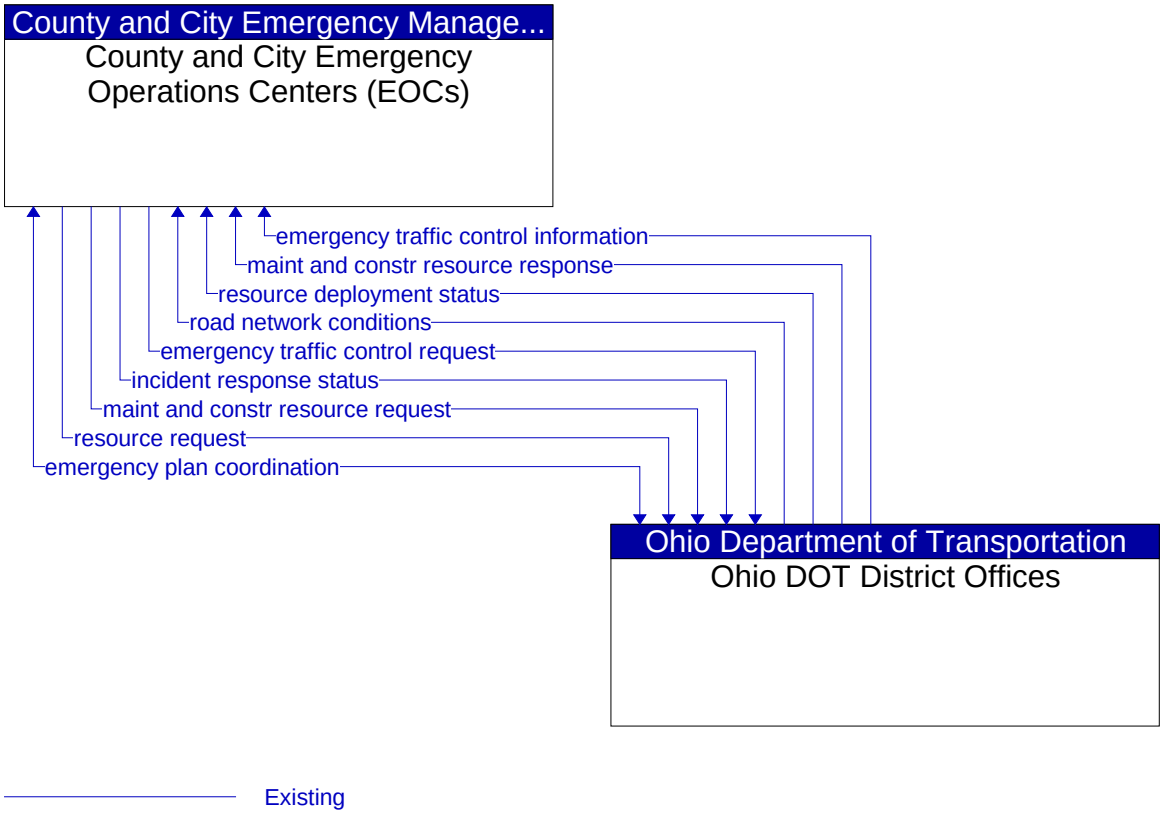

Figure 25: County and City Emergency Operations Centers (EOCs) - Ohio DOT District Offices Interface

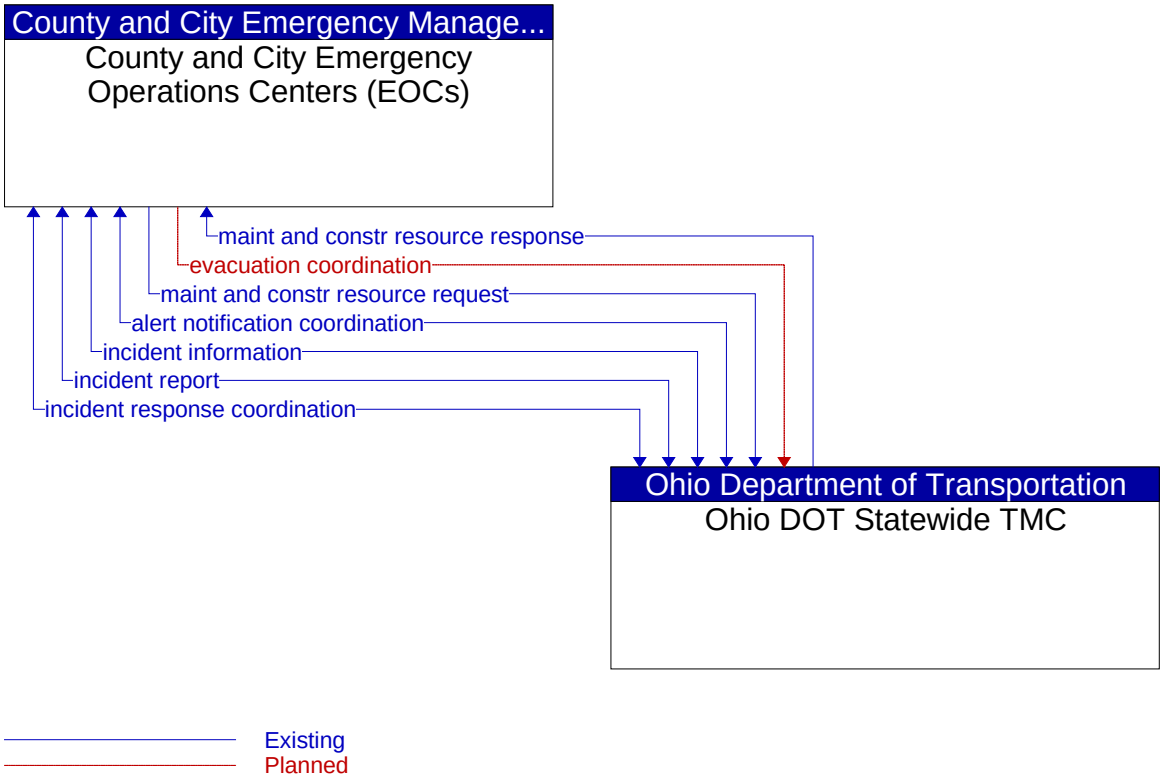

Figure 26: County and City Emergency Operations Centers (EOCs) - Ohio DOT Statewide TMC Interface

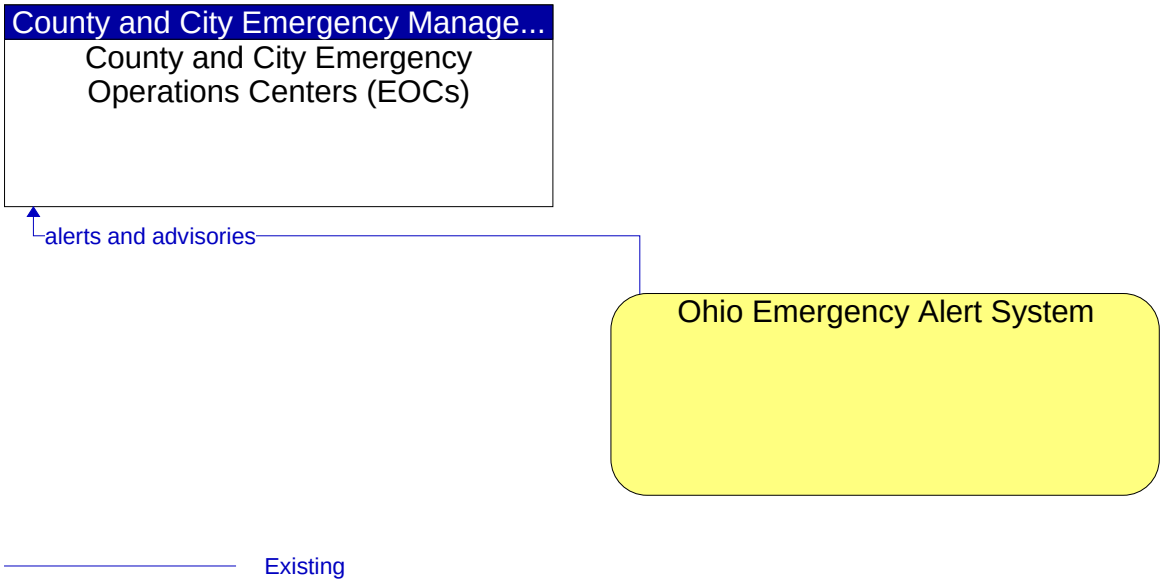

Figure 27: County and City Emergency Operations Centers (EOCs) - Ohio Emergency Alert System Interface

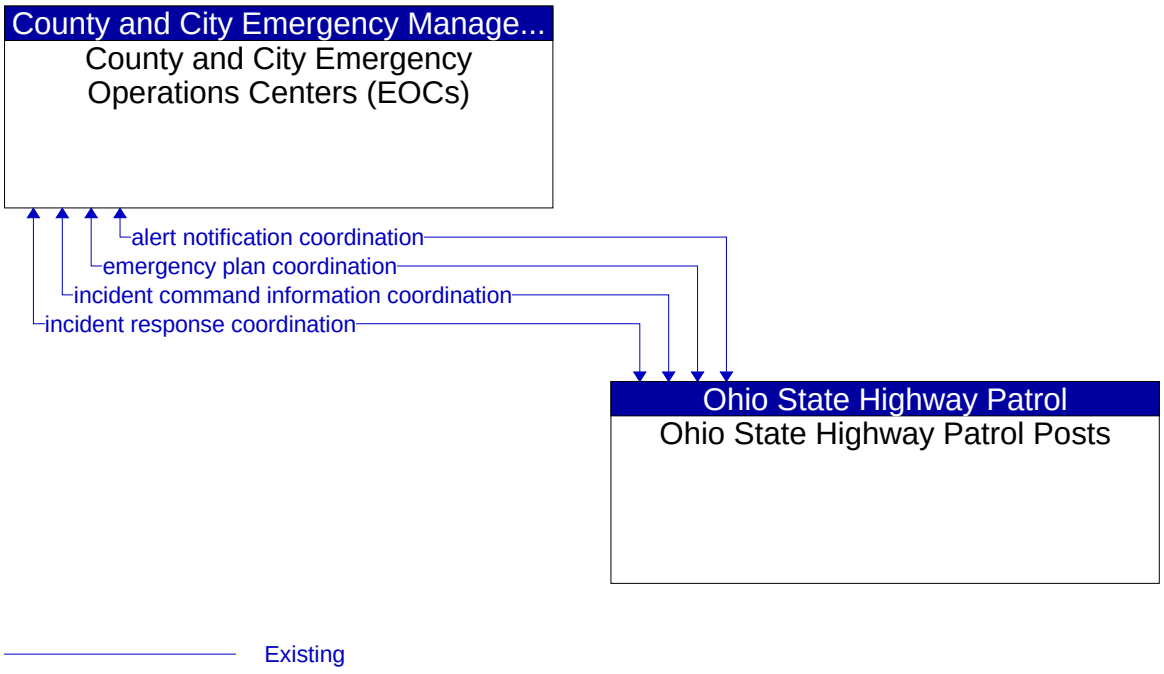

Figure 28: County and City Emergency Operations Centers (EOCs) - Ohio State Highway Patrol Posts Interface

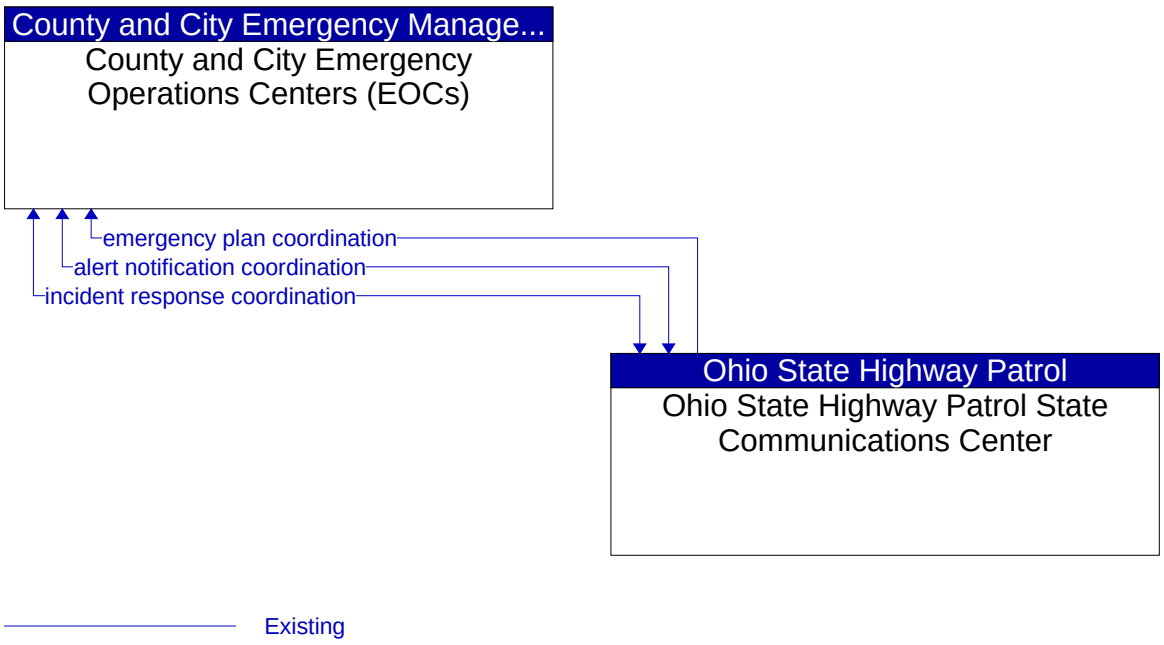

Figure 29: County and City Emergency Operations Centers (EOCs) - Ohio State Highway Patrol State Communications Center Interface

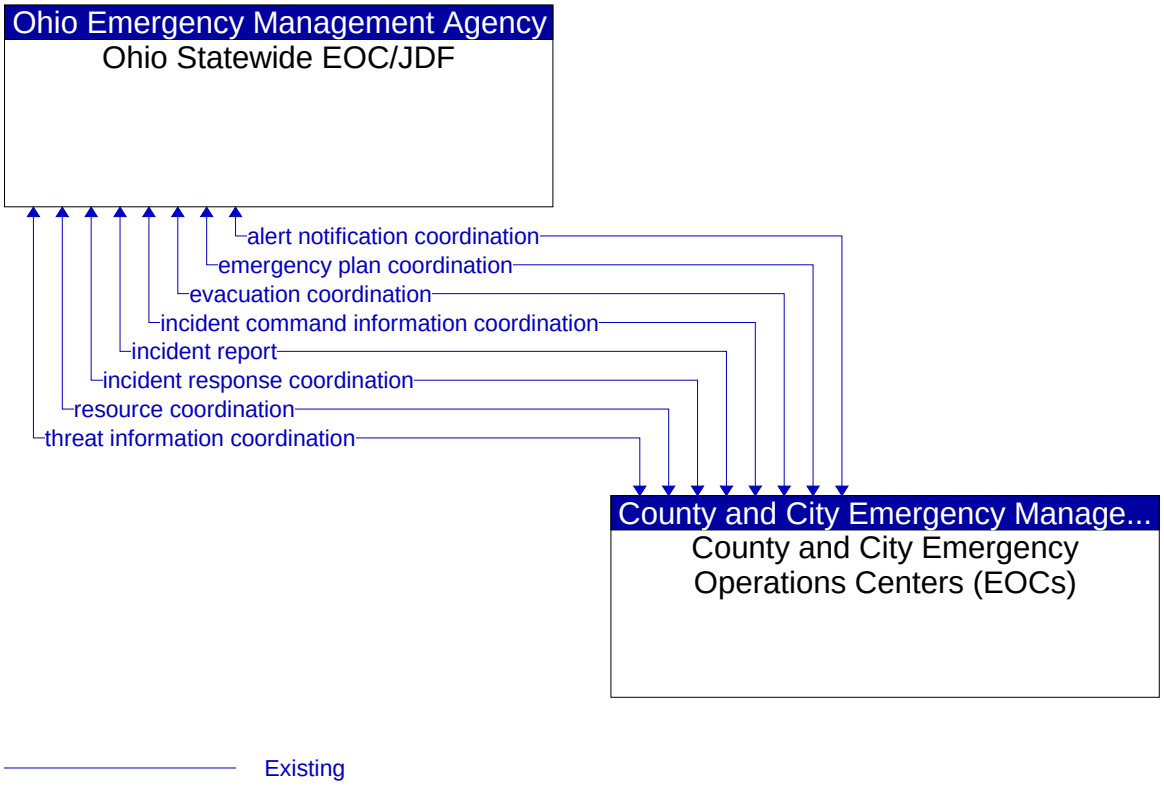

Figure 30: County and City Emergency Operations Centers (EOCs) - Ohio Statewide EOC/JDF Interface

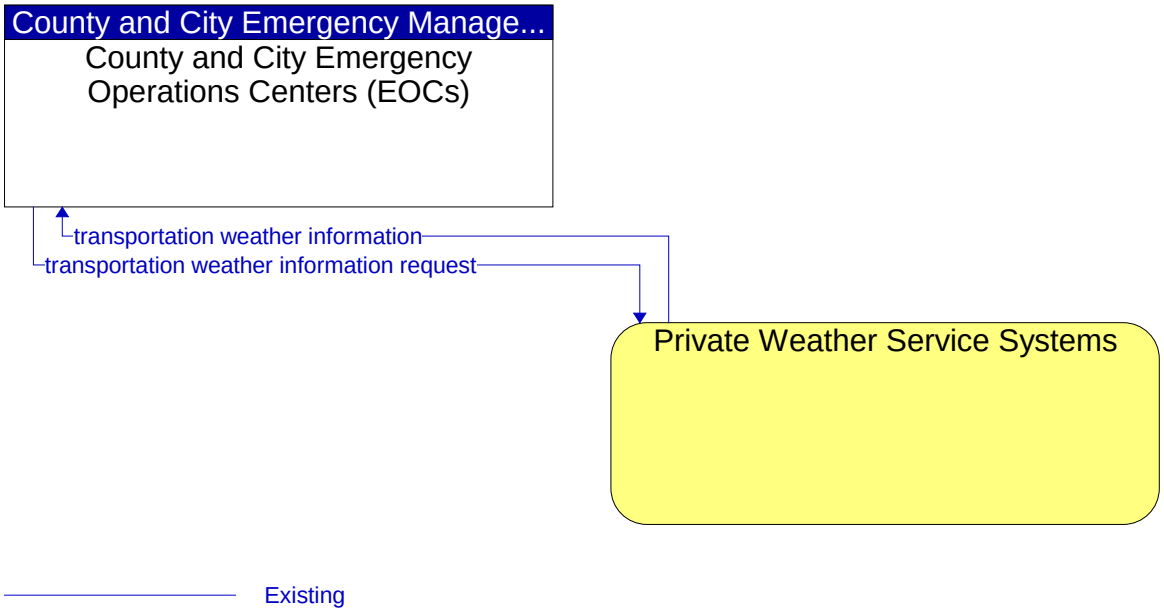

Figure 31: County and City Emergency Operations Centers (EOCs) - Private Weather Service Systems Interface

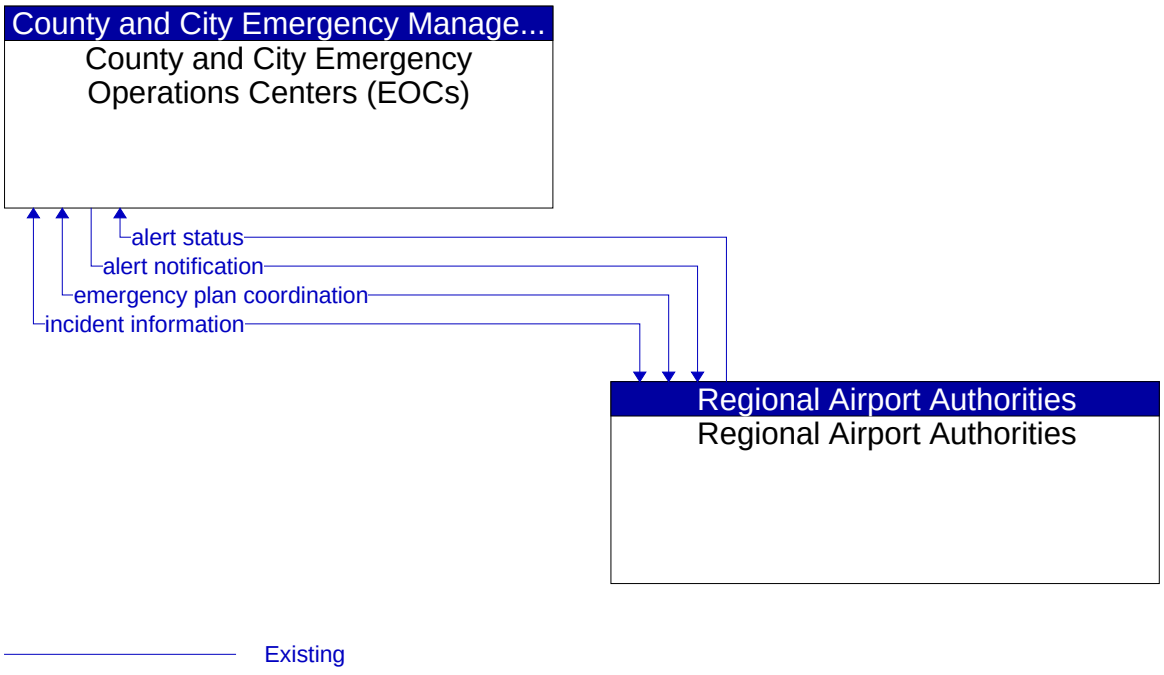

Figure 32: County and City Emergency Operations Centers (EOCs) - Regional Airport Authorities Interface

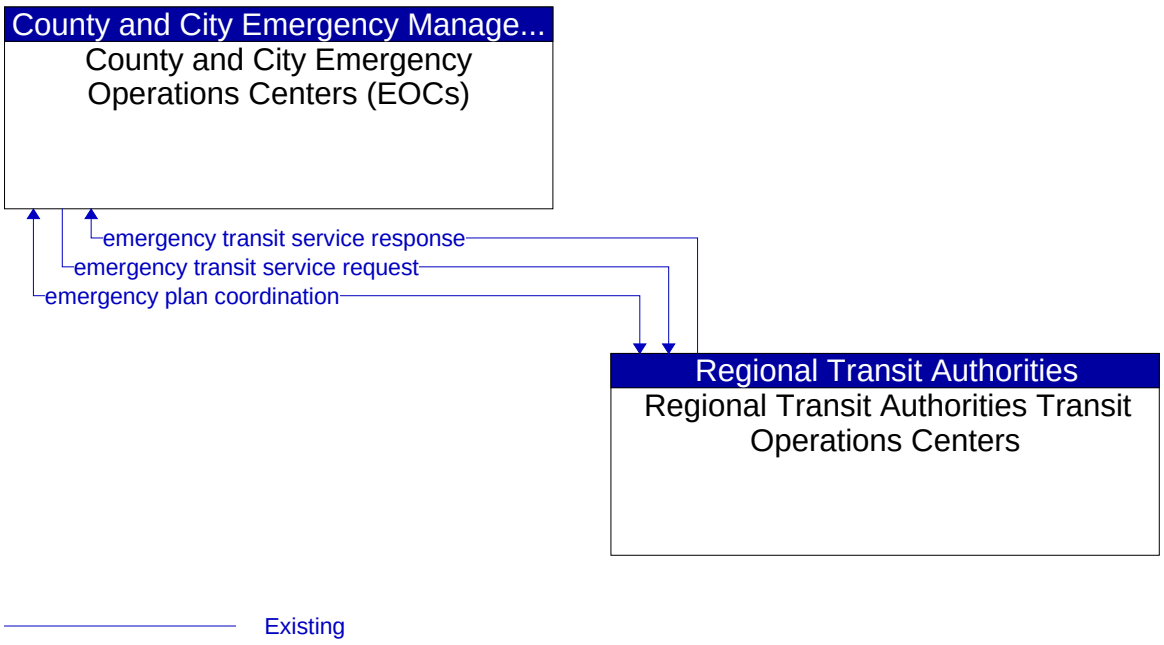

Figure 33: County and City Emergency Operations Centers (EOCs) - Regional Transit Authorities Transit Operations Centers Interface

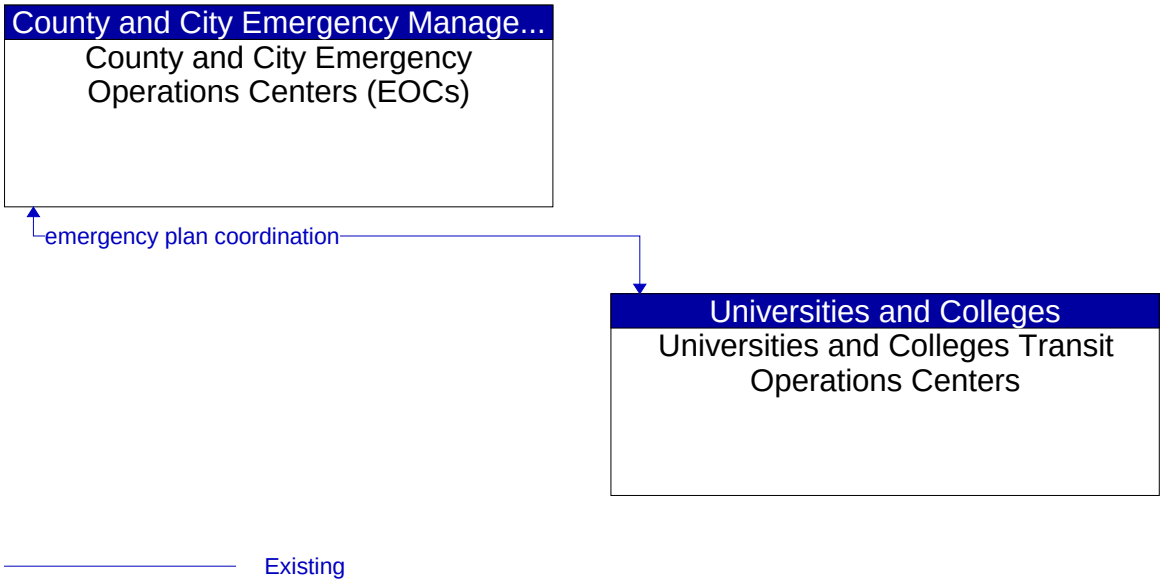

Figure 34: County and City Emergency Operations Centers (EOCs) - Universities and Colleges Transit Operations Centers Interface

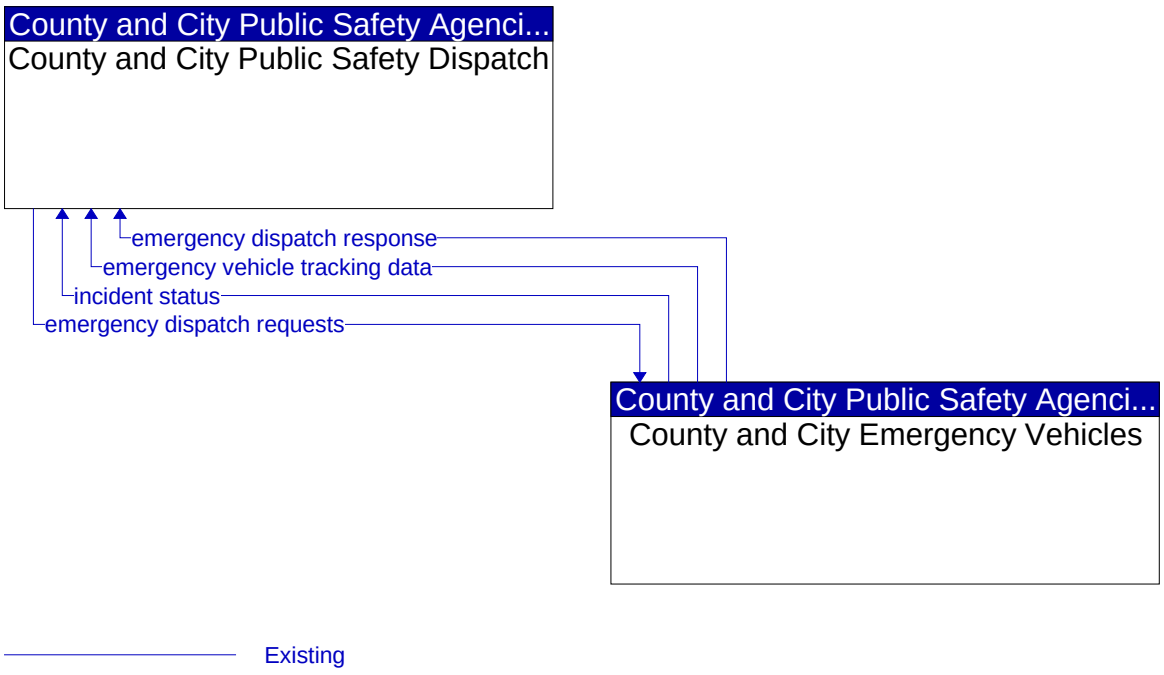

Figure 35: County and City Emergency Vehicles - County and City Public Safety Dispatch Interface

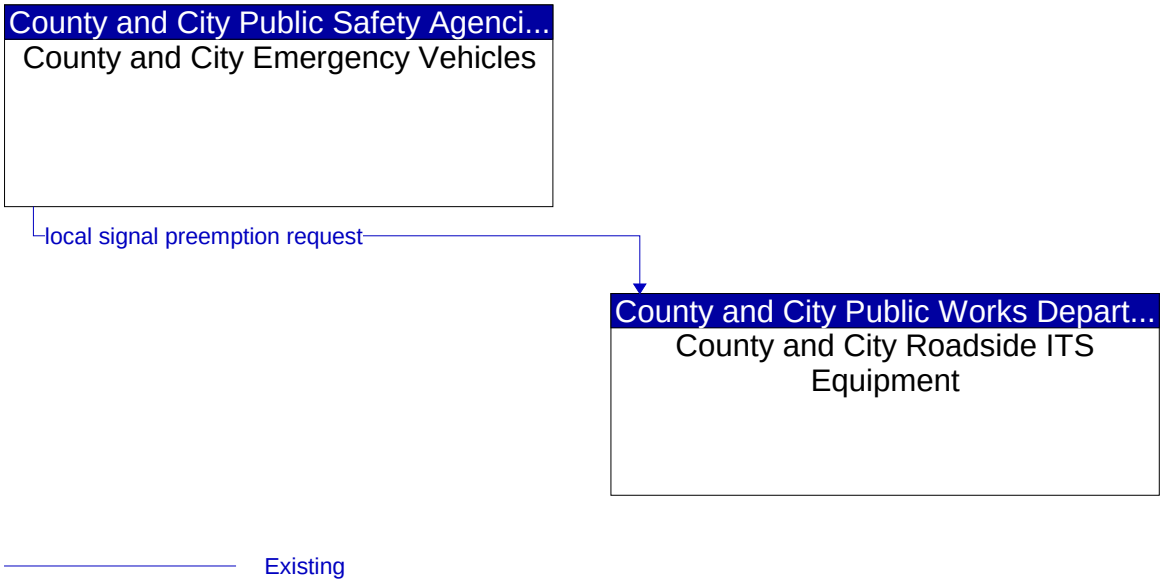

Figure 36: County and City Emergency Vehicles - County and City Roadside ITS Equipment Interface

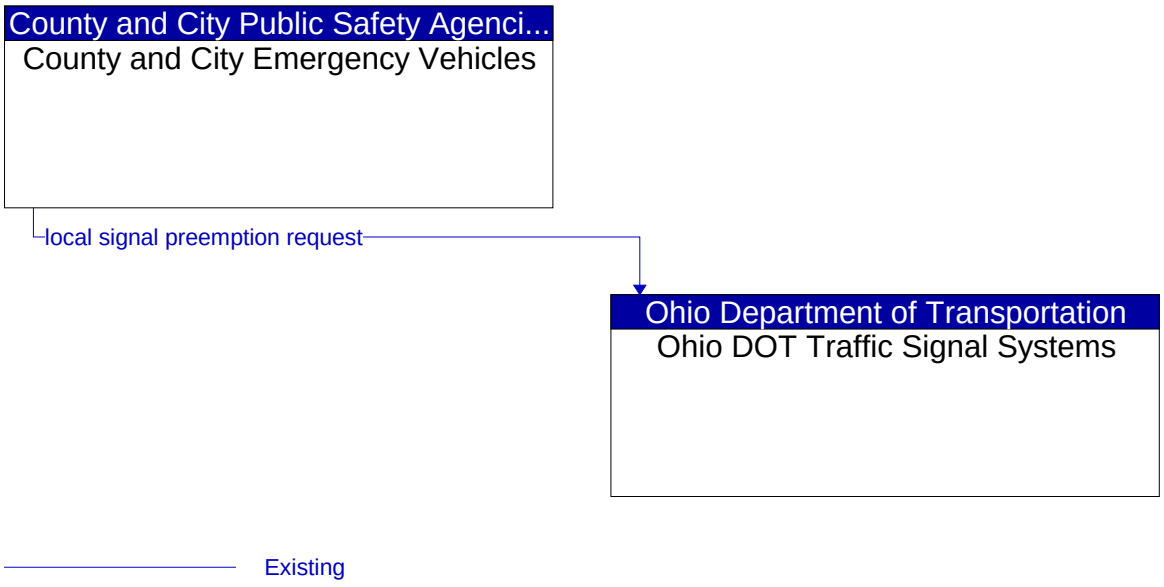

Figure 37: County and City Emergency Vehicles - Ohio DOT Traffic Signal Systems Interface

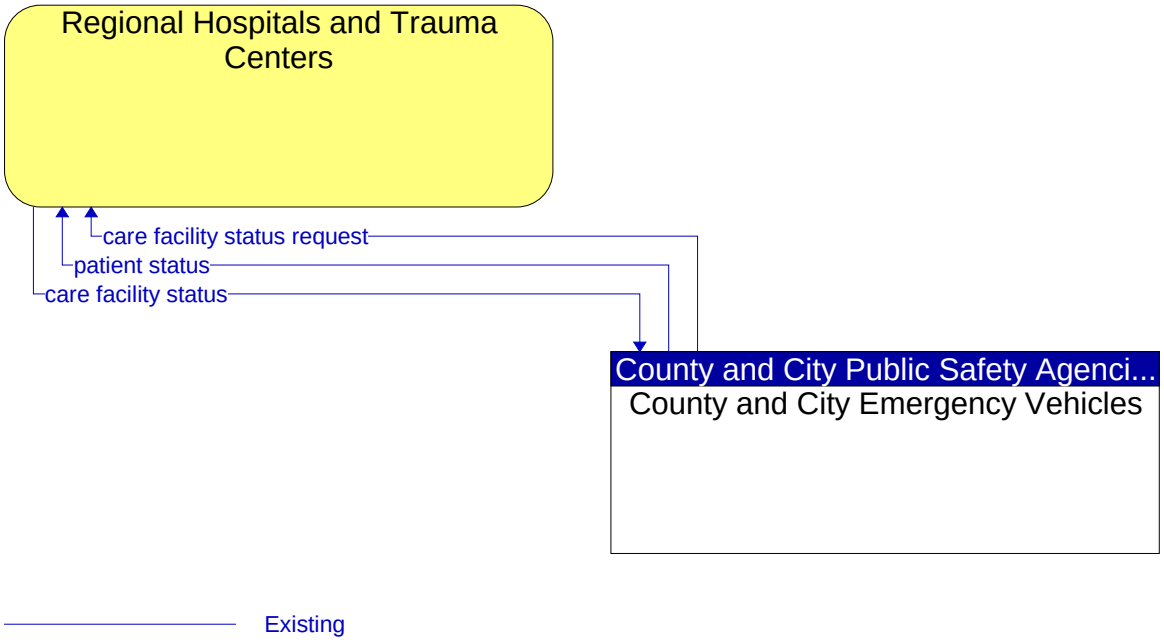

Figure 38: County and City Emergency Vehicles - Regional Hospitals and Trauma Centers Interface

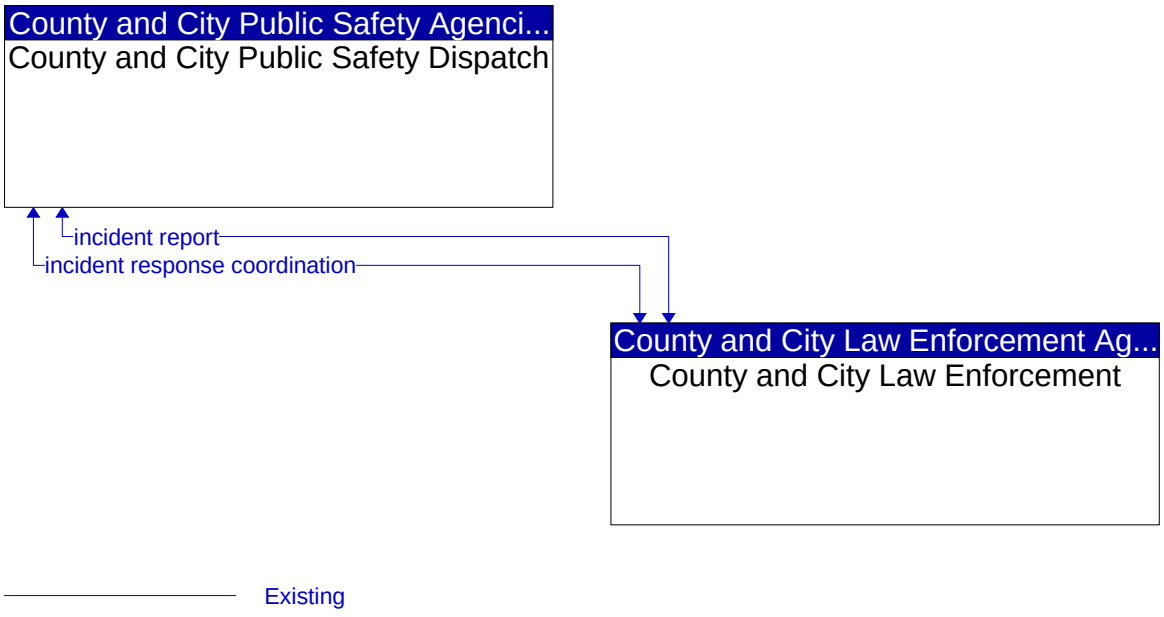

Figure 39: County and City Law Enforcement - County and City Public Safety Dispatch Interface

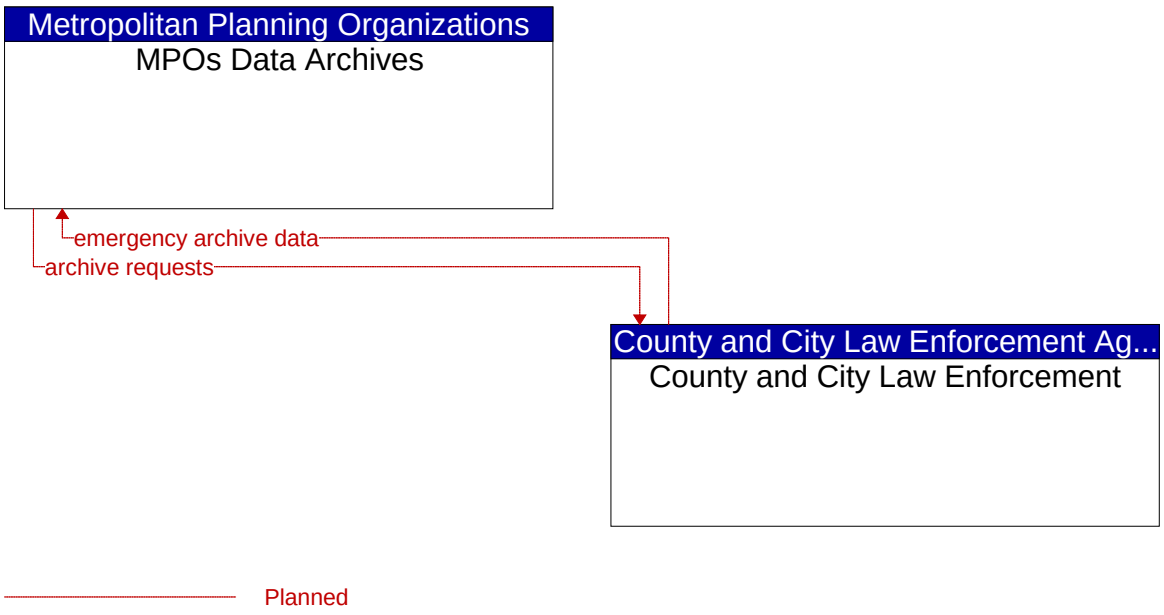

Figure 40: County and City Law Enforcement - MPOs Data Archives Interface

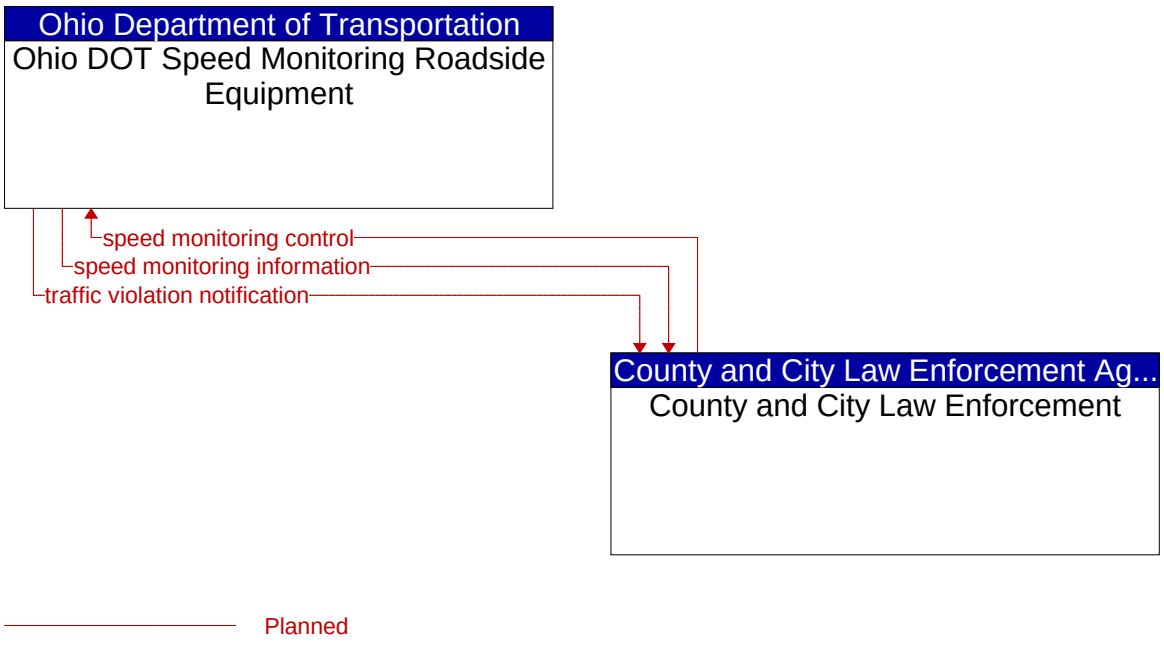

Figure 41: County and City Law Enforcement - Ohio DOT Speed Monitoring Roadside Equipment Interface

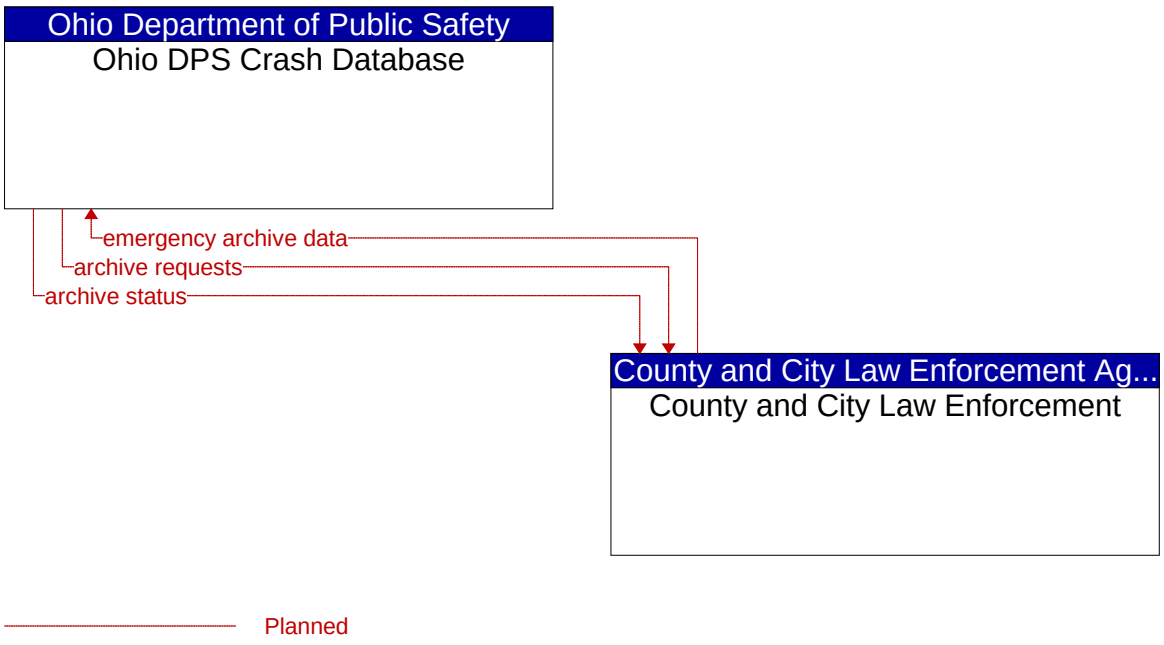

Figure 42: County and City Law Enforcement - Ohio DPS Crash Database Interface

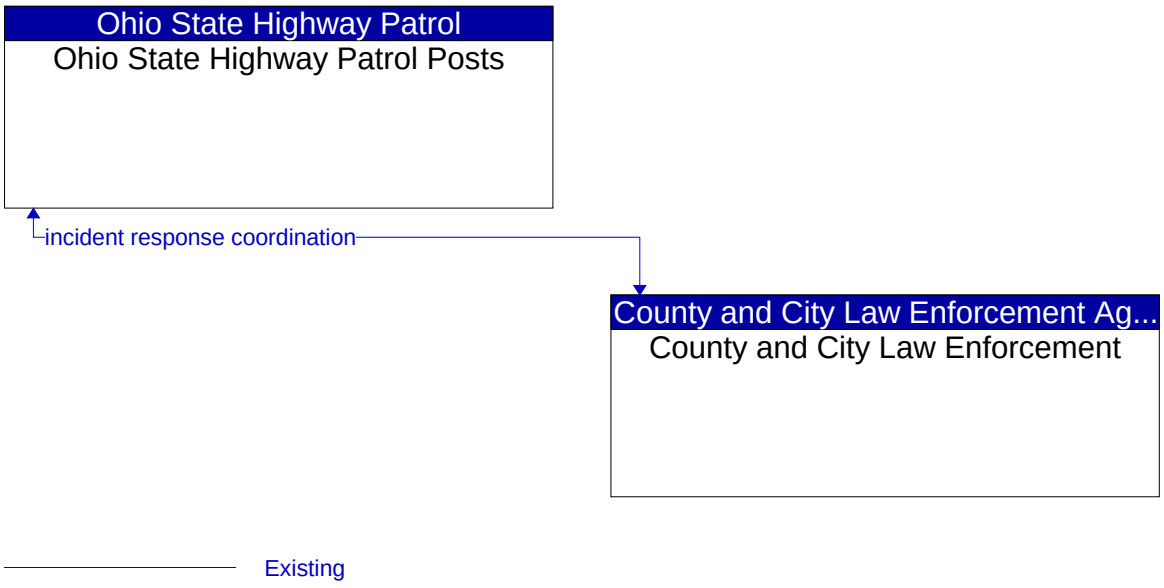

Figure 43: County and City Law Enforcement - Ohio State Highway Patrol Posts Interface

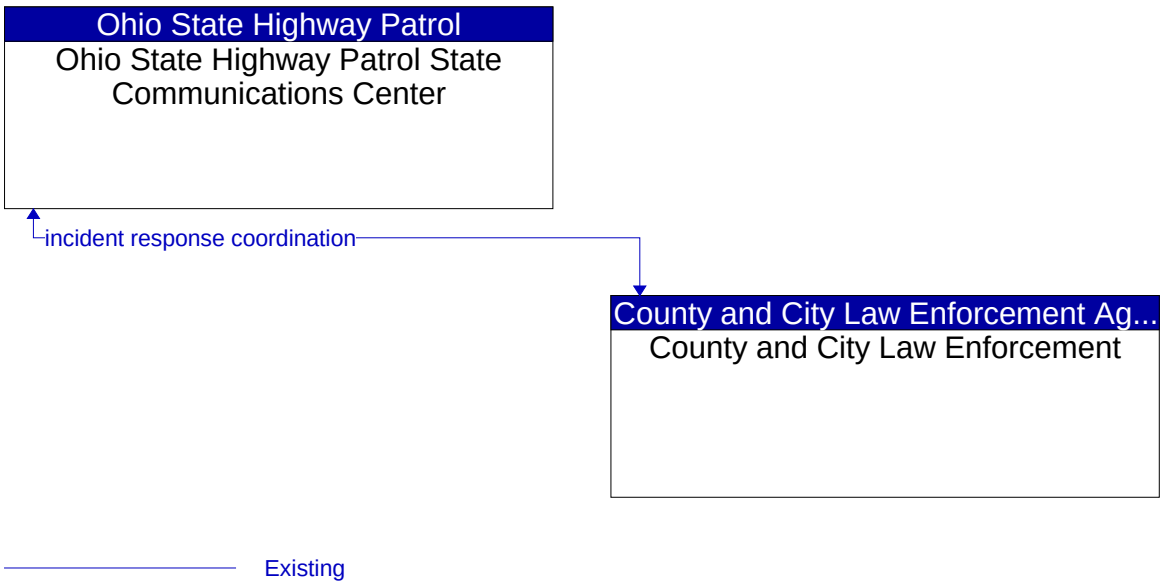

Figure 44: County and City Law Enforcement - Ohio State Highway Patrol State Communications Center Interface

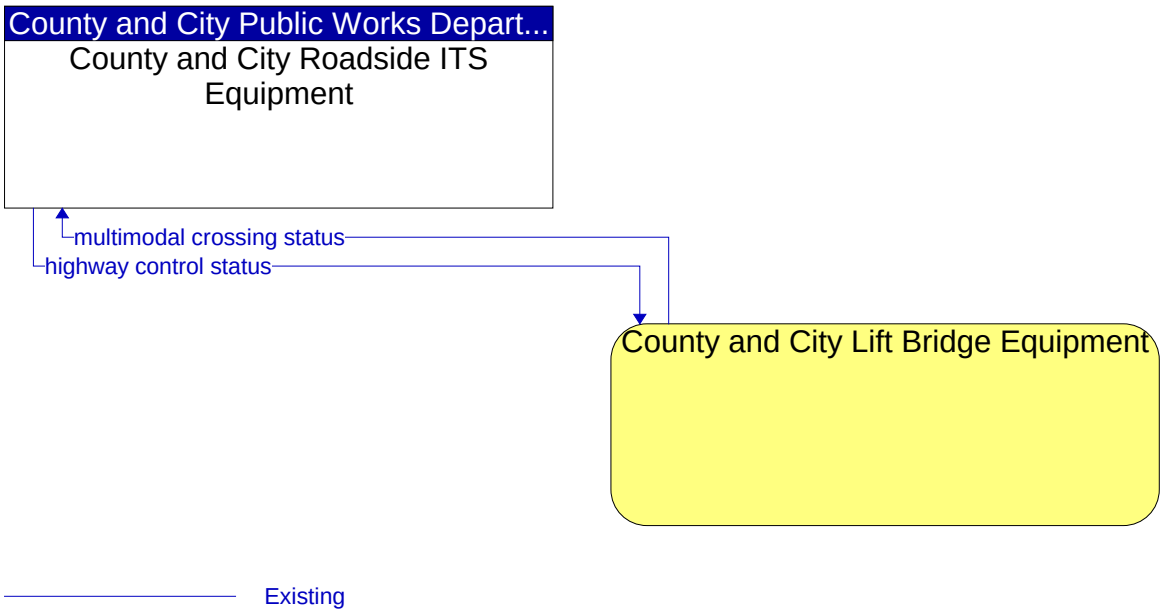

Figure 45: County and City Lift Bridge Equipment - County and City Roadside ITS Equipment Interface

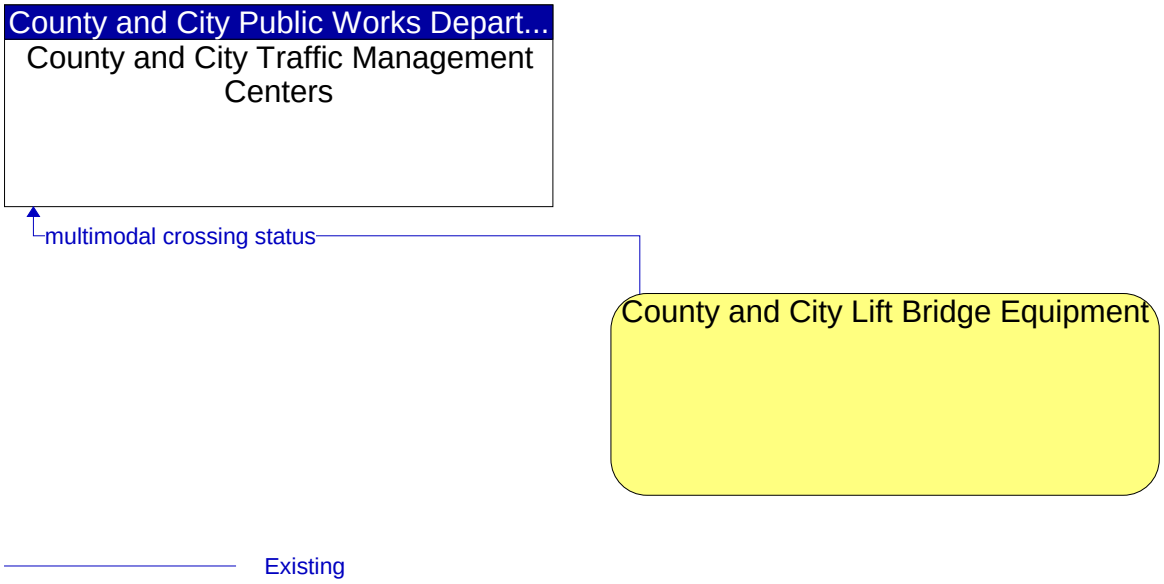

Figure 46: County and City Lift Bridge Equipment - County and City Traffic Management Centers Interface

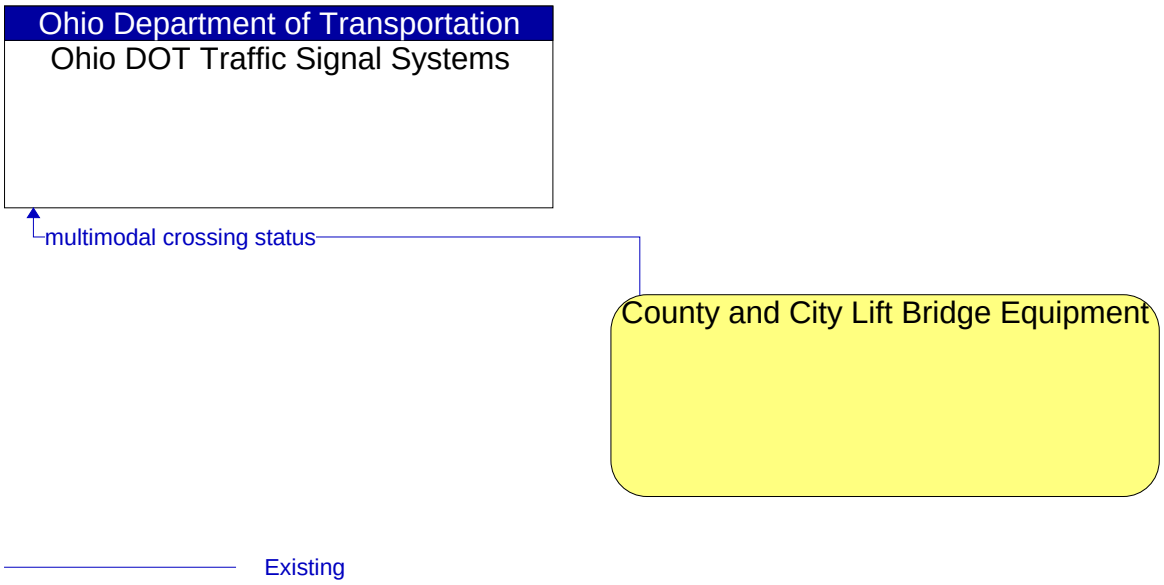

Figure 47: County and City Lift Bridge Equipment - Ohio DOT Traffic Signal Systems Interface

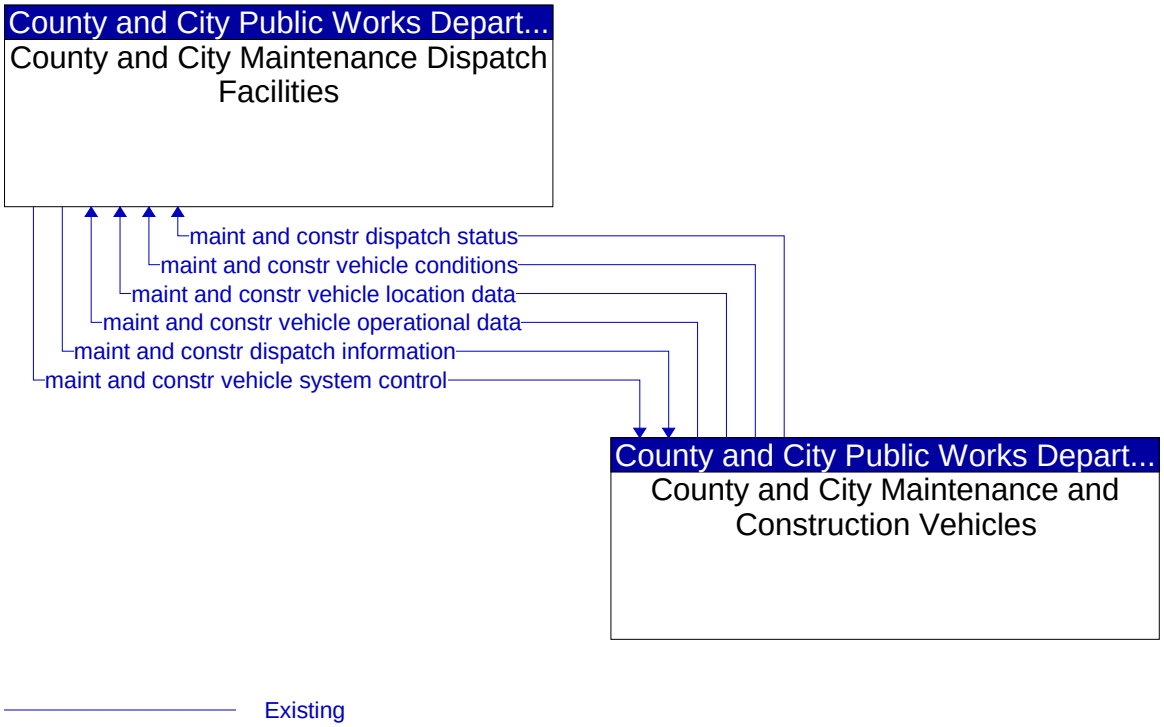

Figure 48: County and City Maintenance and Construction Vehicles - County and City Maintenance Dispatch Facilities Interface

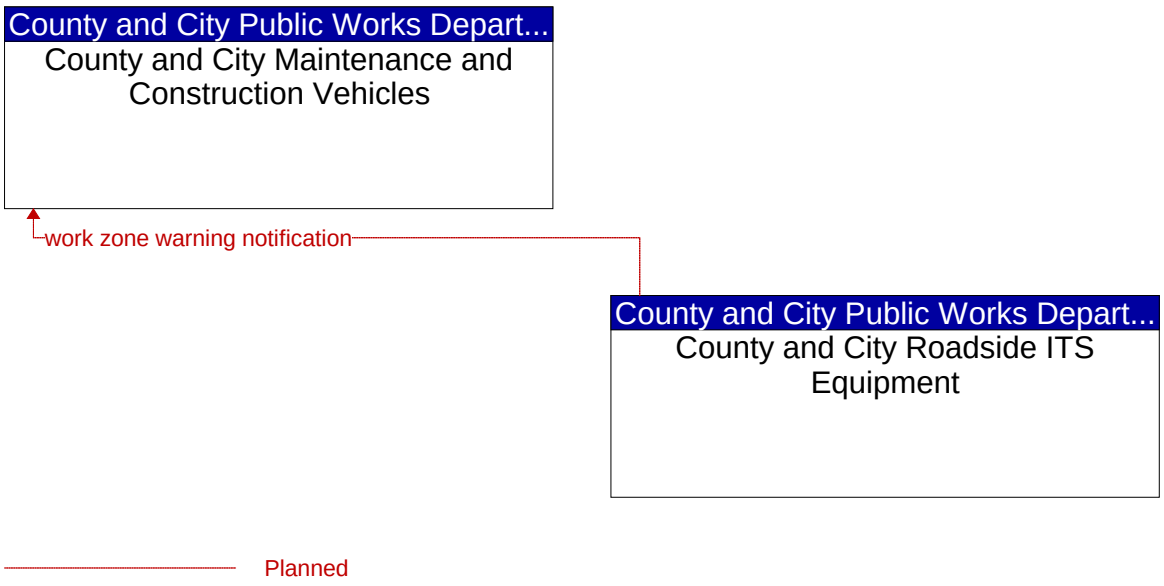

Figure 49: County and City Maintenance and Construction Vehicles - County and City Roadside ITS Equipment Interface

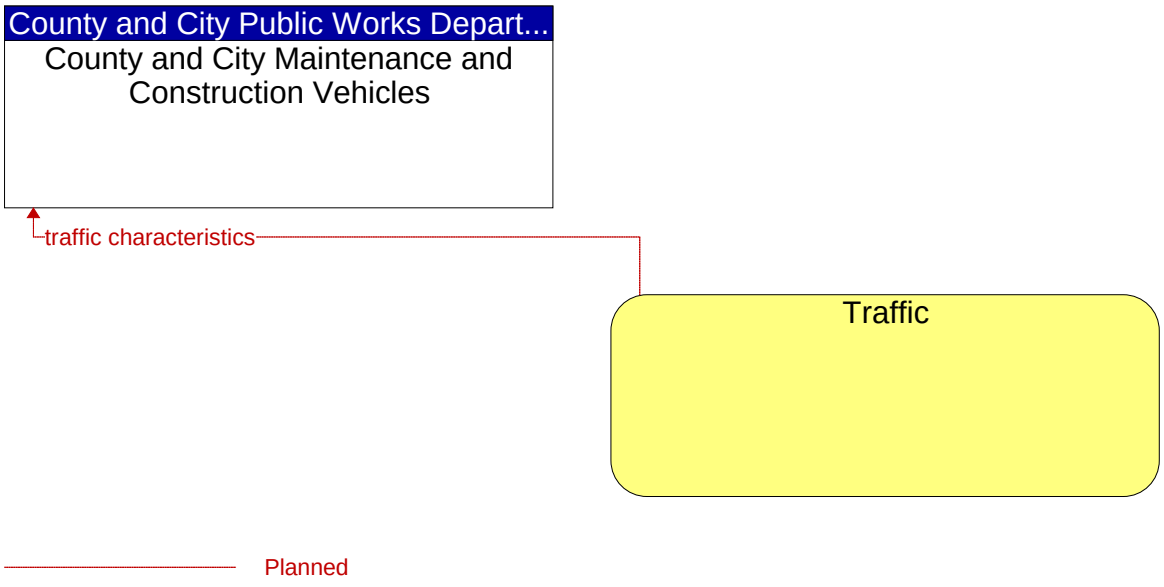

Figure 50: County and City Maintenance and Construction Vehicles - Traffic Interface

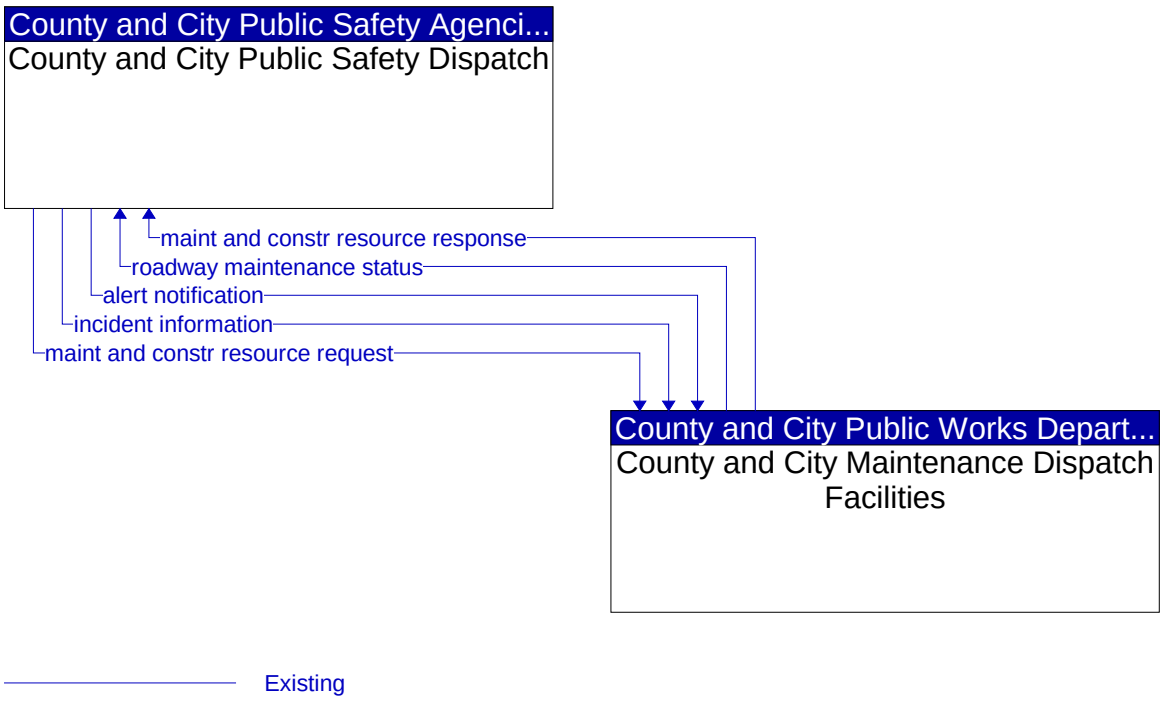

Figure 51: County and City Maintenance Dispatch Facilities - County and City Public Safety Dispatch Interface

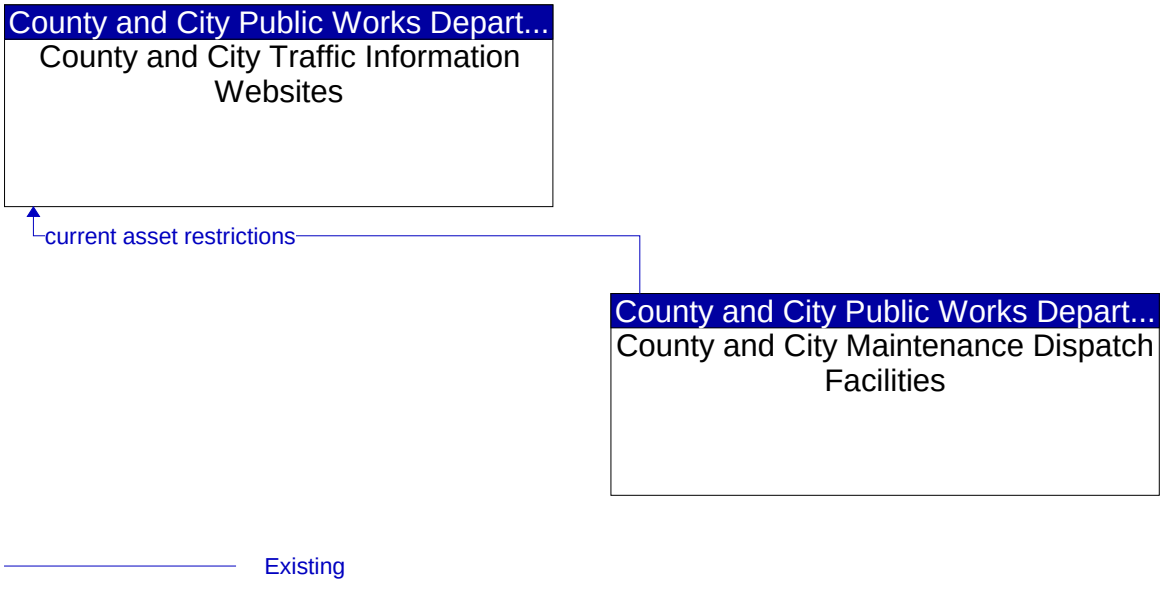

Figure 52: County and City Maintenance Dispatch Facilities - County and City Traffic Information Websites Interface

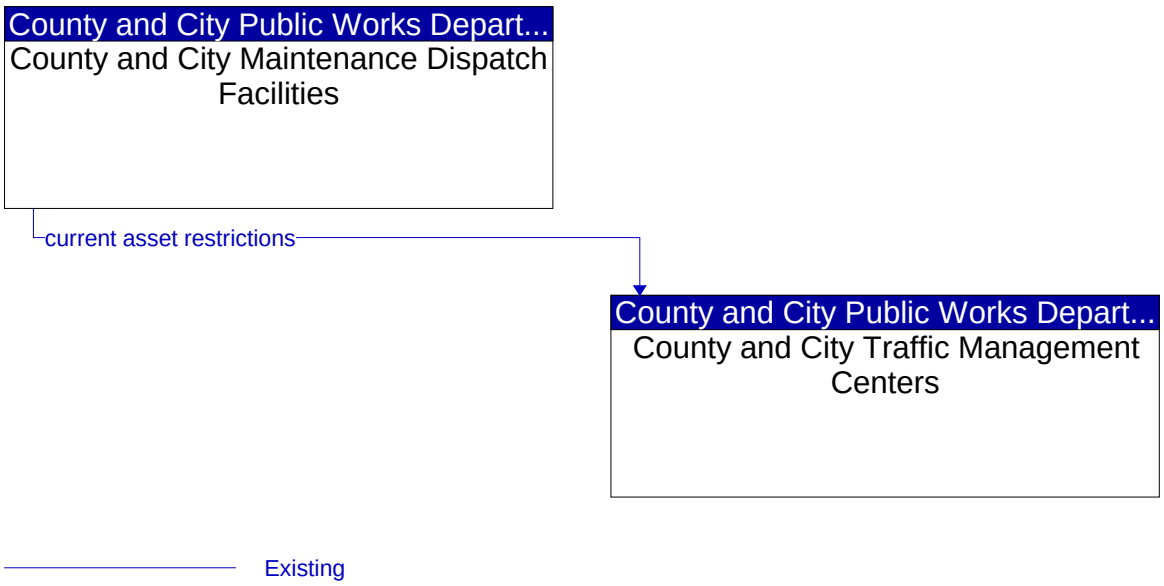

Figure 53: County and City Maintenance Dispatch Facilities - County and City Traffic Management Centers Interface

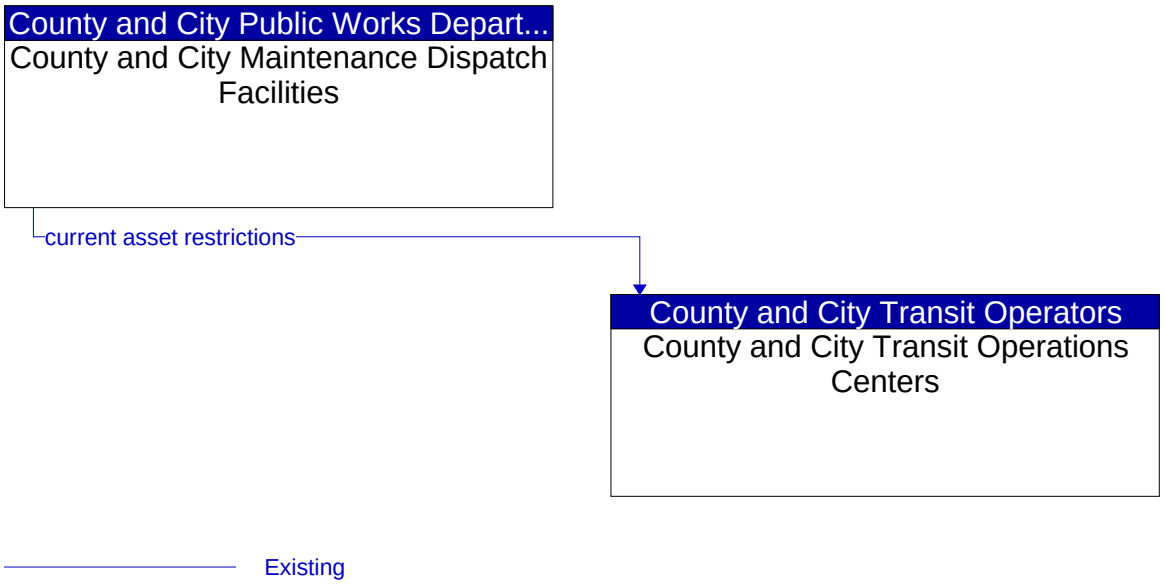

Figure 54: County and City Maintenance Dispatch Facilities - County and City Transit Operations Centers Interface

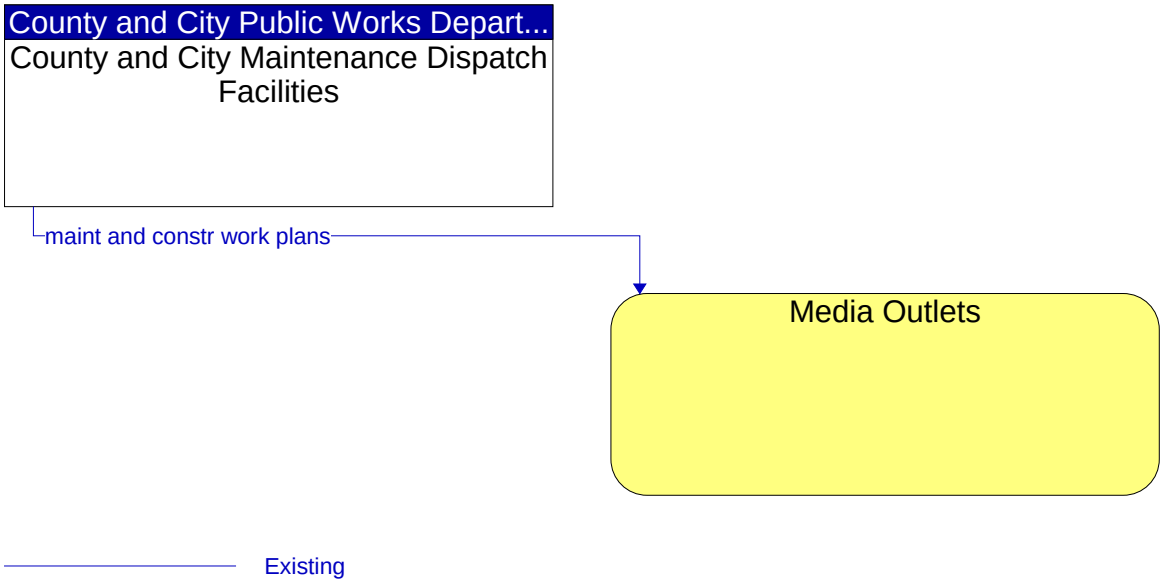

Figure 55: County and City Maintenance Dispatch Facilities - Media Outlets Interface

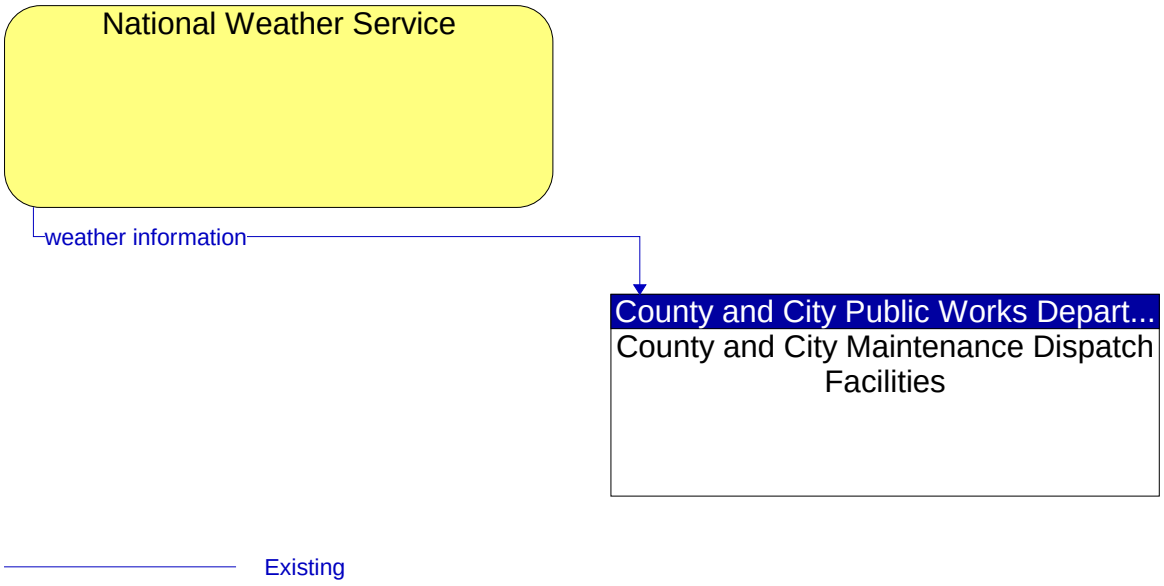

Figure 56: County and City Maintenance Dispatch Facilities - National Weather Service Interface

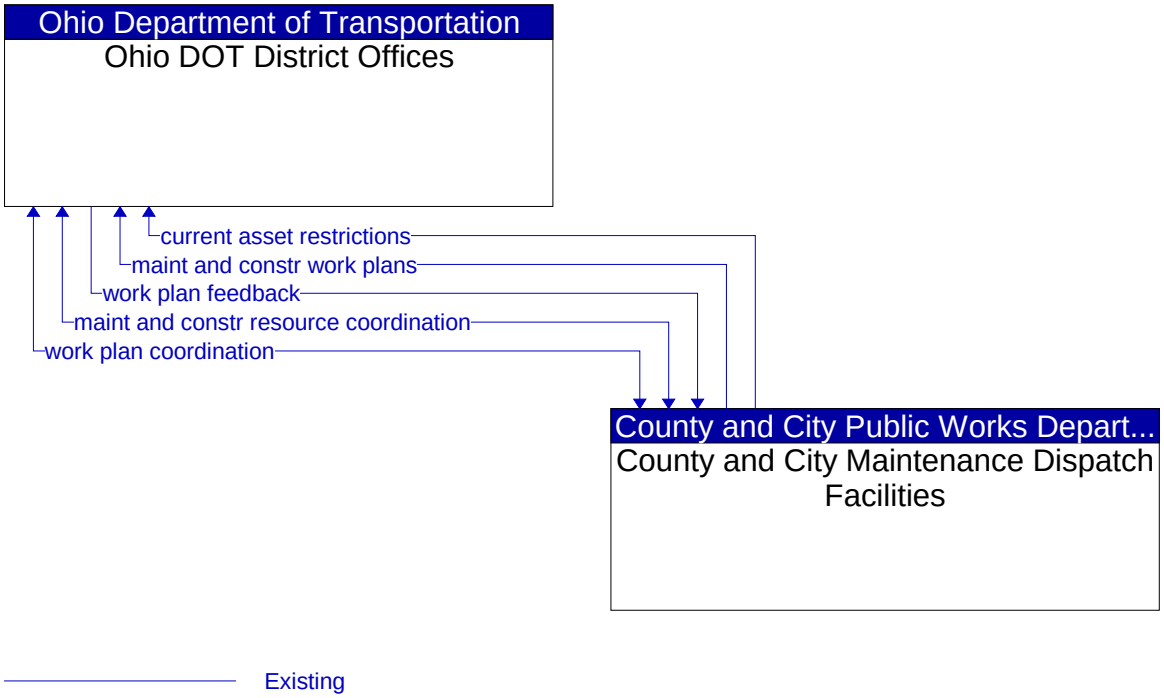

Figure 57: County and City Maintenance Dispatch Facilities - Ohio DOT District Offices Interface

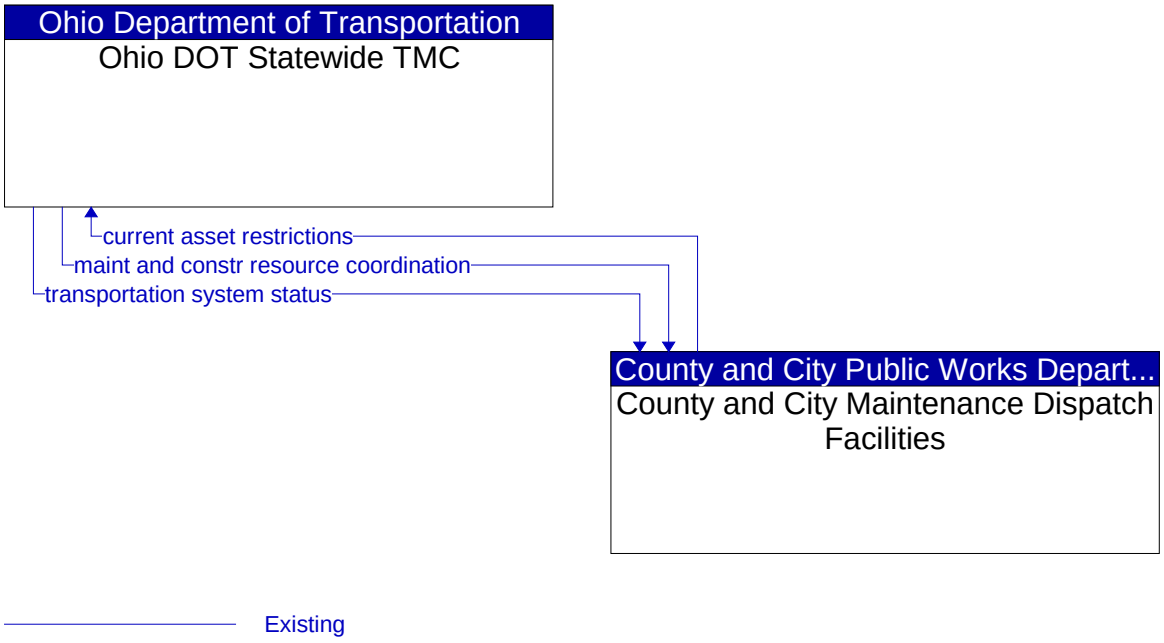

Figure 58: County and City Maintenance Dispatch Facilities - Ohio DOT Statewide TMC Interface

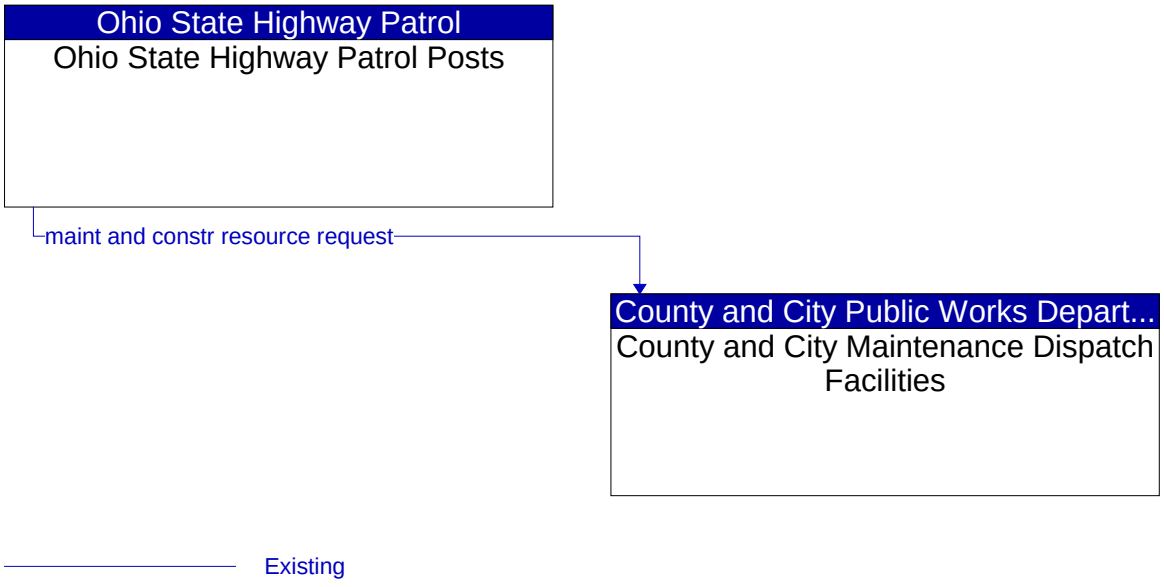

Figure 59: County and City Maintenance Dispatch Facilities - Ohio State Highway Patrol Posts Interface

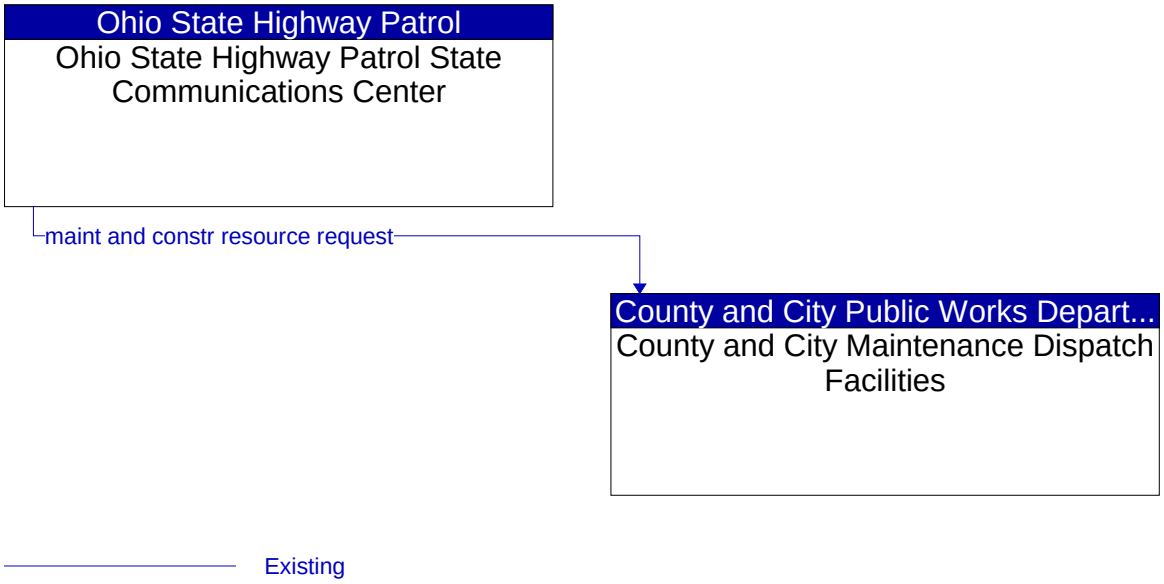

Figure 60: County and City Maintenance Dispatch Facilities - Ohio State Highway Patrol State Communications Center Interface

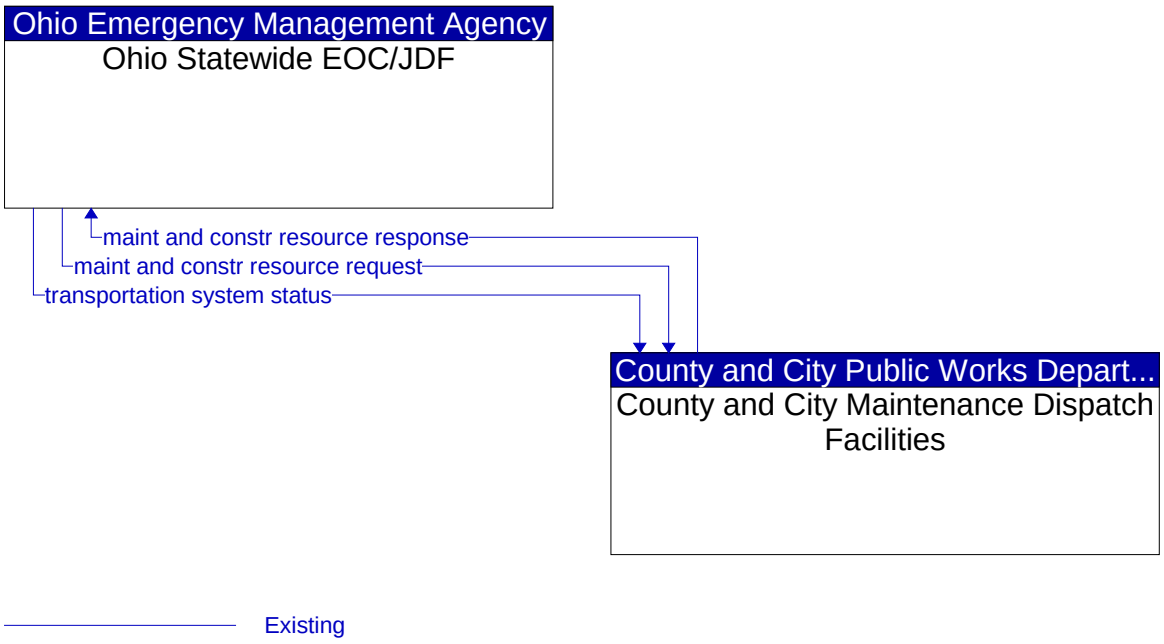

Figure 61: County and City Maintenance Dispatch Facilities - Ohio Statewide EOC/JDF Interface

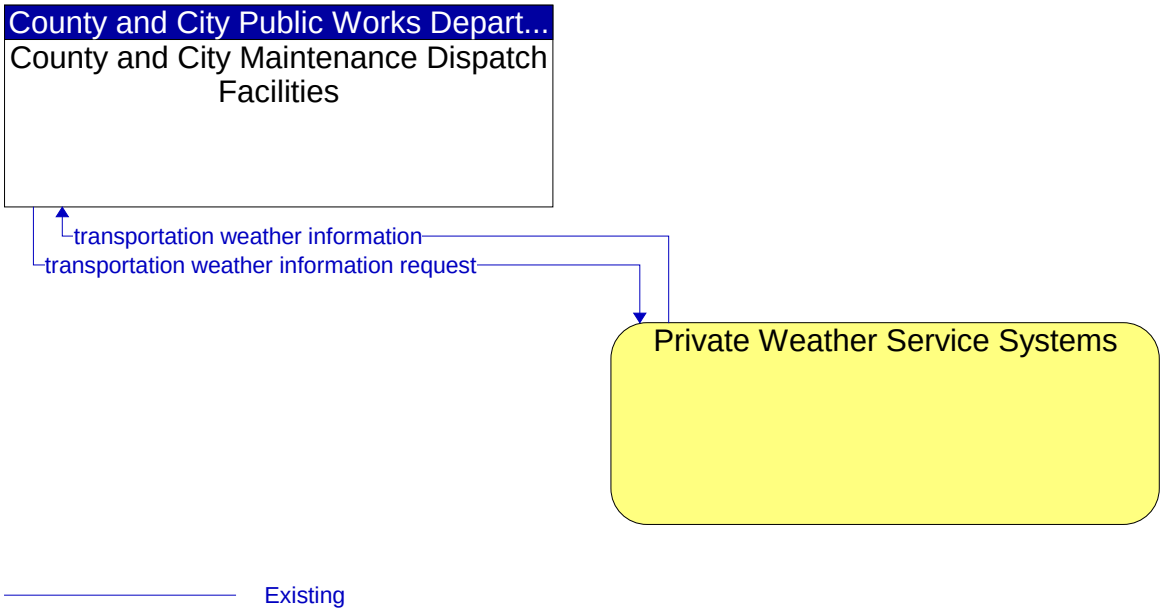

Figure 62: County and City Maintenance Dispatch Facilities - Private Weather Service Systems Interface

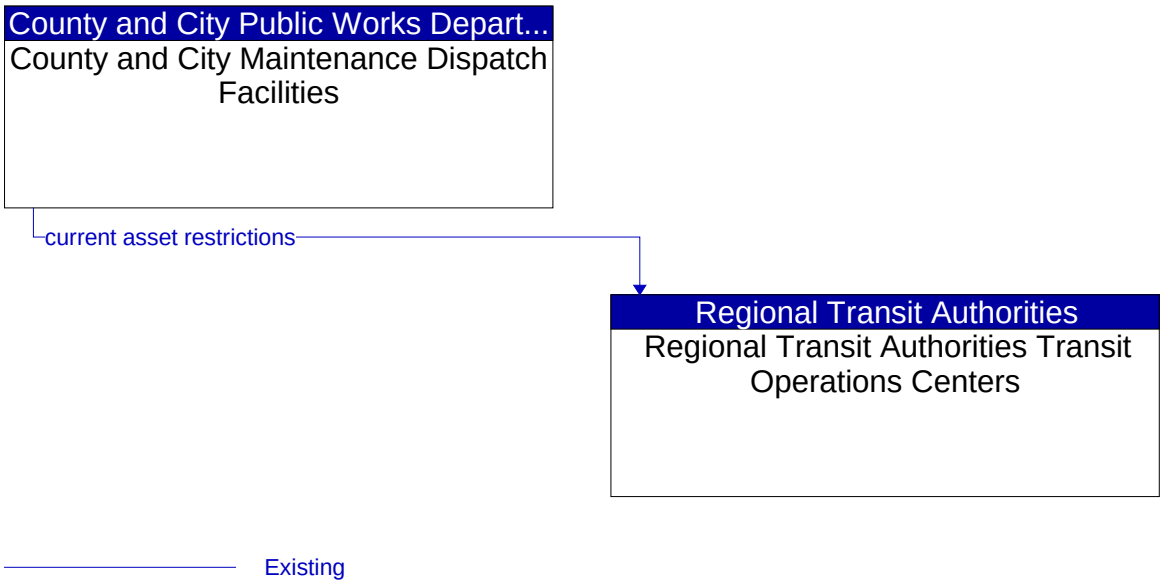

Figure 63: County and City Maintenance Dispatch Facilities - Regional Transit Authorities Transit Operations Centers Interface

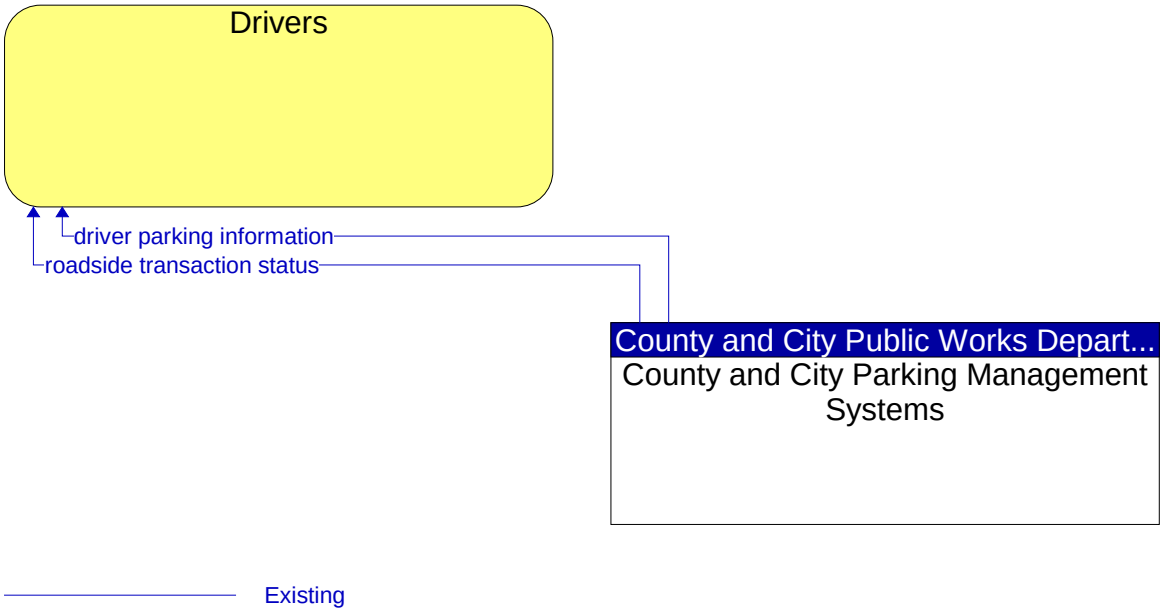

Figure 64: County and City Parking Management Systems - Drivers Interface

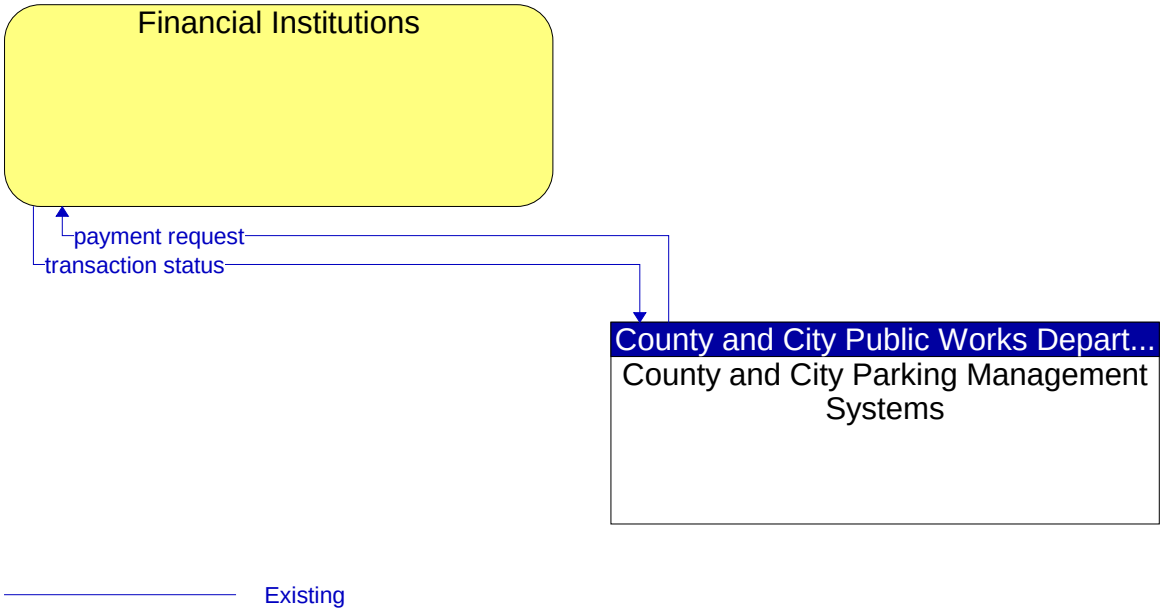

Figure 65: County and City Parking Management Systems - Financial Institutions Interface

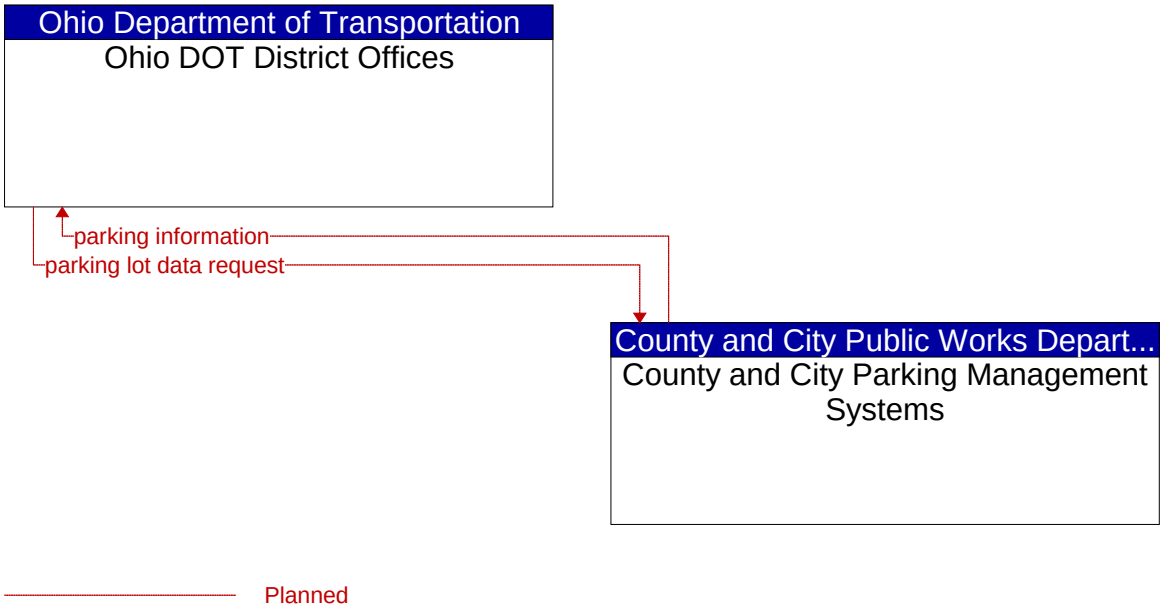

Figure 66: County and City Parking Management Systems - Ohio DOT District Offices Interface

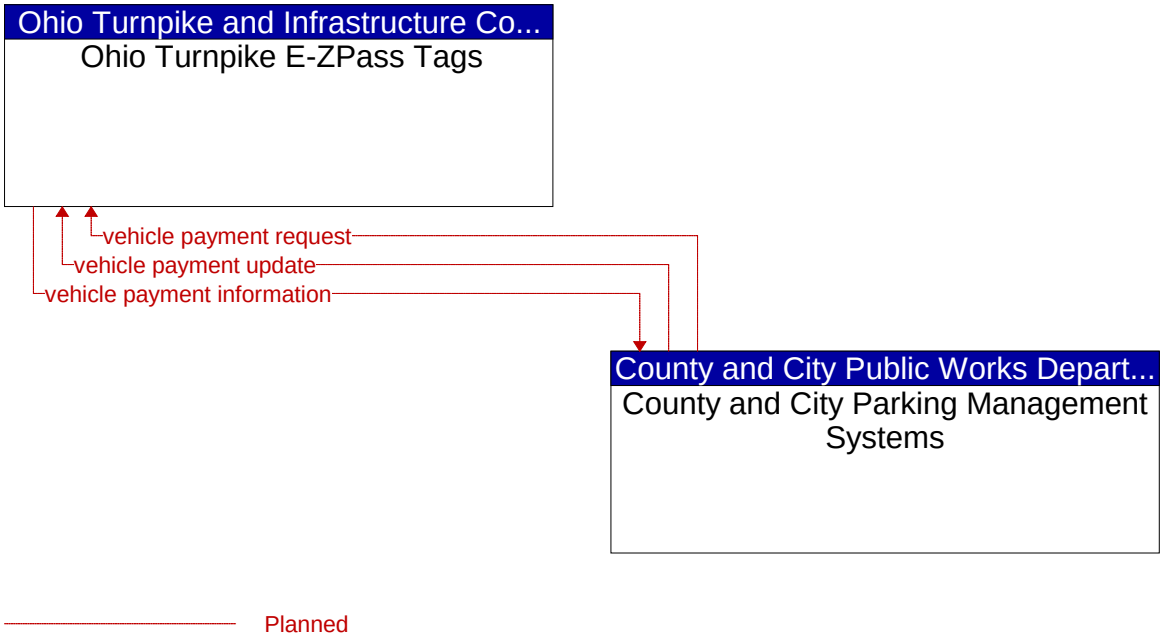

Figure 67: County and City Parking Management Systems - Ohio Turnpike E-ZPass Tags Interface

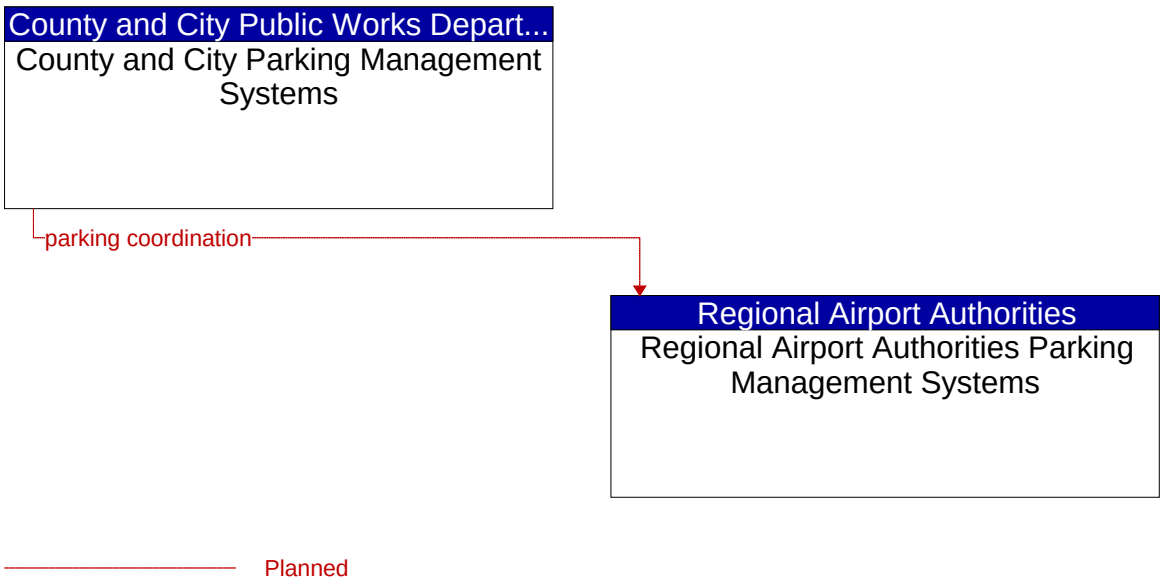

Figure 68: County and City Parking Management Systems - Regional Airport Authorities Parking Management Systems Interface

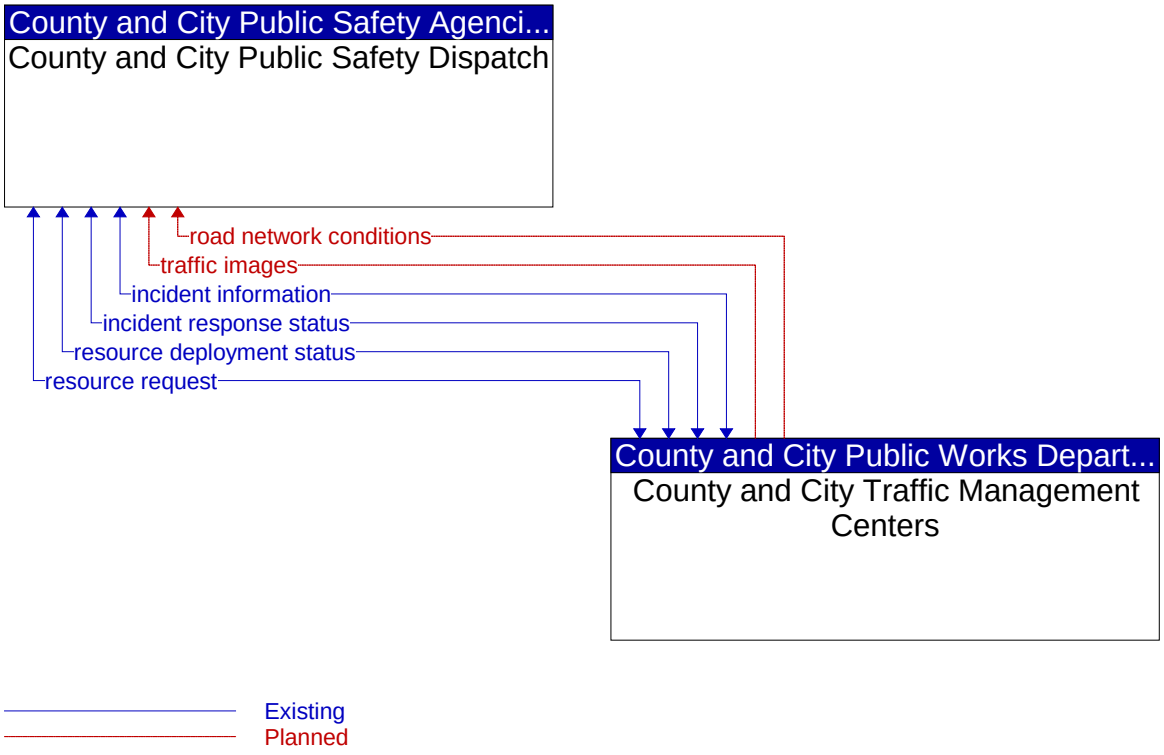

Figure 69: County and City Public Safety Dispatch - County and City Traffic Management Centers Interface

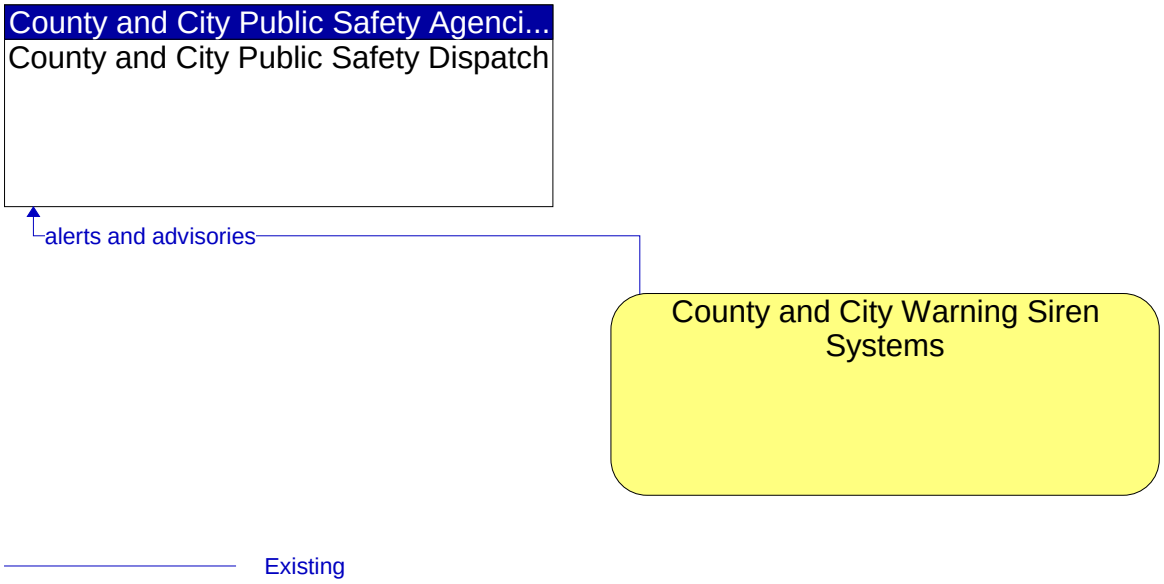

Figure 70: County and City Public Safety Dispatch - County and City Warning Siren Systems Interface

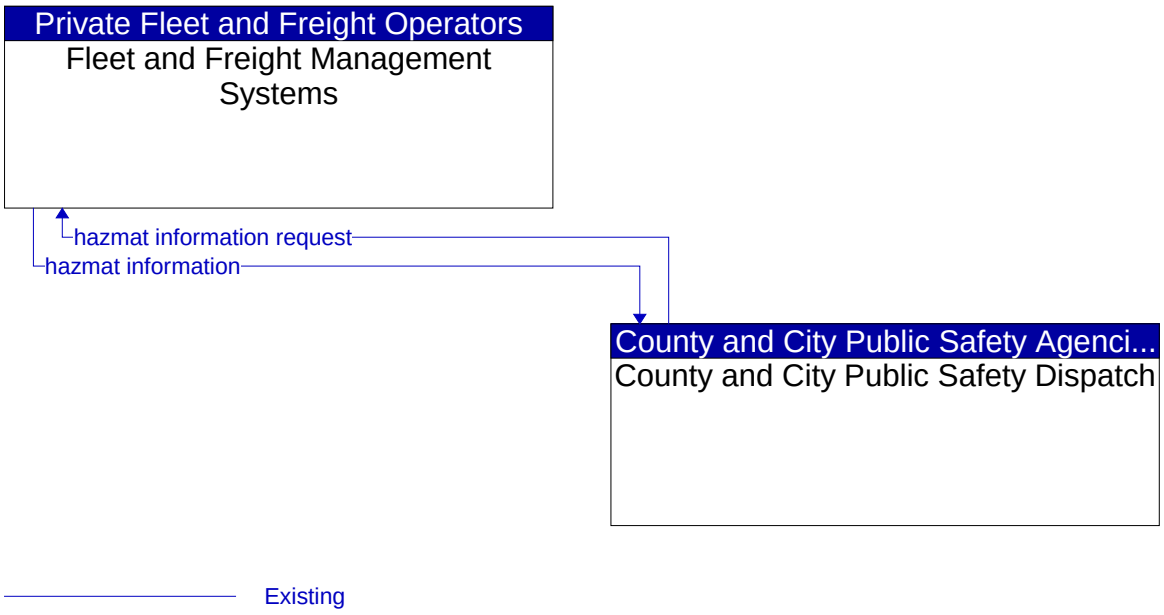

Figure 71: County and City Public Safety Dispatch - Fleet and Freight Management Systems Interface

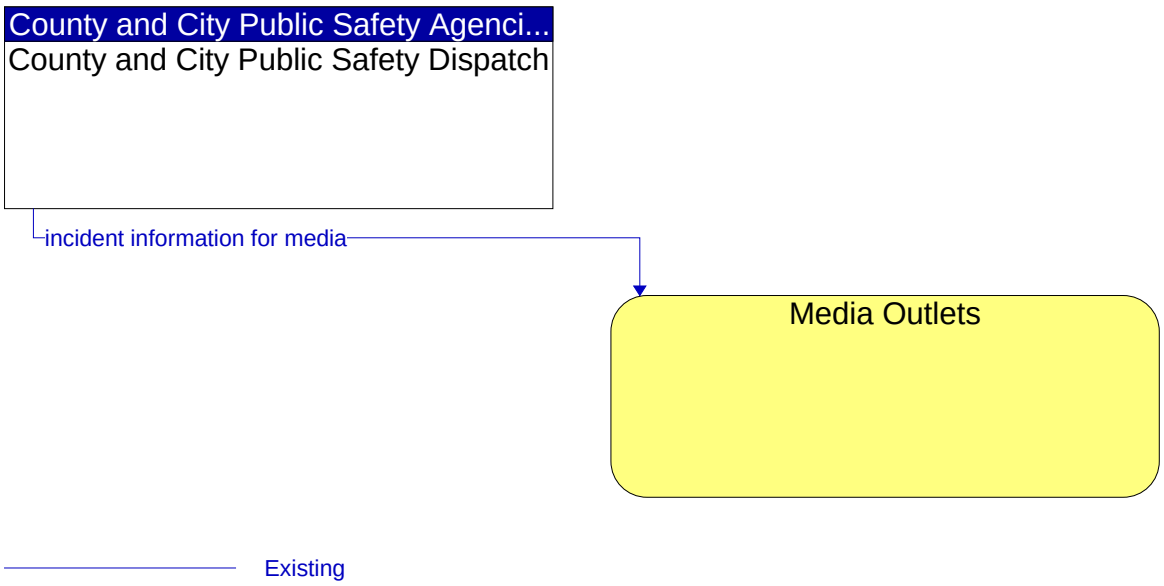

Figure 72: County and City Public Safety Dispatch - Media Outlets Interface

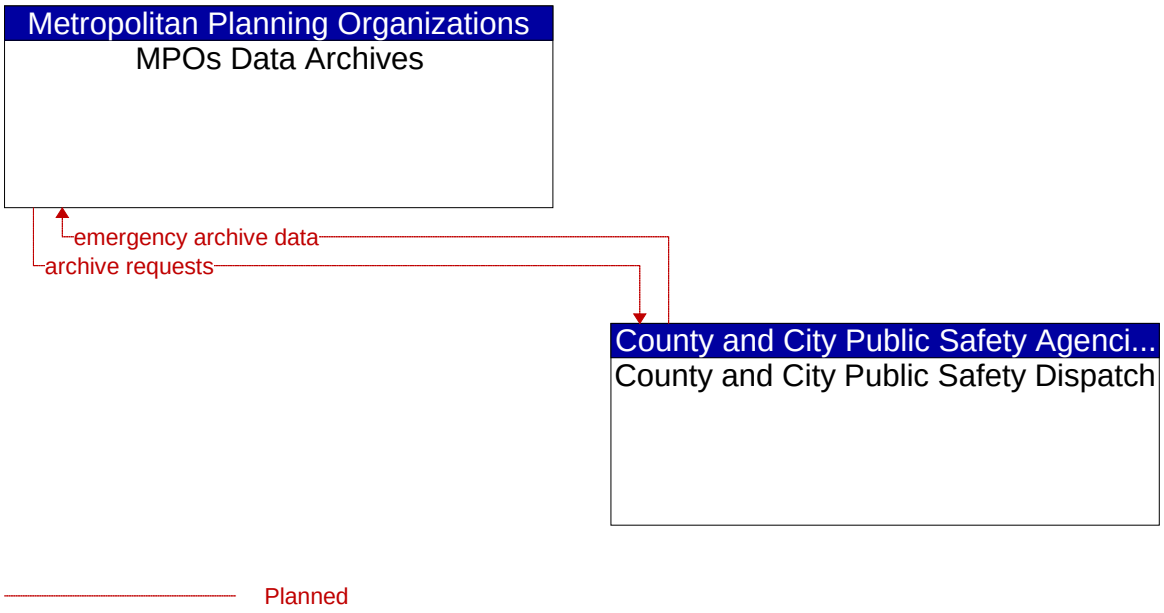

Figure 73: County and City Public Safety Dispatch - MPOs Data Archives Interface

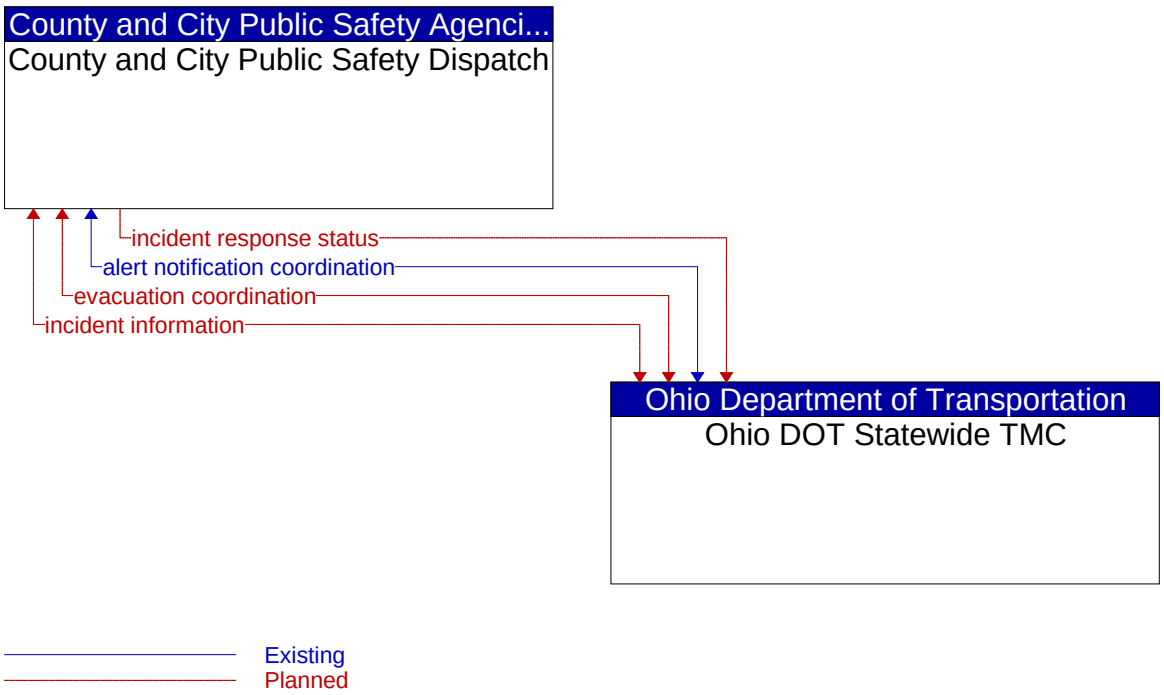

Figure 74: County and City Public Safety Dispatch - Ohio DOT Statewide TMC Interface

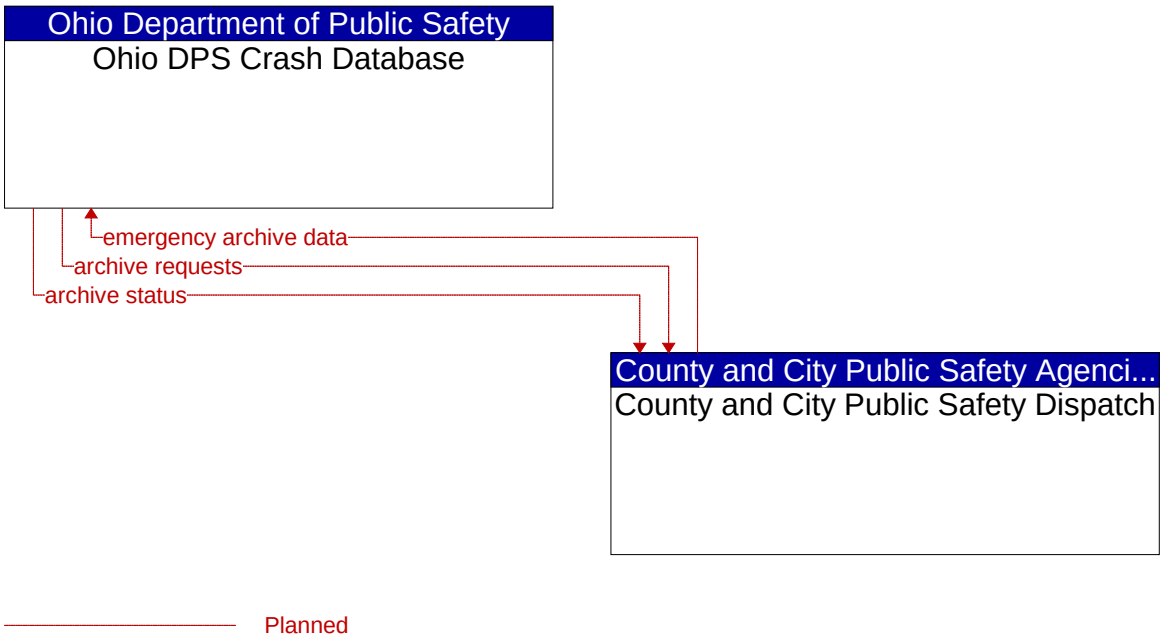

Figure 75: County and City Public Safety Dispatch - Ohio DPS Crash Database Interface

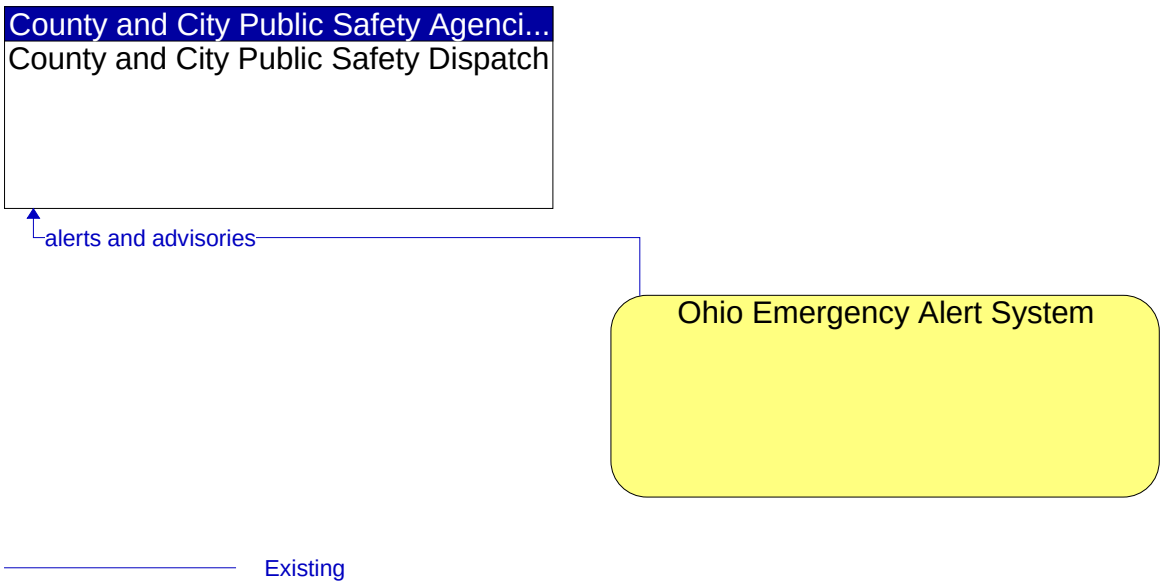

Figure 76: County and City Public Safety Dispatch - Ohio Emergency Alert System Interface

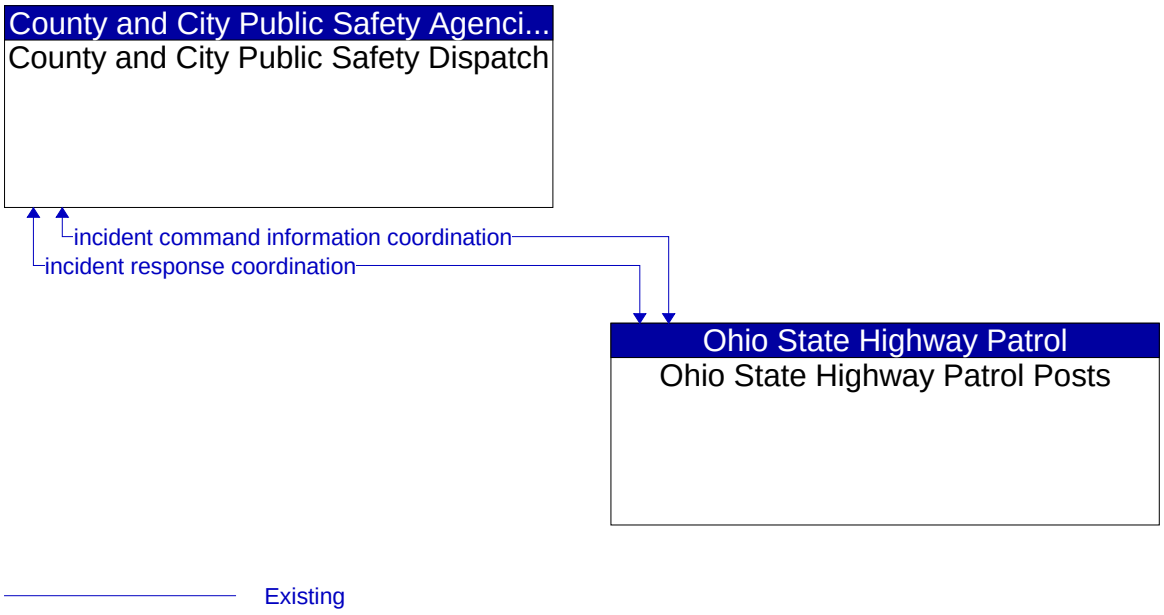

Figure 77: County and City Public Safety Dispatch - Ohio State Highway Patrol Posts Interface

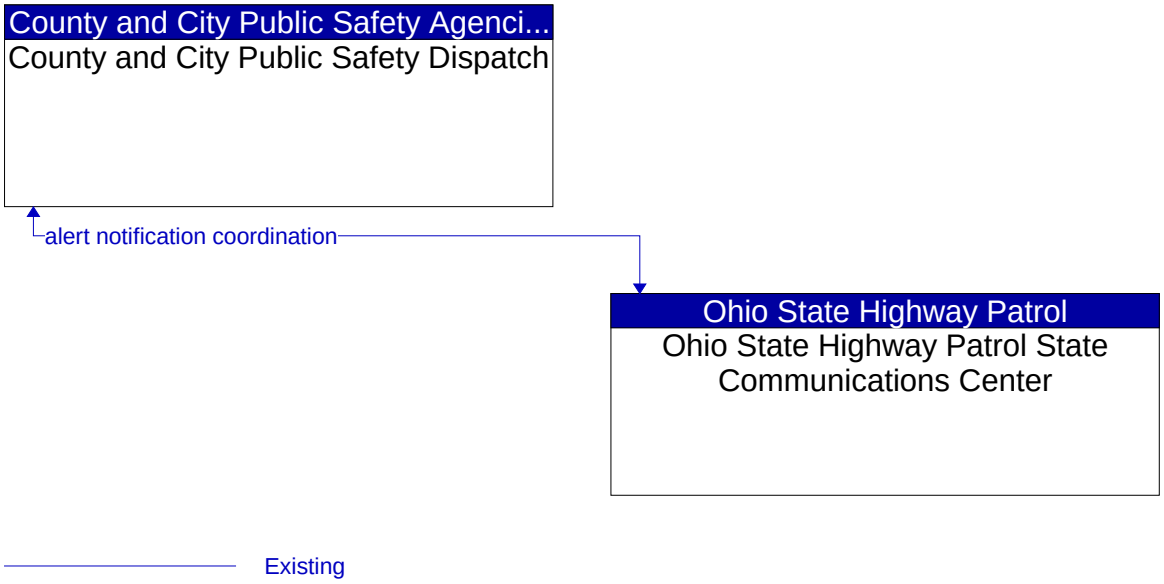

Figure 78: County and City Public Safety Dispatch - Ohio State Highway Patrol State Communications Center Interface

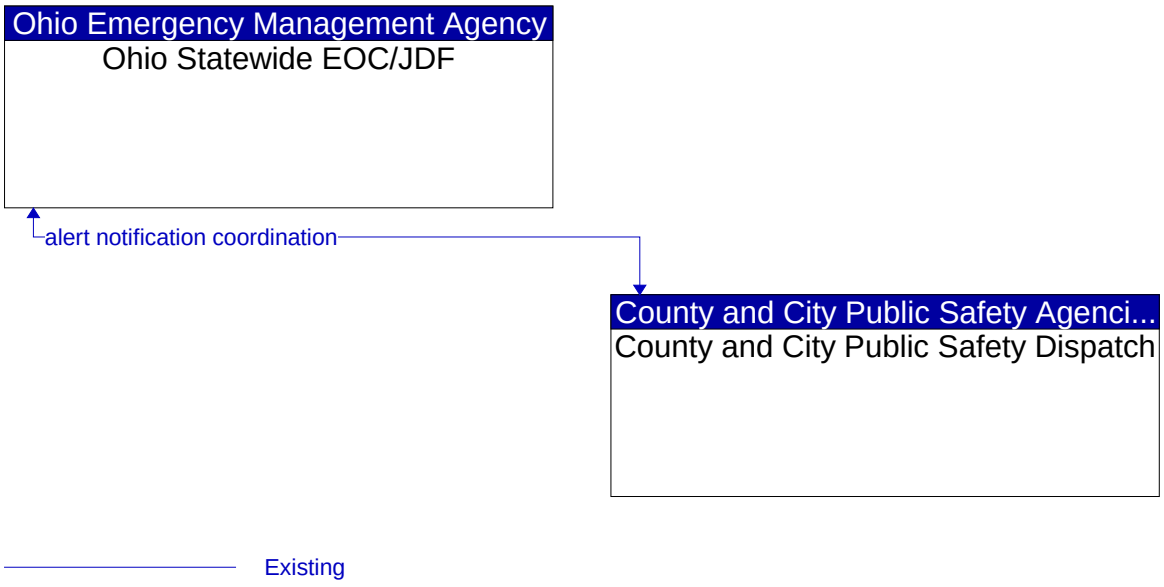

Figure 79: County and City Public Safety Dispatch - Ohio Statewide EOC/JDF Interface

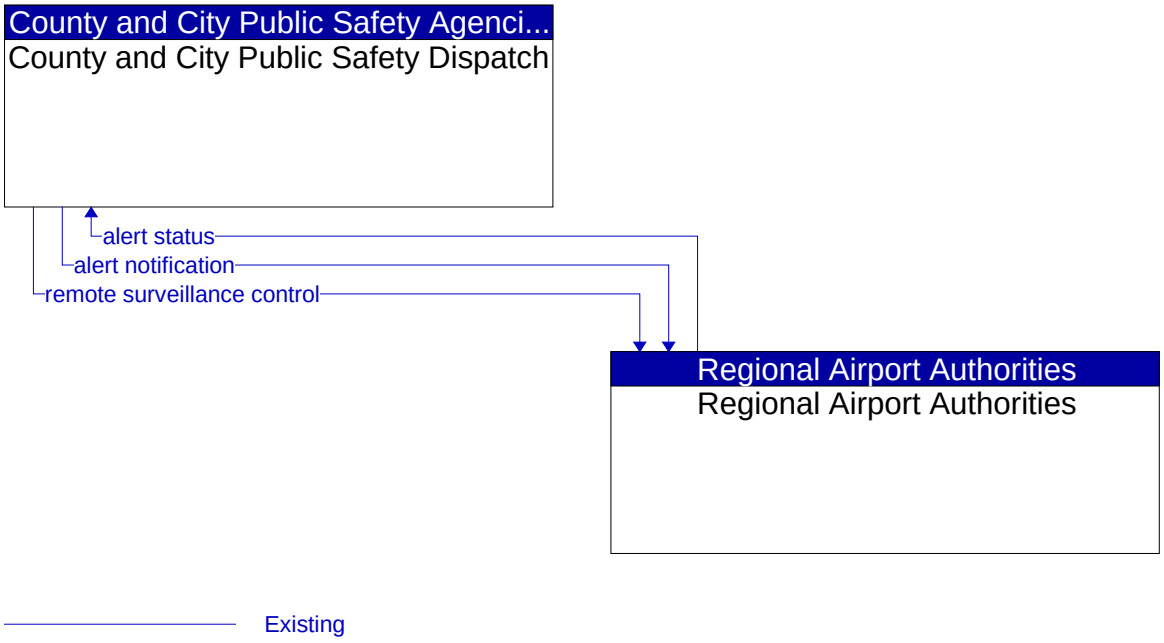

Figure 80: County and City Public Safety Dispatch - Regional Airport Authorities Interface

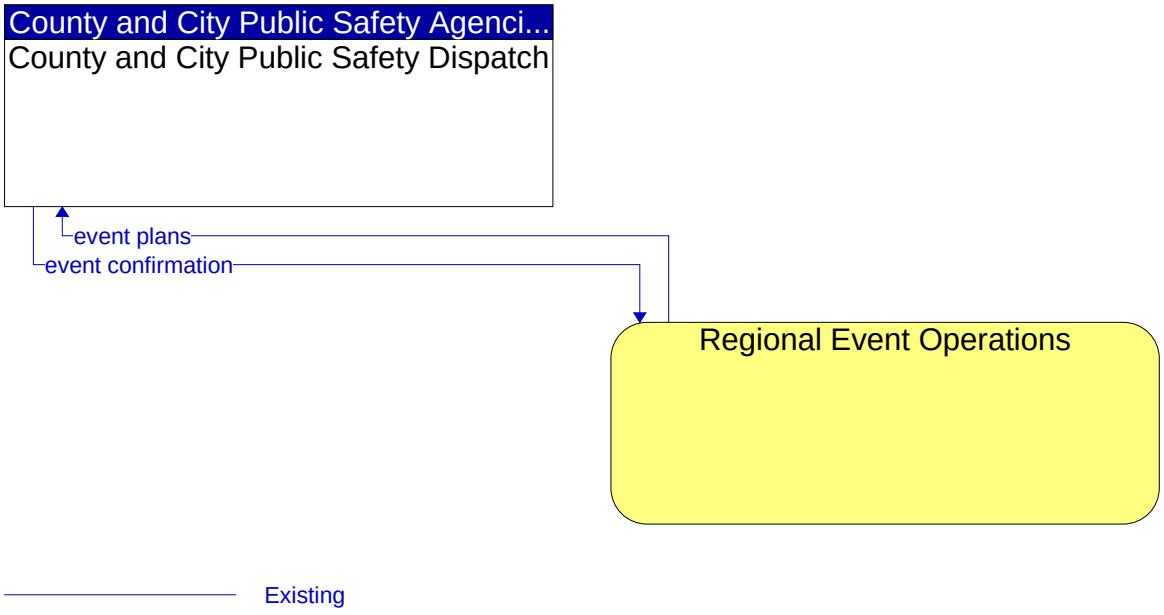

Figure 81: County and City Public Safety Dispatch - Regional Event Operations Interface

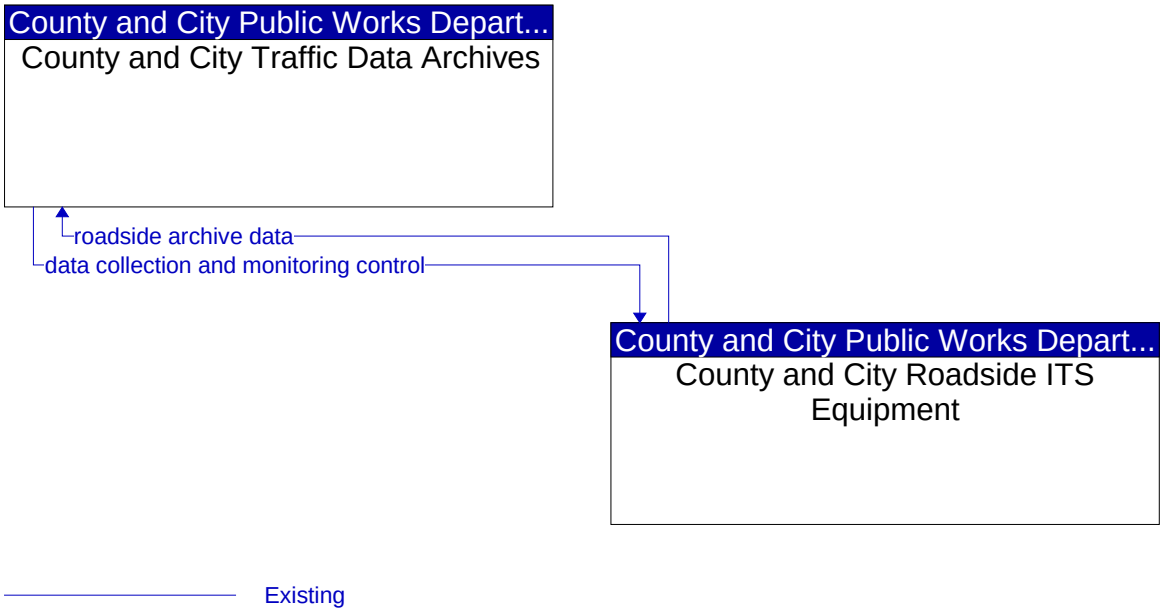

Figure 82: County and City Roadside ITS Equipment - County and City Traffic Data Archives Interface

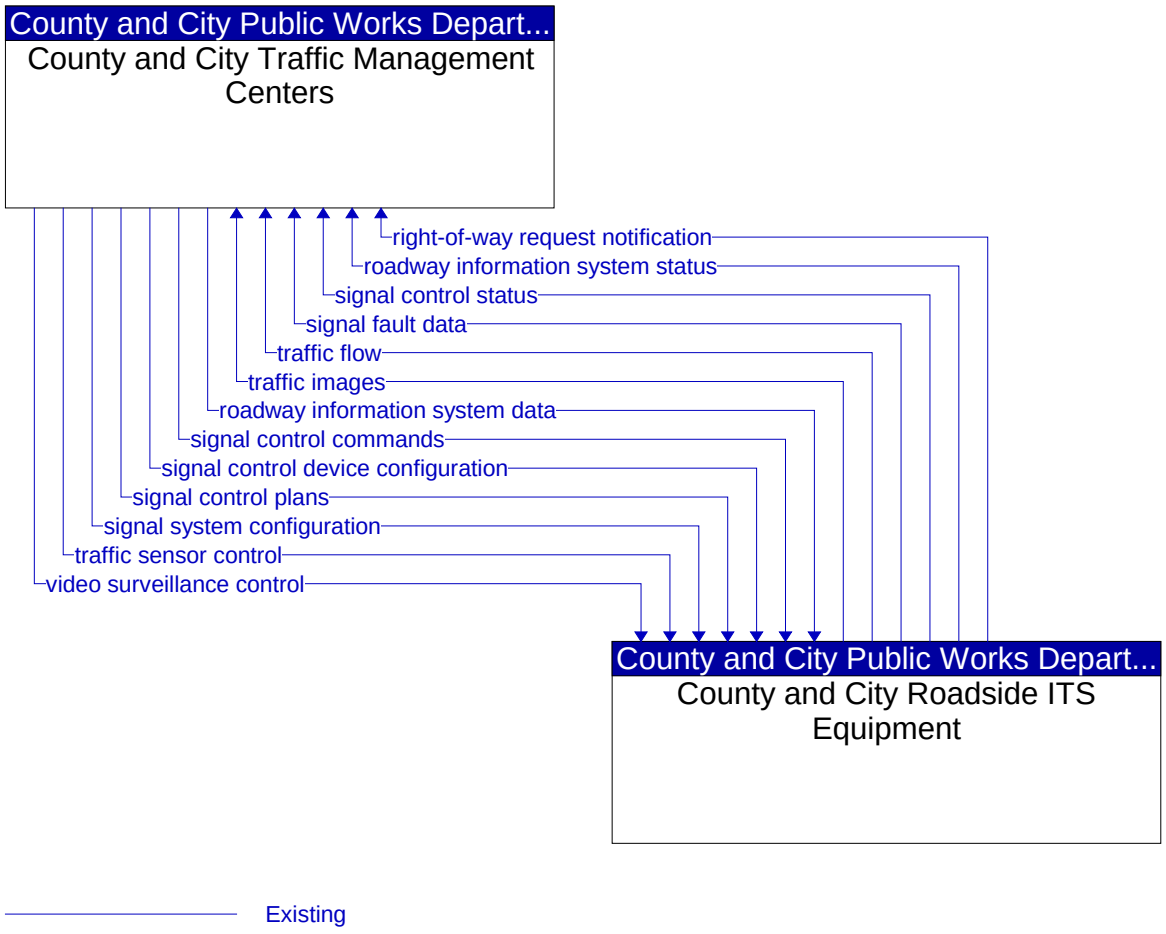

Figure 83: County and City Roadside ITS Equipment - County and City Traffic Management Centers Interface

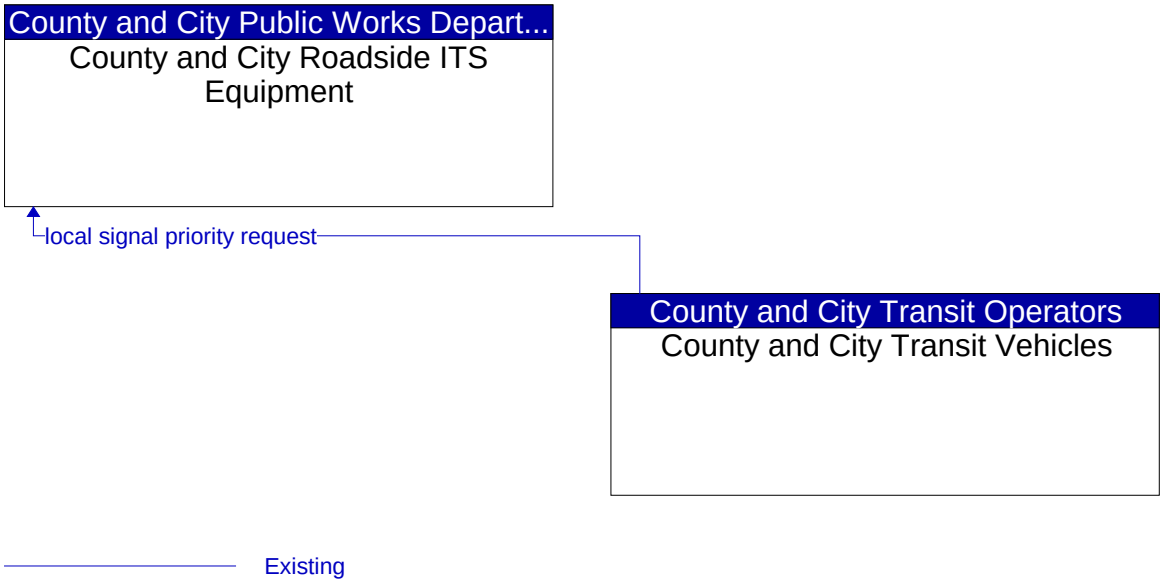

Figure 84: County and City Roadside ITS Equipment - County and City Transit Vehicles Interface

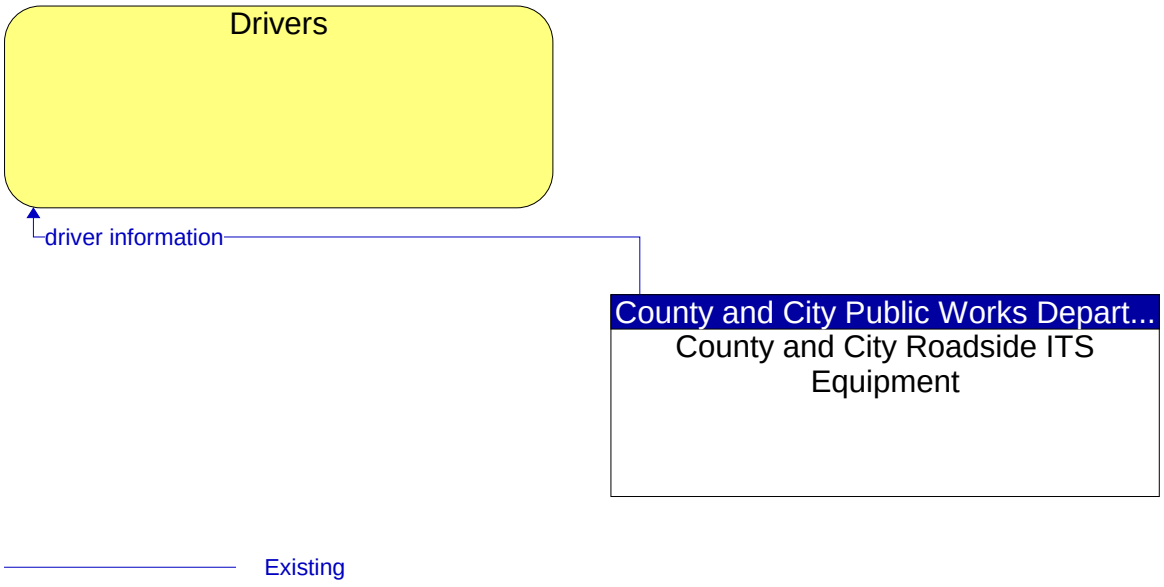

Figure 85: County and City Roadside ITS Equipment - Drivers Interface

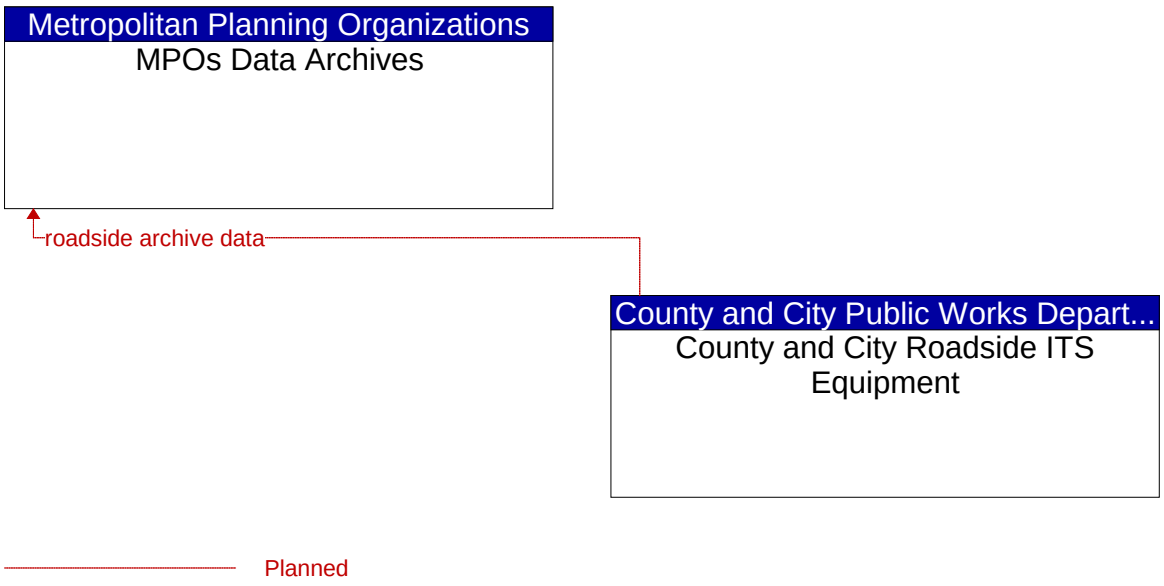

Figure 86: County and City Roadside ITS Equipment - MPOs Data Archives Interface

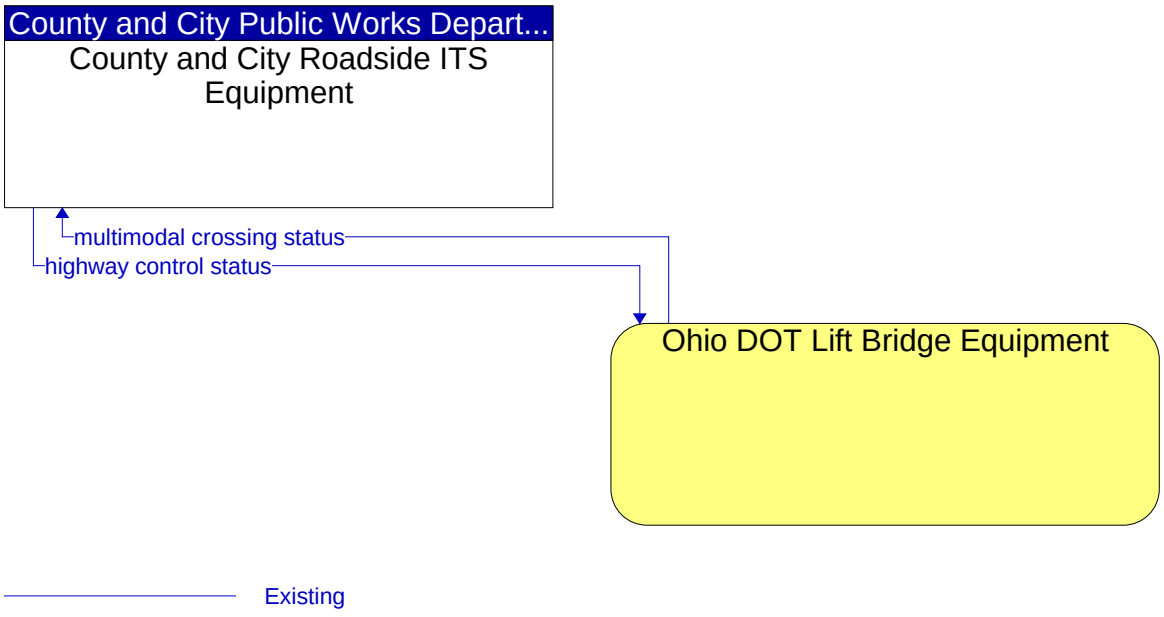

Figure 87: County and City Roadside ITS Equipment - Ohio DOT Lift Bridge Equipment Interface

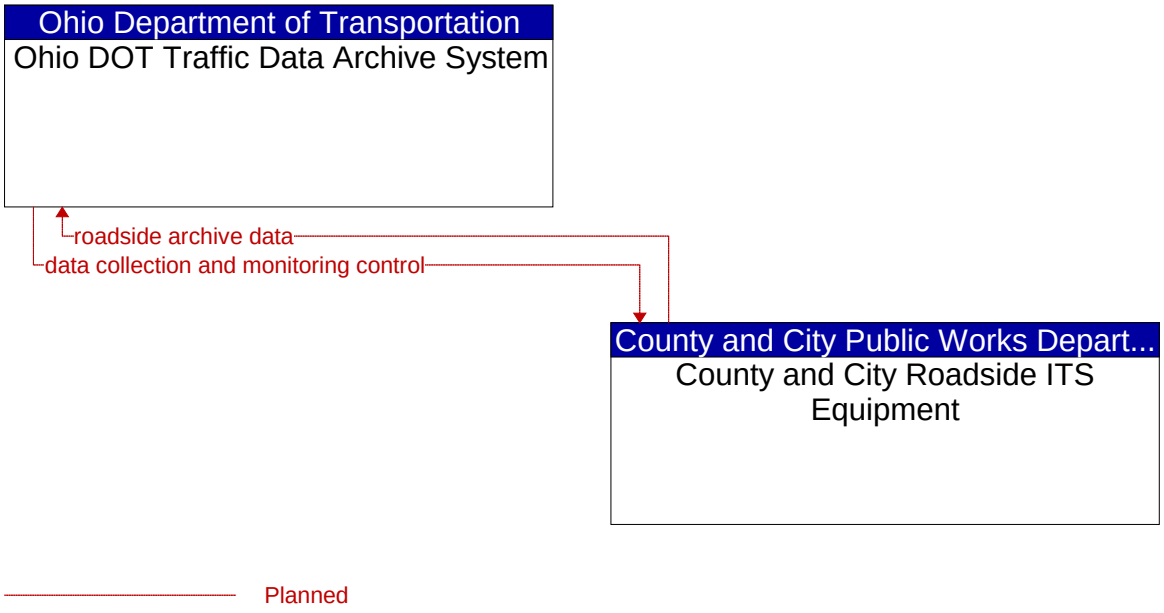

Figure 88: County and City Roadside ITS Equipment - Ohio DOT Traffic Data Archive System Interface

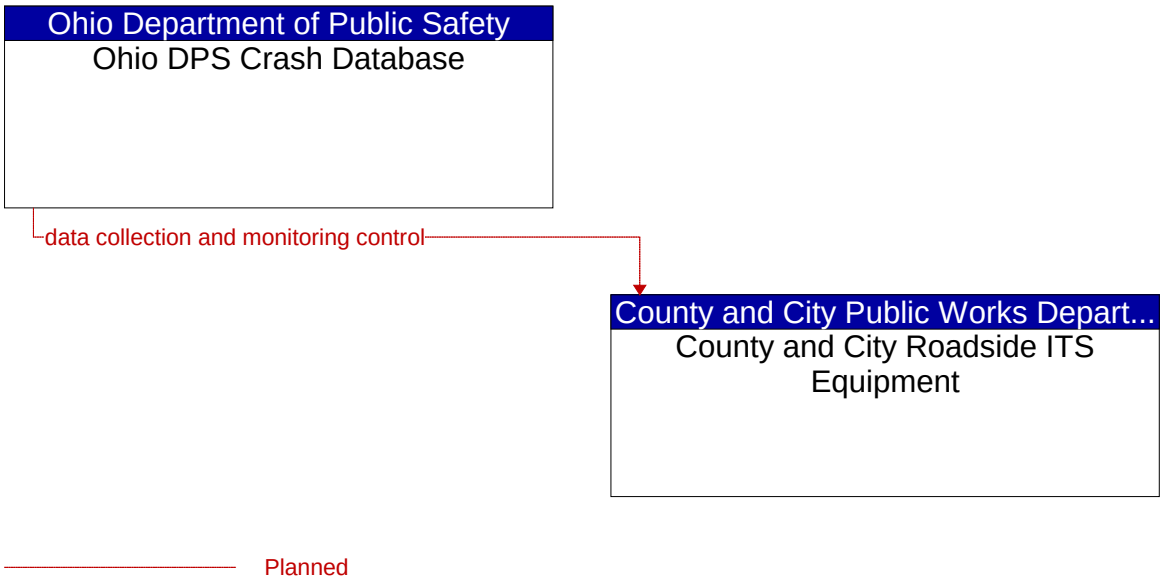

Figure 89: County and City Roadside ITS Equipment - Ohio DPS Crash Database Interface

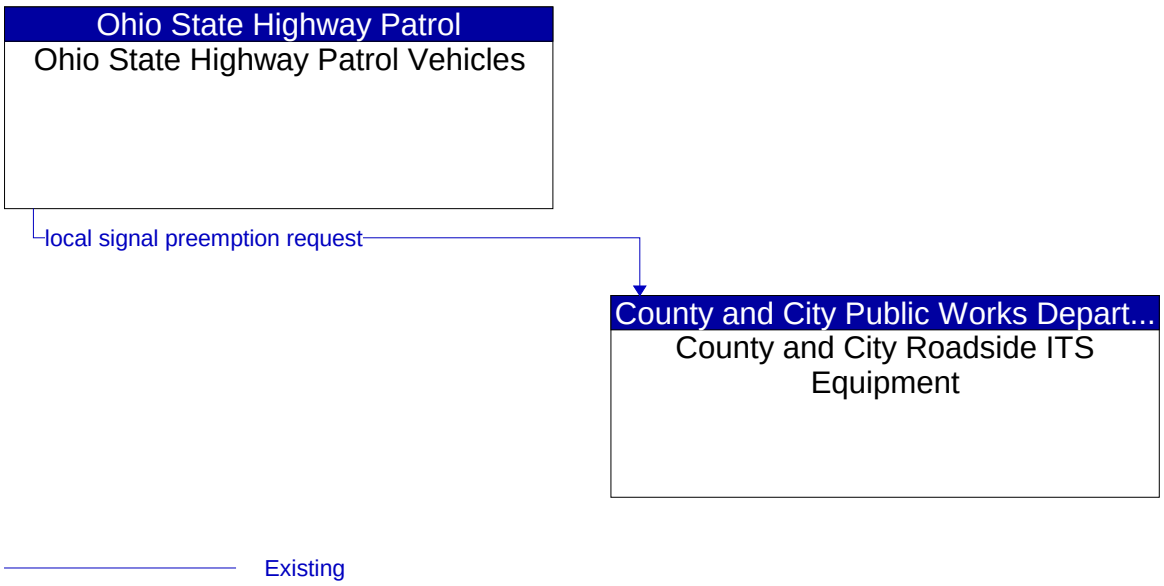

Figure 90: County and City Roadside ITS Equipment - Ohio State Highway Patrol Vehicles Interface

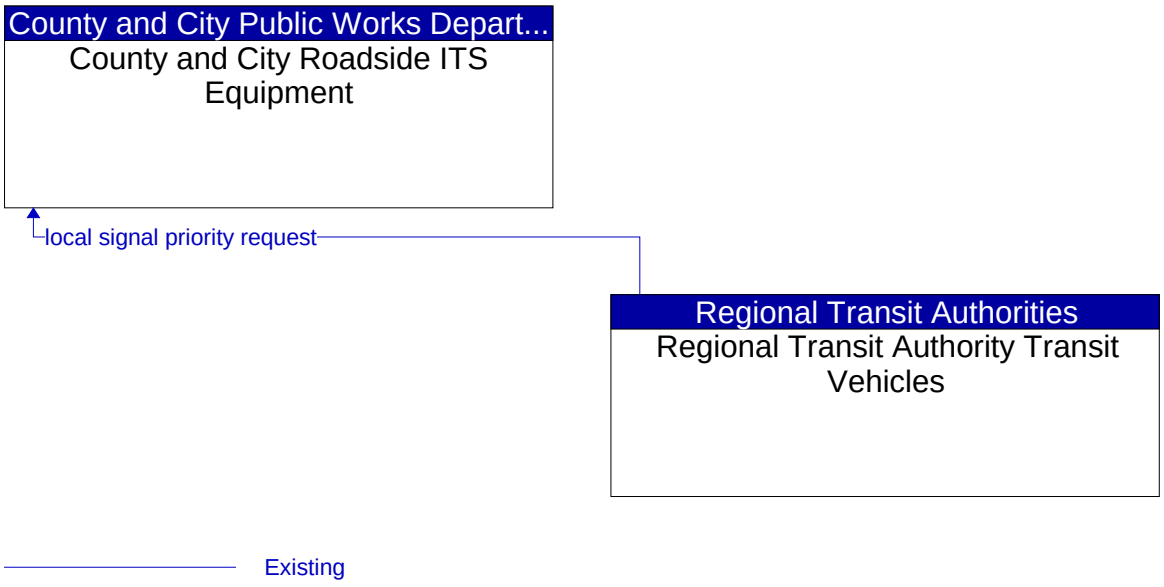

Figure 91: County and City Roadside ITS Equipment - Regional Transit Authority Transit Vehicles Interface

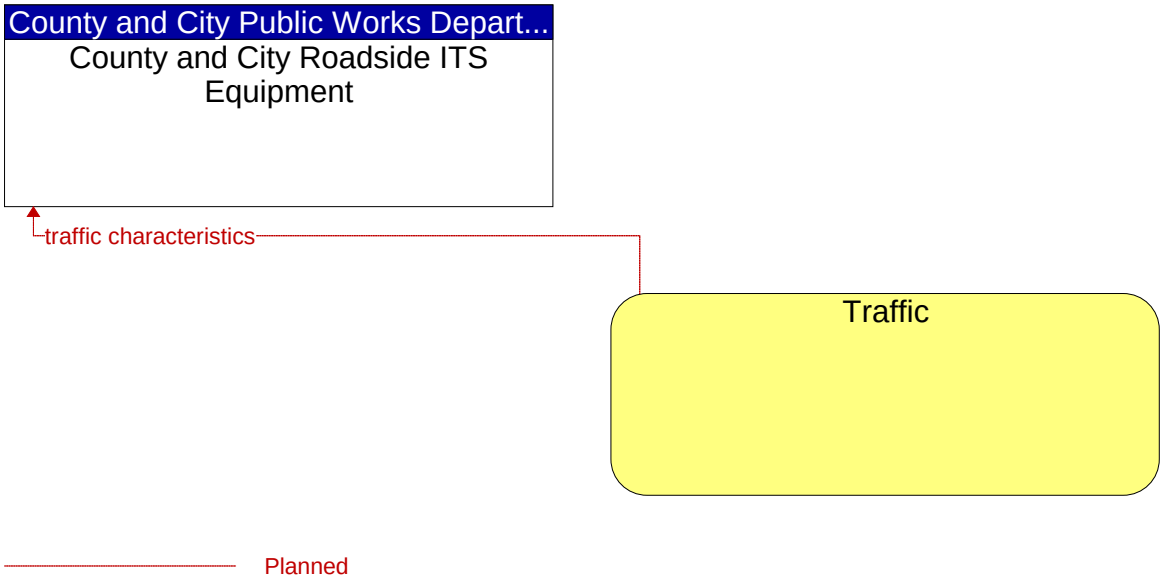

Figure 92: County and City Roadside ITS Equipment - Traffic Interface

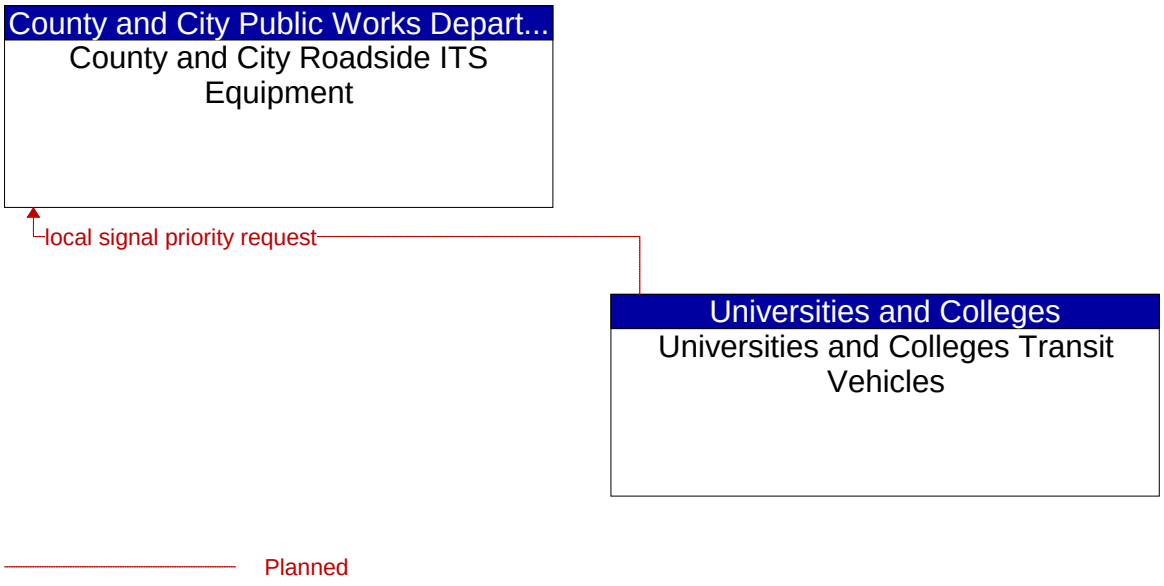

Figure 93: County and City Roadside ITS Equipment - Universities and Colleges Transit Vehicles Interface

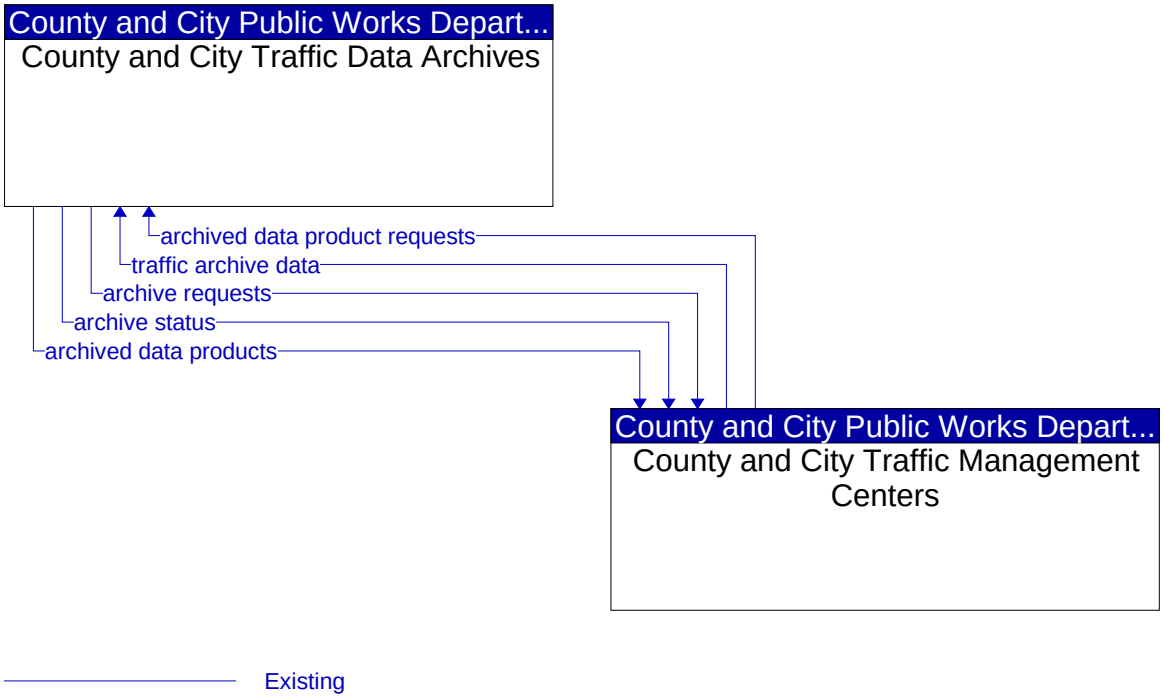

Figure 94: County and City Traffic Data Archives - County and City Traffic Management Centers Interface

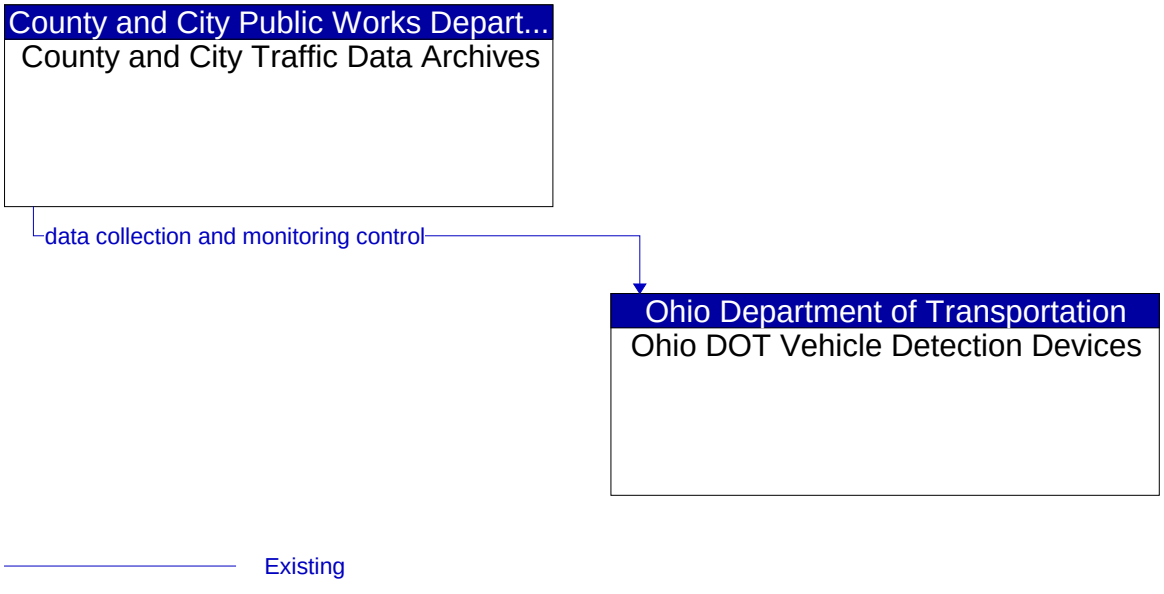

Figure 95: County and City Traffic Data Archives - Ohio DOT Vehicle Detection Devices Interface

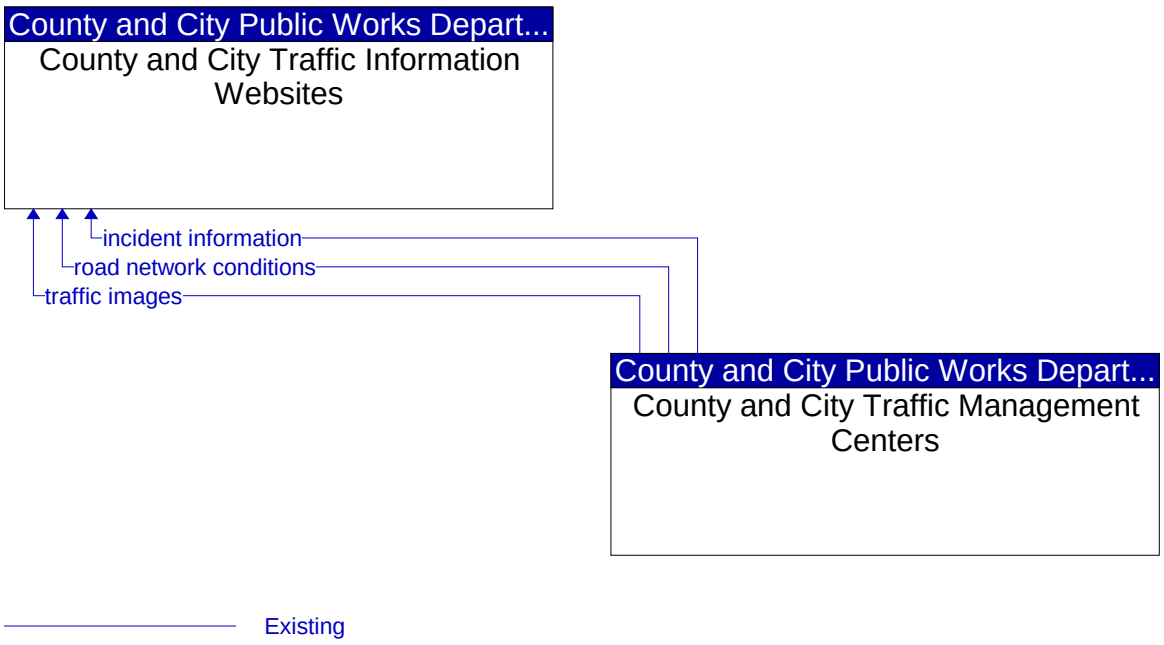

Figure 96: County and City Traffic Information Websites - County and City Traffic Management Centers Interface

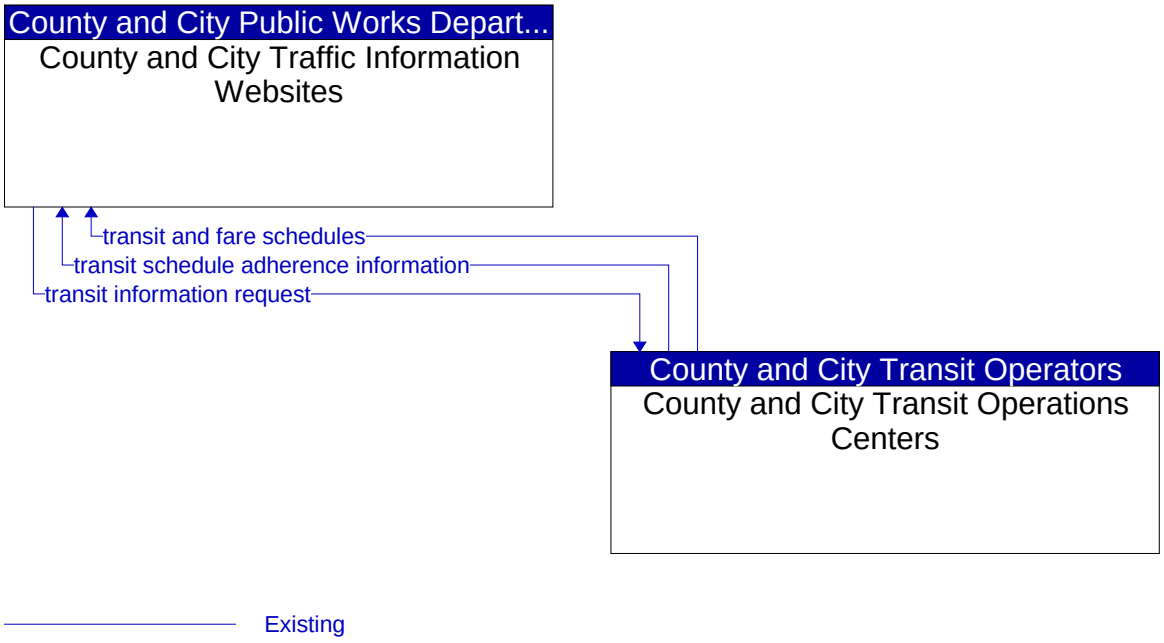

Figure 97: County and City Traffic Information Websites - County and City Transit Operations Centers Interface

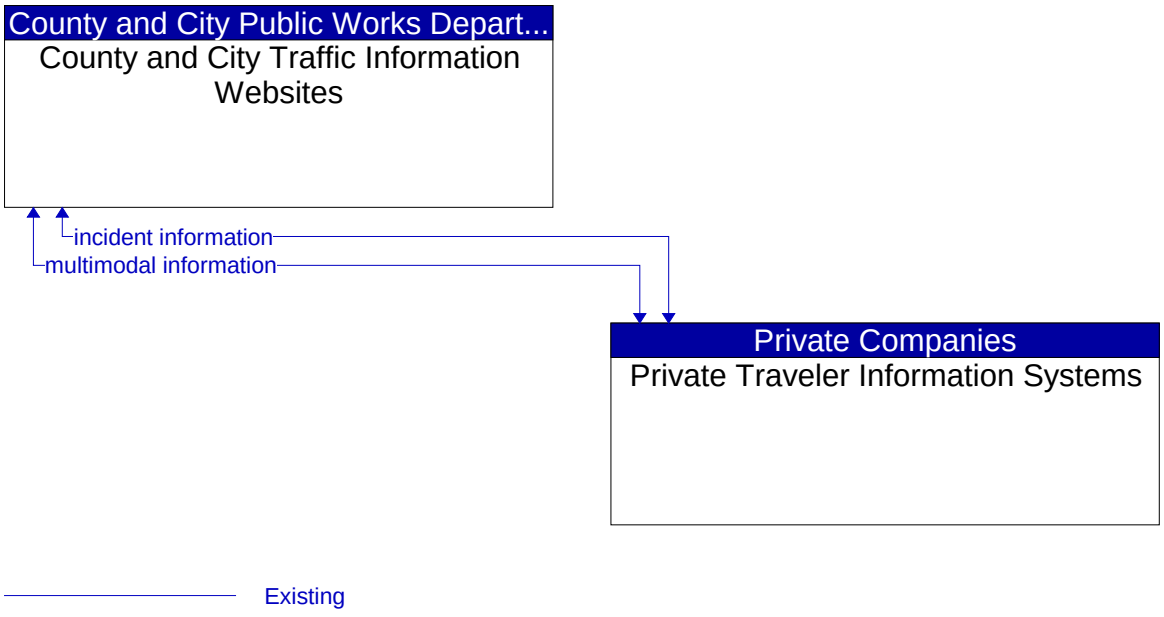

Figure 98: County and City Traffic Information Websites - Private Traveler Information Systems Interface

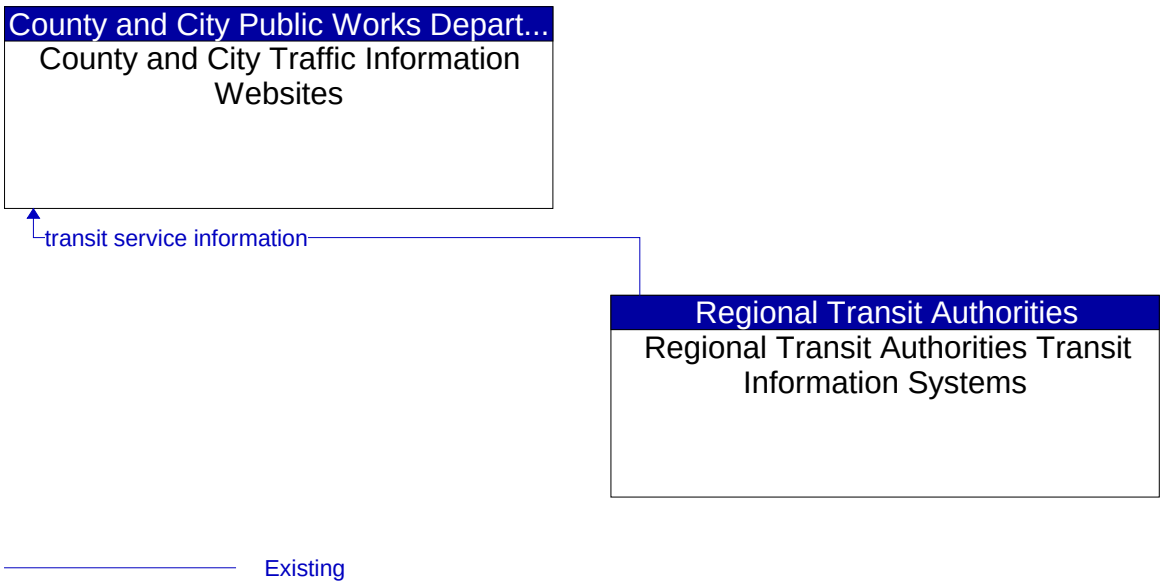

Figure 99: County and City Traffic Information Websites - Regional Transit Authorities Transit Information Systems Interface

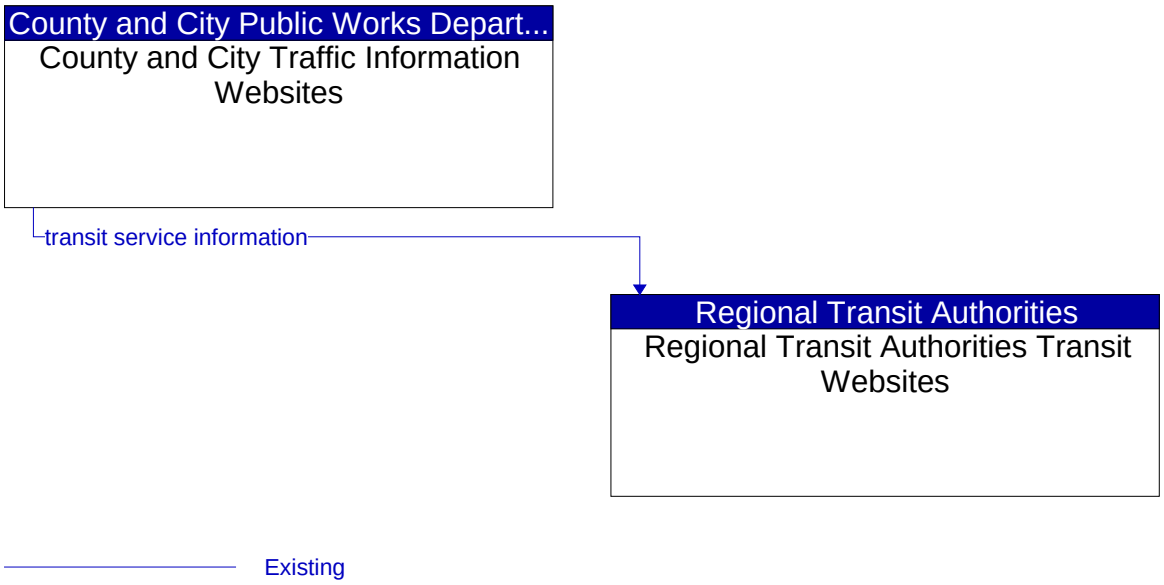

Figure 100: County and City Traffic Information Websites - Regional Transit Authorities Transit Websites Interface

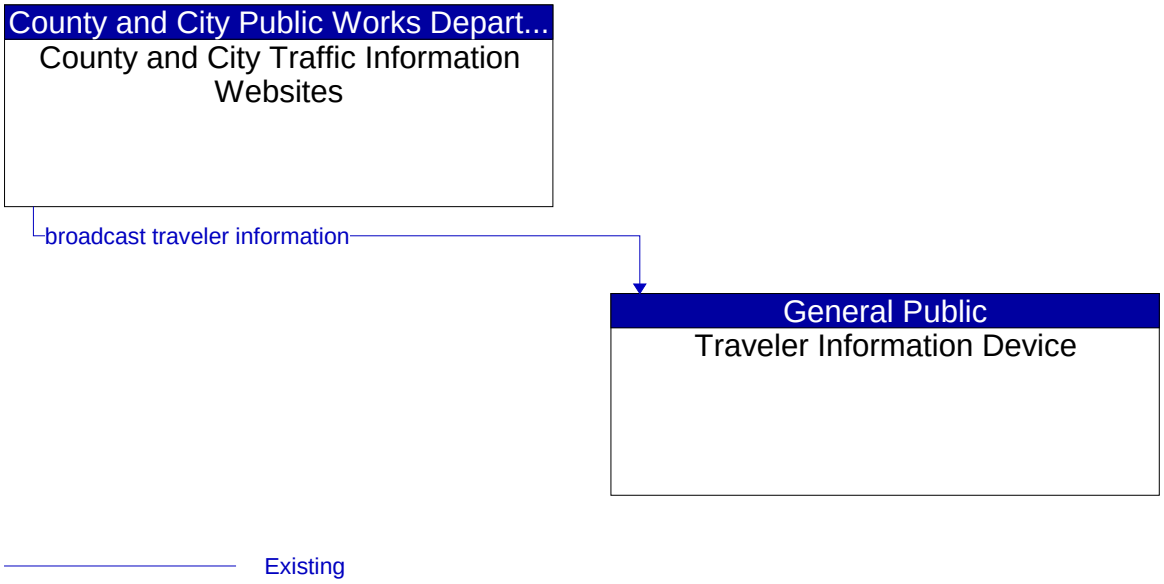

Figure 101: County and City Traffic Information Websites - Traveler Information Device Interface

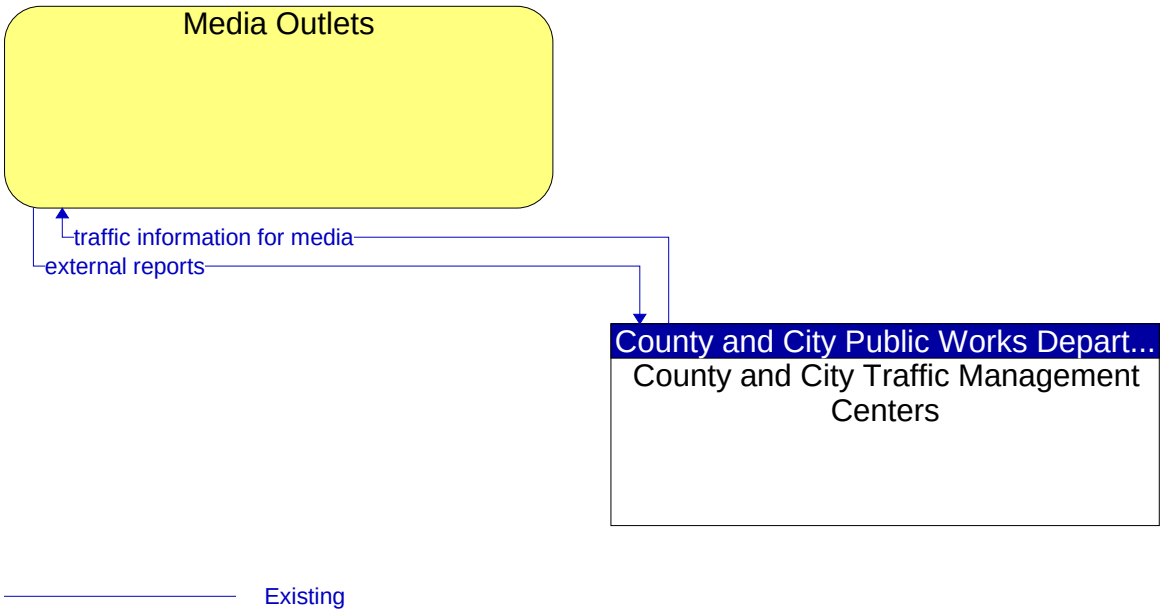

Figure 102: County and City Traffic Management Centers - Media Outlets Interface

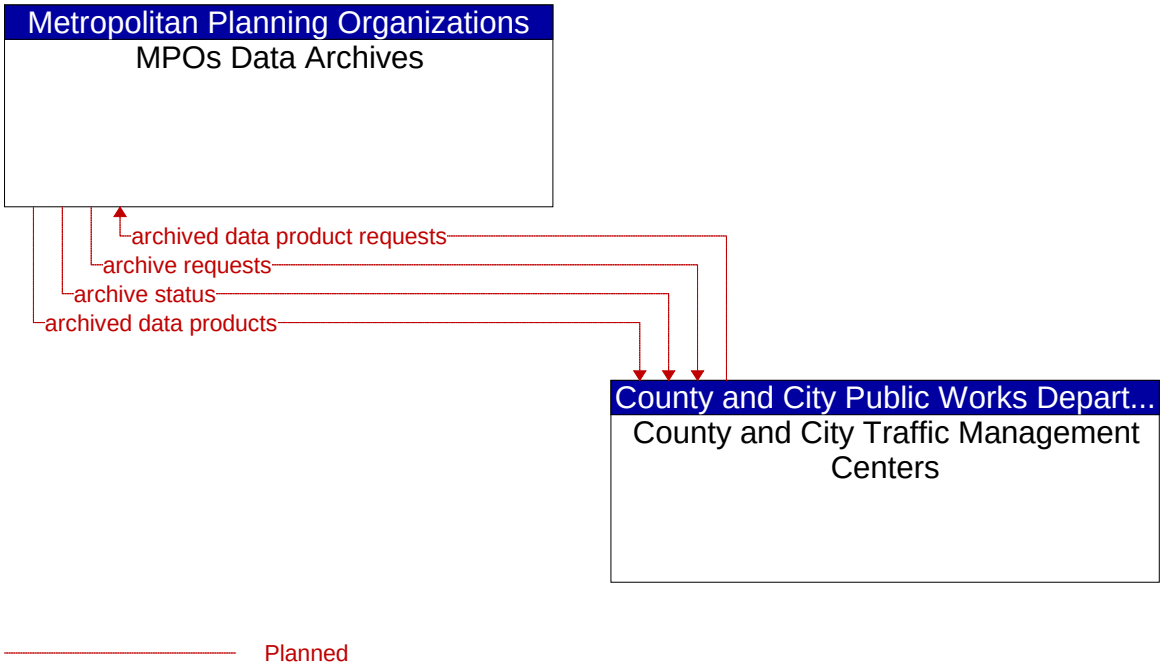

Figure 103: County and City Traffic Management Centers - MPOs Data Archives Interface

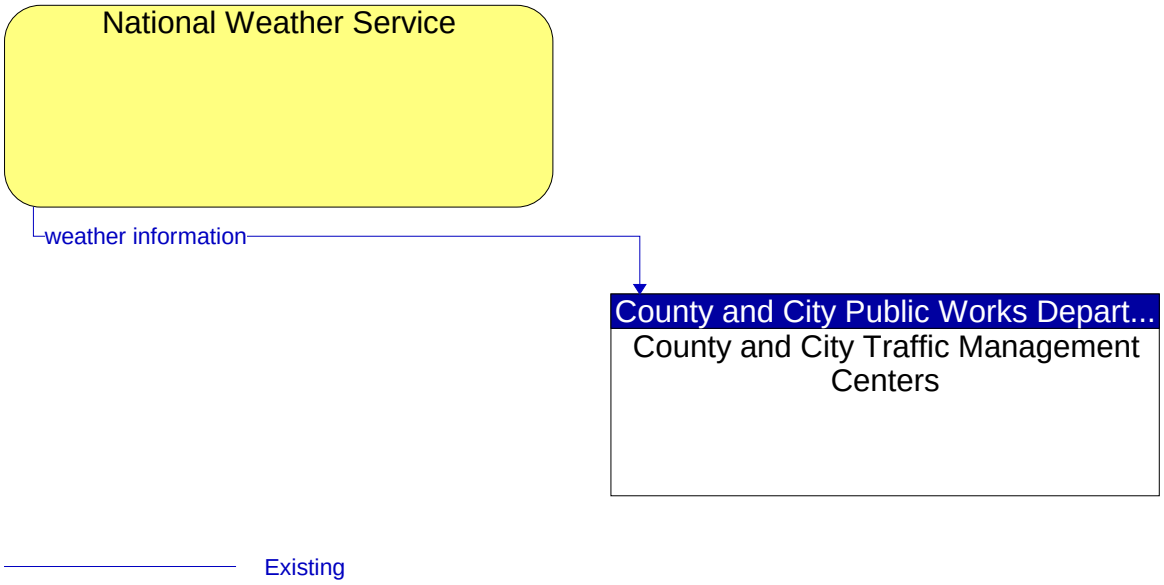

Figure 104: County and City Traffic Management Centers - National Weather Service Interface

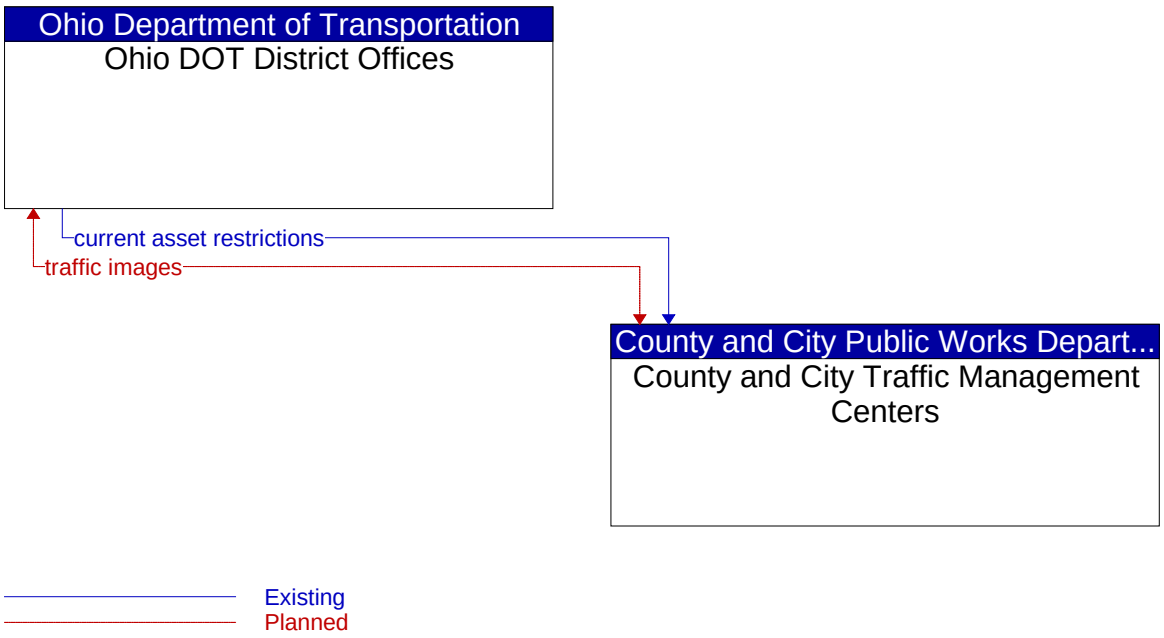

Figure 105: County and City Traffic Management Centers - Ohio DOT District Offices Interface

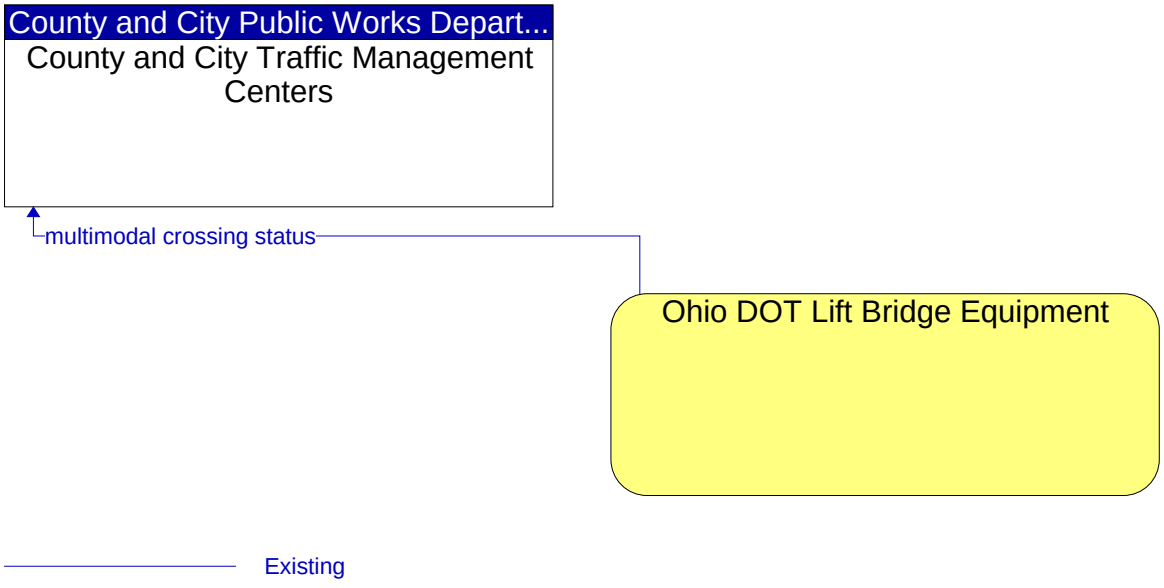

Figure 106: County and City Traffic Management Centers - Ohio DOT Lift Bridge Equipment Interface

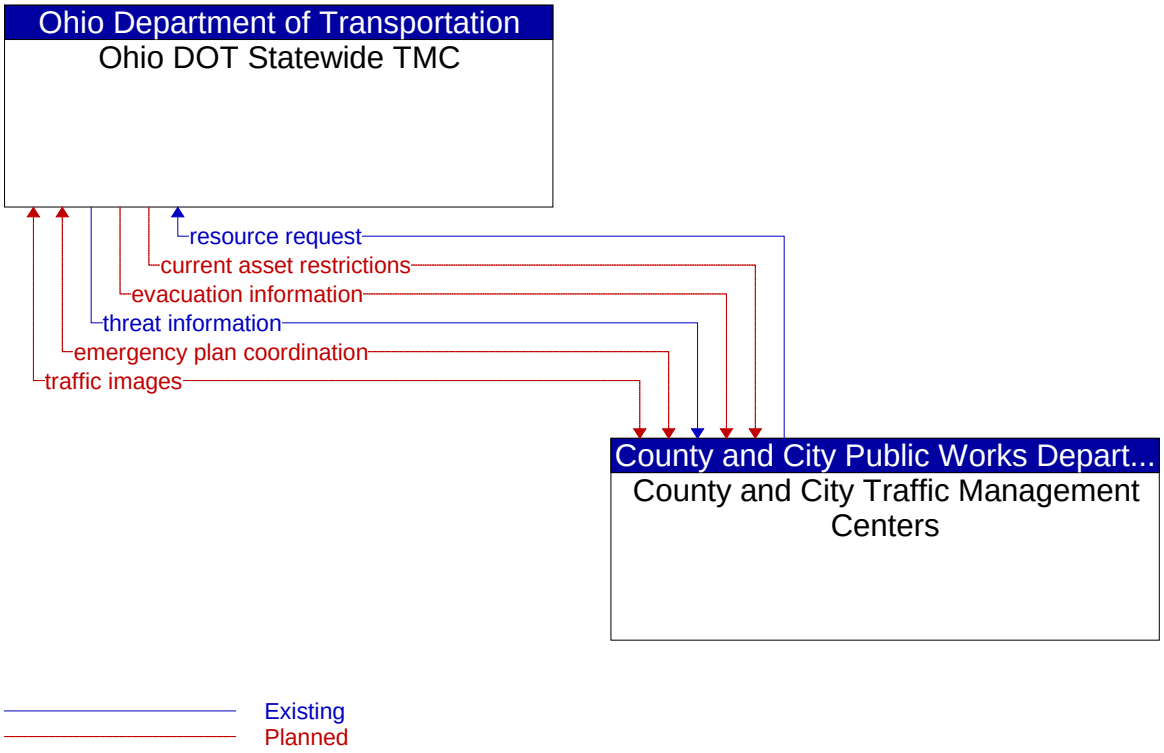

Figure 107: County and City Traffic Management Centers - Ohio DOT Statewide TMC Interface

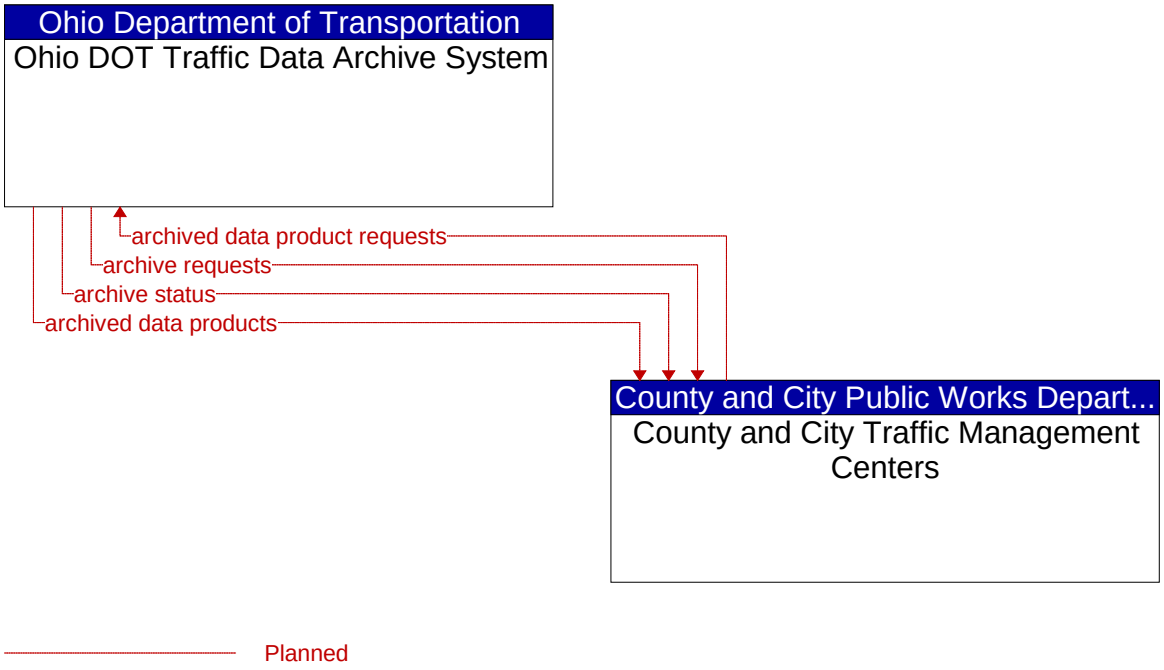

Figure 108: County and City Traffic Management Centers - Ohio DOT Traffic Data Archive System Interface

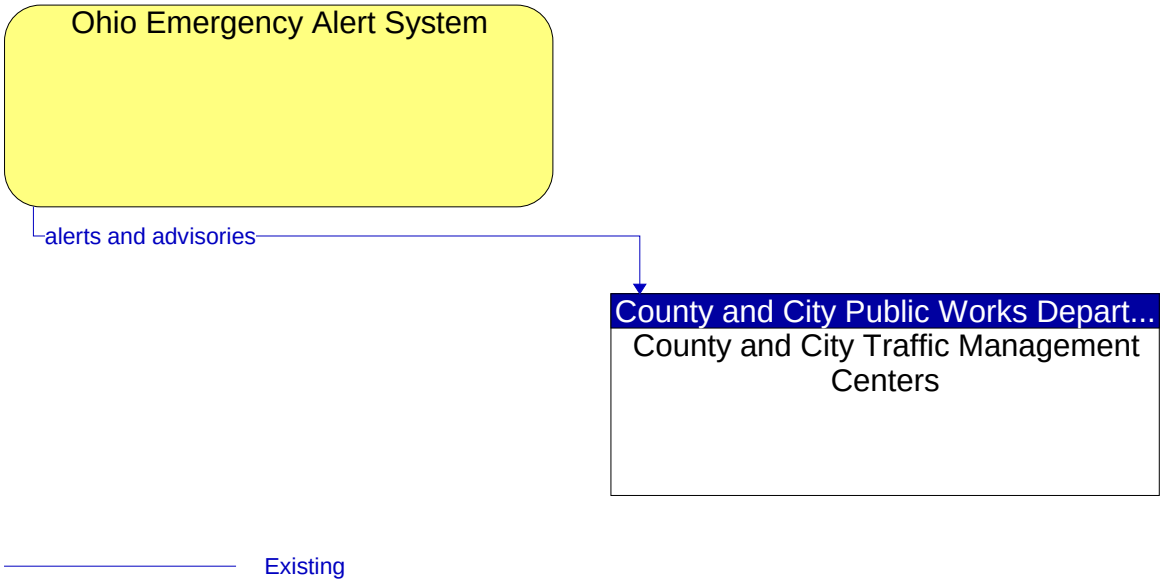

Figure 109: County and City Traffic Management Centers - Ohio Emergency Alert System Interface

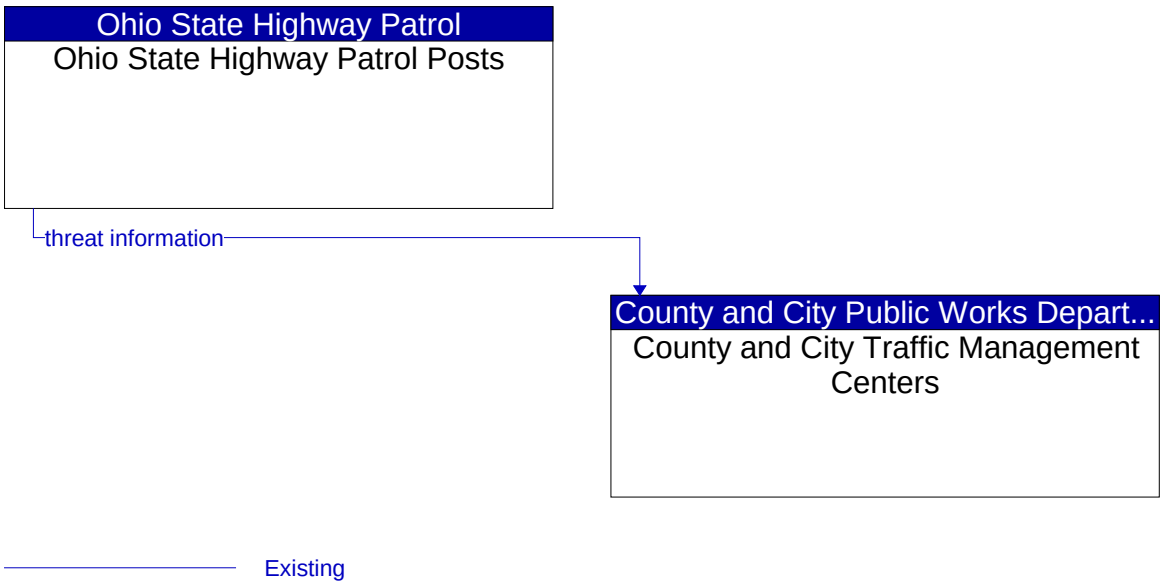

Figure 110: County and City Traffic Management Centers - Ohio State Highway Patrol Posts Interface

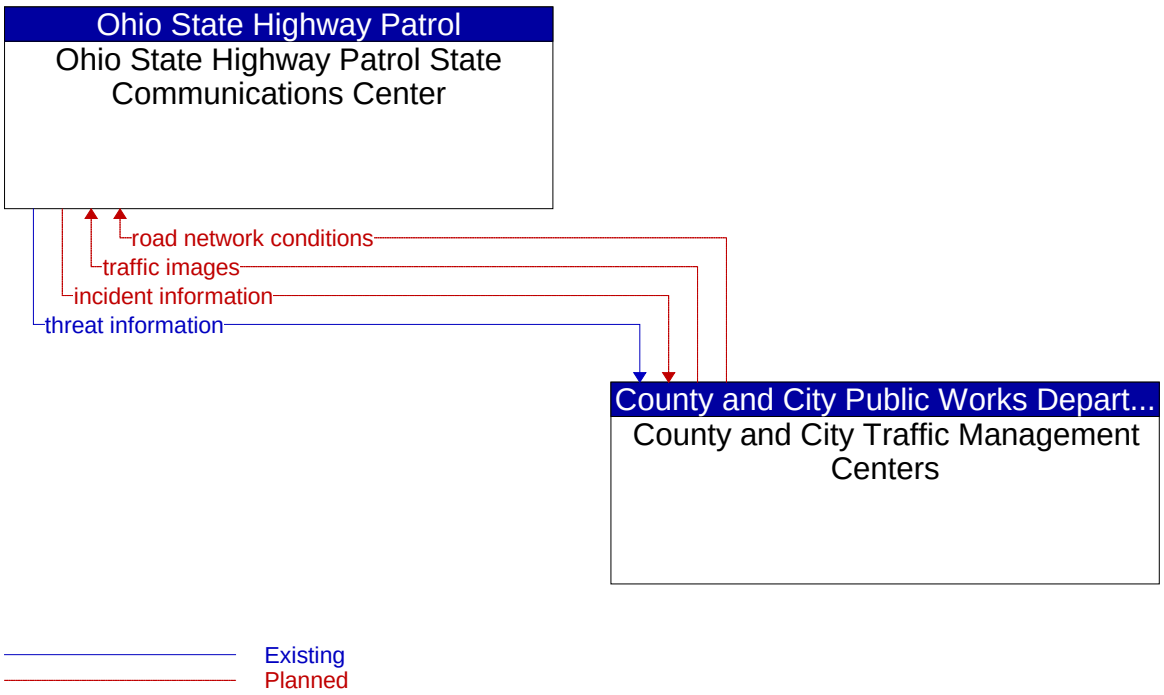

Figure 111: County and City Traffic Management Centers - Ohio State Highway Patrol State Communications Center Interface

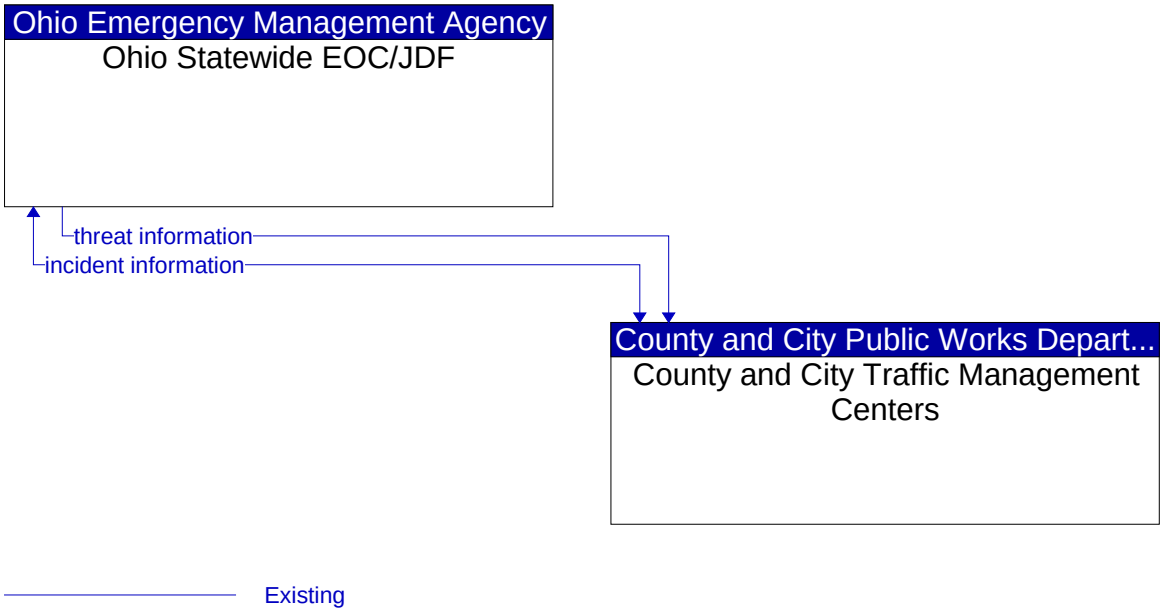

Figure 112: County and City Traffic Management Centers - Ohio Statewide EOC/JDF Interface

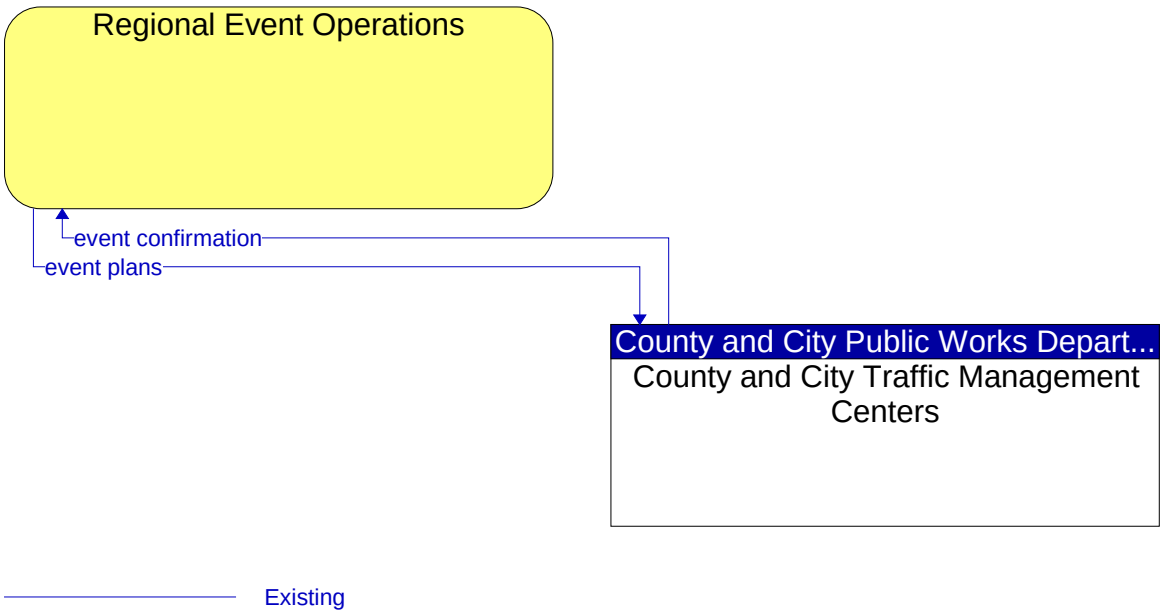

Figure 113: County and City Traffic Management Centers - Regional Event Operations Interface

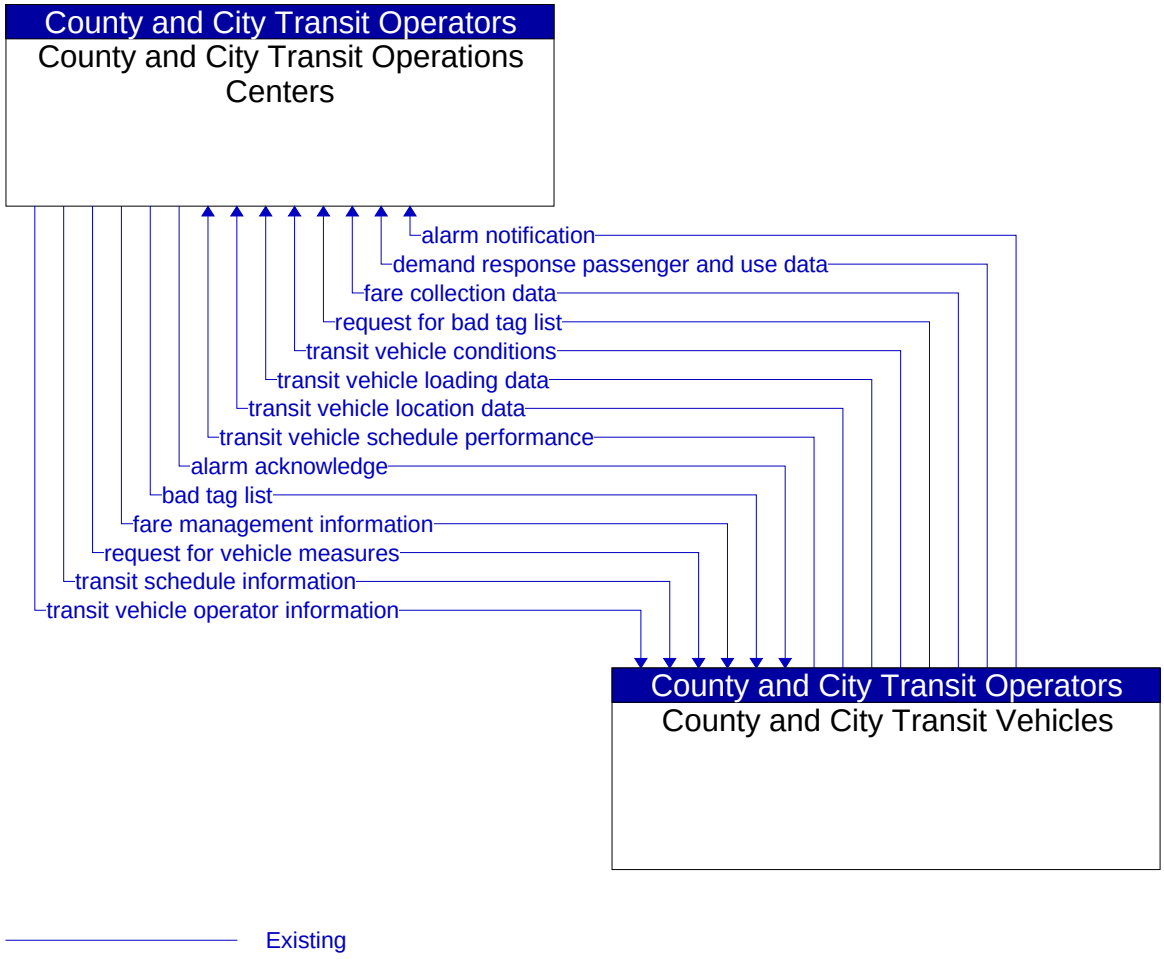

Figure 114: County and City Transit Operations Centers - County and City Transit Vehicles Interface

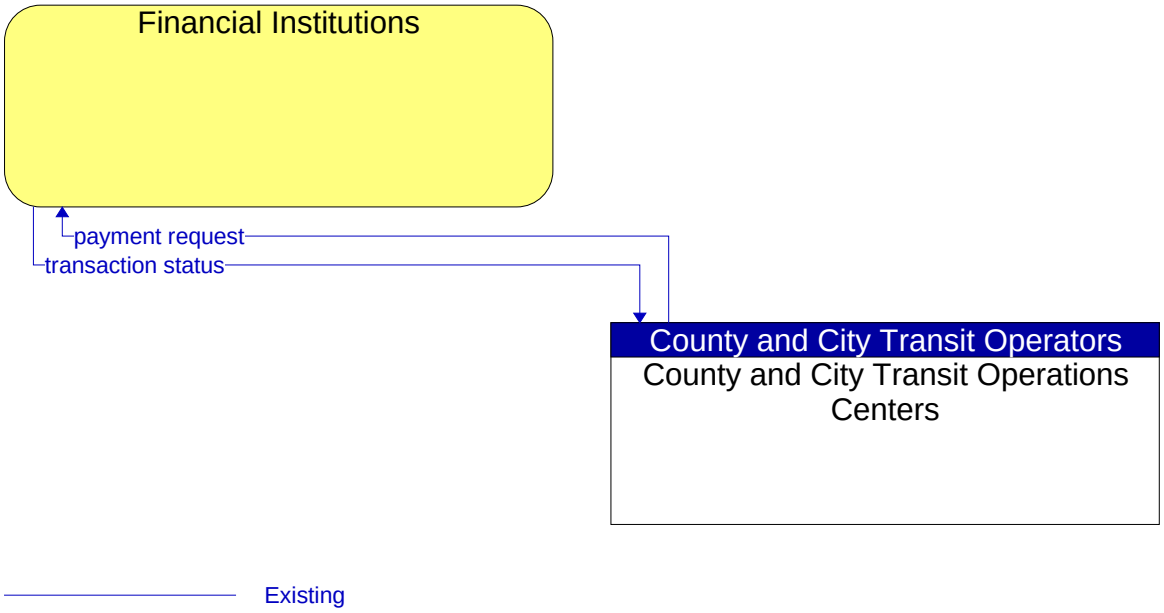

Figure 115: County and City Transit Operations Centers - Financial Institutions Interface

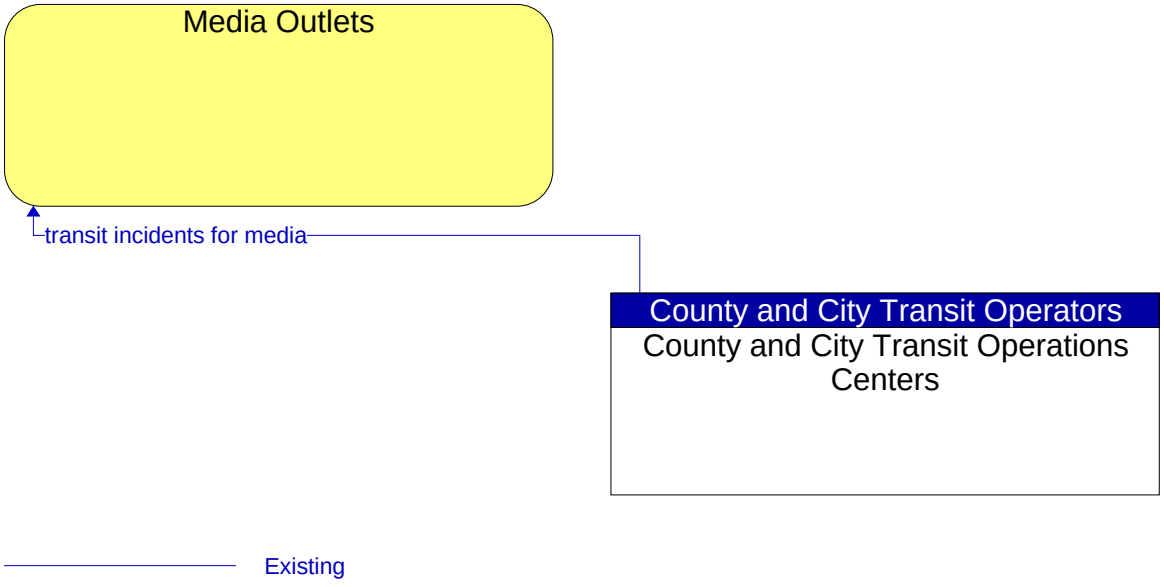

Figure 116: County and City Transit Operations Centers - Media Outlets Interface

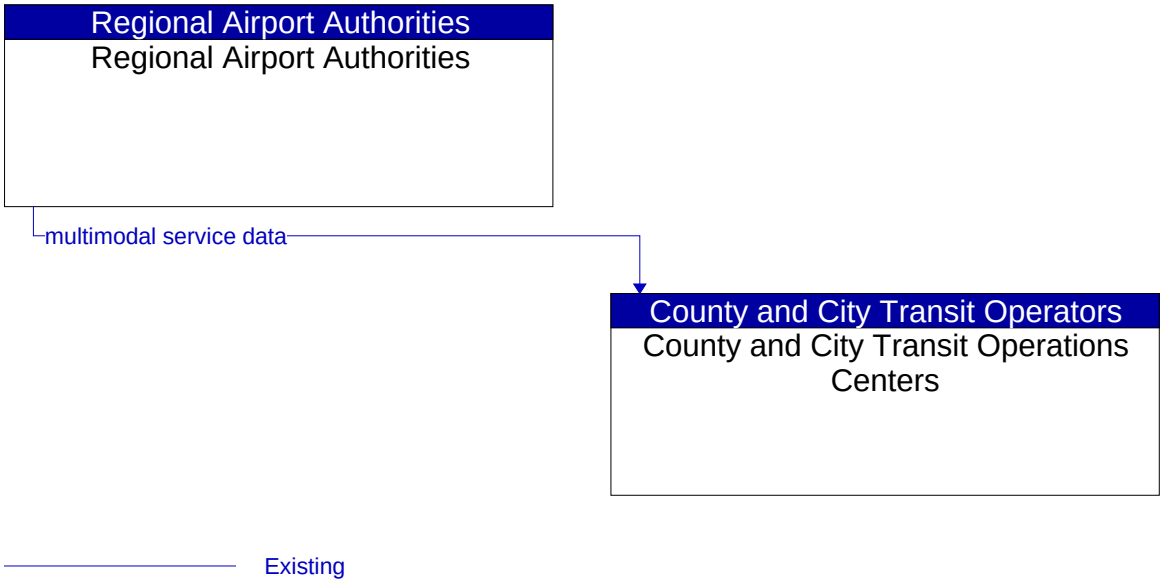

Figure 117: County and City Transit Operations Centers - Regional Airport Authorities Interface

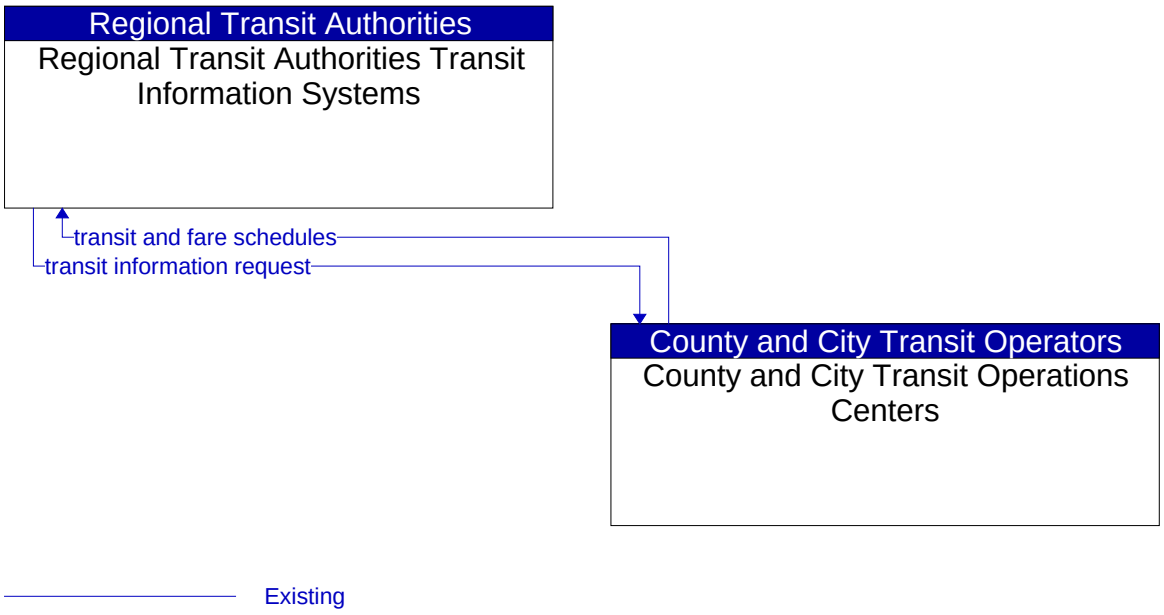

Figure 118: County and City Transit Operations Centers - Regional Transit Authorities Transit Information Systems Interface

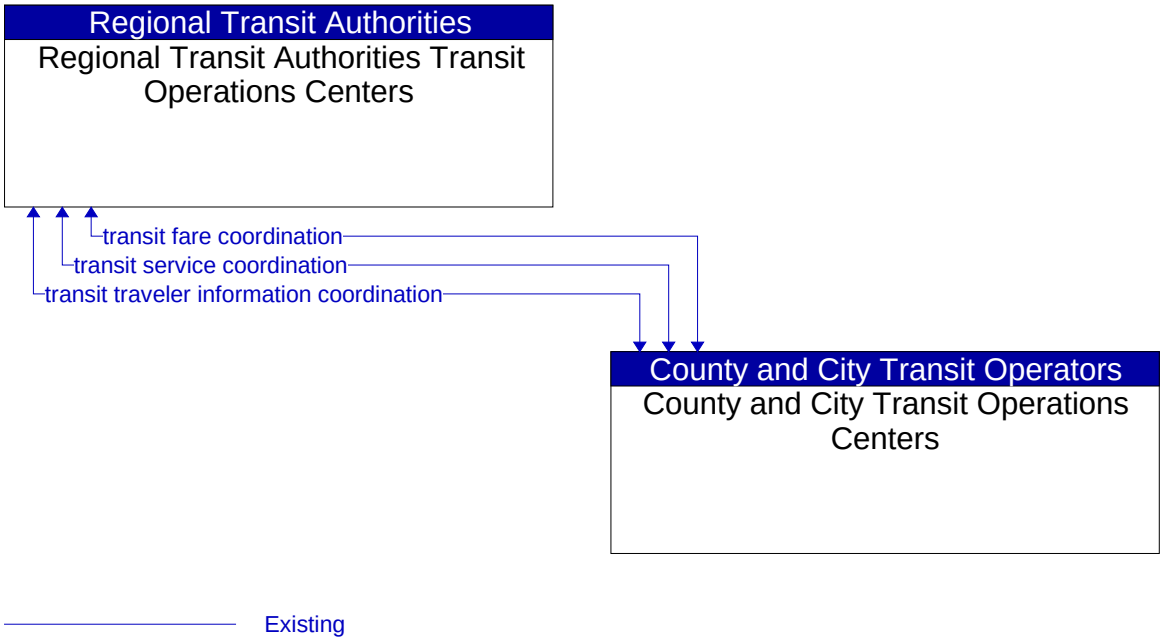

Figure 119: County and City Transit Operations Centers - Regional Transit Authorities Transit Operations Centers Interface

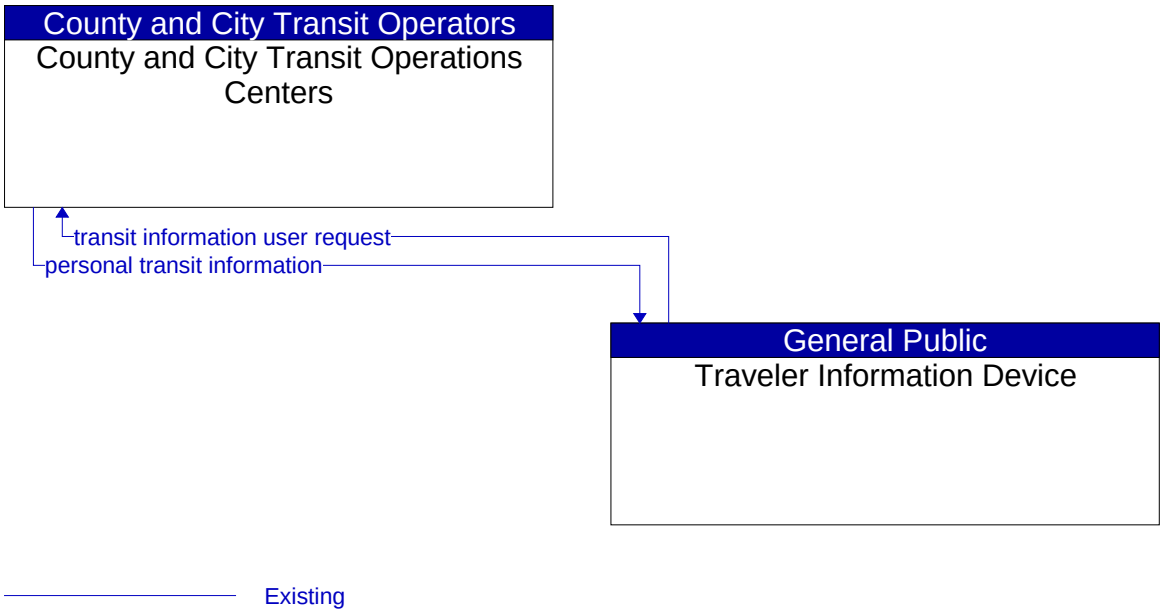

Figure 120: County and City Transit Operations Centers - Traveler Information Device Interface

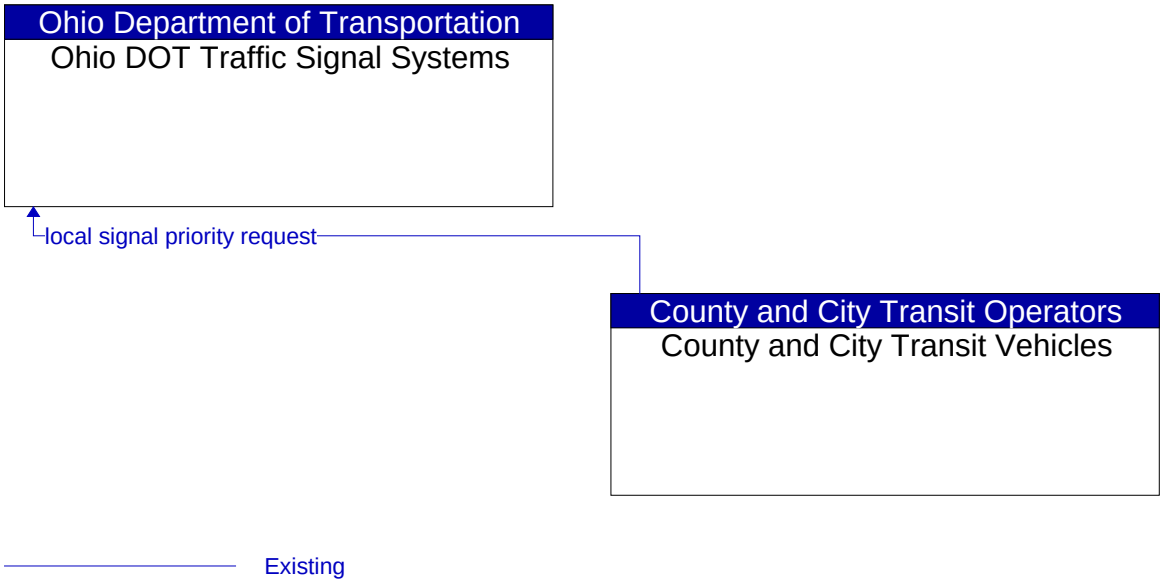

Figure 121: County and City Transit Vehicles - Ohio DOT Traffic Signal Systems Interface

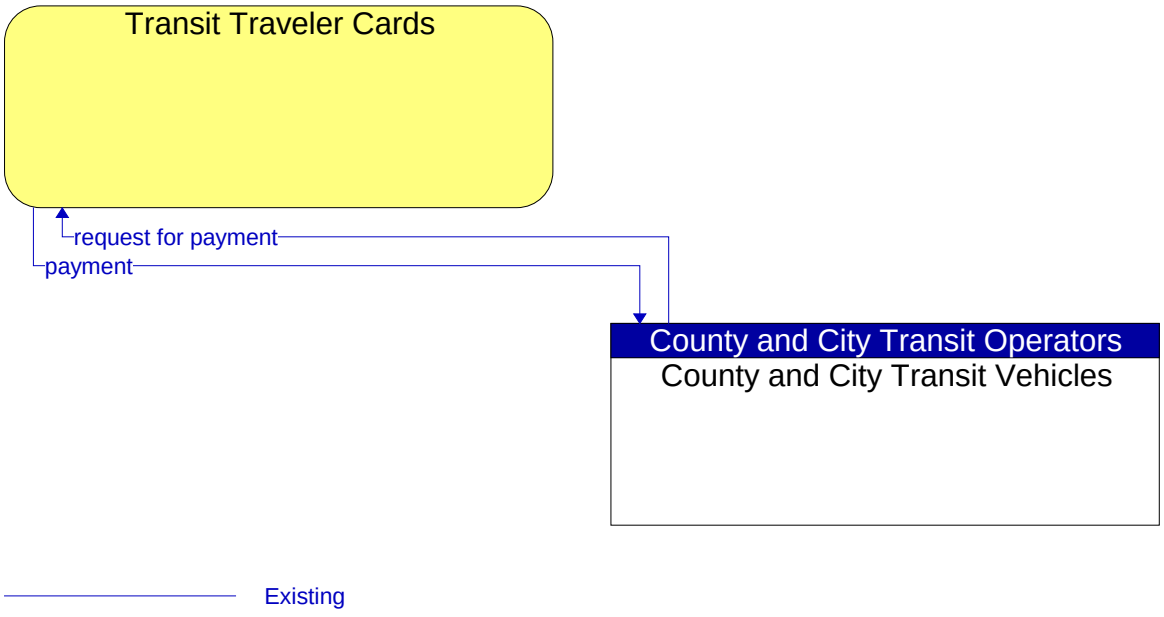

Figure 122: County and City Transit Vehicles - Transit Traveler Cards Interface

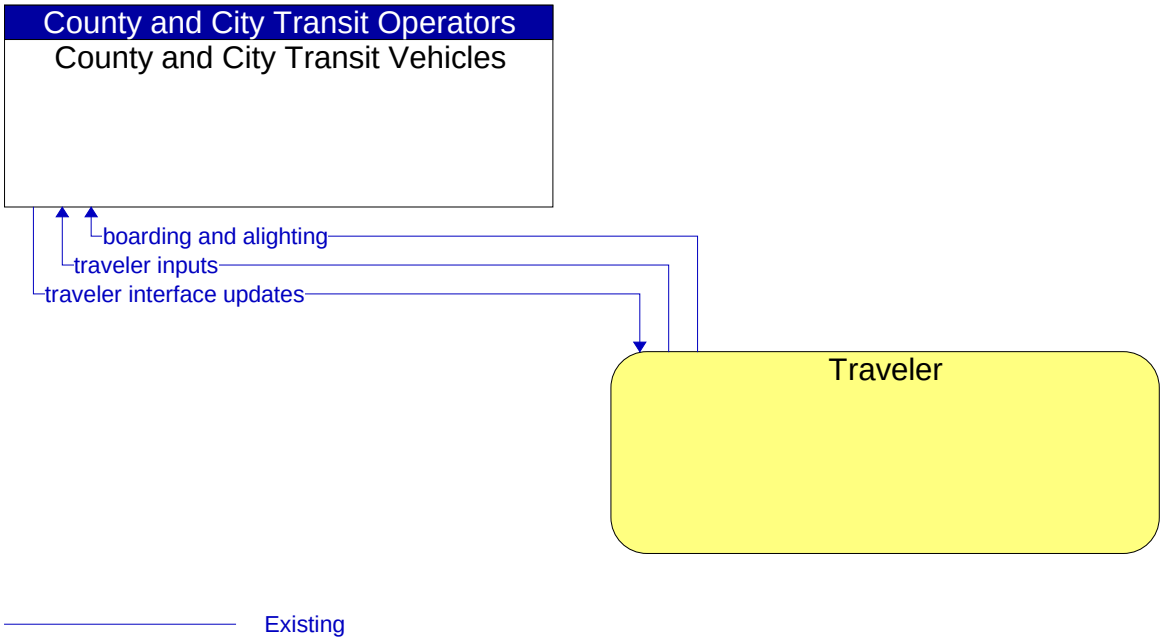

Figure 123: County and City Transit Vehicles - Traveler Interface

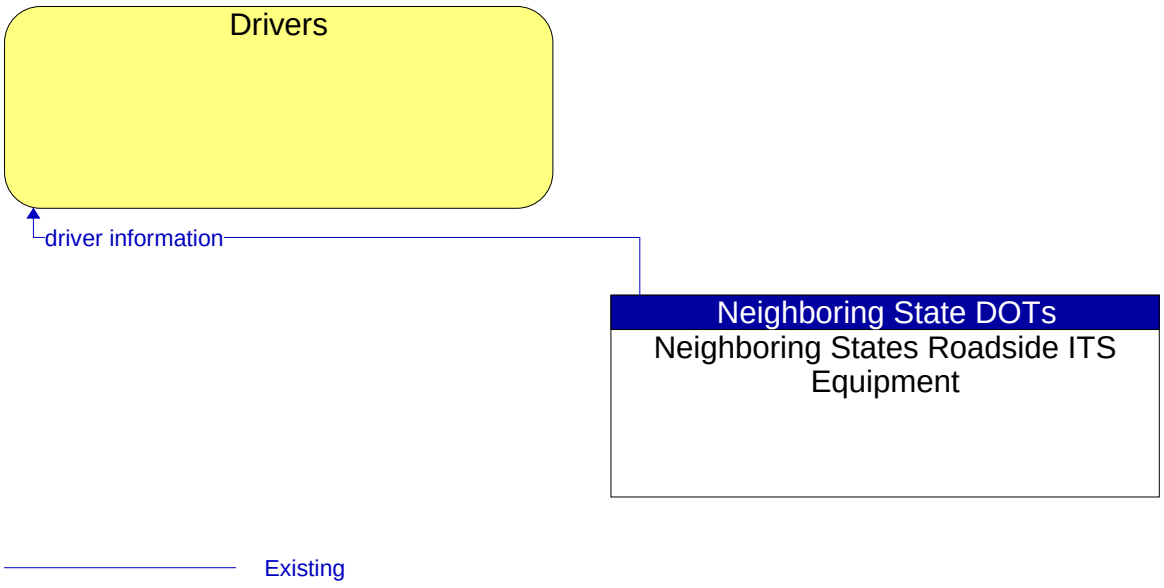

Figure 124: Drivers - Neighboring States Roadside ITS Equipment Interface

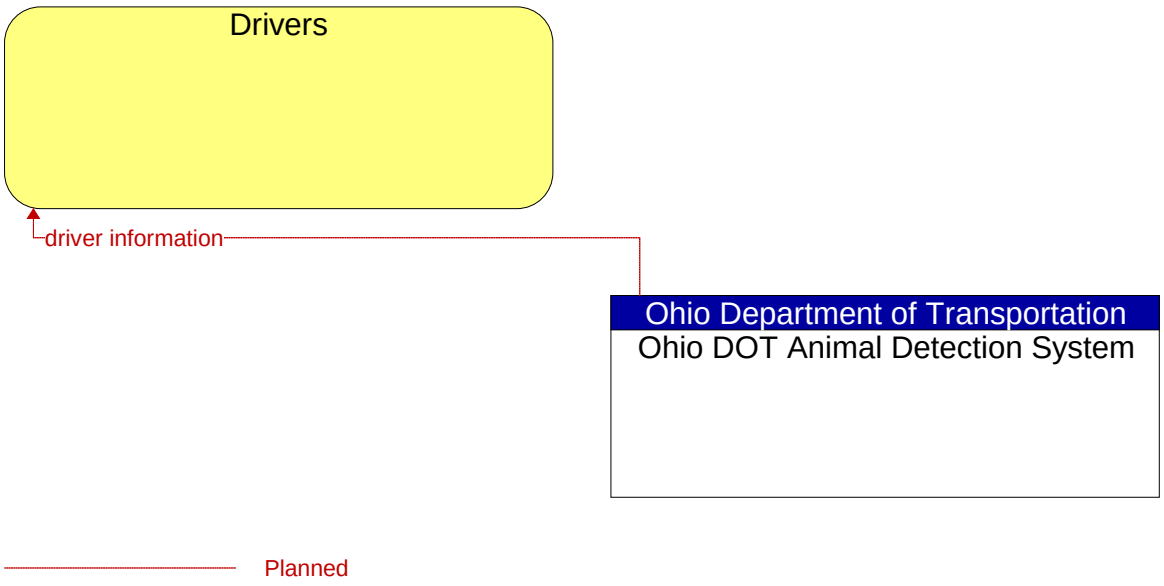

Figure 125: Drivers - Ohio DOT Animal Detection System Interface

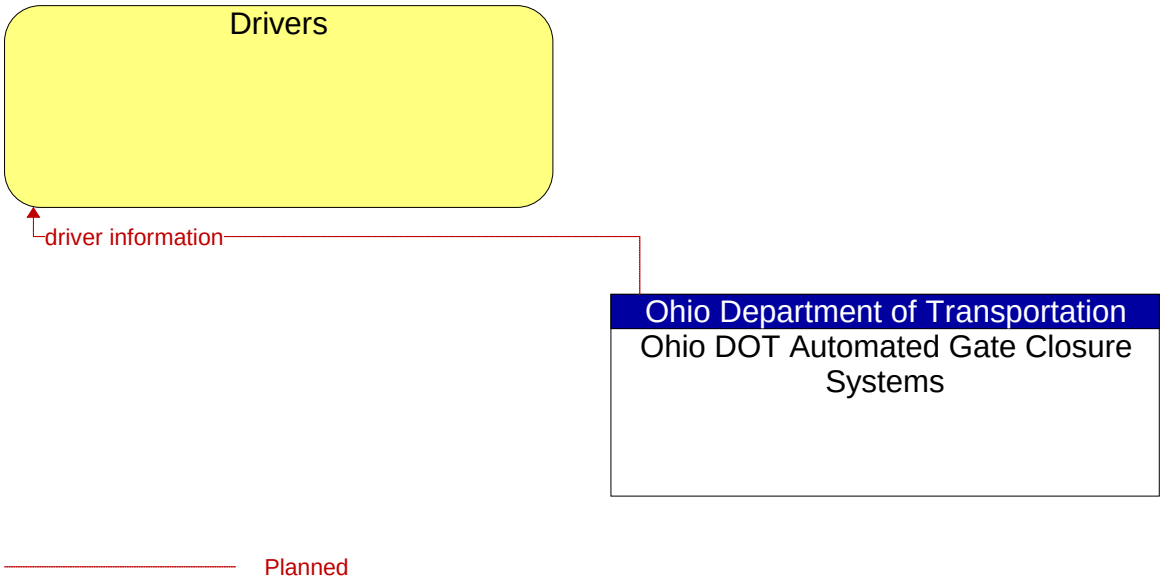

Figure 126: Drivers - Ohio DOT Automated Gate Closure Systems Interface

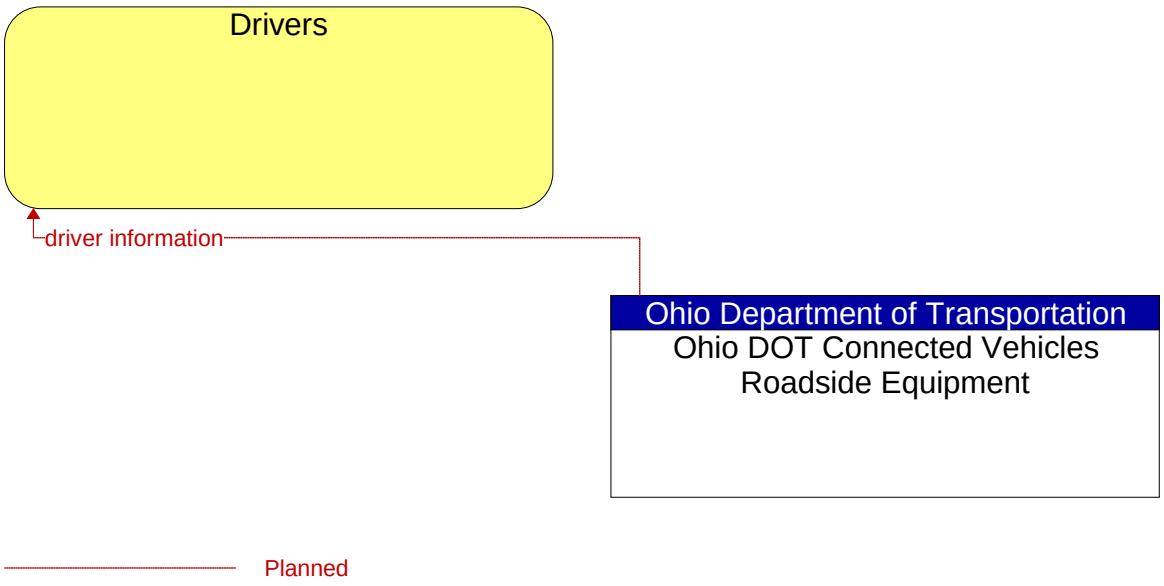

Figure 127: Drivers - Ohio DOT Connected Vehicles Roadside Equipment Interface

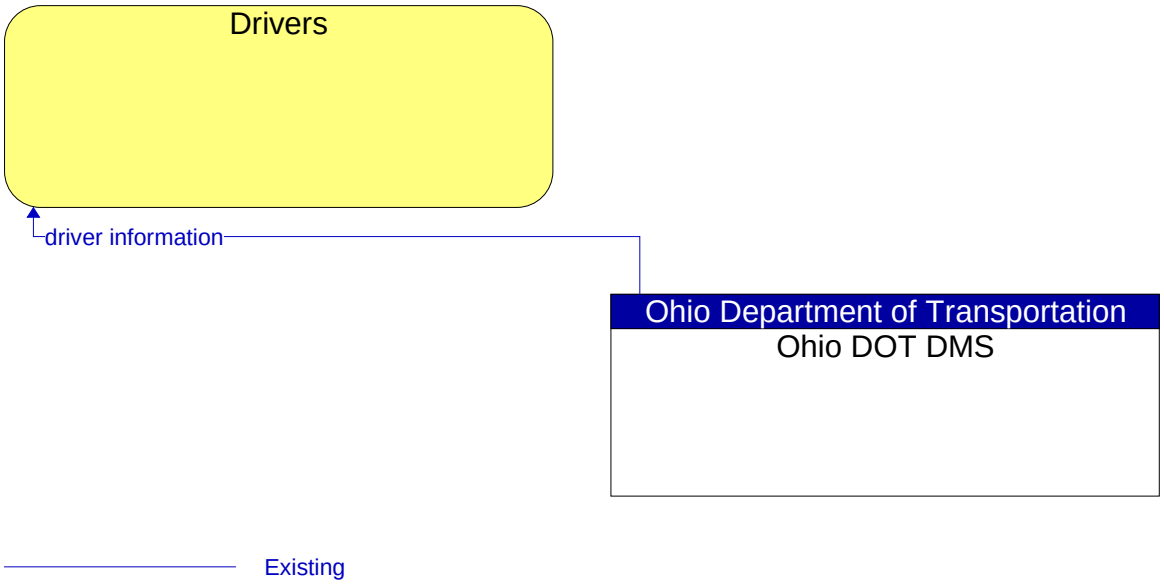

Figure 128: Drivers - Ohio DOT DMS Interface

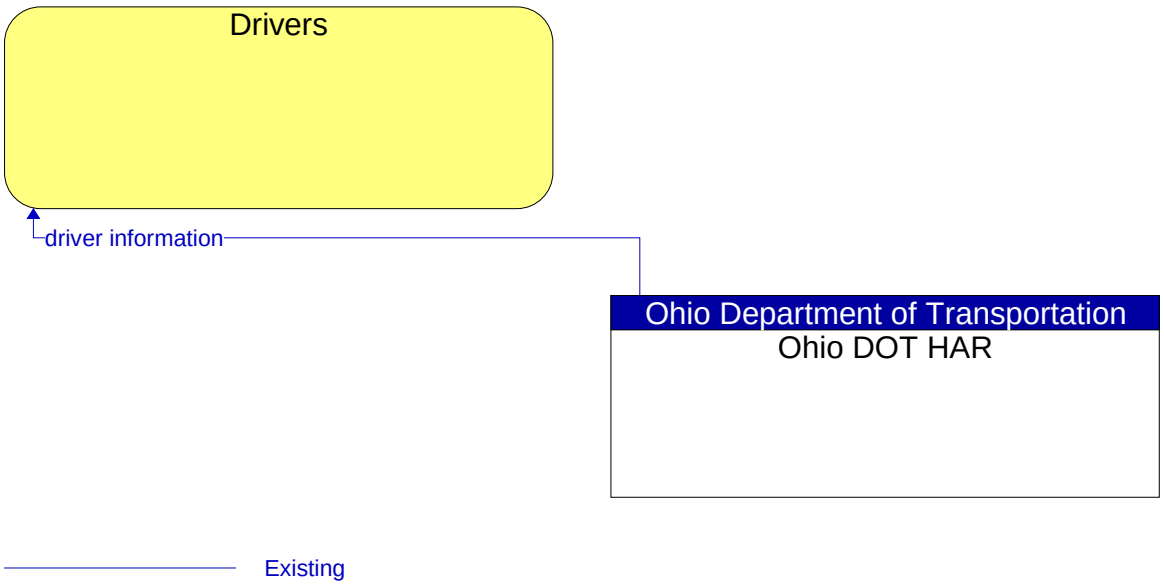

Figure 129: Drivers - Ohio DOT HAR Interface

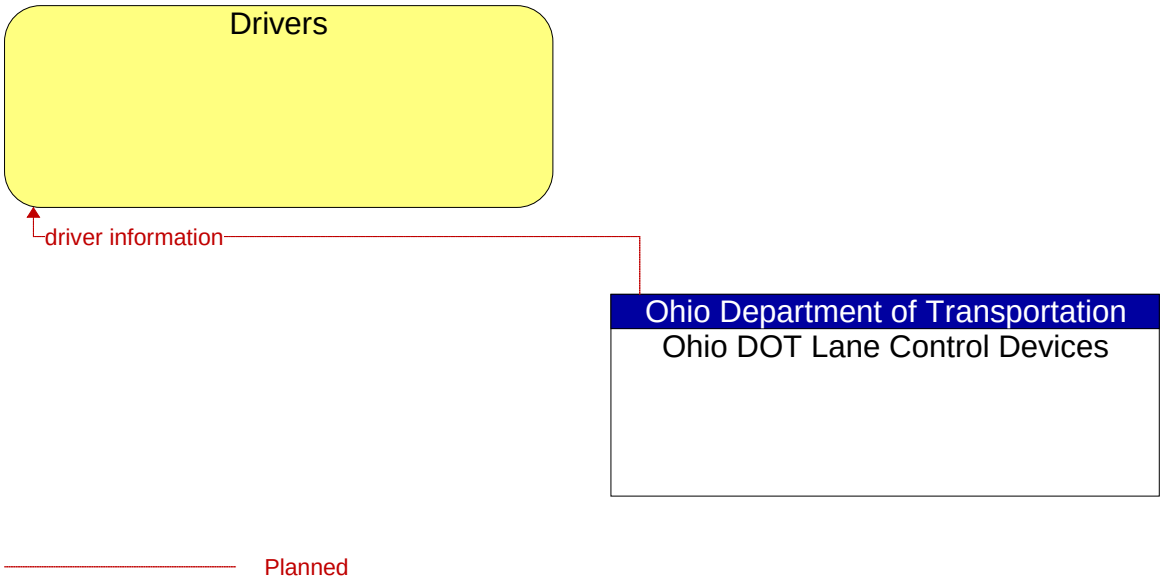

Figure 130: Drivers - Ohio DOT Lane Control Devices Interface

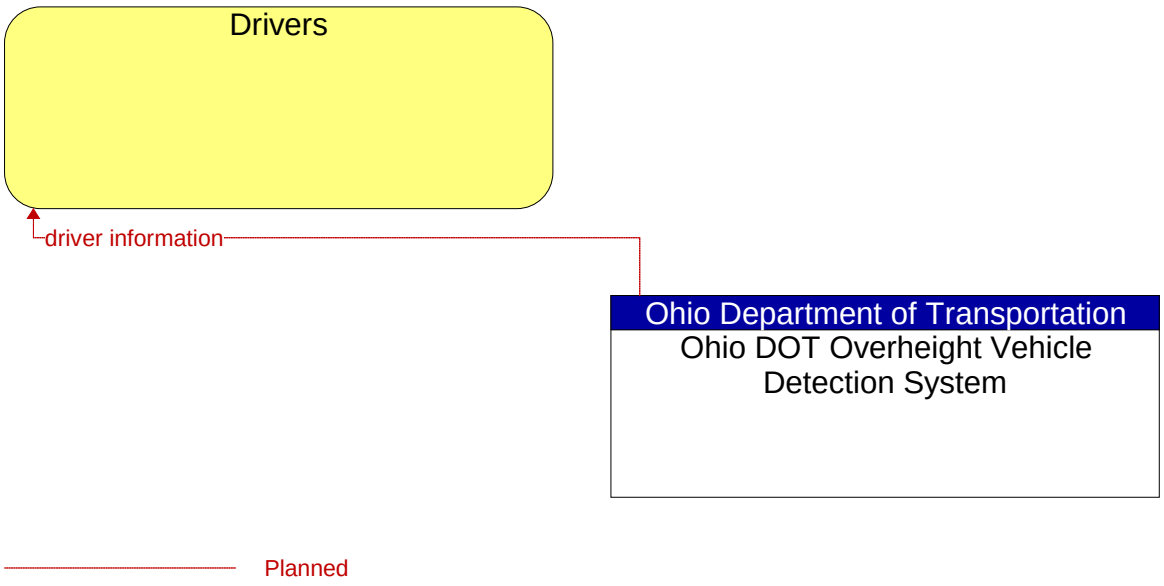

Figure 131: Drivers - Ohio DOT Overheight Vehicle Detection System Interface

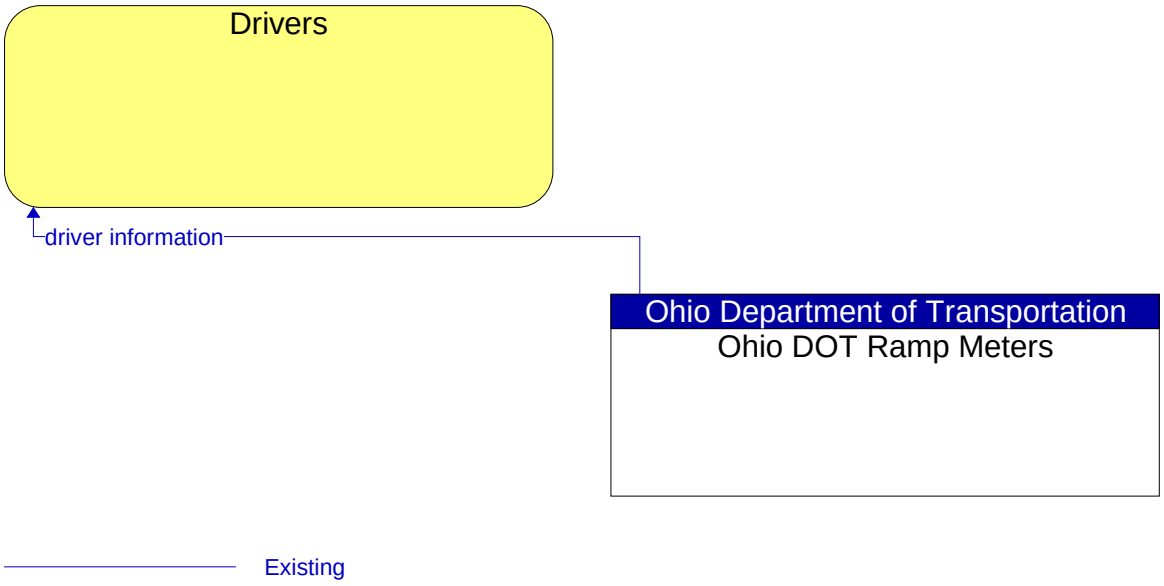

Figure 132: Drivers - Ohio DOT Ramp Meters Interface

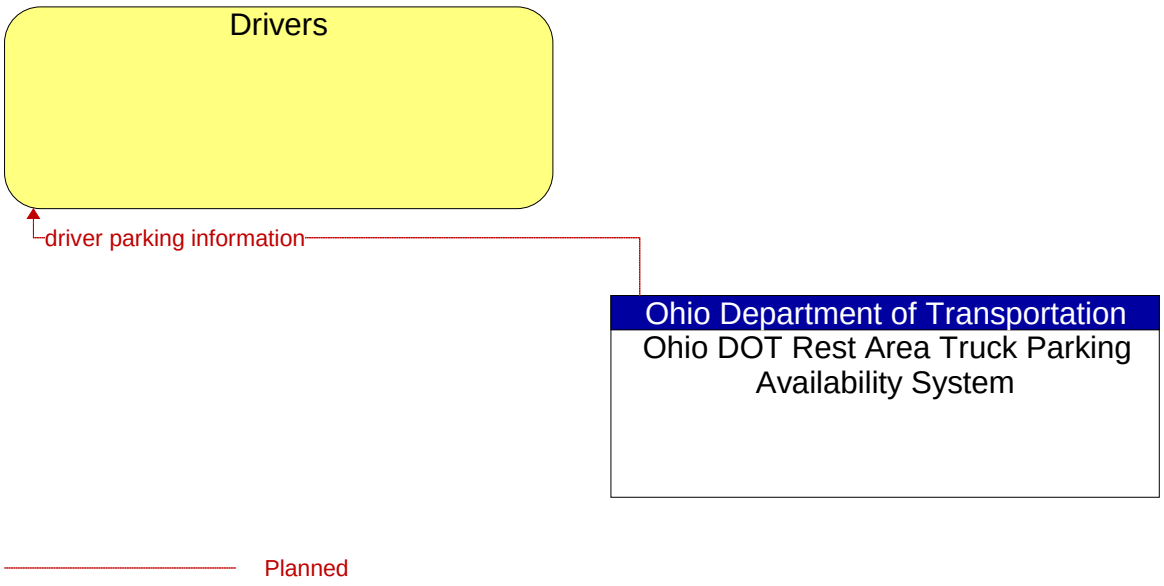

Figure 133: Drivers - Ohio DOT Rest Area Truck Parking Availability System Interface

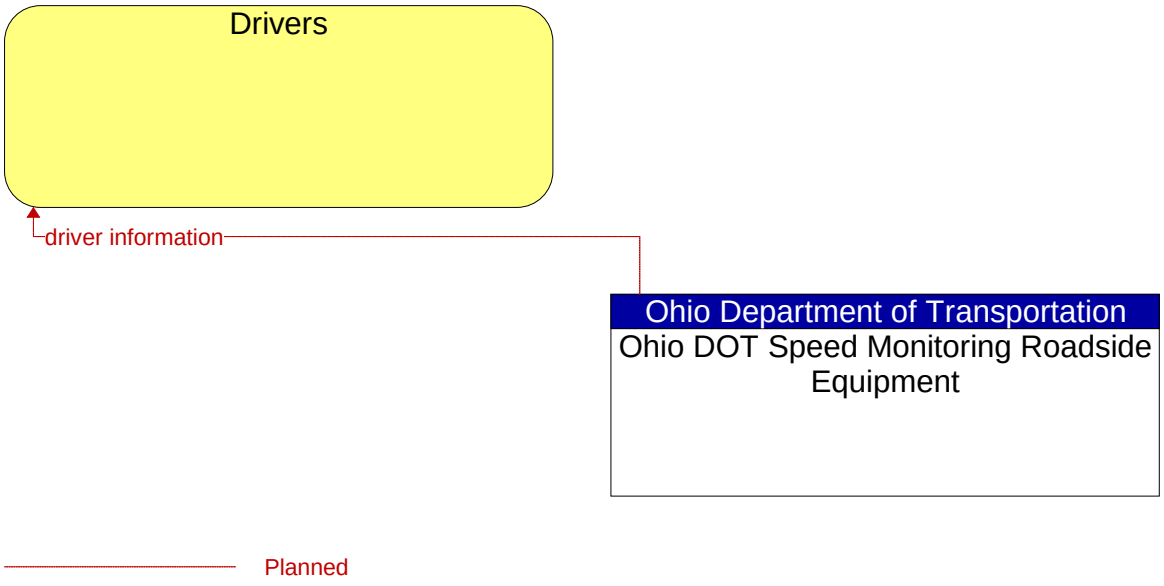

Figure 134: Drivers - Ohio DOT Speed Monitoring Roadside Equipment Interface

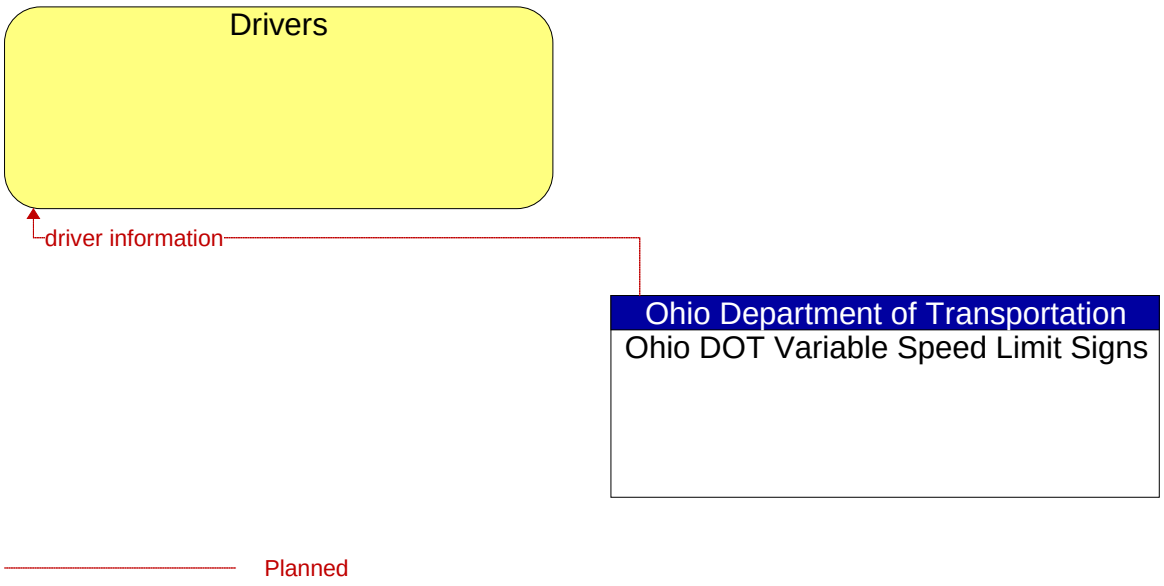

Figure 135: Drivers - Ohio DOT Variable Speed Limit Signs Interface

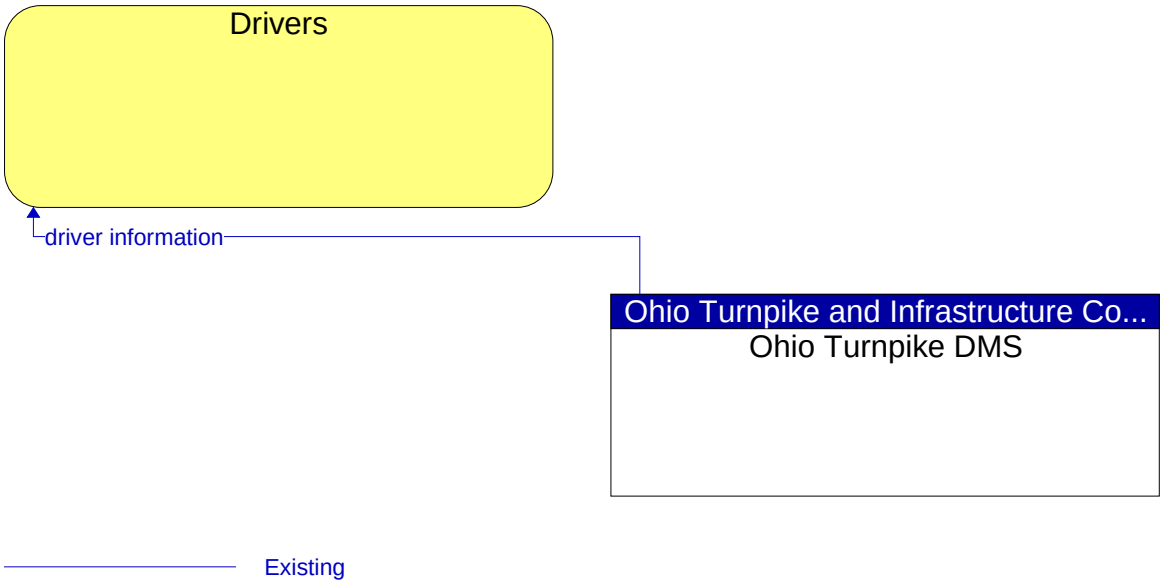

Figure 136: Drivers - Ohio Turnpike DMS Interface

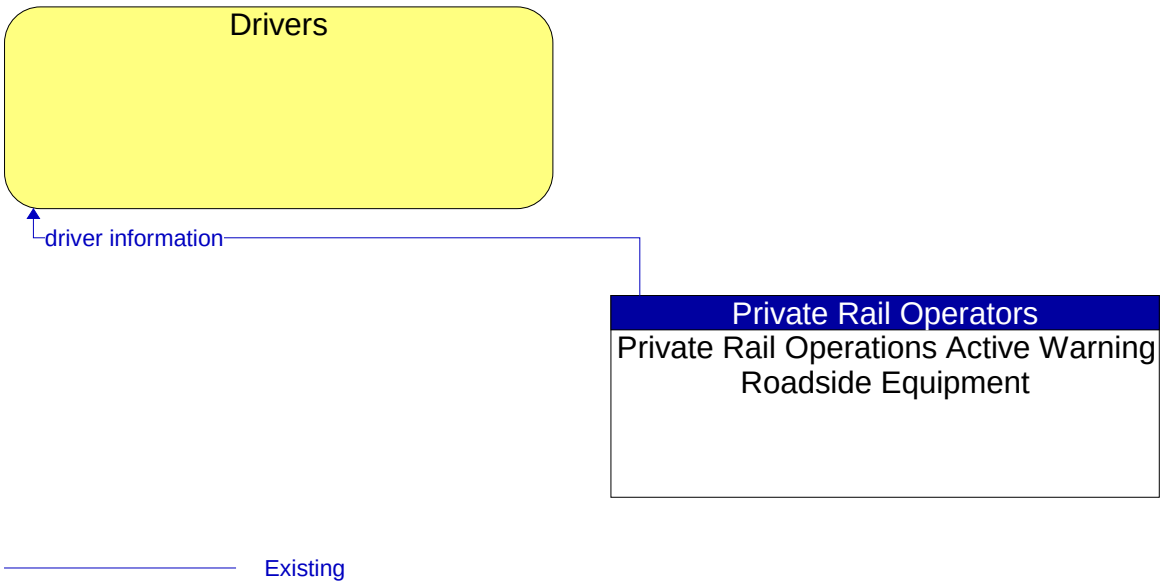

Figure 137: Drivers - Private Rail Operations Active Warning Roadside Equipment Interface

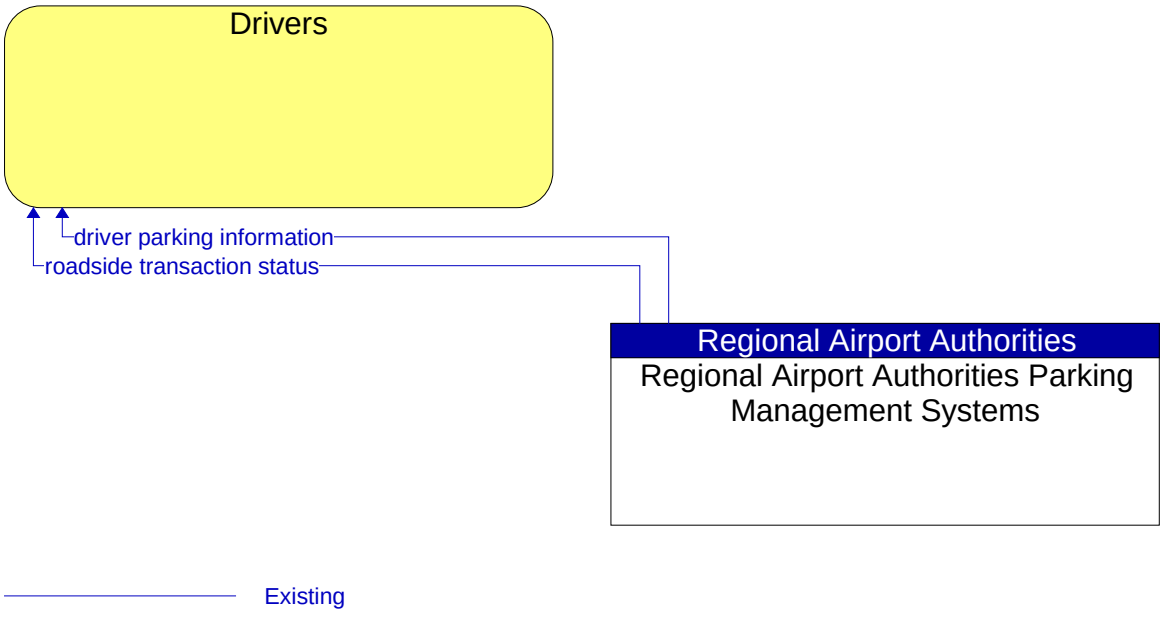

Figure 138: Drivers - Regional Airport Authorities Parking Management Systems Interface

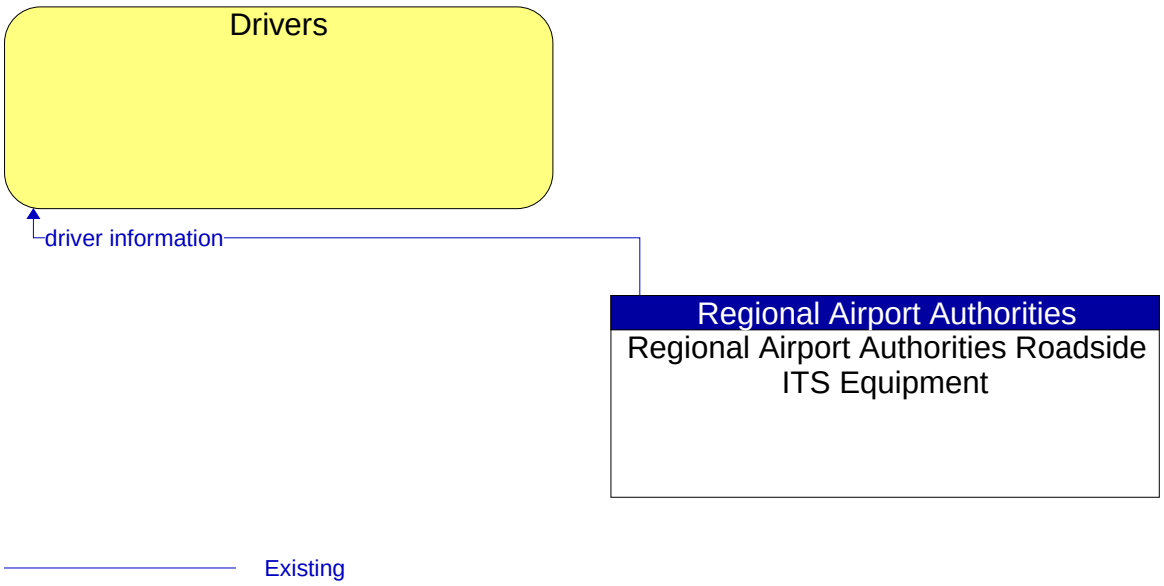

Figure 139: Drivers - Regional Airport Authorities Roadside ITS Equipment Interface

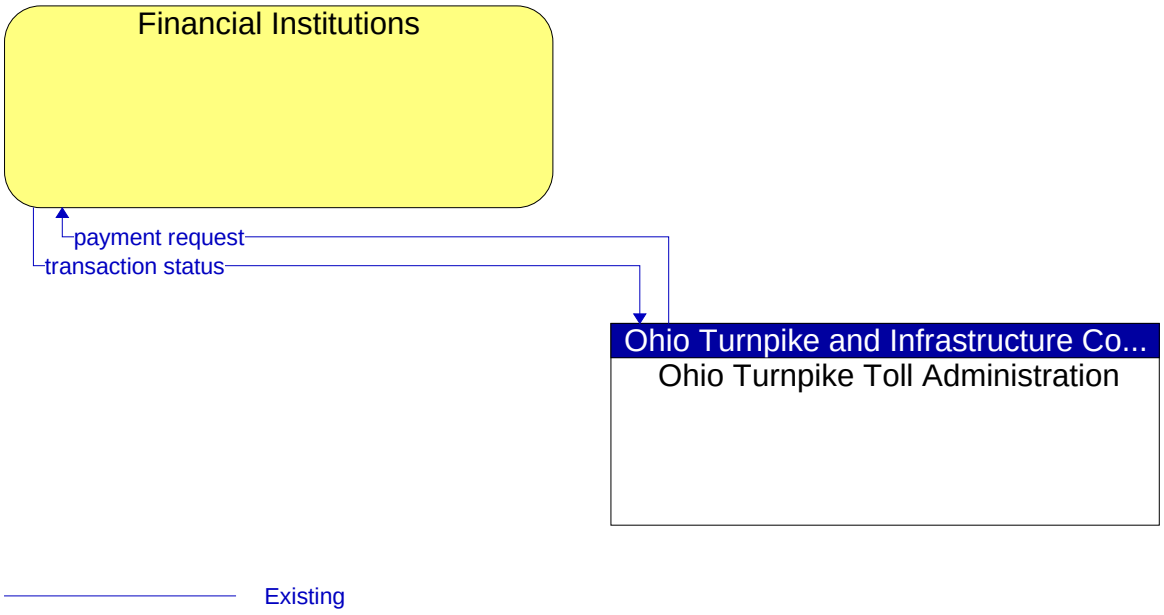

Figure 140: Financial Institutions - Ohio Turnpike Toll Administration Interface

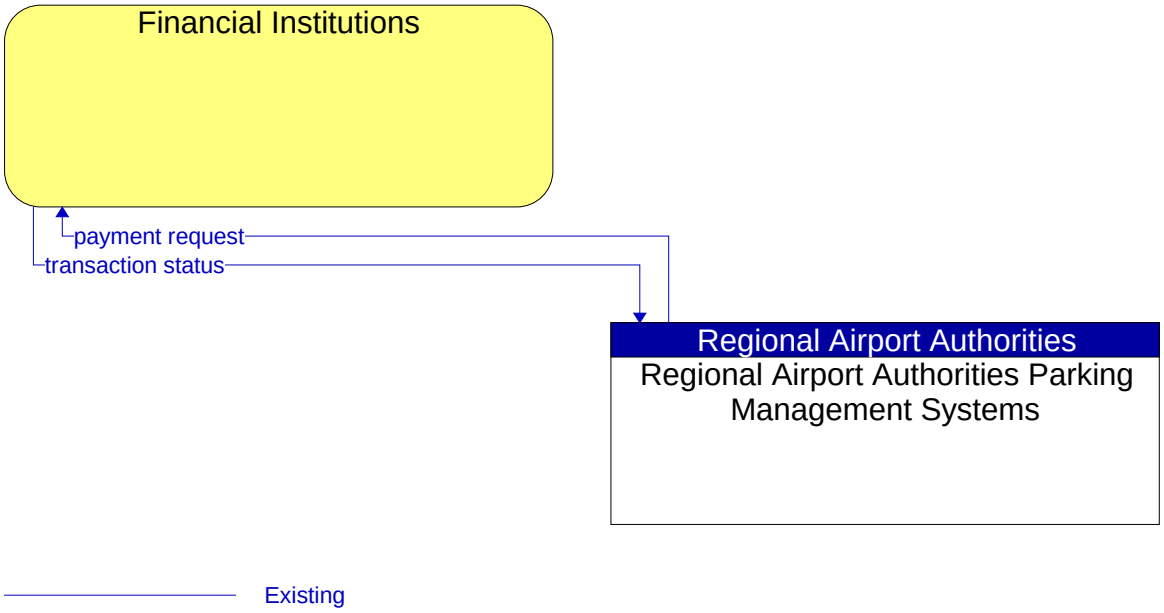

Figure 141: Financial Institutions - Regional Airport Authorities Parking Management Systems Interface

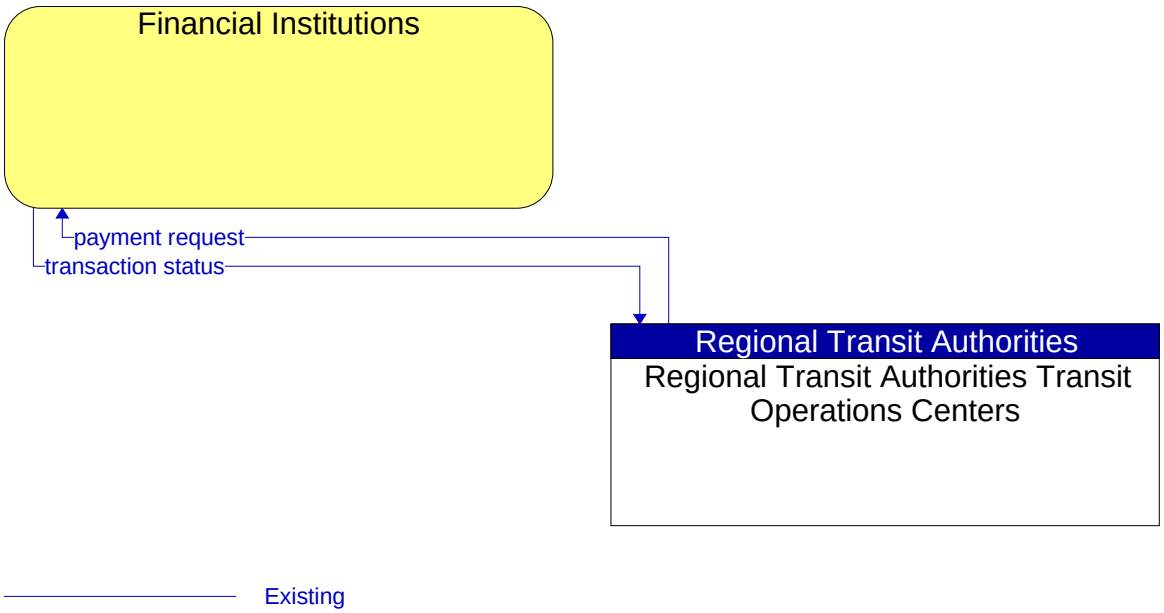

Figure 142: Financial Institutions - Regional Transit Authorities Transit Operations Centers Interface

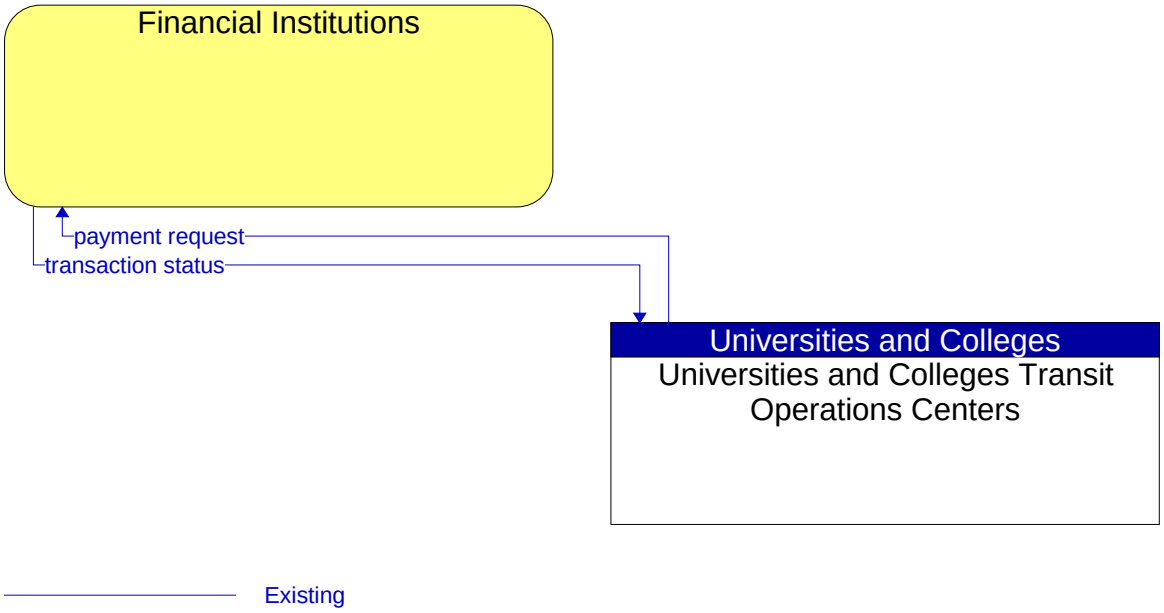

Figure 143: Financial Institutions - Universities and Colleges Transit Operations Centers Interface

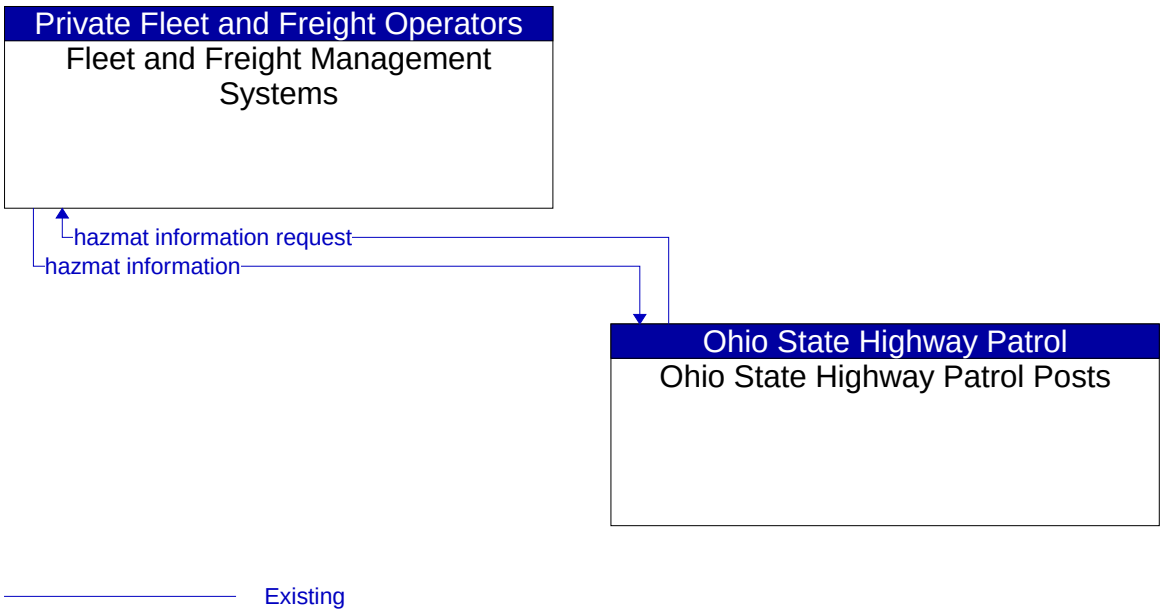

Figure 144: Fleet and Freight Management Systems - Ohio State Highway Patrol Posts Interface

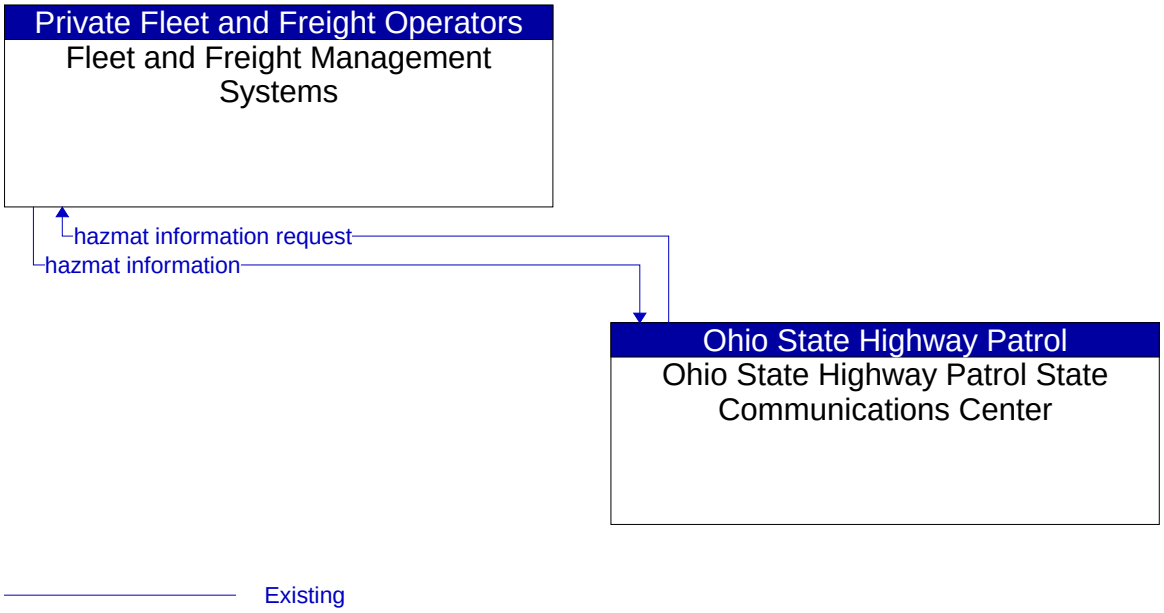

Figure 145: Fleet and Freight Management Systems - Ohio State Highway Patrol State Communications Center Interface

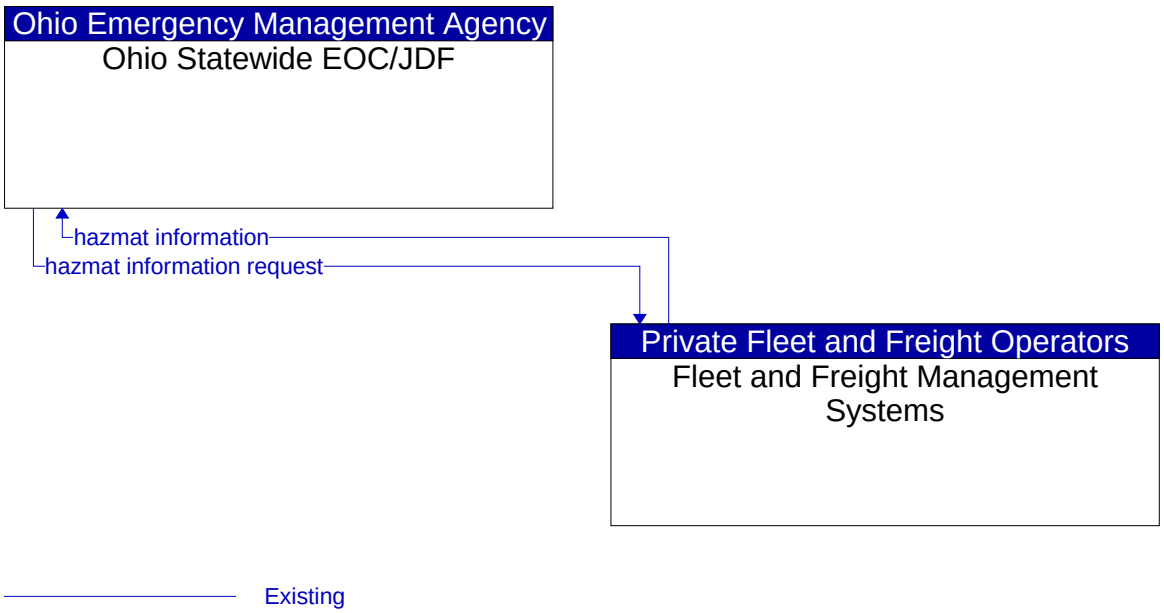

Figure 146: Fleet and Freight Management Systems - Ohio Statewide EOC/JDF Interface

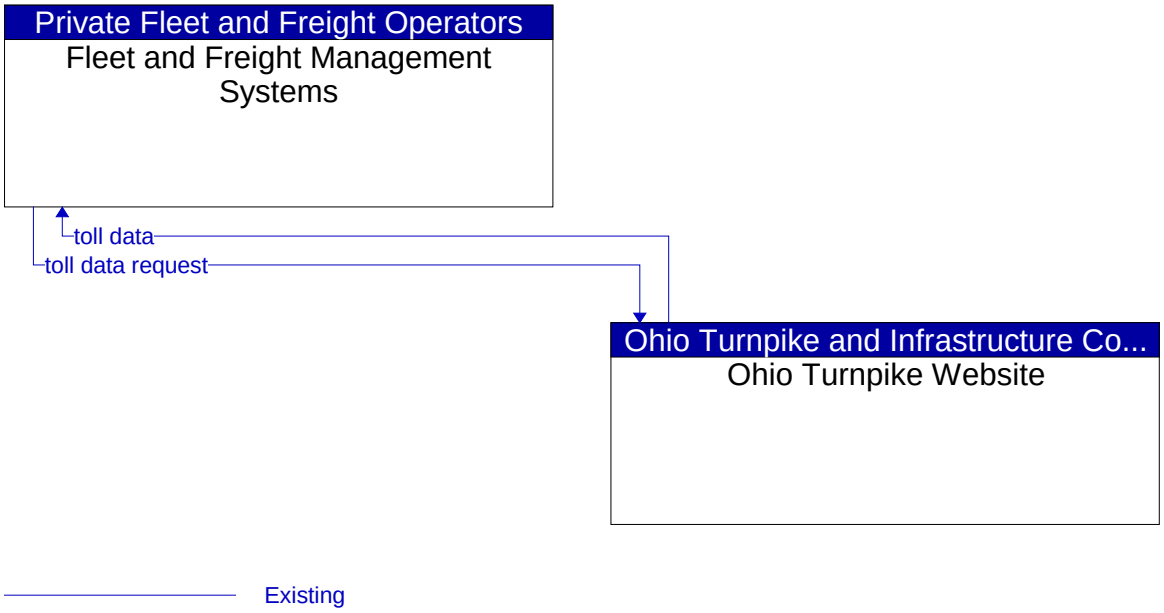

Figure 147: Fleet and Freight Management Systems - Ohio Turnpike Website Interface

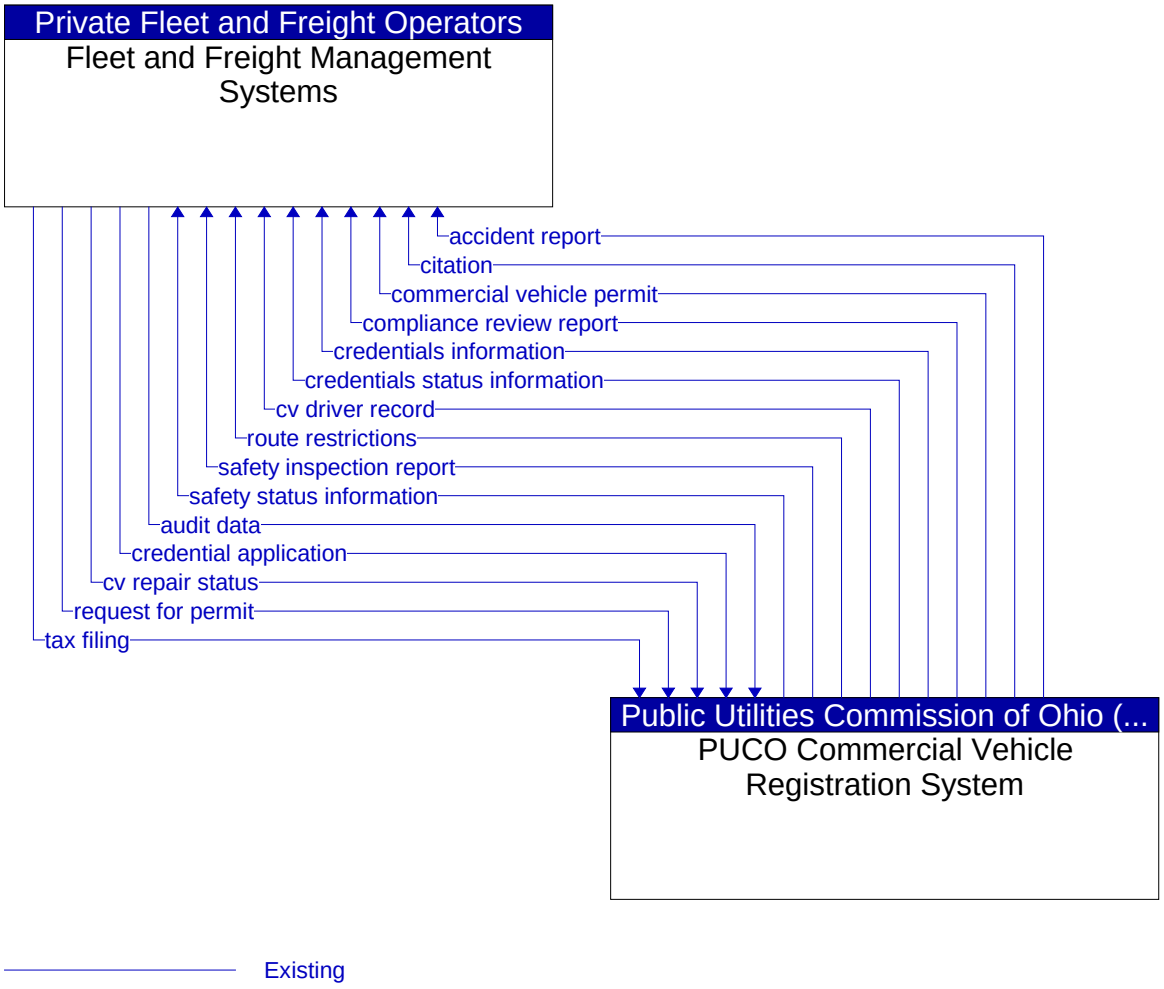

Figure 148: Fleet and Freight Management Systems - PUCO Commercial Vehicle Registration System Interface

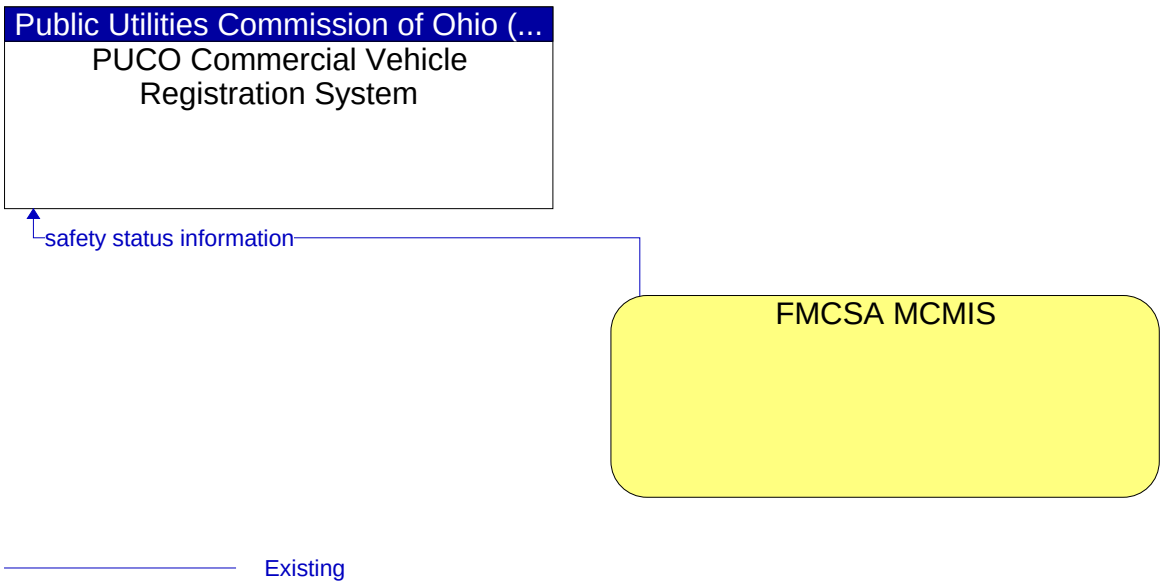

Figure 149: FMCSA MCMIS - PUCO Commercial Vehicle Registration System Interface

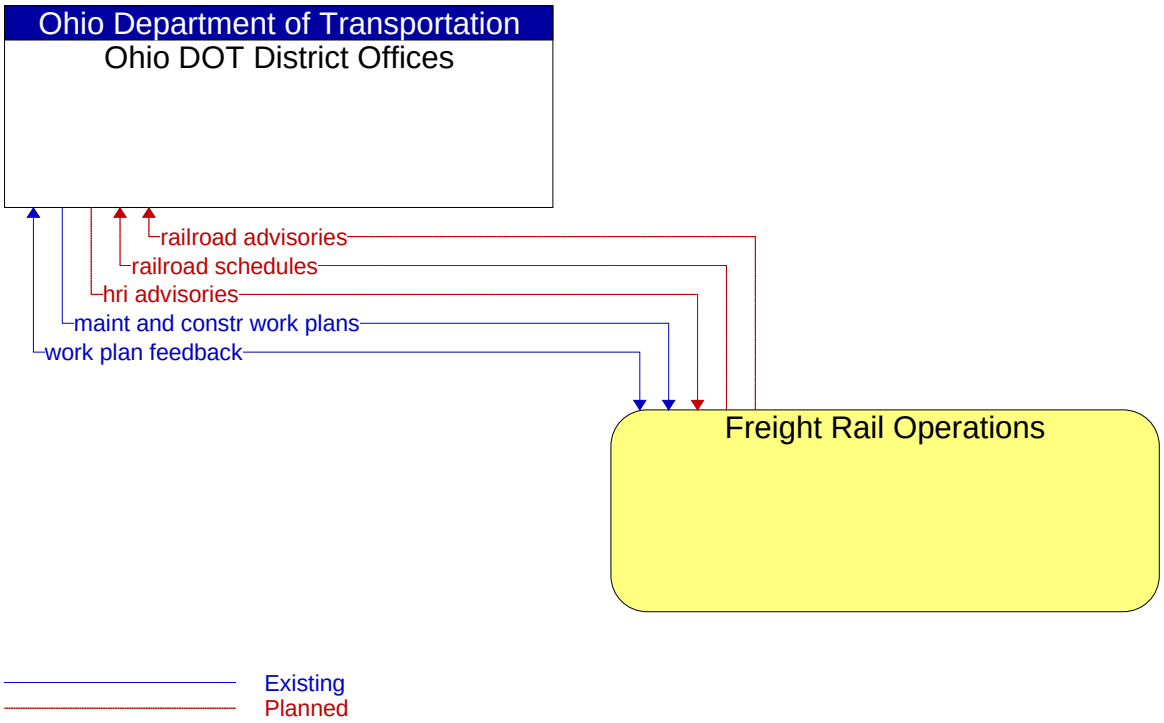

Figure 150: Freight Rail Operations - Ohio DOT District Offices Interface

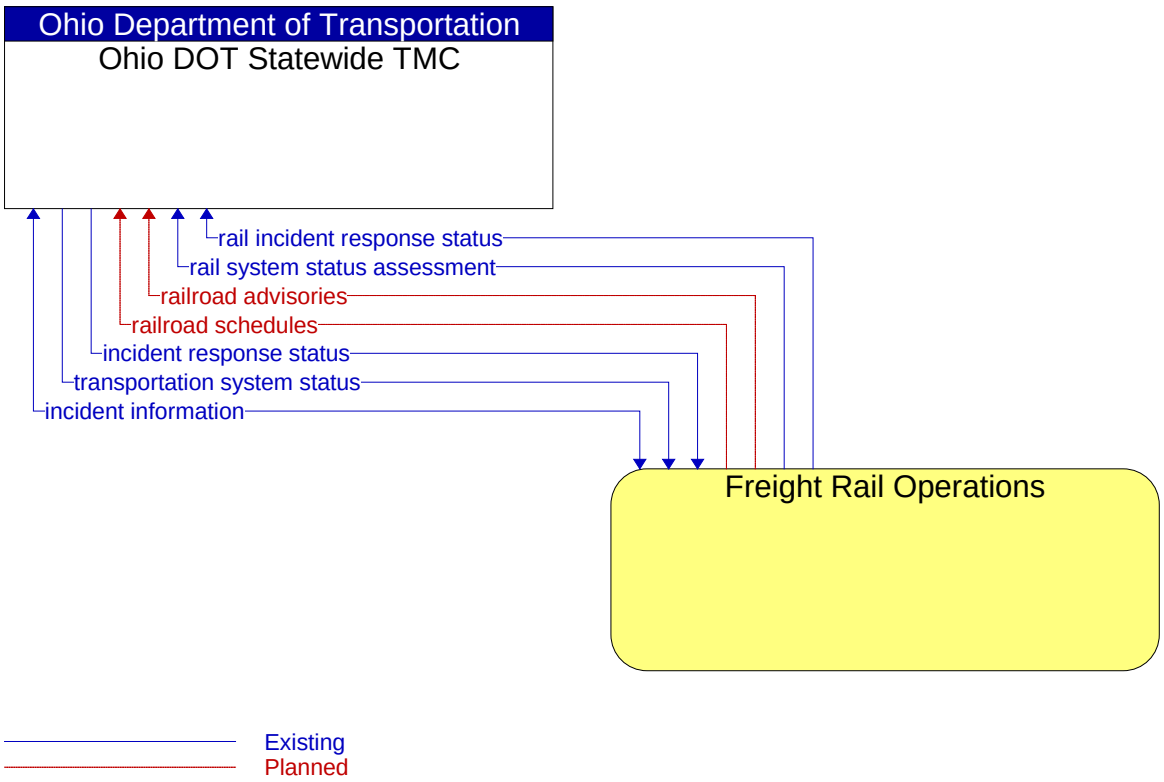

Figure 151: Freight Rail Operations - Ohio DOT Statewide TMC Interface

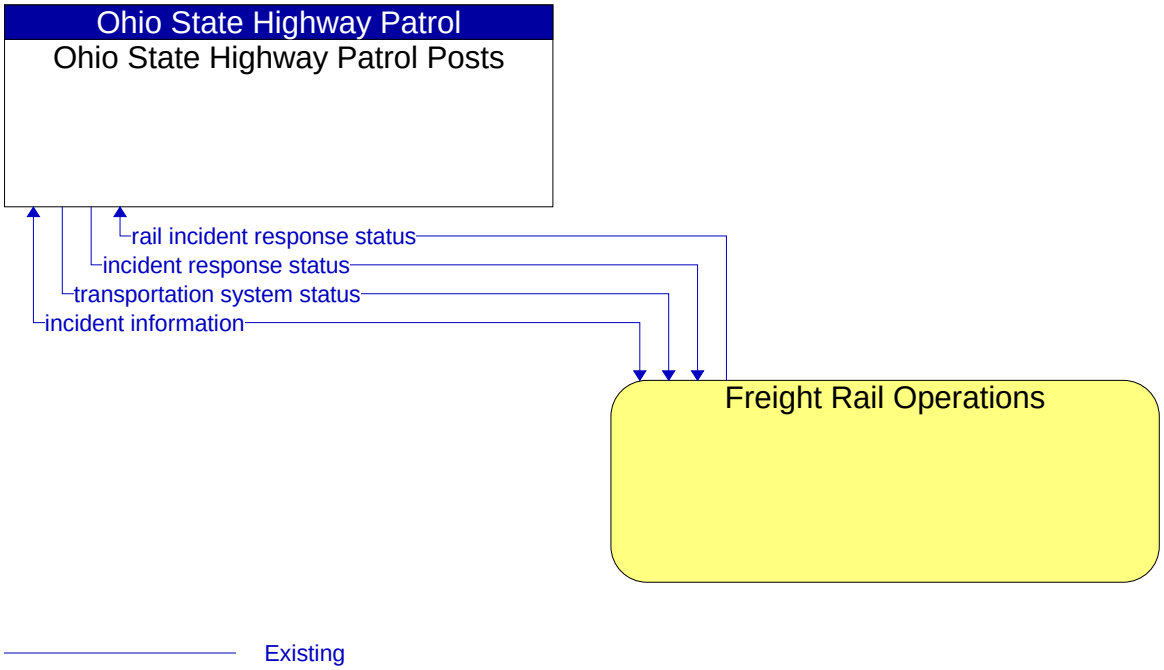

Figure 152: Freight Rail Operations - Ohio State Highway Patrol Posts Interface

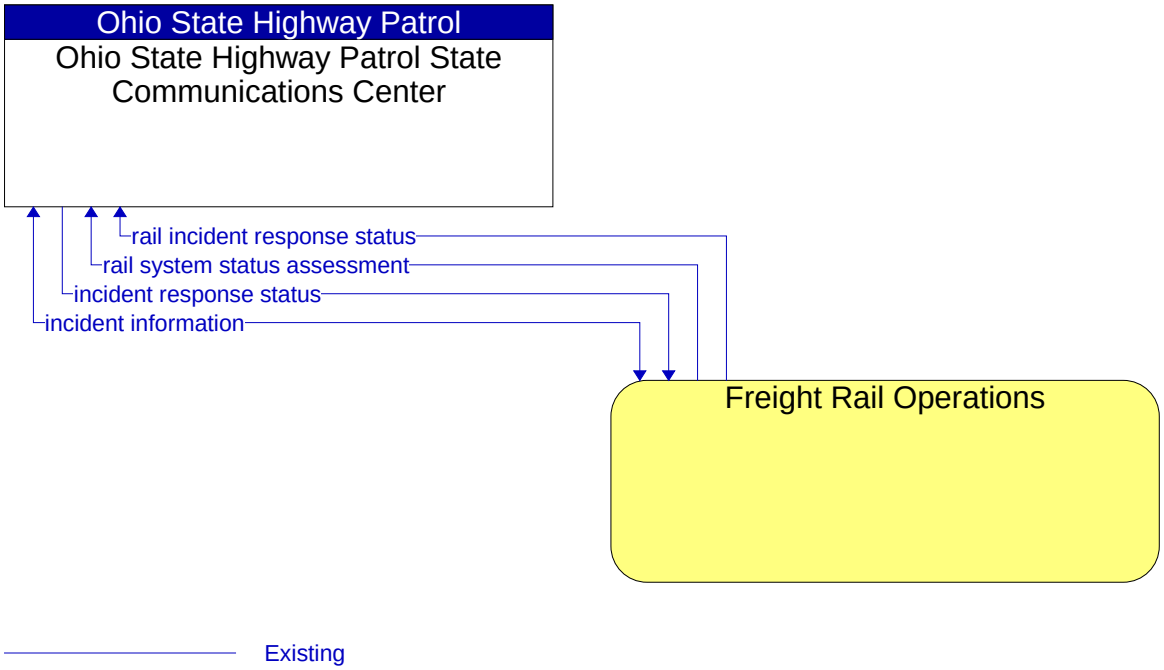

Figure 153: Freight Rail Operations - Ohio State Highway Patrol State Communications Center Interface

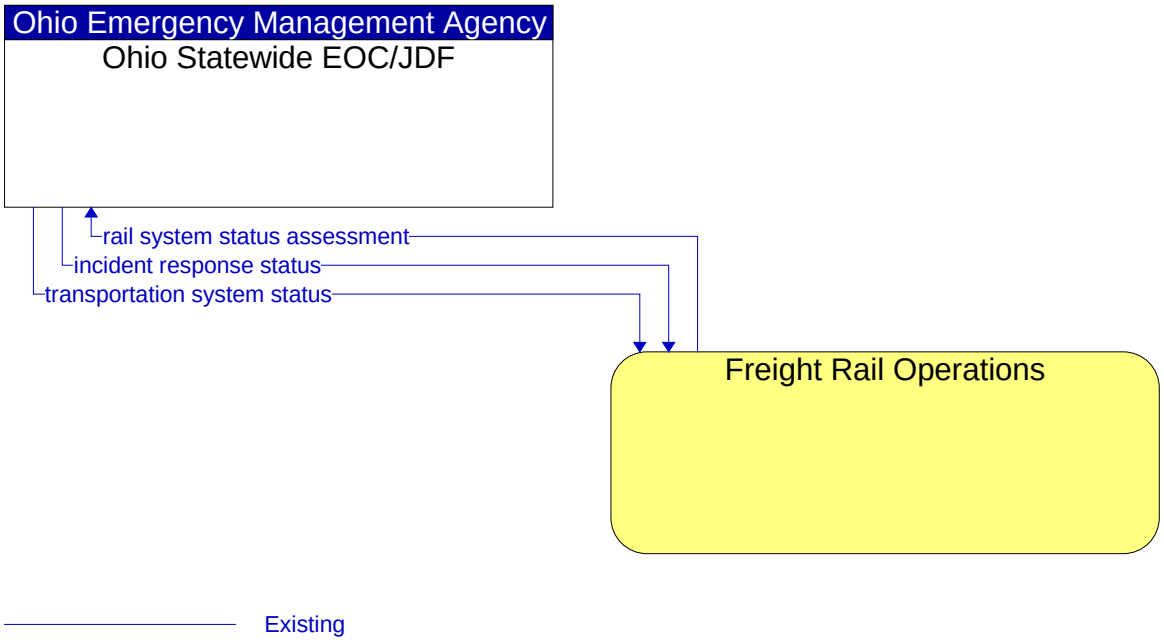

Figure 154: Freight Rail Operations - Ohio Statewide EOC/JDF Interface

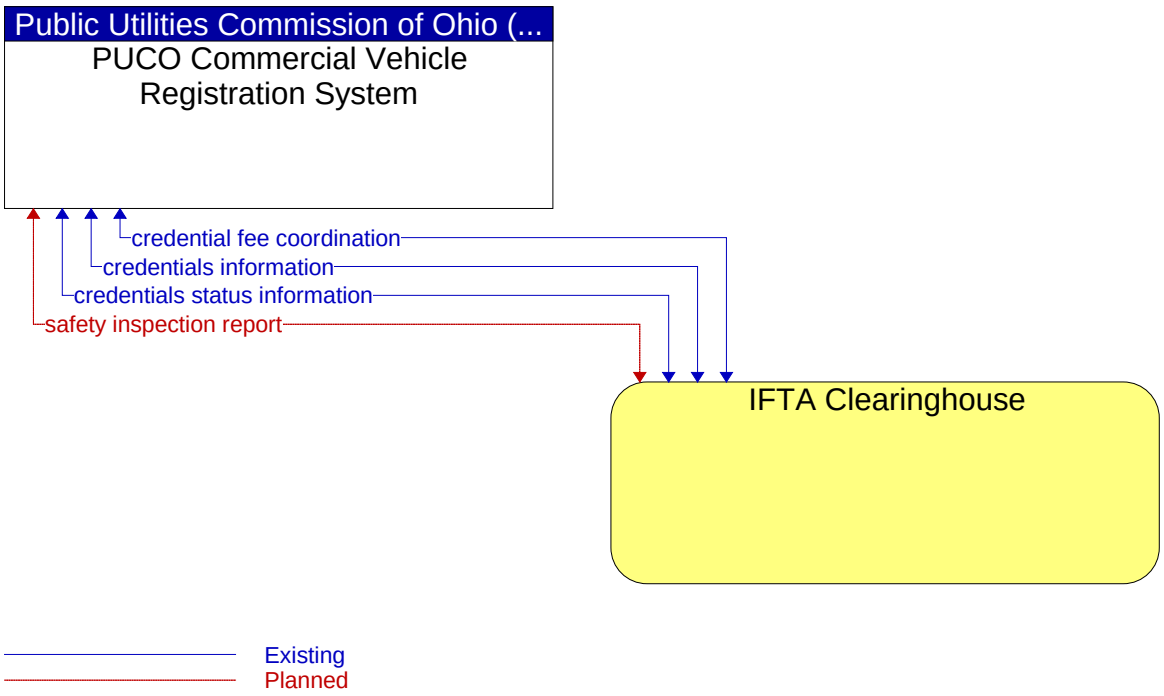

Figure 155: IFTA Clearinghouse - PUCO Commercial Vehicle Registration System Interface

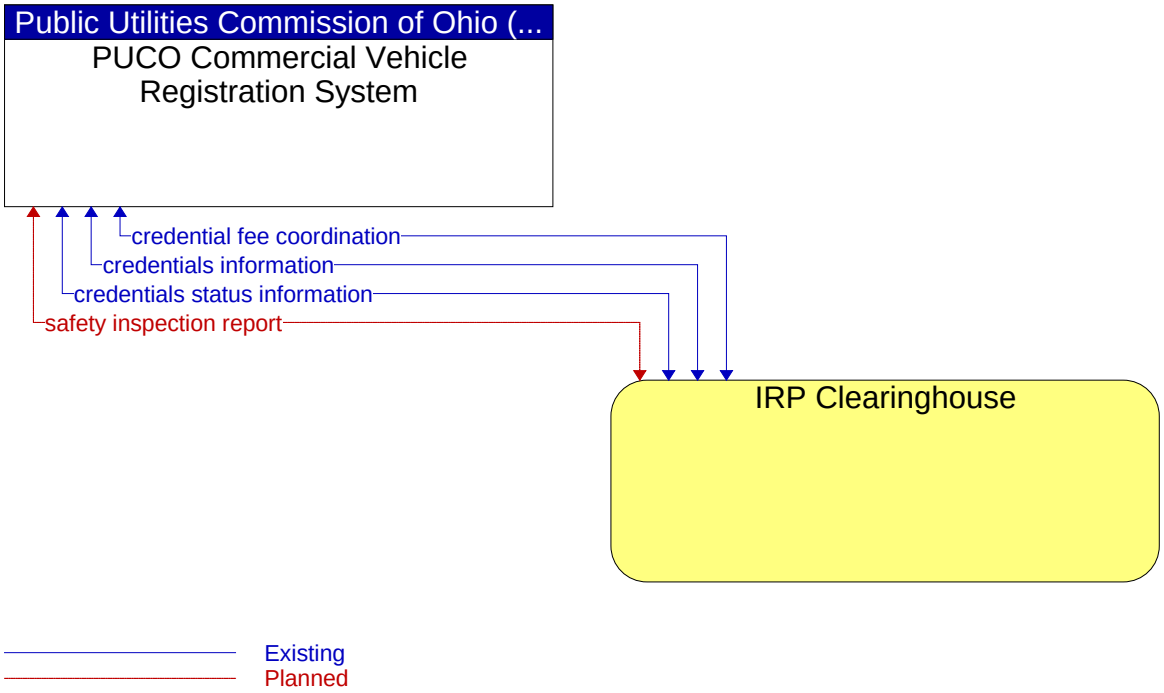

Figure 156: IRP Clearinghouse - PUCO Commercial Vehicle Registration System Interface

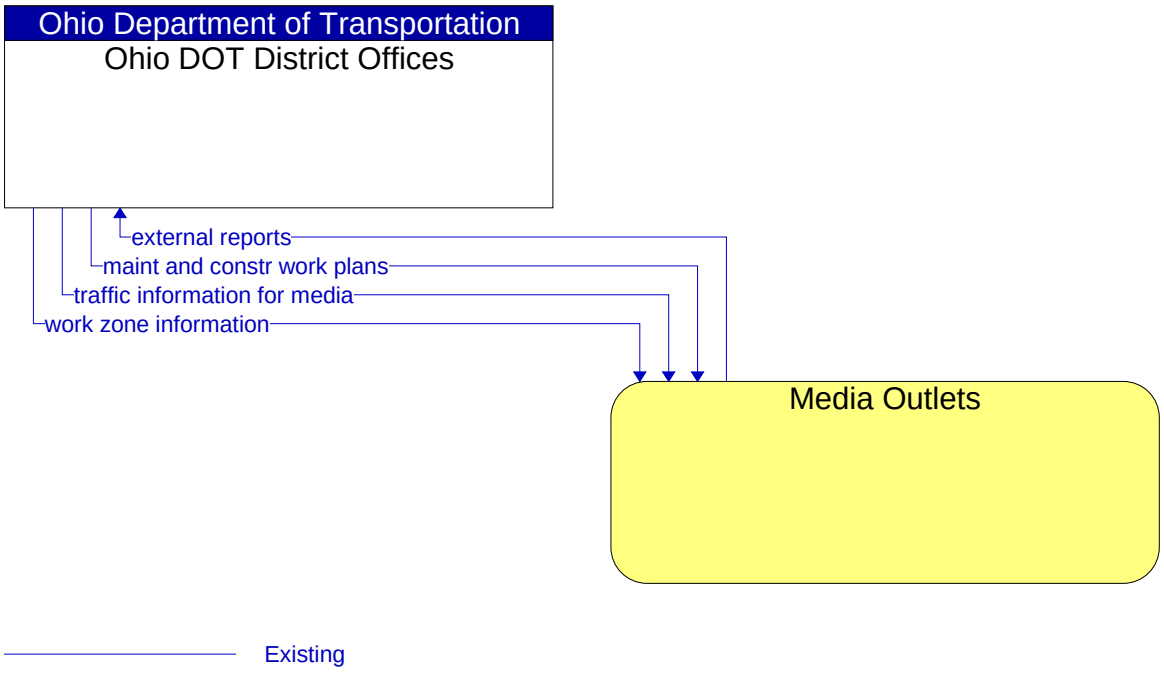

Figure 157: Media Outlets - Ohio DOT District Offices Interface

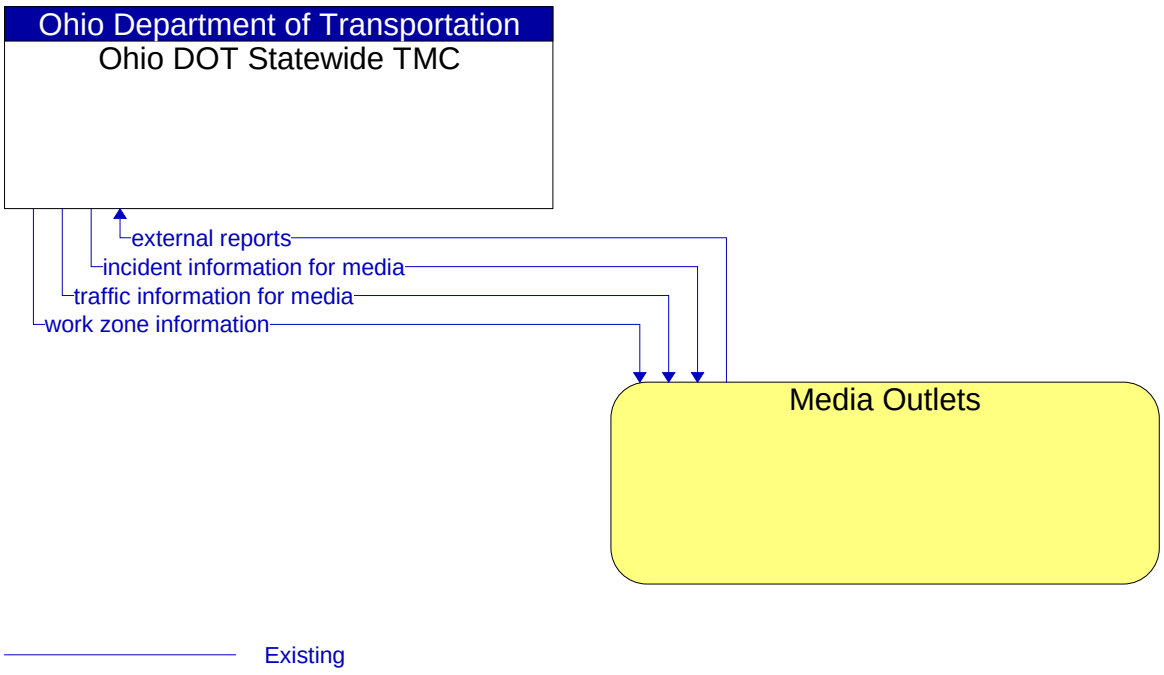

Figure 158: Media Outlets - Ohio DOT Statewide TMC Interface

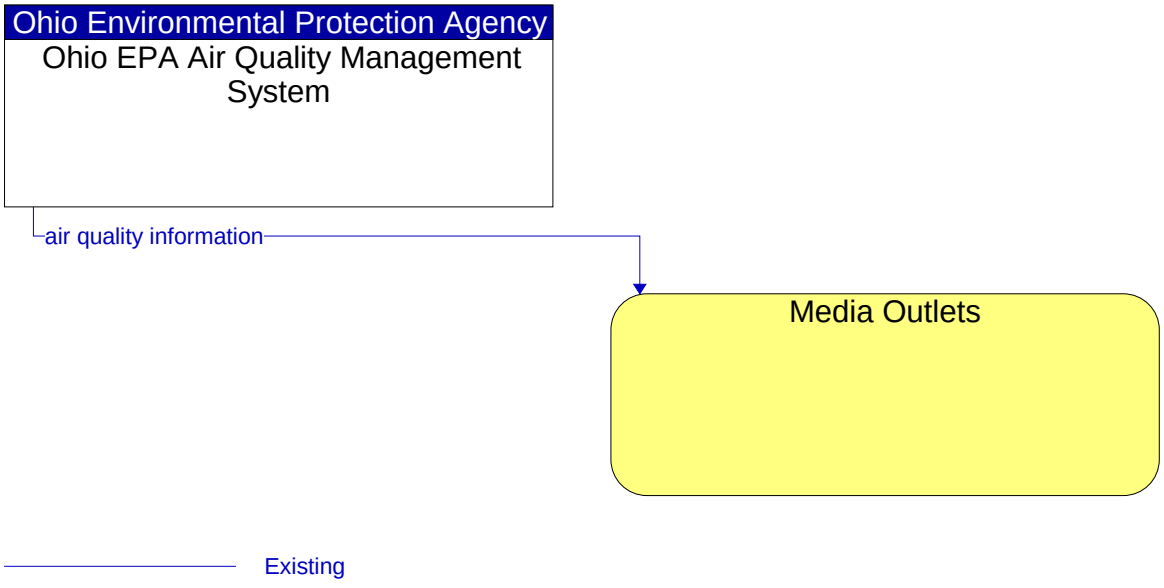

Figure 159: Media Outlets - Ohio EPA Air Quality Management System Interface

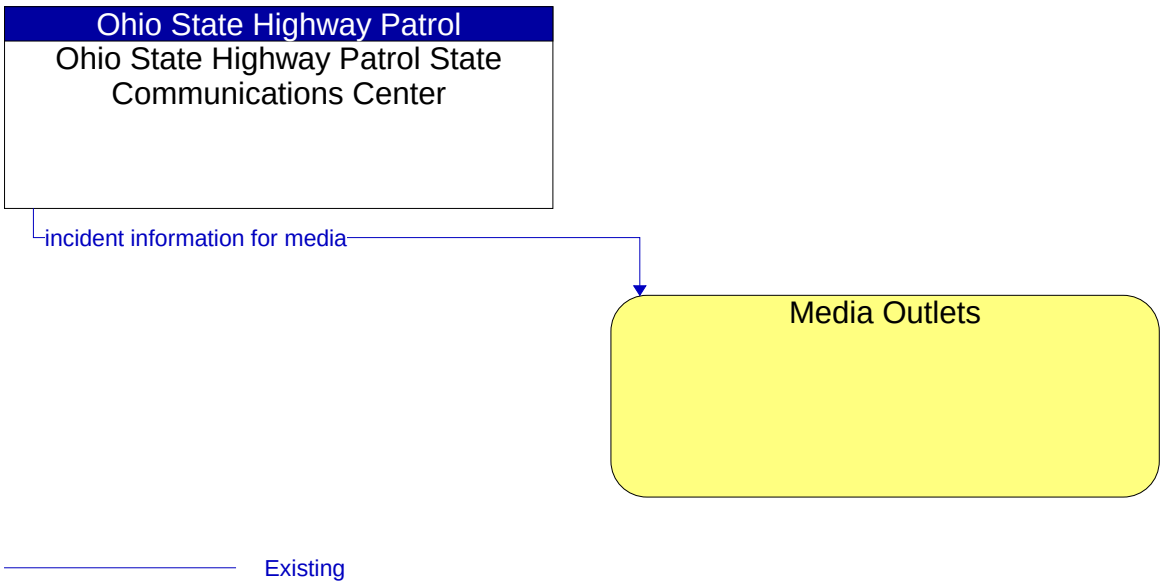

Figure 160: Media Outlets - Ohio State Highway Patrol State Communications Center Interface

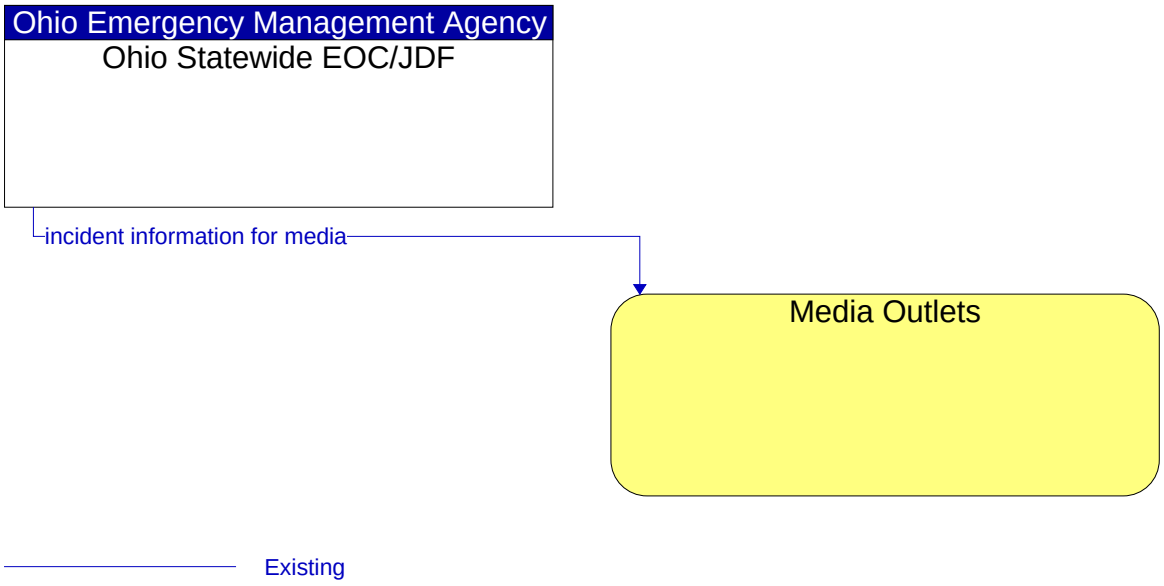

Figure 161: Media Outlets - Ohio Statewide EOC/JDF Interface

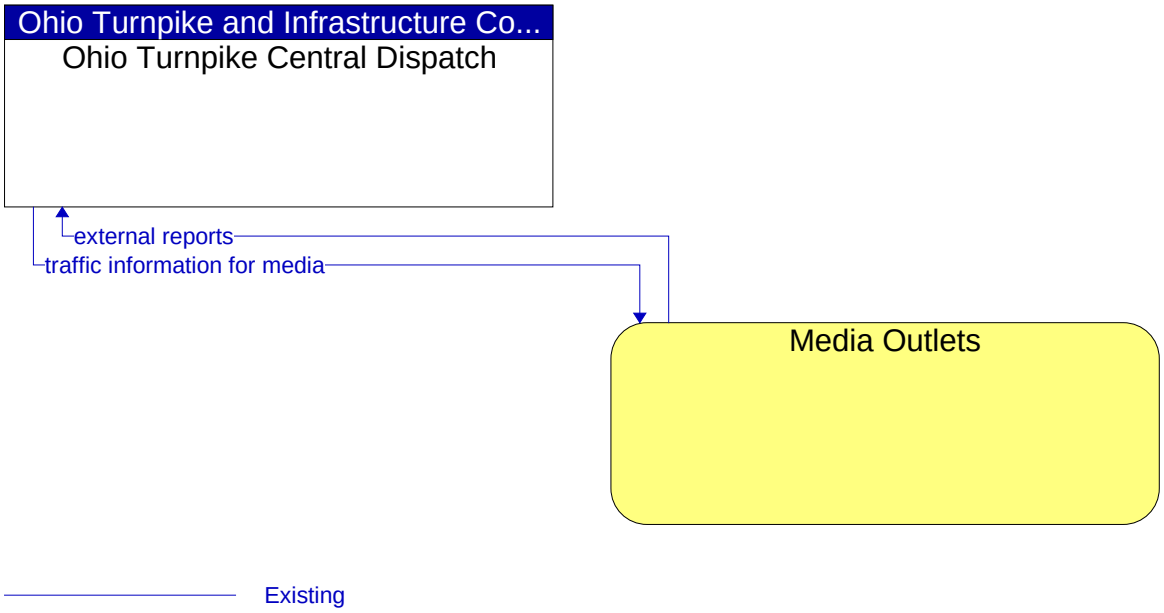

Figure 162: Media Outlets - Ohio Turnpike Central Dispatch Interface

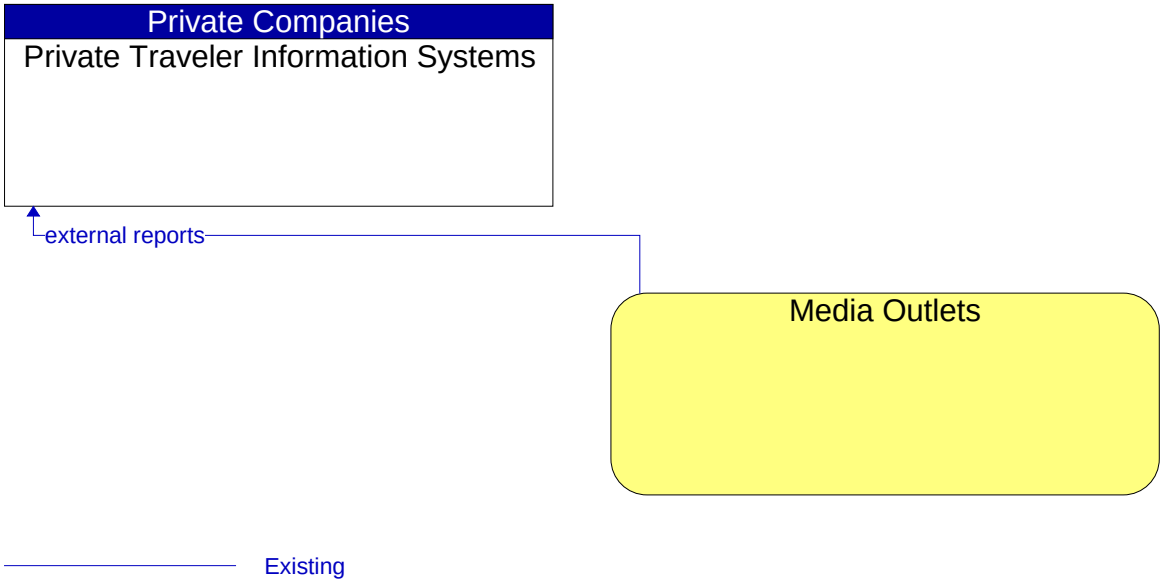

Figure 163: Media Outlets - Private Traveler Information Systems Interface

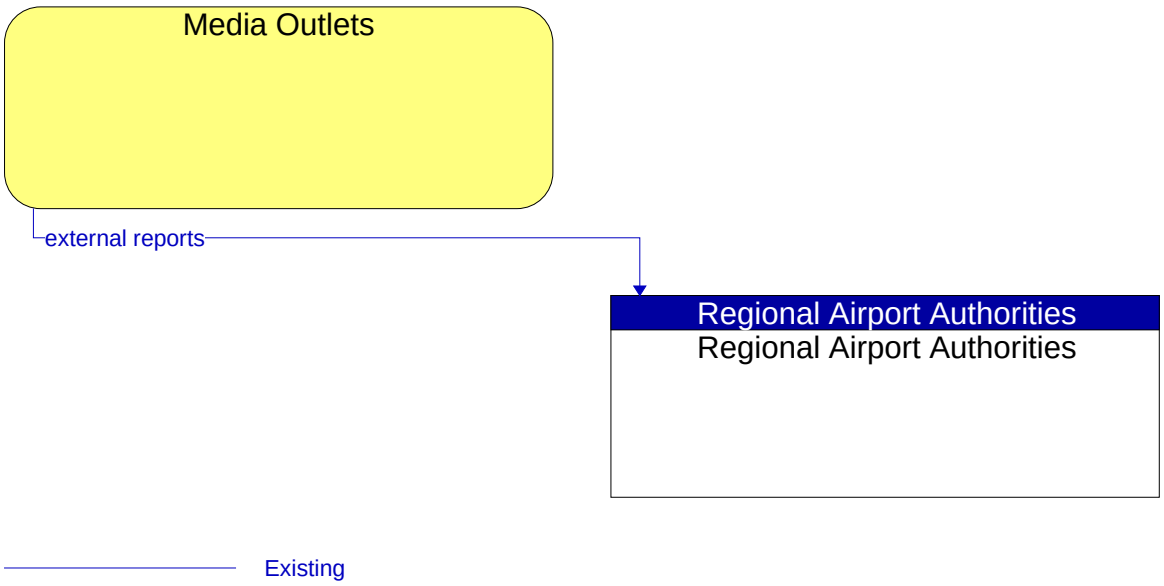

Figure 164: Media Outlets - Regional Airport Authorities Interface

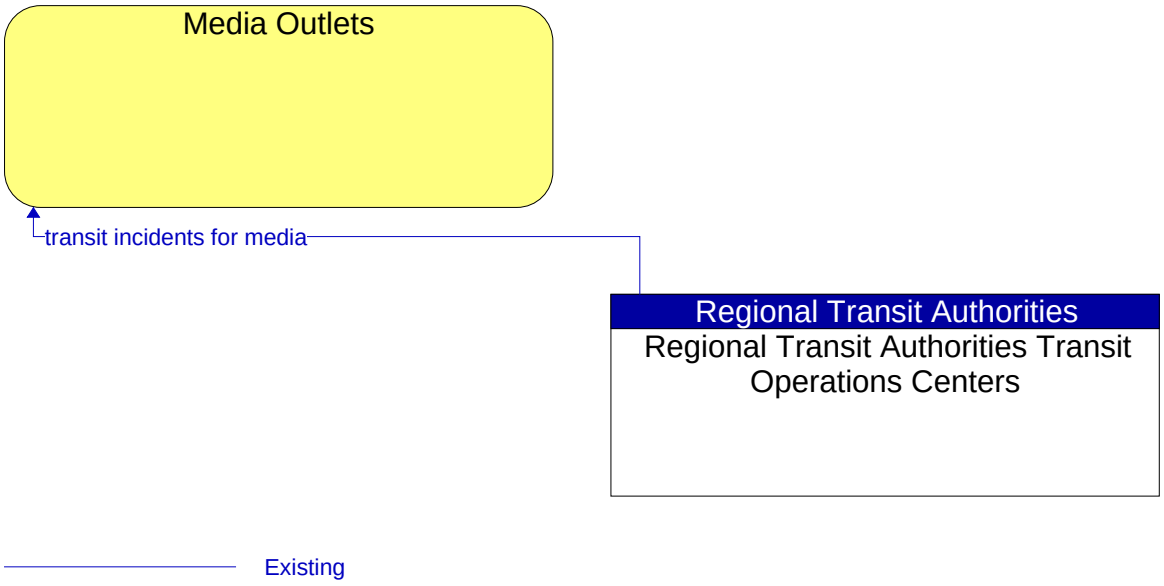

Figure 165: Media Outlets - Regional Transit Authorities Transit Operations Centers Interface

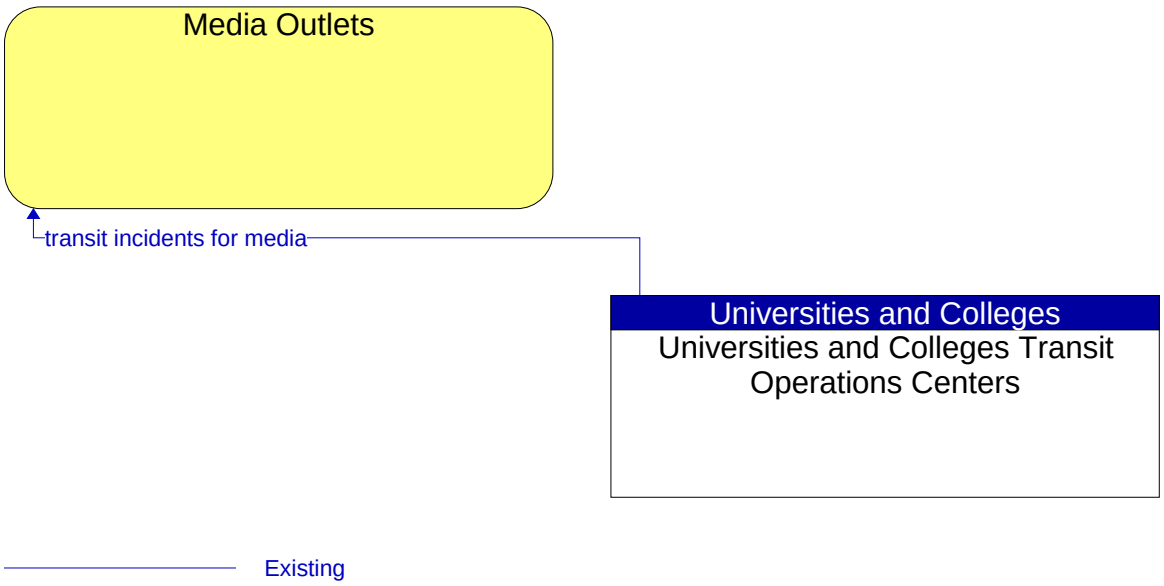

Figure 166: Media Outlets - Universities and Colleges Transit Operations Centers Interface

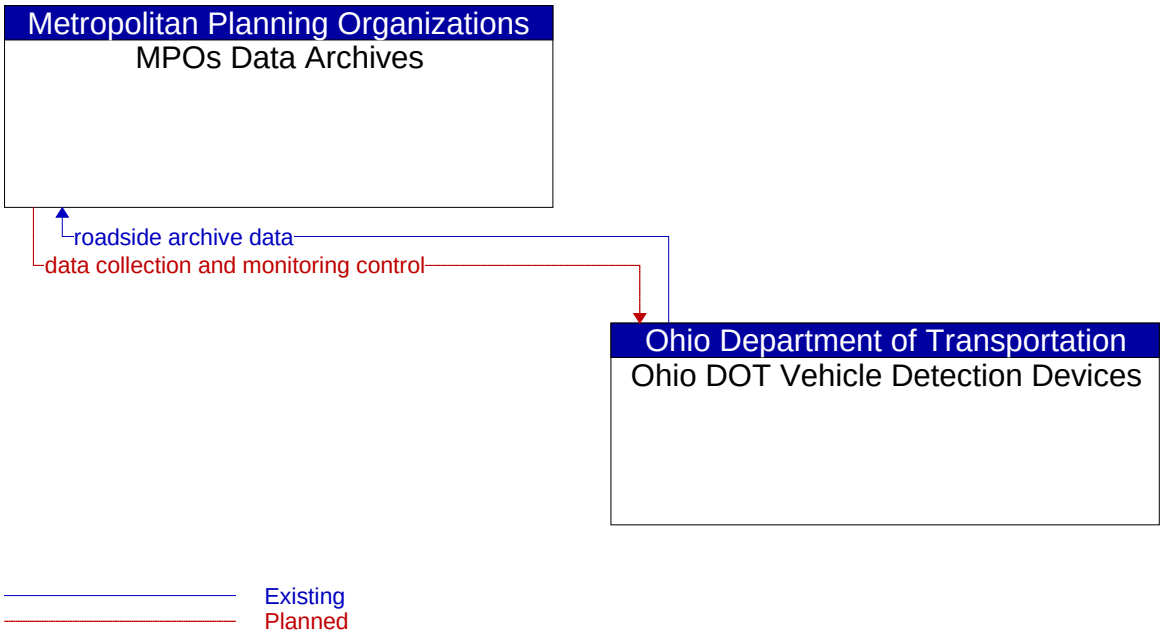

Figure 167: MPOs Data Archives - Ohio DOT Vehicle Detection Devices Interface

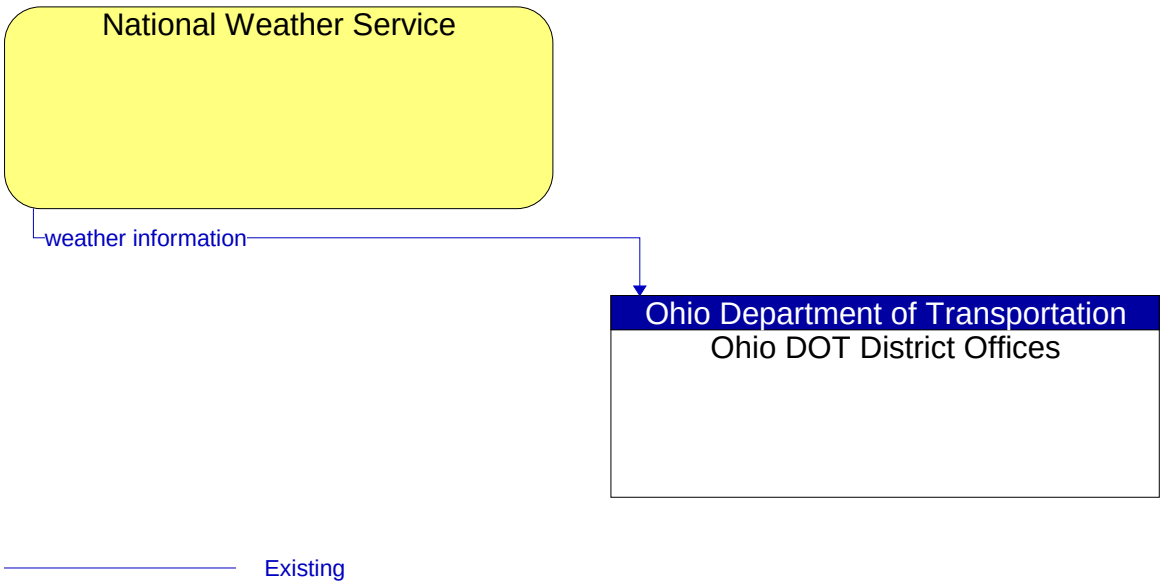

Figure 168: National Weather Service - Ohio DOT District Offices Interface

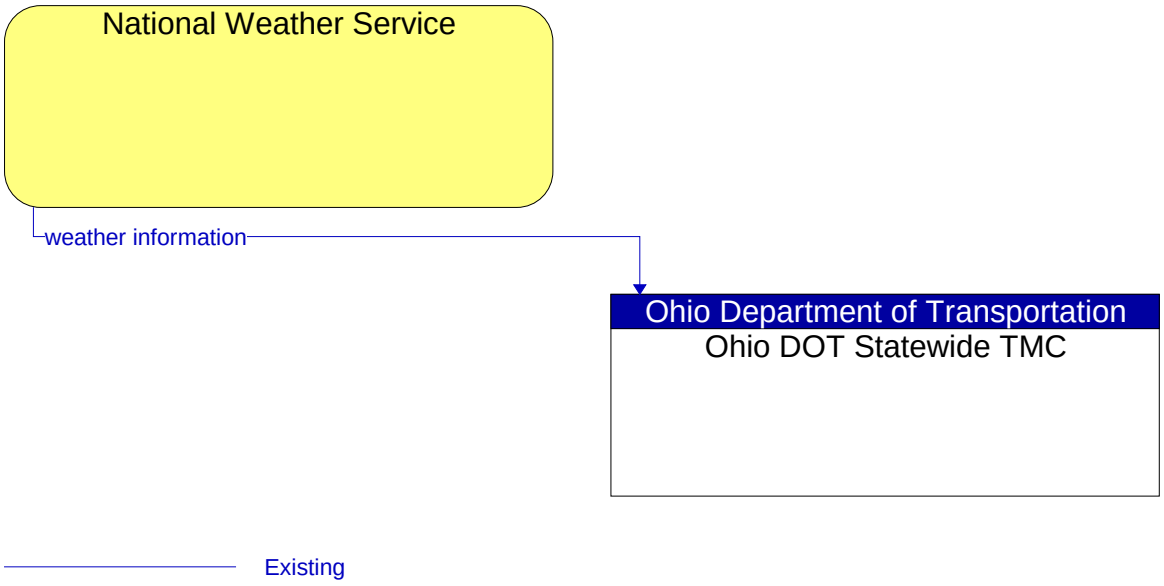

Figure 169: National Weather Service - Ohio DOT Statewide TMC Interface

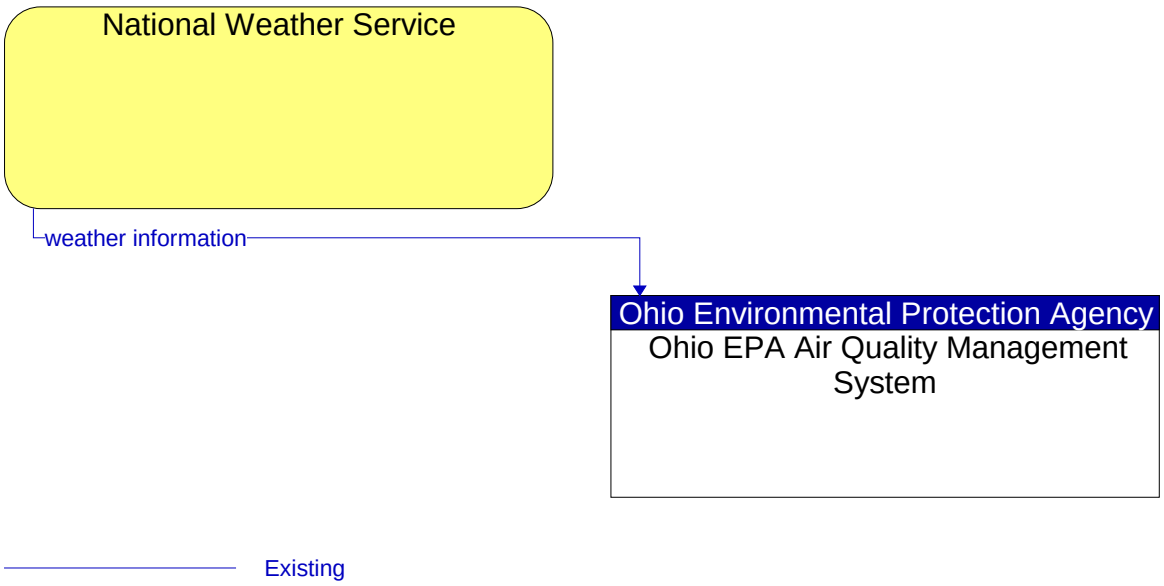

Figure 170: National Weather Service - Ohio EPA Air Quality Management System Interface

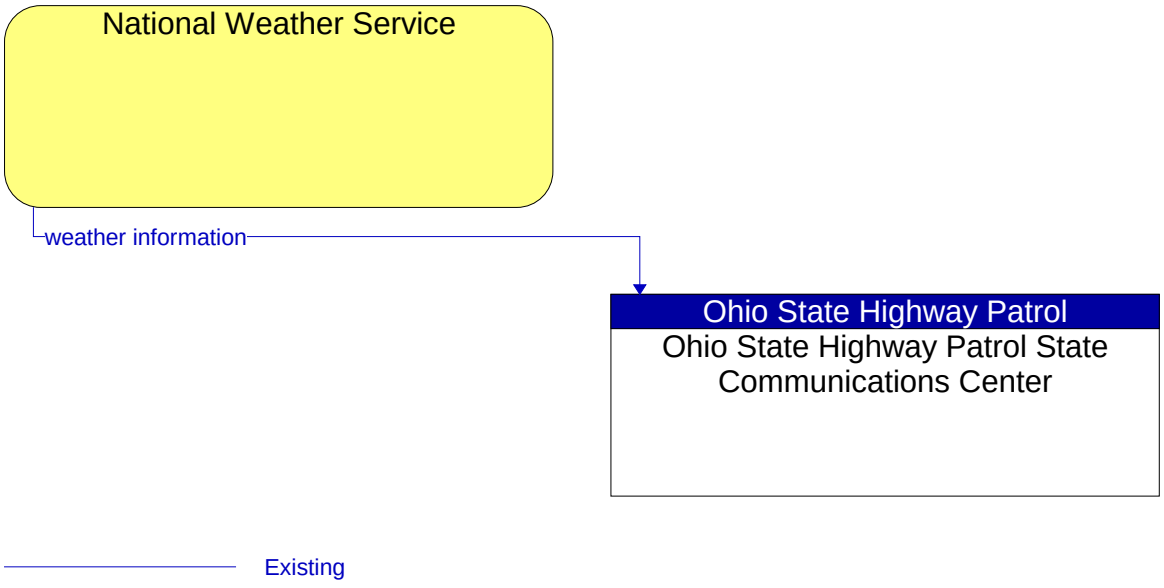

Figure 171: National Weather Service - Ohio State Highway Patrol State Communications Center Interface

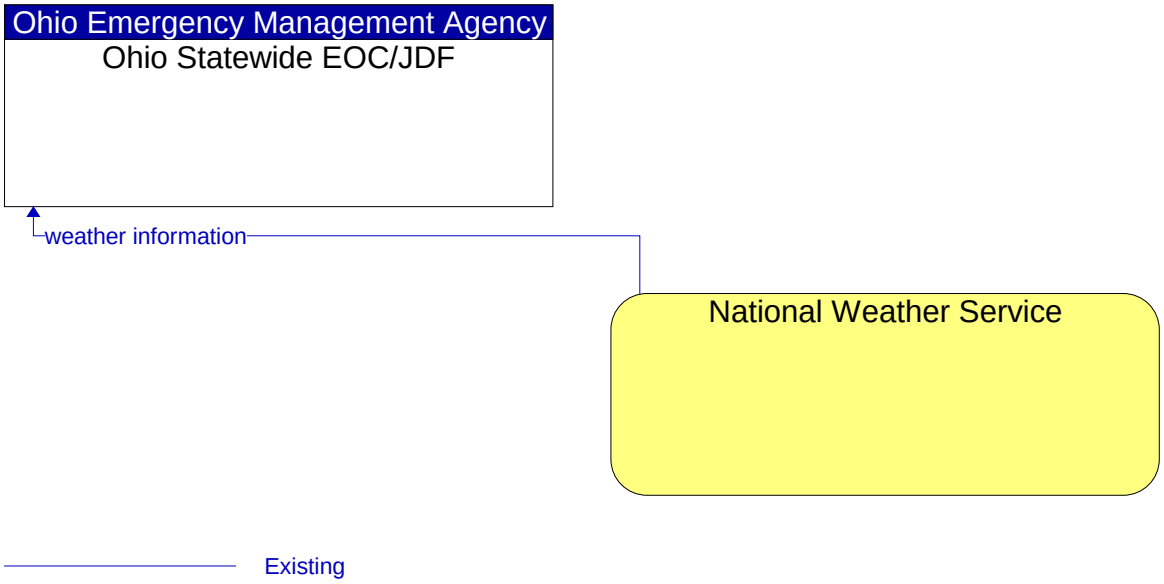

Figure 172: National Weather Service - Ohio Statewide EOC/JDF Interface

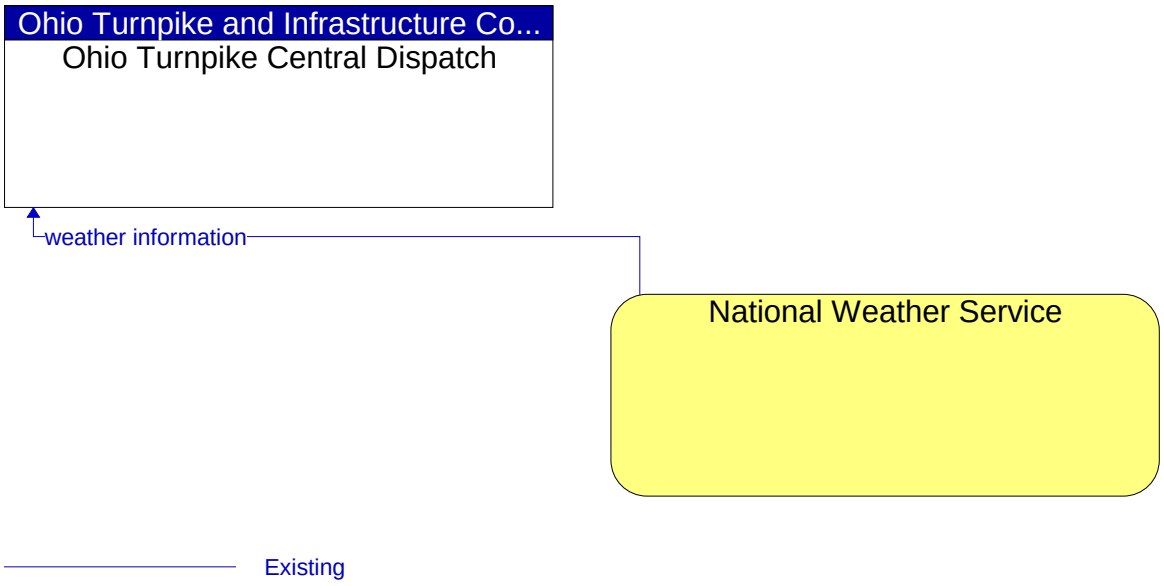

Figure 173: National Weather Service - Ohio Turnpike Central Dispatch Interface

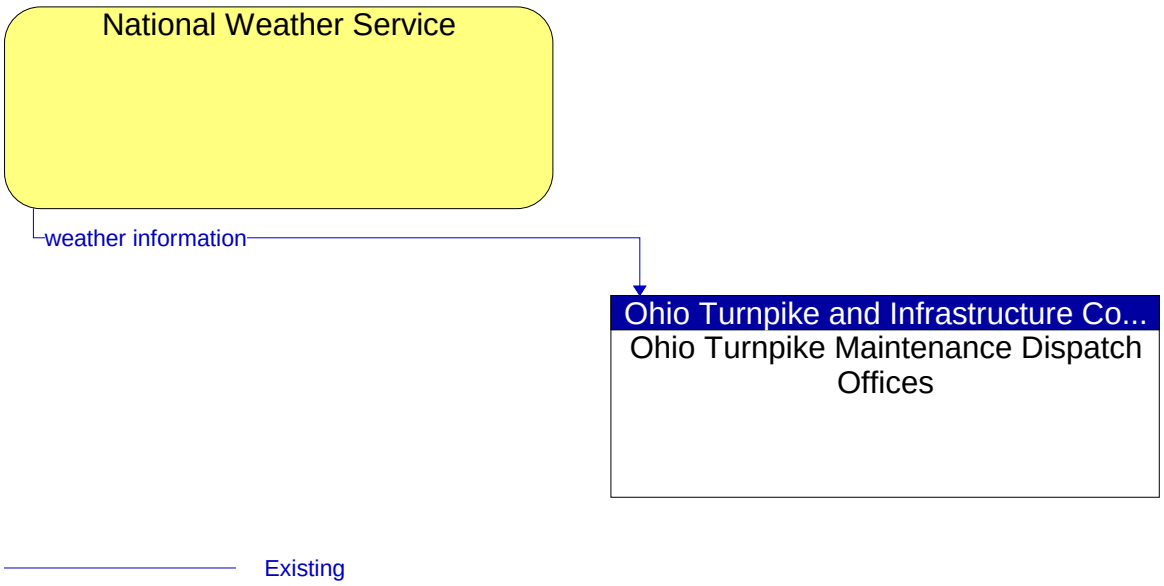

Figure 174: National Weather Service - Ohio Turnpike Maintenance Dispatch Offices Interface

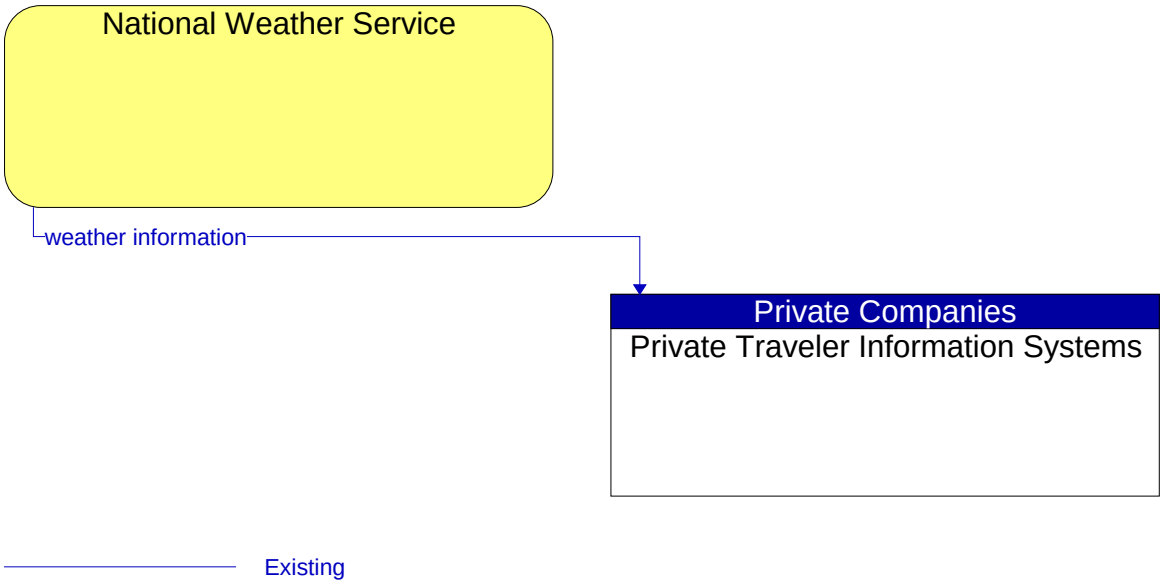

Figure 175: National Weather Service - Private Traveler Information Systems Interface

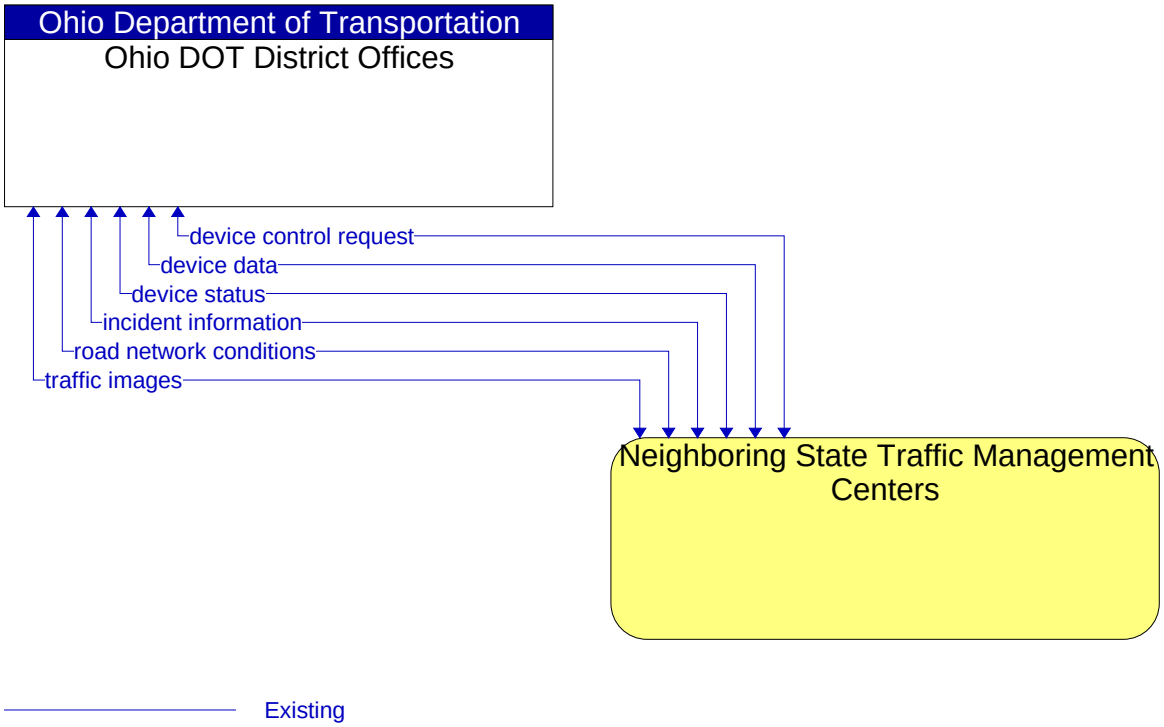

Figure 176: Neighboring State Traffic Management Centers - Ohio DOT District Offices Interface

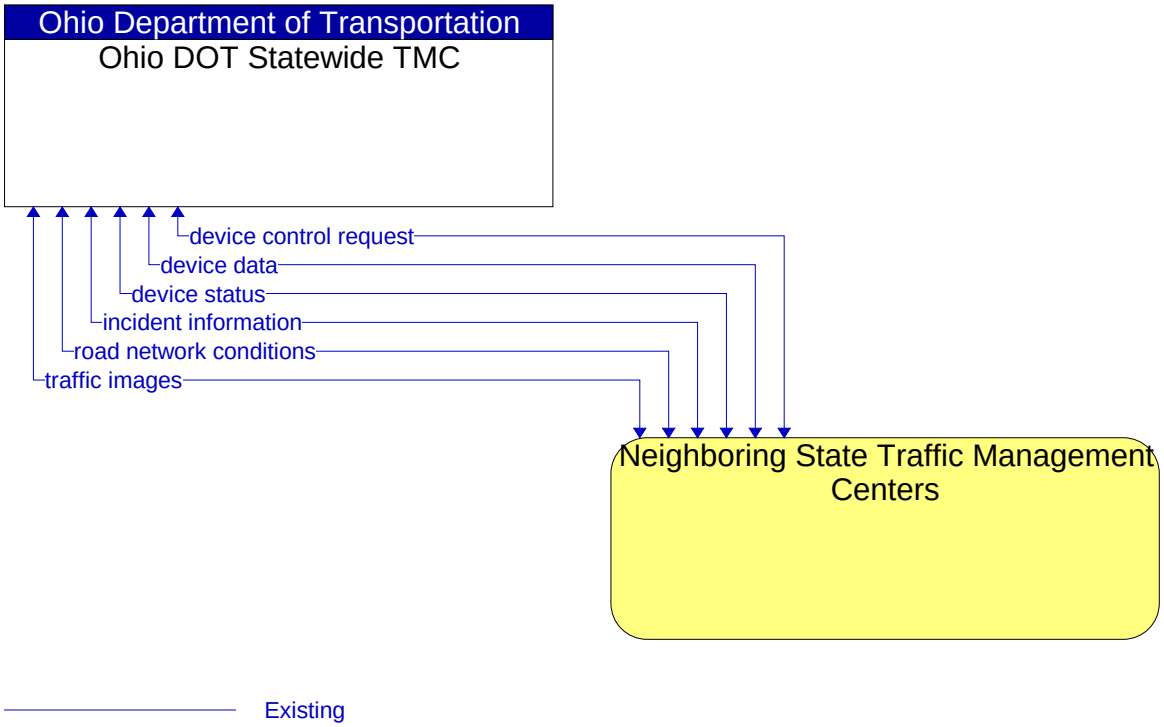

Figure 177: Neighboring State Traffic Management Centers - Ohio DOT Statewide TMC Interface

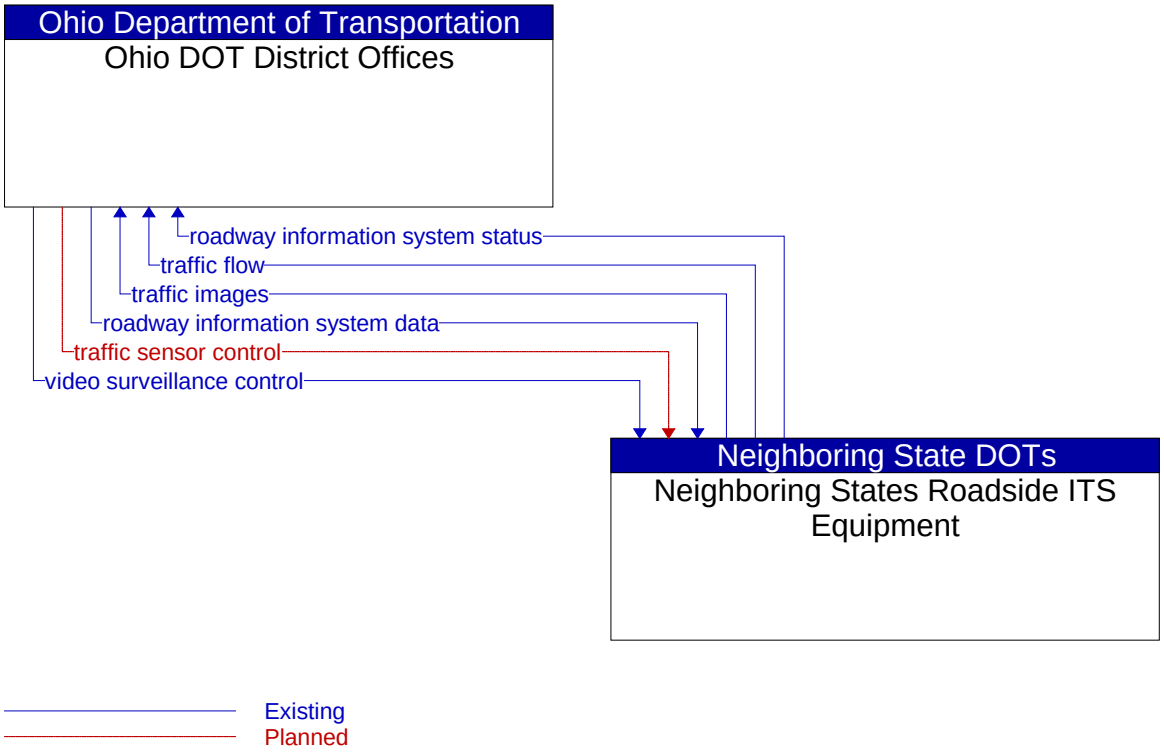

Figure 178: Neighboring States Roadside ITS Equipment - Ohio DOT District Offices Interface

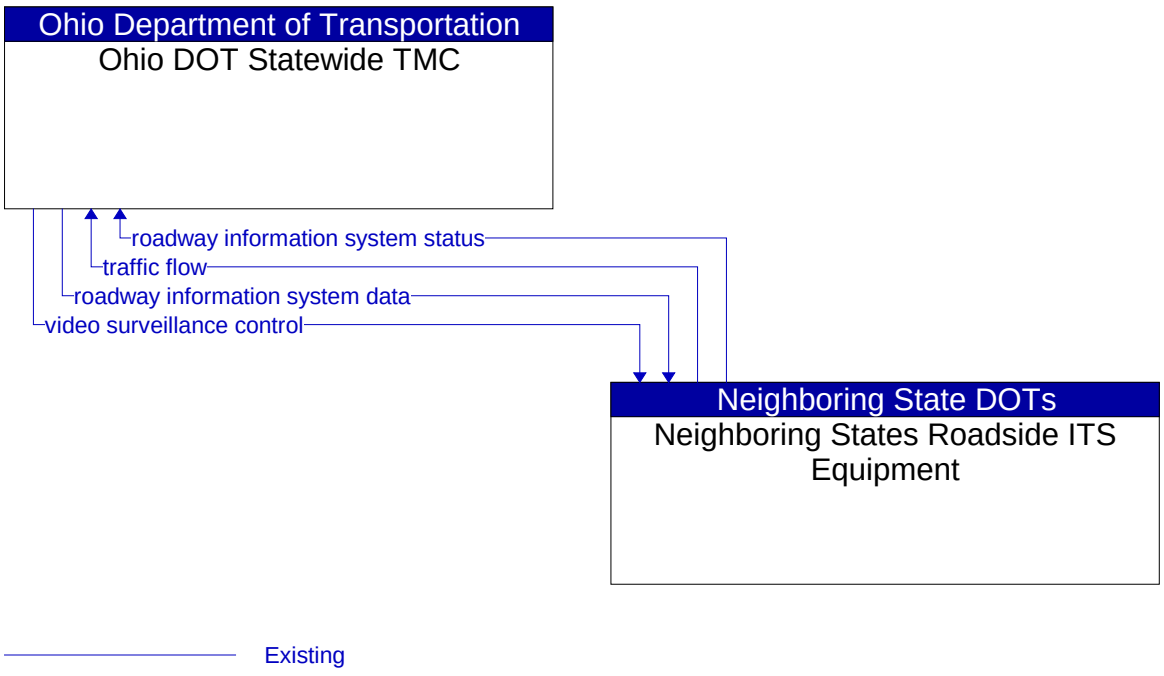

Figure 179: Neighboring States Roadside ITS Equipment - Ohio DOT Statewide TMC Interface

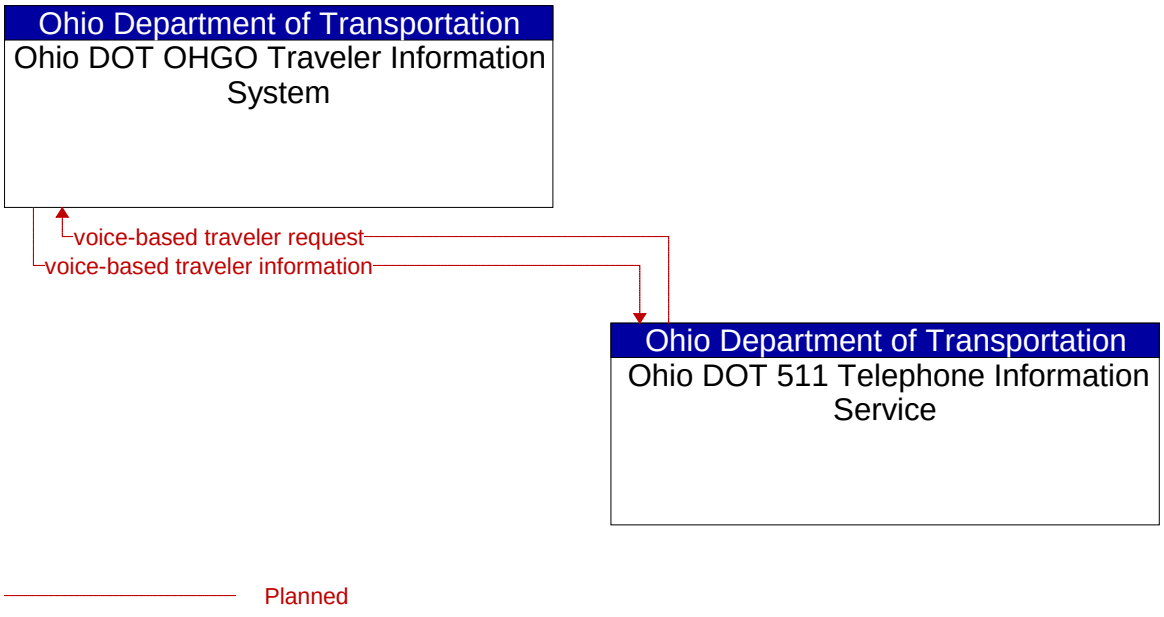

Figure 180: Ohio DOT 511 Telephone Information Service - Ohio DOT OHGO Traveler Information System Interface

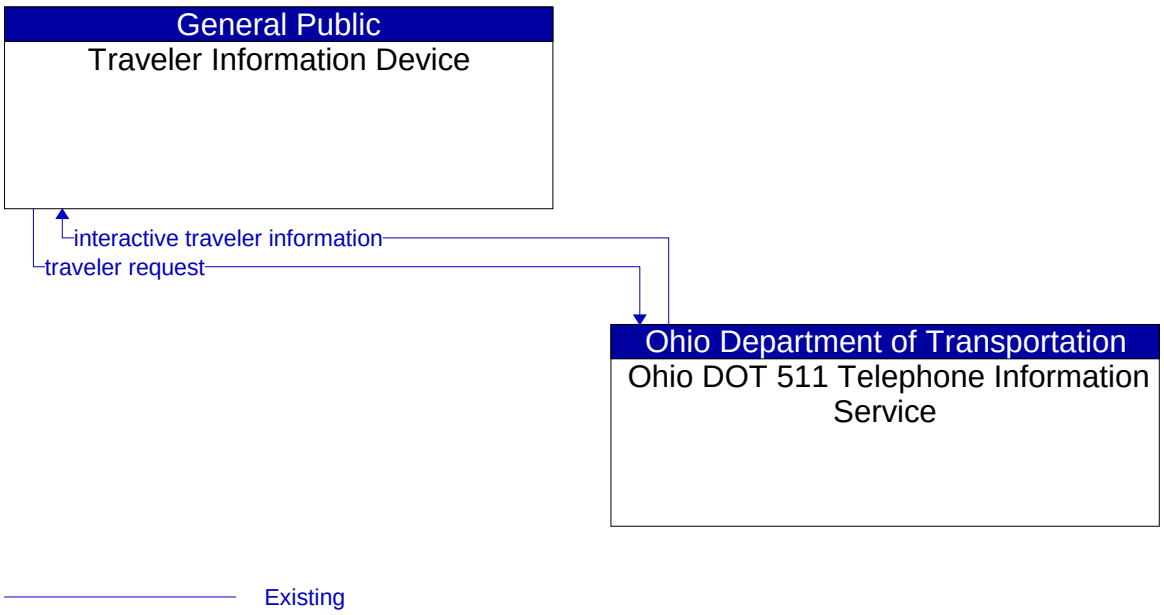

Figure 181: Ohio DOT 511 Telephone Information Service - Traveler Information Device Interface

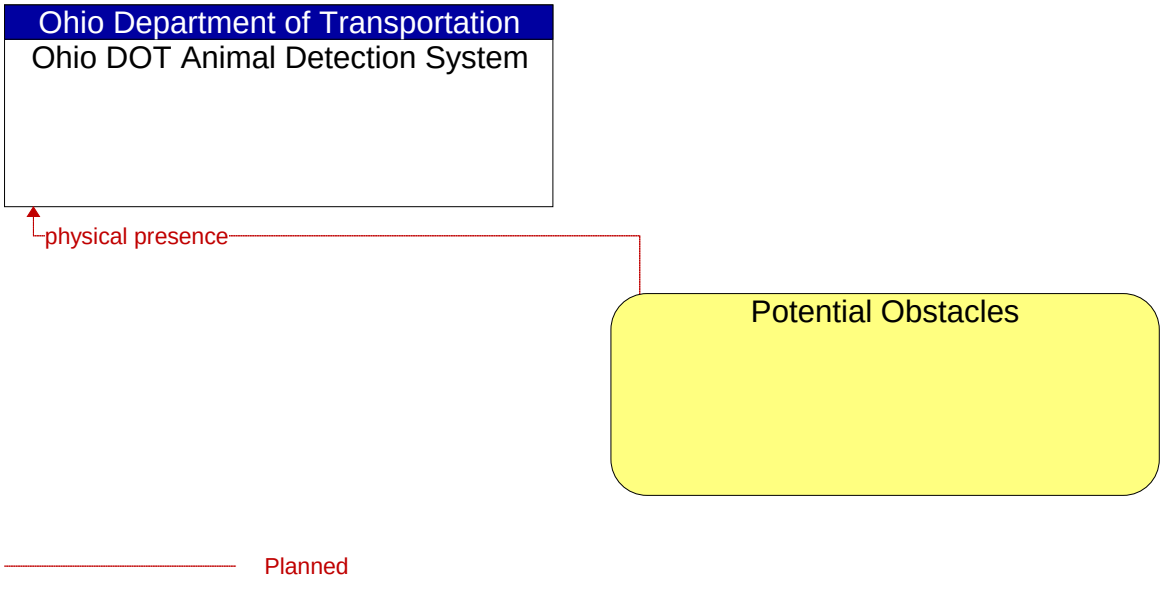

Figure 182: Ohio DOT Animal Detection System - Potential Obstacles Interface

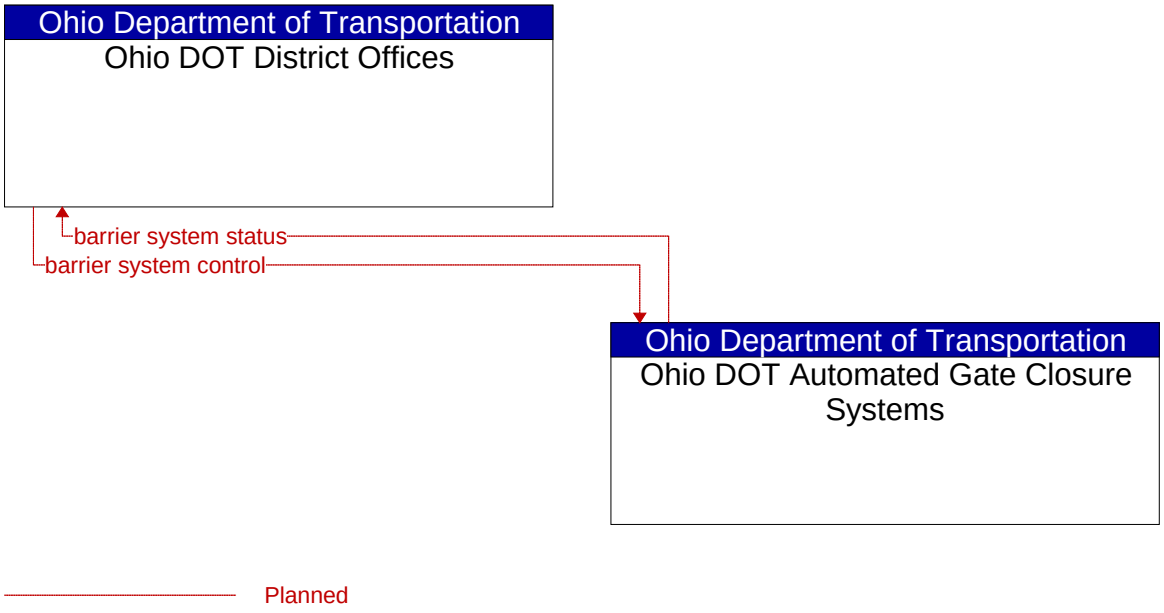

Figure 183: Ohio DOT Automated Gate Closure Systems - Ohio DOT District Offices Interface

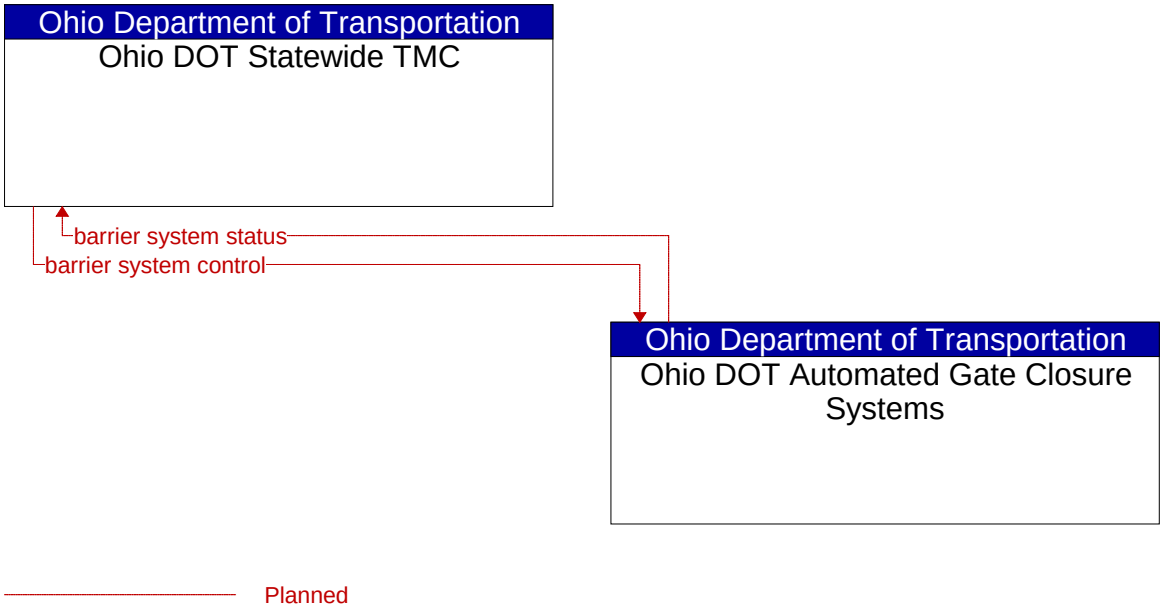

Figure 184: Ohio DOT Automated Gate Closure Systems - Ohio DOT Statewide TMC Interface

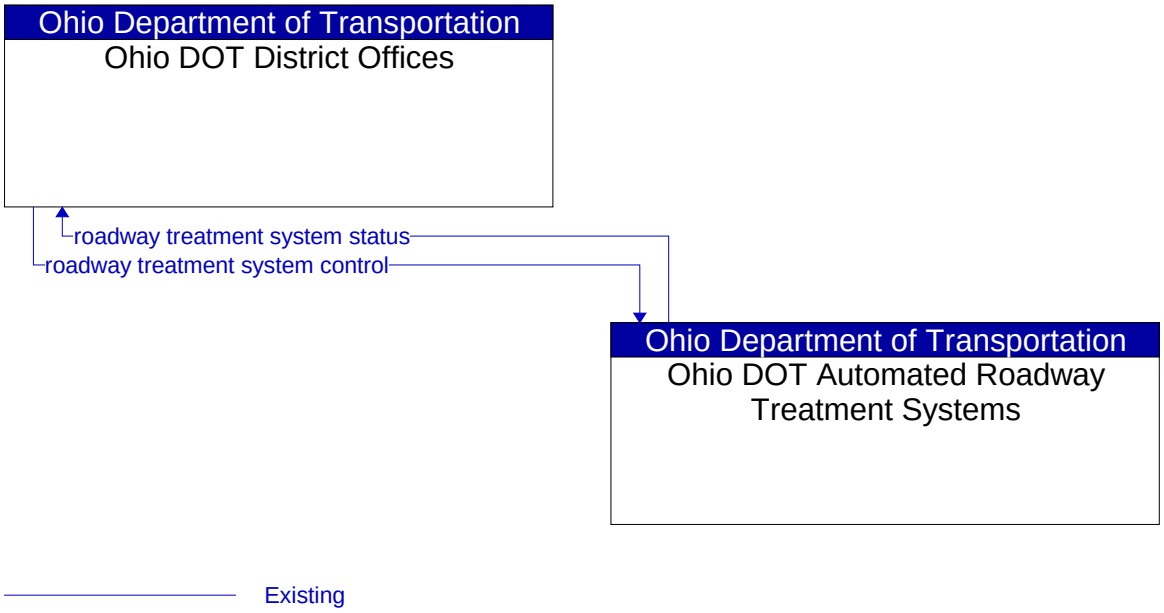

Figure 185: Ohio DOT Automated Roadway Treatment Systems - Ohio DOT District Offices Interface

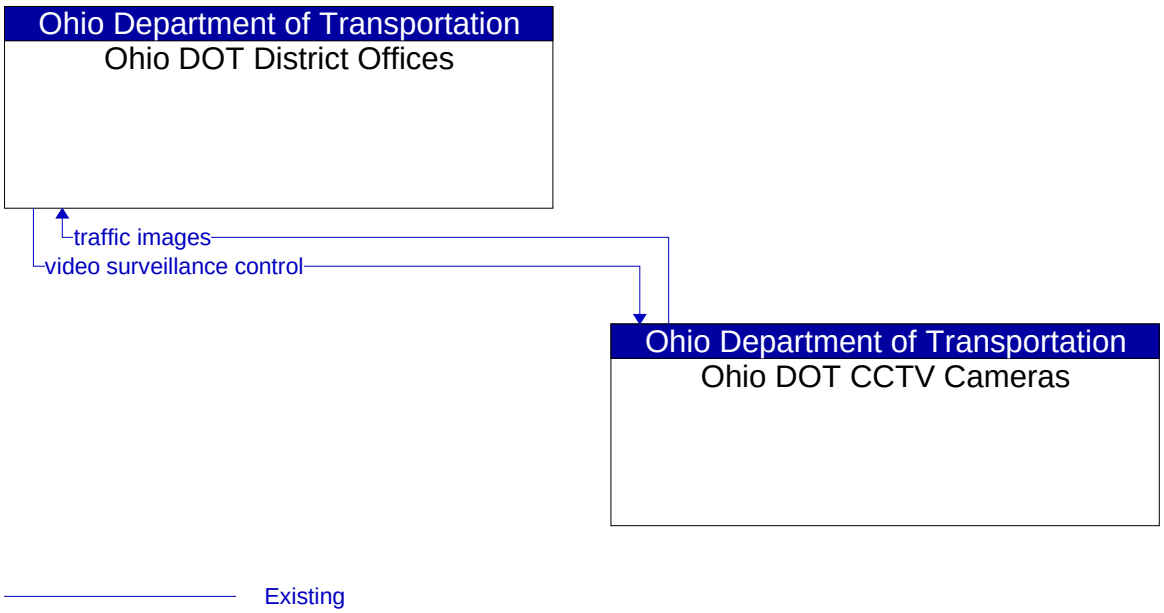

Figure 186: Ohio DOT CCTV Cameras - Ohio DOT District Offices Interface

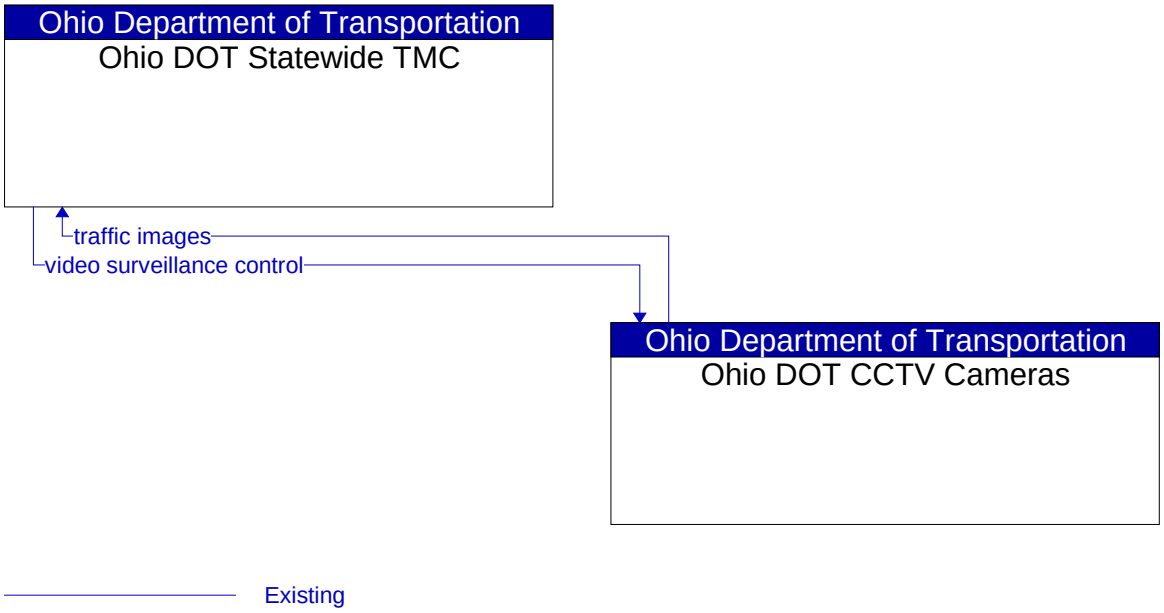

Figure 187: Ohio DOT CCTV Cameras - Ohio DOT Statewide TMC Interface

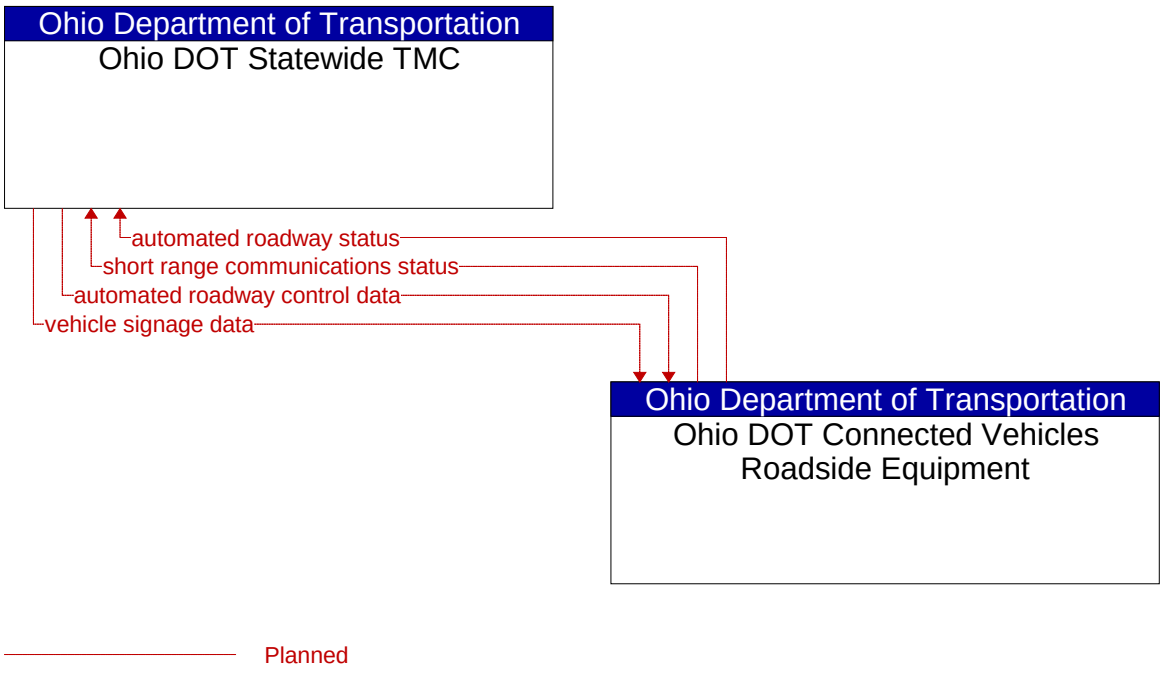

Figure 188: Ohio DOT Connected Vehicles Roadside Equipment - Ohio DOT Statewide TMC Interface

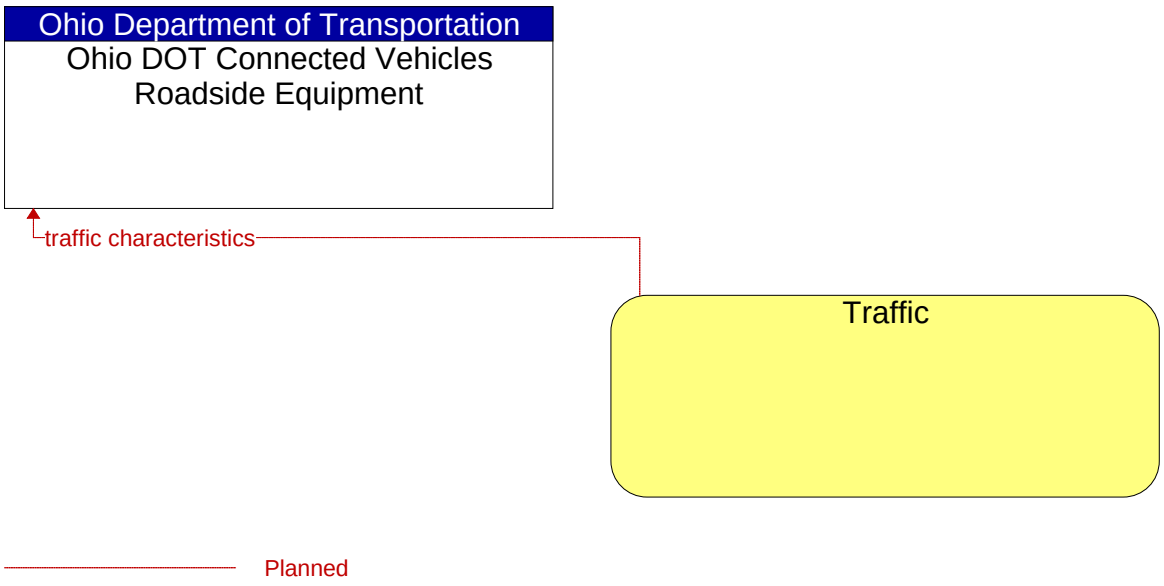

Figure 189: Ohio DOT Connected Vehicles Roadside Equipment - Traffic Interface

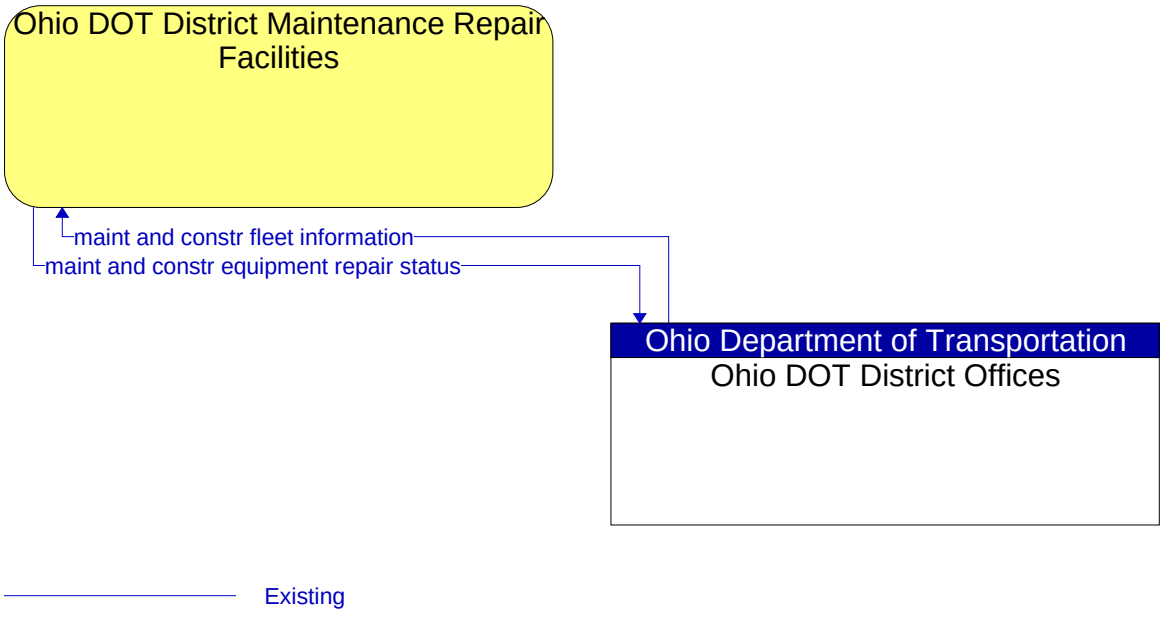

Figure 190: Ohio DOT District Maintenance Repair Facilities - Ohio DOT District Offices Interface

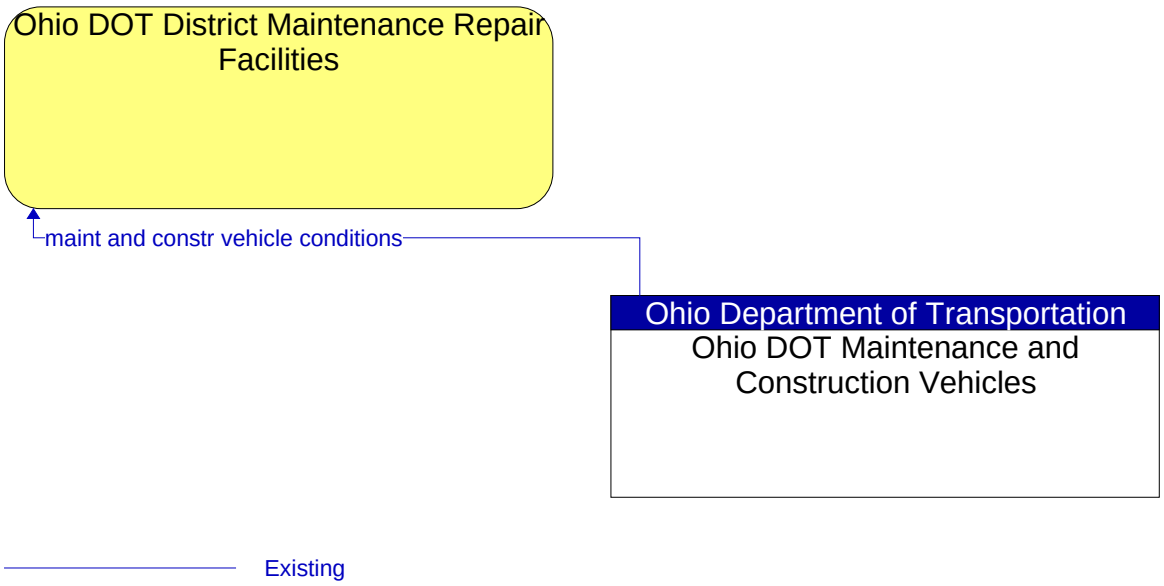

Figure 191: Ohio DOT District Maintenance Repair Facilities - Ohio DOT Maintenance and Construction Vehicles Interface

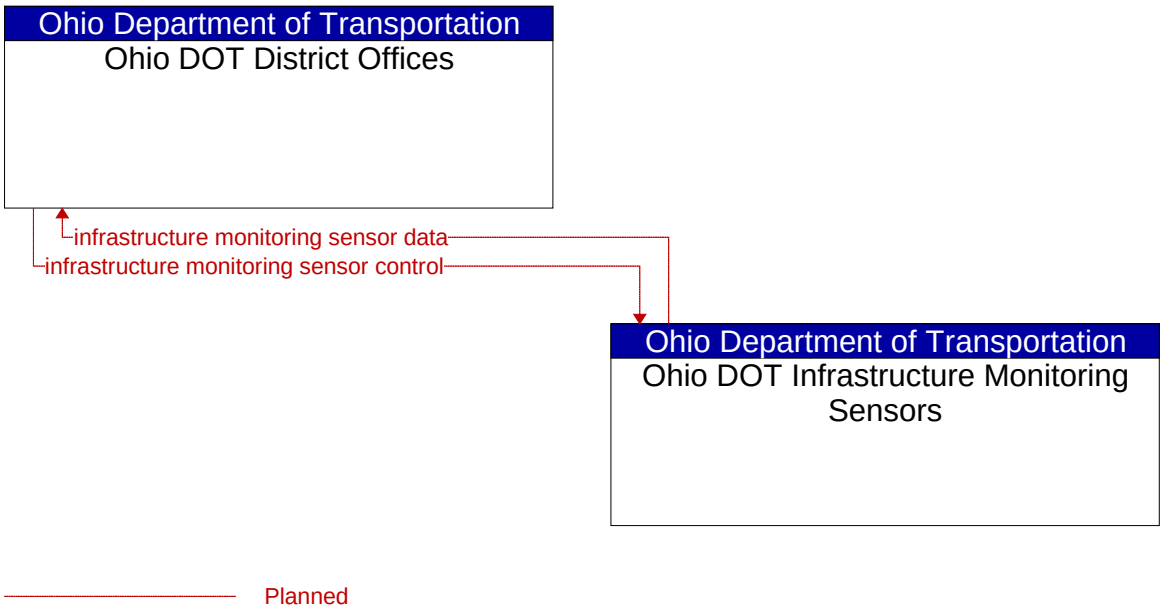

Figure 192: Ohio DOT District Offices - Ohio DOT Infrastructure Monitoring Sensors Interface

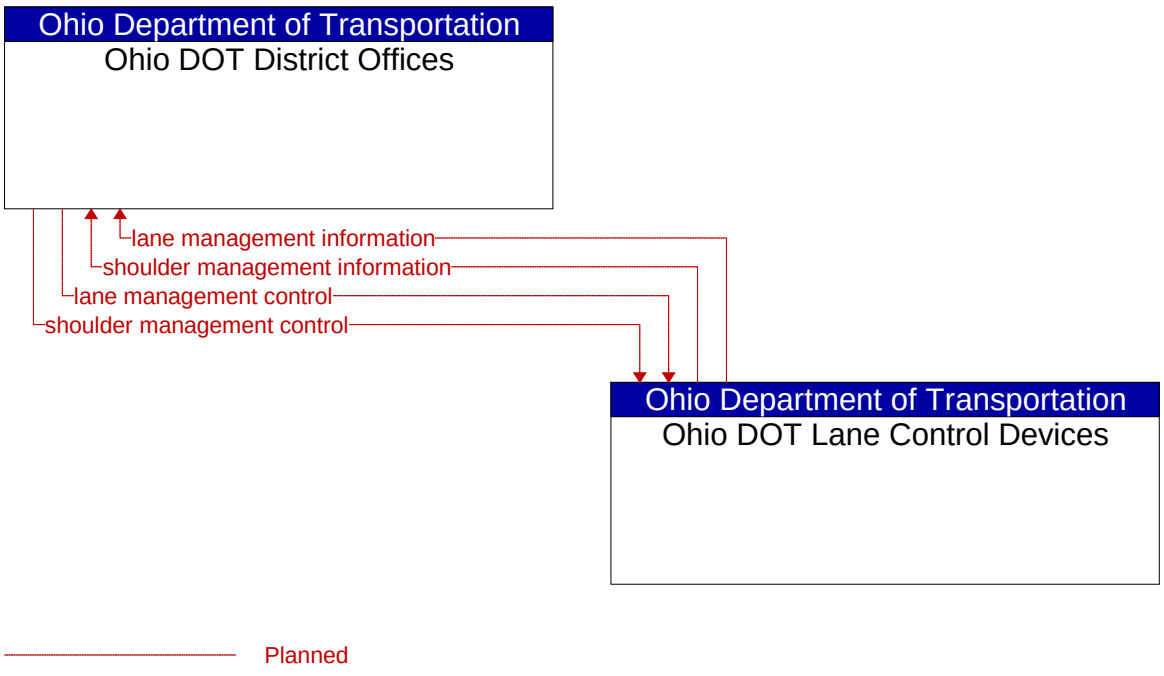

Figure 193: Ohio DOT District Offices - Ohio DOT Lane Control Devices Interface

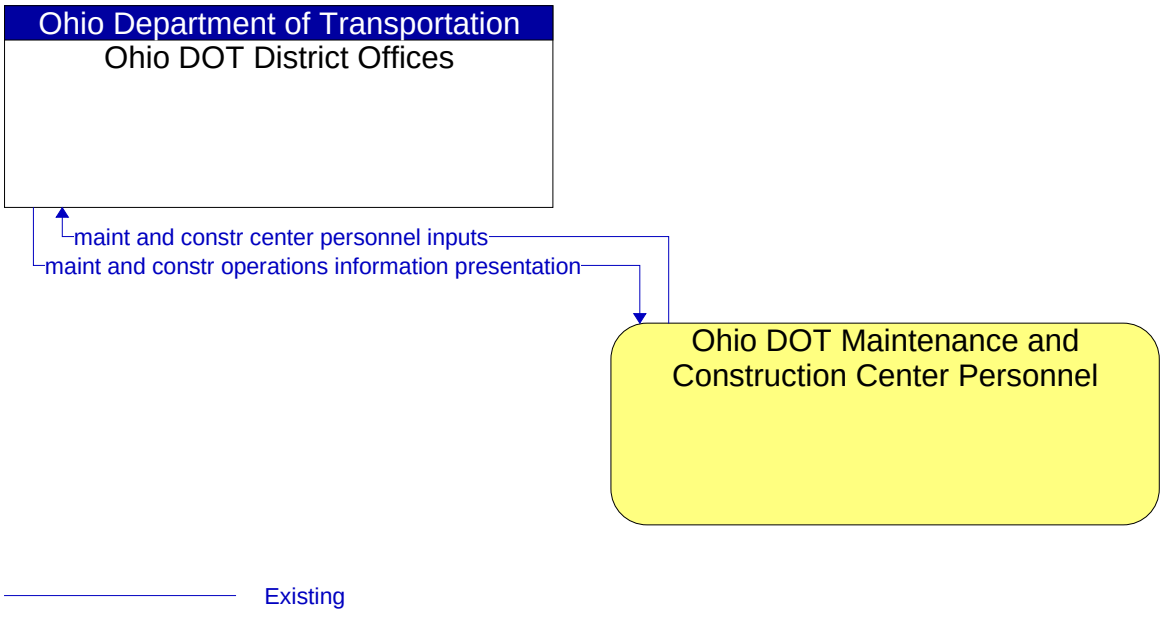

Figure 194: Ohio DOT District Offices - Ohio DOT Maintenance and Construction Center Personnel Interface

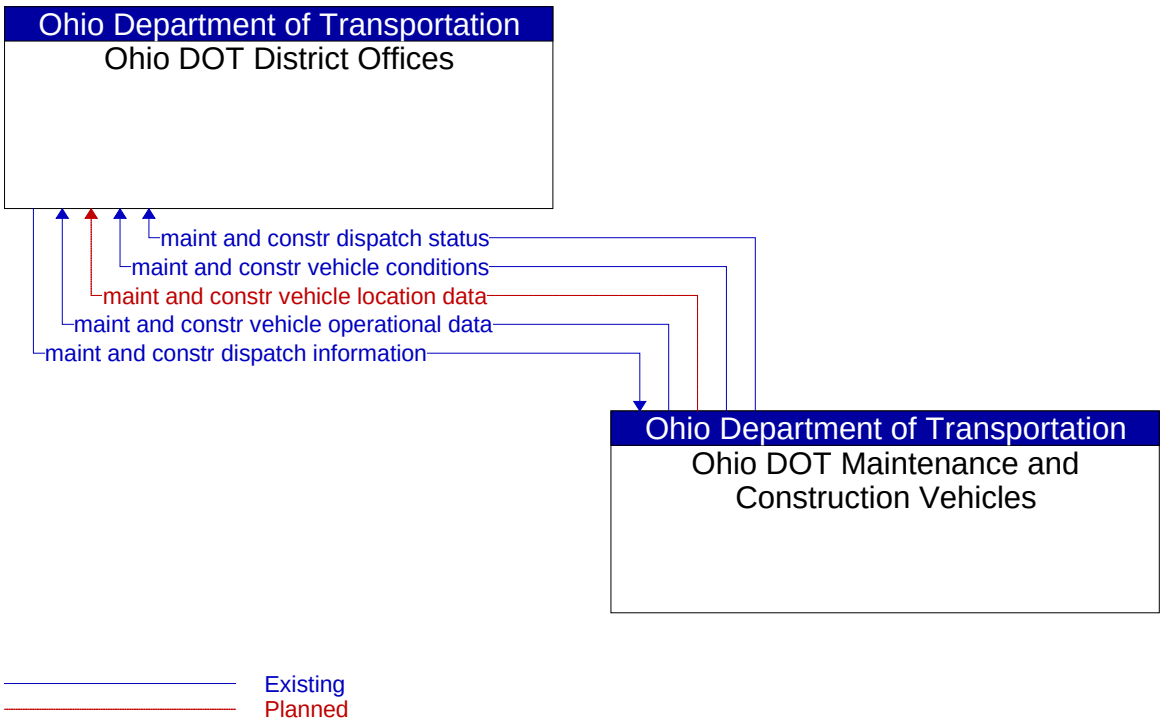

Figure 195: Ohio DOT District Offices - Ohio DOT Maintenance and Construction Vehicles Interface

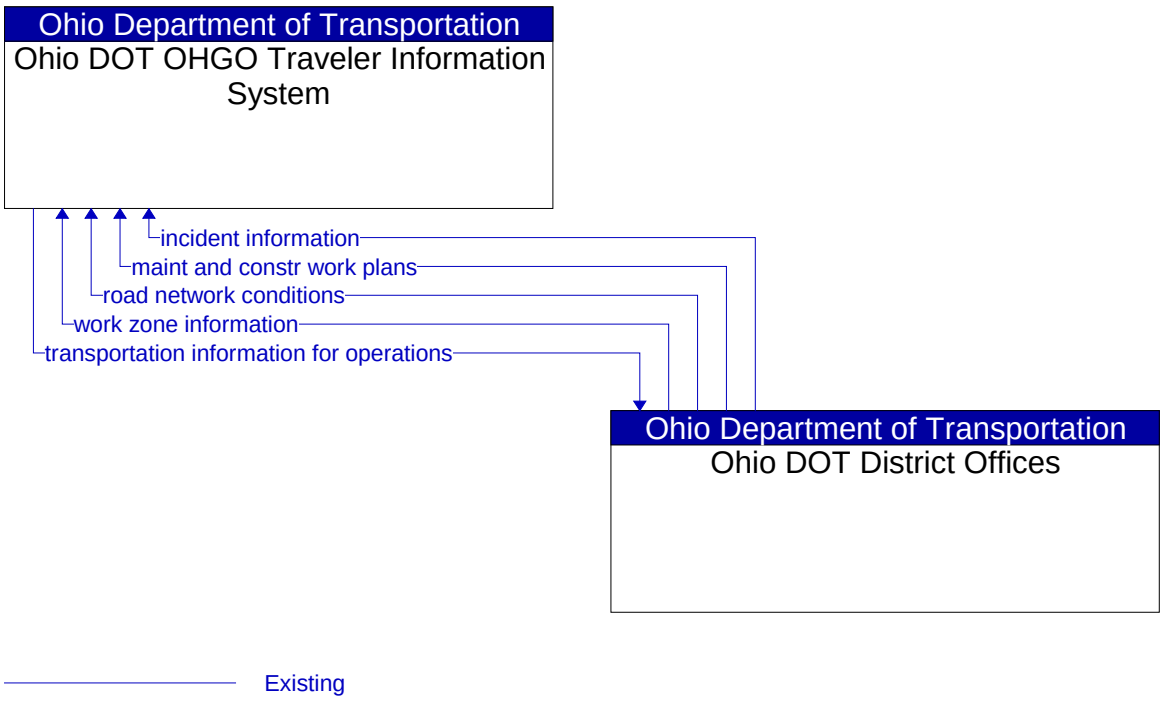

Figure 196: Ohio DOT District Offices - Ohio DOT OHGO Traveler Information System Interface

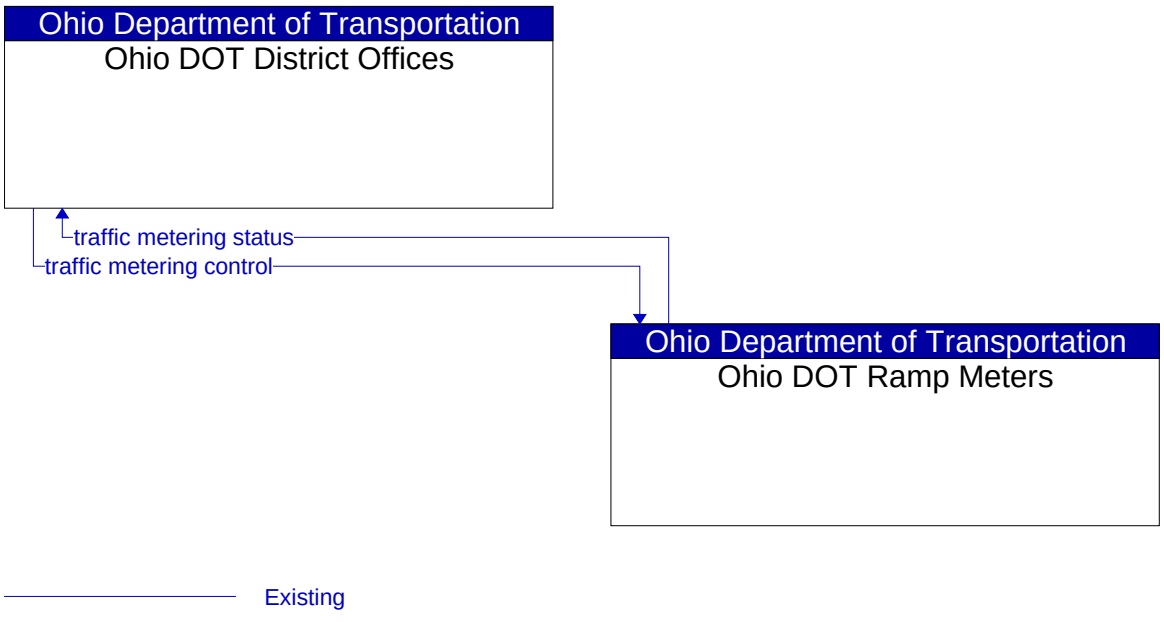

Figure 197: Ohio DOT District Offices - Ohio DOT Ramp Meters Interface

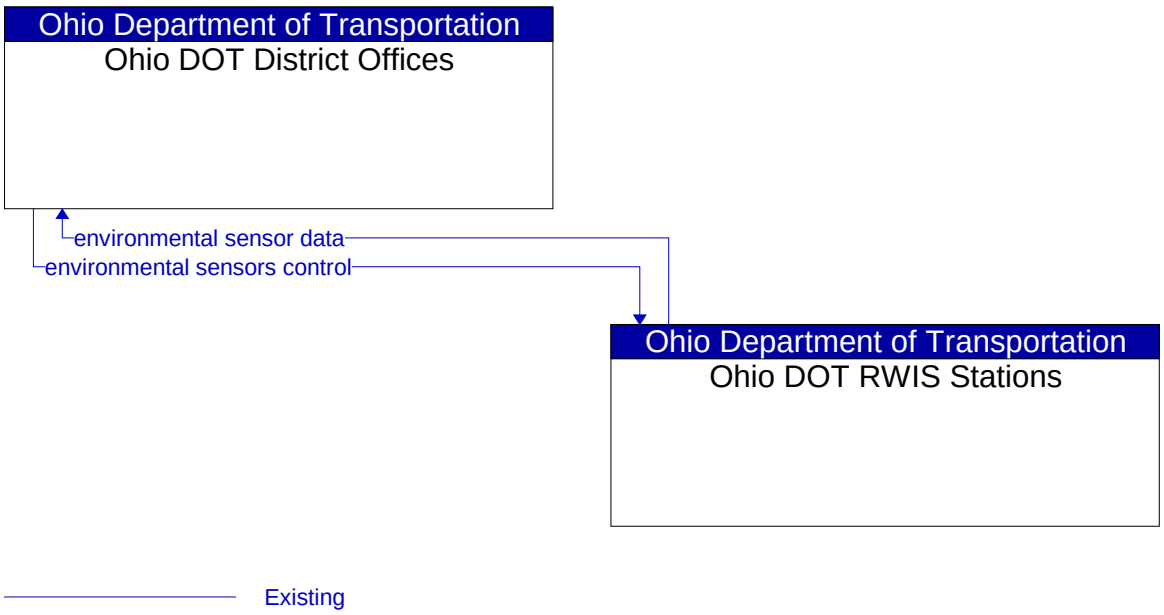

Figure 198: Ohio DOT District Offices - Ohio DOT RWIS Stations Interface

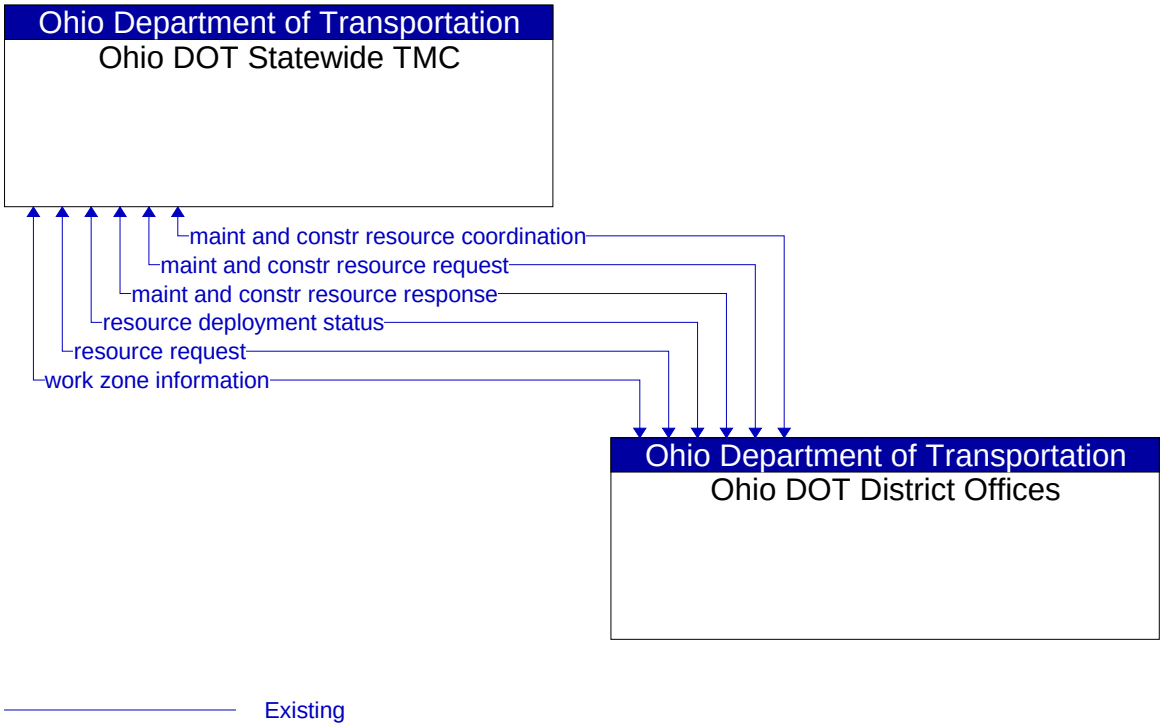

Figure 199: Ohio DOT District Offices - Ohio DOT Statewide TMC Interface

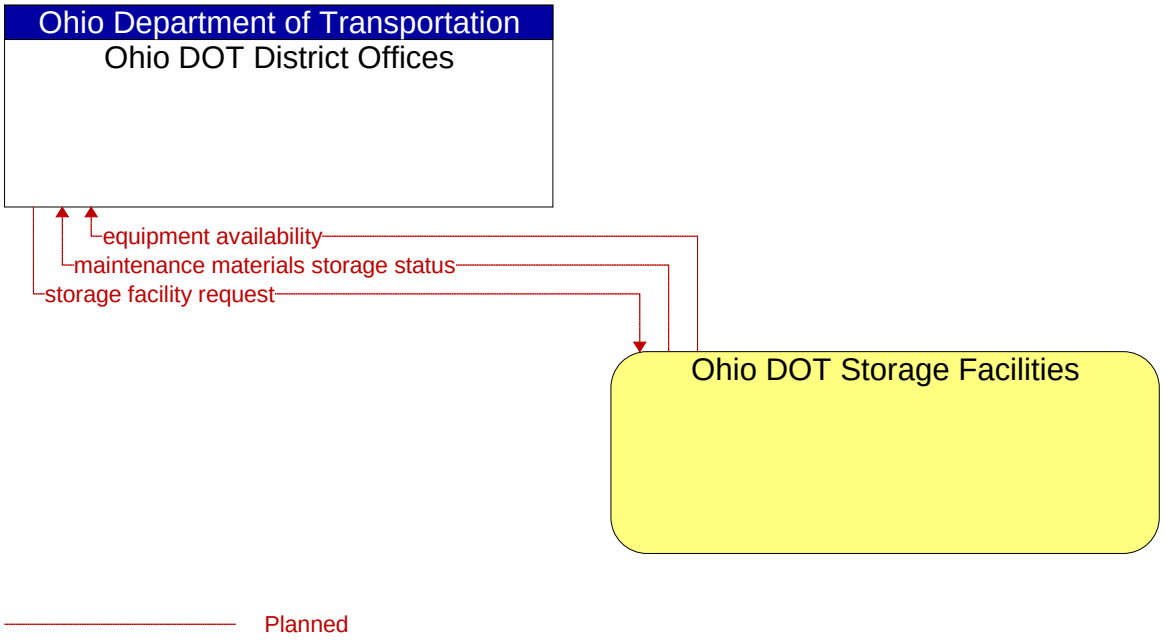

Figure 200: Ohio DOT District Offices - Ohio DOT Storage Facilities Interface

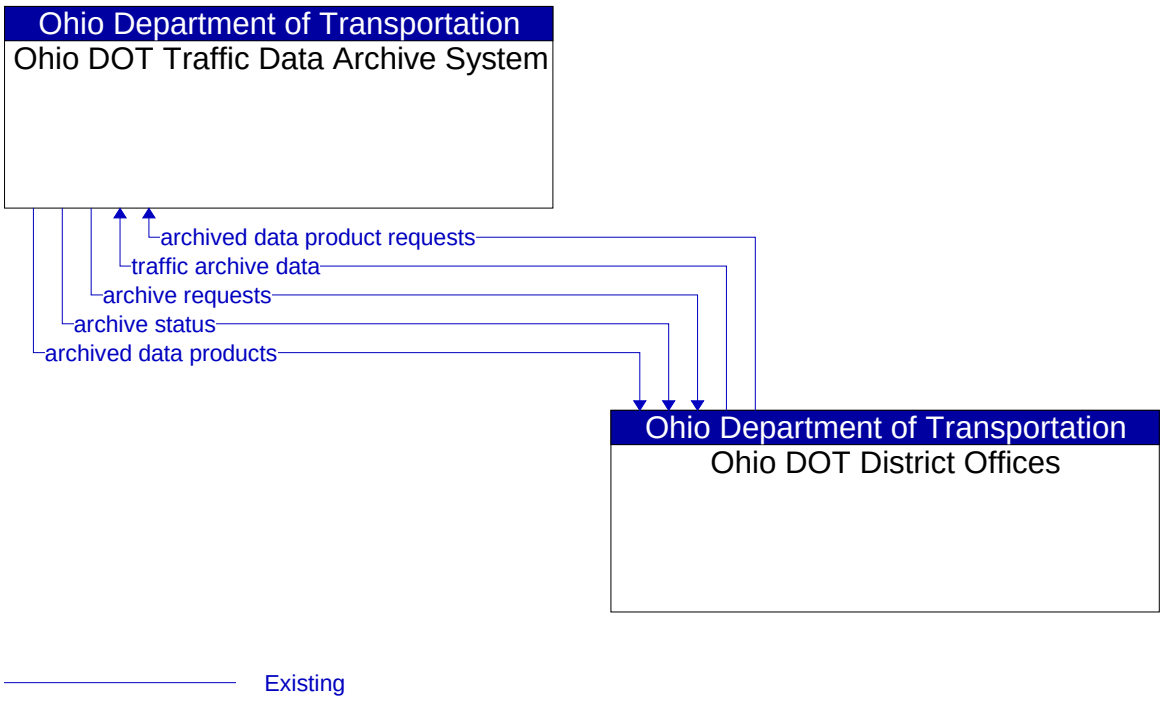

Figure 201: Ohio DOT District Offices - Ohio DOT Traffic Data Archive System Interface

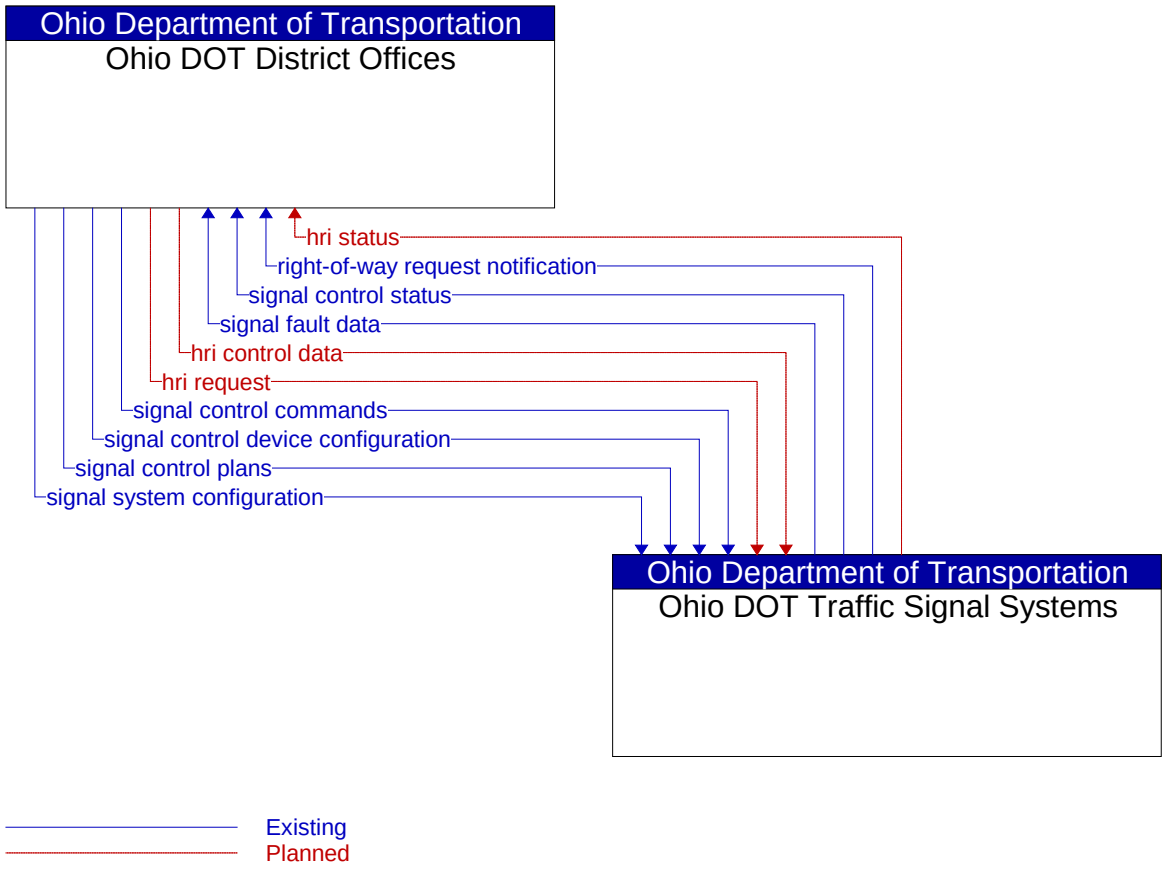

Figure 202: Ohio DOT District Offices - Ohio DOT Traffic Signal Systems Interface

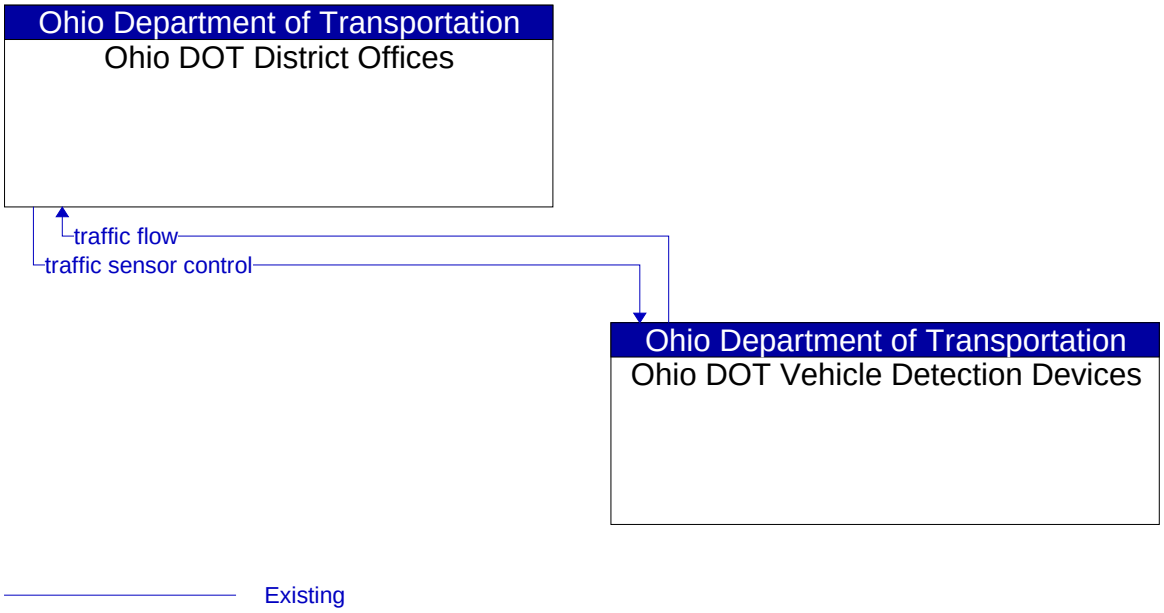

Figure 203: Ohio DOT District Offices - Ohio DOT Vehicle Detection Devices Interface

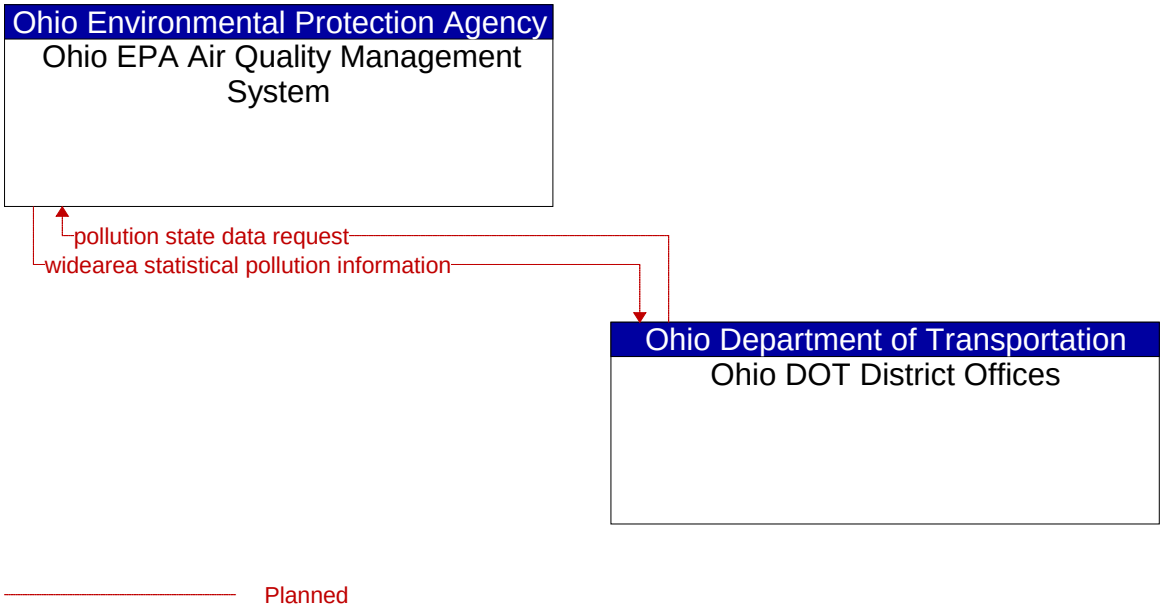

Figure 204: Ohio DOT District Offices - Ohio EPA Air Quality Management System Interface

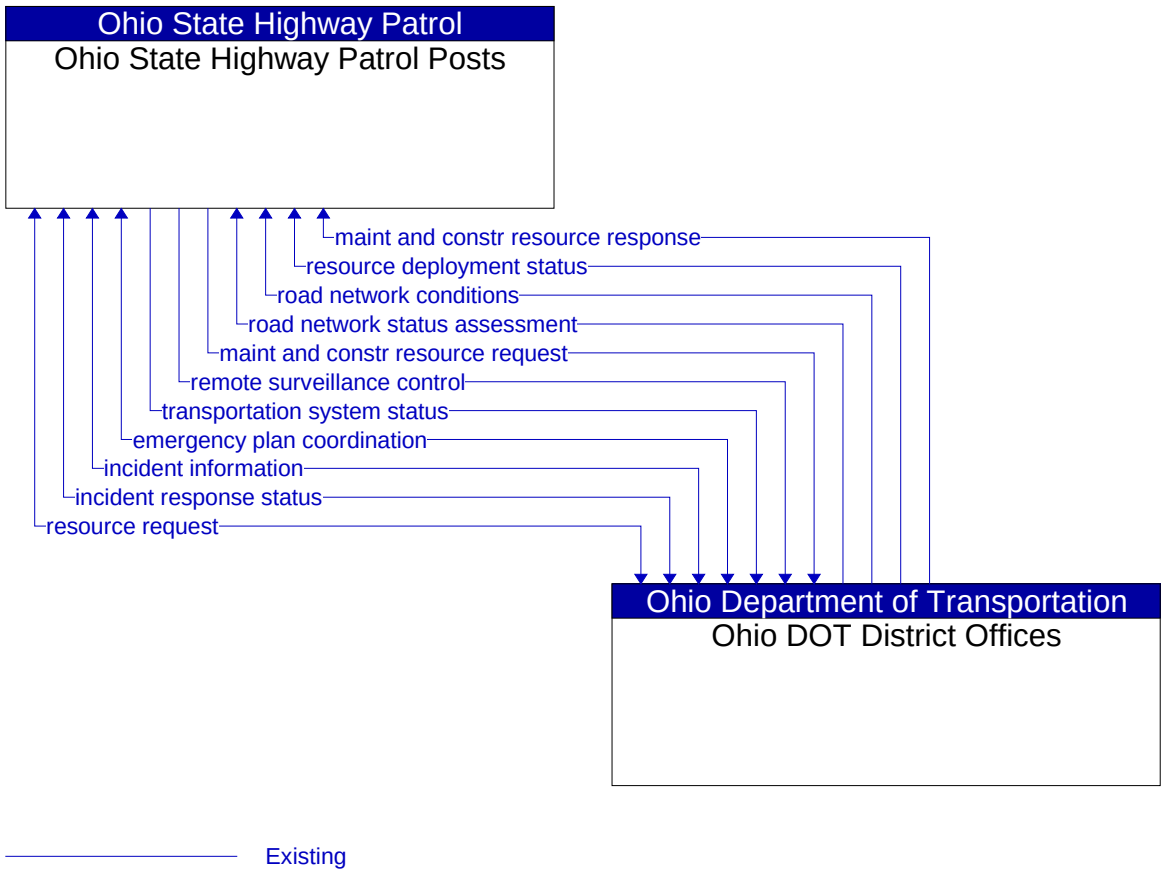

Figure 205: Ohio DOT District Offices - Ohio State Highway Patrol Posts Interface

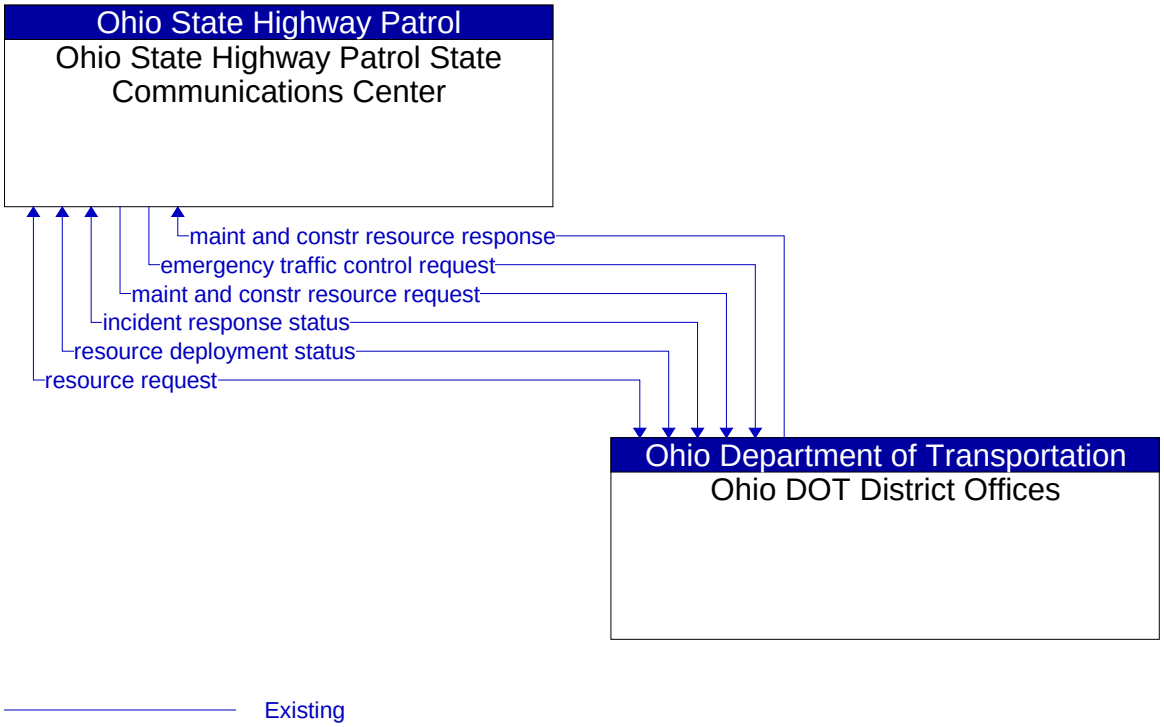

Figure 206: Ohio DOT District Offices - Ohio State Highway Patrol State Communications Center Interface

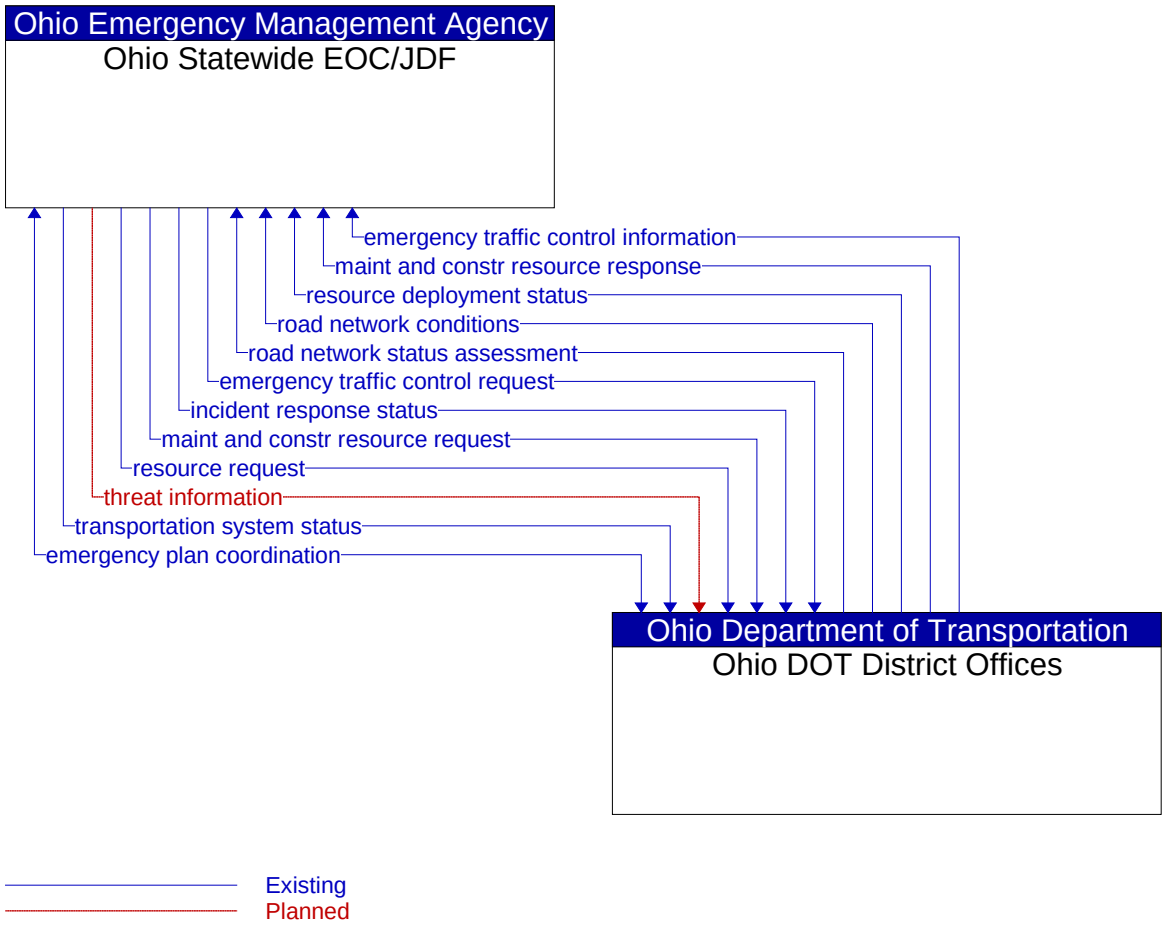

Figure 207: Ohio DOT District Offices - Ohio Statewide EOC/JDF Interface

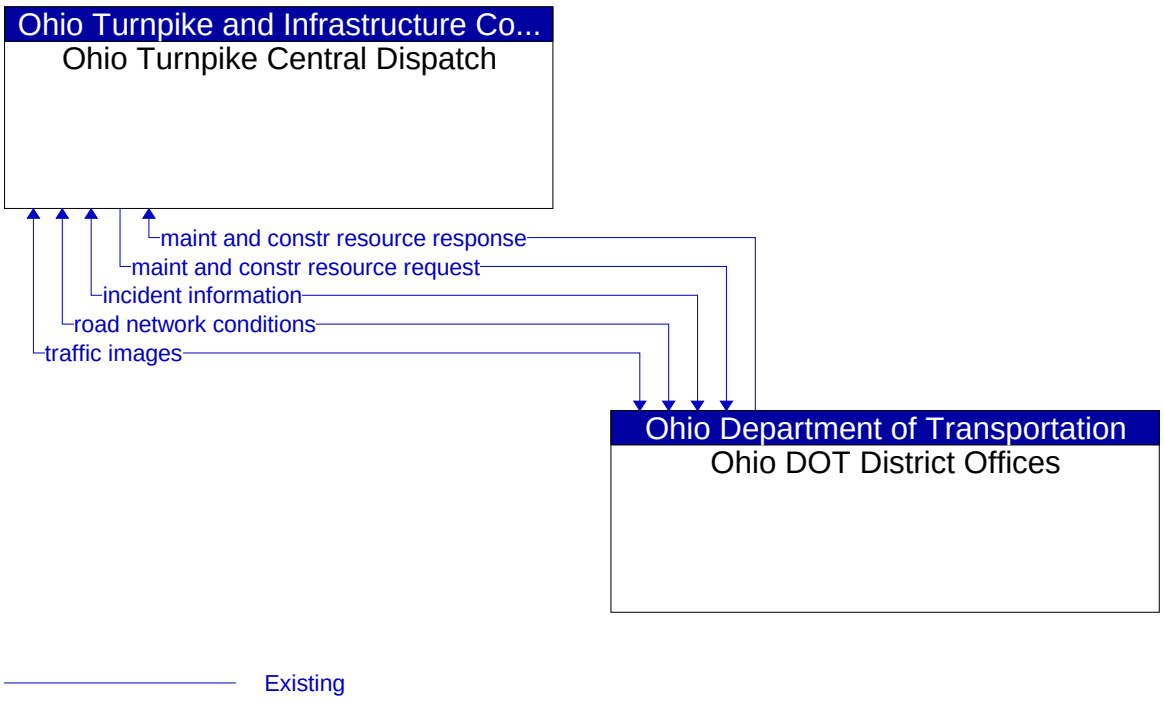

Figure 208: Ohio DOT District Offices - Ohio Turnpike Central Dispatch Interface

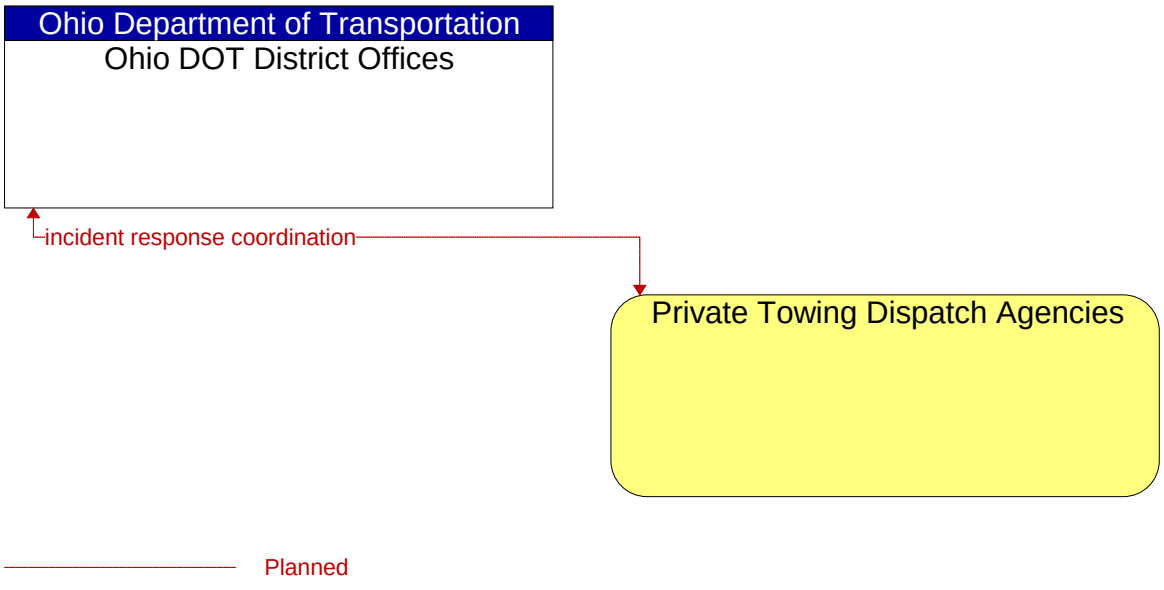

Figure 209: Ohio DOT District Offices - Private Towing Dispatch Agencies Interface

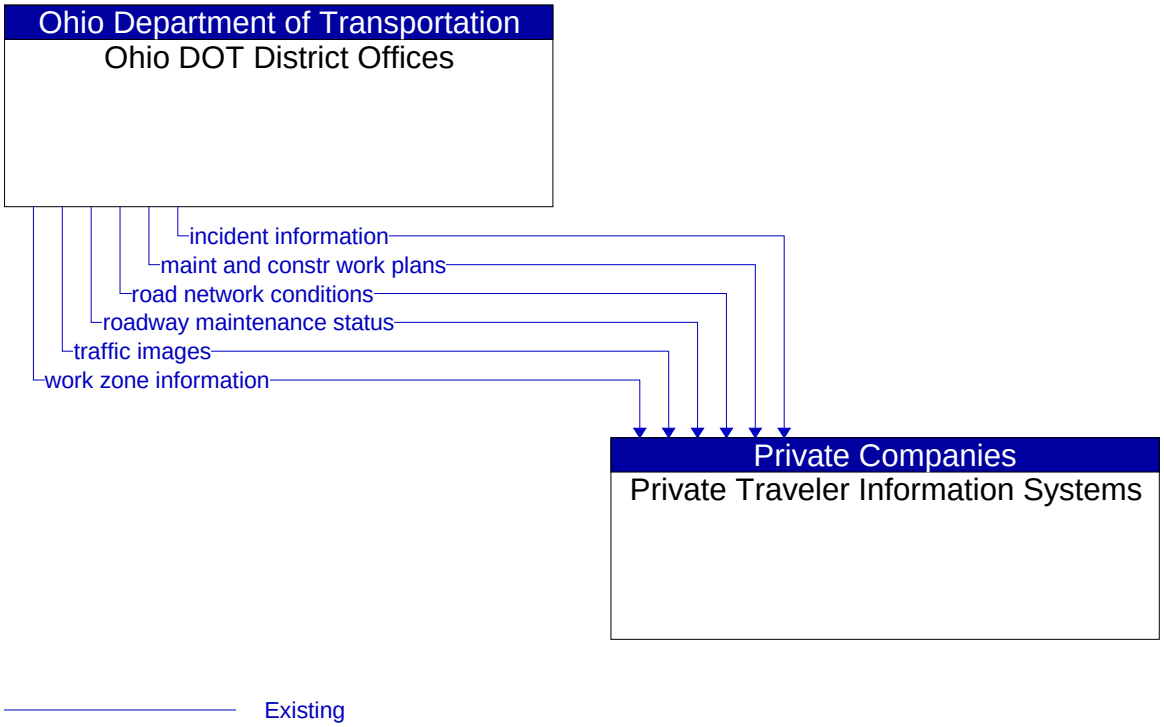

Figure 210: Ohio DOT District Offices - Private Traveler Information Systems Interface

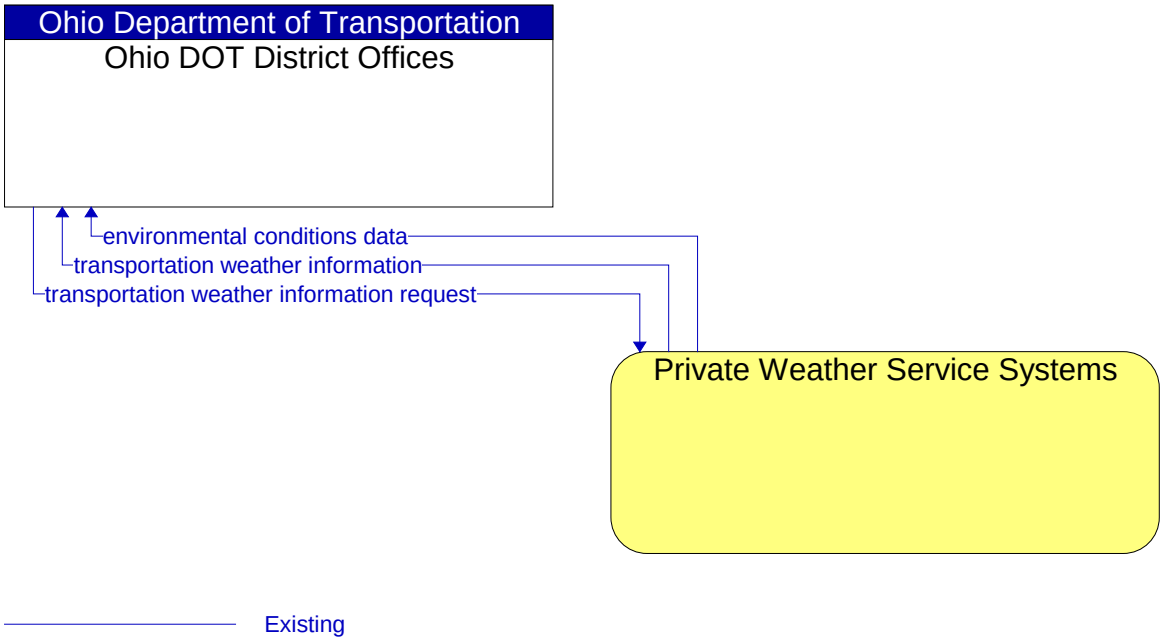

Figure 211: Ohio DOT District Offices - Private Weather Service Systems Interface

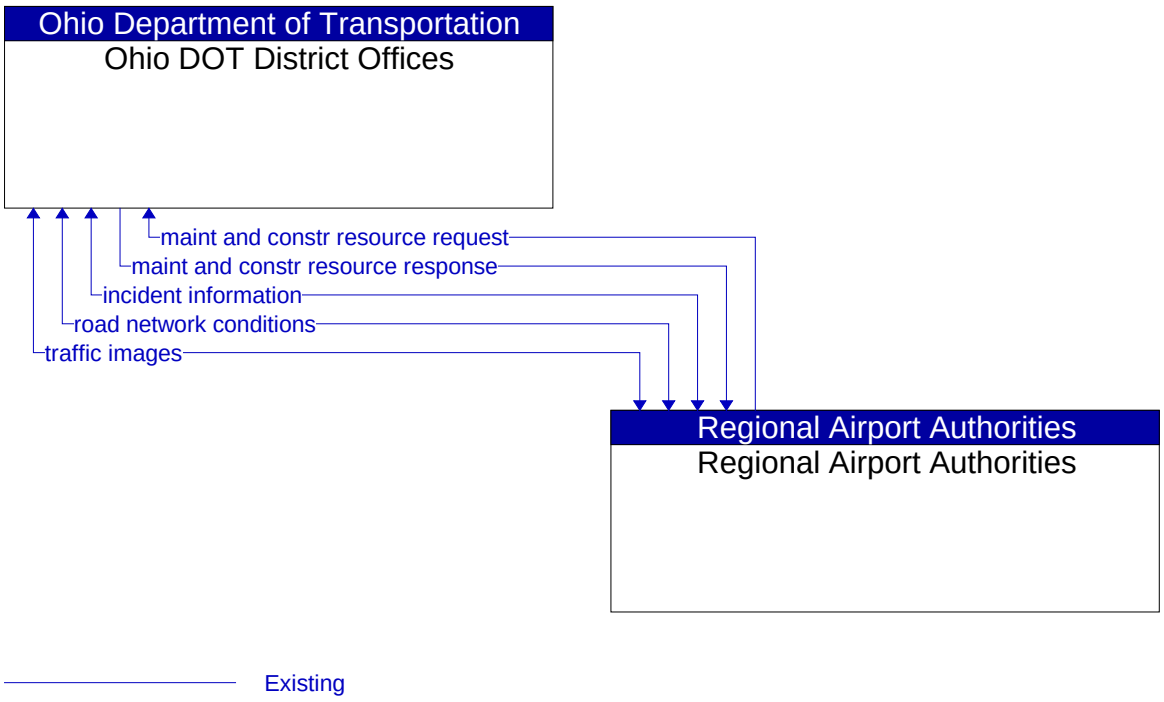

Figure 212: Ohio DOT District Offices - Regional Airport Authorities Interface

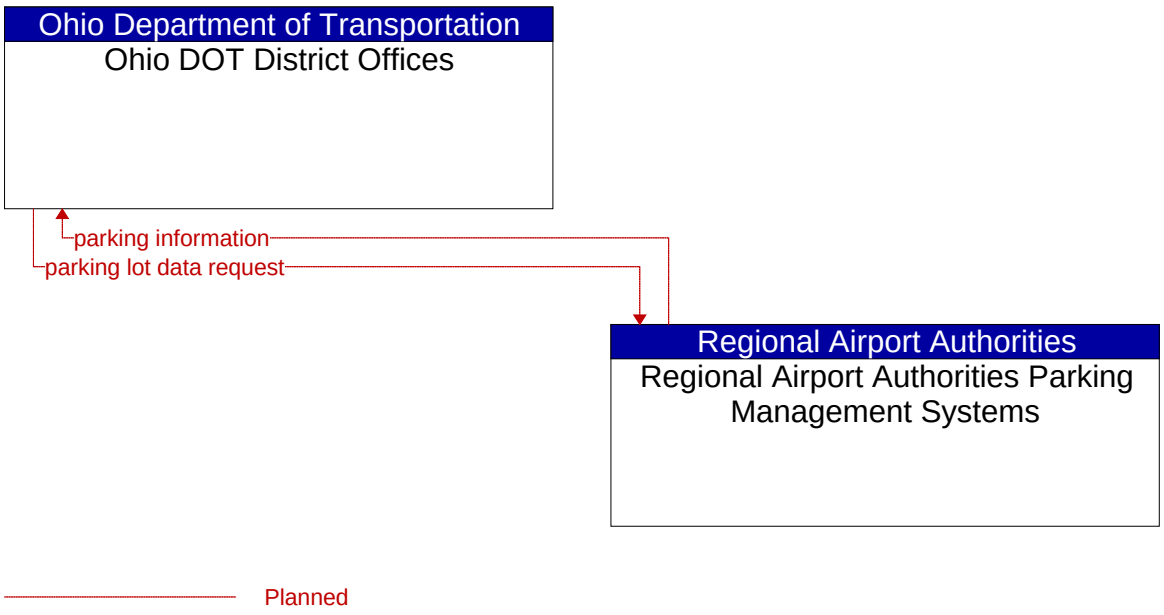

Figure 213: Ohio DOT District Offices - Regional Airport Authorities Parking Management Systems Interface

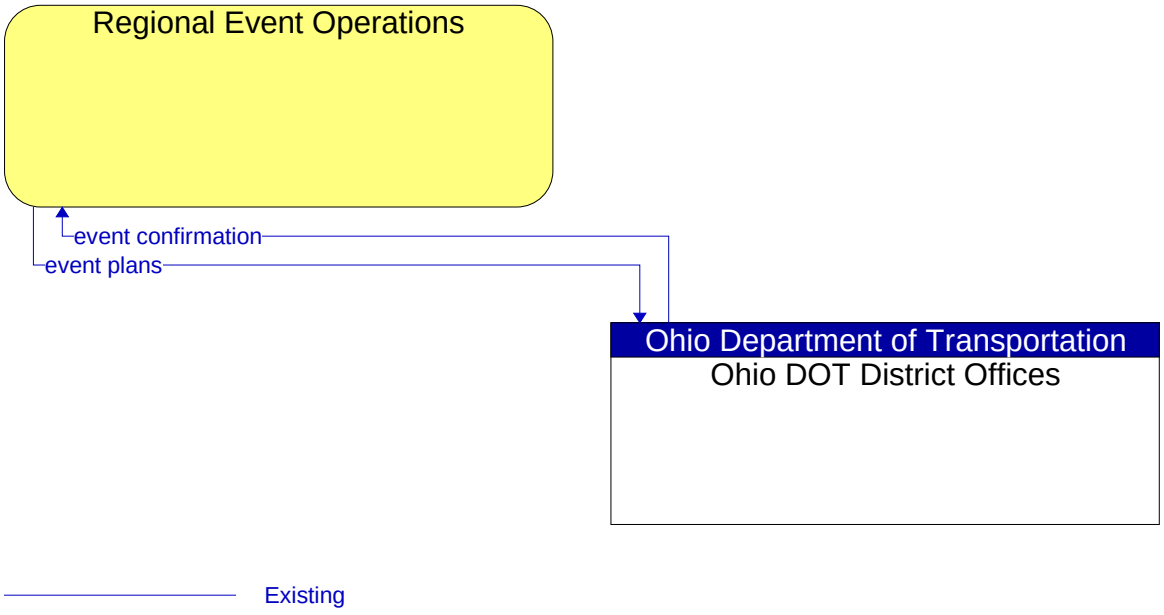

Figure 214: Ohio DOT District Offices - Regional Event Operations Interface

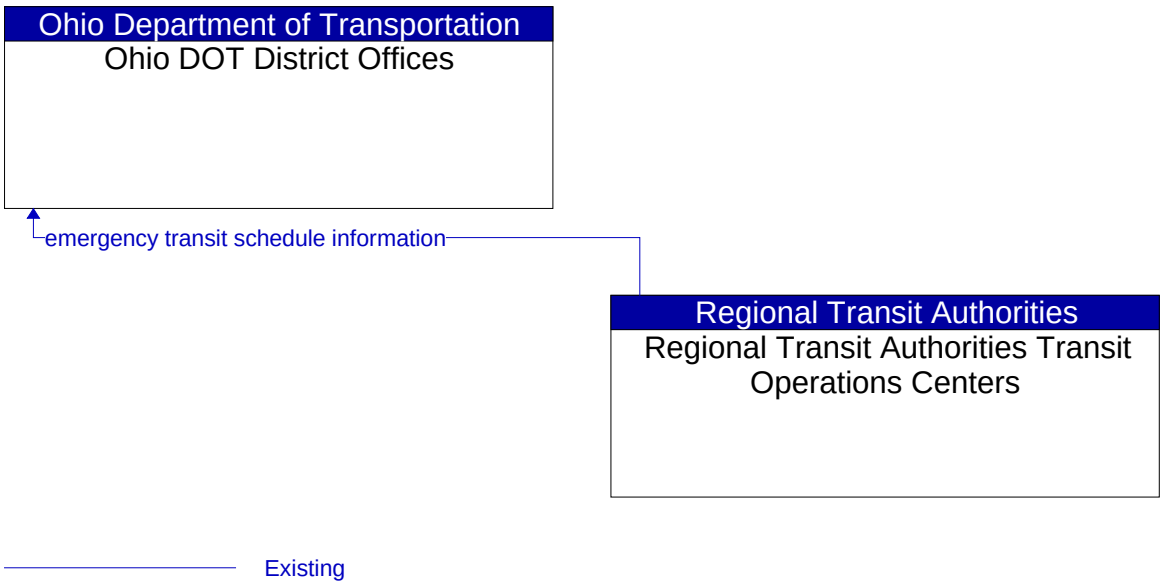

Figure 215: Ohio DOT District Offices - Regional Transit Authorities Transit Operations Centers Interface

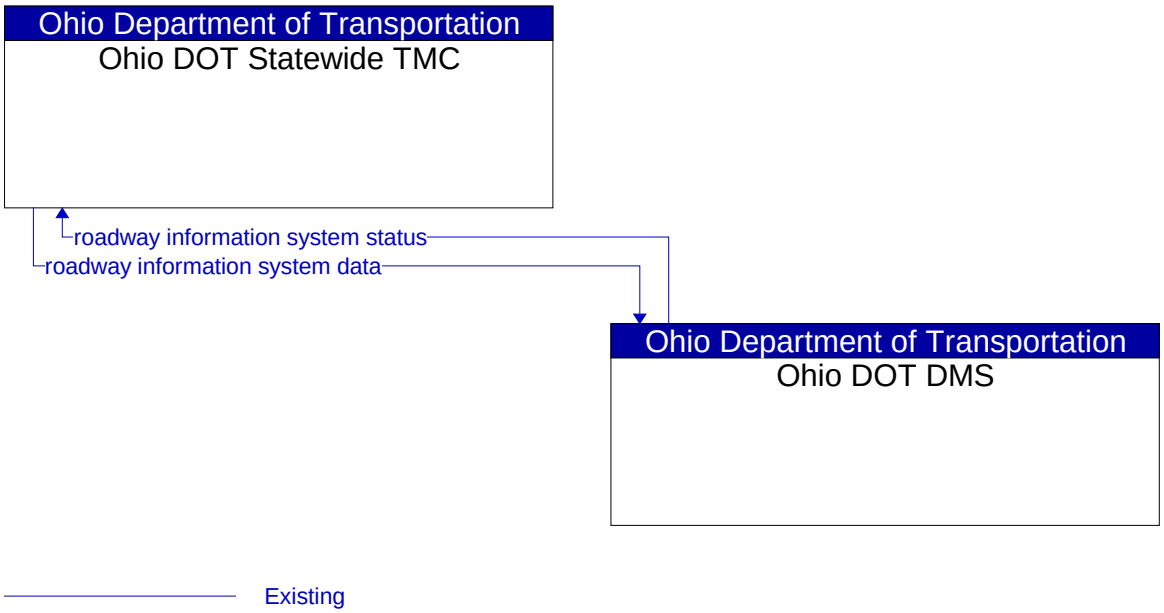

Figure 216: Ohio DOT DMS - Ohio DOT Statewide TMC Interface

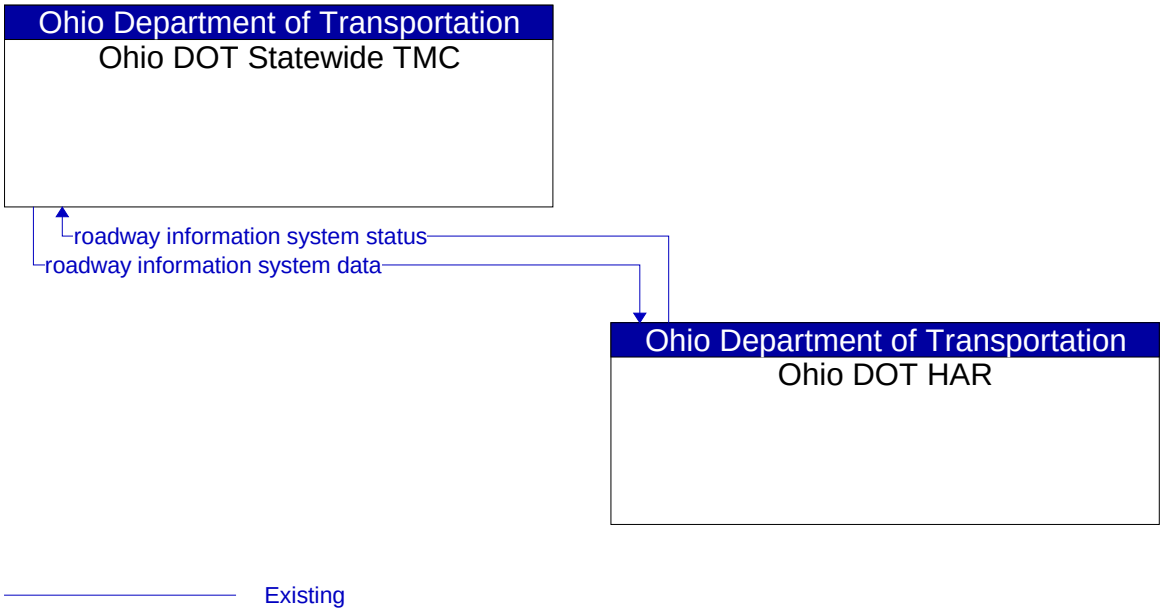

Figure 217: Ohio DOT HAR - Ohio DOT Statewide TMC Interface

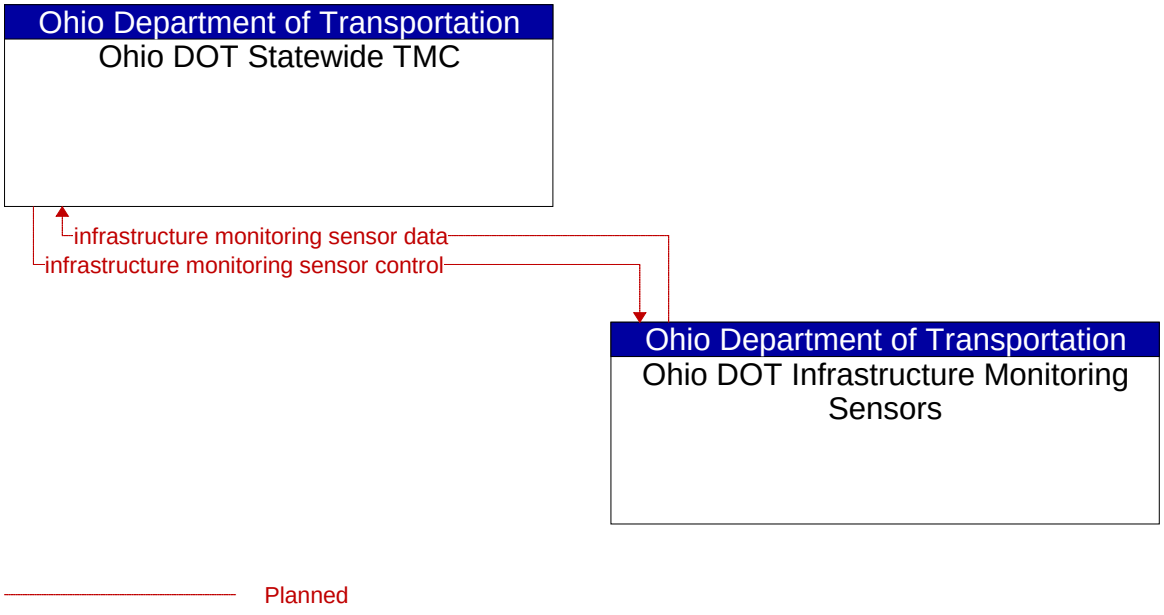

Figure 218: Ohio DOT Infrastructure Monitoring Sensors - Ohio DOT Statewide TMC Interface

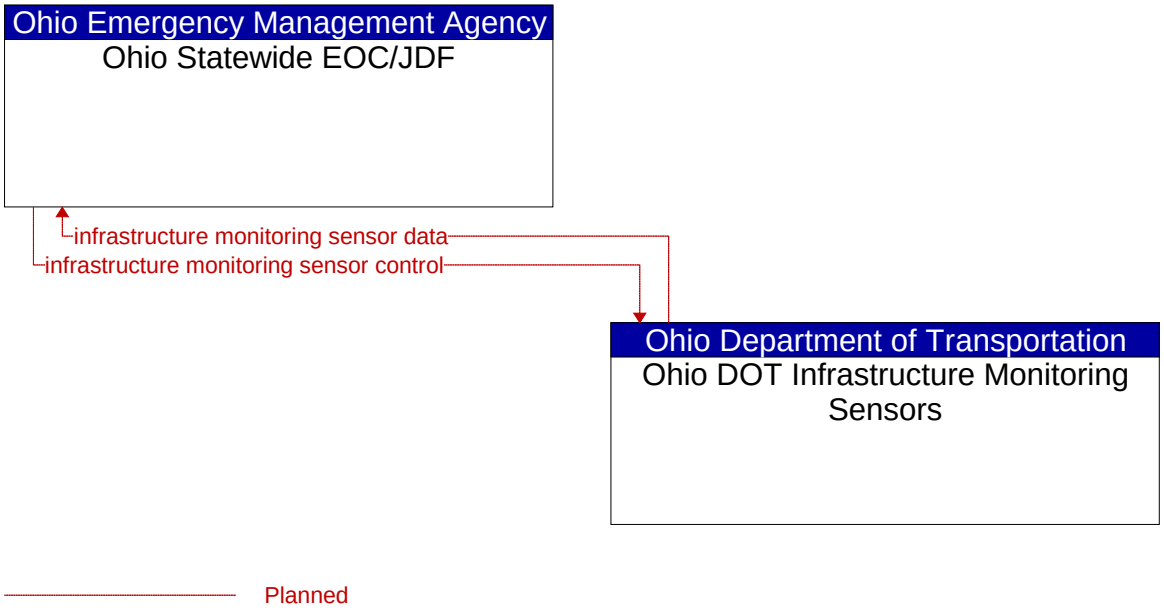

Figure 219: Ohio DOT Infrastructure Monitoring Sensors - Ohio Statewide EOC/JDF Interface

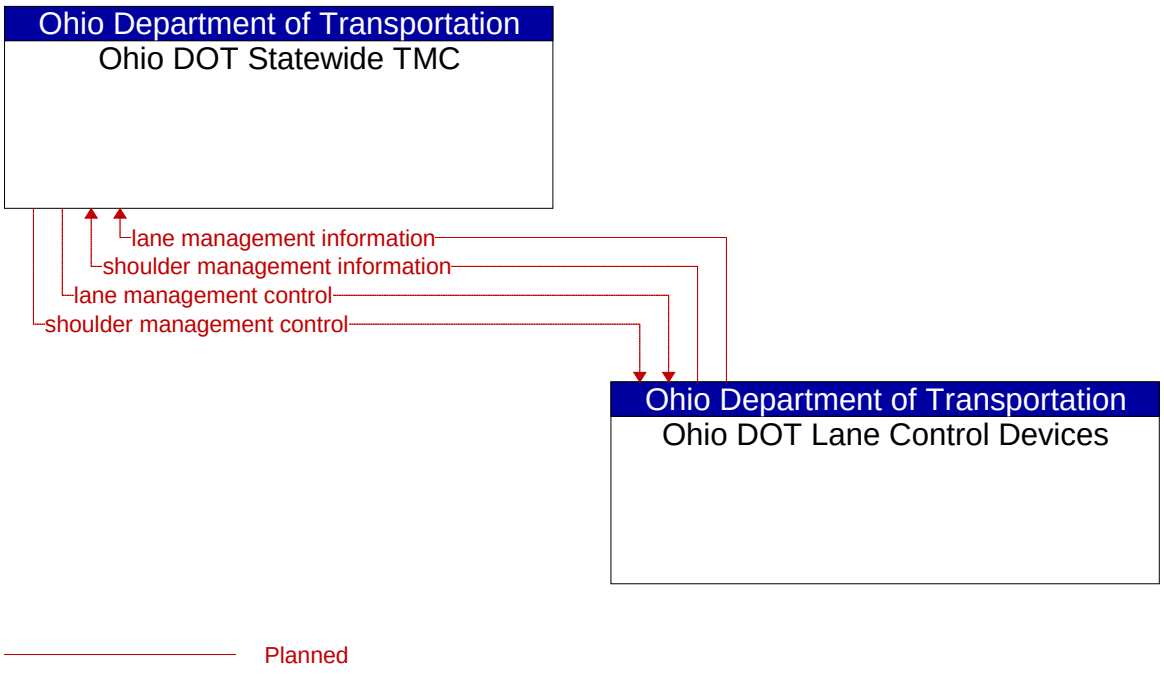

Figure 220: Ohio DOT Lane Control Devices - Ohio DOT Statewide TMC Interface

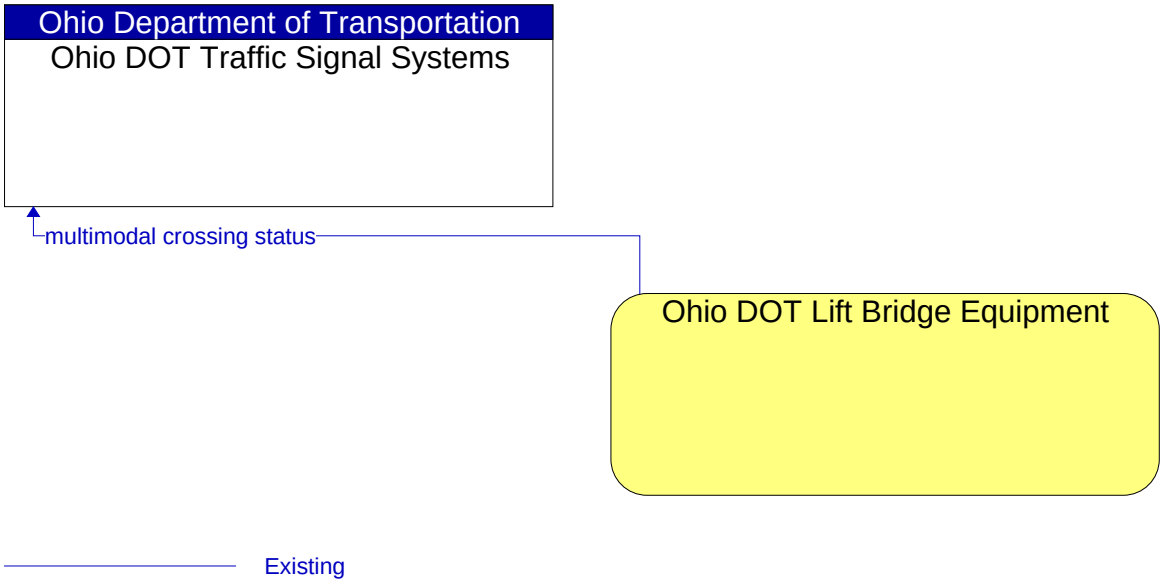

Figure 221: Ohio DOT Lift Bridge Equipment - Ohio DOT Traffic Signal Systems Interface

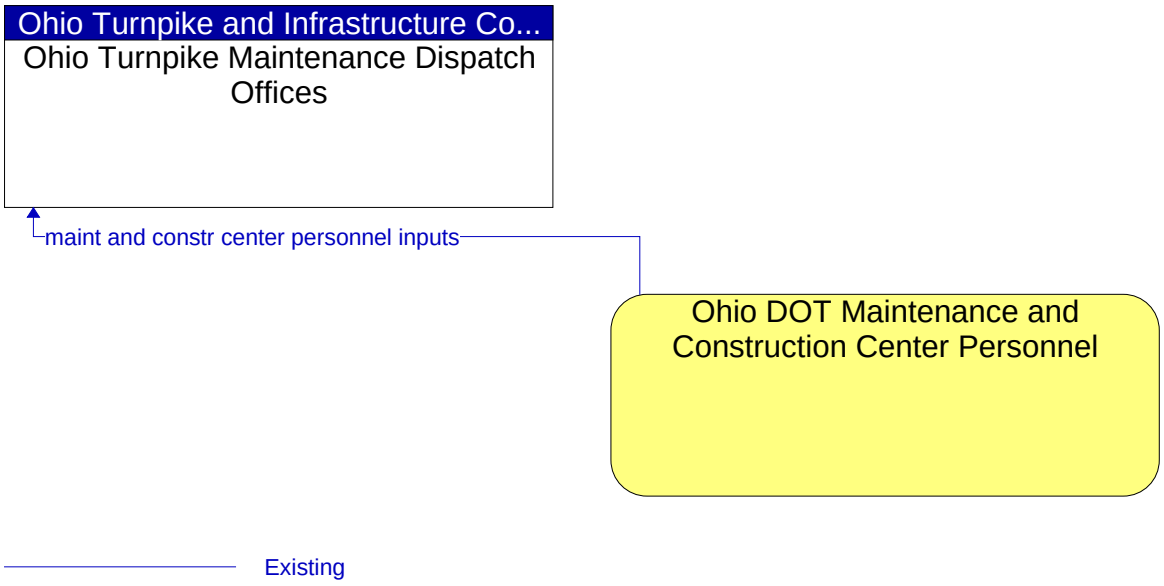

Figure 222: Ohio DOT Maintenance and Construction Center Personnel - Ohio Turnpike Maintenance Dispatch Offices Interface

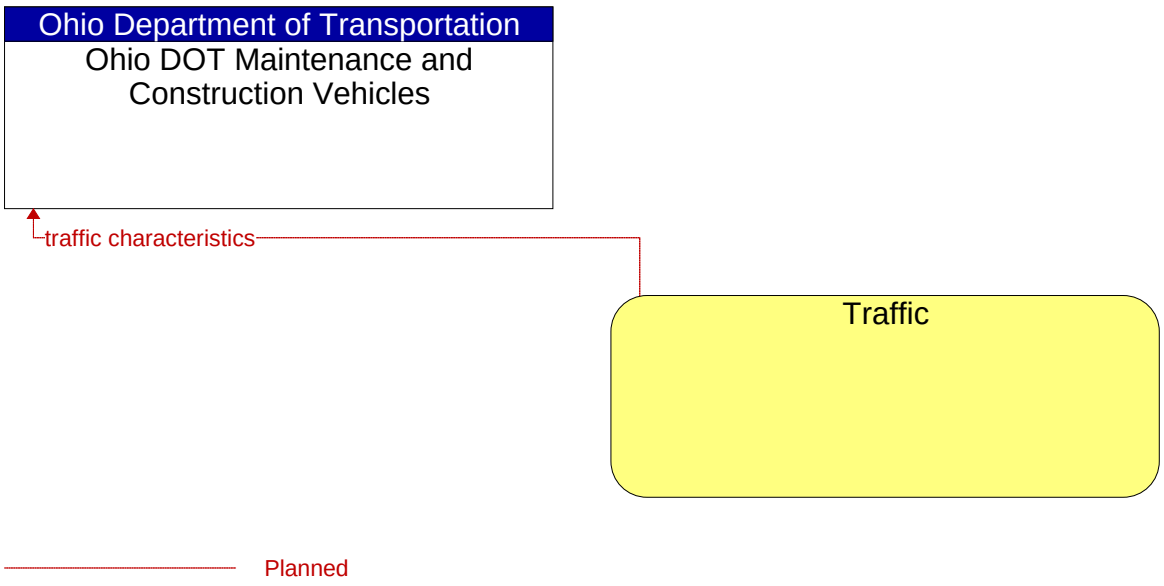

Figure 223: Ohio DOT Maintenance and Construction Vehicles - Traffic Interface

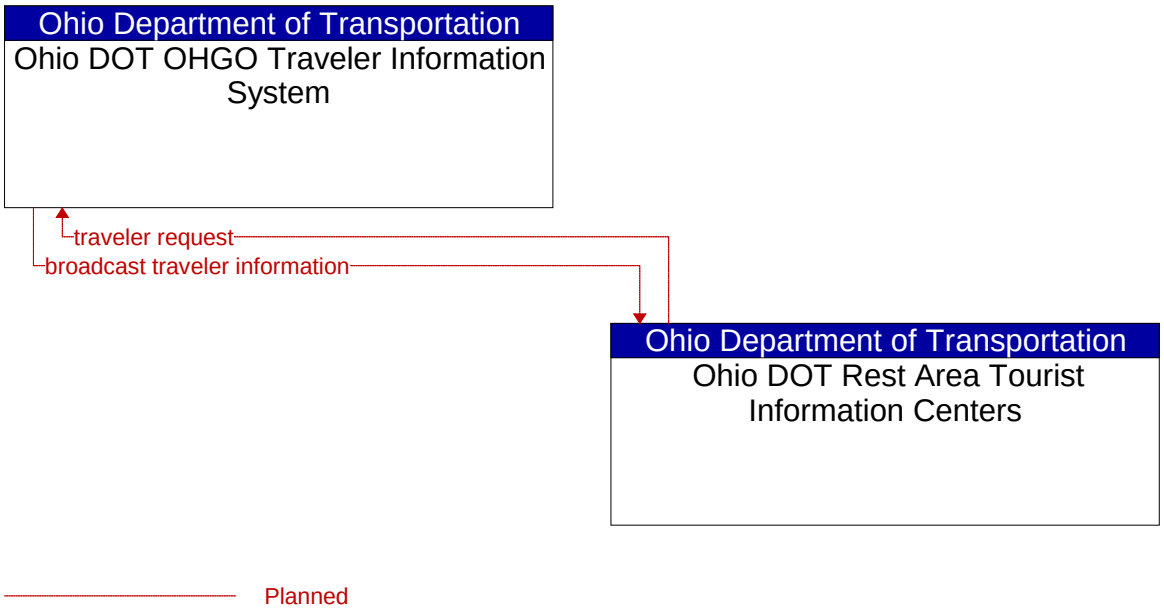

Figure 224: Ohio DOT OHGO Traveler Information System - Ohio DOT Rest Area Tourist Information Centers Interface

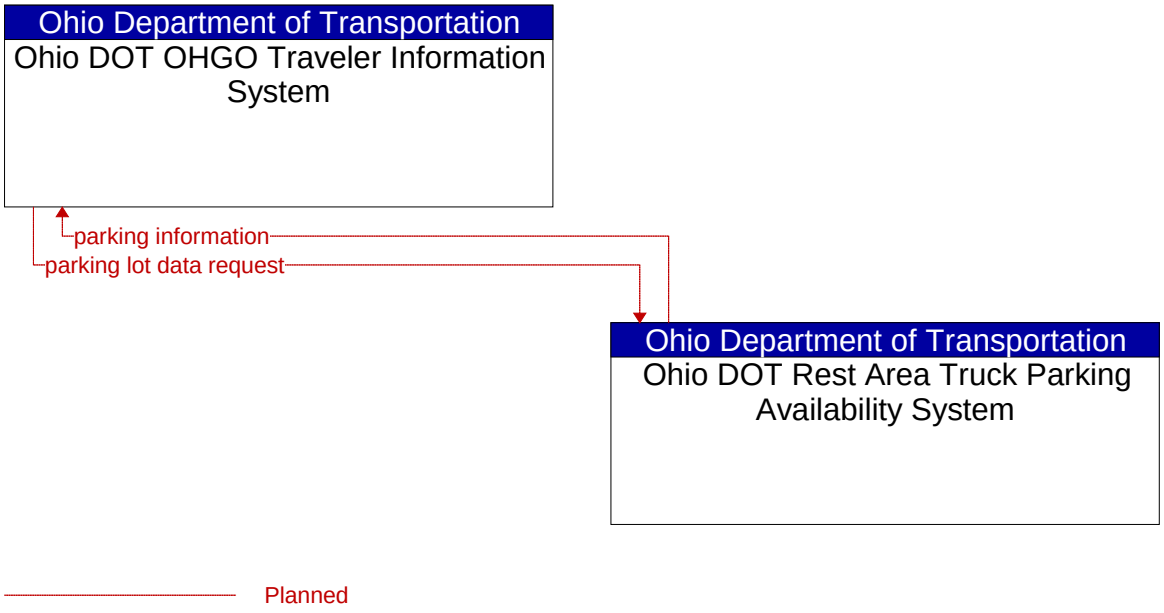

Figure 225: Ohio DOT OHGO Traveler Information System - Ohio DOT Rest Area Truck Parking Availability System Interface

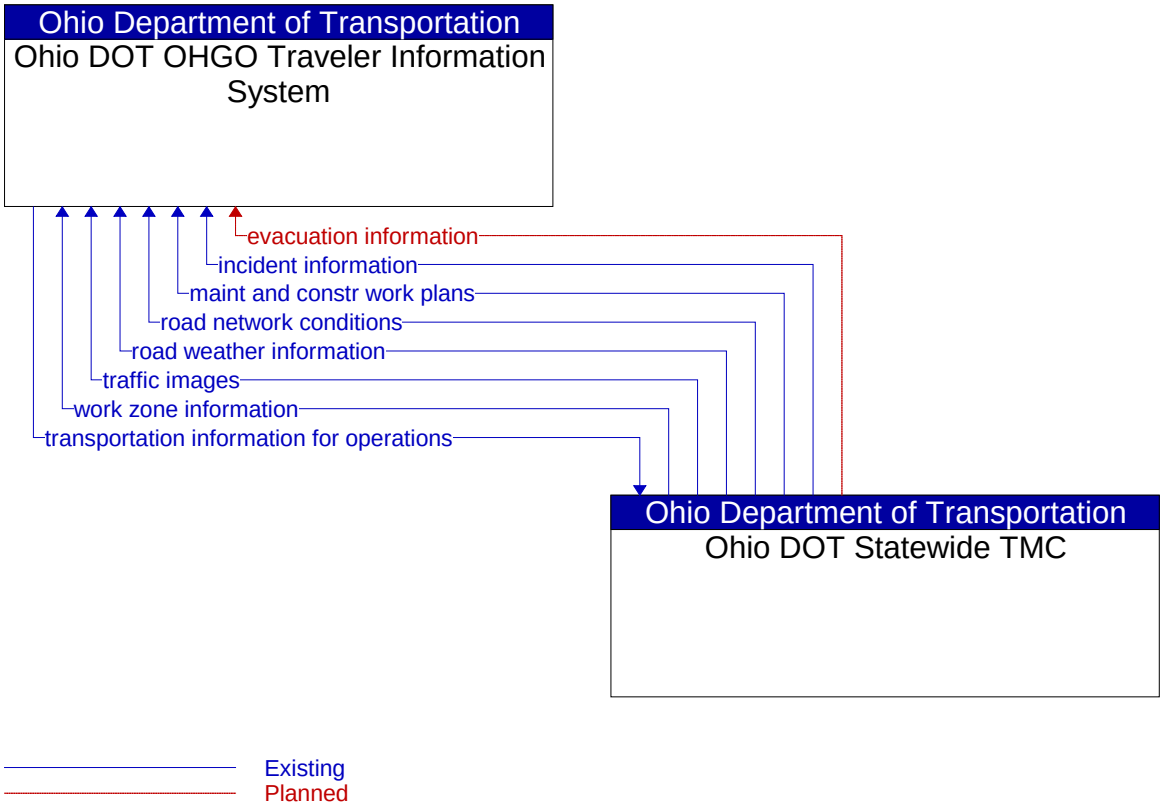

Figure 226: Ohio DOT OHGO Traveler Information System - Ohio DOT Statewide TMC Interface

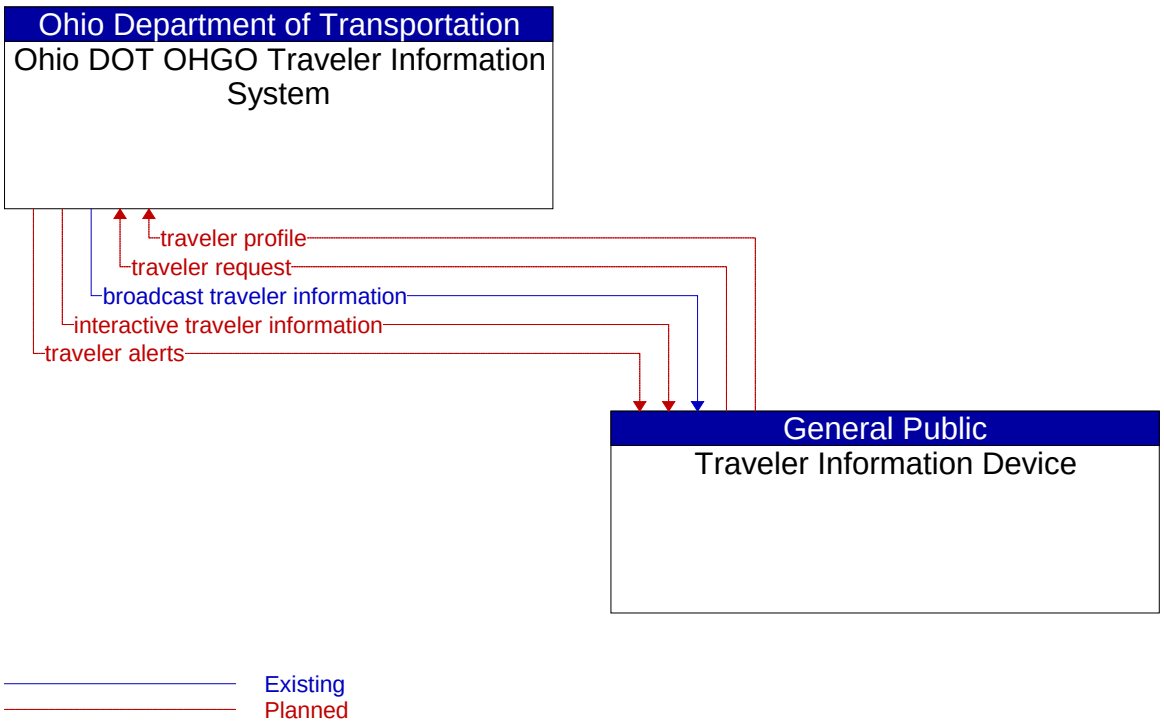

Figure 227: Ohio DOT OHGO Traveler Information System - Traveler Information Device Interface

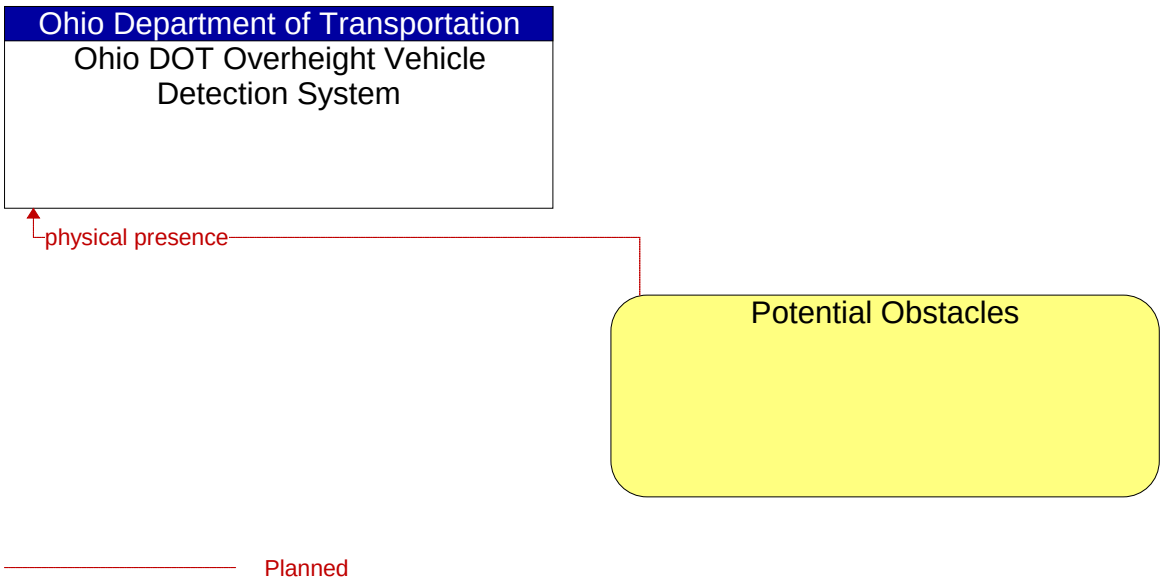

Figure 228: Ohio DOT Overheight Vehicle Detection System - Potential Obstacles Interface

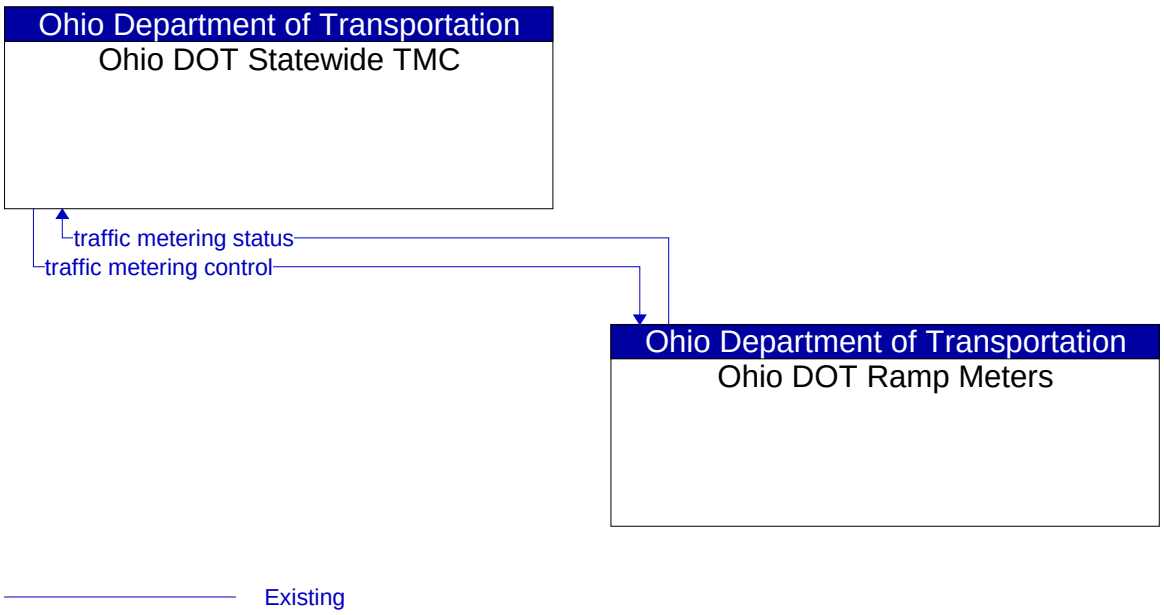

Figure 229: Ohio DOT Ramp Meters - Ohio DOT Statewide TMC Interface

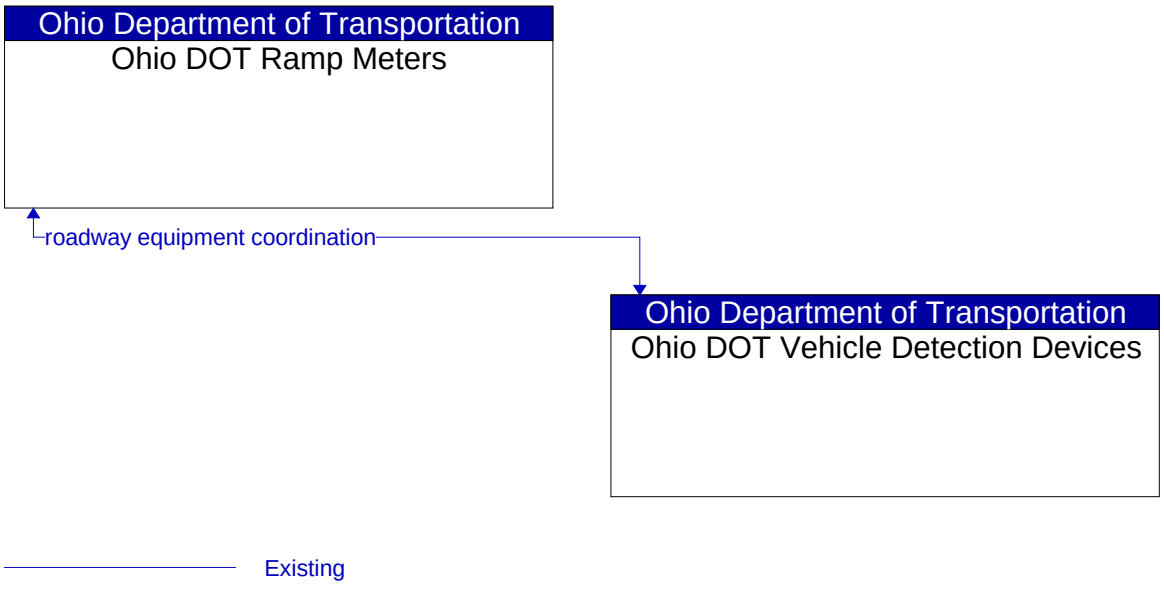

Figure 230: Ohio DOT Ramp Meters - Ohio DOT Vehicle Detection Devices Interface

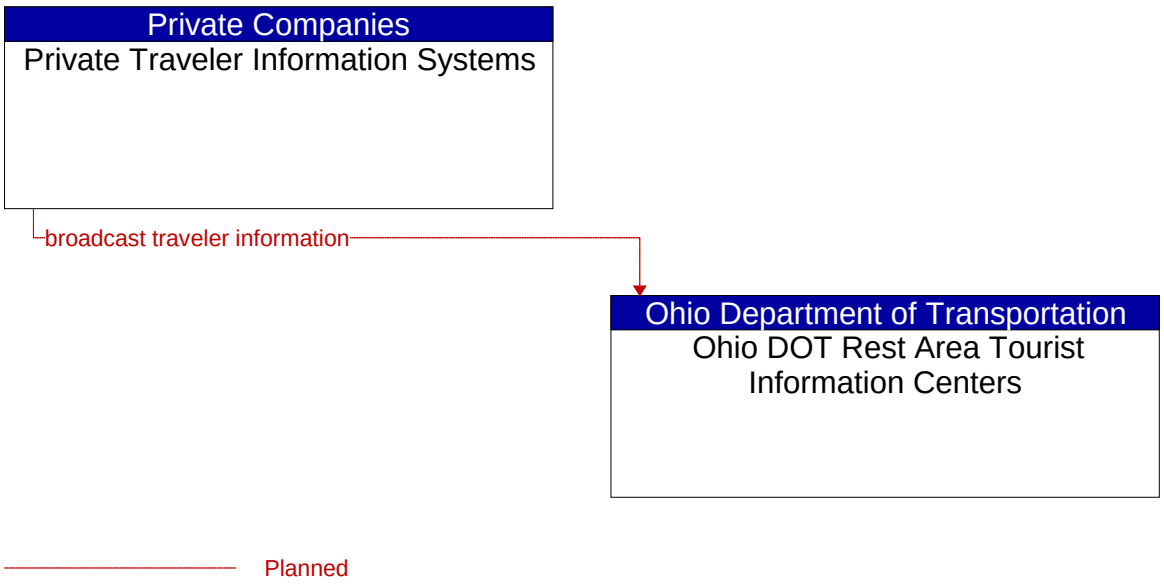

Figure 231: Ohio DOT Rest Area Tourist Information Centers - Private Traveler Information Systems Interface

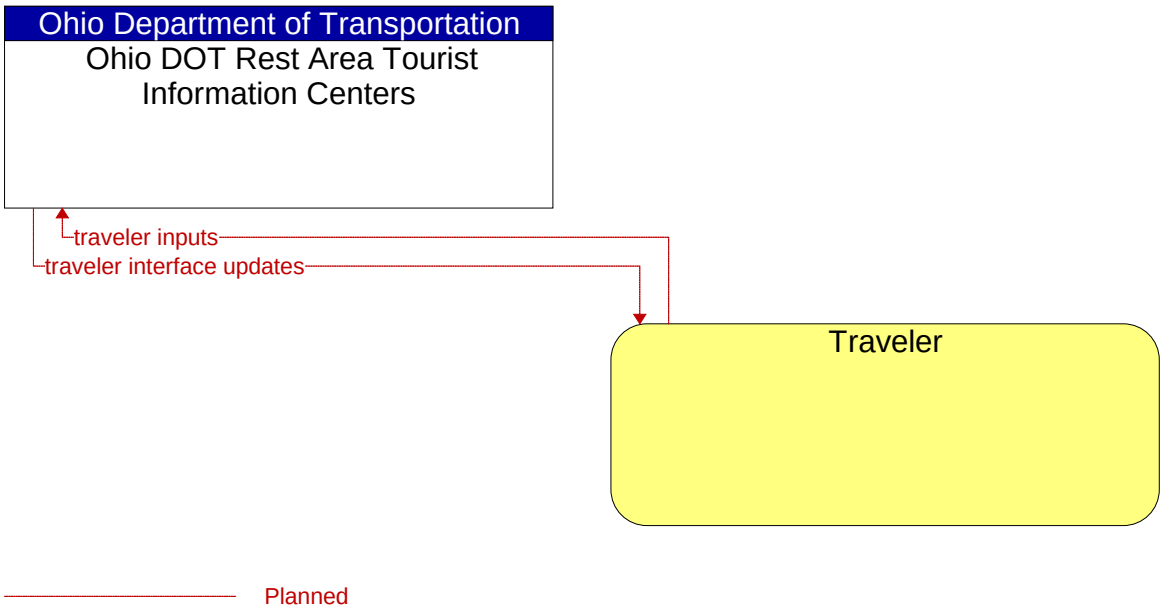

Figure 232: Ohio DOT Rest Area Tourist Information Centers - Traveler Interface

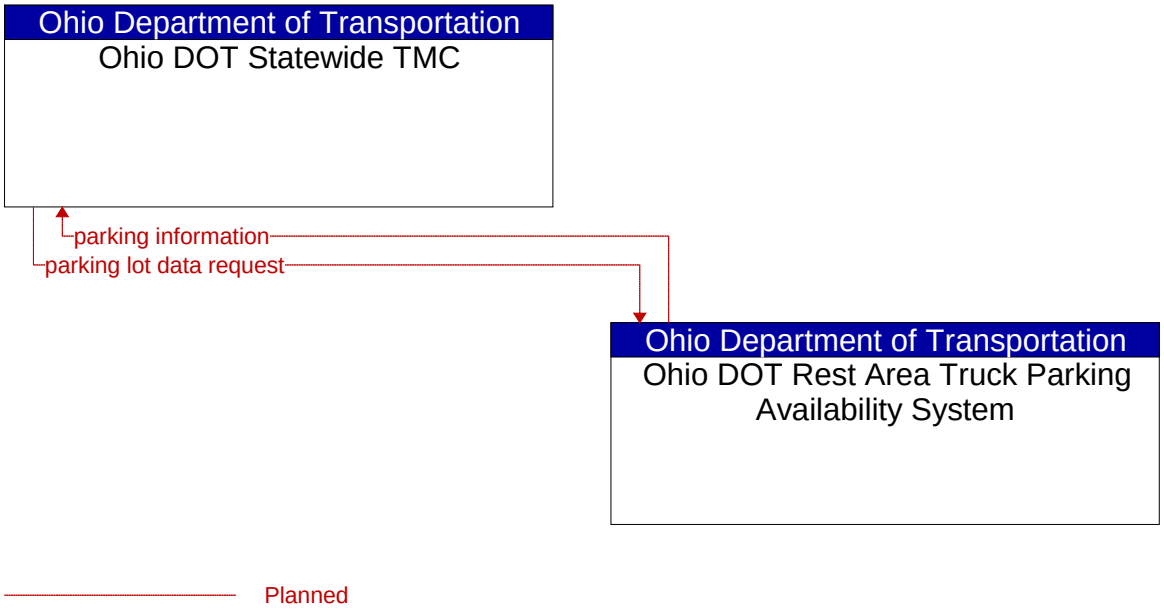

Figure 233: Ohio DOT Rest Area Truck Parking Availability System - Ohio DOT Statewide TMC Interface

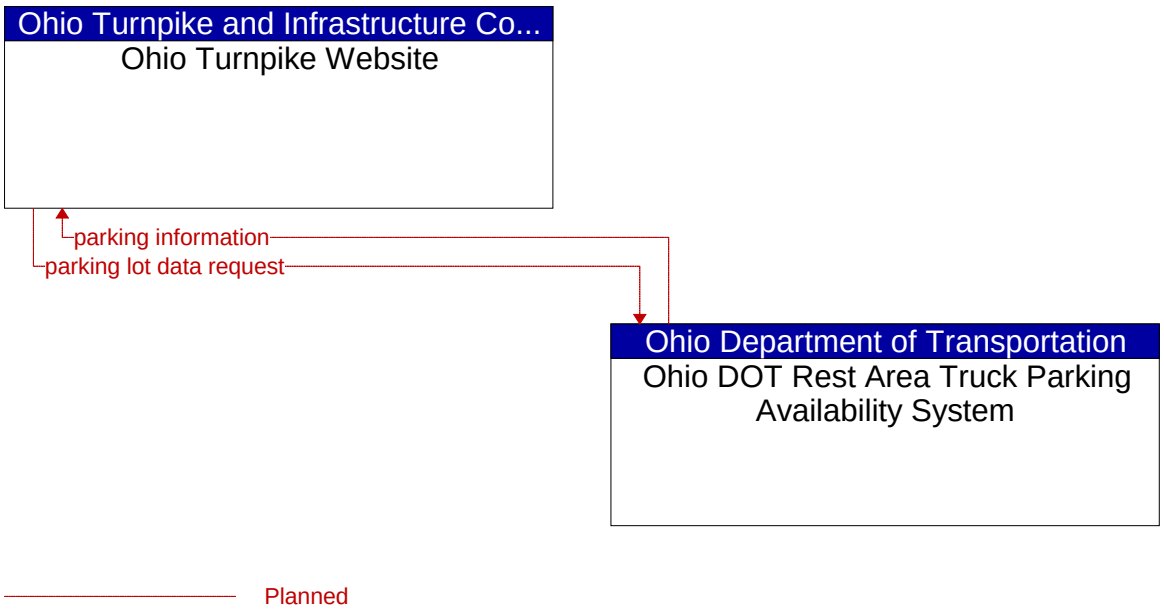

Figure 234: Ohio DOT Rest Area Truck Parking Availability System - Ohio Turnpike Website Interface

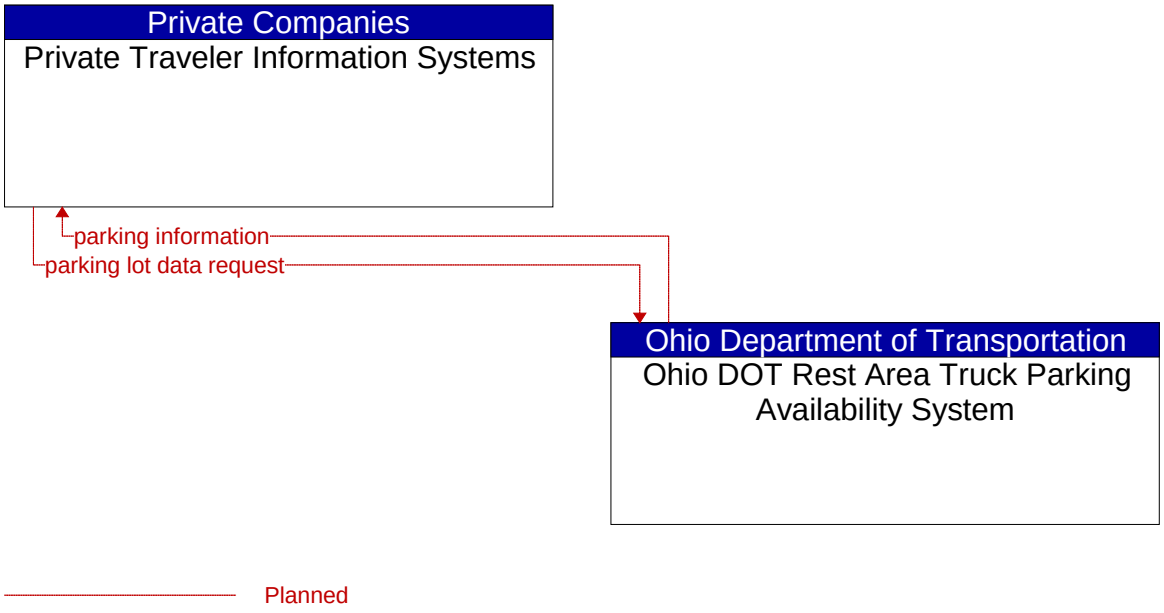

Figure 235: Ohio DOT Rest Area Truck Parking Availability System - Private Traveler Information Systems Interface

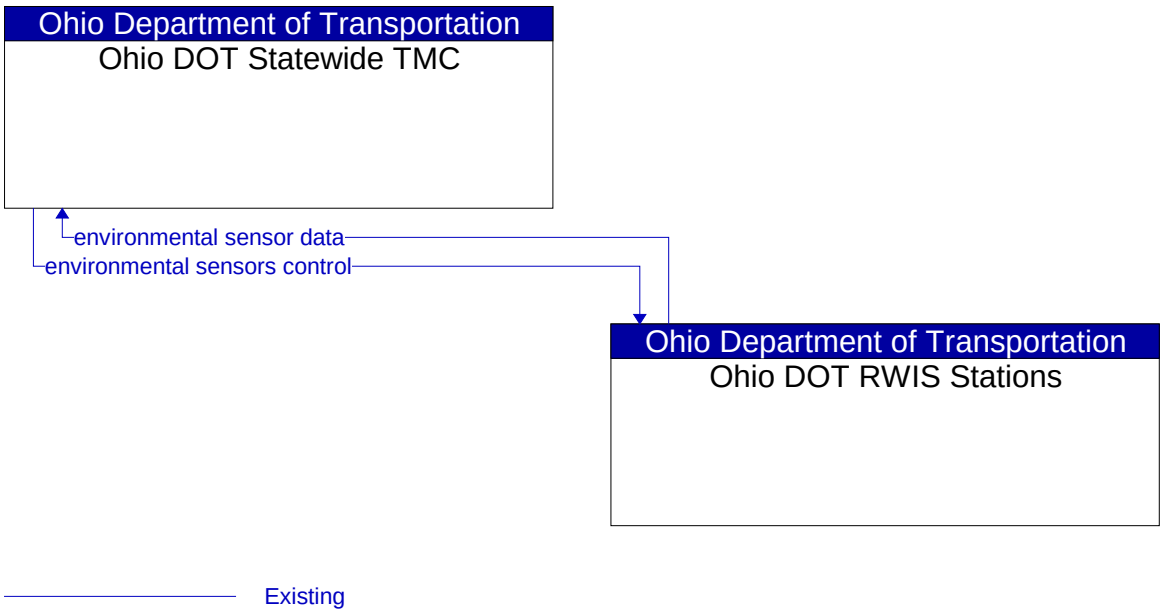

Figure 236: Ohio DOT RWIS Stations - Ohio DOT Statewide TMC Interface

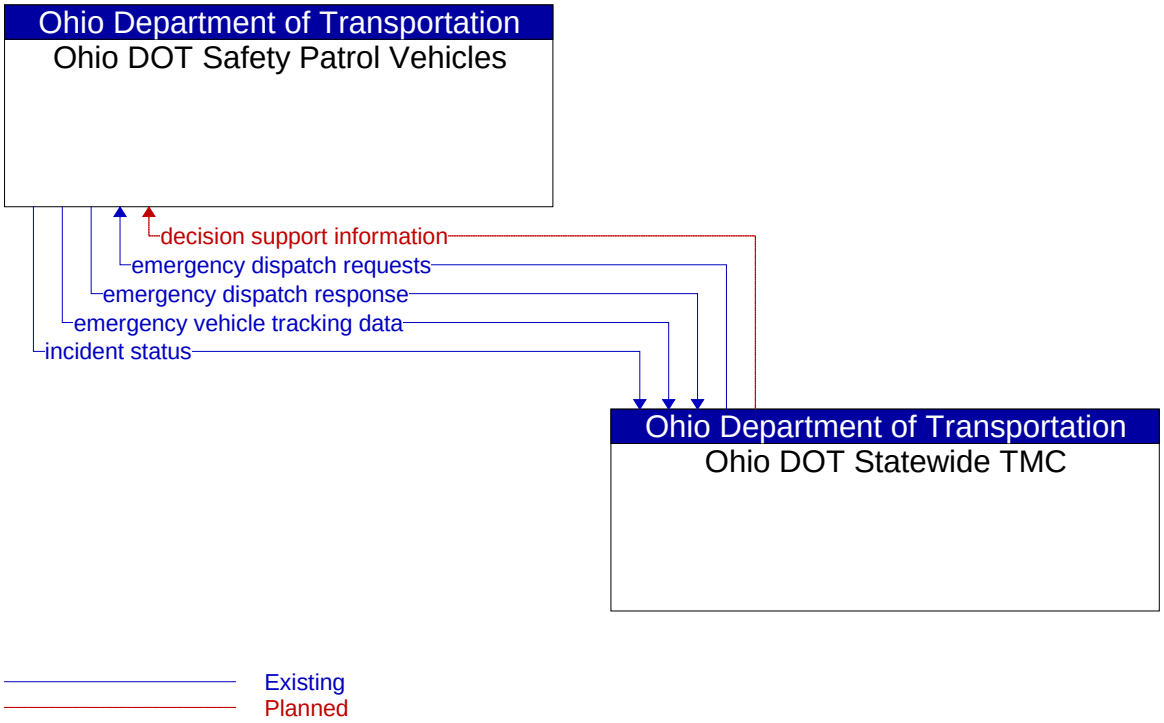

Figure 237: Ohio DOT Safety Patrol Vehicles - Ohio DOT Statewide TMC Interface

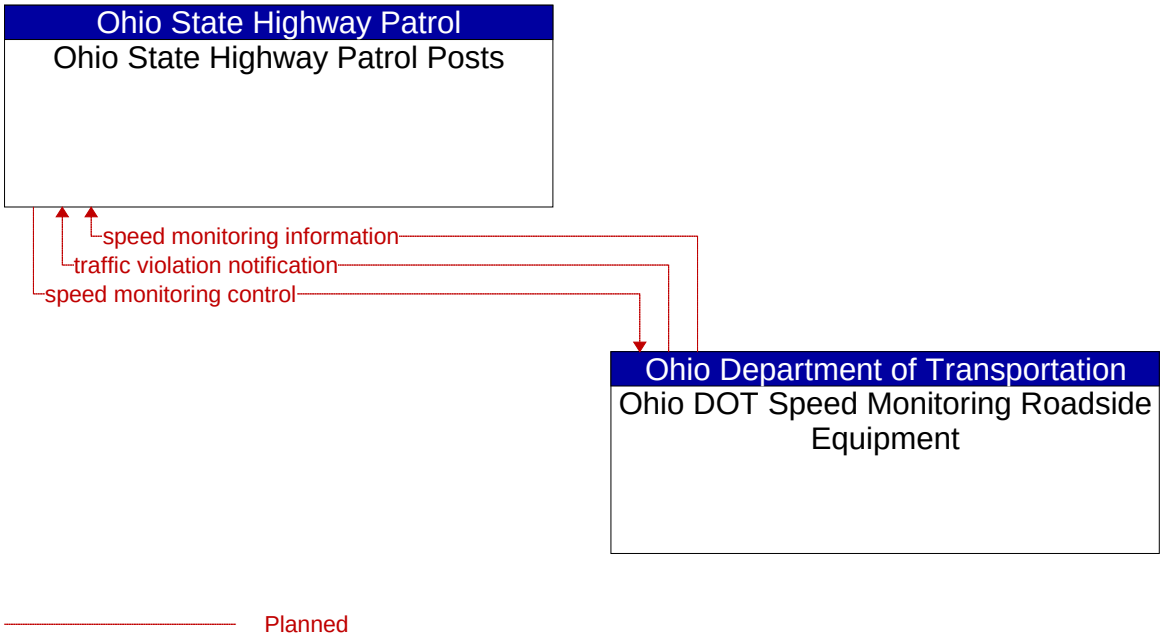

Figure 238: Ohio DOT Speed Monitoring Roadside Equipment - Ohio State Highway Patrol Posts Interface

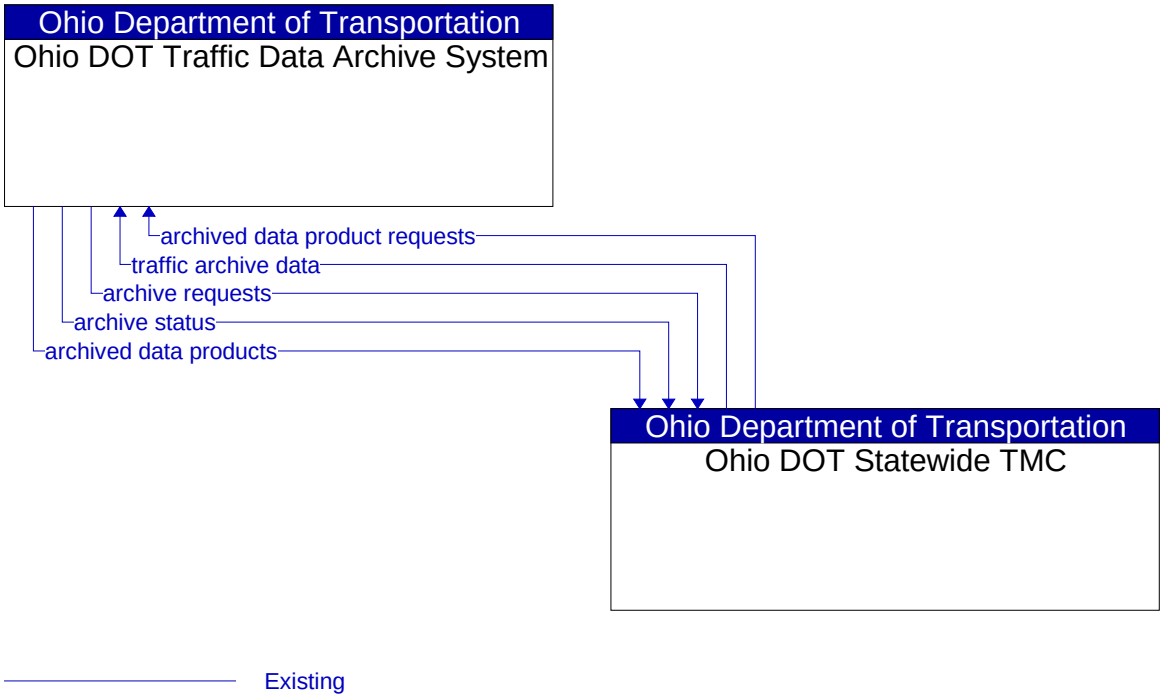

Figure 239: Ohio DOT Statewide TMC - Ohio DOT Traffic Data Archive System Interface

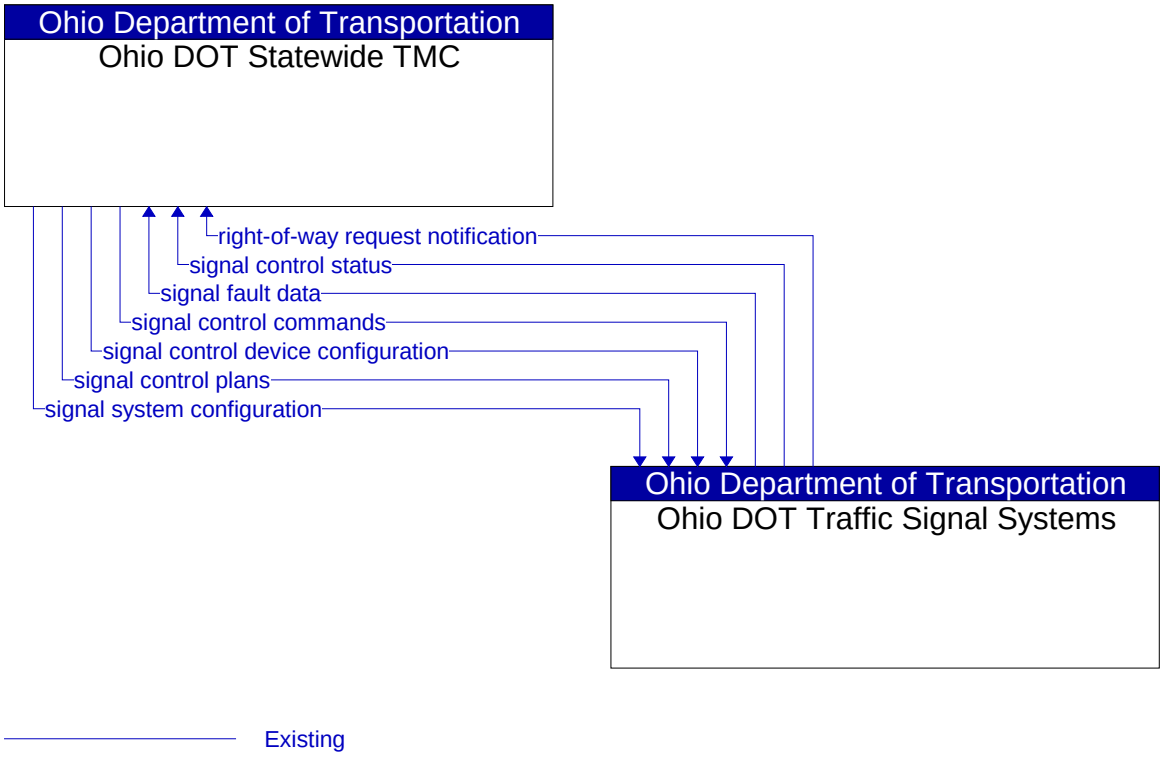

Figure 240: Ohio DOT Statewide TMC - Ohio DOT Traffic Signal Systems Interface

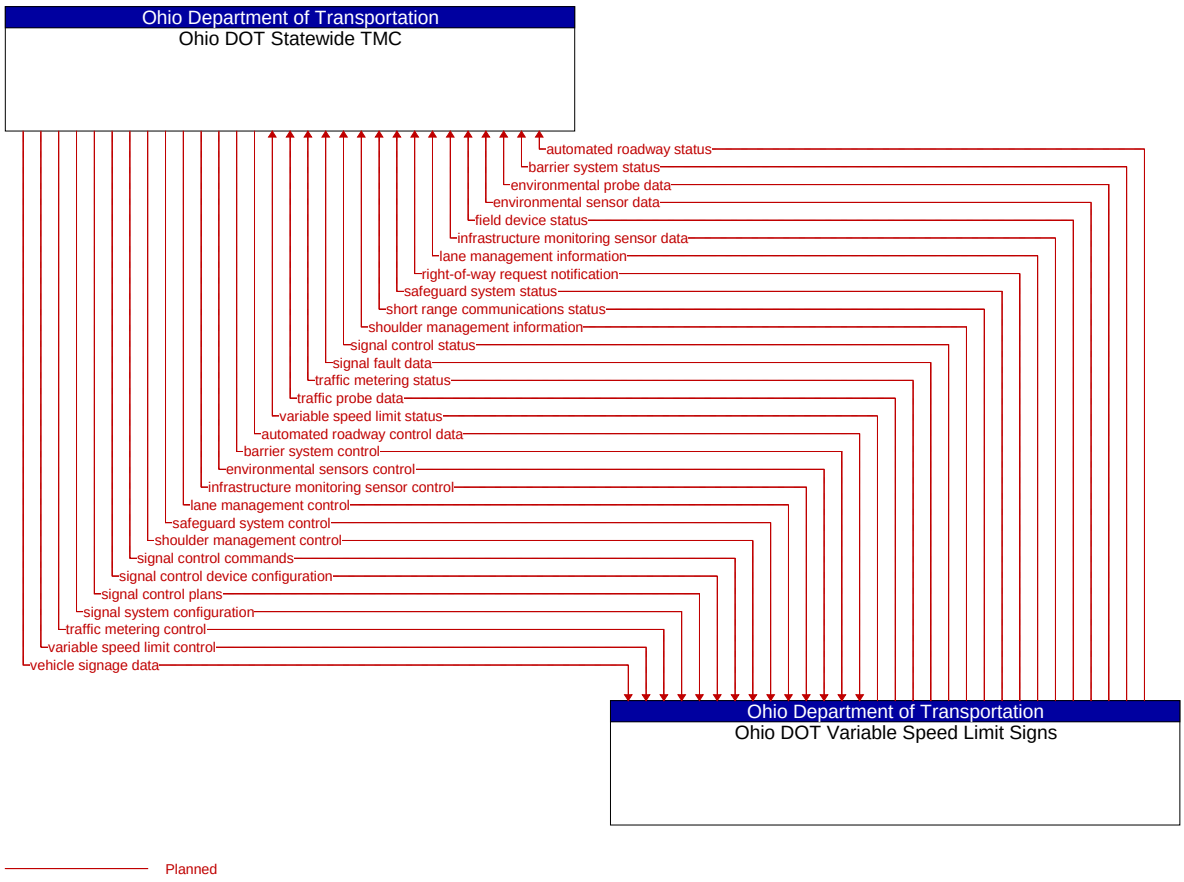

Figure 241: Ohio DOT Statewide TMC - Ohio DOT Variable Speed Limit Signs Interface

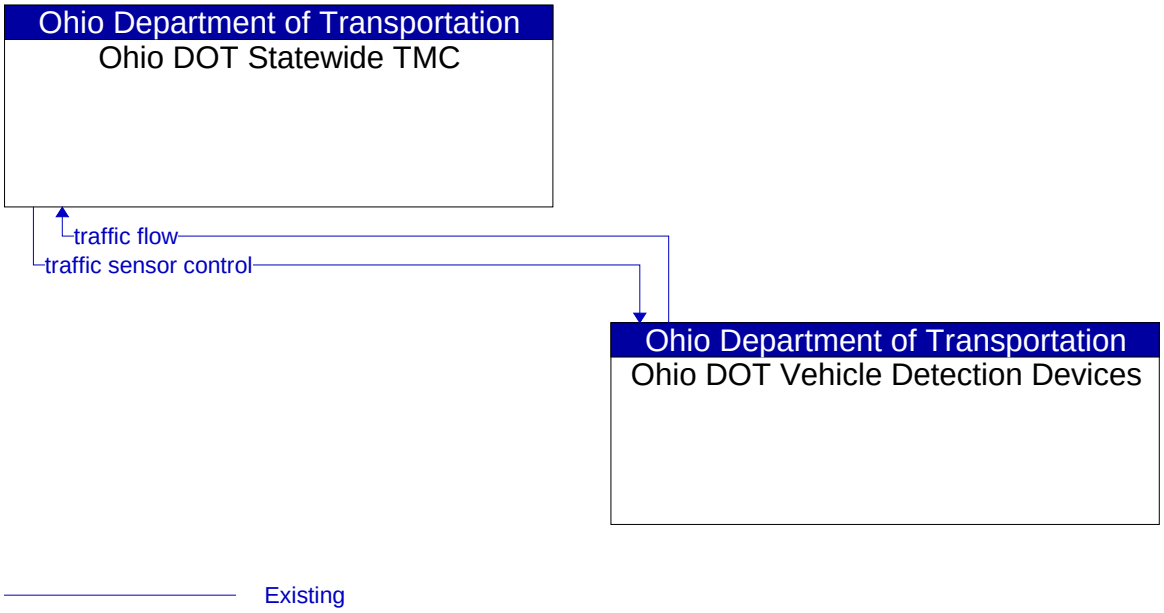

Figure 242: Ohio DOT Statewide TMC - Ohio DOT Vehicle Detection Devices Interface

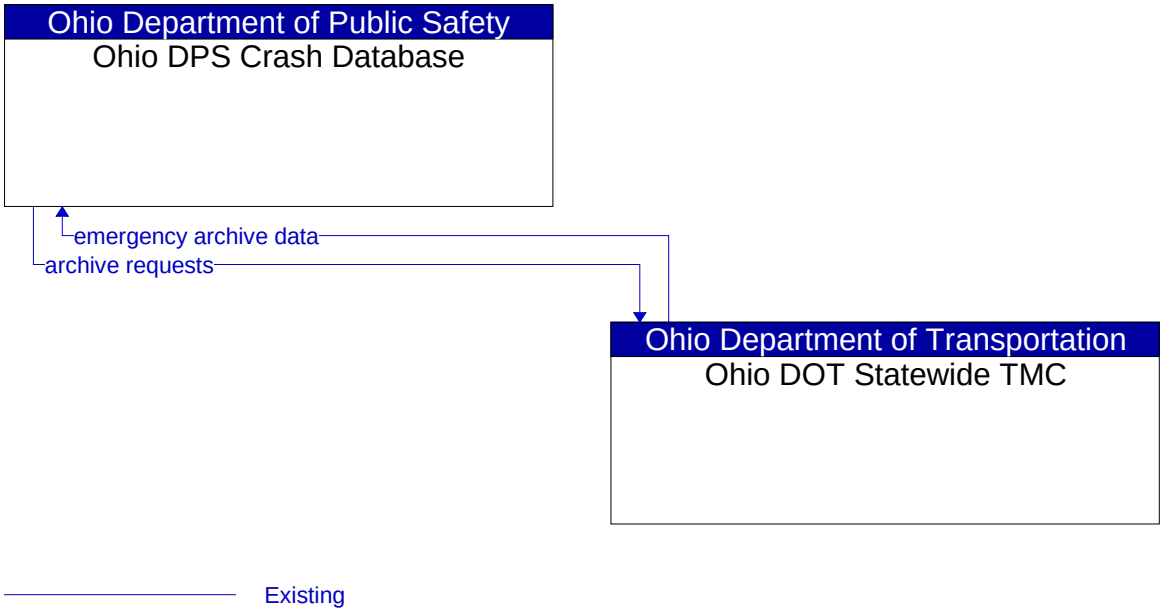

Figure 243: Ohio DOT Statewide TMC - Ohio DPS Crash Database Interface

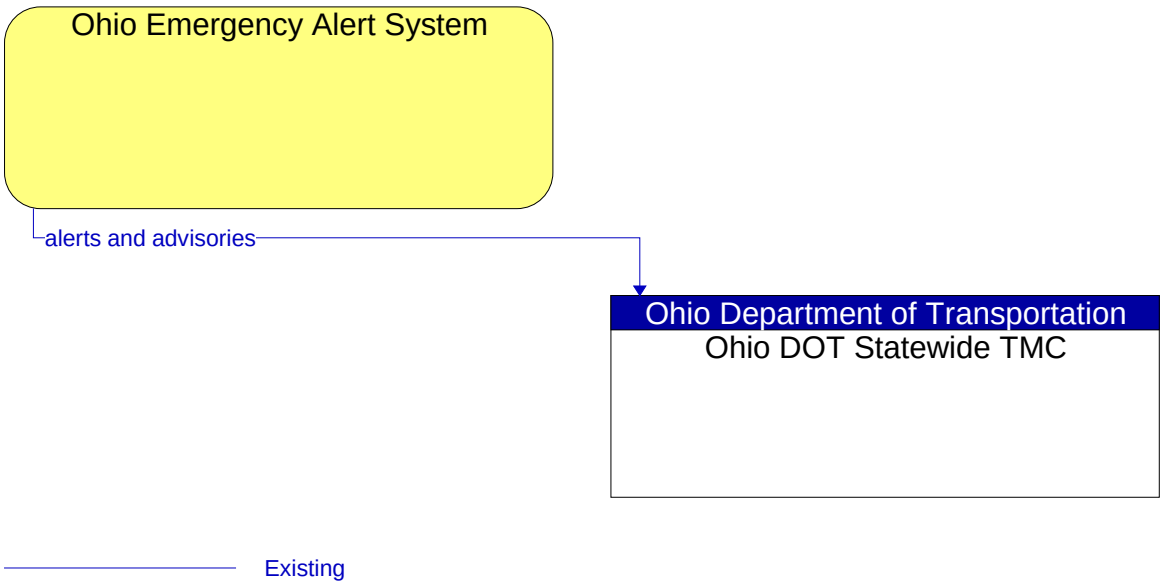

Figure 244: Ohio DOT Statewide TMC - Ohio Emergency Alert System Interface

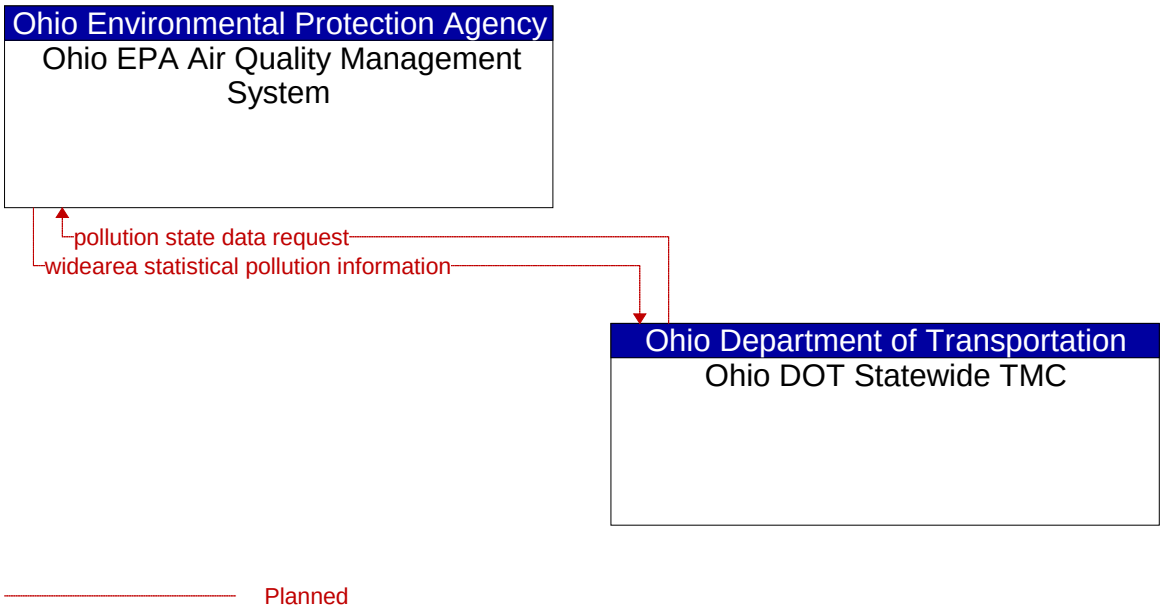

Figure 245: Ohio DOT Statewide TMC - Ohio EPA Air Quality Management System Interface

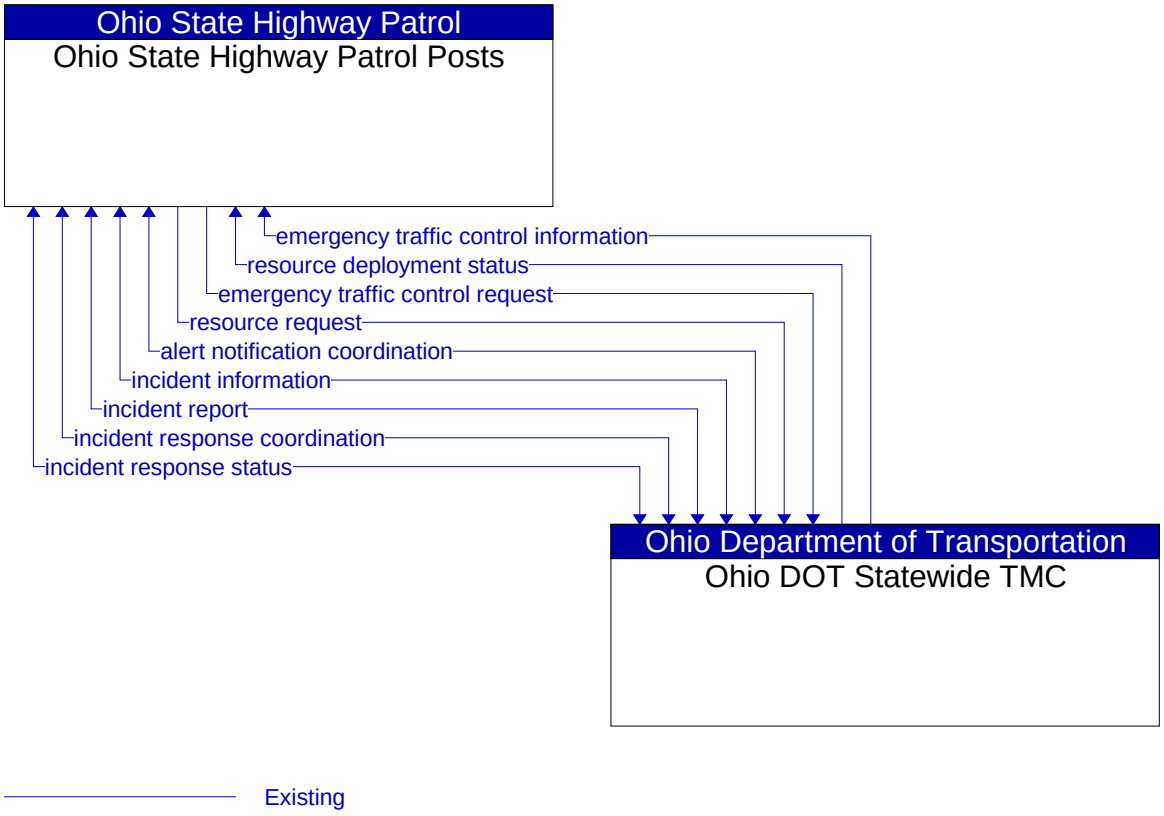

Figure 246: Ohio DOT Statewide TMC - Ohio State Highway Patrol Posts Interface

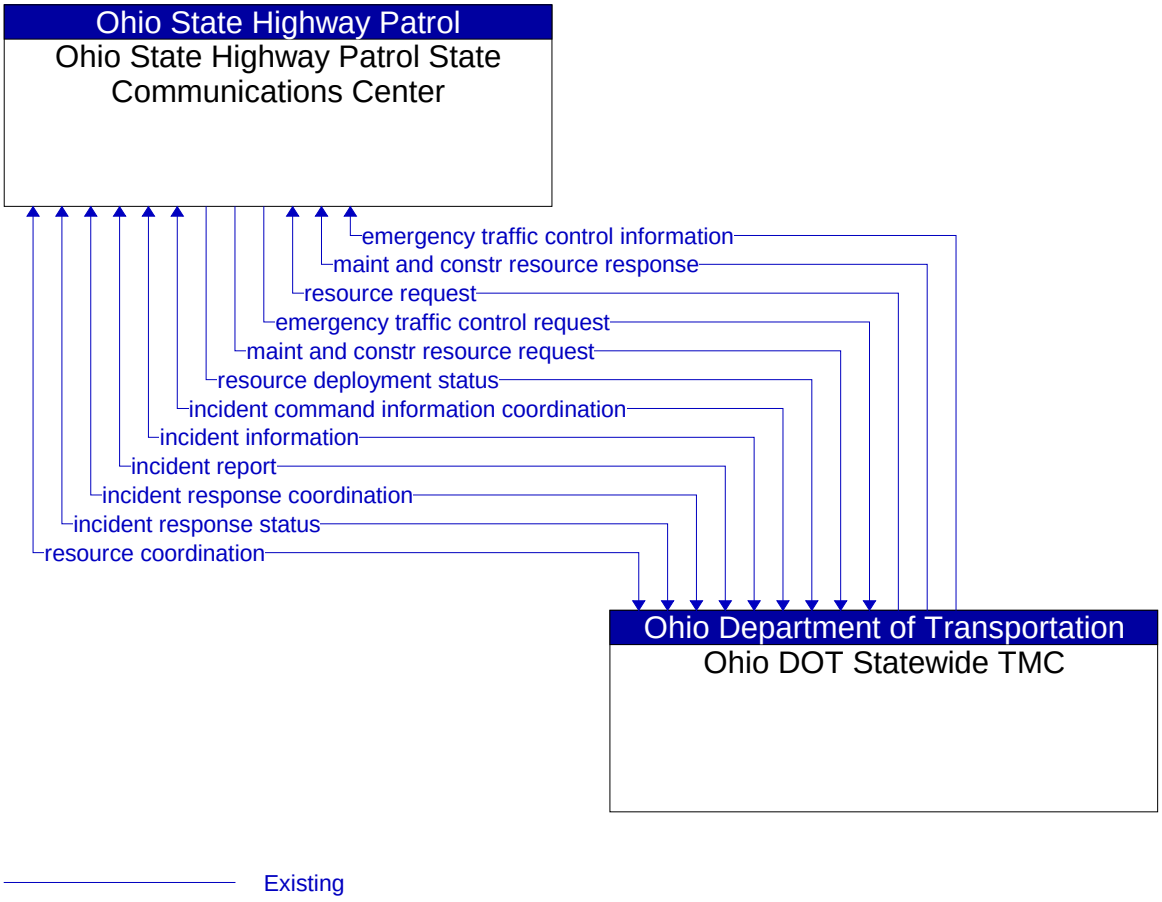

Figure 247: Ohio DOT Statewide TMC - Ohio State Highway Patrol State Communications Center Interface

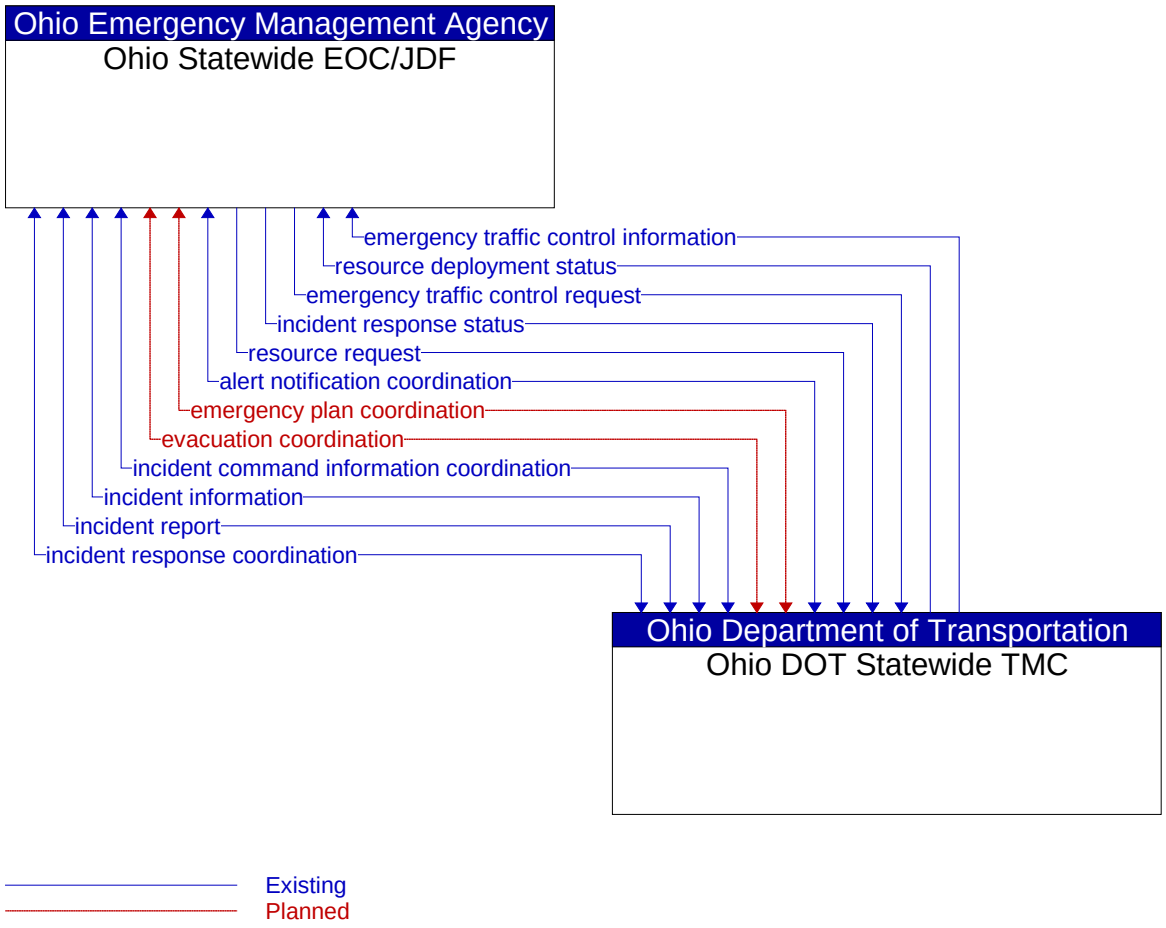

Figure 248: Ohio DOT Statewide TMC - Ohio Statewide EOC/JDF Interface

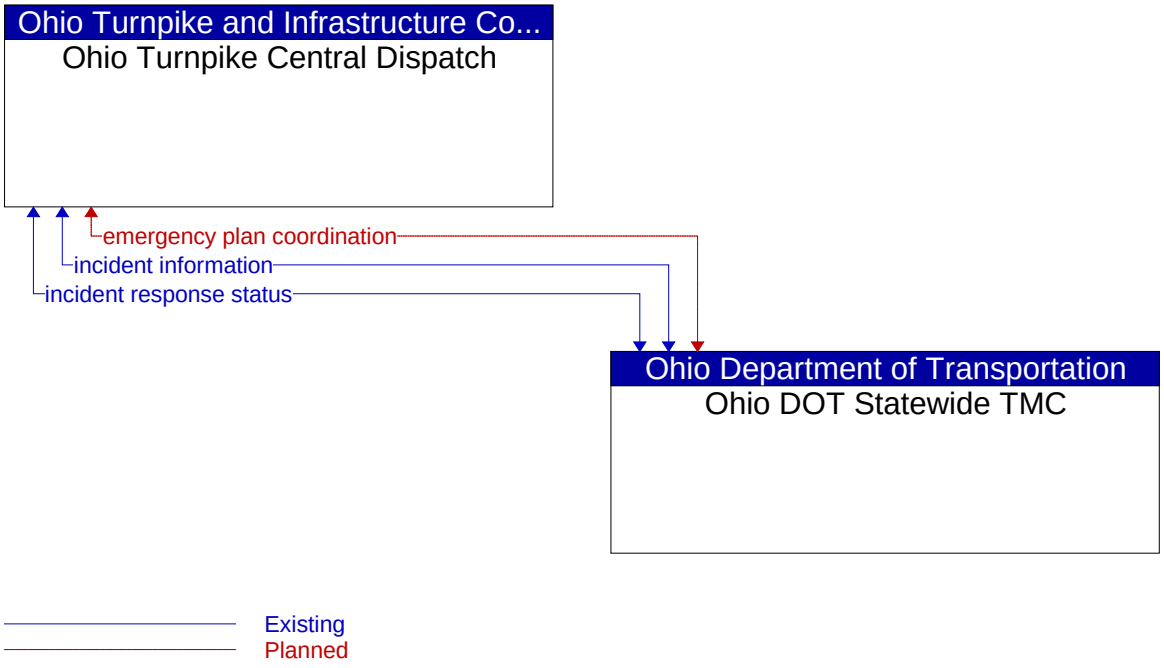

Figure 249: Ohio DOT Statewide TMC - Ohio Turnpike Central Dispatch Interface

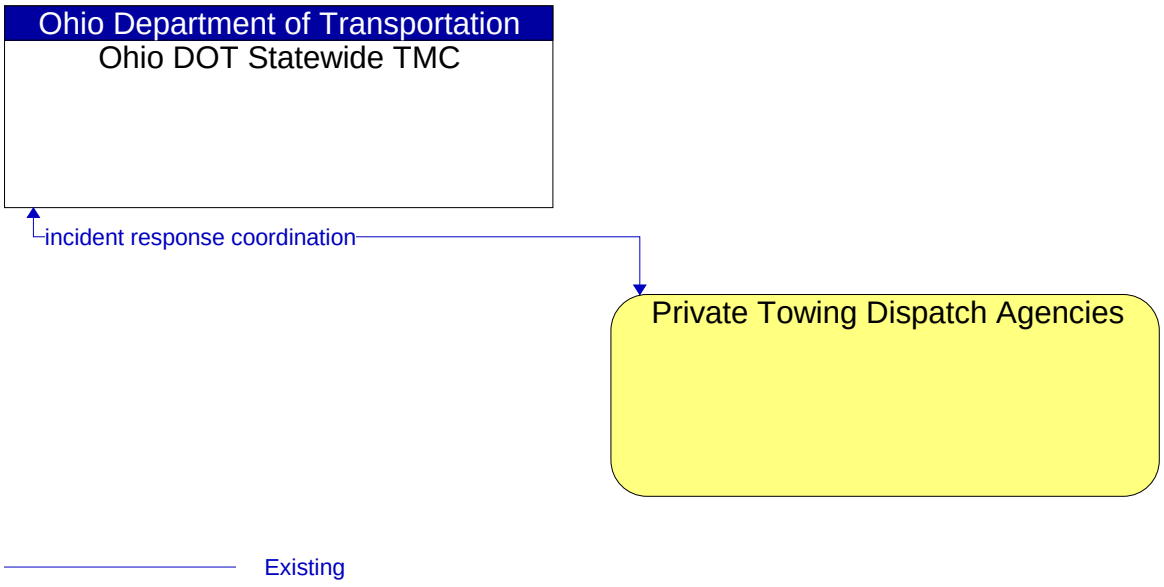

Figure 250: Ohio DOT Statewide TMC - Private Towing Dispatch Agencies Interface

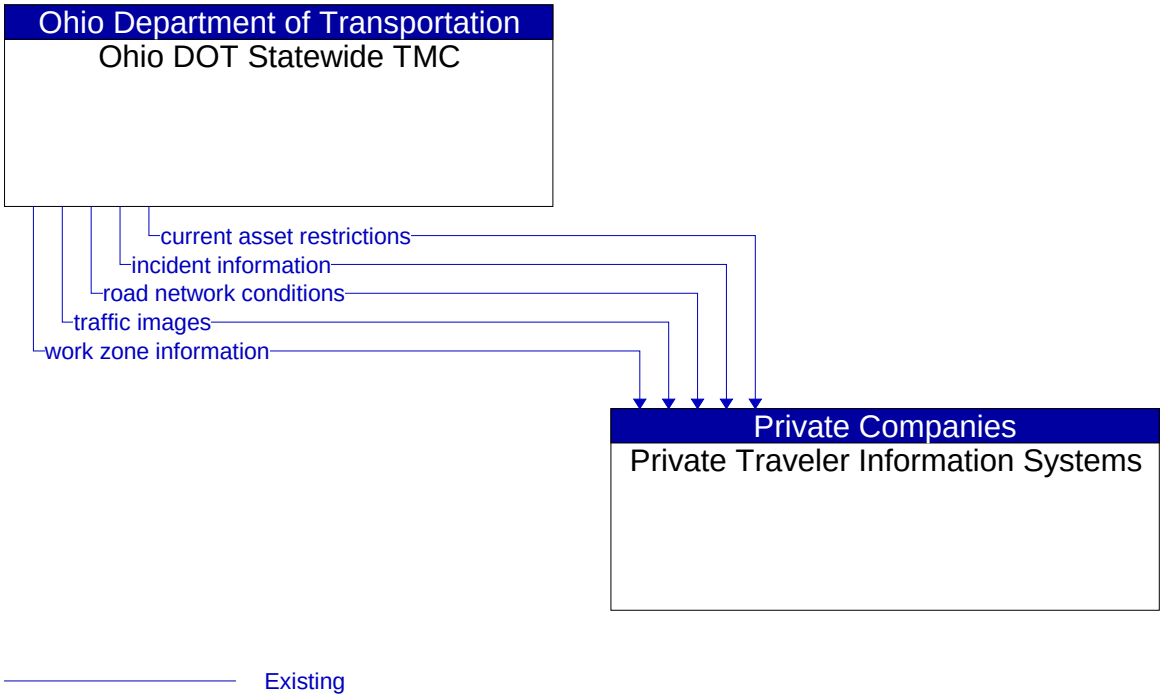

Figure 251: Ohio DOT Statewide TMC - Private Traveler Information Systems Interface

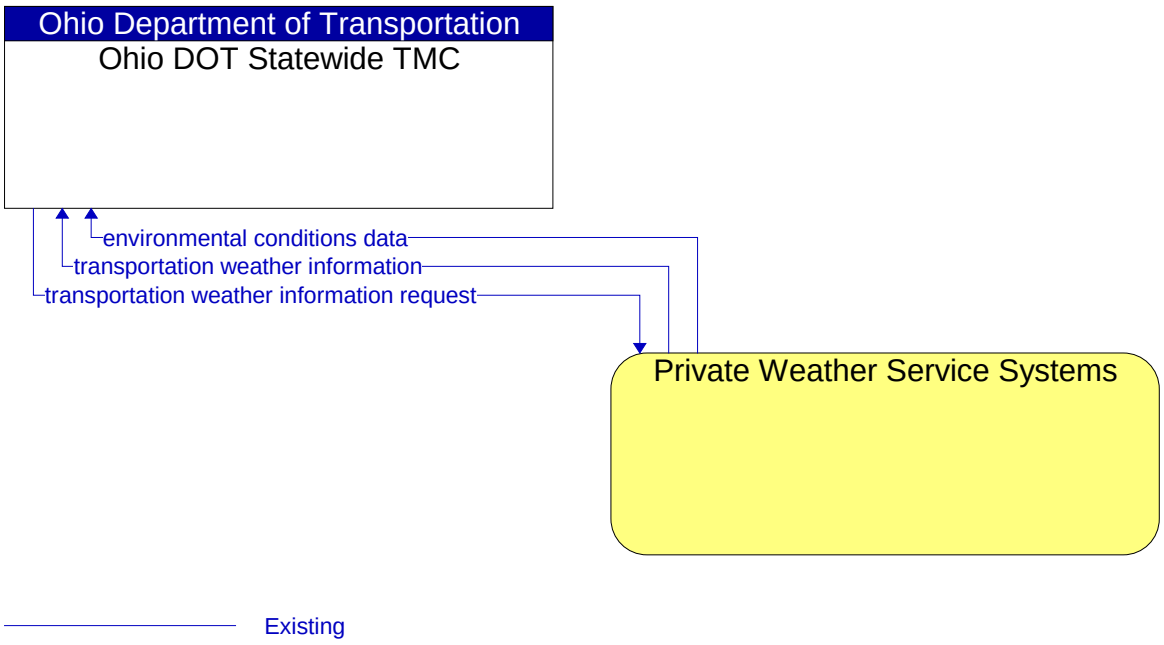

Figure 252: Ohio DOT Statewide TMC - Private Weather Service Systems Interface

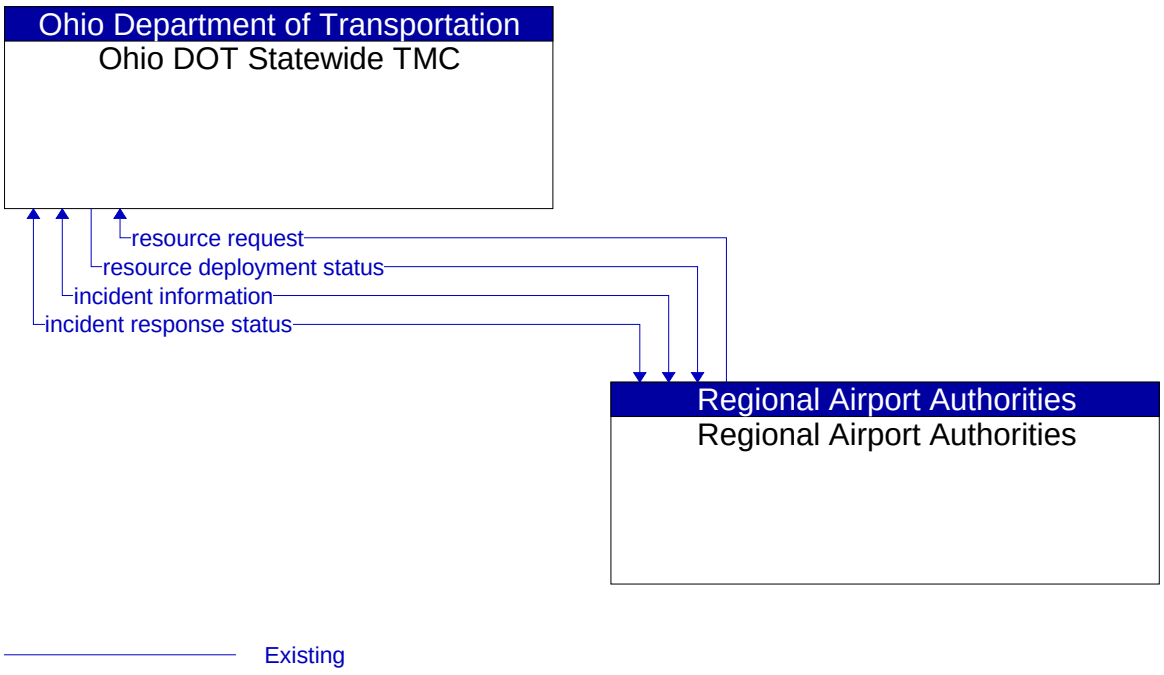

Figure 253: Ohio DOT Statewide TMC - Regional Airport Authorities Interface

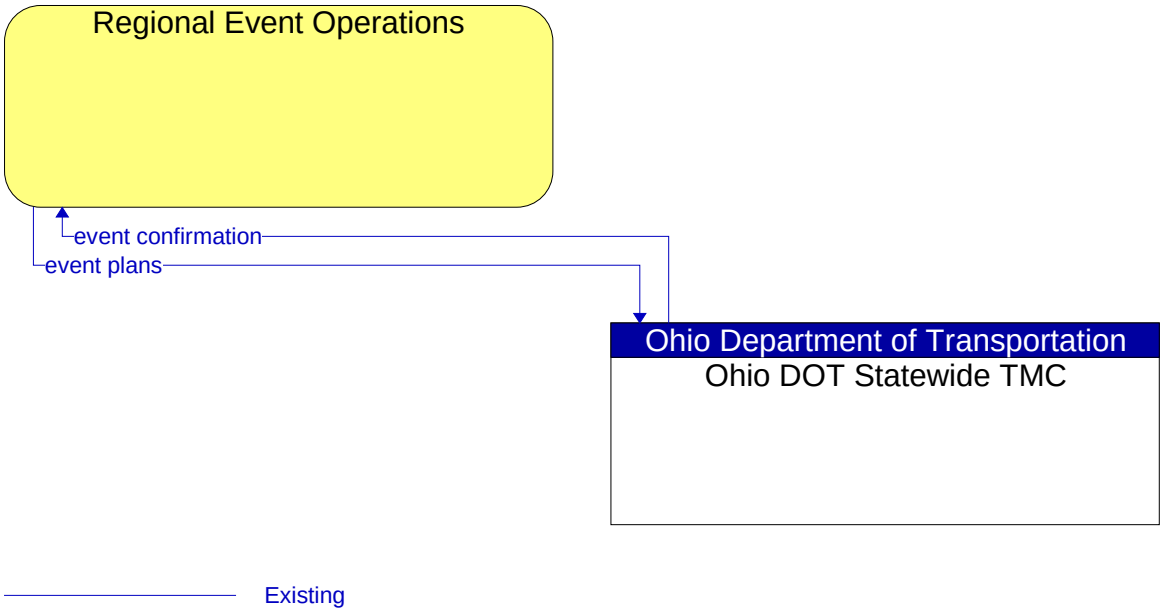

Figure 254: Ohio DOT Statewide TMC - Regional Event Operations Interface

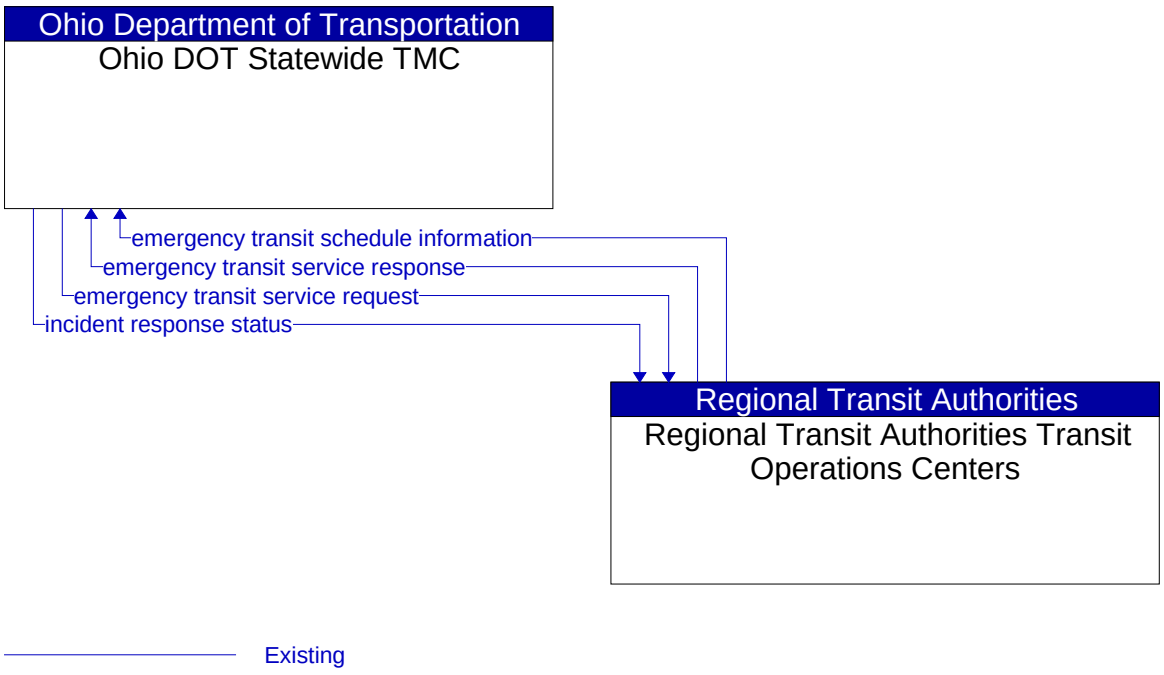

Figure 255: Ohio DOT Statewide TMC - Regional Transit Authorities Transit Operations Centers Interface

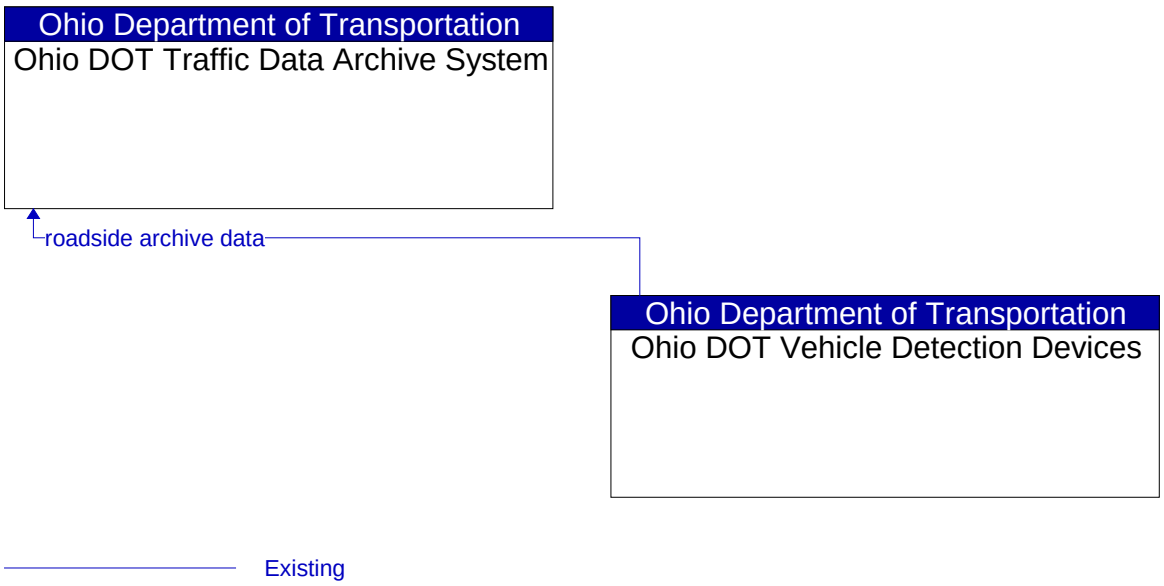

Figure 256: Ohio DOT Traffic Data Archive System - Ohio DOT Vehicle Detection Devices Interface

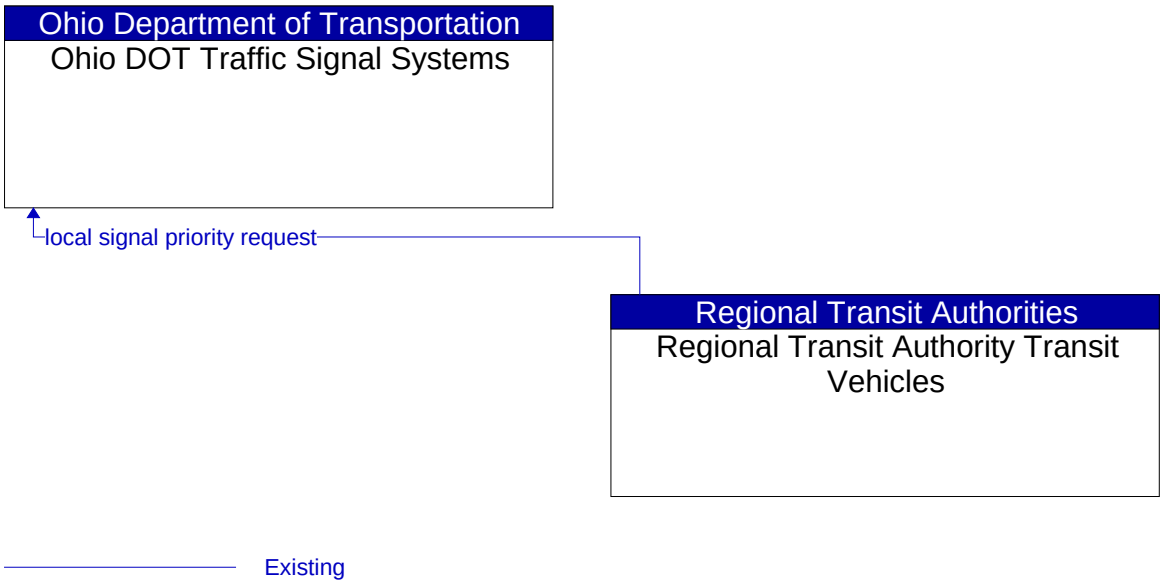

Figure 257: Ohio DOT Traffic Signal Systems - Regional Transit Authority Transit Vehicles Interface

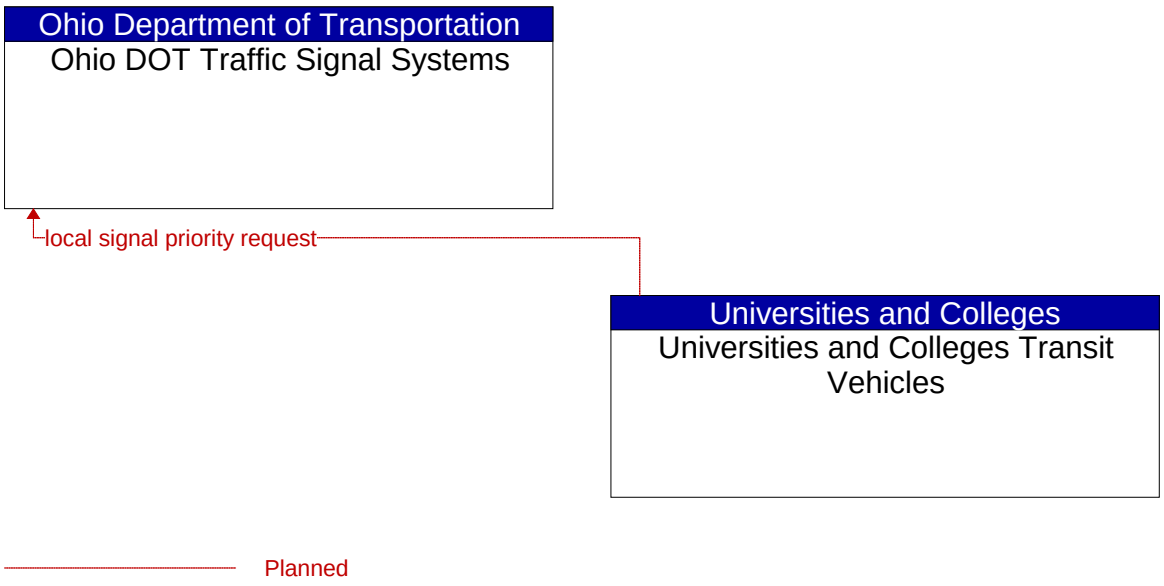

Figure 258: Ohio DOT Traffic Signal Systems - Universities and Colleges Transit Vehicles Interface

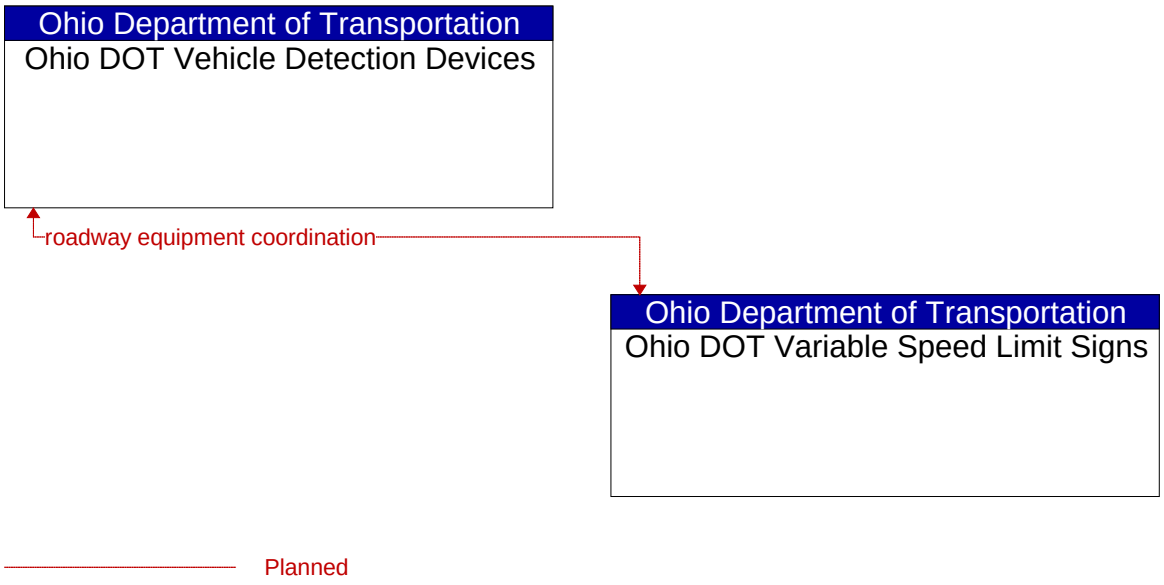

Figure 259: Ohio DOT Variable Speed Limit Signs - Ohio DOT Vehicle Detection Devices Interface

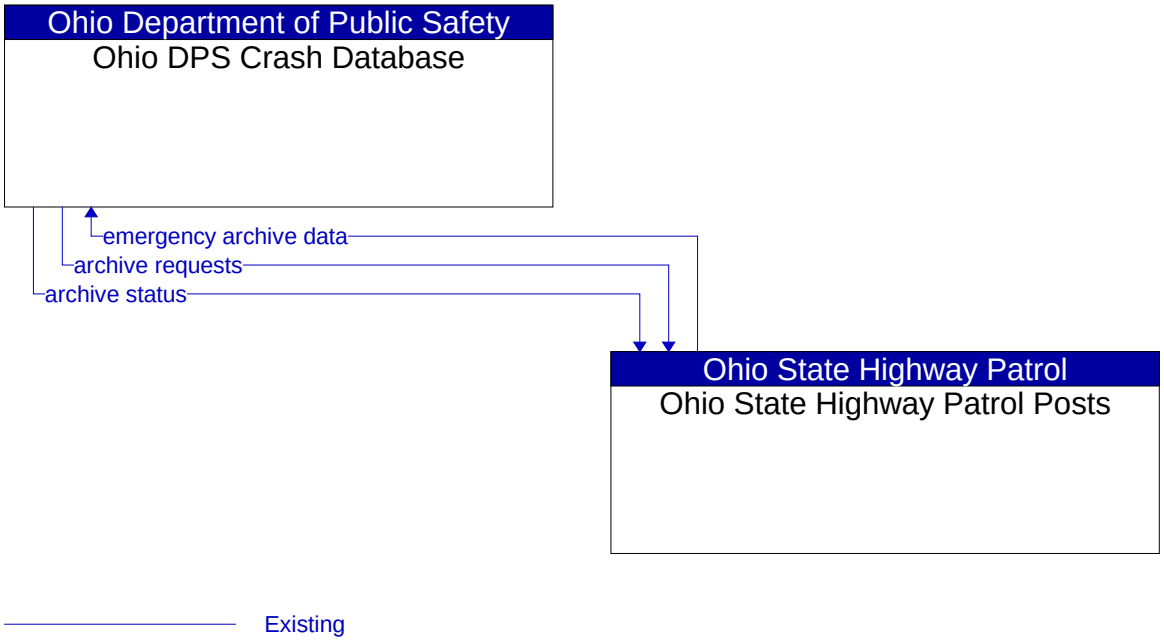

Figure 260: Ohio DPS Crash Database - Ohio State Highway Patrol Posts Interface

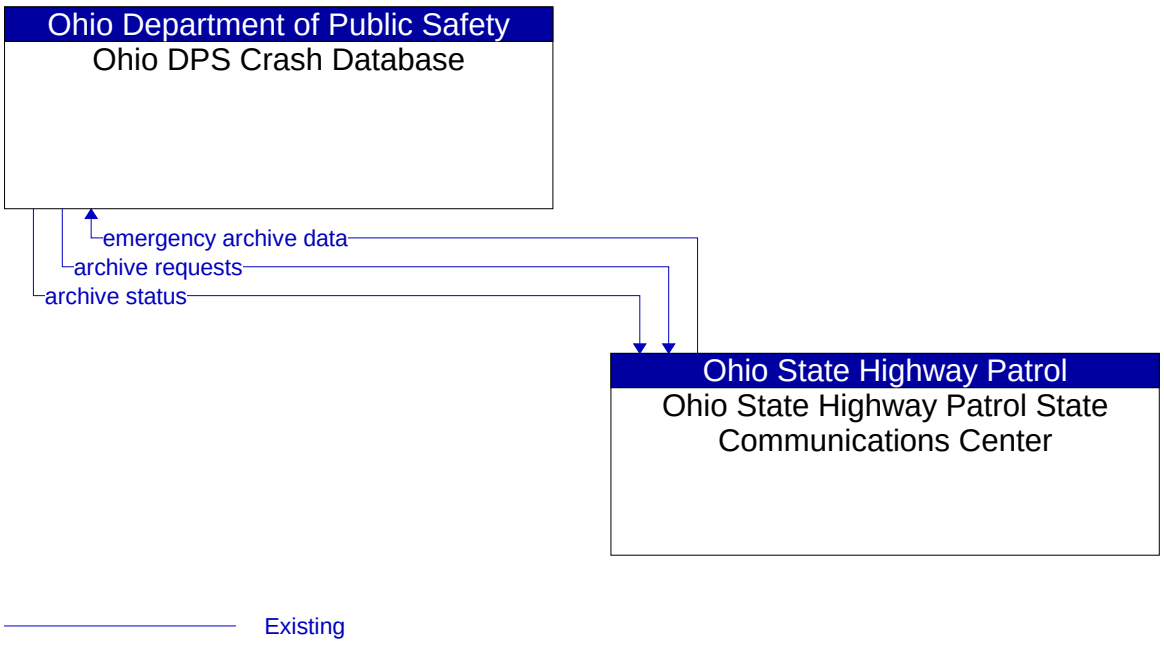

Figure 261: Ohio DPS Crash Database - Ohio State Highway Patrol State Communications Center Interface

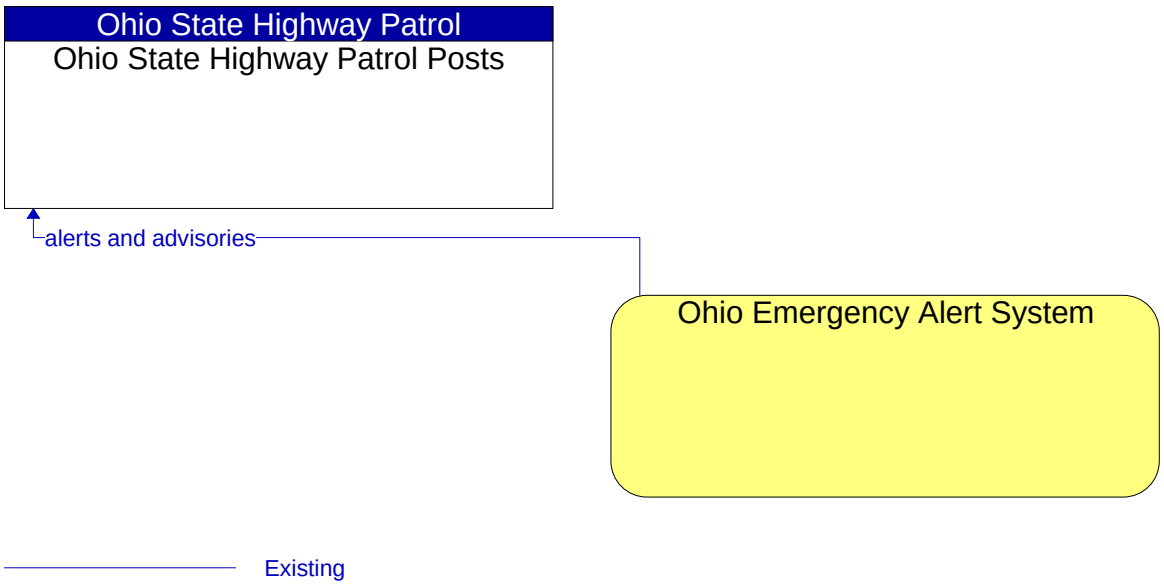

Figure 262: Ohio Emergency Alert System - Ohio State Highway Patrol Posts Interface

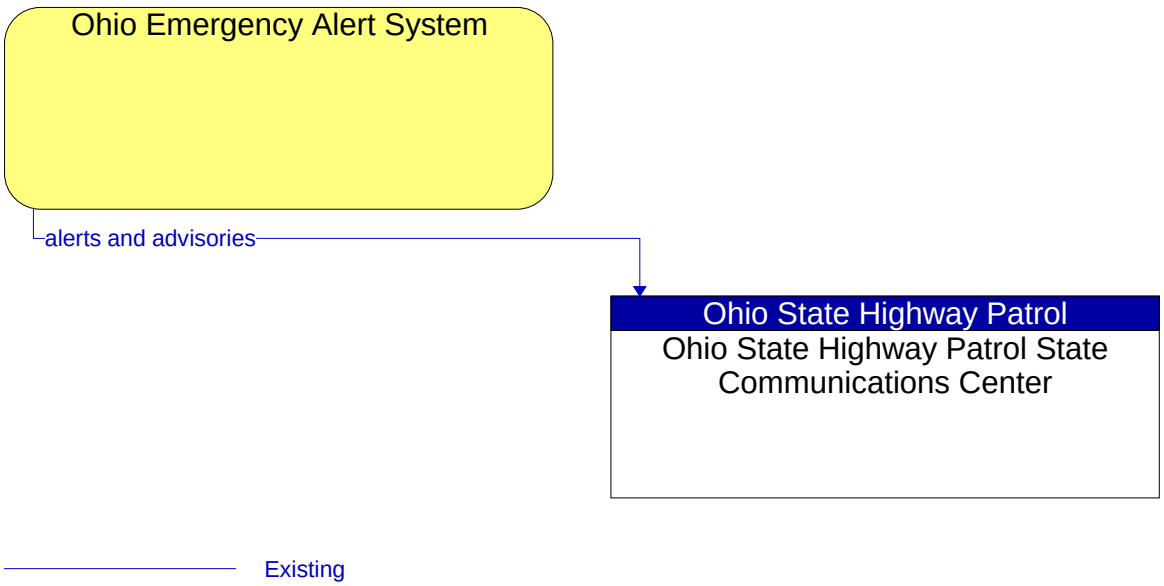

Figure 263: Ohio Emergency Alert System - Ohio State Highway Patrol State Communications Center Interface

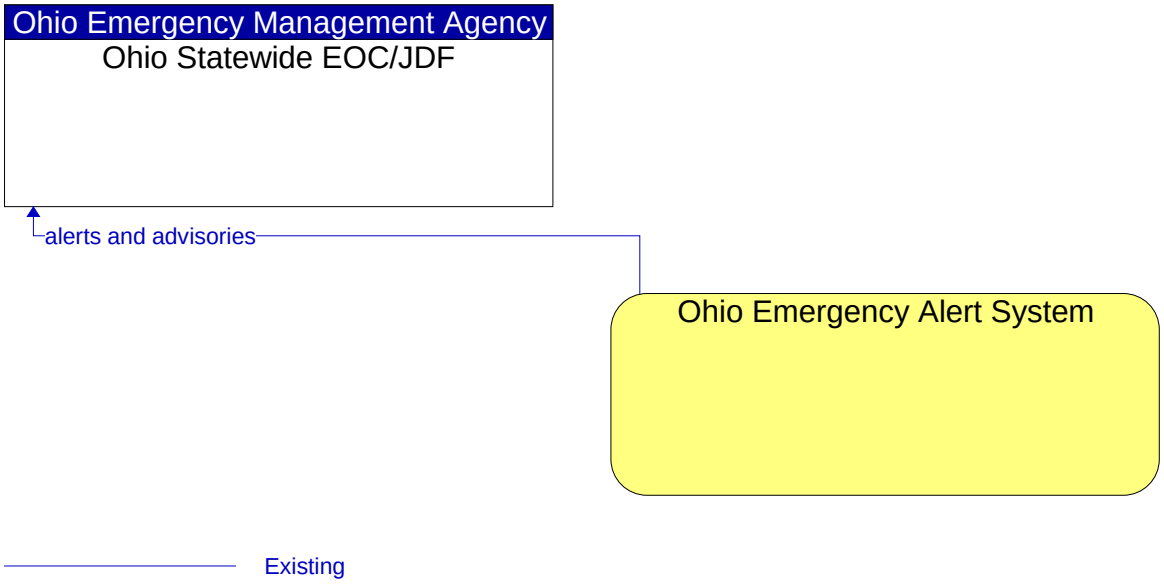

Figure 264: Ohio Emergency Alert System - Ohio Statewide EOC/JDF Interface

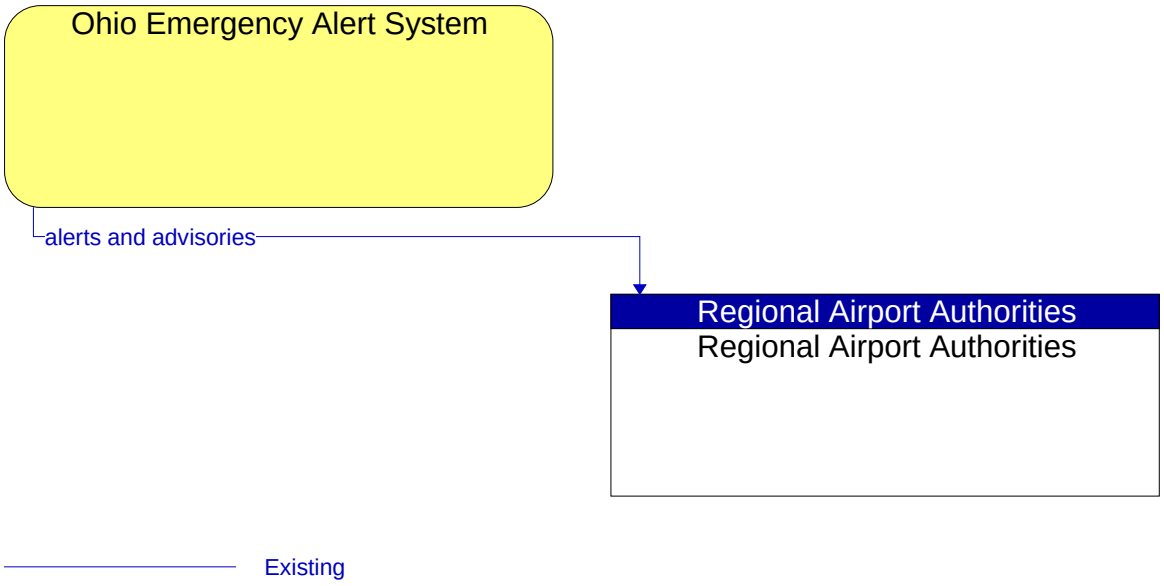

Figure 265: Ohio Emergency Alert System - Regional Airport Authorities Interface

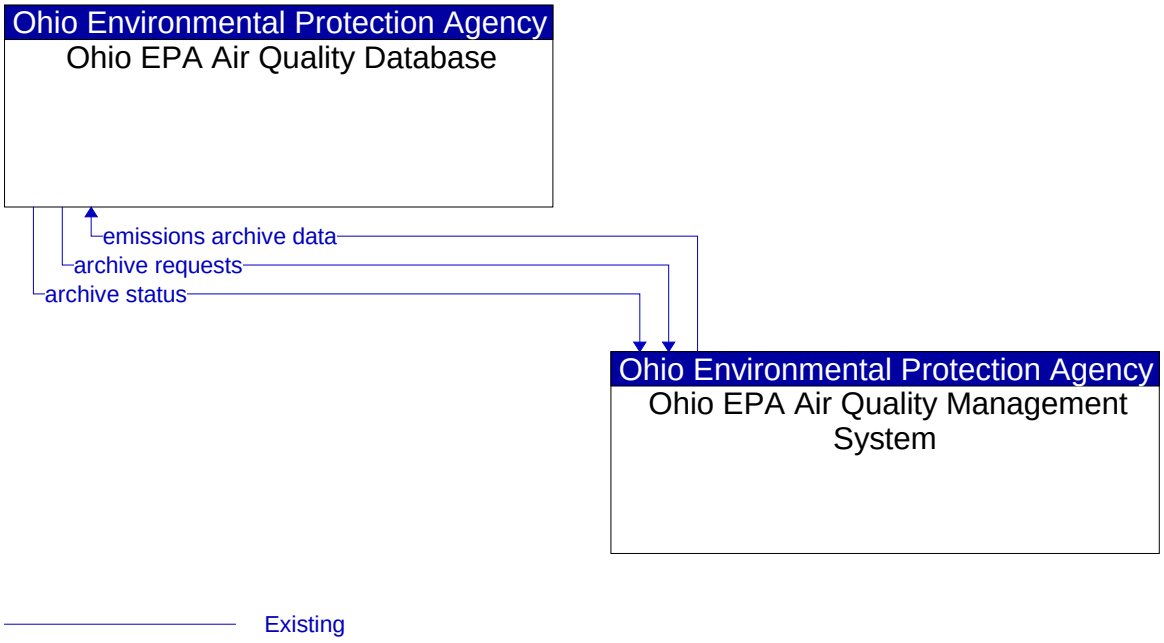

Figure 266: Ohio EPA Air Quality Database - Ohio EPA Air Quality Management System Interface

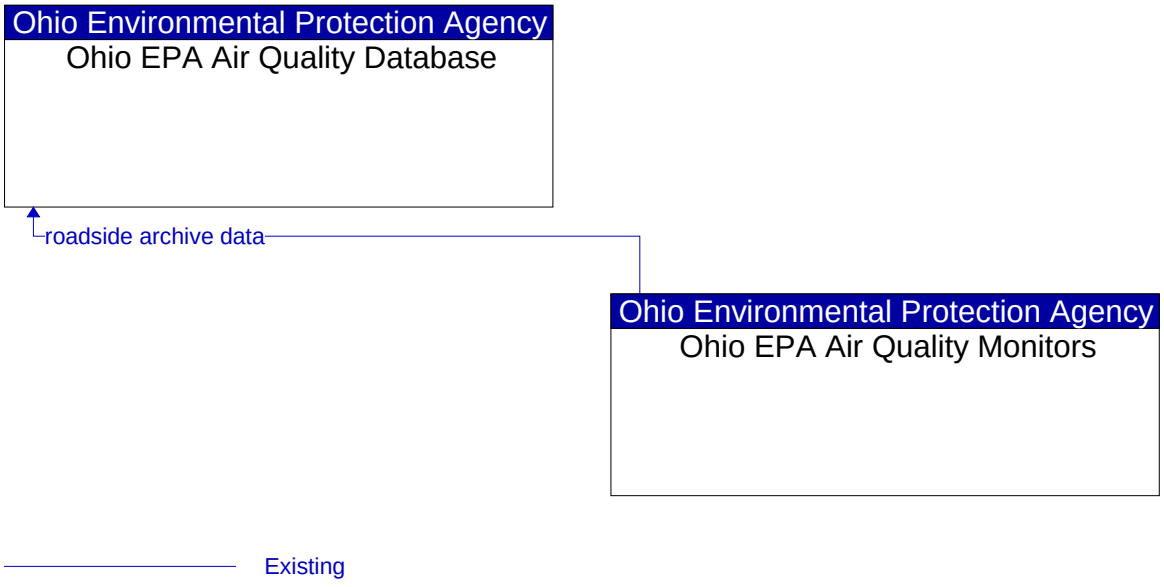

Figure 267: Ohio EPA Air Quality Database - Ohio EPA Air Quality Monitors Interface

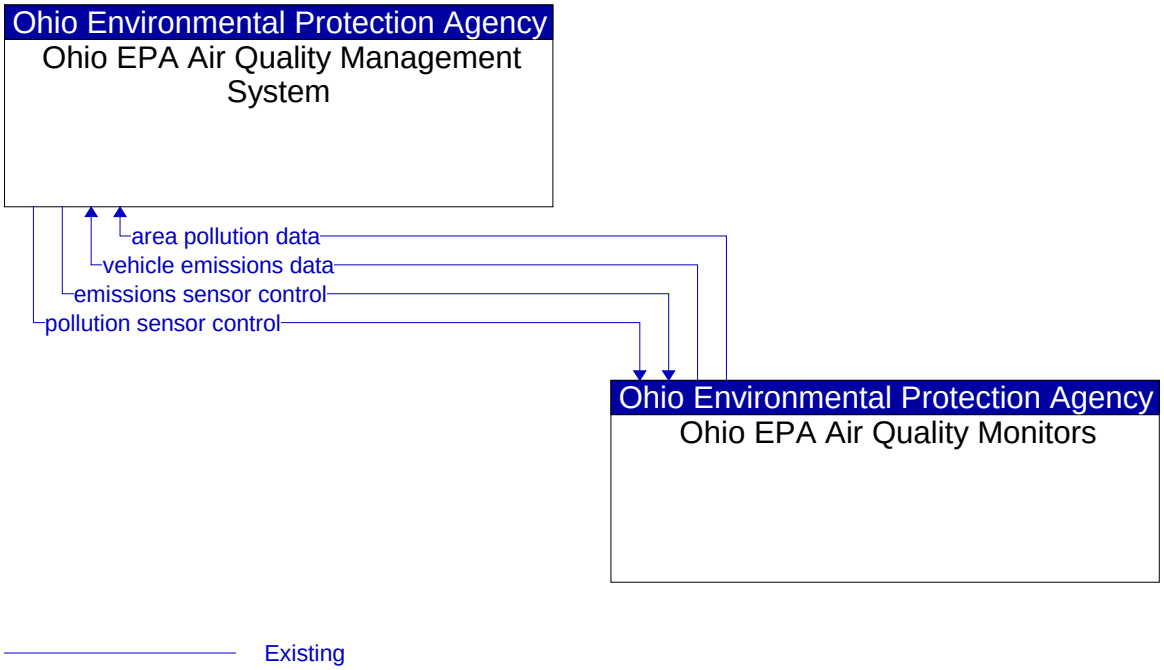

Figure 268: Ohio EPA Air Quality Management System - Ohio EPA Air Quality Monitors Interface

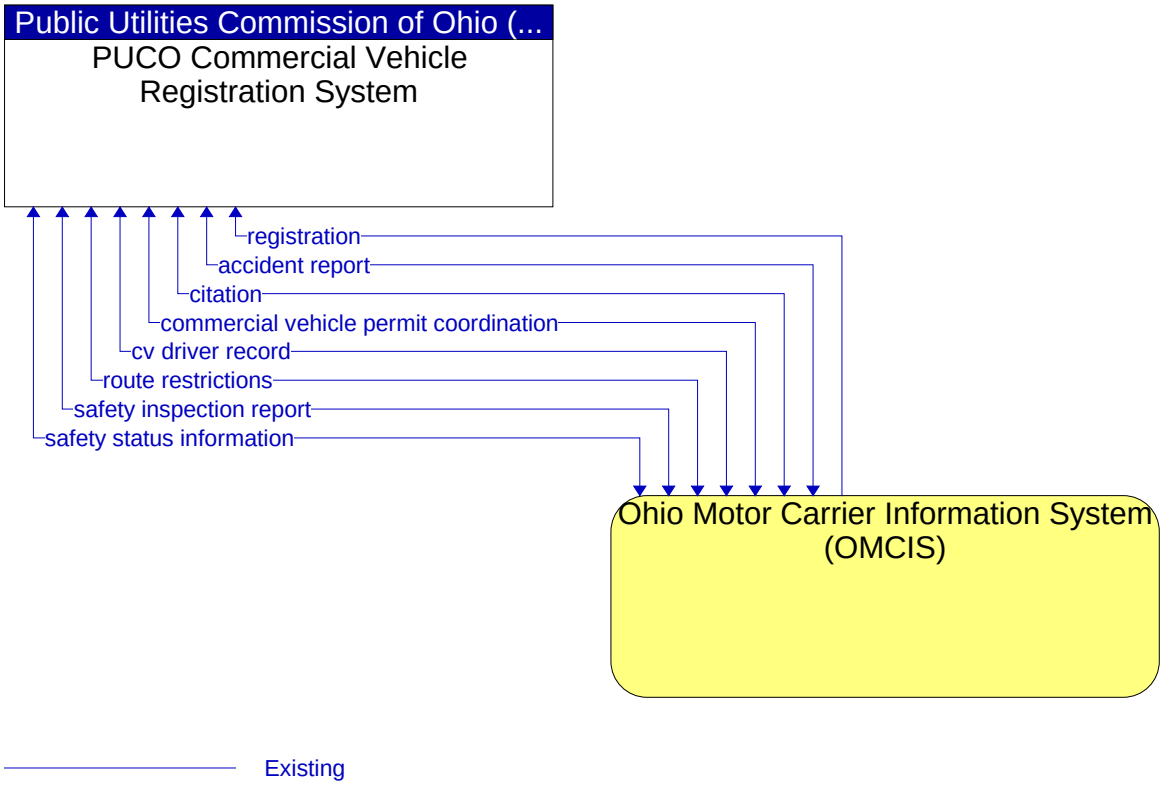

Figure 269: Ohio Motor Carrier Information System (OMCIS) - PUCO Commercial Vehicle Registration System Interface

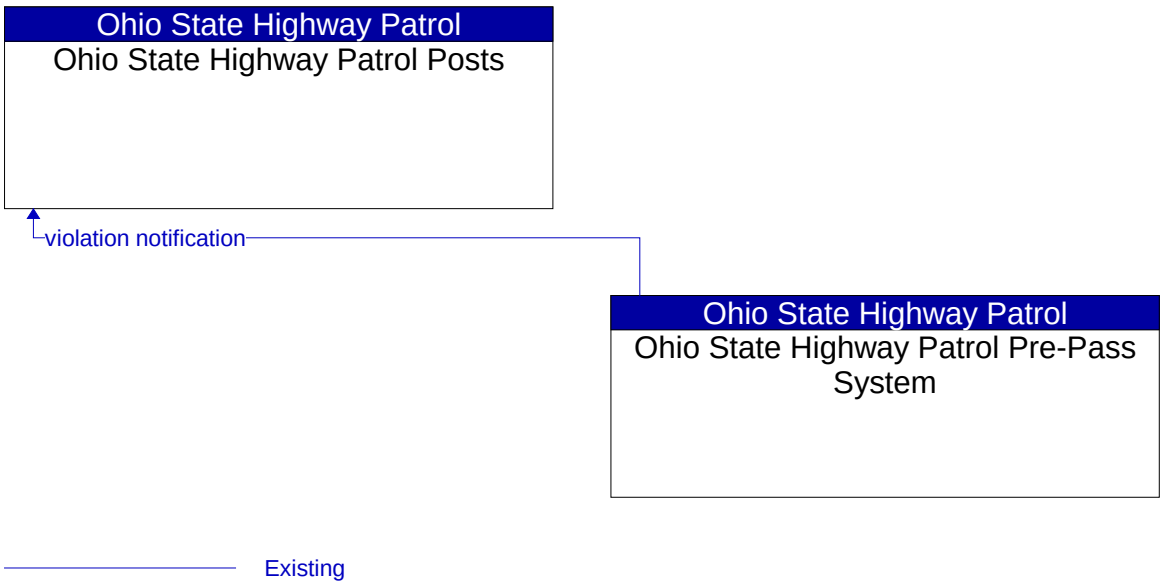

Figure 270: Ohio State Highway Patrol Posts - Ohio State Highway Patrol Pre-Pass System Interface

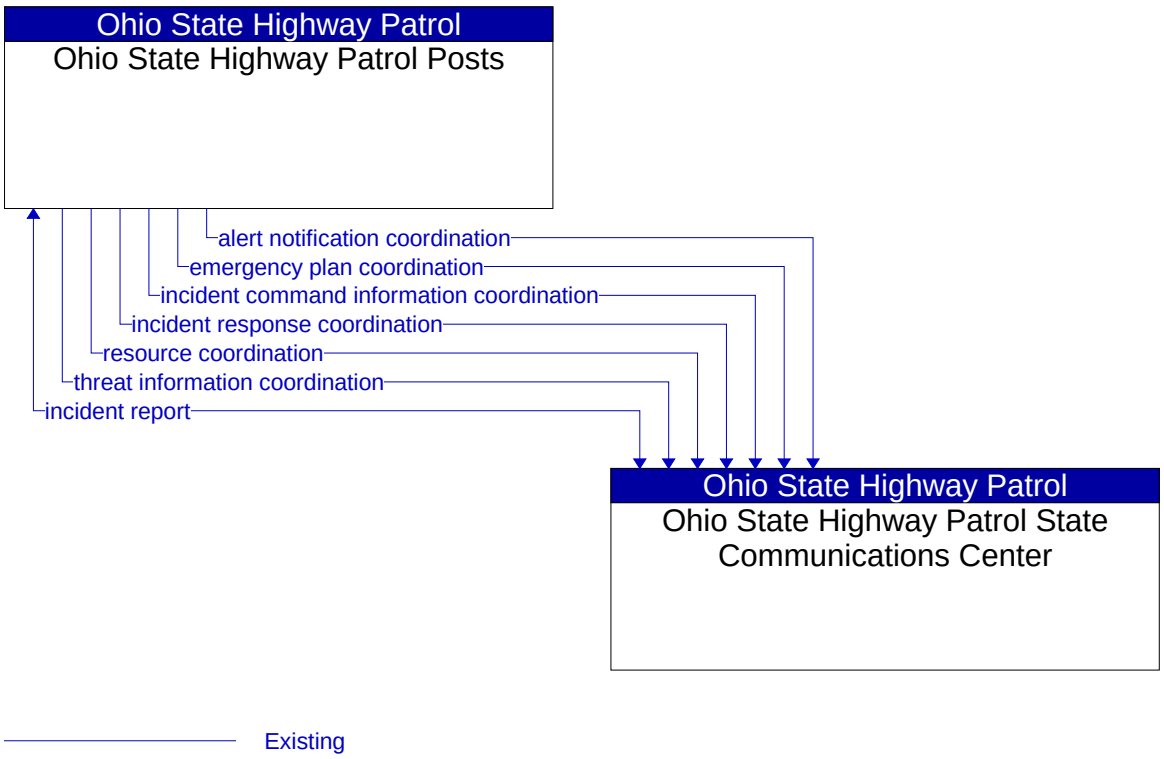

Figure 271: Ohio State Highway Patrol Posts - Ohio State Highway Patrol State Communications Center Interface

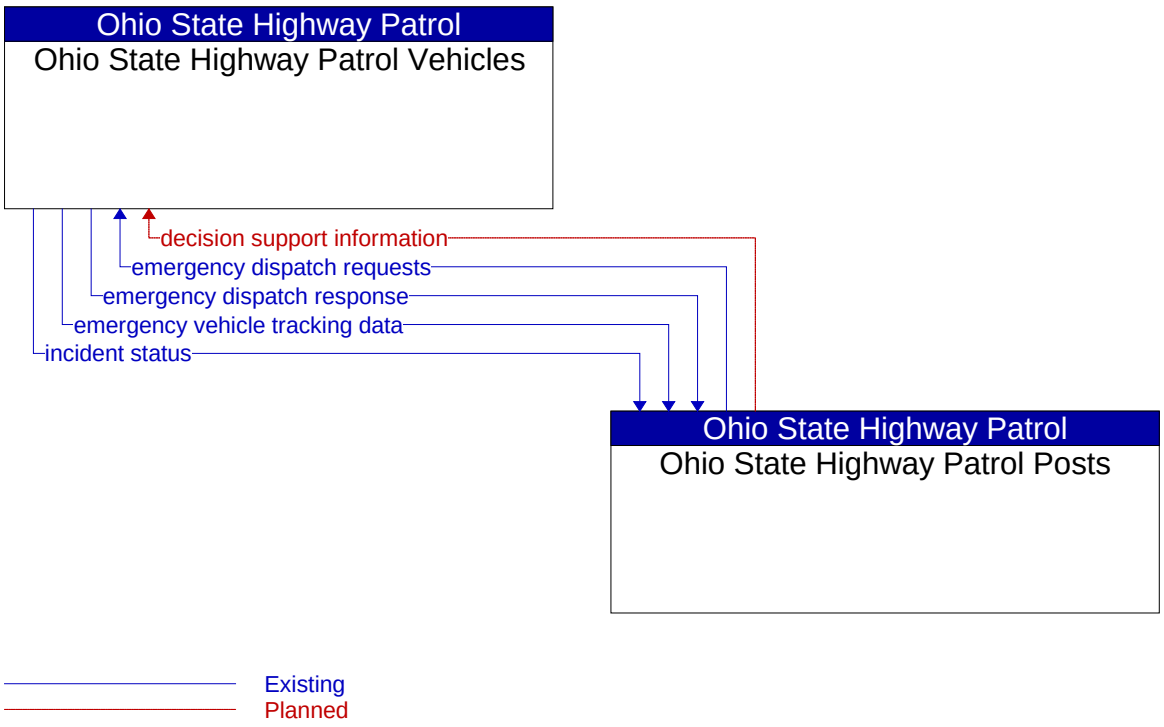

Figure 272: Ohio State Highway Patrol Posts - Ohio State Highway Patrol Vehicles Interface

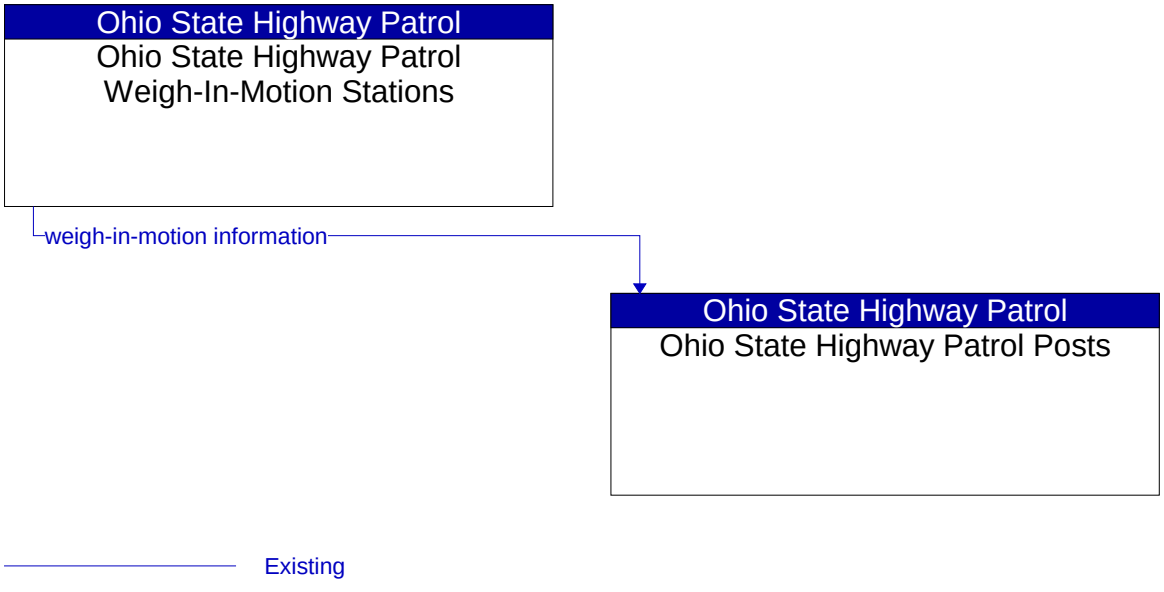

Figure 273: Ohio State Highway Patrol Posts - Ohio State Highway Patrol Weigh-In-Motion Stations Interface

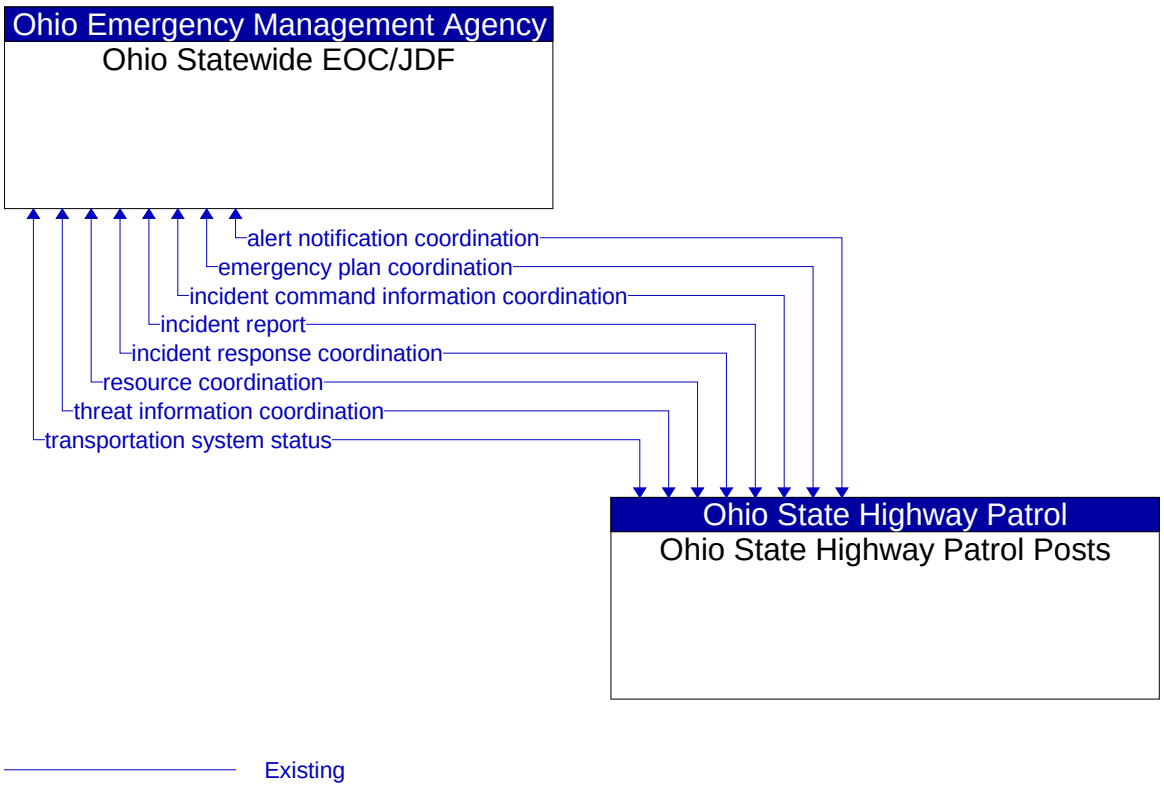

Figure 274: Ohio State Highway Patrol Posts - Ohio Statewide EOC/JDF Interface

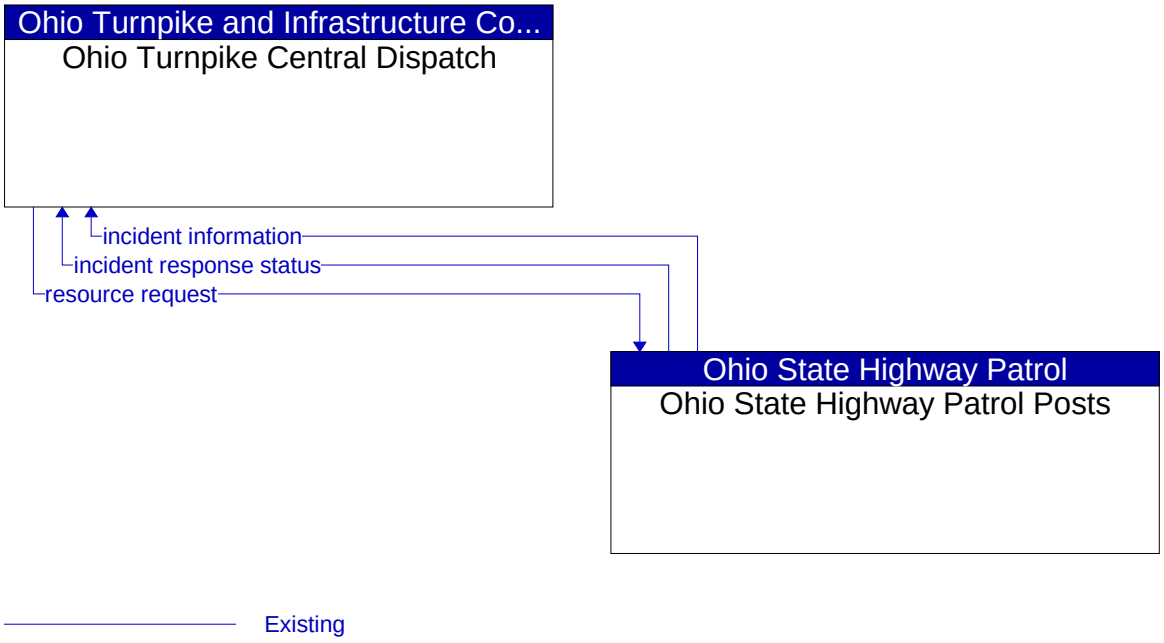

Figure 275: Ohio State Highway Patrol Posts - Ohio Turnpike Central Dispatch Interface

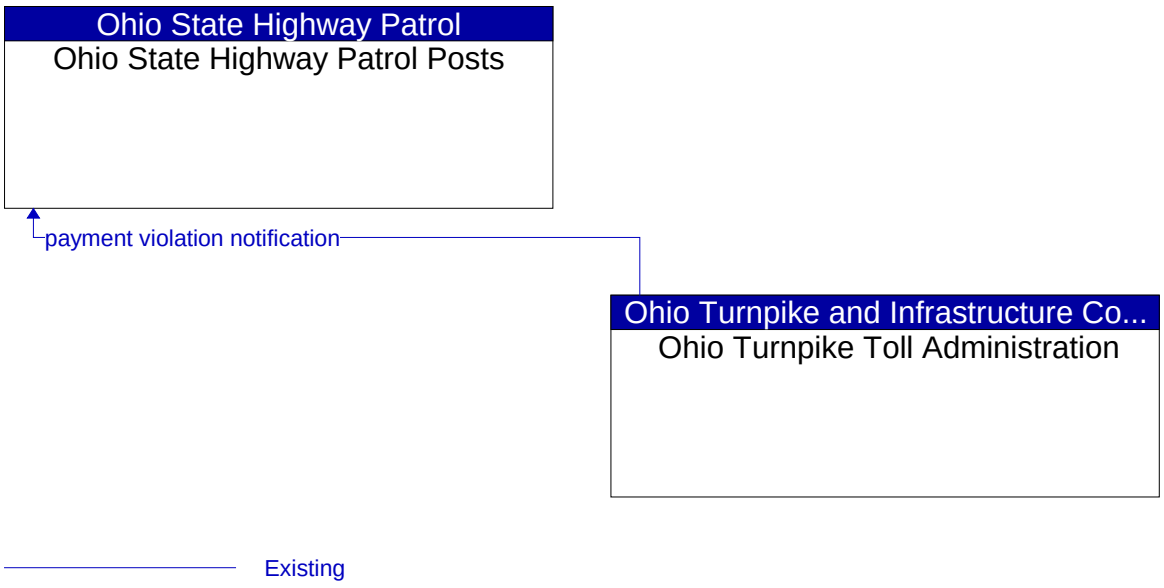

Figure 276: Ohio State Highway Patrol Posts - Ohio Turnpike Toll Administration Interface

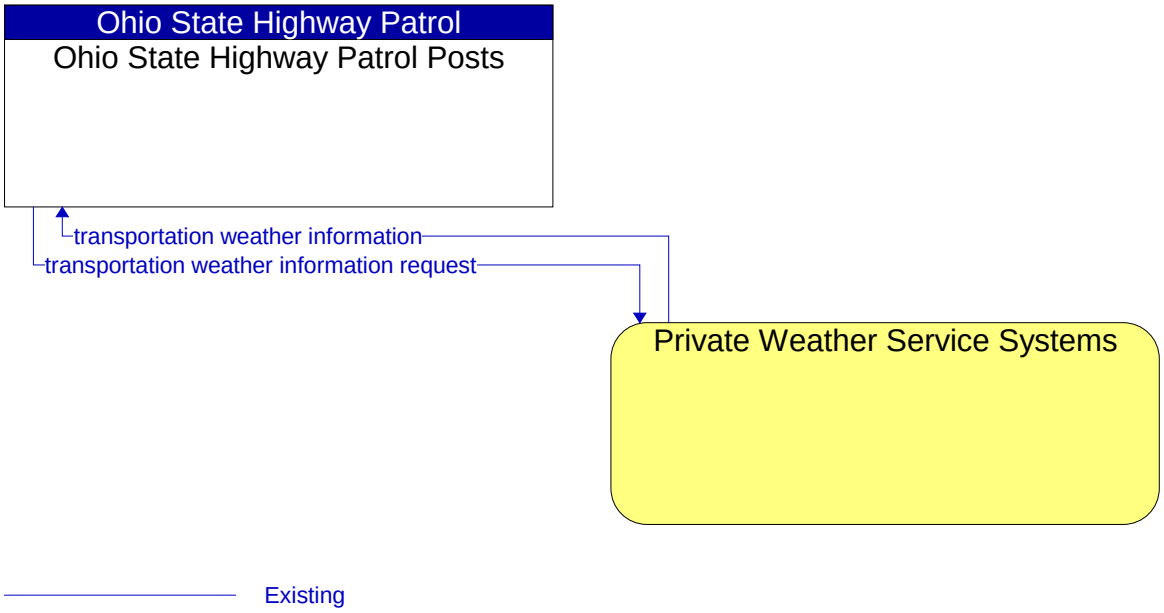

Figure 277: Ohio State Highway Patrol Posts - Private Weather Service Systems Interface

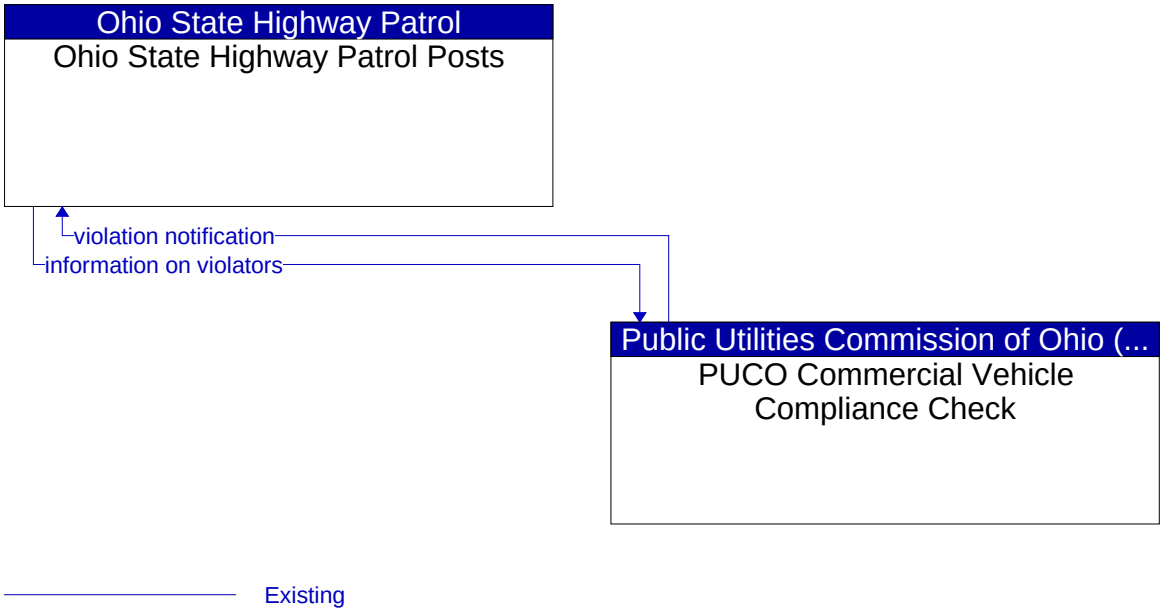

Figure 278: Ohio State Highway Patrol Posts - PUCO Commercial Vehicle Compliance Check Interface

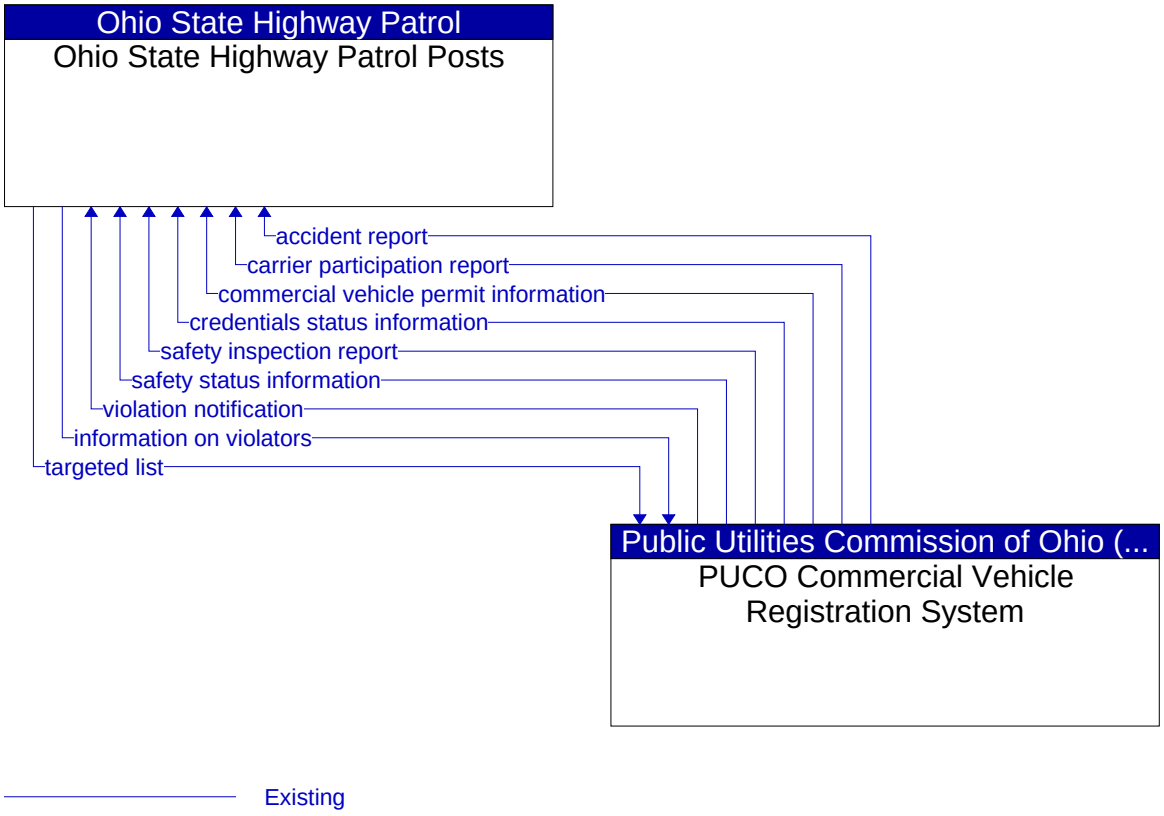

Figure 279: Ohio State Highway Patrol Posts - PUCO Commercial Vehicle Registration System Interface

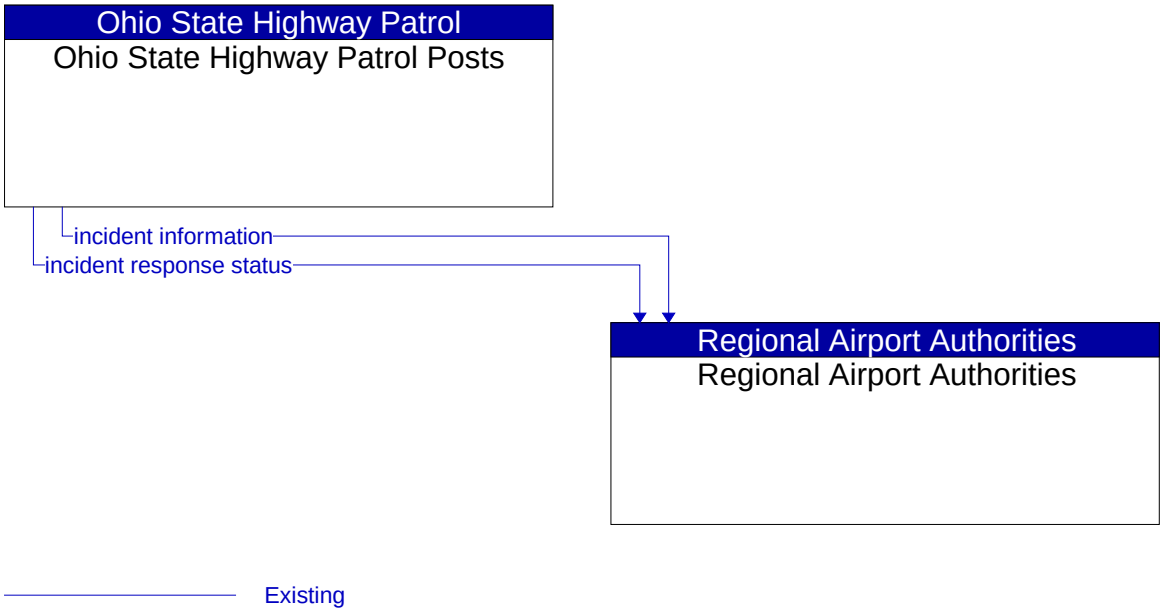

Figure 280: Ohio State Highway Patrol Posts - Regional Airport Authorities Interface

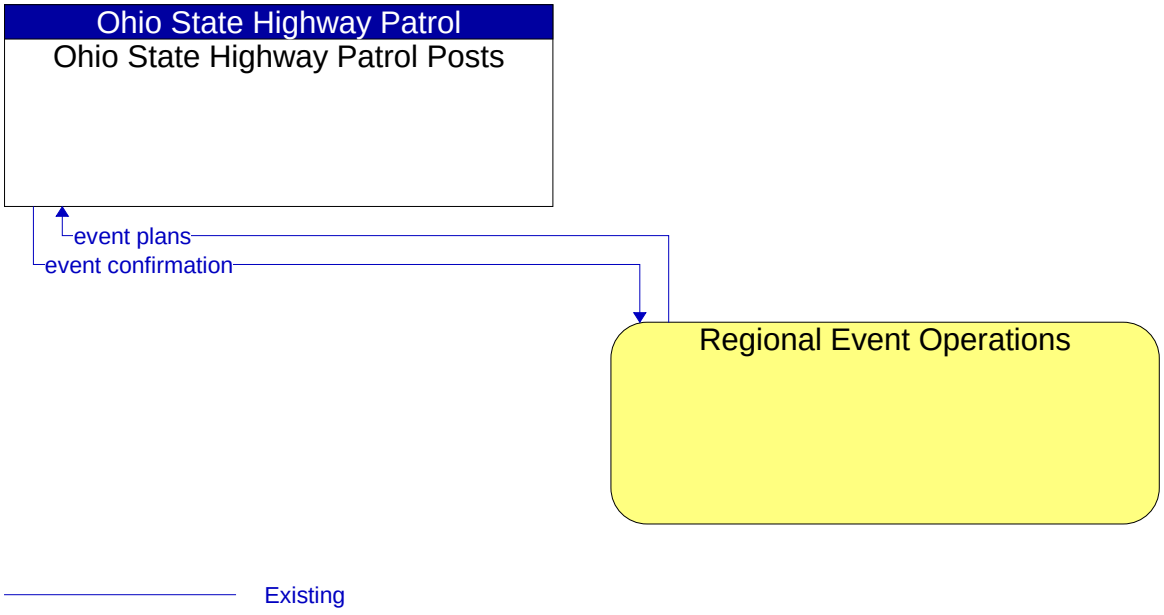

Figure 281: Ohio State Highway Patrol Posts - Regional Event Operations Interface

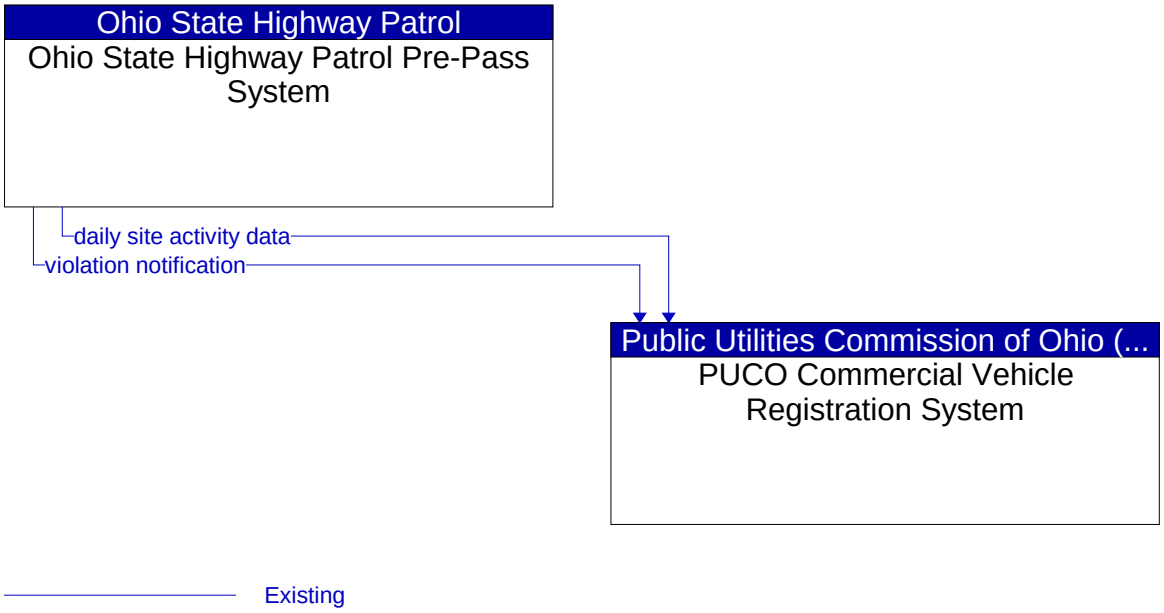

Figure 282: Ohio State Highway Patrol Pre-Pass System - PUCO Commercial Vehicle Registration System Interface

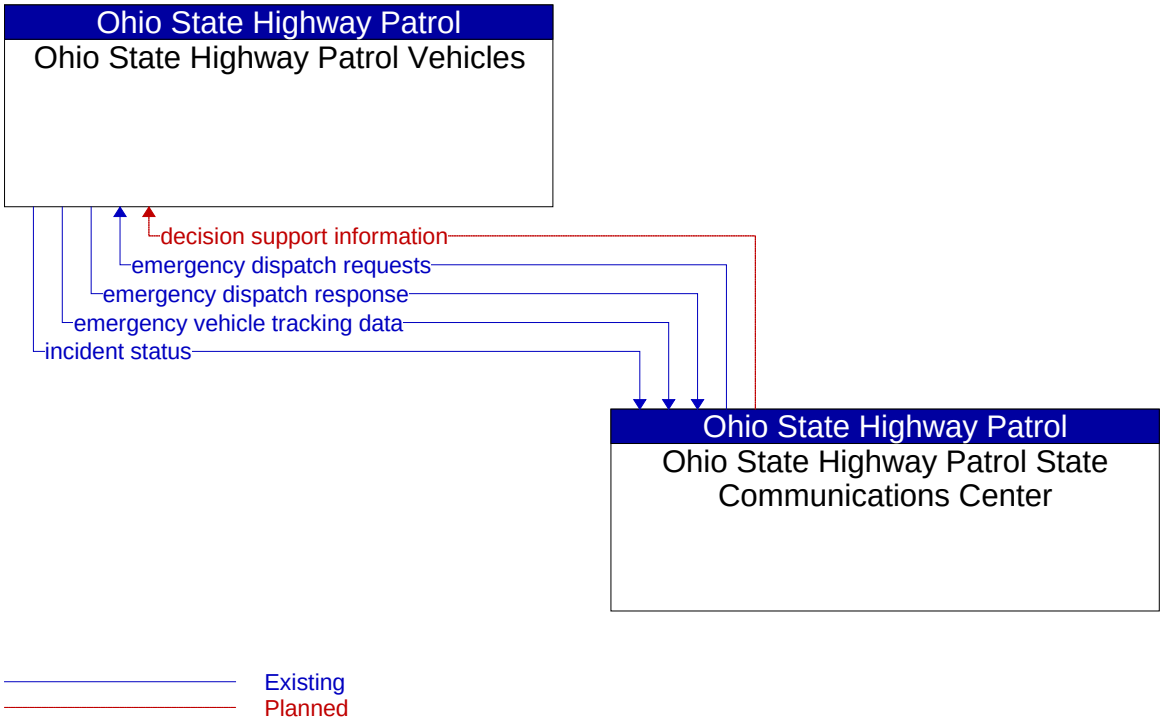

Figure 283: Ohio State Highway Patrol State Communications Center - Ohio State Highway Patrol Vehicles Interface

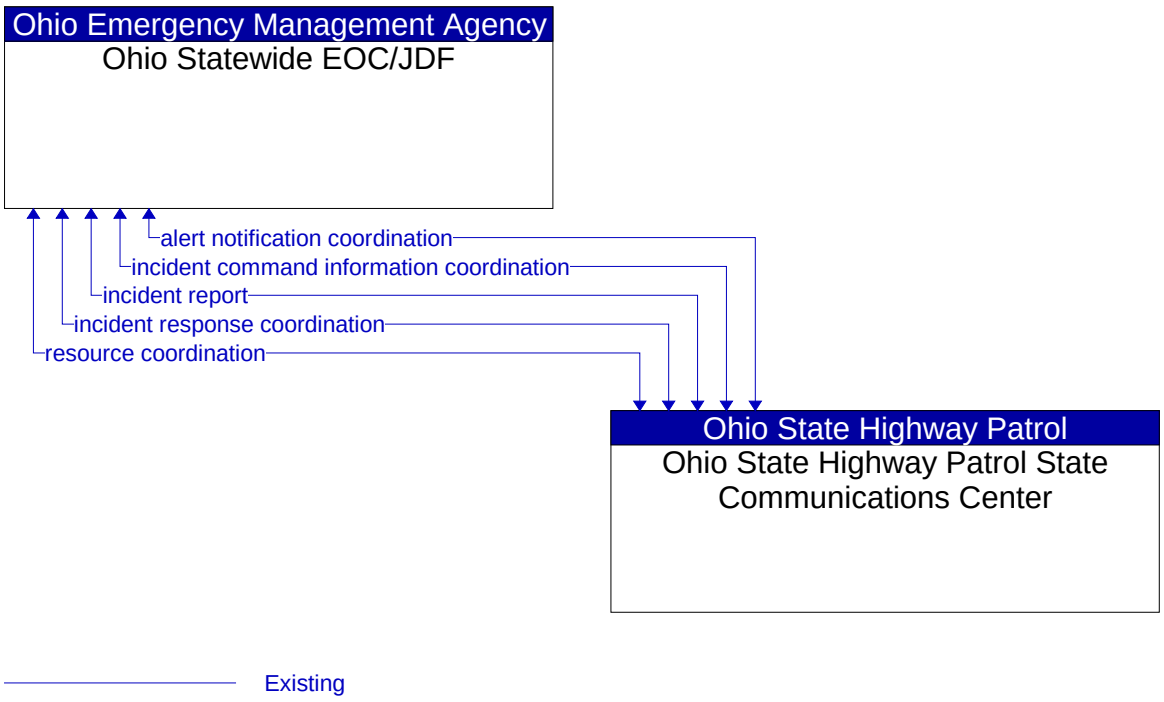

Figure 284: Ohio State Highway Patrol State Communications Center - Ohio Statewide EOC/JDF Interface

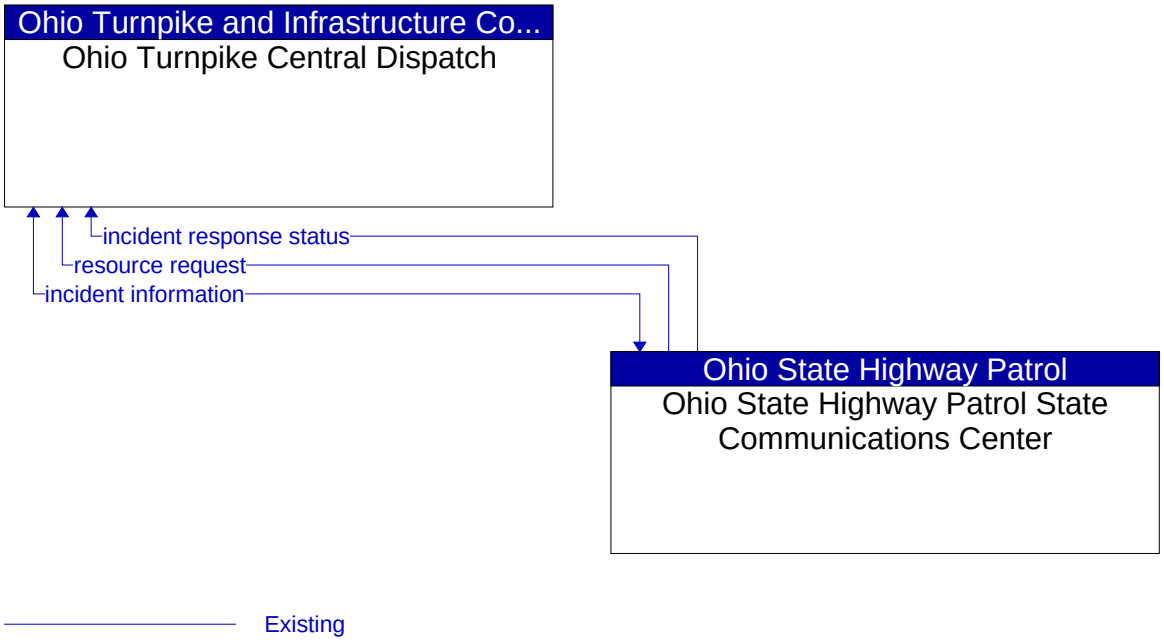

Figure 285: Ohio State Highway Patrol State Communications Center - Ohio Turnpike Central Dispatch Interface

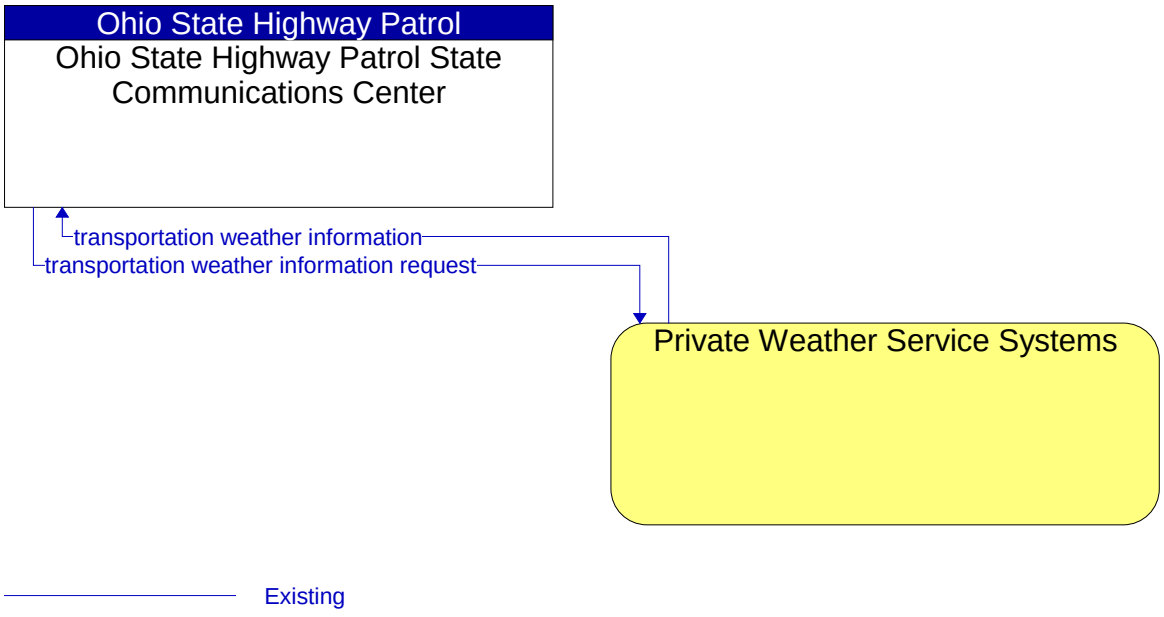

Figure 286: Ohio State Highway Patrol State Communications Center - Private Weather Service Systems Interface

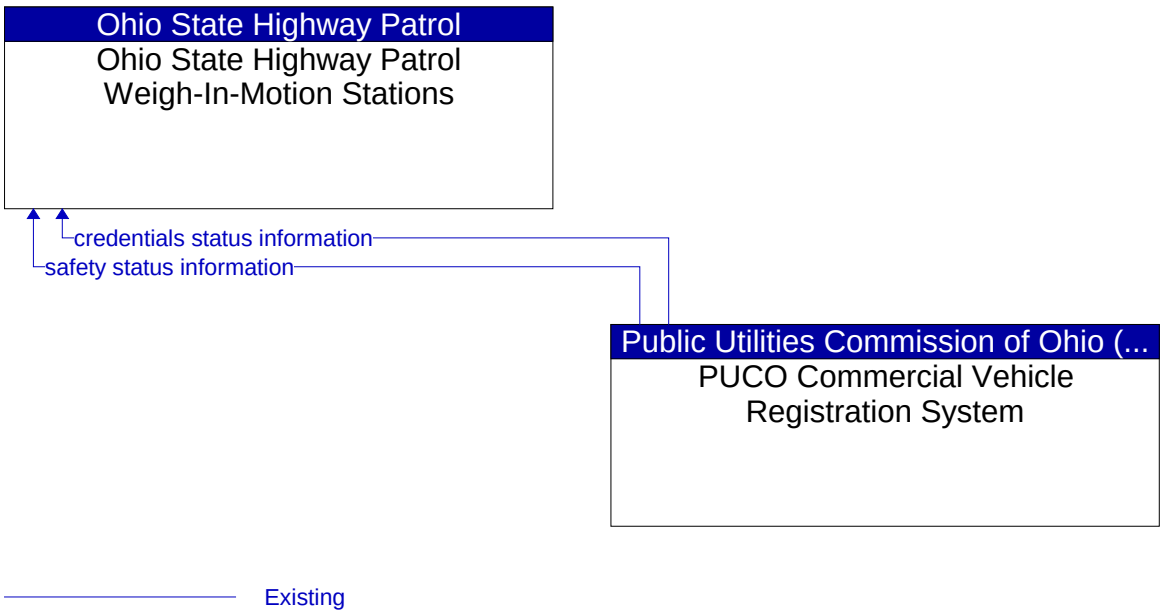

Figure 287: Ohio State Highway Patrol Weigh-In-Motion Stations - PUCO Commercial Vehicle Registration System Interface

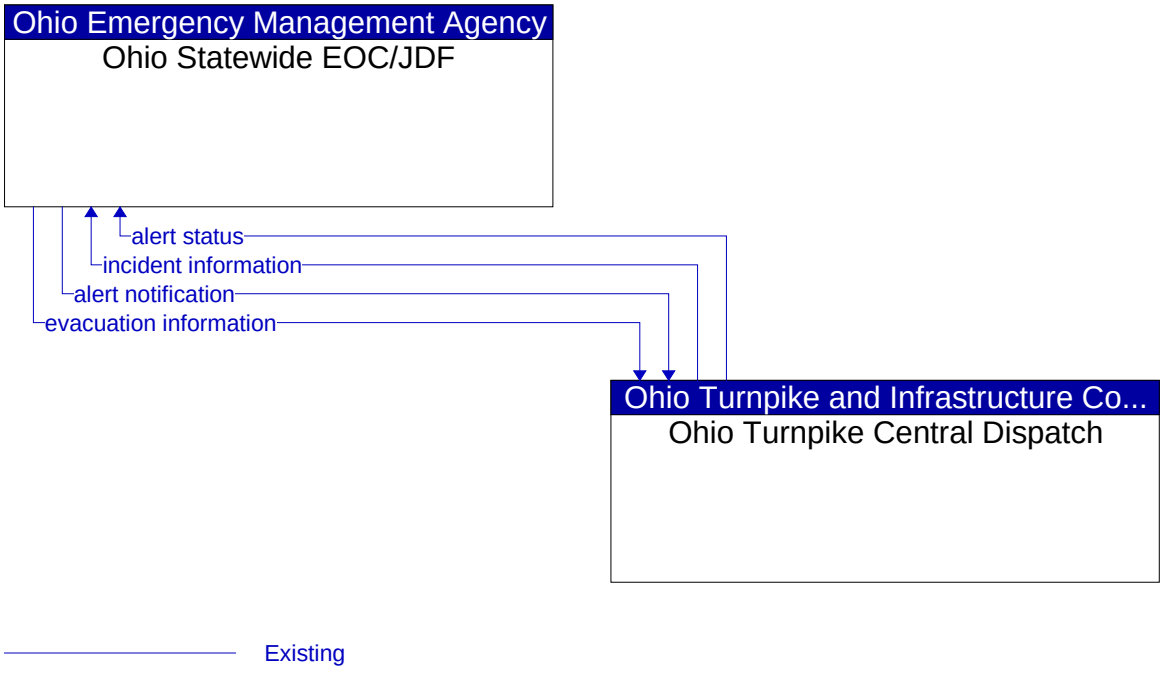

Figure 288: Ohio Statewide EOC/JDF - Ohio Turnpike Central Dispatch Interface

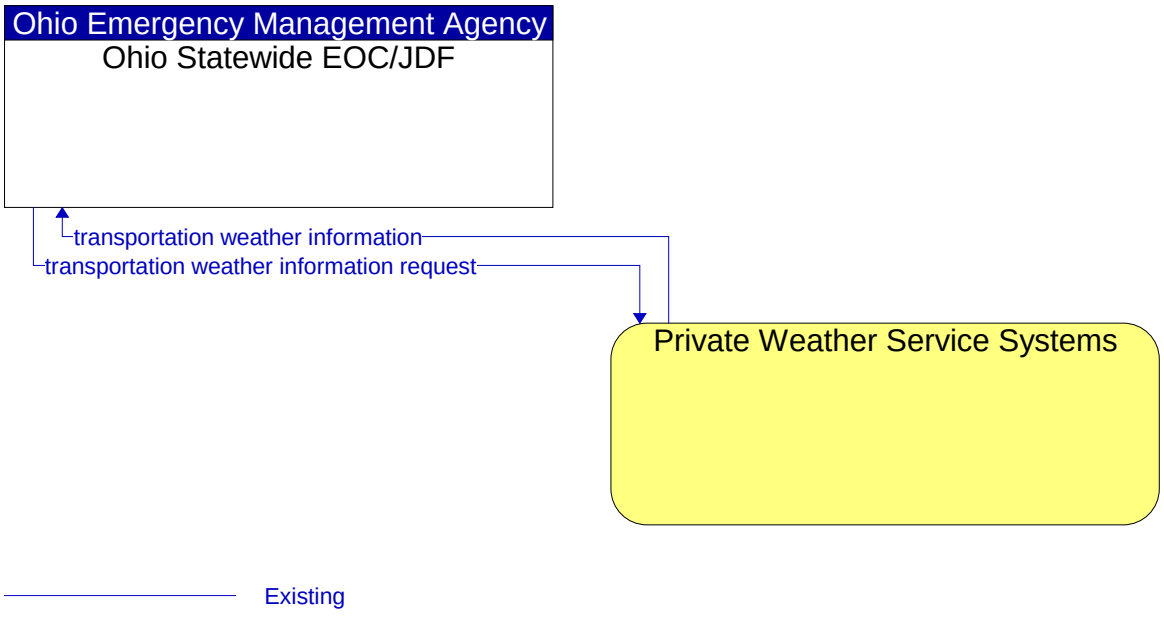

Figure 289: Ohio Statewide EOC/JDF - Private Weather Service Systems Interface

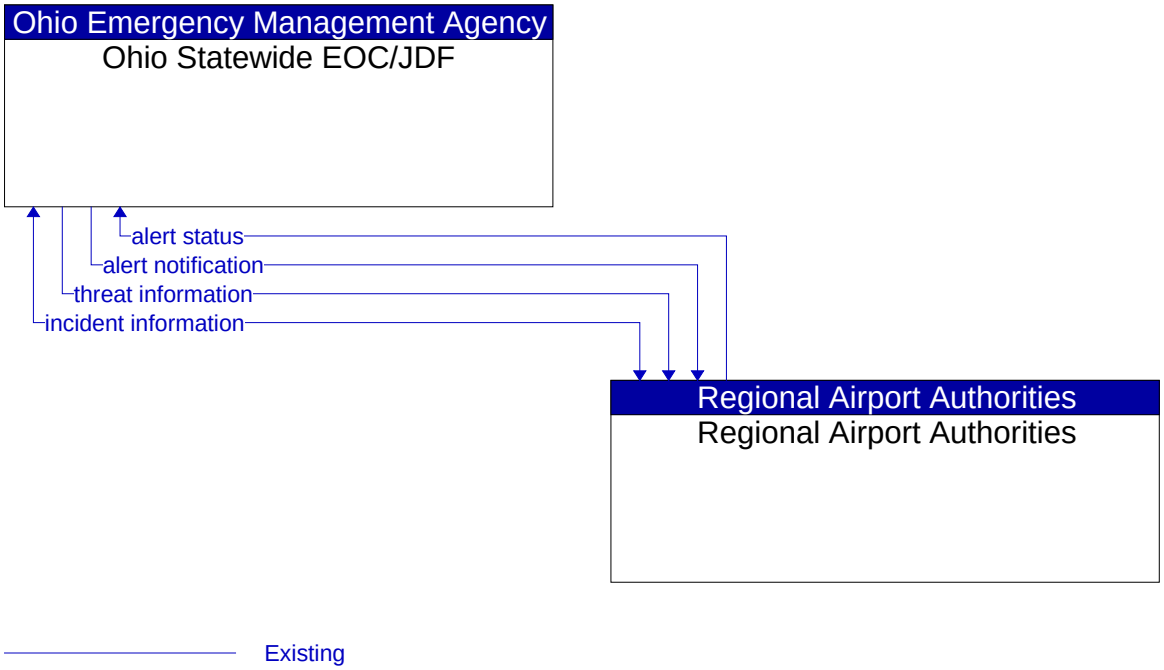

Figure 290: Ohio Statewide EOC/JDF - Regional Airport Authorities Interface

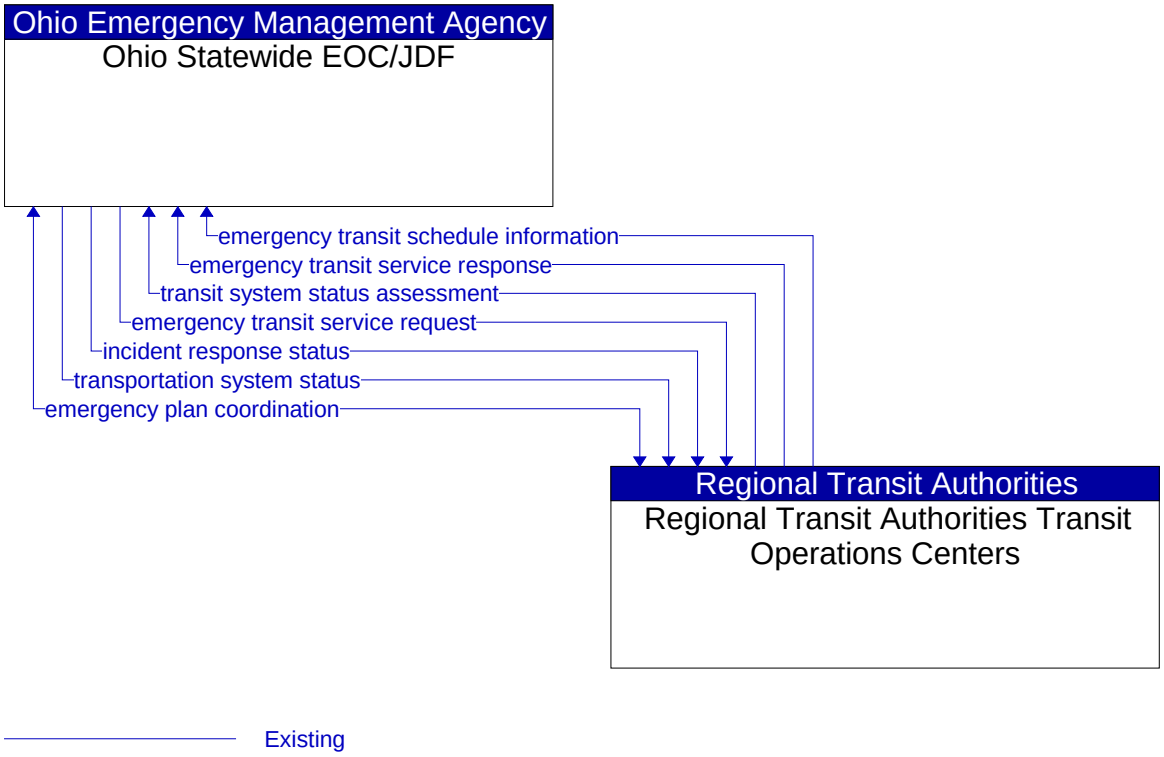

Figure 291: Ohio Statewide EOC/JDF - Regional Transit Authorities Transit Operations Centers Interface

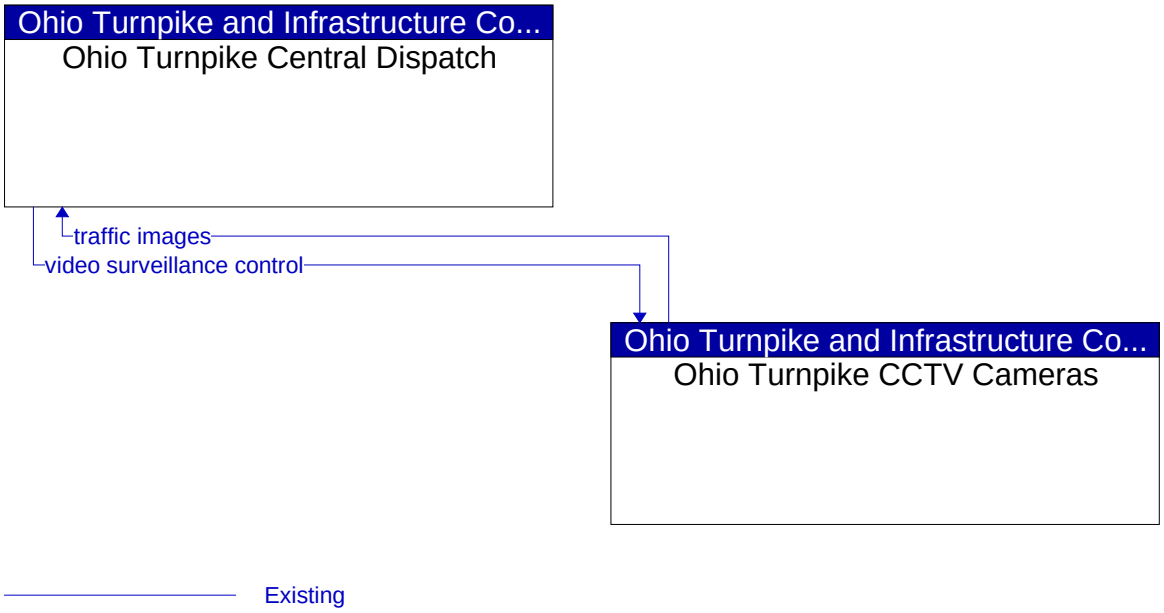

Figure 292: Ohio Turnpike CCTV Cameras - Ohio Turnpike Central Dispatch Interface

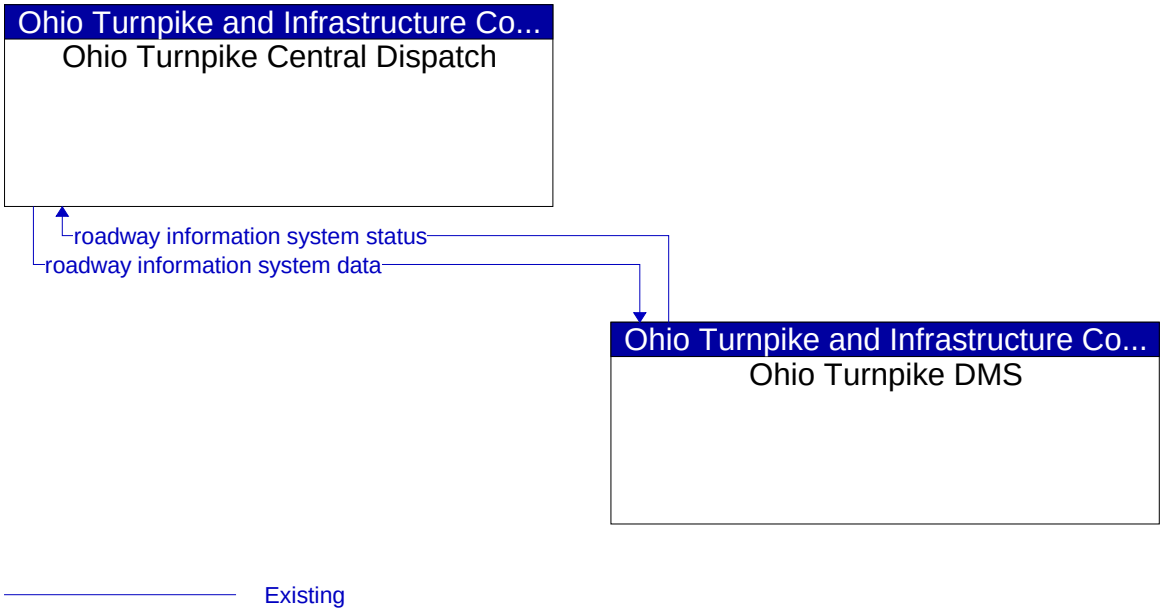

Figure 293: Ohio Turnpike Central Dispatch - Ohio Turnpike DMS Interface

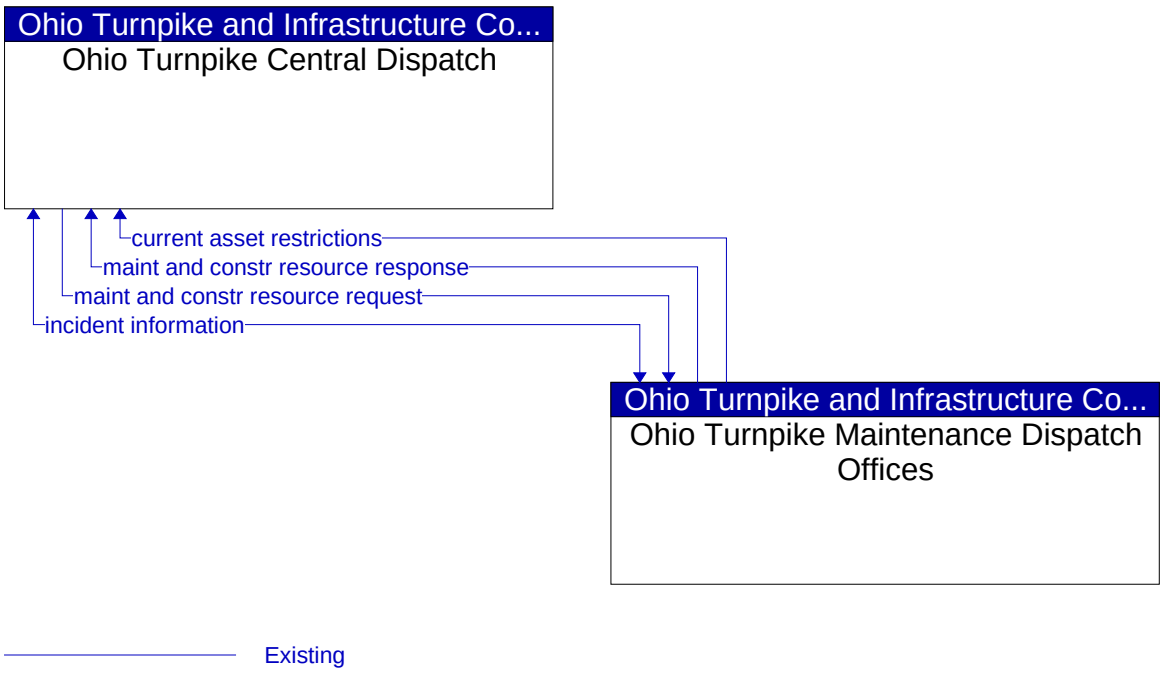

Figure 294: Ohio Turnpike Central Dispatch - Ohio Turnpike Maintenance Dispatch Offices Interface

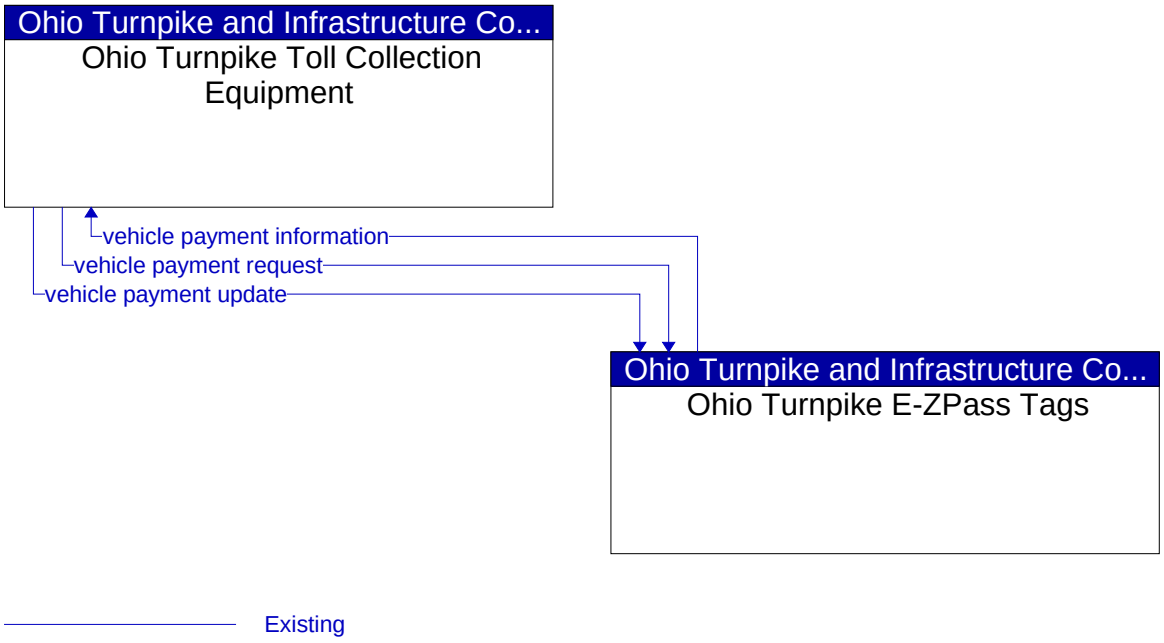

Figure 295: Ohio Turnpike E-ZPass Tags - Ohio Turnpike Toll Collection Equipment Interface

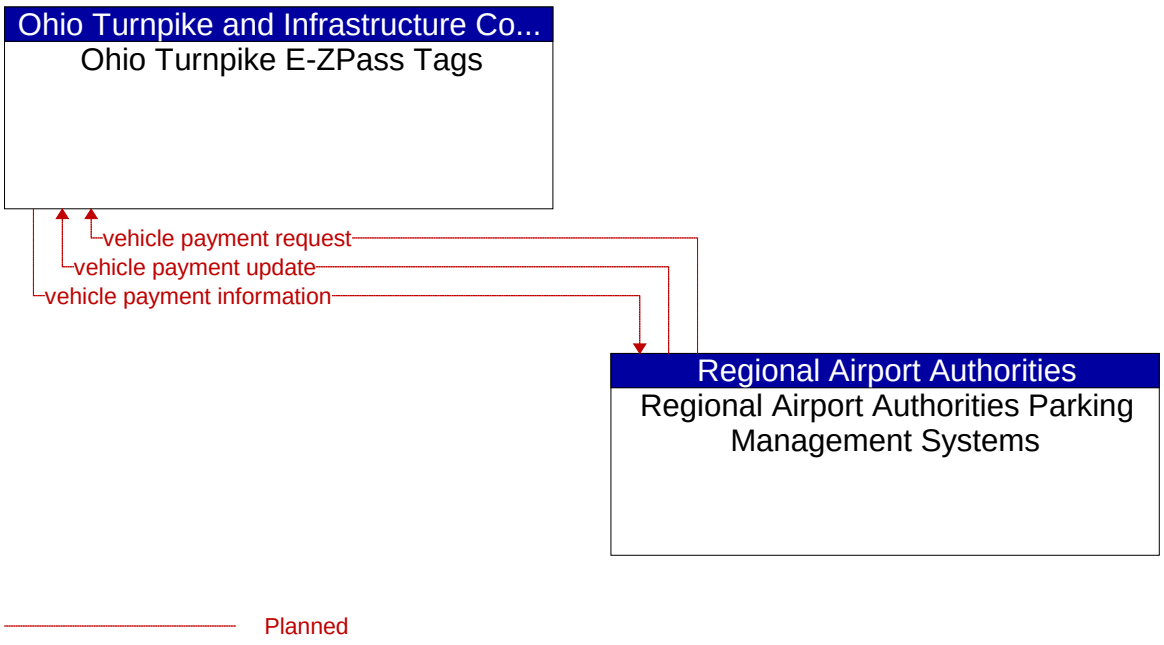

Figure 296: Ohio Turnpike E-ZPass Tags - Regional Airport Authorities Parking Management Systems Interface

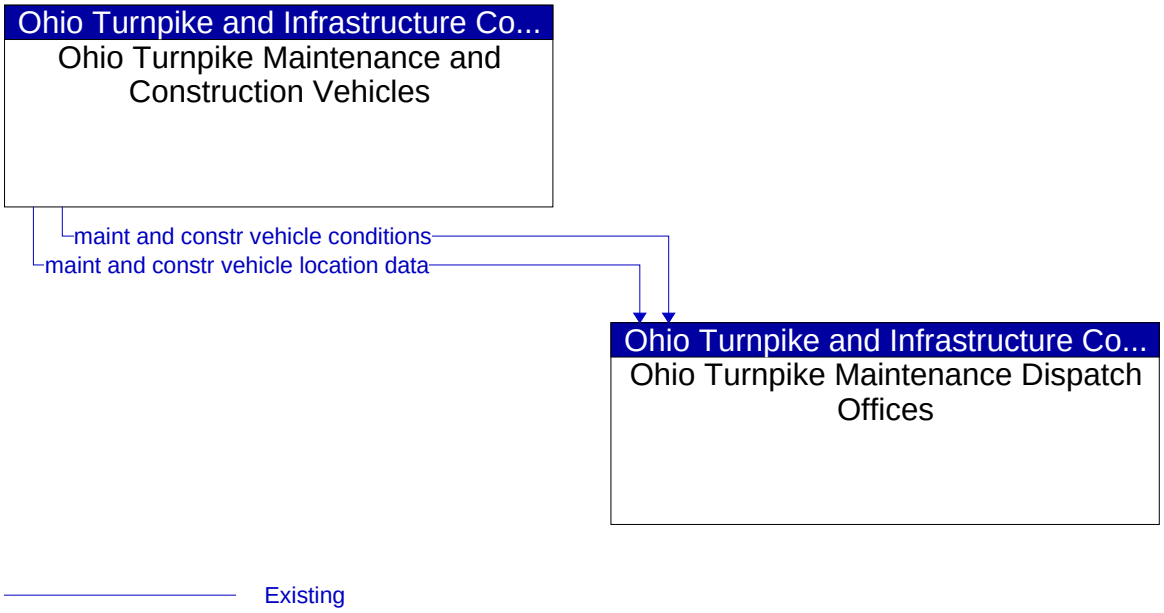

Figure 297: Ohio Turnpike Maintenance and Construction Vehicles - Ohio Turnpike Maintenance Dispatch Offices Interface

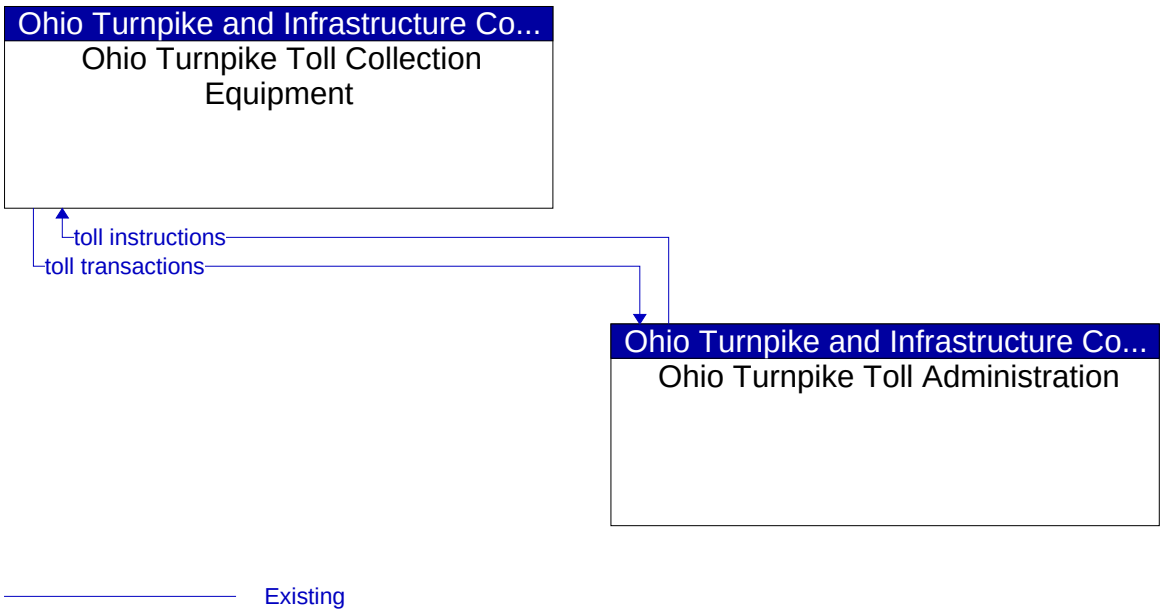

Figure 298: Ohio Turnpike Toll Administration - Ohio Turnpike Toll Collection Equipment Interface

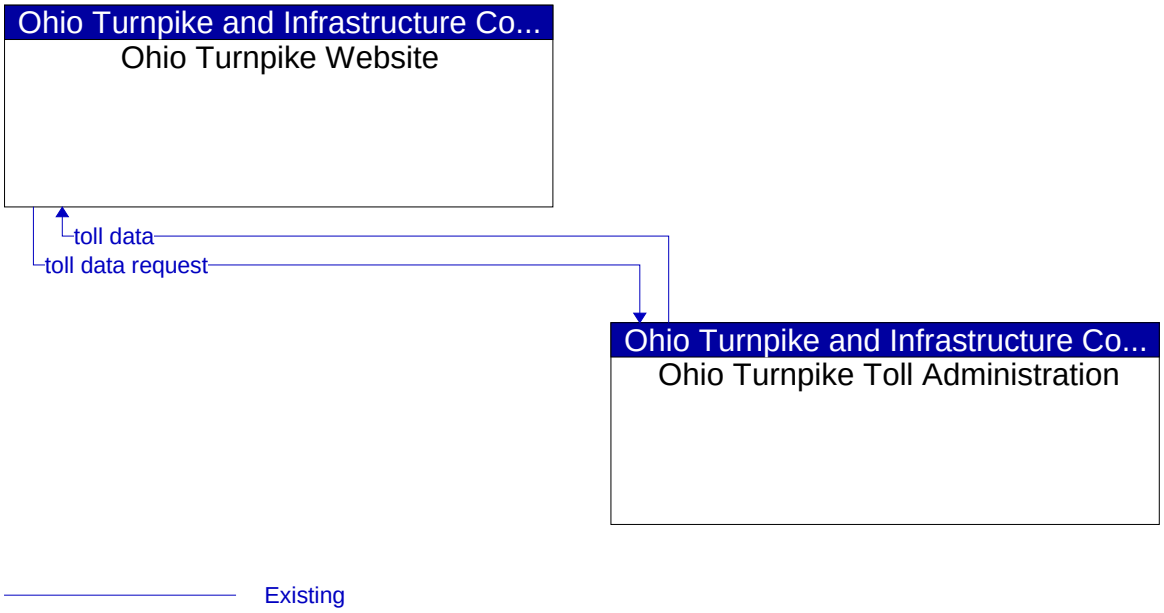

Figure 299: Ohio Turnpike Toll Administration - Ohio Turnpike Website Interface

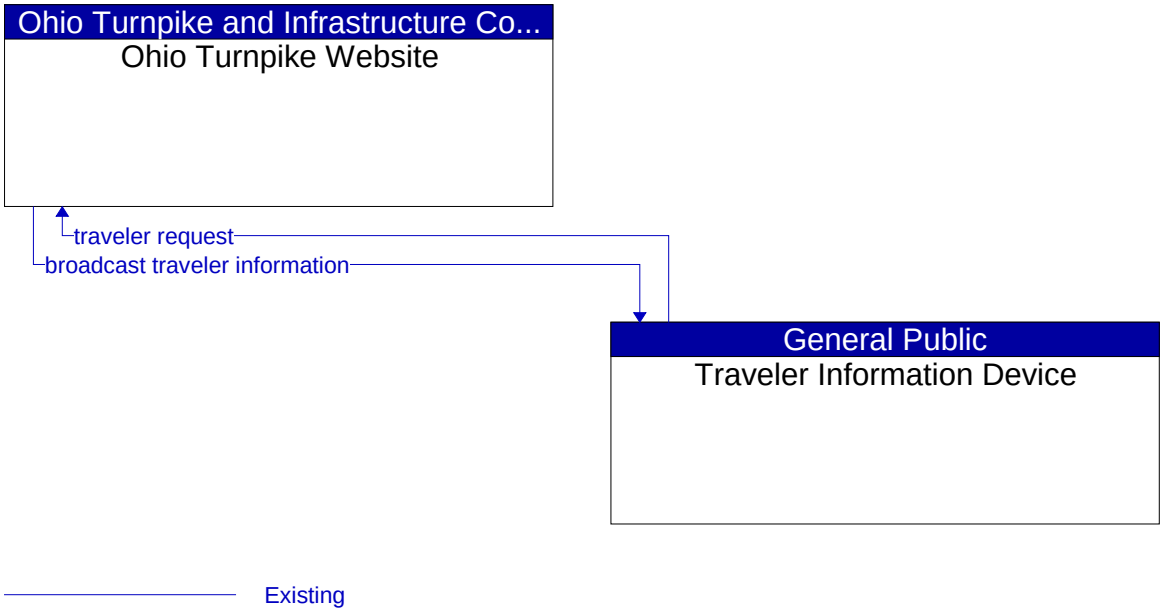

Figure 300: Ohio Turnpike Website - Traveler Information Device Interface

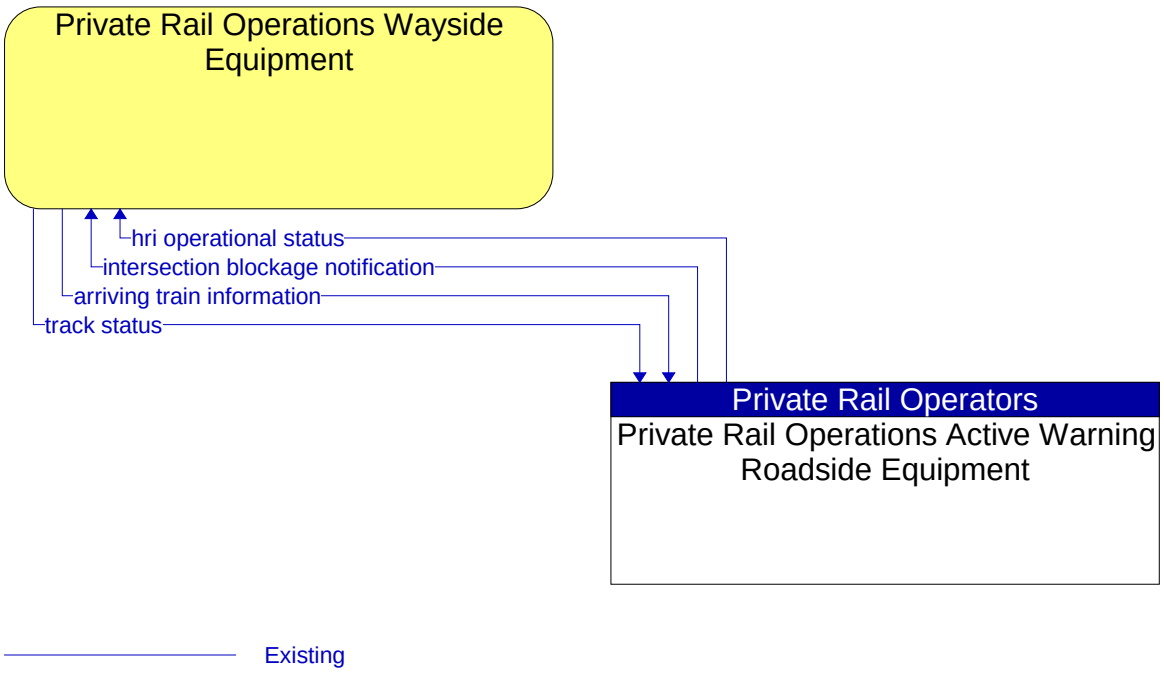

Figure 301: Private Rail Operations Active Warning Roadside Equipment - Private Rail Operations Wayside Equipment Interface

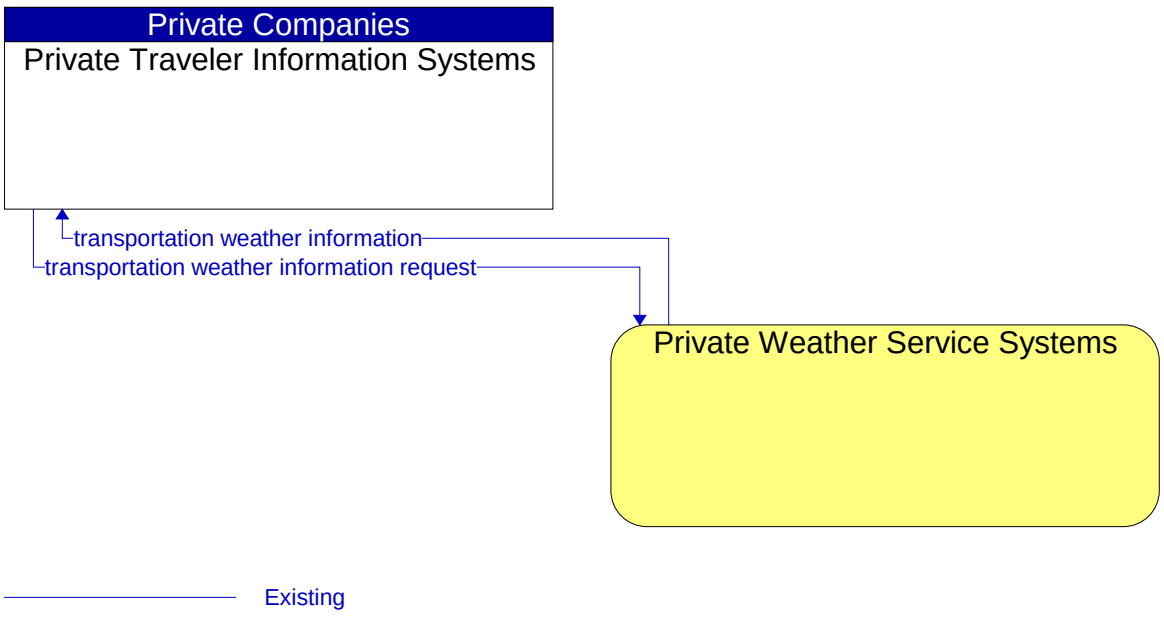

Figure 302: Private Traveler Information Systems - Private Weather Service Systems Interface

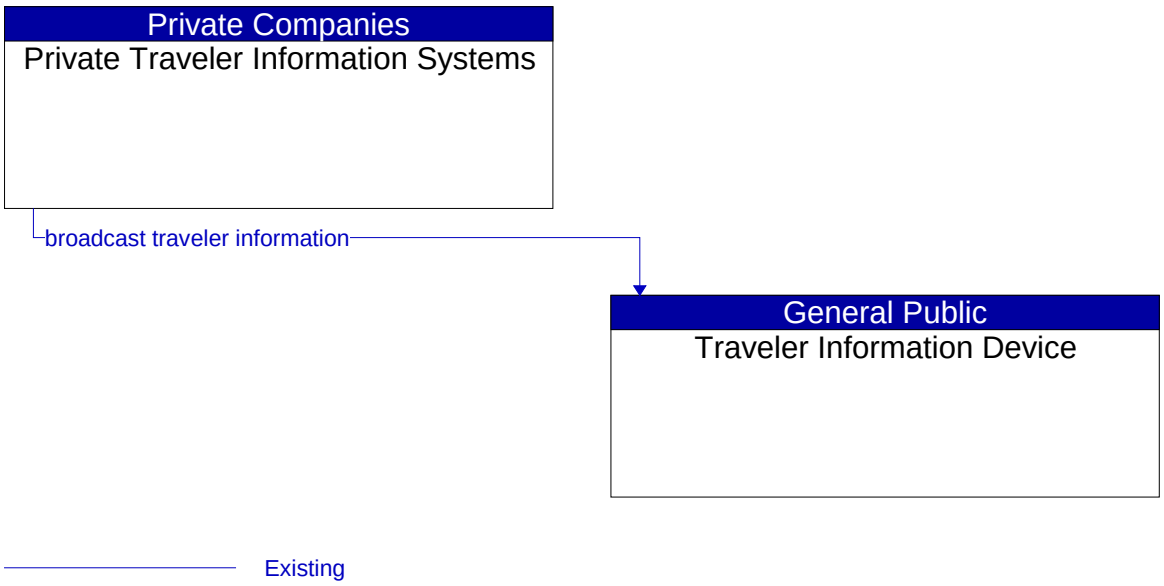

Figure 303: Private Traveler Information Systems - Traveler Information Device Interface

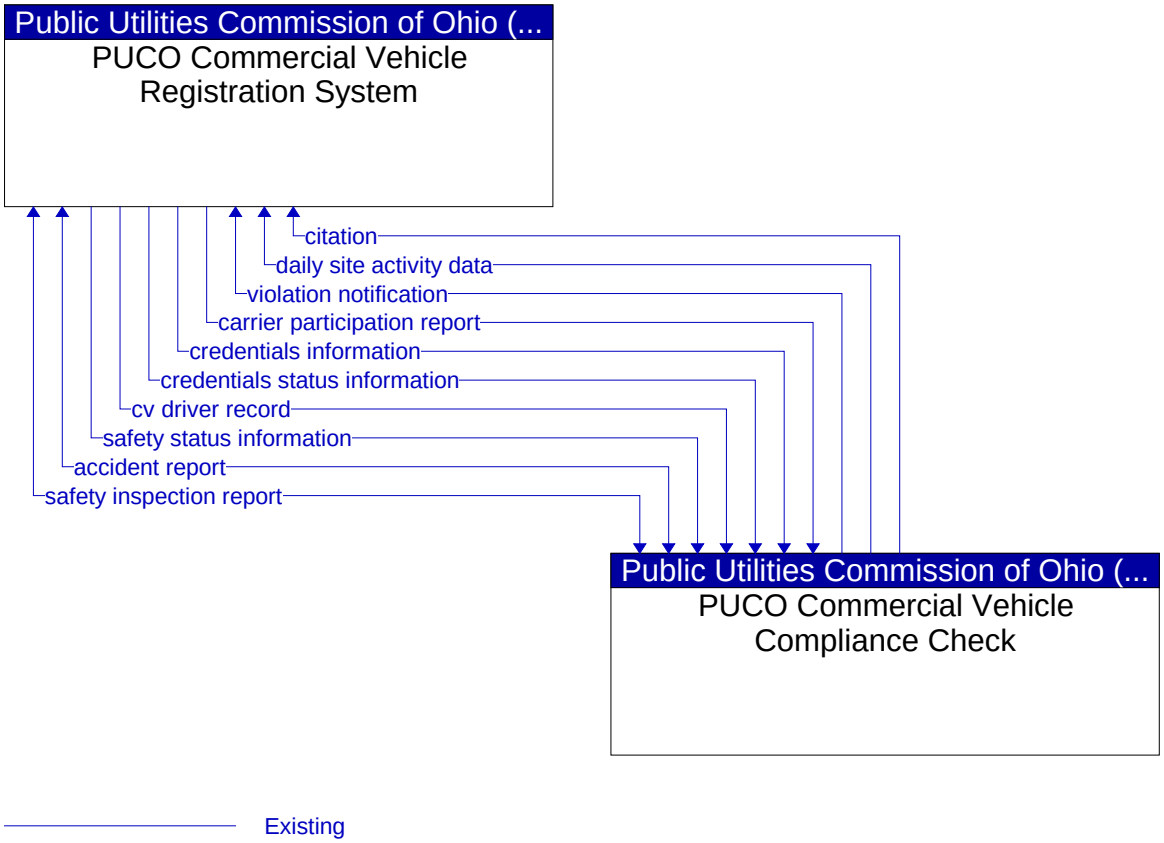

Figure 304: PUCO Commercial Vehicle Compliance Check - PUCO Commercial Vehicle Registration System Interface

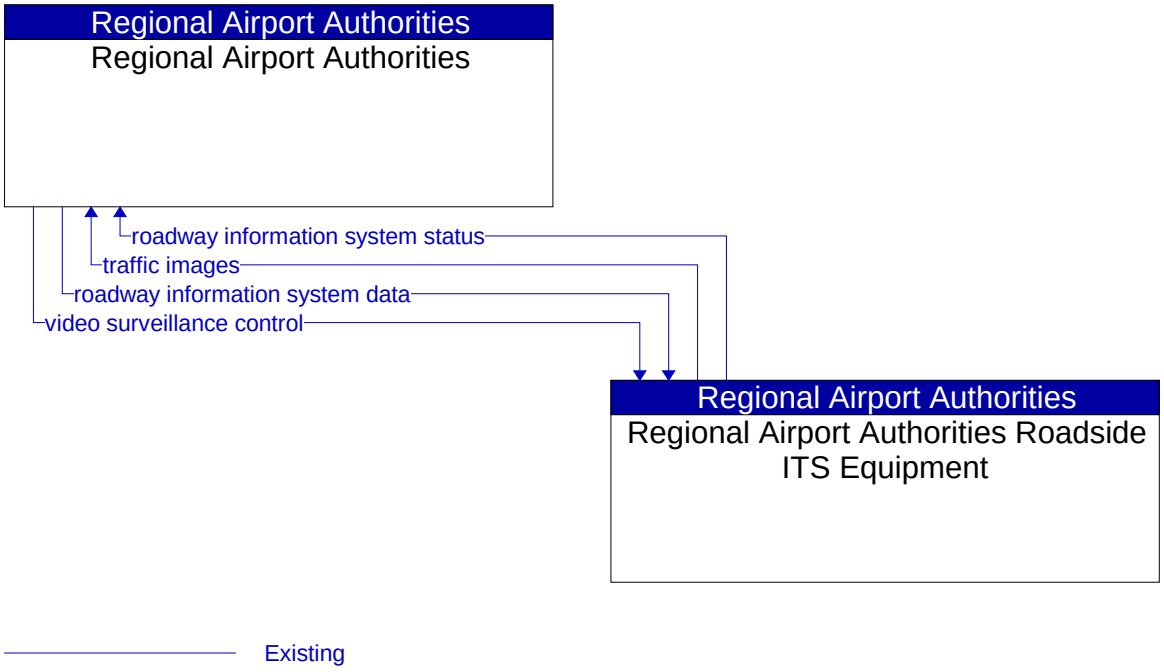

Figure 305: Regional Airport Authorities - Regional Airport Authorities Roadside ITS Equipment Interface

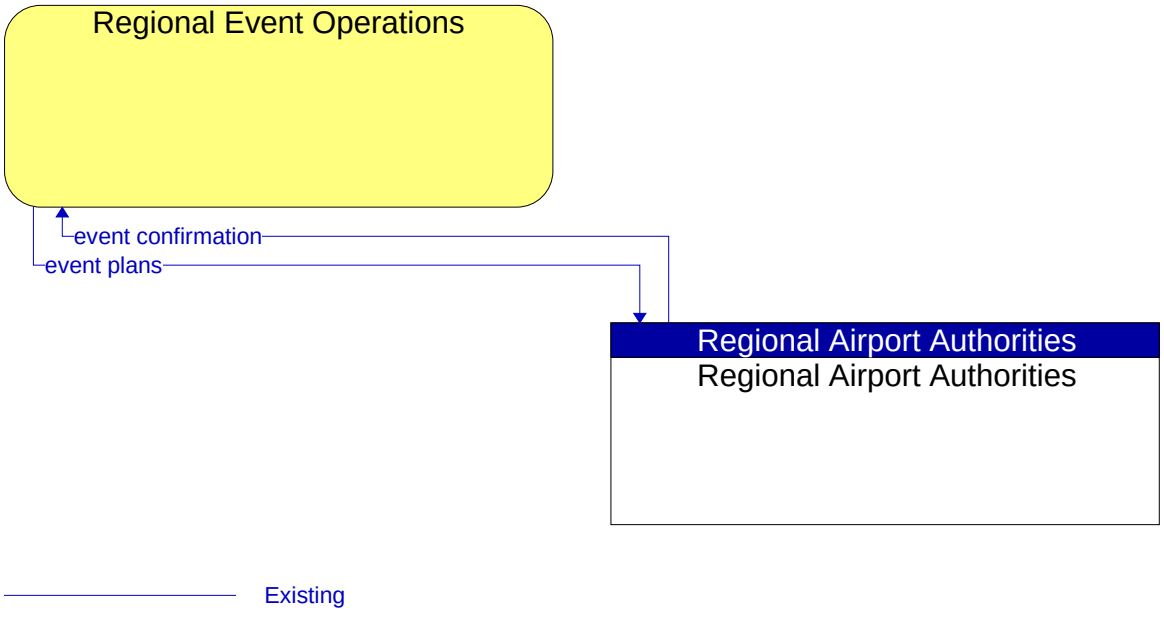

Figure 306: Regional Airport Authorities - Regional Event Operations Interface

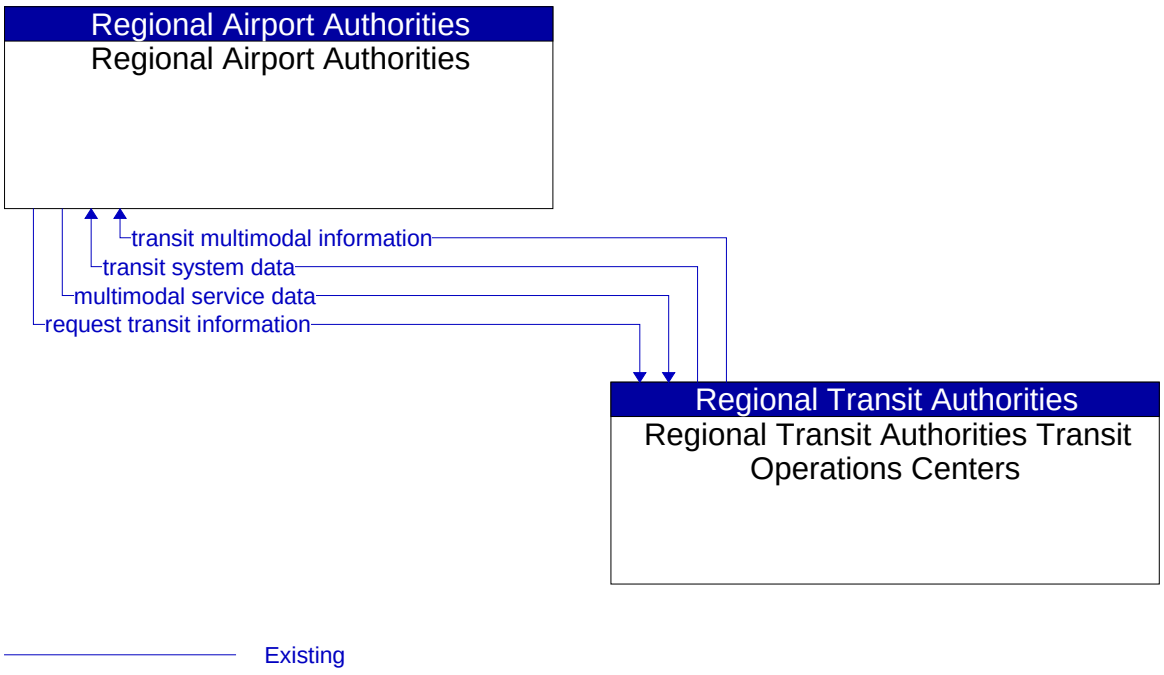

Figure 307: Regional Airport Authorities - Regional Transit Authorities Transit Operations Centers Interface

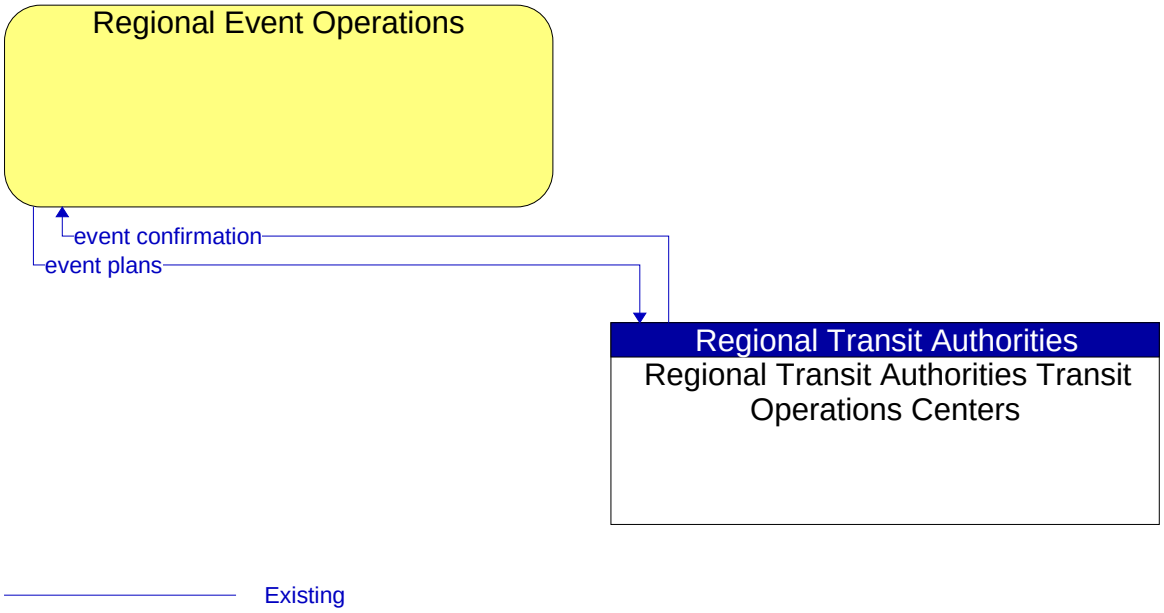

Figure 308: Regional Event Operations - Regional Transit Authorities Transit Operations Centers Interface

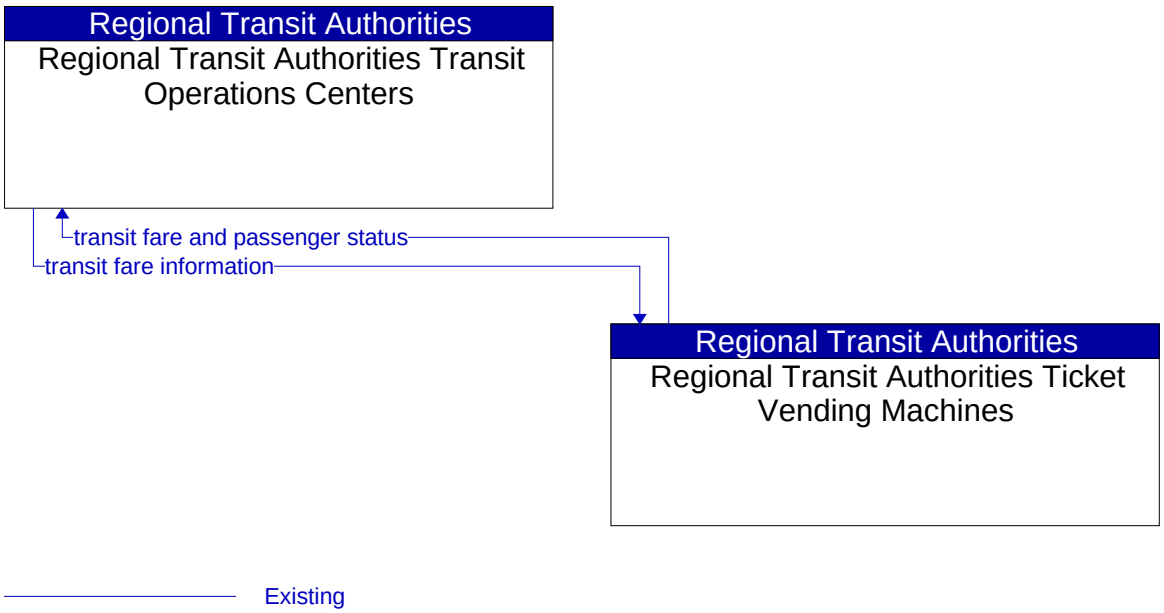

Figure 309: Regional Transit Authorities Ticket Vending Machines - Regional Transit Authorities Transit Operations Centers Interface

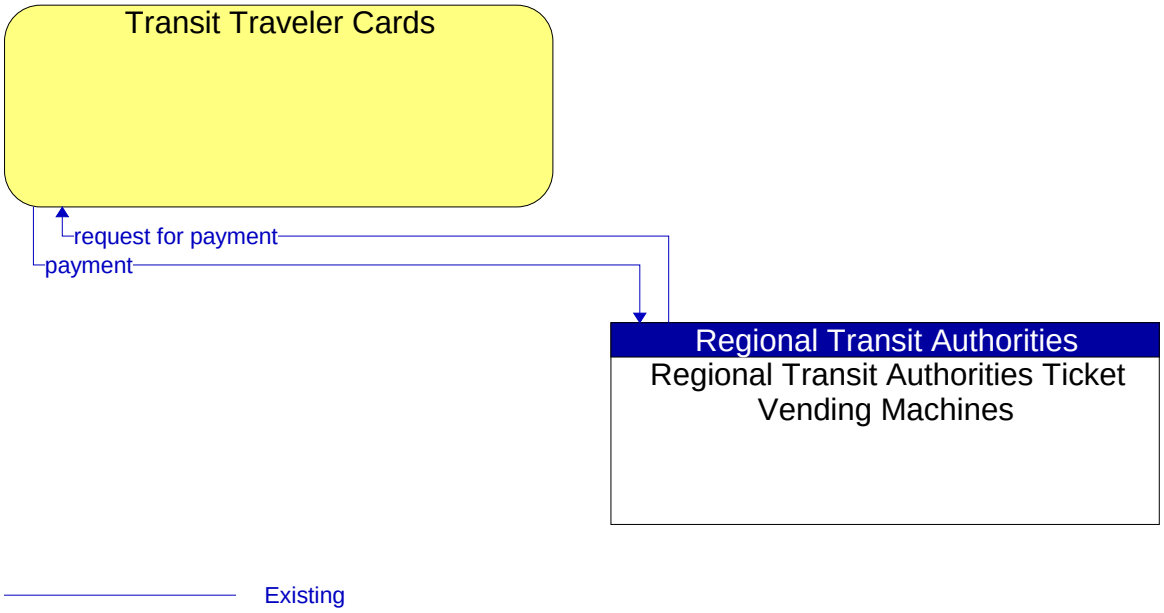

Figure 310: Regional Transit Authorities Ticket Vending Machines - Transit Traveler Cards Interface

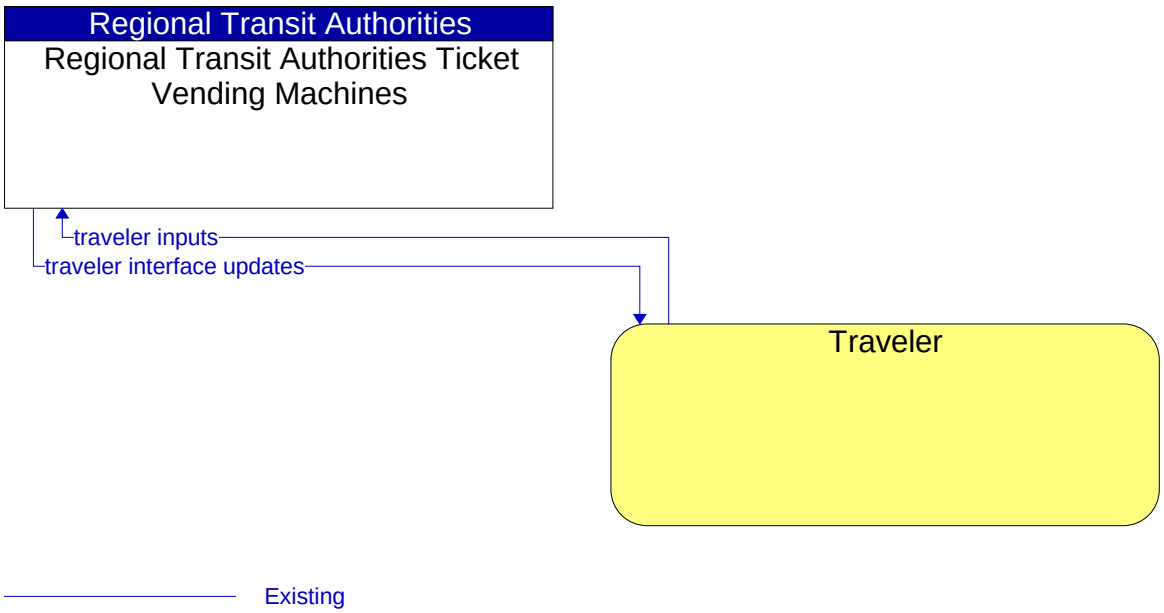

Figure 311: Regional Transit Authorities Ticket Vending Machines - Traveler Interface

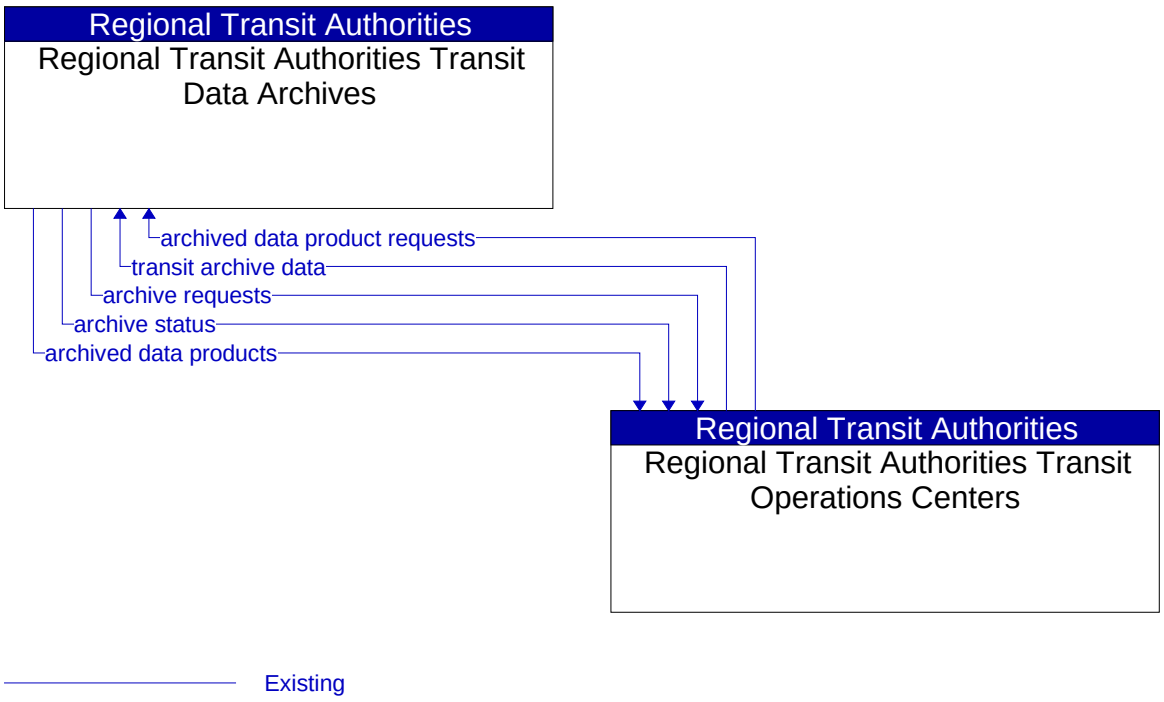

Figure 312: Regional Transit Authorities Transit Data Archives - Regional Transit Authorities Transit Operations Centers Interface

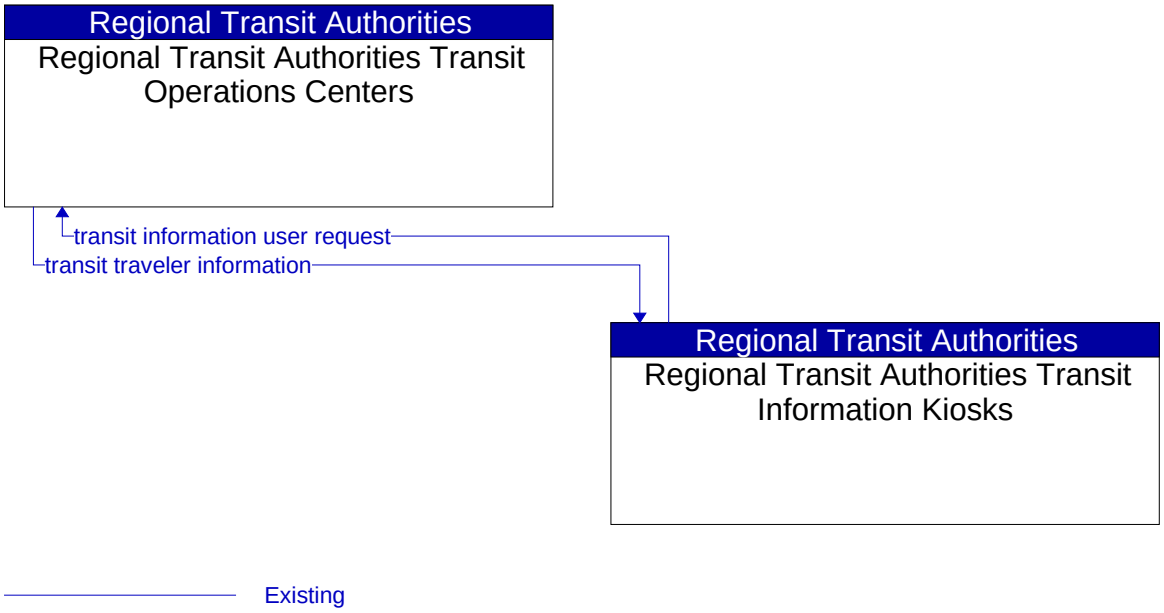

Figure 313: Regional Transit Authorities Transit Information Kiosks - Regional Transit Authorities Transit Operations Centers Interface

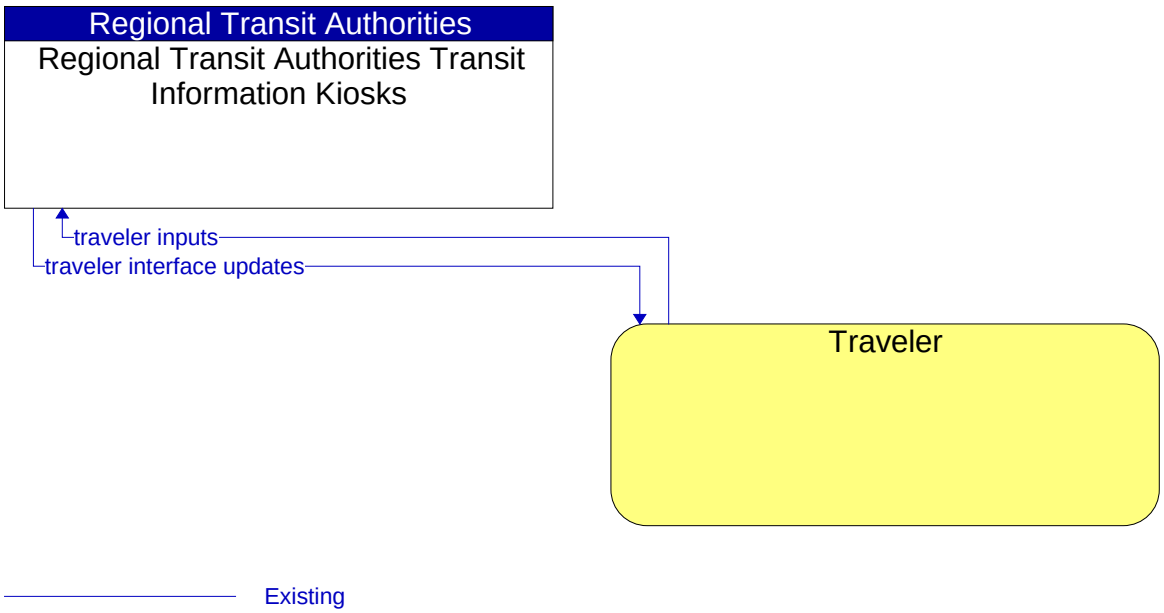

Figure 314: Regional Transit Authorities Transit Information Kiosks - Traveler Interface

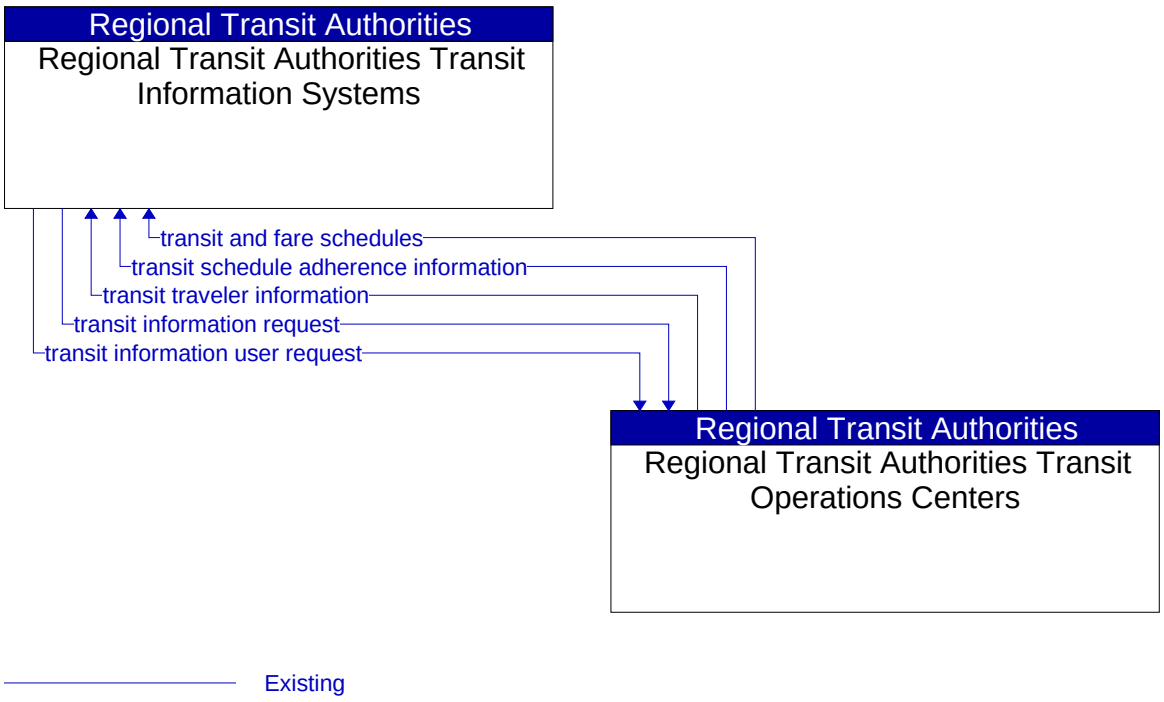

Figure 315: Regional Transit Authorities Transit Information Systems - Regional Transit Authorities Transit Operations Centers Interface

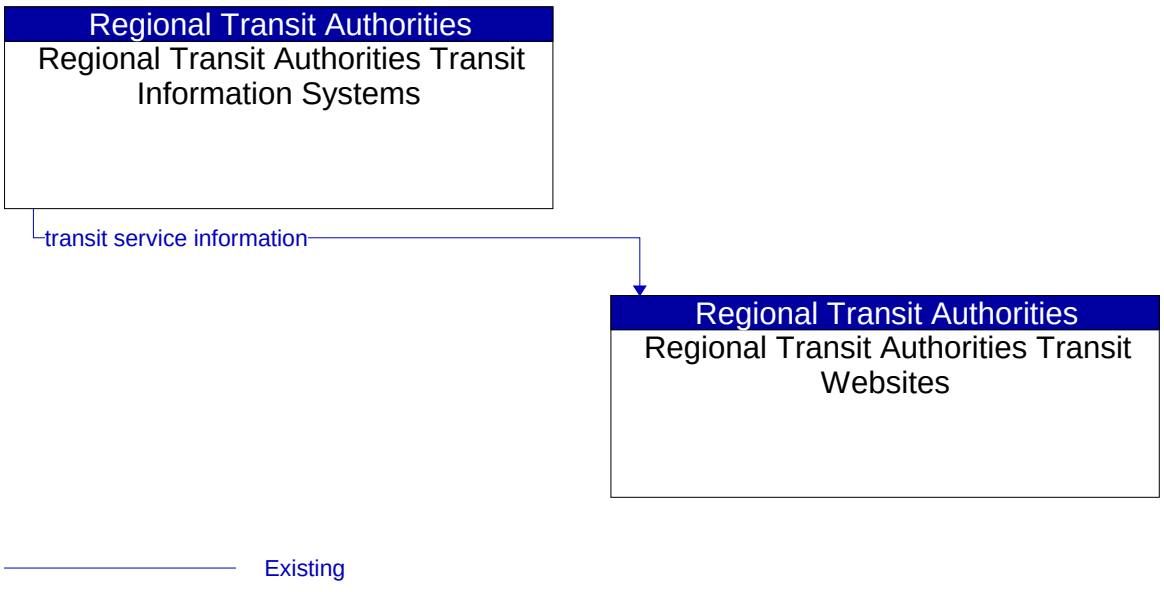

Figure 316: Regional Transit Authorities Transit Information Systems - Regional Transit Authorities Transit Websites Interface

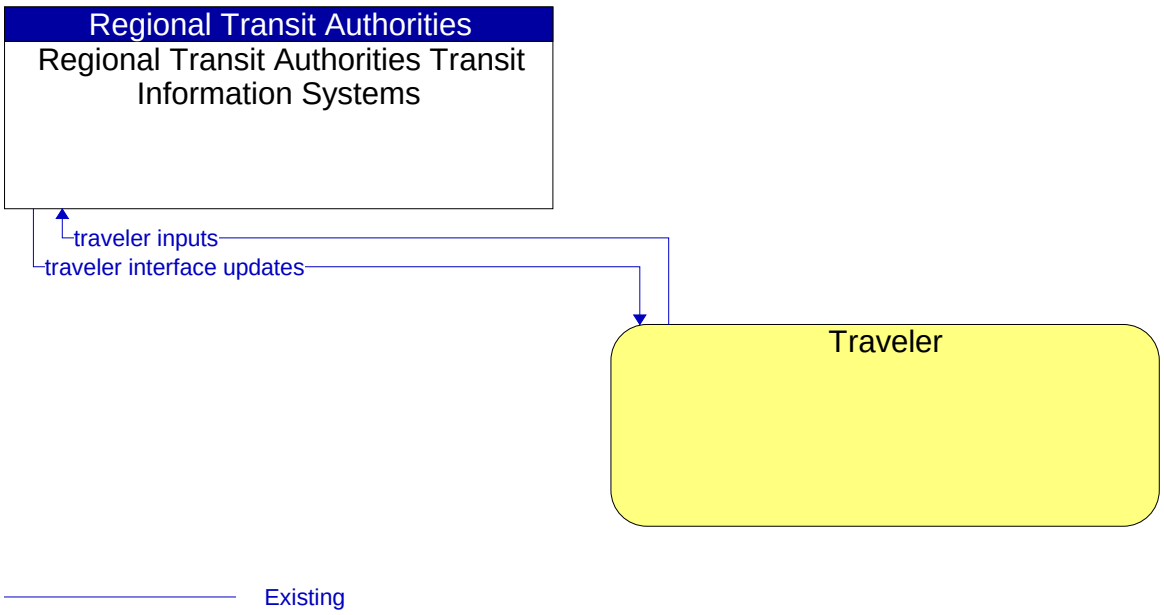

Figure 317: Regional Transit Authorities Transit Information Systems - Traveler Interface

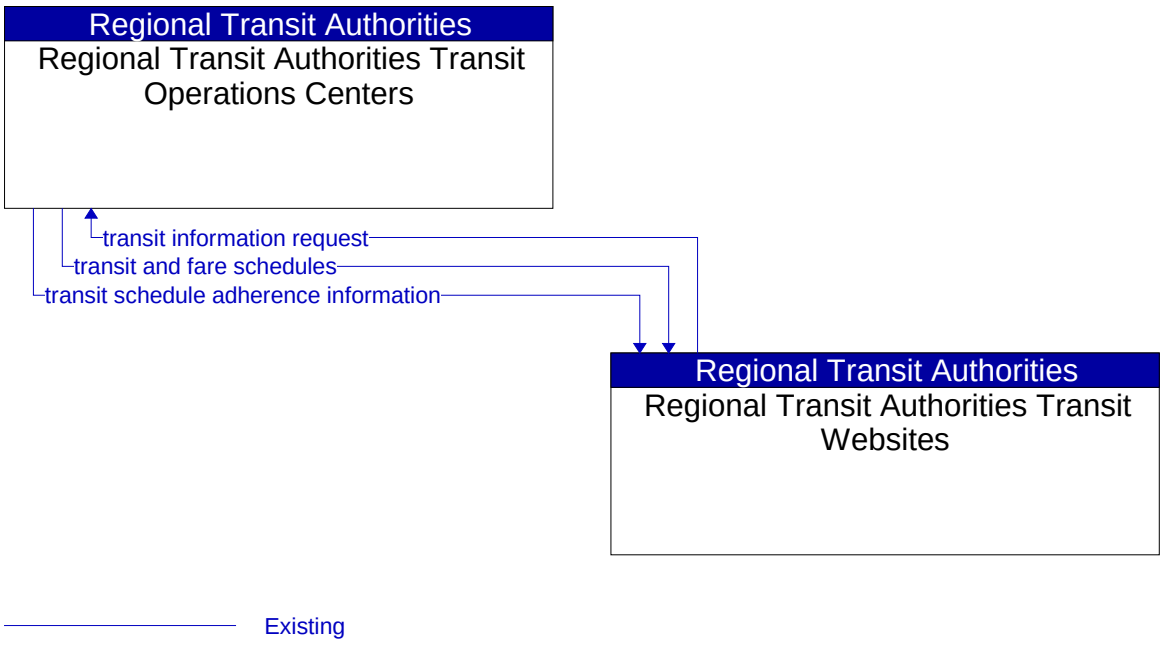

Figure 318: Regional Transit Authorities Transit Operations Centers - Regional Transit Authorities Transit Websites Interface

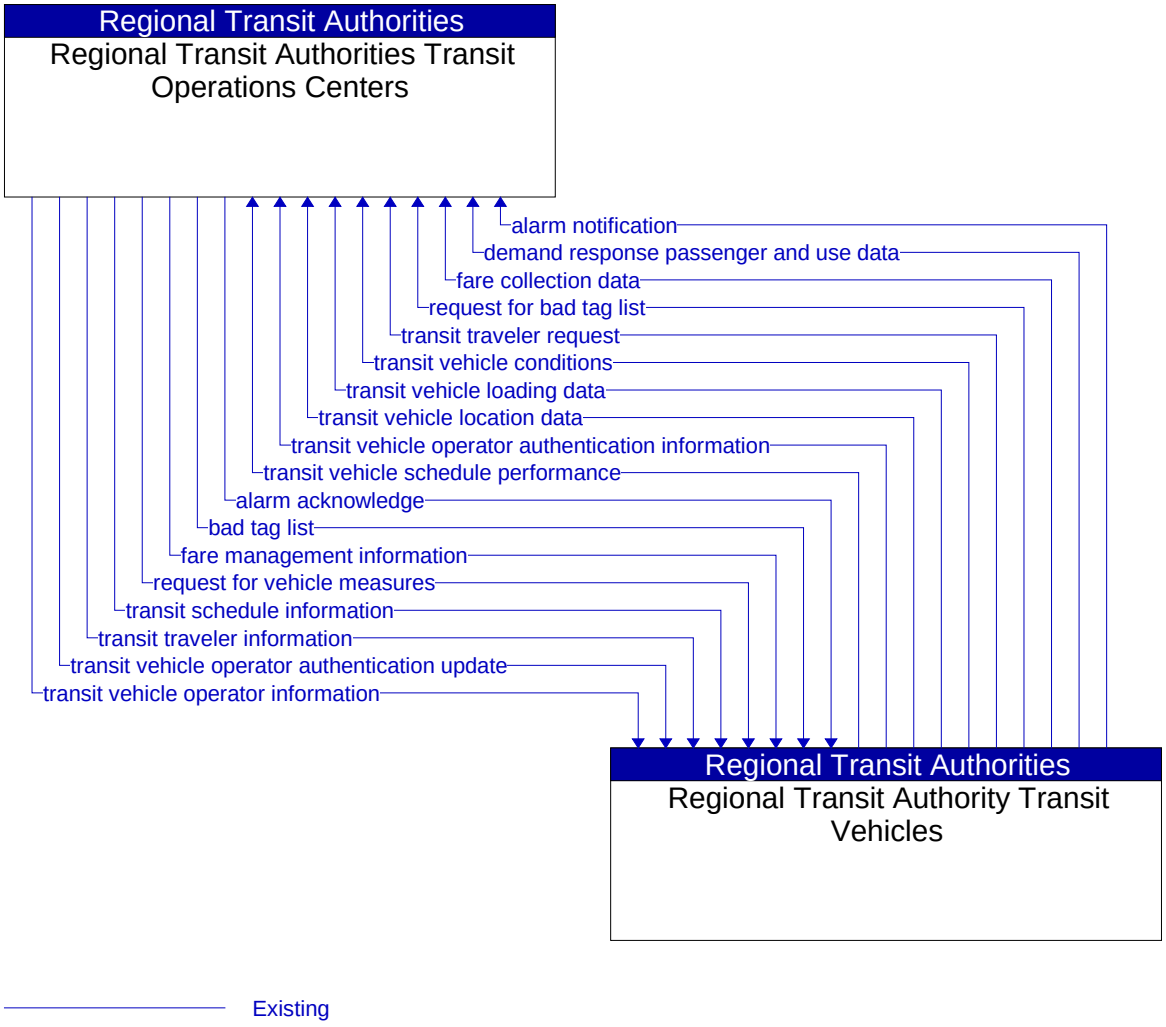

Figure 319: Regional Transit Authorities Transit Operations Centers - Regional Transit Authority Transit Vehicles Interface

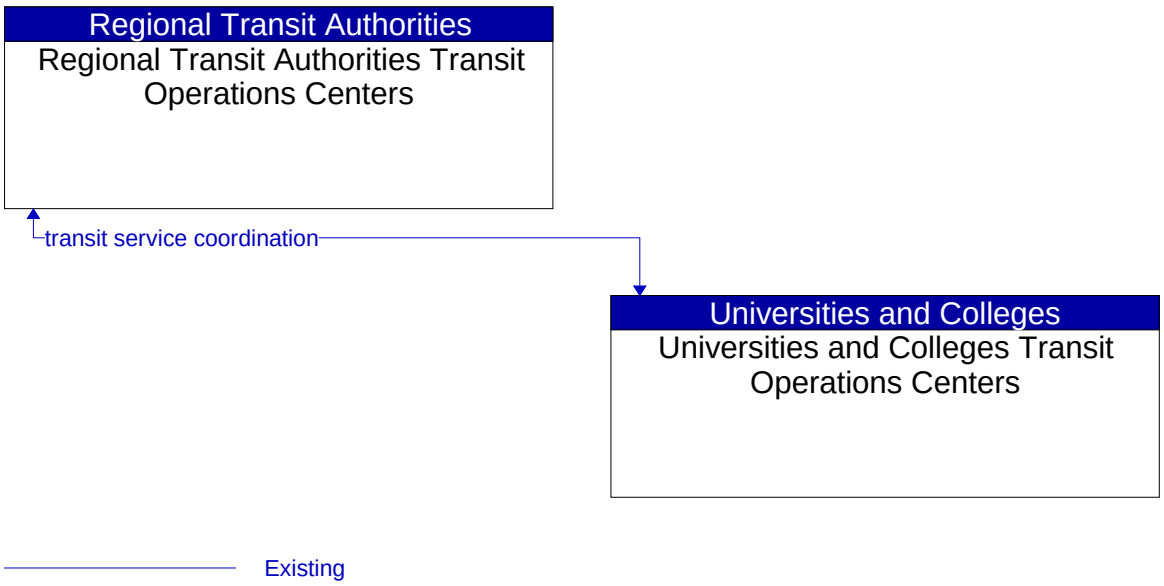

Figure 320: Regional Transit Authorities Transit Operations Centers - Universities and Colleges Transit Operations Centers Interface

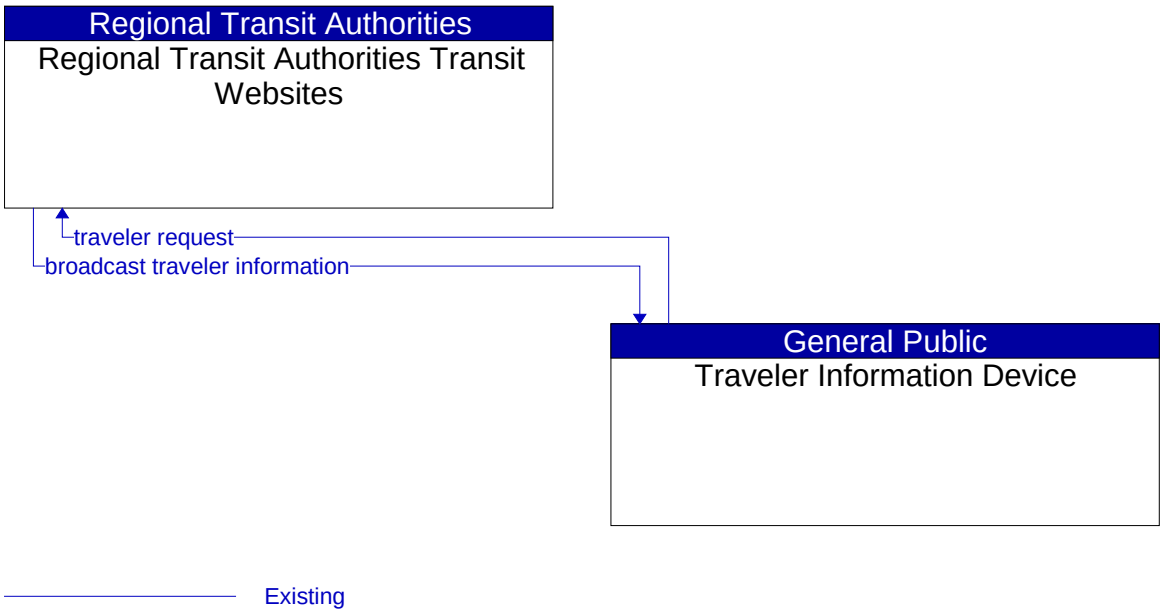

Figure 321: Regional Transit Authorities Transit Websites - Traveler Information Device Interface

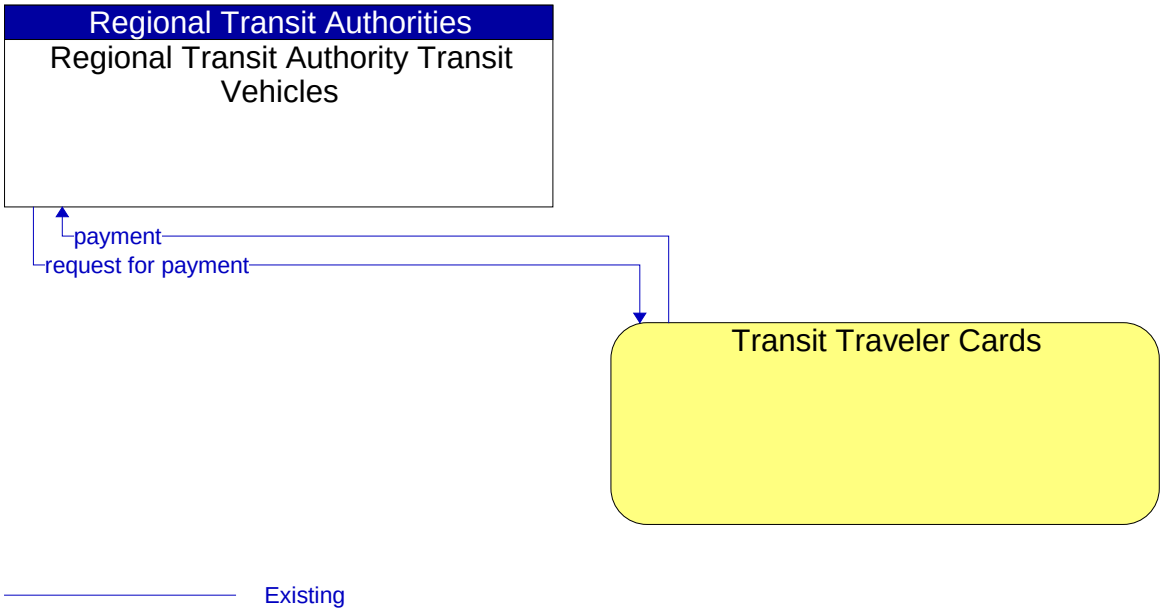

Figure 322: Regional Transit Authority Transit Vehicles - Transit Traveler Cards Interface

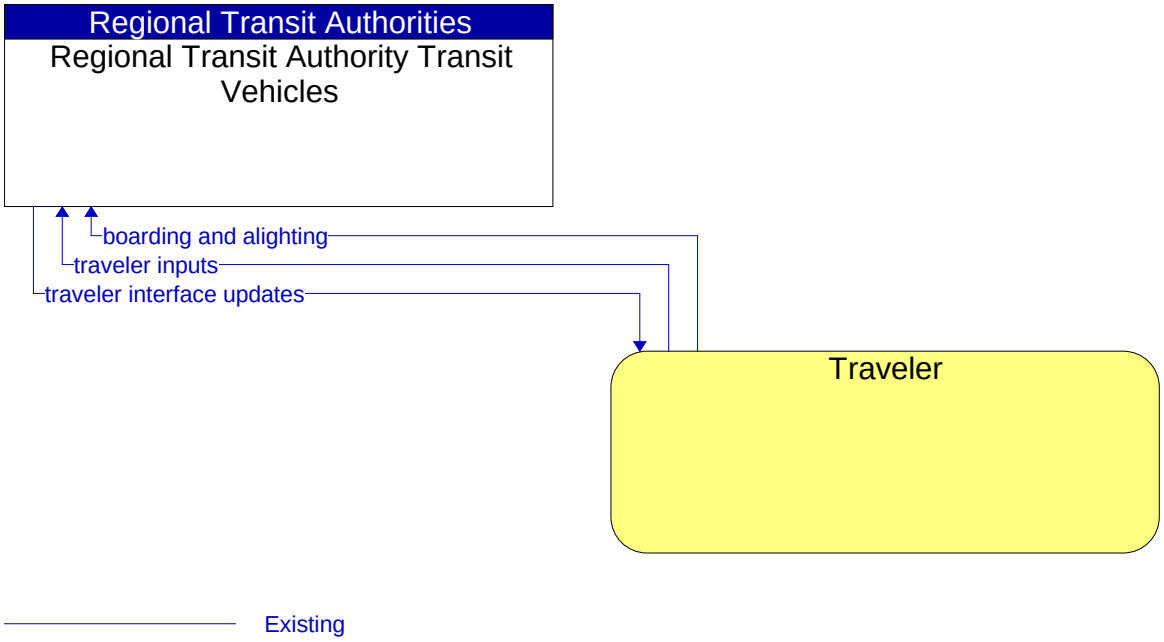

Figure 323: Regional Transit Authority Transit Vehicles - Traveler Interface

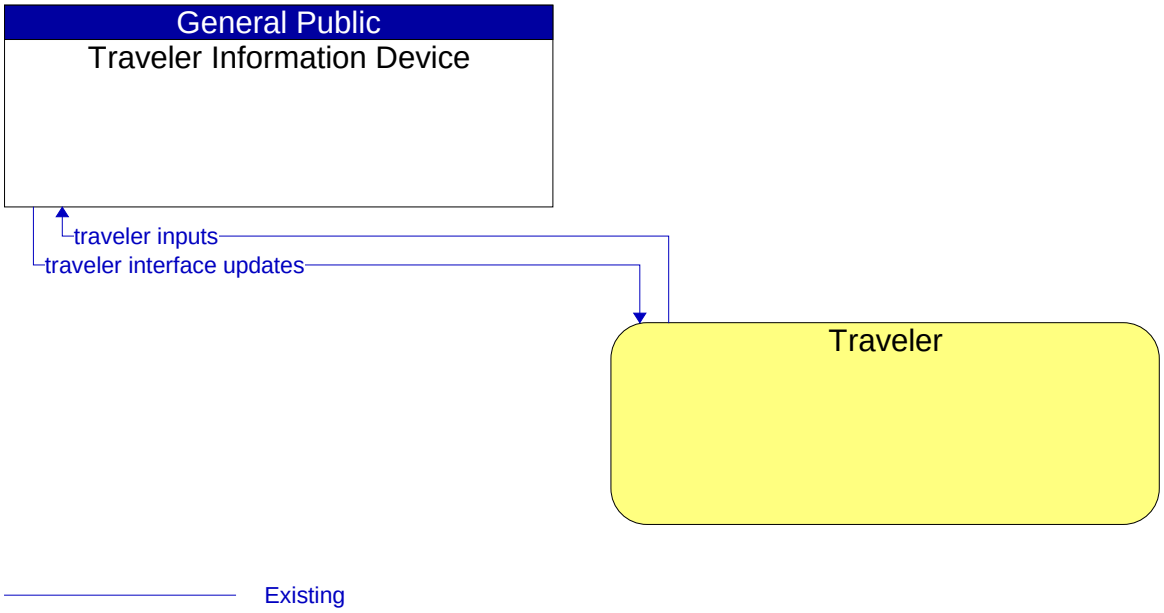

Figure 324: Traveler - Traveler Information Device Interface

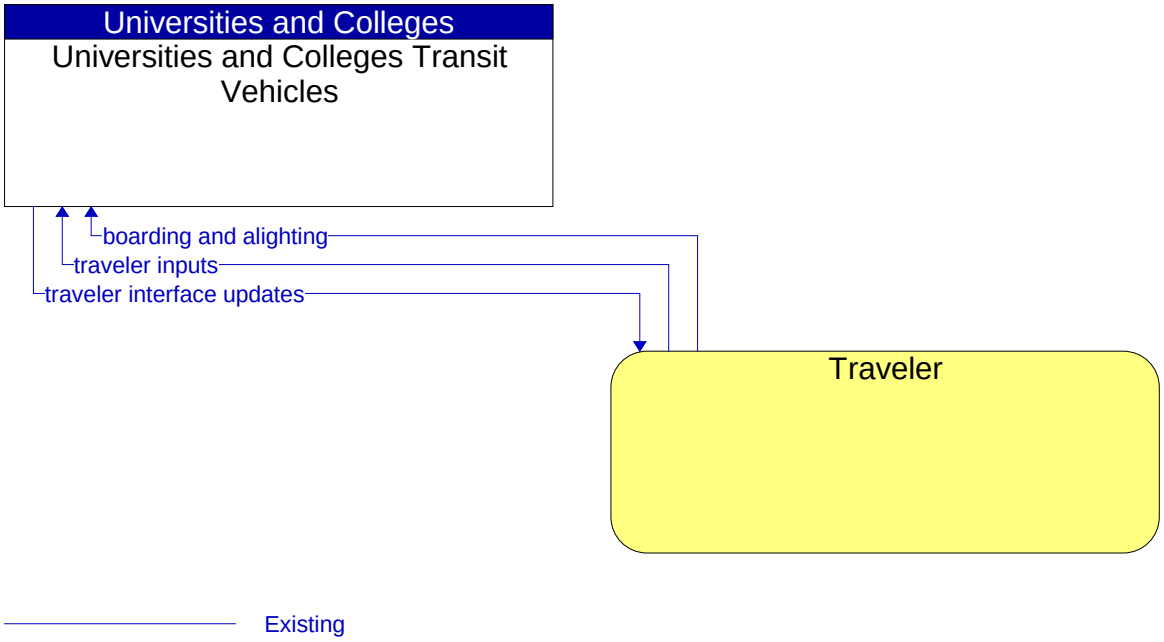

Figure 325: Traveler - Universities and Colleges Transit Vehicles Interface

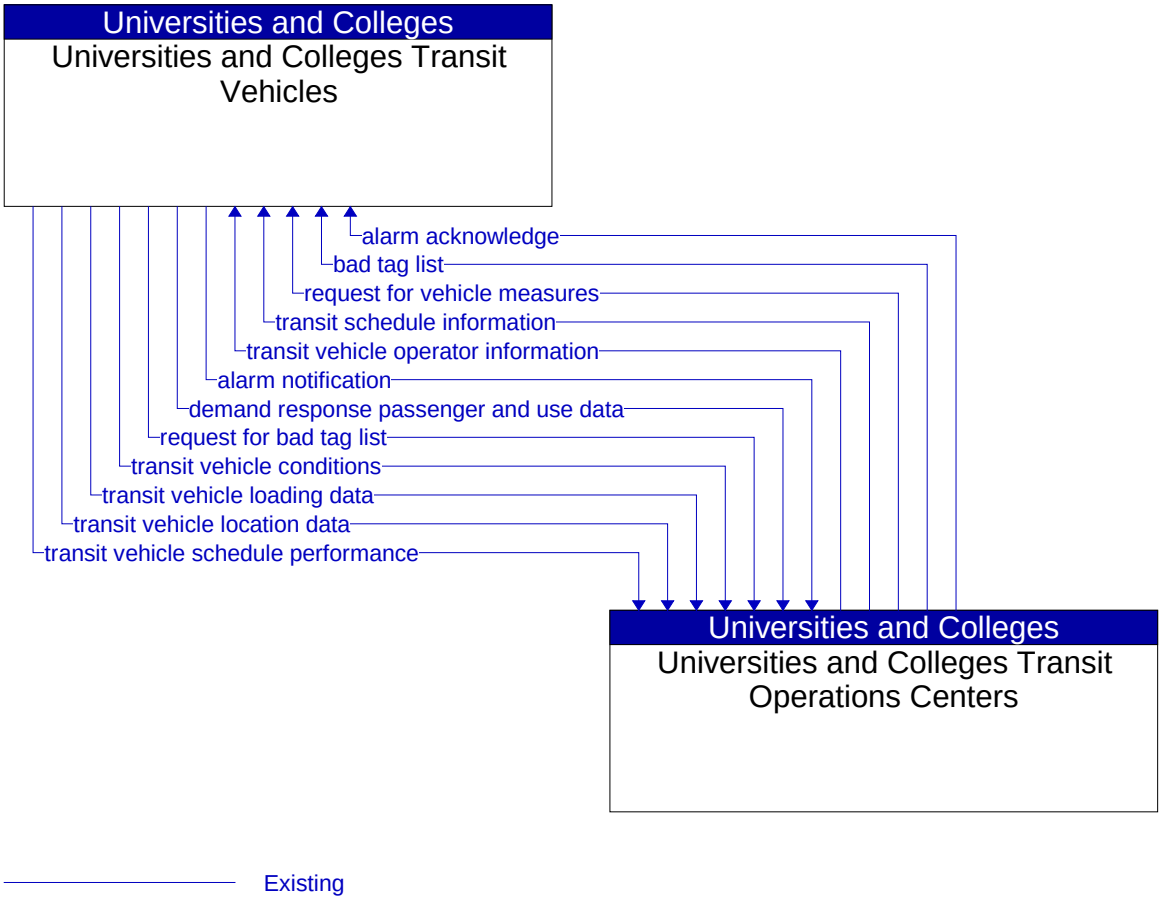

Figure 326: Universities and Colleges Transit Operations Centers - Universities and Colleges Transit Vehicles Interface

Architecture Flow Definitions

Flow Name	Description
accident report	Report of commercial vehicle safety accident. The information may be provided as a response to a real-time query or proactively by the source. The query flow is not explicitly shown.
air quality information	Aggregated region-wide measured air quality data and possible pollution incident information.
alarm acknowledge	Confirmation that alarm was received, instructions and additional information for the alarm initiator, and requests for additional information.
alarm notification	Notification of activation of an audible or silent alarm by a traveler in a public area or by a transit vehicle operator using an on-board device.
alert notification	Notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The flow identifies the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This flow may also identify specific information that should not be released to the public.
alert notification coordination	Coordination of emergency alerts to be distributed to the public. This includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public and status of the public notification.

Flow Name	Description
alert status	Information indicating the current status of the emergency alert including identification of the traveler and driver information systems that are being used to provide the alert.
alerts and advisories	Assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), and alerts (information on imminent or in-progress emergencies). This flow also provides supporting descriptive detail on incidents, threats, and vulnerabilities to increase preparedness and support effective response to threats against the surface transportation system.
archive analysis requests	A user request that initiates data mining, analytical processing, aggregation or summarization, report formulation, or other advanced processing and analysis of archived data. The request also includes information that is used to identify and authenticate the user and support electronic payment requirements, if any.
archive analysis results	Processed information products, supporting meta data, and any associated transaction information resulting from data mining, analytical processing, aggregation or summarization, report formulation, or other on-line processing and analysis of archived data.
archive request confirmation	Confirmation that an archive request has been received and processed with information on the disposition of the request.
archive requests	A request to a data source for information on available data (i.e. "catalog") or a request that defines the data to be archived. The request can be a general subscription intended to initiate a continuous or regular data stream or a specific request intended to initiate a one-time response from the recipient.
archive status	Notification that data provided to an archive contains erroneous, missing, or suspicious data or verification that the data provided appears valid. If an error has been detected, the offending data and the nature of the potential problem are identified.
archived data product requests	A user-specified request for archived data products (i.e. data, meta data, or data catalogs). The request also includes information that is used to identify and authenticate the user and support electronic payment requirements, if any.
archived data products	Raw or processed data, meta data, data catalogs and other data products provided to a user system upon request. The response may also include any associated transaction information.
area pollution data	Measured air quality data, including measured levels of atmospheric pollutants including ozone, particulate matter, carbon monoxide, and nitrogen oxides, and operational status of the sensors.
arriving train information	Information for a train approaching a highway-rail intersection that may include direction and allow calculation of approximate arrival time and closure duration.
audit data	Information to support a tax audit.
automated roadway control data	Control commands and operating parameters provided to field equipment that controls and monitors automated vehicle operations.
automated roadway status	Current operational status of an automated vehicle operations facility, including the status of the field equipment and vehicles using the facility.
automated vehicle control data	Instructions and control parameters for automated vehicle operation including current system conditions and advisories, control parameters (e.g., speed and performance profiles, headways), maneuver coordination, and check in/checkout instructions.
automated vehicle status	Data provided by an automated vehicle identifying it's current mode and operational status, current position and motion, preferred route, and information provided to support checking/checkout and coordinated maneuvers while on the automated facility.
bad tag list	List of invalid transit user tags which may have previously failed a fare payment transaction.
barrier system control	Information used to configure and control barrier systems that are represented by gates, barriers and other automated or remotely controlled systems used to manage entry to roadways.
barrier system status	Current operating status of barrier systems. Barrier systems represent gates, barriers and other automated or remotely controlled systems used to manage entry to roadways. Status of the systems includes operating condition and current operational state.
boarding and alighting	Detection of transit passenger boarding and alighting. This flow represents the travelers' physical presence as they board a transit vehicle that can be detected or monitored by on-board sensors.
broadcast traveler information	General traveler information that contains traffic and road conditions, link travel times, incidents, advisories, restrictions, transit service information, weather information, parking information, and other related traveler information.
care facility status	Information regarding facility type and capabilities, facility status, and its ability to admit new patients.
care facility status request	Request for information regarding care facility availability and status.

Flow Name	Description
carrier participation report	Report that summarizes motor carrier participation in CVO programs. Used to identify the level of active participation and to report which enrolled carriers are not participating as expected.
citation	Report of commercial vehicle citation. The citation includes references to the statute(s) that was (were) violated. It includes information on the violator and the officer issuing the citation. A citation differs from a violation because it is adjudicated by the courts. The information may be provided as a response to a real-time query or proactively by the source. The query flow is not explicitly shown.
commercial vehicle breach	Information about a breach or tamper event on a Commercial Vehicle or its attached freight equipment which includes identity, type of breach, location, and time.
commercial vehicle permit	Permit for oversize, overweight, or hazmat shipments.
commercial vehicle permit coordination	Information for the coordination of commercial vehicle permits for oversize, overweight, or for dangerous goods.
commercial vehicle permit information	Information about commercial vehicle permits for oversize, overweight, or for dangerous goods.
compliance review report	Report containing results of carrier compliance review, including concomitant out-of-service notifications, carrier warnings/notifications. The information may be provided as a response to a real-time query of proactively by the source. The query flow is not explicitly shown.
credential application	Application for commercial vehicle credentials. Authorization for payment is included.
credential fee coordination	Jurisdiction's rates for various credentials (IRP, IFTA, etc.) that are exchanged between agencies.
credentials information	Response containing full vehicle fuel tax and registration credentials information. "Response" may be provided in reaction to a real-time query or a standing request for updated information. The query flow is not explicitly shown.
credentials status information	Credentials information such as registration, licensing, insurance, check flags, and electronic screening enrollment data. A unique identifier is included. Corresponds to the credentials portion of CVISN "snapshots." The status information may be provided as a response to a real-time query or as a result of a standing request for updated information (subscription). This may also include information about non-U.S. fleets for use by U.S. authorities, and information regarding U.S. fleets made available to Mexican and Canadian authorities. The query flow is not explicitly shown.
current asset restrictions	Restrictions levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions, and temporary facility restrictions that are imposed during maintenance and construction.
cv driver record	Information typically maintained by a state driver licensing agency about a driver of a commercial vehicle including driver identification data, license data, permit data, and driving history details. Information can correspond to a 'driver snapshot' as described by the CVISN program. The query flow is not explicitly shown.
cv repair status	Information about the completion of a repair to a commercial vehicle.
daily site activity data	Record of daily activities at commercial vehicle check stations including summaries of screening events and inspections.
data collection and monitoring control	Information used to configure and control data collection and monitoring systems.
decision support information	Information provided to support effective and safe incident response, including local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.
demand response passenger and use data	Data collected on board a demand response vehicle relating to the picking up and discharging of passengers.
device control request	Request for device control action
device data	Data from detectors, environmental sensor stations, and traffic control devices including device inventory information.
device status	Status information from devices
driver alert response	Commercial Vehicle Driver response to a breach alert for a Freight Equipment breach or tamper event.
driver information	Regulatory, warning, and guidance information provided to the driver while en route to support safe and efficient vehicle operation.

Flow Name	Description
driver inputs	Driver input to the vehicle including configuration data, settings and preferences, interactive requests, and control commands.
driver parking information	Presentation of general parking information to drivers including lot status, parking availability, and directions to available spaces, entrances, and exits.
driver to fleet request	Requests from the driver and vehicle for routing, payment, and enrollment information.
driver updates	Information displayed or otherwise conveyed by the vehicle to the driver.
electronic lock data	Notification to roadside (via transponder) of the presence and status of electronic cargo locks.
electronic lock data request	Request from roadside for data regarding presence and status of electronic cargo locks.
electronic screening request	Request for identification data to support electronic screening.
emergency archive data	Logged emergency information including information that characterizes identified incidents (routine highway incidents through disasters), corresponding incident response information, evacuation information, surveillance data, threat data, and resource information. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.
emergency dispatch requests	Emergency vehicle dispatch instructions including incident location and available information concerning the incident.
emergency dispatch response	Request for additional emergency dispatch information and provision of en route status.
emergency plan coordination	Information that supports coordination of emergency management plans, continuity of operations plans, emergency response and recovery plans, evacuation plans, and other emergency plans between agencies. This includes general plans that are coordinated prior to an incident and shorter duration tactical plans that are prepared during an incident.
emergency traffic control information	Status of a special traffic control strategy or system activation implemented in response to an emergency traffic control request, a request for emergency access routes, a request for evacuation, a request to activate closure systems, a request to employ driver information systems to support public safety objectives, or other special requests. Identifies the selected traffic control strategy and system control status.
emergency traffic control request	Special request to preempt the current traffic control strategy in effect at one or more signalized intersections or highway segments, activate traffic control and closure systems such as gates and barriers, activate safeguard systems, or use driver information systems. For example, this flow can request all signals to red-flash, request a progression of traffic control preemptions along an emergency vehicle route, request a specific evacuation traffic control plan, request activation of a road closure barrier system, or place a public safety or emergency-related message on a dynamic message sign.
emergency transit schedule information	Information on transit schedule and service changes that adapt the service to better meet needs of responders and the general public in an emergency situation, including special service schedules supporting evacuation.
emergency transit service request	Request to modify transit service and fare schedules to address emergencies, including requests for transit services to evacuate people from and/or deploy response agency personnel to an emergency scene. The request may poll for resource availability or request pre-staging, staging, or immediate dispatch of transit resources.
emergency transit service response	Response indicating changes to transit service, fares, and/or restrictions that will be made and status of transit resources to be deployed to support emergency response and/or evacuation.
emergency vehicle tracking data	The current location and operating status of the emergency vehicle.
emissions archive data	Air quality and vehicle emissions information that is collected by sensors or derived from models. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.
emissions sensor control	Data used to configure and control vehicle emissions sensors.
environmental conditions data	Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) as measured and reported by fixed and/or mobile environmental sensors and aggregated by the data collector. Attributes relating to the data collection (and aggregation) are also included.

Flow Name	Description
environmental probe data	Data from vehicle safety and convenience systems that can be used to estimate environmental conditions, including measured air temperature, exterior light status, wiper status, sun sensor status, rain sensor status, traction control status, anti-lock brake status, and other collected vehicle system status and sensor information. The collected data is reported along with the location, heading, and time that the data was collected. Both current data and snapshots of recent events (e.g., traction control or anti-lock brake system activations) may be reported.
environmental sensor data	Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) as measured and reported by fixed and/or mobile environmental sensors. Operational status of the sensors is also included.
environmental sensors control	Data used to configure and control environmental sensors.
equipment availability	An inventory of the maintenance and construction equipment available at the storage facility. This flow includes the type of equipment, enough descriptive information to indicate its suitability for use, and its current status. This flow may contain information for a specific type of equipment or include all equipment available at the facility.
evacuation coordination	Coordination of information regarding a pending or in-process evacuation. Includes evacuation zones, evacuation times, evacuation routes, forecast network conditions, and reentry times.
evacuation information	Evacuation instructions and information including evacuation zones, evacuation times, and reentry times.
event confirmation	Confirmation that special event details have been received and processed.
event plans	Plans for major events possibly impacting traffic.
external reports	Traffic and incident information that is collected by the media through a variety of mechanisms (e.g., radio station call-in programs, air surveillance).
fare collection data	Fare collection information including the summary of on-board fare system data and financial payment transaction data.
fare management information	Transit fare information and transaction data used to manage transit fare processing on the transit vehicle.
field device status	Reports from field equipment (sensors, signals, signs, controllers, etc.) which indicate current operational status.
fleet to driver update	Updated instructions to the driver including dispatch, routing, and special instructions.
freight equipment information	Container, trailer, or chassis information regarding identity, type, location, brake wear data, mileage, seal #, seal type, door open/close status, chassis bare/covered status, tethered / untethered status, Bill of Lading, and sensor status.
hazmat information	Information about a particular hazmat load including nature of the load and unloading instructions. May also include hazmat vehicle route and route update information.
hazmat information request	Request for information about a particular hazmat load.
highway control status	Current traffic control equipment status that indicates operational status and right-of-way availability to the non-highway transportation mode at a multimodal crossing.
hri advisories	Notification of Highway-Rail Intersection equipment failure, intersection blockage, or other condition requiring attention, and maintenance activities at or near highway rail intersections.
hri control data	Data required for HRI information transmitted at railroad grade crossings and within railroad operations.
hri operational status	Status of the highway-rail grade crossing equipment including both the current state or mode of operation and the current equipment condition.
hri request	A request for highway-rail intersection status or a specific control request intended to modify HRI operation.
hri status	Status of the highway-rail intersection equipment including both the current state or mode of operation and the current equipment condition.
incident command information coordination	Information that supports local management of an incident. It includes resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response.

Flow Name	Description
incident information	Notification of existence of incident and expected severity, location, time and nature of incident. As additional information is gathered and the incident evolves, updated incident information is provided. Incidents include any event that impacts transportation system operation ranging from routine incidents (e.g., disabled vehicle at the side of the road) through large-scale natural or human-caused disasters that involve loss of life, injuries, extensive property damage, and multi-jurisdictional response. This also includes special events, closures, and other planned events that may impact the transportation system.
incident information for media	Report of current desensitized incident information prepared for public dissemination through the media.
incident report	Report of an identified incident including incident location, type, severity and other information necessary to initiate an appropriate incident response.
incident response coordination	Incident response procedures and current incident response status that are shared between allied response agencies to support a coordinated response to incidents. This flow provides current situation information, including a summary of incident status and its impact on the transportation system and other infrastructure, and current and planned response activities. This flow also coordinates a positive hand off of responsibility for all or part of an incident response between agencies.
incident response status	Status of the current incident response including a summary of incident status and its impact on the transportation system, traffic management strategies implemented at the site (e.g., closures, diversions, traffic signal control overrides), and current and planned response activities.
incident status	Information gathered at the incident site that more completely characterizes the incident and provides current incident response status.
information on violators	Information on violators provided by a law enforcement agency. May include information about commercial vehicle violations or other kinds of violations associated with the particular entity. The information may be provided as a response to a real-time query or proactively by the source. The query flow is not explicitly shown.
infrastructure monitoring sensor control	Data used to configure and control infrastructure monitoring sensors.
infrastructure monitoring sensor data	Data read from infrastructure-based sensors that monitor the condition or integrity of transportation infrastructure including bridges, tunnels, interchanges, pavement, culverts, signs, transit rail or guideway, and other roadway infrastructure. Includes sensor data and the operational status of the sensors.
interactive traveler information	Traveler information provided in response to a traveler request. The provided information includes traffic and road conditions, advisories, incidents, payment information, transit services, parking information, weather information, and other travel-related data updates and confirmations.
intersection blockage notification	Notification that a highway-rail intersection is obstructed and supporting information.
intersection status	Intersection status including current operational status, signal phase and timing information, intersection geometry, surface conditions, warnings of potential violations or hazardous conditions, and approaching vehicle information. This may include information about the position, velocity, acceleration, and turning status of approaching vehicles.
in-vehicle transaction status	The status of an electronic payment transaction presented to the driver by in-vehicle equipment.
lane management control	Information used to configure and control dynamic lane management systems.
lane management information	System status including current operational state, violations, and logged information.
local signal preemption request	Direct control signal or message to a signalized intersection that results in preemption of the current control plan and grants right-of-way to the requesting vehicle.
local signal priority request	Request from a vehicle to a signalized intersection for priority at that intersection.
maint and constr center personnel inputs	User input from maintenance and construction center personnel including routing information, scheduling data, dispatch instructions, device configuration and control, resource allocations, alerts, incident and emergency response plan coordination.

Flow Name	Description
maint and constr dispatch information	Information used to dispatch maintenance and construction vehicles, equipment, and crews and information used to keep work zone crews informed. This information includes routing information, traffic information, road restrictions, incident information, environmental information, decision support information, maintenance schedule data, dispatch instructions, personnel assignments, alert notifications, and corrective actions.
maint and constr dispatch status	Current maintenance and construction status including work data, operator status, crew status, and equipment status.
maint and constr equipment repair status	Current maintenance and repair status of the maintenance and construction vehicle fleet and other support equipment. This information includes a record of all maintenance and repair activities performed.
maint and constr fleet information	Information supporting maintenance of the maintenance and construction vehicle fleet and other support equipment. This information includes vehicle status and diagnostic information, vehicle utilization, and coordination of when vehicles will be available for preventative and corrective maintenance.
maint and constr operations information presentation	Presentation of maintenance and construction operations information to center personnel. This information includes maintenance resource status (vehicles, equipment, and personnel), work schedule information, work status, road and weather conditions, traffic information, incident information and associated resource requests, security alerts, emergency response plans and a range of other information that supports efficient maintenance and construction operations and planning.
maint and constr resource coordination	Request for road maintenance and construction resources that can be used in the diversion of traffic (cones, portable signs), clearance of a road hazard, repair of ancillary damage, or any other incident response.
maint and constr resource request	Request for road maintenance and construction resources that can be used in the diversion of traffic (cones, portable signs), clearance of a road hazard, repair of ancillary damage, or any other incident response. The request may poll for resource availability or request pre-staging, staging, or immediate dispatch of resources.
maint and constr resource response	Current status of maintenance and construction resources including availability and deployment status. General resource inventory information covering vehicles, equipment, materials, and people and specific resource deployment status may be included.
maint and constr vehicle conditions	Vehicle diagnostics information that is collected, filtered, and selectively reported by a maintenance and construction vehicle. The information includes engine temperature, mileage, tire wear, brake wear, belt wear, and any warnings or alarms concerning the operational condition of the vehicle and ancillary equipment.
maint and constr vehicle location data	The current location and related status (e.g., direction and speed) of the maintenance/construction vehicle.
maint and constr vehicle operational data	Data that describes the maintenance and construction activity performed by the vehicle. Operational data includes materials usage (amount stored and current application rate), operational state of the maintenance equipment (e.g., blade up/down, spreader pattern), vehicle safety status, and other measures associated with the operation of a maintenance, construction, or other special purpose vehicle. Operational data may include basic operational status of the vehicle equipment or a more precise record of the work performed (e.g., application of crack sealant with precise locations and application characteristics).
maint and constr vehicle system control	Configure and control data that supports remote control of on-board maintenance and construction vehicle systems and field equipment that is remotely controlled by the vehicle. For example, the data can be used to adjust material application rates and spread patterns.
maint and constr work plans	Future construction and maintenance work schedules and activities including anticipated closures with anticipated impact to the roadway, alternate routes, anticipated delays, closure times, and durations.
maintenance materials storage status	The amount and availability of maintenance materials in storage facilities.
multimodal crossing status	Indication of operational status and pending requests for right-of-way from equipment supporting the non-highway mode at multimodal crossings.
multimodal information	Schedule information for alternate mode transportation providers such as train, ferry, air and bus.
multimodal service data	Multimodal transportation schedules and other service information.
on-board safety data	Safety data measured by on-board sensors. Includes information about the vehicle, vehicle components, cargo, and driver. The query flow is not explicitly shown.
on-board vehicle data	Information about the commercial vehicle stored on-board (for maintenance purposes, gate access, cargo status, lock status, etc.).

Flow Name	Description
on-board vehicle request	Request for on-board vehicle data.
parking coordination	Information that enables parking management activities to be coordinated between different parking operators or systems in a region.
parking information	General parking information and status, including current parking availability.
parking lot data request	Request for parking lot occupancy, fares, and availability. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
pass/pull-in	Command to commercial vehicle to pull into or bypass inspection station.
patient status	Information that supports assessment of the patient's condition. Information could include general categorization of patient status, patient vital signs, pertinent medical history, and emergency care information.
payment	Payment of some kind (e.g., toll, parking, fare) by traveler which, in most cases, can be related to a credit account.
payment request	Request for payment from financial institution.
payment violation notification	Notification to enforcement agency of a toll, parking, or transit fare payment violation.
personal transit information	General and personalized transit information for a particular fixed route, flexible route, or paratransit system.
physical presence	Detection of an obstacle. Obstacle could include animals, vehicles, pedestrians, rocks in roadway etc.
pollution sensor control	Data used to configure and control area pollution and air quality sensors.
pollution state data request	Aggregated emissions data information request.
rail incident response status	Status of the rail system's response to current incidents.
rail system status assessment	Assessment of damage sustained by rail lines and associated railroad infrastructure including location and extent of the damage, impact on current operations and necessary restrictions, and time frame for repair and recovery.
railroad advisories	Real-time notification of railway-related incident or advisory.
railroad schedules	Train schedules, maintenance schedules, and other information from the railroad that supports forecast of HRI closures.
registration	Registered owner of vehicle and associated vehicle information.
remote surveillance control	The control commands used to remotely operate another center's sensors or surveillance equipment so that roadside surveillance assets can be shared by more than one agency.
request for bad tag list	Request for list of bad vehicle tag IDs.
request for payment	Request to deduct cost of service from user's payment account.
request for permit	Request by fleet management for oversize, overweight, or hazmat permit.
request for service	Driver inputs that summon an emergency response, request a financial transaction, or initiate other services.
request for vehicle measures	Request for vehicle performance and maintenance data collected by onboard sensors.
request tag data	Request for tag information including credit identity, stored value card cash, etc.
request transit information	Request for transit service information and current transit status.
resource coordination	Coordination of resource inventory information, specific resource status information, resource prioritization and reallocation between jurisdictions, and specific requests for resources and responses that service those requests.
resource deployment status	Status of resource deployment identifying the resources (vehicles, equipment, materials, and personnel) available and their current status. General resource inventory information and specific status of deployed resources may be included.

Flow Name	Description
resource request	A request for resources to implement special traffic control measures, assist in clean up, verify an incident, etc. The request may poll for resource availability or request pre-staging, staging, or immediate deployment of resources. Resources may be explicitly requested or a service may be requested and the specific resource deployment may be determined by the responding agency.
right-of-way request notification	Notice that a request has occurred for signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other source for right-of-way.
road network conditions	Current and forecasted traffic information, road and weather conditions, and other road network status. Either raw data, processed data, or some combination of both may be provided by this architecture flow. Information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements) in effect is included along with a definition of the links, nodes, and routes that make up the road network.
road network status assessment	Assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.
road weather information	Road conditions and weather information that are made available by road maintenance operations to other transportation system operators.
roadside archive data	A broad set of data derived from roadside sensors that includes current traffic conditions, environmental conditions, and any other data that can be directly collected by roadside sensors. This data also indicates the status of the sensors and reports of any identified sensor faults.
roadside transaction status	The status of an electronic payment transaction provided directly to the driver via sign or other roadside infrastructure.
roadway equipment coordination	The direct flow of information between field equipment. This includes transfer of information between sensors and driver information systems (e.g., DMS, HAR, variable speed limit signs, dynamic lane signs) or control devices (e.g., traffic signals, ramp meters), direct coordination between adjacent control devices, interfaces between detection and warning or alarm systems, and any other direct communications between field equipment.
roadway information system data	Information used to initialize, configure, and control roadside systems that provide driver information (e.g., dynamic message signs, highway advisory radio, beacon systems). This flow can provide message content and delivery attributes, local message store maintenance requests, control mode commands, status queries, and all other commands and associated parameters that support remote management of these systems.
roadway information system status	Current operating status of dynamic message signs, highway advisory radios, beacon systems, or other configurable field equipment that provides dynamic information to the driver.
roadway maintenance status	Summary of maintenance fleet operations affecting the road network. This includes the status of winter maintenance (snow plow schedule and current status).
roadway safety data	Information about potential safety hazards in the vehicle path such as stalled vehicles, wrong way drivers, debris, or standing water.
roadway treatment system control	Control data for remotely located, automated devices, that affect the roadway surface (e.g. de-icing applications).
roadway treatment system status	Current operational status of automated roadway treatment devices (e.g., anti-icing systems).
route deviation alert	An alert that indicates a deviation from a planned route has been detected. The alert will contain the current Commercial Vehicle location and identity.
route restrictions	Information about routes, road segments, and areas that do not allow the transport of security sensitive hazmat cargoes or include other restrictions (such as height or weight limits).
safeguard system control	Data that controls safeguard systems (remotely controlled equipment used to mitigate the impact of incidents on transportation infrastructure, such as blast shields, exhaust systems, etc.).
safeguard system status	Current operating status of safeguard systems (remotely controlled equipment used to mitigate the impact of incidents on transportation infrastructure, such as blast shields, exhaust systems, etc.). Status of the systems includes operating condition and current operational state.
safety inspection record	Record containing results of commercial vehicle safety inspection.
safety inspection report	Report containing results of commercial vehicle safety inspection. The information may be provided as a response to a real-time query or proactively by the source. The query flow is not explicitly shown.
safety inspection request	Request for safety inspection record.

Flow Name	Description
safety status information	Safety information such as safety ratings, security ratings or flags, inspection summaries, and violation summaries. A unique identifier is included. Corresponds to the safety and security portion of CVISN "snapshots." The status information may be provided as a response to a real-time query or as a result of a standing request for updated information (subscription). This may also include information about non-U.S. fleets for use by U.S. authorities, and information regarding U.S. fleets made available to Mexican and Canadian authorities. The query flow is not explicitly shown.
screening event record	Results of CVO electronic screening activity.
short range communications status	Status of the short range communications equipment including the current state or mode of operation and the current equipment status.
shoulder management control	Information used to configure and control systems that allow use of a shoulder as a lane for vehicular traffic.
shoulder management information	System status including current operational state, violations and logged information.
signal control commands	Control of traffic signal controllers or field masters including clock synchronization.
signal control device configuration	Data used to configure traffic signal control equipment including local controllers and system masters.
signal control plans	Traffic signal timing parameters including minimum green time and interval durations for basic operation and cycle length, splits, offset, phase sequence, etc. for coordinated systems.
signal control status	Operational and status data of traffic signal control equipment including operating condition and current indications.
signal fault data	Faults from traffic signal control equipment.
signal system configuration	Data used to configure traffic signal systems including configuring control sections and mode of operation (time based or traffic responsive).
speed monitoring control	Information used to configure and control automated speed monitoring, speed warning, and speed enforcement systems.
speed monitoring information	System status including current operational state and logged information including measured speeds, warning messages displayed, and violation records.
storage facility request	Request for information about the equipment and/or materials available at a maintenance storage facility.
tag data	Unique tag ID and related vehicle information.
targeted list	List of carriers, drivers, and/or vehicles of interest for enforcement purposes.
tax filing	Commercial vehicle tax filing data. Authorization for payment is included.
threat information	Threats regarding transportation infrastructure, facilities, or systems detected by a variety of methods (sensors, surveillance, threat analysis of advisories from outside agencies, etc.
threat information coordination	Sensor, surveillance, and threat data including raw and processed data that is collected by sensor and surveillance equipment located in secure areas.
toll data	Current toll schedules for different types of vehicles as well as advanced toll payment information.
toll data request	Request made to obtain toll schedule information or pay a toll in advance. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
toll instructions	Information provided to configure and support toll plaza operations including toll pricing information.
toll transactions	Detailed list of transactions from a toll station.
track status	Current status of the wayside equipment and notification of an arriving train.
traffic archive data	Information describing the use and vehicle composition on transportation facilities and the traffic control strategies employed. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.
traffic characteristics	Physical traffic characteristics which are monitored and translated into macroscopic measures like occupancy, volume, density, and average speed. Point measures support presence detection and individual vehicle measures like speed.
traffic flow	Raw and/or processed traffic detector data which allows derivation of traffic flow variables (e.g., speed, volume, and density measures) and associated information (e.g., congestion, potential incidents). This flow includes the traffic data and the operational status of the traffic detectors.

Flow Name	Description
traffic images	High fidelity, real-time traffic images suitable for surveillance monitoring by the operator or for use in machine vision applications.
traffic information for media	Report of traffic conditions including traffic incident reports and traffic images for public dissemination through the media. The reports may also include information on diversions and alternate routes, closures, and special traffic restrictions in effect.
traffic metering control	Control commands and operating parameters for ramp meters, interchange meters, mainline meters, and other systems equipment associated with roadway metering operations.
traffic metering status	Current operational status and operating parameters for ramp meters, interchange meters, mainline meters and other control equipment associated with roadway metering operations.
traffic probe data	Vehicle data that is used to determine traffic conditions. In a basic implementation, the data could be limited to time stamped unique identifiers that can be used to measure a vehicle's progress through the network. In more advanced implementations, the vehicle may report current position, speed, and heading and snapshots of recent events including route information, starts and stops, speed changes, and other information that can be used to estimate traffic conditions.
traffic sensor control	Information used to configure and control traffic sensor systems.
traffic violation notification	Notification to enforcement agency of a detected traffic violation including speed violations, HOV violations, and dynamic lane violations.
transaction status	Response to transaction request. Normally dealing with a request for payment.
transit and fare schedules	Transit service information including routes, schedules, and fare information.
transit archive data	Data used to describe and monitor transit demand, fares, operations, and system performance. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.
transit fare and passenger status	Information provided from the traveler location that supports fare payments, passenger data, and associated record-keeping.
transit fare coordination	Fare and pricing information shared between local/regional transit organizations.
transit fare information	Information provided by transit management that supports fare payment transactions and passenger data collection.
transit incidents for media	Report of an incident impacting transit operations for public dissemination through the media.
transit information request	Request for transit operations information including schedule and fare information. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
transit information user request	Request for special transit routing, real-time schedule information, and availability information.
transit multimodal information	Transit schedule information for coordination at modal interchange points.
transit schedule adherence information	Dynamic transit schedule adherence and transit vehicle location information.
transit schedule information	Current and projected transit schedule information used to initialize the transit vehicle with a vehicle assignment, monitor schedule performance, and develop corrective actions on-board.
transit service coordination	Schedule coordination information shared between local/regional transit organizations.
transit service information	Transit service information including routes, schedules, and fare information as well as dynamic transit schedule adherence and transit vehicle location information.
transit system data	Current transit system operations information indicating current transit routes, the level of service on each route, and the progress of individual vehicles along their routes for use in forecasting demand and estimating current transportation network performance.
transit system status assessment	Assessment of damage sustained by the public transportation system including location and extent of the damage, current operational status including an estimate of remaining capacity and necessary restrictions, and time frame for repair and recovery.
transit traveler information	Transit information prepared to support transit users and other travelers. It contains transit schedules, real-time arrival information, fare schedules, alerts and advisories, and general transit service information.

Flow Name	Description
transit traveler information coordination	Transit schedules, real-time arrival information, fare schedules, and general transit service information shared between transit organizations to support transit traveler information systems.
transit traveler request	Request by a Transit traveler to summon assistance, request transit information, or request any other transit services.
transit vehicle conditions	Operating conditions of transit vehicle (e.g., engine running, oil pressure, fuel level and usage).
transit vehicle loading data	Data collected on board the transit vehicle relating to passenger boarding and alighting.
transit vehicle location data	Current transit vehicle location and related operational conditions data provided by a transit vehicle.
transit vehicle operator authentication information	Information regarding on-board transit operator authentication
transit vehicle operator authentication update	Results of authentication process or update of on-board authentication database.
transit vehicle operator information	Transit service instructions, wide area alerts, traffic information, road conditions, and other information for both transit and paratransit operators.
transit vehicle schedule performance	Estimated times of arrival and anticipated schedule deviations reported by a transit vehicle.
transportation information for operations	Information on the state of transportation system operations including traffic and road conditions, advisories, incidents, transit service information, weather information, parking information, and other related data.
transportation system status	Current status and condition of transportation infrastructure (e.g., tunnels, bridges, interchanges, TMC offices, maintenance facilities). In case of disaster or major incident, this flow provides an assessment of damage sustained by the surface transportation system including location and extent of the damage, estimate of remaining capacity and necessary restrictions, and time frame for repair and recovery.
transportation weather information	Current and forecast road conditions and weather information (e.g., surface condition, flooding, wind advisories, visibility, etc.) associated with the transportation network. This information is of a resolution, timeliness, and accuracy to be useful in transportation decision making.
transportation weather information request	A request for transportation weather information that may specify the area of interest (a geographic region, particular routes within a region, specific road segments), the type of information that is required, the desired spatial resolution of the information, and time horizon.
traveler alerts	Traveler information alerts reporting congestion, incidents, adverse road or weather conditions, parking availability, transit service delays or interruptions, and other information that may impact the traveler. Relevant alerts are provided based on traveler-supplied profile information including trip characteristics and preferences.
traveler inputs	User input from a traveler to summon assistance, request travel information, make a reservation, or request any other traveler service.
traveler interface updates	Visual or audio information (e.g., routes, messages, guidance, emergency information) that is provided to the traveler.
traveler profile	Information about a traveler including equipment capabilities, personal preferences, and traveler alert subscriptions.
traveler request	A request for traveler information including traffic, transit, toll, parking, road weather conditions, event, and passenger rail information. The request identifies the type of information, the area of interest, parameters that are used to prioritize or filter the returned information, and sorting preferences.
trip log	Driver's daily log, vehicle location, mileage, and trip activity (includes screening, inspection and border clearance event data as well as fare payments).
trip log request	Request for trip log.
variable speed limit control	Information used to configure and control variable speed limit systems including the equipment used to provide current speed limits and other information to drivers and the equipment used to monitor traffic and environmental conditions along the roadway.
variable speed limit status	Current operating status of the variable speed limit systems including the state of the equipment.

Flow Name	Description
vehicle characteristics	The physical or visible characteristics of an individual vehicle that can be measured to classify a vehicle and imaged to uniquely identify a vehicle.
vehicle emissions data	Measured emissions of specific vehicles comprised of exhaust pollutants including hydrocarbons, carbon monoxide, and nitrogen oxides.
vehicle intersection safety data	Vehicle path and acceleration data provided by vehicles approaching or occupying an intersection. It identifies the intersection, vehicle position and motion, the anticipated lane and movement that will be used in the intersection, and notification of potential violations or other detected safety hazards.
vehicle payment information	Information provided for payment of tolls and parking fees including identification that can be used to identify the payment account or source and related vehicle and service information that are used to determine the type and price of service requested.
vehicle payment request	Request for information supporting toll and parking payments.
vehicle payment update	Data written to vehicle equipment to support electronic toll collection or parking payment.
vehicle safety data	Vehicle safety data indicating vehicle location, vehicle motion (speed, heading, acceleration), vehicle control (brakes, steering, throttle, exterior lights), basic vehicle characteristics (length, width). May also include additional vehicle status (e.g., anti-lock brake activation, stability control system activation).
vehicle signage data	In-vehicle signing data that augments regulatory, warning, and informational road signs and signals. The information provided would include static sign information (e.g., stop, curve warning, guide signs, service signs, and directional signs) and dynamic information (e.g., current signal states, grade crossing information, local traffic and road conditions, advisories, and detours).
video surveillance control	Information used to configure and control video surveillance systems.
violation notification	Notification to enforcement agency of a violation. The violation notification flow describes the statute or regulation that was violated and how it was violated (e. g., overweight on specific axle by xxx pounds or which brake was out of adjustment and how far out of adjustment it was). A violation differs from a citation because it is not adjudicated by the courts.
voice-based traveler information	Traveler information sent to the telecommunications systems for traveler information terminator. This flow may represent the bulk transfer of traveler information, including traffic conditions, incident information, transit information and weather and road condition information. It may be specially formatted for voice-based traveler information.
voice-based traveler request	The electronic traveler information request from the telecommunications systems for traveler information terminator. It may be specifically formatted for voice-based traveler requests. The request can be a general subscription intended to initiate a continuous or regular data stream or a specific request intended to initiate a one-time response from the recipient.
weather information	Accumulated forecasted and current weather data (e.g., temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc.).
weigh-in-motion information	Information from commercial vehicle virtual weigh-in-motion systems including vehicle weight, vehicle dimensions, vehicle identification and driver identification.
widearea statistical pollution information	Aggregated region-wide measured emissions data and possible pollution incident information.
work plan coordination	Coordination of work plan schedules and activities between maintenance and construction organizations or systems. This information includes the work plan schedules and comments and suggested changes that are exchanged as work plans are coordinated and finalized.
work plan feedback	Comments and suggested changes to proposed construction and maintenance work schedules and activities. This information influences work plan schedules so that they minimize impact to other system operations and the overall transportation system.
work zone information	Summary of maintenance and construction work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.
work zone warning notification	Notification of a work zone emergency or safety issue. This flow identifies that a work zone emergency or safety issue has occurred so that warnings may be generated by more than one system in the work zone.