Kansas Statewide Intelligent Transportation Systems Architecture
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Volume I

KANSAS STATEWIDE ITS ARCHITECTURE PLAN

Version 2.01

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Document Revision History

Version	Date	Comments
1.0	January 2008	Initial/baseline architecture
2.0	January 2016	Incorporating changes in ITS planning and deployment since 2008
2.1	June 2016	Incorporating the Truck Parking Information and Management System (TPIMS)

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1. INTRODUCTION

An Intelligent Transportation Systems (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 data flows among these subsystems.

The Kansas Statewide ITS Architecture is a roadmap for the deployment and integration of transportation systems in Kansas over the next 15 years. The architecture has been developed through a cooperative effort by the transportation, transit, law enforcement, emergency management, commercial vehicle and freight management agencies. The architecture represents a shared vision of how each agency's systems will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in Kansas.

This document is Volume I of the series reports that have been developed as part of the Development of a Kansas Statewide ITS Architecture Project. This document is a direct result of stakeholder inputs and interactions on existing and future inter-agency coordination and information sharing as well as issues and needs related to surface transportation systems. Two other documents are also developed as part of this project:

- Volume II – Integration and Implementation Plan
- Volume III – Architecture Maintenance Plan

Volume II presents an ITS architecture Integration and Implementation Plan that will guide the Kansas Department of Transportation (KDOT) and participating stakeholders in effectively using the architecture in the planning, design, implementation, and operation stages of ITS systems and projects. This plan investigates and identifies opportunities to further integrate various ITS systems at local, regional and statewide levels.

Volume III describes a process for controlled updates to the Statewide ITS Architecture baseline so that the architecture continues to accurately reflect the existing ITS capabilities and future plans in the state.

The timeframe considered for this architecture is a 15-year vision for ITS activities in Kansas. This means that the Kansas Statewide ITS Architecture addresses current ITS systems as well as those planned for development over the next 15 years. It represents a snapshot of the currently anticipated projects based on information from stakeholders. As such, the architecture will require regular updates to ensure that it maintains an accurate representation of the state.

1.1 Vision, Mission, and Objectives

1.1.1 Vision

Stakeholders in Kansas have recognized the need for vision and strategic planning with respect to ITS technology. The vision for the Kansas Statewide ITS Architecture is one of enhanced transportation productivity, mobility, safety, efficiency and security through the use of integrated, cost-effective ITS technologies and systems and strong operational relationships.

1.1.2 Mission

The mission for the Kansas Statewide ITS Architecture is to develop 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 to support existing and future ITS projects and enhance compatibility of existing architectures within Kansas and emerging National ITS Architecture.

1.1.3 Objectives

Eight objectives were established as a means towards realization of the mission statement above. They are:

- Establish an ITS architecture that: is open, receptive and adaptable; is consistent with developing national standards; provides opportunities for private/public partnerships; and encourages and supports interagency cooperation.
- Develop and integrate traveler information, traffic management, public transportation management, maintenance and construction management, emergency management, commercial vehicle operations, and information management systems throughout Kansas as appropriate.
- Define how information is collected, processed, distributed and disseminated.
- Define interfaces and information flow among/between subsystems, agencies, and users.
- Support transportation planning process and provide key input to the Kansas Long-Range Transportation Plan and State Transportation Improvement Program.
- Support development of strategies and actions in planning process that lead to an integrated, efficient multimodal transportation system.
- Support development of ITS projects.
- Assist in developing, prioritizing, and addressing consistency of proposed transportation investment.

1.2 Description of the Region

The region covered by this architecture is the entire state of Kansas with the exception of the areas covered by the regional ITS architectures for the six metropolitan planning organizations (MPOs). The six MPOs are:

- Flint Hills Metropolitan Planning Organization
- Lawrence-Douglas County Planning Organization
- Mid-America Regional Council (Kansas City)
- St. Joseph Area Transportation Study Organization
- Topeka-Shawnee County Metropolitan Planning Commission
- Wichita-Sedgwick County Metropolitan Area Planning Commission

Regional ITS architectures have been developed for the MPO areas in Kansas City, Topeka, Lawrence-Douglas County, Wichita, and St. Joseph. The regional ITS architecture for the Flint Hills MPO is currently underway and will be completed by the end of 2015. The Kansas Statewide ITS Architecture is intended to cover the areas that are not covered by the MPO regional ITS architectures and provide interfaces with these architectures.

The Kansas Statewide ITS Architecture will serve as a framework for ensuring compatibility and interoperability among the five regional ITS architectures developed separately from this document. The areas covered by the Statewide ITS Architecture are primarily rural areas with small to medium size cities where a regional ITS architecture would not be practical. ITS projects developed within the State of Kansas (except for the geographical areas covered under the five regional ITS architectures) would be covered under this statewide ITS architecture regardless of which agency was responsible for the planning, design, implementation, or operations of the ITS project.

1.3 Organization of the Report

This document is organized as the following:

- **Section 1 - Introduction**: This section identifies the vision, mission, and objectives of the Kansas Statewide ITS Architecture. It also provides a general description of the area covered in the Statewide ITS Architecture.

- **Section 2 – Glossary and Definitions**: This section contains a glossary and definitions of terms that are used throughout this document.

- **Section 3 – ITS Architecture Development Process**: This section describes the process for developing the Kansas Statewide ITS Architecture and summarizes the requirements of the final FHWA Rule and FTA policy on ITS Architecture and Standards.

- **Section 4 – Stakeholders and Operational Concept**: This section identifies and describes participating agencies and stakeholders and their roles and responsibilities in the operation and implementation of the ITS systems and/or components within the state.

- **Section 5 – Inventory**: This section identifies the existing and planned ITS elements within the state.

- **Section 6 – User Services and Service Packages**: This section identifies a list of user services and service packages that are applicable to the state. The user services describe what transportation functions and services should be provided from the user's perspective. The service packages provide a collection of service-oriented technology bundles that can be incorporated in the development of the Statewide ITS Architecture.

- **Section 7 – Equipment Packages and Functional Requirements**: The customized list of service packages developed in Section 6 is used to define the subsystems, equipment packages, and functional requirements that are necessary for the implementation of the customized service packages.

- **Section 8 – Interconnects and Architecture Flows**: This section describes the physical architecture by defining interfaces between equipment and systems that may be deployed by different organizational or operating agencies throughout the state.

2. GLOSSARY AND DEFINITIONS

Advanced Public Transportation System (APTS)
APTS involves the application and integration of existing and emerging technologies in the areas of communications, navigation, information processing, and control systems to improve the effectiveness of transit operations.

Advanced Traffic Management Systems (ATMS)
Systems, which collect, utilize, and disseminate real-time data on congestion on arterial streets and expressways, and will alert motorists of alternate routes. Components of an ATMS include CCTV monitoring, ramp metering, traffic signal control, vehicle detection, and communications.

Advanced Traveler Information Systems (ATIS)
Systems, which disseminate 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
Information that is exchanged between subsystems and terminators in 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 and their communication requirements define the interfaces which form the basis for much of the ongoing standards work in the national ITS program. The terms "information flow" and "architecture flow" are used interchangeably.

Architecture Interconnect
Communications paths that carry information between subsystems and terminators in 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.

Arterial (Non-Freeway) Traffic Management
Systems that monitor traffic flow on arterial street and non-freeway rural roadway systems and implement signal timing plans in order to optimize the progression of traffic, including coordination with railroad crossings.

Automated Vehicle Maintenance
This technology 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.

Automatic Vehicle Location (AVL)
AVL systems enable the approximate location of a vehicle to be determined and tracked as it traverses the transportation network. The most common application of AVL technology is for dispatching emergency vehicles, tracking transit vehicles and providing passengers with arrival time estimations through information displays, and delivery companies.

Closed-Loop System
A system in which the computer controls an external process using information received from the process—e.g., the closed loop in a traffic signal control system is from the computer to the controllers affecting the vehicular traffic and sensed by the traffic detectors and this information sent to the computer.

Computer-Aided Dispatch (CAD)
An "intelligent" interactive mapping and data entry system to dispatch, monitor, and manage emergency services. The emergency-dispatching hub uses a database and configuration tools in which an agency

can store, use, and report on information such as incident histories, unit activities, etc., in a way that is logical and useful to the dispatcher and administrator.

Commercial Vehicle Operations (CVO)
Systems that support administrative functions for commercial vehicle operations, including credentialing, taxing, and enforcement of safety regulations, as well as oversize/overweight and HAZMAT permitting.

Dedicated Short Range Communications
A wireless communications channel used for close-proximity communications between vehicles and the immediate infrastructure. It supports location-specific communications for ITS capabilities such as toll collection, transit vehicle management, driver information, and automated commercial vehicle operations.

Dynamic Message Sign (DMS)
A sign that uses electronics or mechanics to vary the visual word, number, or symbolic display as traffic conditions warrant. The term is used interchangeably with variable message sign (VMS) and changeable message sign (CMS).

Element
This is the basic building block of Regional ITS Architectures 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 intervene in the normal operation of traffic control systems using wireless communications installed on traffic intersections and emergency vehicles. As the emergency vehicle approaches a traffic signal, it is recognized by the traffic signal controller through light, radio waves, or sound. The normal green-yellow-and-red cycle can then be interrupted to change the light to green.

Environmental Sensor Stations
A specific type of roadway equipment that monitors pollution, emissions, weather, roadway surface, and air/water quality conditions. The environmental sensor station is comprised of a remote processor unit connected to one or more sensors that collect environmental or meteorological data. It collects weather data such as air temperature, amount and type of precipitation, visibility, dew point, relative humidity, wind speed, and wind direction. It also collects surface conditions, including pavement temperature, subsurface temperature, surface conditions (dry, wet, or frozen), amount of deicing material, and freezing point on the road surface. The primary users of the information from these devices are roadway maintenance and traffic operations.

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. The grouping also takes into account the user services and the need to accommodate various levels of functionality. The equipment packages were used as a basis for estimating deployment costs (as part of the evaluation that was performed).

Fixed-Point to Fixed-Point Communications
A communication link serving stationary entities. It may be implemented using a variety of public or private communication networks and technologies. It can include, but is not limited to, twisted pair, coaxial cable, fiber optic, microwave relay networks, spread spectrum, etc.

Freeway Management Systems
Freeway management systems provide real-time control, guidance, warning, and management of traffic in order to improve flow of people and goods safely and efficiently.

HAZMAT Detection
This technology provides the capability to detect and classify security sensitive hazardous materials on commercial vehicles using roadside sensing and imaging technology.

Incident Detection
Incident Detection provides the capability to traffic managers to detect and verify incidents. This capability includes analyzing and reducing the collected data from traffic surveillance equipment, monitoring external alerting and advisory and incident reporting systems, collecting special event information, and monitoring for incidents and hazardous conditions through available sensor and surveillance systems.

Incident/Emergency Management
A system that enables communities to quickly identify crashes/breakdowns and ensure agency coordination so that the closest available and most appropriate emergency unit can be dispatched 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 system, 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 them. An architecture is functionally oriented and not technology-specific which allows the architecture to remain effective over time. It defines "what must be done," not "how it will be done."

Maintenance and Construction Operations (MCO)
MCO functions to support monitoring, operating, maintaining, improving and managing the physical condition of roadways, the associated infrastructure equipment, and the required resources.

Service Package
The service packages provide an accessible, service-oriented perspective to the National ITS Architecture. They are tailored to fit, separately or in combination, real world transportation problems and needs. Service packages collect together one or more equipment packages that must work together to deliver a given transportation service and the architecture flows that connect them and other important external systems.

Mobile Data Terminal (MDT)
Mobile Data Terminals (MDTs) are computerized devices used in emergency, transit, patrol, maintenance, and other vehicles to communicate with a central dispatch. They feature a screen on which to view information and a keyboard or keypad for entering information, and may be connected to various peripheral devices, such as an AVL System.

On Board Security Monitoring System
On board security monitoring system provides security and safety functions on-board the transit vehicle. This includes surveillance and sensors to monitor the on-board environment, silent alarms that can be activated by transit user or vehicle operator, operator authentication, and a remote vehicle disable function. 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).

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 around the processes and data flows defined in the logical architecture.

Regional ITS Architecture
A specific, tailored framework for ensuring institutional agreement and technical integration for the implementation of ITS projects or groups of projects in a particular region. It functionally defines what pieces of the system are linked to others and what information is exchanged between them.

Road Weather Information System (RWIS)
A system consisting of meteorological components strategically located alongside the highway, which allow the owner to make more informed decision during winter storms. Specialized equipment and computer programs monitor air and pavement temperature to make forecasts regarding how the winter storms impact the highways. The principal components of RWIS include pavement sensors, atmospheric sensors, remote processing unit (RPU), and central processing unit (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.

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

Subsystem
The principle structural element 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 interface to ITS.

Transit Signal Priority
Transit signal priority is an operational strategy that facilitates the movement of in-service transit vehicles through traffic-signal controlled intersections. Transit signal priority modifies the normal signal operation process to better accommodate transit vehicles. The objectives of transit signal priority include improved schedule adherence, improved transit efficiency, contribution to enhanced transit information, and increased road network efficiency.

Turbo Architecture
An automated software tool used 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.

Weigh In Motion (WIM)
Various technologies that enable vehicle weights to be determined without the need for a vehicle to physically stop on a scale. High-speed WIM enables trucks to be weighed at highway speed with or without Automated Vehicle Identification (AVI) capabilities.

Wi-Fi
Wi-Fi is a short-hand generic term referring to the wireless interface of mobile computing devices, such as laptops in local area networks (LANs) and Internet access. Standards are in development that will allow Wi-Fi to be used by cars on highways in support of an Intelligent Transportation System to increase safety, gather statistics, and enable mobile commerce.

3. ARCHITECTURE DEVELOPMENT PROCESS

3.1 Architecture Development Process

The process used to develop the Kansas Statewide ITS Architecture is illustrated in Figure 3-1. This figure shows six general steps in the "life-cycle" of an ITS architecture. In the first four steps, the ITS architecture products are developed and then these products 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 products that will guide the "implementation" of the ITS architecture.

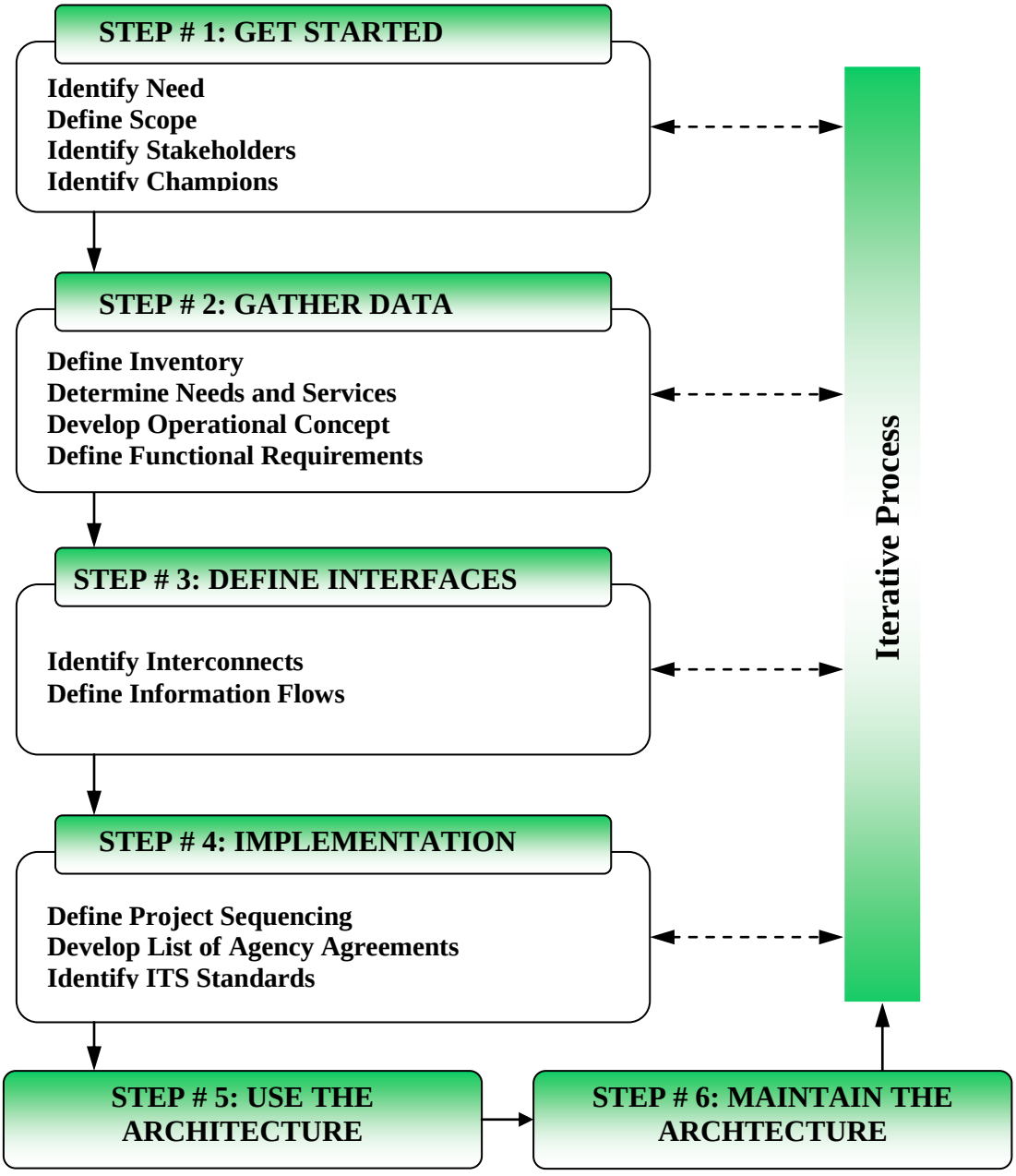


Figure 3-1. Architecture Development Process

This report documents the output of the first three steps. The outcomes of Steps 4 and 5 are documented in Volume II – Integration and Implementation Plan, and Step 6 is covered in Volume III – Architecture Maintenance Plan.

3.2 Systems Engineering

Final Rule 940 requires that all ITS projects funded with highway trust funds be developed based on a systems engineering analysis. Systems engineering is a phrase used to describe the cyclical process of planning, designing, implementing, testing, operation, and maintenance of an ITS system or project throughout its useful life. The systems engineering process begins with the development and implementation of an ITS architecture and continues by outlining the steps and level of detail of each phase of project deployment, from high-level tasks such as establishing the Concept of Operations to very detailed component design, installation, and testing. The purpose of the system engineering process is to ensure that a well-planned foundation is in place and then to affirm the requirements of an ITS system.

As illustrated in Figure 3-2, Systems Engineering Approach recommended by the FHWA, an ITS architecture provides a starting point for systems engineering analyses that are performed during ITS project development. The ITS Architecture is a dynamic document that requires periodic updates to reflect changes in an agency's ITS program due to funding levels, evolving project or system requirements, or the introduction of improved technology. Once ITS projects are programmed, the ITS architecture provides initial inputs to support the systems engineering process including the establishment of the concept of operations, requirements, and high-level design and test planning of ITS projects. The ITS architecture improves continuity across the project lifecycle, from planning through project development and operations. As required by the FHWA and FTA, the Statewide ITS Architecture serves to meet the criteria of Final Rule 940.

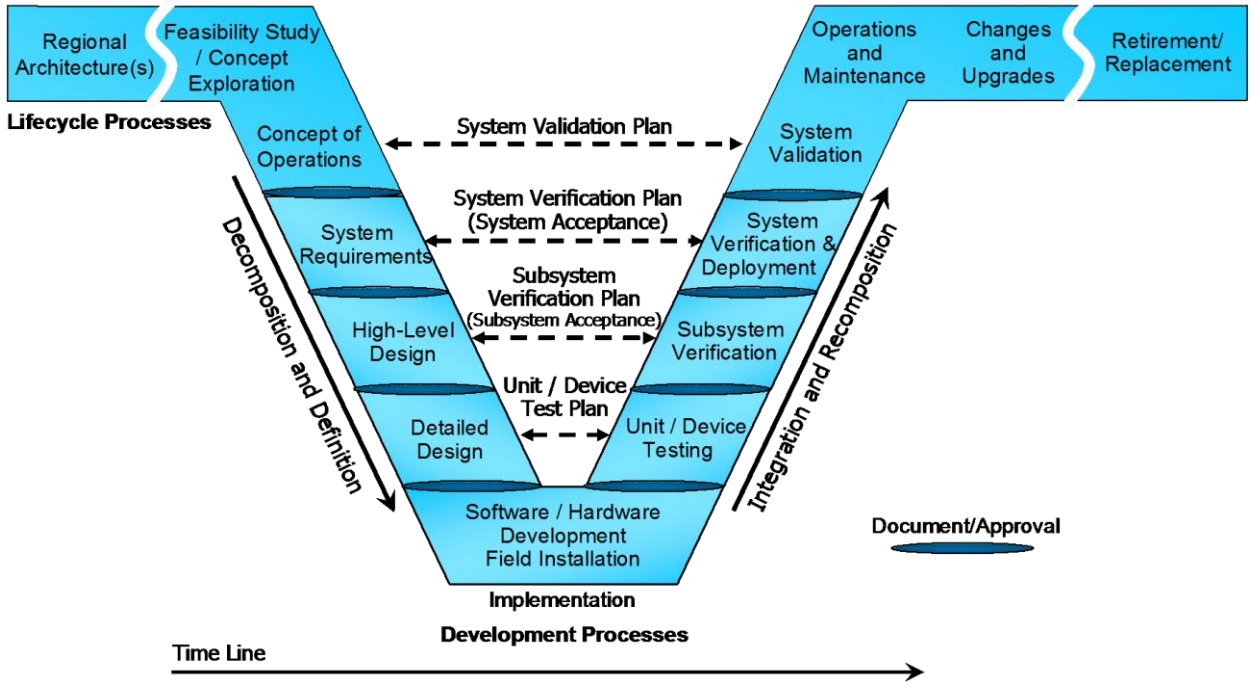


Figure 3-2. Systems Engineering Approach

The development and implementation of the Kansas Statewide ITS Architecture within the framework of the National ITS Architecture and using the system engineering approach will help ensure the stability and longevity of ITS projects and systems deployed throughout Kansas. From the Statewide Architecture, regional architectures will be developed to provide a more detailed foundation on which to build the region's ITS infrastructure.

3.3 Requirements of the Final FHWA Rule and FTA Policy on Architecture

Table 3-1 shows how the requirements of the rule are met by the outputs developed for the Kansas Statewide ITS Architecture.

Table 3-1. Mapping of Requirements to Architecture Outputs

Statewide/Regional ITS Architecture Requirements	Where Requirements documented
Description of region	Geographic definition, as well as timeframe and scope of services are given in Section 1 of this document
Identification of participating agencies and other stakeholders	Listing of stakeholders and their definitions is given in Section 4.1 of this document. An inventory of the elements operated by the stakeholders is contained in Section 5 of this document.
An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders	The operational concept is defined in Section 4.2 of this document.
A list of any agreements (existing or new) for deployment and/or operations	A discussion of existing and new agreements is given in Volume II – Integration and Implementation Plan.
System functional requirements	The functional requirements of the ITS systems are described in an overview in Section 7 of this document, and are provided in detail in the Turbo Architecture database.
Interface requirements and information exchanges with planned and existing systems and subsystems	The interfaces and information flows are described in an overview in Section 8 of the document, and are described in detail in the Turbo Architecture database.
Identification of ITS standards supporting regional and national interoperability	An overview of the ITS standards is given in Volume II. The detailed listing of ITS standards applicable to each interface in the architecture is described in the Turbo Architecture database.
The sequence of projects required for implementation	Projects and their sequencing are covered in Volume II.
Procedures and responsibilities for maintaining ITS architecture	Procedures and responsibilities for maintaining the Statewide ITS Architecture are covered in Volume III - Architecture Maintenance Plan.

As summarized in Table 3-1, this Volume I document, in conjunction with Volumes II and III, and the Turbo Architecture database for the Kansas Statewide ITS Architecture, satisfies the mandatory requirements defined in the ITS Architecture and Standards Final Rule and Policy set forth by the FHWA and FTA.

4. STAKEHOLDERS AND OPERATIONAL CONCEPT

4.1 Identification of Participating Agencies and Stakeholders

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. As stakeholders provide crucial input regarding the region's transportation investment and ITS deployments, stakeholder participation and coordination is critical to the success of the ITS architecture development. The Kansas Statewide ITS Architecture includes a wide range of stakeholders. Table 4-1 lists the agencies and stakeholders participated in the implementation and operation of the ITS projects in Kansas. It includes both specific individual stakeholders and broadly defined generic stakeholders. Most of the specific stakeholders are at the multi-state or state level. Generic stakeholders, representing a group of stakeholders that provide similar roles, responsibilities and functions, are typically at regional and county/city levels. The main purpose of defining and using generic stakeholder groups at regional and county/city level is to allow a more efficient way to organize the Statewide ITS Architecture and to keep the architecture at a maintainable level.

Table 4-1. Kansas Statewide ITS Architecture Stakeholders

Stakeholder Name	Stakeholder Description
Multi-State Stakeholders	
Federal Motor Carrier Safety Administration (FMCSA)	FMCSA is part of the US DOT. Administration activities contribute to ensuring safety in motor carrier operations through strong enforcement of safety regulations, targeting high-risk carriers and commercial motor vehicle drivers; improving safety information systems and commercial motor vehicle technologies; strengthening commercial motor vehicle equipment and operating standards; and increasing safety awareness.
Federal Highway Administration (FHWA)	FHWA is a Federal agency with the broad responsibility of ensuring that America's roads and highways continue to be the safest and most technologically up-to-date. FHWA provides financial and technical support to State, local, and tribal governments for constructing, improving, and preserving America's highway system.
Federal Transit Administration (FTA)	FTA administers public transportation including buses, subways, light rail, commuter rail, monorail, passenger ferries, trolleys, inclined railways, and people movers. FTA provides financial assistance to state and local transit providers for developing new transit systems and improving, maintaining, and operating existing systems. FTA is a sister agency to FHWA.
International Registration Plan (IRP), Inc.	The IRP, Inc. administers International Registration Plan. For motor carriers operating under the International Registration Plan, registering a fleet of inter-jurisdictional vehicles becomes a one-stop process for motor carriers, with a simple, one-step registration.
International Fuel Tax Association (IFTA), Inc.	The IFTA, Inc. administers the International Fuel Tax Agreement.
National Oceanic and Atmospheric Administration (NOAA)	National Weather Service, an operating branch of the NOAA, provides weather forecast and issues warnings related to adverse weather conditions.
High Plains Coalition	Coalition consisting of the Kansas, Colorado, and Wyoming Departments of Transportation and the Nebraska Department of Roads. Coalition will administer a Pooled Fund activity in which the group will plan for, then ultimately design and deploy, a network or system to exchange information (between members and with the traveling public) that can be used to coordinated day-to-day operations with a particular focus on non-routine weather and traffic incidents.

Table 4-1. (Continued)

Stakeholder Name	Stakeholder Description
MAASTO	The Mid America Association of State Transportation Officials (MAASTO) consists of ten states primarily in the Midwest including Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Ohio, and Wisconsin.
Mid-America Freight Coalition	The Mid-America Freight Coalition is a regional organization that cooperates in the planning, operation, preservation, and improvement of transportation infrastructure in the Midwest. The ten states of the AASHTO Mid-America Association of State Transportation Officials (MAASTO) share key interstate corridors, inland waterways, and the Great Lakes.
State Level Agencies	
Kansas Department of Transportation (KDOT)	State-level agency responsible for the transportation system for Kansas.
KDOT Bureau of Computer Services	The KDOT Bureau of Computer Services is responsible for developing and assisting in the management of information systems in support of KDOT's planning, development and operation of a multi-modal statewide transportation system.
KDOT Bureau of Construction and Maintenance	The KDOT Bureau of Construction and Maintenance is responsible for plans and proposals, specifications, special provisions and maintenance management.
KDOT Bureau of Design	The KDOT Bureau of Design has responsibility for Road Design, Bridge Design, Bridge Management, Utilities, Environmental assessment, and Design Contracts.
KDOT Bureau of Materials and Research	The KDOT Bureau of Materials and Research is responsible for approved materials, the Pavement Management System, testing, and research. This includes technology transfer and pavement design.
KDOT Bureau of Transportation Safety and Technology	The KDOT Bureau of Transportation Safety and Technology includes Traffic Safety Section and ITS. The KDOT Traffic Safety is responsible for administering programs funded in part by the National Highway Traffic Safety Administration (NHTSA). These programs address priority areas including alcohol countermeasures, occupant protection, emergency medical services, motorcycle safety, pedestrian safety and bicycle safety.
KDOT Bureau of Transportation Planning	The KDOT Bureau of Transportation Planning is responsible for collecting, analyzing, and reporting information for the statewide transportation system. Major areas of responsibility include traffic counting and classification, geometric and accident data, cartography (mapping) and geographic information systems, metropolitan planning, statewide systems evaluation, public transportation, long range planning, ITS, and developing and coordinating state policy on rail transportation issues.
KDOT Division of Aviation	The Division is responsible for the promotion of aviation activities, including the evaluation of their economic impact on the state, and is responsible for administering the Federal Airport Inspection Program and updating the State Aviation System Plan.
KDOT Division of Public Affairs	This Division of KDOT provides information about transportation issues and agency functions and activities. The office issues news releases and reports regarding construction status, detour information, safety issues, and agency activities.

Table 4-1. (Continued)

Stakeholder Name	Stakeholder Description
Kansas Department of Revenue (KDOR)	KDOR registers commercial vehicles operating in Kansas and issues temporary permits, including oversize/overweight permits. KDOR oversees the administration of motor vehicle registrations, issues motor vehicle and trailer titles, maintains vehicle title and registration records, and licenses and monitors Kansas vehicle dealers.
Kansas Turnpike Authority (KTA)	KTA is responsible for the administration and collection of tolls, enforcement and maintenance along the Kansas Turnpike.
Kansas Highway Patrol (KHP)	KHP is a state-level agency responsible for incident and emergency management and enforcement of Kansas Interstate highways. Eight Troop Commands serve the East, Central, West regions throughout the state.
Kansas Highway Patrol Troop G	Troop G patrols the turnpike 24 hours a day through its own dispatch center, which communicates with the Kansas Highway Patrol, the toll plazas, and KTA maintenance personnel. These dispatchers are also responsible for reporting weather conditions and monitoring security systems. Troop G serves 11 counties between the Oklahoma border south of Wellington and Kansas City and provides security at the interchange and service areas, deals with unpaid tolls, and performs special projects for KTA, which contracts with the Patrol for Troop G's services.
Kansas Division of Emergency Management (KDEM)	KDEM is a state-level agency that works to reduce loss of life and property and protect Kansans from all hazards by providing and coordinating resources, expertise, leadership and advocacy through a comprehensive, risk-based emergency management program of mitigation, preparedness, response and recovery.
Kansas Bureau of Investigation (KBI)	KBI provides professional investigative and laboratory services to criminal justice agencies and collects and disseminates criminal justice information to public and private agencies for the purpose of promoting public safety and the prevention of crime in Kansas.
Kansas Corporation Commission (KCC)	KCC regulates the rates, service and safety of public utilities, common carriers, motor carriers, and regulates oil and gas production.
Kansas Army National Guard (KANG)	KANG assists in operation of Kansas Emergency Operations Center and Kansas Alternative Emergency Operations Center.
Kansas Department of Wildlife, Parking and Tourism	The Kansas Department of Wildlife, Parks and Tourism is a cabinet-level agency with a Secretary appointed by the Governor. A seven-member, bipartisan commission, also appointed by the Governor, advises the Secretary and approves regulations governing outdoor recreation and fish and wildlife resources in Kansas. The commission conducts business during regular public sessions.
Kansas Department of Health and Environment	Kansas Department of Health and Environment, Bureau of Air and Radiation organize and plan air monitoring activities within the State of Kansas. Bureau monitors air quality, collects air data, and reports the data to the public.
Kansas Traffic Records Coordinating Committee (TRCC)	The TRCC oversees Traffic Records IT systems statewide. The TRCC is a partnership of state and local interests from the transportation, law enforcement, criminal justice, and health professions.
Neighboring States	A stakeholder group representing agencies and stakeholders of adjacent states that coordinate with Kansas agencies on transportation management within state border regions.
Regional Level Stakeholders	
KDOT District / Area / Sub-Area Offices	KDOT District/ Area/Sub-area Offices support central office performing district/area/sub-area specific emergency and incident management, traffic management and maintenance and construction activities.

Table 4-1. (Continued)

Stakeholder Name	Stakeholder Description
Coordinated Transit Districts (CTD)	CTD coordinates various public transportation services within the jurisdiction areas. Public and private transit service providers offer demand responsive and fixed-route services to the general public, elderly, disabled, and others within each CTD.
Kansas City SmartPort	Kansas City SmartPort is a non-profit economic development organization that focuses on (1) improving the area's transportation industry by attracting businesses with significant transportation and logistics elements, and (2) making it cheaper, faster, more efficient, and secure for companies to move goods into, from, and through the Kansas City area.
Kansas Metropolitan Planning Organizations	A stakeholder group representing four regions to provide transportation planning and technical assistance services to various agencies within the MPO jurisdiction areas.
County/City Level Stakeholders	
Counties and Cities	A stakeholder group representing all the counties, cities, and municipalities that have ITS components.
County and City Sheriff, Police, Fire and EMS 911 Dispatch Centers	County and city-level centers that receive 911 calls, and dispatch sheriff, police, fire and EMS within the jurisdiction area via communication system. Exchange mutual aid and incident information with other local agencies. CAD dispatch may be equipped.
County Emergency Management Agencies	County Emergency Management Agencies coordinate emergency and incident management planning within county boundaries.
County Engineer Offices	County Engineer Offices provide emergency and incident management, maintenance and construction management and traffic management within county boundaries.
County Sheriff's Offices	A stakeholder group representing county sheriff's offices responsible for public safety within the jurisdiction areas.
City Public Works Departments	City Public Works Departments provide emergency and incident management, maintenance and construction management and traffic management within city boundaries.
City Police Departments	City Police Departments provide emergency and incident management within city boundaries.
City Fire Departments	City Fire Departments provide emergency and incident management within city boundaries.
School District Transportation Departments	School District Transportation Departments support emergency and incident management activities within school districts.
Urban Transit Providers	Transit providers operating in urbanized areas of Kansas. These areas include the Kansas City, Wichita, Topeka, and Lawrence.
Rural Transit Providers	Transit providers that operate in rural areas of Kansas. Providers are grouped into 15 coordinated transit districts throughout the state.
Other Stakeholders	
Airports	Airports include major, regional, and municipal airports serving the state of Kansas.
American Automobile Association (AAA)	AAA provides automotive services such as emergency road assistance to AAA members.
American Trucking Association	ATA (American Trucking Association) is an organization working to advance the interests of the trucking industry at the federal level.
Kansas Motor Carriers Association (KMCA)	KMCA provides a wide variety of services from fuel and mileage tax reports to safety seminars and driver recognition programs.

Table 4-1. (Continued)

Stakeholder Name	Stakeholder Description
Railroad Companies	A stakeholder group representing owner/operators of rail transportation facilities and associated ITS equipment and communications. Includes Class 1 railroad companies (BNSF, Union Pacific, Kansas City Southern, and Norfolk Southern) as well as Class 3 short line railroads (Kyle Railroad Company, Kansas & Oklahoma Railroad, and South Kansas & Oklahoma Railroad).
Special Event Promoters	Special Event Sponsors that have knowledge of events that may impact travel on roadways or other modal means. Examples of special event sponsors include sporting events, conventions, motorcades/parades, and public/political events.
Private Trucking Companies	A stakeholder group representing trucking companies that operate commercial vehicles.
Private Information Service Providers	A stakeholder group representing private environmental and transportation weather information service providers.
Private Towing Companies	Private Towing Companies contract with the KHP and KTA for vehicles traveling along Kansas interstate highways that require towing. Towing companies are dispatched by either the Kansas Highway Patrol or the Kansas Turnpike Authority Troop G Dispatch office depending on where towing services are required.
Travelers	Stakeholder group representing travelers along Kansas highways and roads.
Media Outlets	TV and radio stations, news media, etc.

4.2 Operational Concept

An operational concept defines each stakeholder's current and future roles and responsibilities in the implementation and operation of the ITS systems in Kansas. Table 4-2 summarizes the general roles and responsibilities of the participating stakeholders identified above. As illustrated, the roles and responsibilities are categorized in eleven transportation service areas. These transportation service areas provide general classifications of what functions the participating agencies are providing or will provide. The eleven service areas and their major functions are described in the following.

Archived Data Management – Archived data management represents the functions that collect, process, store and utilize transportation data including traffic data, accident data, maintenance and construction data, public transportation data, commercial vehicle data, emission data, parking data and others.

Commercial Vehicle Operations – Commercial vehicle operations represents the administrative functions that support commercial vehicle credentials, tax, and safety regulations.

Electronic Payment – Electronic payment represents the functions that support electronic payment of transportation services, including transit, parking and tolls.

Emergency Management – Emergency management represents the functions that provide emergency call taking, public safety dispatch, disaster response and evacuation, securing monitoring and other security and public safety-oriented services.

Incident Management – Incident management represents the functions that manage both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. It includes incident detection and verification, appropriate incident response, and regional coordination between traffic management agencies, maintenance and construction management agencies, emergency management agencies and others.

Maintenance and Construction Management – Maintenance and construction management represents the functions that provide construction management and maintenance of roadways, including snow and ice removal.

Parking Management – Parking Management represents the functions that provide enhanced monitoring and management of parking facilities and coordination between parking facilities.

Public Transportation – Public transportation represents the functions that plan, manage, operate and maintain transit services. It also includes the function that provides transit traveler information.

Traffic Management – Traffic management represents the functions that manage a broad range of transportation facilities including freeway systems, rural and suburban highway systems, and urban and suburban traffic control systems.

Traveler Information – Traveler information represents the functions that collect, process, store, and disseminate static and real time transportation information to the traveling public.

ITS Architecture Planning Maintenance – ITS architecture planning maintenance represents ITS/transportation planning functions and other related services. It also includes roles and responsibilities for the development and maintenance of an ITS architecture within the stakeholder's jurisdiction.

Table 4-2. Operational Concept for Kansas Statewide Architecture

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
1	Federal Highway Administration	ITS Architecture Planning and Maintenance	Provide technical and institutional guidance on ITS planning and deployment.	Existing
2	Federal Transit Administration	ITS Architecture Planning and Maintenance	Provide technical and institutional guidance on transit related projects.	Existing
3	Federal Motor Carrier Safety Administration	Commercial Vehicle Operations	Manage Motor Carrier Management System (MCMIS) – a central repository of motor carrier data including operational information filed by carriers on the Motor Carrier Identification Report (MCS-150) and safety violation data.	Existing
			Manage Safety and Fitness Electronic Records (SAFER) System which provides company safety data and related services to industry and the public over the Internet. Utilize ASPEN software to record roadside inspections electronically, and upload the information automatically to SAFER.	Existing
			Communicate and coordinate motor carrier information and safety data with state agencies.	Existing
		Archived Data Management	Manage commercial vehicle information databases.	Existing
4	International Fuel Tax Association (IFTA), Inc.	Commercial Vehicle Operations	Allocate fuel taxes between multiple states for motor carrier activities across jurisdictional boundaries, in accordance with the International Fuel Tax Agreement.	Existing
			Coordinate IFTA carrier information and transmittal records between participating states.	Existing
5	International Registration Plan (IRP), Inc.	Commercial Vehicle Operations	Support the IRP base state agreement electronically. Streamline the exchange and reconcilement of registration information and fees by (1) enabling jurisdiction to electronically exchange motor carriers and fee information between jurisdictions; (2) providing an electronic remittance netting function with concurrent electronic fund Transfer capability through a central IRP bank; (3) tracking all amounts due to/from a base jurisdiction; (4) provide reports on the information exchanged and netted fees processed.	Existing
6	NOAA	Traveler Information	Make available weather forecast; issue warnings related to adverse weather conditions.	Existing
7	American Automobile Association (AAA) of Kansas	Emergency Management	Operate a dispatch center in Topeka and receive calls from AAA members and dispatches AAA-owned and contract towing services for the entire state except the Kansas City and St. Joseph metropolitan areas.	Existing
		Traveler Information	Disseminate traveler information (road/weather conditions) to members.	Existing

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
8	KDOT	Archived Data Management	Manage KDOT databases including KDOT GIS web portal (KanPlan), KANSYS, KanRoad, RWIS, KARS, etc.	Existing
		Emergency Management	Support disaster response and recovery, and disaster evacuation.	Existing
			Disseminate disaster-related information to the public.	Existing
			Provide weather alerts on rest area kiosks.	Planned
			Share information and personnel with KDEM Emergency Operations Center for emergency response.	Existing
			Plan to operate Sedgwick County/City of Wichita traffic/emergency operations center.	Existing
		Incident Management	Provide support to traffic incident management and recovery.	Existing
		Traffic Management	Communicate traffic related information to other agencies.	Existing
			Operate roadside equipment to collect traffic flow data.	Existing
			Manage a virtual statewide Traffic Operations and Management Center (Virtual TMC).	Planned
		Commercial Vehicle Operations	Support Commercial Vehicle Information Exchange Window (CVIEW-Plus) – an electronic data exchange system that will provide carrier, vehicle, safety and credential information to fixed and mobile roadside inspection stations, state agencies, and other third party users.	Planned
			Manage TRIS (Truck Routing Information Systems).	Planned
		ITS Architecture Planning and Maintenance	Coordinate the stakeholders of the statewide ITS architecture on the architecture implementation.	Existing
			Responsible for the maintenance of the statewide ITS architecture.	Planned
9	KDOT Bureau of Computer Services	Archived Data Management	Responsible for developing and assisting in the management of information systems in support of KDOT's planning, development and operation of a multi-modal statewide transportation system.	Existing
10	KDOT Bureau of Construction and Maintenance	Maintenance and Construction Management	Perform construction management.	Existing
			Communicate maintenance and construction schedule and other related information with local agencies.	Existing
			Provide and operate RWIS system and collect road weather information along major roadways, and distribute road weather information to local public safety agencies and transportation agencies.	Existing
		Traveler Information	Operate portable highway advisory radios (HARs) and dynamic message signs (DMSs).	Existing

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
11	KDOT Bureau of Design	Maintenance and Construction Management	Responsibility for Road Design, Bridge Design, Bridge Management, Utilities, Environmental assessment, and Design Contracts.	Existing
12	KDOT Bureau of Materials & Research	Maintenance and Construction Management	Support analysis, testing and research used in construction and maintenance projects; and responsible for approved materials, the Pavement Management System, testing, and research. This includes technology transfer and pavement design.	Existing
13	KDOT Bureau of Transportation Safety and Technology	Traffic Management	Responsible for traffic control on Interstates and State Highways.	Existing
		Emergency Management	Responsible for administering programs funded in part by the National Highway Traffic Safety Administration (NHTSA). These programs address priority areas including alcohol countermeasures, occupant protection, emergency medical services, motorcycle safety, pedestrian safety and bicycle safety.	Existing
		ITS Architecture Planning and Maintenance	Coordinate the stakeholders of the statewide ITS Architecture on the architecture implementation.	Existing
			Responsible for the maintenance of the Kansas Statewide ITS Architecture.	Existing
14	KDOT Division of Public Affairs	Traveler Information	Operate and support a telephone traveler information system (511 System) via either cell phone or landline.	Existing
			Disseminate road weather, road restrictions, construction and maintenance work zone and detours alerts, and other transportation-related information via Internet. The websites include http://511.ksdot.org; www.kanroad.org; http://www.kcscout.net/.	Existing
			Provide wireless access point at rest areas.	Existing/Planned
			Collect weather related road conditions information and information on construction/maintenance work zones, detours and other hazards.	Existing
			Deploy and support kiosks at traveler information centers, and rest areas providing traveler information such weather, road conditions and construction/maintenance work zones and detours in Kansas and surrounding states.	Planned
15	KDOT Bureau of Transportation Planning	Archived Data Management	Collect information for the statewide transportation system. Information collected includes traffic counting and classification, geometric and accident data, cartography (mapping) and geographic information systems, and transit data,	Existing
		Traveler Information	Maintain KanPlan and KanRoad.	Existing
16	KDOT Division of Aviation	Maintenance and Construction Management	Coordinate with airports in Kansas in planning and deploying automated weather stations (AWS).	Existing
17	KDOT Traffic Records Coordinating Committee	Archived Data Management	The Traffic Records Coordinating Committee (TRCC) oversees Traffic Records IT systems statewide.	Existing/Planned

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
18	Kansas Army National Guard (KANG)	Emergency Management	Operate the Kansas alternate EOC located in Salina together with KDEM.	Existing
19	Kansas Bureau of Investigation (KBI)	Emergency Management	Responsible for issuing AMBER Alerts.	Existing
20	Kansas Corporation Commission (KCC)	Commercial Vehicles Operations	Regulate public utilities, common carriers, motor carriers, and oil and gas producers. KCC participates in weight-in-motion regulations.	Existing
		Archived Data Management	Provides Motor Carrier Database at http://www.kcc.state.ks.us/trans/mcsearch.cgi).	Existing
21	Kansas Department of Wildlife, Parks and Tourism	Traveler Information	Disseminate travel and tourism information via TravelKS.com to travelers on Kansas Highways.	Existing
22	Kansas Department of Health and Environment, Bureau of Air and Radiation	Traffic Management	Organize and plan air monitoring activities within the State of Kansas. Bureau monitors air quality, collects air data, and reports the data to the public.	Existing
23	Kansas Department of Revenue (KDOR) Motor Vehicle Division	Commercial Vehicle Operations	Administer and enforce federal and state motor vehicle laws and regulations.	Existing
			Administer credential and safety information of carriers, drivers and vehicles.	Existing
			Provide electronic permit applications and reporting, electronic commercial vehicle inspection system, and commercial vehicle operation and management information via Internet.	Existing
			Provide commercial vehicle inspection records to the Federal Motor Carrier Management System.	Existing
			Exchange commercial vehicle information with other agencies.	Existing
			Manage IFTA credential information for carriers which base jurisdiction for IFTA reporting and licensing is Kansas.	Existing
			Manage IRP registration information in Kansas.	Existing
		Archived Data Management	Maintain commercial vehicle credential and safety data.	Existing

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
24	Kansas Division of Emergency Management (KDEM)	Emergency Management	Provide emergency management center for statewide emergency operations and national response during major emergencies and disasters.	Existing
			Coordinate with local, state, and federal agencies.	Existing
			Manage web EOC which is an Internet-based software program that posts information from multiple agencies during an emergency.	Existing
			Operate an alternate EOC during statewide emergencies when the Kansas EOC is inoperable.	Planned
			Issue nationwide and regional warnings to government authorities and the civilian population in areas endangered by disasters.	Existing
25	Kansas Highway Patrol	Commercial Vehicle Operations	Participate in roadside vehicle inspection for law and regulations enforcement.	Existing
			Exchange safety and/or security information with other agencies.	Existing
			Operate PrePass, weight-in-motion scales, and other roadside inspection equipment through the state for law and regulations enforcement.	Existing
		Emergency Management	Operate a statewide communication and dispatching center in Salina. Provide emergency calls taking and dispatching state patrol vehicles. Communicate with KDOT's District, Area, or Sub-Area offices when KDOT personnel, equipment, or materials are needed to support incident management and response to emergency calls.	Existing
			Coordinate emergency response with local emergency management agencies, public safety agencies, and/or transportation agencies.	Existing
			Support disaster response and recovery, and disaster evacuation.	Existing
			Provide disaster-related information to the public.	Existing
		Incident Management	Routinely patrol major roadways including interstates, US highways, state highways and secondary county roads, and enforce motor vehicle laws.	Existing
			Receive emergency calls for incidents within the jurisdiction area and dispatch state patrol vehicles responding to emergency calls.	Existing
			Dispatch Private Towing Companies contracted with the KHP and KTA for vehicles traveling along Kansas interstate highways that require towing.	Existing
			Coordinate incident response with KDOT and local emergency management agencies, public safety agencies, and/or transportation agencies, including road closure.	Existing
			Provide motorists assistance service to travelers.	Existing
		Traveler Information	Observe winter road conditions on Interstates, US highways, and major state highways and report to KDOT field offices.	Existing
26	Kansas Motor Carrier Association (KMCA)	Commercial Vehicles Operations	KCMA serves and promotes the trucking and transportation industry in Kansas. KCMA helps to coordinate weight-in-motion station regulations.	Existing
			Operate in association with the American Trucking Association (ATA) a system for distributing road-related information to truck companies via email and fax.	Existing

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
27	Kansas Scenic Byways Program	Traveler Information	Identify and designate scenic roadways for the enjoyment of the traveling public in Kansas to increase tourism and educate the traveling public about environment, history and culture.	Existing
28	Kansas Turnpike Authority (KTA)	Traveler Information	Provide weather information, traffic alerts and advisories, toll schedules, and construction information via Internet.	Existing
			Input road surface conditions to the KDOT's KanRoad.	Existing
			Provide construction information to the KDOT's KanRoad.	Planned
			Disseminate road information to travelers via travel advisory radios (TARs) along the Kansas Turnpike.	Existing
		Maintenance and Construction Management	Operate portable DMS to direct traffic for special events, and maintenance and construction. Permanent DMSs are planned.	Existing/Planned
		Emergency Management	Operate portable and permanent DMS (planned) to direct traffic for AMBER Alert.	Existing/Planned
		Incident Management	Operate portable and permanent DMS (planned) to direct traffic for incident management along the corridor.	Existing/Planned
		Traffic Management	Operate security traffic cameras primarily located at toll plazas for toll enforcement.	Existing/Planned
		Electronic Toll Collection	Operate the multifunction Kansas Turnpike Authority (KTA) operation center located in Wichita. Manage the toll collection process on the Turnpike.	Existing
29	Neighboring States, including Missouri, Nebraska, Colorado, and Oklahoma	Traffic Management	Exchange traffic related information with KDOT.	Existing
			Share CCTV images with KDOT.	Planned
			Share control of ITS devices with KDOT.	Planned
		Incident Management	Exchange incident and road closure information with KDOT.	Existing
		Maintenance and Construction Management	Share road weather condition information with KDOT.	Existing

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
30	KDOT District/ Area/Sub-area Offices	Emergency Management	Provide resources to support emergency management when requested by emergency agencies.	Existing
			Support disaster response and recovery, and disaster evacuation.	Existing
			Provide disaster-related information to the public.	Existing
			Participate in coordinated emergency response with emergency management agencies, law enforcement agencies, and/or transportation agencies.	Existing
			Operate DMS and HAR for AMBER Alerts and other appropriate emergencies.	Existing
		Incident Management	Perform incident detection and verification through video surveillance.	Existing/Planned
			Provide incident information to local public safety agencies.	Existing
			Provide resources to support incident management when requested by emergency agencies.	Existing
			Coordinate incident response and road closures with local emergency management agencies, public safety agencies, and/or transportation agencies.	Existing
			Operate DMS and HAR for incident management.	Existing/Planned
		Maintenance and Construction Management	Perform maintenance of interstate, state highways and bridges.	Existing
			Dispatch maintenance vehicles for planned activities (road maintenance, snow plowing, etc.) and unplanned incidents within the jurisdiction area.	Existing
			Communicate maintenance and construction schedule and other related information with local agencies.	Existing
			Operate and maintain agency vehicle fleet.	Existing
			Maintain DOT owned ITS roadside equipment such as DMS, HAR, traffic recorders, etc.	Existing/Planned
			Operate automated bridge de-icing system.	Existing
			Operate field devices including sensors, cameras, and/or DMS/HAR for maintenance and construction activities.	Existing
			Operate Computer Aided System for Planning Efficient Routes (CASPER) to re-design network snow service routes and optimize the plowing process.	Planned
			Operate permanent and mobile Weight-in-Motion Stations in conjunction with KMCA, KDOR, KCC, and KHP.	Existing/Planned
			Operate automatic gate closure systems.	Planned
		Traffic Management	Manage and control roadside equipment (including traffic signal system, CCTV, DMS, HAR, detection sensors, and others).	Existing
			Communicate traffic related information to other agencies.	Existing
			Operate portable and permanent DMS across Kansas to direct traffic for special events, maintenance and construction, incident management, and AMBER Alerts.	Existing
			Operate Condition-based Variable Speed Limit Signs.	Planned

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
31	Kansas Highway Patrol Troops-Regional Offices	Commercial Vehicle Operations	Participate in roadside vehicle inspection for law and regulations enforcement.	Existing
			Exchange safety and/or security information with other agencies.	Existing
			Operate PrePass, weight-in-motion scales, and other roadside inspection equipment through the state for law and regulations enforcement.	Existing
		Emergency Management	Communicate with KDOT's District, Area, or Sub-Area offices when KDOT personnel, equipment, or materials are needed to support incident management and response to emergency calls.	Existing
			Coordinate emergency response with local emergency management agencies, public safety agencies, and/or transportation agencies.	Existing
			Support disaster response and recovery, and disaster evacuation.	Existing
			Provide disaster-related information to the public.	Existing
		Incident Management	Routinely patrol major roadways including interstates, US highways, state highways and secondary county roads, and enforce motor vehicle laws.	Existing
			Coordinate incident response with KDOT and local emergency management agencies, public safety agencies, and/or transportation agencies, including road closure.	Existing
			Provide motorists assistance service to travelers.	Existing
		Traveler Information	Observe winter road conditions on Interstates, US highways, and major state highways and report to KDOT field offices.	Existing
32	Kansas Metropolitan Planning Organizations	Archived Data Management	Collect and archive transportation data including traffic counts, accident information, etc.	Existing/Planned
		ITS Architecture Planning and Maintenance	Provide transportation planning and technical assistance services to various agencies within the region, including ITS projects.	Existing
			Coordinate the stakeholders of the Regional ITS Architectures on the architecture implementation.	Existing
			Responsible for the maintenance of the Regional ITS Architectures.	Existing
33	Coordinated Transit Districts	Emergency Management	Support disaster response and recovery, and disaster evacuation.	Existing
		Transit Services	Coordinate various public transportation services within the jurisdiction area.	Existing

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
34	Urban Transit Providers	Transit Services	Provide transit information such as transit routes and schedules, transit transfer options, and transit fares to travelers through the Internet.	Existing
			Operate on-board variable message signs and audible enunciators to provide transit information to travelers.	Existing
			Operate electronic displays at bus stops to disseminate real-time transit information.	Existing
			Dispatch fixed-route and demand responsive transit services throughout urbanized areas using CAD and MDT systems.	Existing
			Operate AVL system to track vehicle location.	Existing/Planned
			Operate transit signal priority system for Bus Rapid Transit (BRT).	Existing
		Incident Management	Operate on-board security cameras, to remotely monitor the vehicles.	Existing/Planned
			Report incident information to public safety agencies.	Existing
		Emergency Management	Support disaster response and recovery, and disaster evacuation.	Existing
		Electronic Toll Collection	Operate electronic fare payment systems.	Existing
35	Rural Transit Providers	Archived Data Management	Operate Central Control Server System for operations & archived data management between DSNWK and RCAT.	Existing
		Transit Services	Operate or plan to operate CAD, MDT and AVL systems.	Existing/Planned
			Provide transit information to travelers through Internet.	Existing
			Dispatch fixed time and demand responsive services within the jurisdiction area.	Existing
		Incident Management	Report incident information to public safety agencies.	Existing
		Emergency Management	Support disaster response and recovery, and disaster evacuation.	Existing
		Electronic Toll Collection	Operate electronic fare payment system.	Planned
36	Counties and Cities	Traveler Information	Maintain websites to disseminate work zone, road closures and restrictions and detours information to the public.	Existing/Planned
			Operate local government cable channels to provide local street construction information, transit information, winter weather advisories and/or other traveler information to cable TV subscribers.	Existing

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
37	County and City 911 Dispatch	Emergency Management	Provide emergency call taking (911) within the city and/or county jurisdiction area and dispatch Sheriff, Police, Fire and EMS services.	Existing
			Coordinate emergency response with local emergency management agencies, public safety agencies, and/or transportation agencies.	Existing
			Support disaster response and recovery evacuations.	Existing
			Provide disaster-related information to the public.	Existing
		Incident Management	Receive emergency calls for incidents within the county and/or city jurisdiction and dispatch Sheriff, Police, Fire and EMS services to incidents.	Existing
			Coordinate incident response with local emergency management agencies, public safety agencies and/or transportation agencies.	Existing
38	County and City Emergency Medical Services	Archived Data Management	Archived data maintenance.	Existing
		Emergency Management	Respond to 911 emergency dispatches	Existing
			Coordinate emergency response with local emergency management agencies, public safety agencies, and/or transportation agencies.	Existing
		Incident Management	Respond to incident dispatch.	Existing
			Coordinates incident response with local emergency management agencies, public safety agencies and/or transportation agencies.	Existing
39	County Engineer Offices	Emergency Management	Provide resources when requested by emergency agency.	Existing
			Coordinate emergency response with local emergency management agencies, public safety agencies, and/or transportation agencies.	Existing
		Incident Management	Perform incident detection and verification using CCTV.	Planned
			Provide incident information to local public safety agencies.	Existing
			Provide resources when requested by emergency agencies.	Existing
			Coordinate incident response with local emergency management agencies, law enforcement agencies, and/or transportation agencies, including road closure.	Existing
		Maintenance and Construction Management	Provide construction management of county roads.	Existing
			Dispatch maintenance vehicles for planned activities (road maintenance, snow plowing, etc.) and unplanned incidents within the jurisdiction area.	Existing
			Provide maintenance on agency vehicle fleet.	Existing
			Communicate maintenance and construction schedule and other related information to local agencies.	Existing
			Operate or plan to operate AVL system to track vehicle/equipment locations.	Existing/Planned

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
40	County Engineer Offices	Traffic Management	Operate roadside equipment including traffic signal system, DMS, detection sensors, CCTV, or others within the county jurisdictions.	Existing/Planned
			Communicate traffic related information to other agencies.	Existing
41	County Emergency Management Agencies	Emergency Management	Operate emergency management center for countywide emergency operations and homeland security practices during major emergencies and disasters.	Existing
			Develop countywide emergency management plan addressing preparation, response, recovery and mitigation actions for all potential risks to the public.	Existing
		Incident Management	Coordinate incident response with emergency management and transportation agencies.	Existing
42	County Sheriff's Offices	Emergency Management	Respond to 911 emergency dispatches.	Existing
			Coordinate emergency response with local emergency management agencies, public safety agencies, and/or transportation agencies.	Existing
			Support disaster response and recovery evacuations.	Existing
			Provide disaster-related information to the public.	Existing
		Incident Management	Respond to incident dispatch	Existing
			Coordinates incident response with local emergency management agencies, public safety agencies and/or transportation agencies.	Existing
43	City Public Works Departments	Emergency Management	Provide resources when requested by emergency agency	Existing
			Coordinate emergency response with local emergency management, public safety, and/or transportation agencies.	Existing
		Incident Management	Perform incident detection and verification for city streets using CCTV.	Planned
			Provide incident information to local public safety agencies.	Existing
			Provide resources when requested by emergency agencies.	Existing
			Coordinate incident response and road closures with local emergency management, law enforcement, and/or transportation agencies.	Existing
		Maintenance and Construction Management	Manage maintenance and construction activities of city roads.	Existing
			Dispatch maintenance vehicles for planned activities (road maintenance, snow plowing, etc.) and unplanned incidents within the jurisdictions.	Existing
			Operate and maintain agency vehicle fleet.	Existing
			Communicate maintenance and construction schedule and other related information to local agencies.	Existing/Planned
			Operate or plan to operate AVL system to track vehicle locations	Existing/Planned
		Traffic Management	Operate traffic signal systems within city jurisdictions.	Existing
			Operate DMS, CCTV, detection sensors, and other roadside equipment.	Existing/Planned
			Communicate traffic related information to other agencies.	Existing

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
44	City Police Departments	Emergency Management	Respond to 911 emergency dispatches.	Existing
			Coordinate emergency response with local emergency management, public safety, and/or transportation agencies.	Existing
			Provide disaster-related information to the public.	Existing
		Incident Management	Respond to incident dispatch	Existing
			Coordinates incident response with local emergency management, public safety, and/or transportation agencies.	Existing
45	City Fire Departments	Emergency Management	Respond to 911 emergency dispatches.	Existing
			Coordinate emergency response with local emergency management, public safety, and/or transportation agencies.	Existing
		Incident Management	Respond to incident dispatch.	Existing
			Coordinates incident response with local emergency management, public safety, and/or transportation agencies.	Existing
46	Kansas Airports	Emergency Management	Coordinates emergency response with local public safety and transportation agencies.	Existing
		Incident Management	Coordinate incident response with local public safety and transportation agencies.	Existing
		Maintenance and Construction Management	Operate and manage airport automated weather stations (AWS).	Existing
			Collect weather condition information and send to NADINE which then sends the information to the National Weather Service and NOAA.	Existing
47	School District Transportation Departments	Incident Management	Report incident information to public safety agencies.	Existing
		Emergency Management	Support disaster response and recovery, and disaster evacuation.	Existing
48	Railroad Companies	Traffic Management	Operate and maintain rail roadside equipment communicating with traffic signal systems or other traffic control devices at highway rail intersections.	Existing
49	Private Trucking Companies	Commercial Vehicle Operations	Own and manage commercial fleets of vehicles equipped with sensory, processing, storage, and communications functions necessary to support safe and efficient commercial vehicle operations.	Existing
50	Private Towing Companies	Incident Management	Respond to incident dispatches.	Existing
51	Private Information Service Providers	Traveler Information	Collect travel-related information from the public sector and private information sources, and broadcast that information to their customers via a variety of user interface equipment.	Existing
52	Media Outlets	Traveler Information	Collect travel-related information from the public sector and private information sources, and broadcast that information to their customers via TV, radio stations, news media, etc.	Existing

Table 4-2. (Continued)

No.	Stakeholder	Transportation Service	Roles/Responsibilities	Status
53	Travelers	Various	Receive travel-related information on various modes of transportation, including surface street, air, rail/transit, and non-motorized.	Existing

5. INVENTORY

The Kansas Statewide ITS Architecture contains ITS systems that have been identified as being implemented or planned within the boundary of the Architecture. The inventory was gathered from a variety of sources. With the assistance from KDOT, extensive stakeholder meetings and surveys was conducted to identify existing and future user needs and ITS inventory. Telephone and e-mail follow-ups were also used to collect additional information and to verify information gathered from document review and stakeholder surveys. The stakeholder survey questionnaire is included in Appendix A.

Figure 5-1 illustrates the locations of key ITS elements that have been deployed or are planned by KDOT.

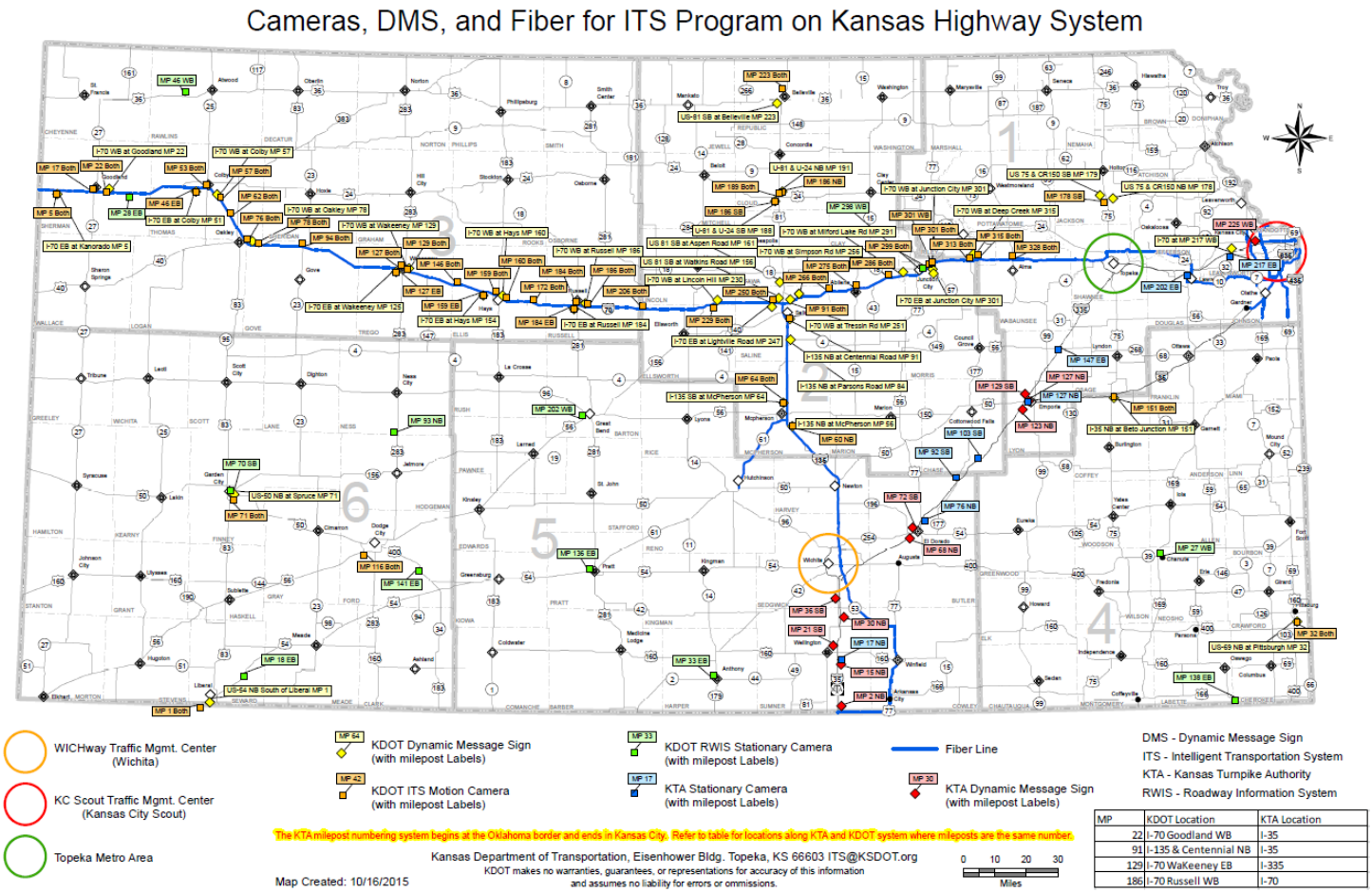


Figure 5-1. ITS Infrastructure in Kansas

Table 5-1 provides a list of ITS systems identified by all stakeholders included in the Architecture, their general descriptions, associated stakeholders that are involved with or responsible for operations and management of the systems, the subsystem(s) and/or terminator(s) they are mapped to in the Statewide ITS Architecture, and their current deployment status. For a system that has multiple stakeholders involved, the stakeholder who is the primary owner of the system or plays a leading role in operating the system is listed on top of the stakeholder list.

Table 5-1. Kansas Statewide ITS Inventory

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
AAA Dispatch Center	The American Automobile Association (AAA) of Kansas operates a dispatch center in Topeka. The center receives calls from AAA members and dispatches AAA-owned and contracted towing services for the entire state except the Kansas City and St. Joseph metropolitan areas. This center utilizes the traveler information that KDOT publishes on the web to inform their members of road conditions and construction information.	AAA	Emergency Management, Information Service Provider	Existing
Airports	Located throughout the state, Kansas airports receive traveler, weather, and construction information from other agencies, and coordinate with emergency management and transit services.	Airports	Emergency Management, Information Service Provider, Traffic Management	Existing
Airports Automated Weather Stations	Weather-related information is transmitted by a combination of land lines, cell phones, radios and LAN/WAN from airport weather stations to a central server located in Topeka. The Information is presented on an Internet site for the public. This weather related information is also ingested into 511 system database.	Airports	Roadway Subsystem	Existing
ATA Highway Information Sharing and Analysis Center	This center is maintained by the American Trucking Association (ATA) and receives reports on potential safety and security threats from truck drivers and construction/maintenance workers who have received the appropriate training. The center then relays the information to the appropriate federal, state and local agencies.	ATA, FMCA, KHP, KDOT	Alerting and Advisory Systems	Existing
Coordinated Transit District Offices	15 Coordinated Transit Districts (CTD) coordinate various public transportation services within the jurisdiction areas. Public and private transit service providers offer demand responsive and fixed-route services to the general public, elderly, disabled, and others within each CTD.	Coordinated Transit Districts	Transit Management	Existing
County and City 911 Dispatch Centers	This element represents local dispatch centers that receive 911 calls, and dispatch the appropriate sheriff, police, fire and EMS within the jurisdiction area via communication system. Dispatch centers exchanges mutual aid and incident information with other local agencies as necessary. Some centers may be equipped with CAD and AVL technologies.	County and City Sheriff, Police, Fire and EMS 911 Dispatch Centers	Emergency Management, Emergency Telecommunica-tions System	Existing
County and City Automated Bridge Anti-/De-icing Systems	This element represents automated bridge anti-/de-icing systems owned and operated by counties and cities in Kansas. The City of Lenexa has two bridge de-icing systems.	Counties and Cities	Roadway Subsystem	Existing
County and City CCTV	This ITS element represents CCTV cameras used to monitor roadway and/or intersections to support traffic management and emergency/incident management.	Counties and Cities	Roadway Subsystem	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
County and City Databases	This element represents databases that maintain and archive Kansas County or City data for a variety of uses and operates similar to a data clearinghouse.	Counties and Cities	Archived Data Management Subsystem	Existing
County and City Emergency Vehicles	Emergency vehicles include ITS equipment that provides the processing, sensory, storage, and communications functions necessary to support safe and efficient emergency response at the county and city level.	County and City Sheriff, Police, Fire and EMS 911 Dispatch Centers	Emergency Vehicle Subsystem	Existing
County and City Maintenance and Construction Vehicles	A collection of maintenance vehicles that that include ITS equipment that provides the processing, sensory, storage, and communications functions necessary to support road maintenance and construction. Vehicles may be equipped or plan to be equipped with ITS components, such as AVL, environmental sensors and vehicle monitoring sensors.	Counties and Cities	Maintenance and Construction Vehicle	Existing
County and City Mobile Speed Monitoring Trailers	Several cities and counties have procured mobile speed monitoring trailers in promoting speed limit compliance.	Counties and Cities	Roadway Subsystem	Existing
County and City Portable DMS	Dynamic Message Signs (DMS) are used to direct traffic for special events, maintenance and construction, and incident management.	Counties and Cities	Roadway Subsystem	Existing
County and City RWIS Stations	Individual Kansas counties and cities own and operate RWIS stations throughout the state. These stations use sensors both mounted in the road surface as well mounted away from the road to determine pavement, subsurface, and ambient temperatures, wind speed and direction, precipitation and relative humidity.	Counties and Cities	Roadway Subsystem	Existing
County and City Traffic Data Collection Equipment	This ITS element represents roadside equipment (e.g. sensors, detectors, traffic recorders, etc.) used to collect traffic flow data.	Counties and Cities	Roadway Subsystem	Existing
County and City Traffic Signal Systems	This element represents traffic signal systems and other roadside equipment used for traffic control and management, and communication of traffic related information with other agencies. Systems may include loop detectors, video detection, and other signal operation equipment used for the control and management of traffic at intersections. Several cities and counties have signal systems that are interconnected and/or coordinated with each other. A few cities and counties also have emergency vehicle signal preemption systems.	Counties and Cities	Roadway Subsystem	Existing
County and City Websites	Websites operated at the county and city level to disseminate work zone, road closures and restrictions and detours information to the public.	Counties and Cities	Information Service Provider	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
County Emergency Operations Centers	Each Kansas county has an emergency operations center (EOC). These EOCs range from minimally equipped, stand-by facilities to centers that operate on a daily basis. The EOCs operate for emergency operations and homeland security practices during emergencies and disasters.	County Emergency Management Agencies	Emergency Management	Existing
County Engineering and City Public Works Offices	This element represents county and city Public Works departments that perform the maintenance and construction activity including planned activities (road maintenance, snow plowing, etc.) and unplanned incidents within the jurisdiction area, and communicate maintenance and construction schedules and other related information to other agencies.	Counties and Cities	Traffic Management, Maintenance and Construction Management	Existing
County Sheriff and City Police Offices	This element represents local law enforcement agencies throughout the state of Kansas.	Counties and Cities	Emergency Management, Enforcement Agency	Existing
CVO Information Requestor	This terminator represents any organization requesting information from the Kansas CVIEW-Plus. It typically represents insurance companies requesting safety information on carriers etc.	KHP, KCC, KDOR	CVO Information Requestor	Existing
Driver	Represents drivers along Kansas roads and highways.	Travelers	Driver	Existing
FMCSA Motor Carrier Management System	This is a central repository of data on motor carriers operated and maintained by the Federal Motor Carrier Safety Administration (FMCSA). It includes operational information filed by carriers on the Motor Carrier Identification Report (MCS-150) and safety violation data.	FMCSA	Other CVAS	Existing
FMCSA Safety and Fitness Electronic Records System	The FMCSA SAFER system provide company safety data and related services to industry and the public over the Internet. Users can search FMCSA databases, access the Hazardous and Out of Service rates for Hazmat Permit Registration, and find information about other FMCSA Information Systems. The Kansas Highway Patrol utilizes ASPEN software to record roadside inspections electronically, and upload the information automatically to SAFER.	FMCSA	Other CVAS	Existing
IFTA Clearinghouse	The IFTA Clearinghouse supports the IFTA base state agreement electronically. The Clearinghouse supports exchange of motor carrier and financial information between participating jurisdictions.	IFTA, Inc., KDOR	Other CVAS	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., KDOR	Other CVAS	Existing
IRS	Internal Revenue Service	IRS	Other CVAS	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
ITS Heartland Multistate Corridor Operations and Management Program (MCOMP)	The program will provide real-time rural travel times in the five-state ITS Heartland region to the public and commercial vehicles. A regional ATIS Clearinghouse test will be developed to determine how to best disseminate information. Data will be collected from public and private sources using existing infrastructure and data exchanges.	KDOT, MoDOT, NDOR,ODOT, Iowa DOT	Information Service Provider, Telecommunica-tions System for Traveler Information, Archived Data Management Subsystem	Planned
Kansas Accident Reporting System(KCARS)	This element also represents a statewide database that maintains records on traffic accidents occurring on public roadways. The public can view accidents by certain accident characteristics through the website http://www.ksdot.org/burTransPlan/prodinfo/accista.asp.	KDOT	Archived Data Management Subsystem	Existing
Kansas Commercial Vehicle Administration Legacy Systems	The Kansas Commercial Vehicle Administration Legacy Systems represent the state legacy systems, including the interfaces with and processes for IFTA, IRP, SSRS (Single State Registration System) and oversize/overweight loads. The owners of the systems include KDOT, KDOR and KCC.	KDOR, KDOT, KCC, KHP	Commercial Vehicle Administration	Existing
Kansas Commercial Vehicle Information Exchange Window (CVIEW-Plus	The Commercial Vehicle Information Exchange Window (CVIEW-Plus™) created by Iteris provides an efficient information foundation for support of state-based commercial vehicle operations. It is a query window which checks federal systems to validate carrier requirements. CVIEW-Plus™ has been certified by the Federal Motor Carrier Safety Administration (FMCSA) as CVISN compliant and has been deployed in Kansas and numerous other states.	KHP, KDOT, KDOR	Commercial Vehicle Administration	Existing
Kansas Traffic Records System	The Kansas Traffic Records System supports data improvements at all levels of government that minimize duplication, improve uniformity, advances electronic data collection, and facilitate data access and use.	Kansas TRCC	Archived Data Management Subsystem	Existing
Kansas Travel and Tourism	Disseminate travel and tourism information to travelers via the Internet.	Kansas Department of Wildlife, Parks & Tourism	Information Service Provider, Traffic Management	Existing
Kansas Travel and Tourism TravelKS.com	TravelKS.com is a database and web portal for information on attractions, traveler information, and events happening in the state of Kansas. Integration with Wi-Fi portals at rest areas has been planned for future deployment.	Kansas Department of Wildlife, Parks & Tourism	Archived Data Management Subsystem, Information Service Provider	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
KBI AMBER Alert System	KDOT participates in the Kansas AMBER Alert program by using its traveler information systems to assist the Kansas Bureau of Investigation (KBI) in the dissemination of child abduction information. The KanDrive website has a link to the Kansas AMBER Alert website, and Kansas 511 features an alert system that enables it to broadcast AMBER Alert information as needed. AMBER Alert messages are also placed on Dynamic Message Signs (DMS) across the state and disseminated to traffic operations centers (TOCs) such as Kansas City Scout. KDOT's future plans call for improving the efficiency of information dissemination by automating the communication of AMBER Alerts to 511, websites, and TOCs.	KBI	Emergency Management, Alerting and Advisory Systems	Existing
KC Scout Operations Center	Located in Lee's Summit, Missouri, the Kansas City Scout Traffic Management Center (TMC) manages 160 miles of the highway system in the bi-state Kansas City metropolitan area. The TMC manages and operates CCTV, DMS and other roadside equipment for traffic control and management. Traveler information is available to the public on the KC Scout website www.kcscout.net, along with IOS and Android mobile applications. The center communicates with the KHP Salina central dispatch for incidents and local Public Safety Answering Points (PSAPs) depending on the location of the incident, along with providing back-up support for all Kansas statewide ITS devices.	MoDOT, KDOT, KHP, KTA	Traffic Management, Other Traffic Management	Existing
KCC Motor Carrier Database	This database is provided through the Kansas Corporation Commission (KCC) website as part of an ongoing project to display motor carrier information in the state Kansas.	KCC	Archived Data Management Subsystem	Existing
KDEM Alternate State Emergency Operations Center	KDEM has an alternate SEOC at the Nickell Armory on the state defense building complex in Topeka, Armed Forces Reserve Center at Forbes Field in Topeka, and at Crisis City in Salina.	KDEM	Emergency Management	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
KDEM National Warning System	The SEOC is equipped with NAWAS capabilities. NAWAS is an automated telephone system used to disseminate warning information concerning natural and technological incidents/disasters to United States-based Federal, State, and Local levels of government. NAWAS is operated by FEMA. NAWAS has major terminals at each State Emergency Operations Center/State Emergency Management facility. Other secondary terminals include other state agencies, National Weather Service field offices, and public safety answering points (PSAPs). NAWAS phone instruments are designed to provide protection for lightning strikes, so they may be used during storms. KDEM tests NAWAS capabilities with local jurisdictions that have NAWAS capabilities monthly. If KDEM is unable to make contact with a local jurisdiction during the monthly tests, contact will be made with the jurisdiction to ensure that their NAWAS telephone system is operating properly. If additional action is required KDEM and/or the jurisdiction will contact the FEMA NAWAS Coordinator and/or their telephone service provider to further troubleshoot the issue.	KDEM, KDOT, KHP	Alerting and Advisory Systems	Existing
KDEM State Emergency Operations Center	Located in Topeka, the Kansas State Emergency Operations Center (SEOC) is operated by the Kansas Division of Emergency Management (KDEM). The SEOC provides logistical support and resources to county-level EOC's during local emergencies and helps coordinate response. In the event of a declaration from the governor, KDEM directs and coordinates other agencies as needed to initiate and complete the emergency response. During a national emergency, the SEOC helps disseminate information and coordinate resources. KDOT may be asked to provide personnel and equipment resources when transportation, communication, or public works facilities are impacted by an emergency or disaster.	KDEM	Emergency Management	Existing
KDEM Web Emergency Operations Center	This is an Internet-based software program that posts information from multiple agencies during an emergency, and is used by state and county governments to assist with coordinating response to wide-spread emergencies. The software program includes modules for emergency contacts, personnel resources and equipment resources, and also has capability to monitor equipment locations by means of a Geographic Information Systems (GIS) interface.	KDEM	Emergency Management	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
KDOT 511 Telephone Information System	The KDOT 511 telephone information system provides real time traveler information including road conditions, construction detours, and travel weather information for the Kansas Turnpike and the Interstate, U.S., or state highways in Kansas and Nebraska. The 511 system features an alert system that enables it to broadcast AMBER Alerts and General Transportation and Homeland Security Alerts as needed. The system can also be accessed by calling 1-866-511-KDOT (5368).	KDOT, KTA	Information Service Provider, Telecommunica-tions System for Traveler Information	Existing
KDOT CCTV	CCTV monitors traffic conditions on roadways to assist in incident management and emergency management. The camera images are available to the public via the KanDrive website.	KDOT	Roadway Subsystem	Existing
KDOT Condition-based Variable Speed Limit Sign System Field Equipment	Field equipment for the Condition-based variable speed limit sign system would require CCTV, car separation sensors, information processing software, DMS, and communications. Laws for variable speed limits have not been established. KDOT has made no decision to pursue variable speed limits.	KDOT	Roadway Subsystem	Planned
KDOT Connected Vehicles	This element represents vehicles capable of communicating with other connected vehicles and roadside equipment that supports vehicle-to-infrastructure (V2I) communications. This includes all modes of connected vehicles (i.e. transit, commercial, private, etc.)	KDOT, KHP, Travelers	Vehicle Subsystem	Planned
KDOT District Maintenance and Construction Management Systems	KDOT Field offices coordinate the maintenance and construction activity for KDOT including planned field activities (road maintenance, construction projects, snow plowing, etc.) and unplanned incident response within the jurisdiction area, and communicate maintenance and construction schedules and other related information to other agencies and the public. KDOT has maintenance and construction systems that store construction inspections and routine maintenance related information. This information is used to document activities performed and provide assistance in decision making by managers. This element also represents the district operations offices for operating traffic control devices and implementing traffic management and operations strategies.	KDOT	Traffic Management, Maintenance and Construction Management	Existing
KDOT Dynamic Message Signs	Portable and permanent Dynamic Message Signs (DMS) are used to direct traffic for special events, maintenance and construction, incident management, AMBER Alerts, and transportation and national emergencies.	KDOT	Roadway Subsystem	Existing
KDOT Highway Advisory Radio	Highway Advisory Radio (HAR) disseminates information to travelers via radio systems. KDOT Districts 5 and 6 have portable HAR units.	KDOT	Roadway Subsystem	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
KDOT ITS Archive	This element represents KDOT ITS archiving system that collects and stores traffic data, incident data, emergency data, TMC data, and other future data from emerging technology such as connected vehicles. The data can be used for planning, research and analysis.	KDOT	Archived Data Management Subsystem	Planned
KDOT KanDrive Traveler Information Website	The KanDrive Traveler Information Website provides real time travel information including weather-related road conditions and construction/maintenance work zones and detours, DMS messages and CCTV snapshots. The information covers each of the six KDOT districts and the Kansas City, Topeka, and Wichita metropolitan areas. Road conditions for the Kansas Turnpike are also provided. The KanDrive website provides a link to the Kansas AMBER Alert website, neighboring state's websites and other traveler information sites. The website address is: http://kandrive.org/.	KDOT, KTA	Information Service Provider	Existing
KDOT KanPlan	The website provides a one stop shop for KDOT maps, apps and data, the ability to map, enrich and perform analysis on your business data and to collaborate and share information with groups inside and outside KDOT in a safe and secure environment. One of the elements is a GIS database of KDOT assets such as ITS infrastructure.	KDOT	Archived Data Management Subsystem	Existing
KDOT KanRoad Reporting System	KANROAD is web-based RCRS application that allows multiple users, primarily KDOT and KTA personnel, to enter information about construction work zones, maintenance work zones, detours, weather-related road conditions and other hazards into a reporting system. Data gathered by the KANROAD is then provided to the KDOT public website and the 511 phone system for public use.	KDOT, KTA	Archived Data Management Subsystem, Information Service Provider	Existing
KDOT Maintenance and Construction Vehicles	This is a collection of maintenance and construction vehicles that utilize ITS equipment that provides the sensory functions necessary to support maintenance and construction. AVL and on-board environmental sensors are planned to track vehicle locations and monitor roadway conditions. Statewide expansion of AVL use and integration of maintenance vehicles with RWIS has been planned. It is planned to install an AVL system on all KDOT paint trucks. In following the KHP AVL model, the KDOT AVL system will use GPS receivers integrated with the 800 MHz radio system.	KDOT	Maintenance and Construction Vehicle	Planned
KDOT Mobile Speed Monitoring Trailers	KDOT all Districts have mobile speed monitoring trailers providing a pro-active approach to speed limit compliance and traffic enforcement.	KDOT	Roadway Subsystem	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
KDOT Rail-Highway Intersection (HRI) ITS System	This system includes a combination of ITS technologies for HRIs, including detectors, digital data communications, railway transponders, train location systems, electronic warning signs, radio, and wireless transmitters to improve safety, efficiency, productivity, control, and communication. The locations and technologies to be deployed will be studied and determined in the future.	KDOT	Roadway Subsystem	Existing
KDOT Railroad Wayside Horn System (WHS)	This system is currently in place on two railroad corridors in Kansas. WHS provides audible train horn warning directed toward the approaching roadway and activated by the train detection circuitry. It also allows the locomotive operator to use the on-board locomotive horns not only when they sense an emergency situation, like trespassers on or near the tracks but also to announce the train approaching a crossing or intersection. This system is also being investigated by several communities in Kansas as an allowable safety measure to help accomplish Railroad Quiet Zones.	KDOT	Roadway Subsystem	Existing
KDOT Rest Area Kiosks	KDOT has planned to install kiosks at rest areas to provide travel information.	KDOT	Remote Traveler Support	Planned
KDOT Rest Area Weather Radio Equipment	This system broadcasts weather information from the NOAA Weather Radio to travelers at KDOT rest areas.	KDOT, NOAA, Meridian	Remote Traveler Support	Existing
KDOT Rest Area Wi-Fi	As a one-year pilot project, KDOT installed wireless access points at four rest areas (Paxico on I-70, Goodland on I-70, Williamsburg on I-35, and Greenwood County on US 400) to allow travelers to connect Internet and obtain traveler information such as weather, road conditions and construction/maintenance work zones and detours in Kansas and surrounding states. The public will have the option to access the internet for other services. Upon successful completion of the pilot project, the Wi-Fi service will be extended to all rest areas of Kansas. KDOT can have access to the wireless bandwidth for the connection of Kiosks at rest areas. Kiosks will provide non-interactive travel information as an alternative to internet access.	KDOT	Personal Information Access	Existing
KDOT Roadside Equipment for Connected Vehicles	This element represents future equipment located along KDOT roadways that supports connected vehicle safety and mobility applications, The equipment will support communication between roadside devices and connected vehicles	KDOT	Roadway Subsystem	Planned

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
KDOT RWIS Central Service (Hosted Off Site)	Weather-related information is transmitted by a combination of cell phones from weather stations to a central server hosted by Schneider Electric. The information is presented on Website for KDOT use as well as a KDOT Internet site for the public, http://kdotapp.ksdot.org/RWIS_Map/Map.aspx. KDOT owns and operates 43 RWIS stations located throughout the state. The KDOT RWIS also leverages other Kansas RWIS assets by integrating information from 10 additional weather stations owned by the KTA. It uses sensors both mounted in the road surface as well as mounted away from the road to determine pavement temperature, subsurface temperature, ambient air temperature, wind speed, wind direction, pavement wet/dry, precipitation, and relative humidity.	KDOT	Maintenance and Construction Management	Existing
KDOT RWIS Stations	KDOT owns and operates 43 RWIS stations located throughout the state and integrates information from 10 additional weather stations owned by the KTA. It uses sensors both mounted in the road surface as well as mounted away from the road to determine pavement temperature, subsurface temperature, ambient temperature, wind speed, wind direction, pavement wet/dry, precipitation, and relative humidity.	KDOT	Roadway Subsystem	Existing
KDOT Smart Work Zones	Smart Work Zones are individually designed systems that relay real-time driver information using portable message boards, radar traffic sensors, CCTV cameras, and variable speed limit trailers in combination with a computer based control system to manage and assimilate all necessary inputs and then determine the appropriate output information. Safety and mobility improvements through work zone areas are the ultimate goals of each Smart Work Zone set-up.	KDOT	Roadway Subsystem	Existing
KDOT Snow Route Design Optimization System	This system will be used by KDOT District Offices to re-design network snow service routes to optimize the plowing process. System could be enhanced to form a master system enabling the planning, management, and scheduling of other road maintenance activities such as striping.	KDOT	Maintenance and Construction Management	Planned

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
KDOT Statewide Virtual TMC	The virtual Statewide Traffic Management Center (TMC) allows for immediate and real-time operation of ITS devices from both the local and statewide level. The ATMS software is located on a central server in Topeka and can be accessed by district staff in multiple locations throughout the state and by headquarters staff in Topeka to manage and operate CCTV, DMS and other roadside equipment to improve the efficiency of the transportation system. The software is used to provide traveler information including DMS messages and CCTV snapshots to the public via data feeds to the KanDrive website.	KDOT, KC Scout, WICHway, KHP, KTA	Traffic Management, Other Traffic Management	Existing
KDOT Traffic Detection and Data Collection Equipment	This element represents roadside equipment (e.g. sensors, detectors, traffic recorders, etc.) used to collect traffic flow data. Weigh in motion equipment is also used to collect traffic data. Communications methods include fiber, radio, and cellular.	KDOT	Roadway Subsystem	Existing
KDOT Traffic Signal Systems	This element represents traffic signal systems and other roadside equipment used for traffic control and management, and communication of traffic related information with other agencies. Systems may include loop detectors, video detection, and other signal operation equipment used for the control and management of traffic at intersections. Signal systems may be interconnected and/or coordinated with each other. Emergency vehicle signal preemption may be existing or planned. Generally systems are operated and/or maintained by Cities.	KDOT	Roadway Subsystem	Existing
KDOT Transportation Database (CANSYS)	This element represents a statewide database that collects and archives transportation data including traffic volumes among other data.	KDOT	Archived Data Management Subsystem	Existing
KDOT Truck Parking Information and Management System	KDOT's Truck Parking Information and Management System (TPIMS) consists of CCTV cameras or detectors, roadside DMS, and central system software. Existing DMS located upstream of designated truck parking locations will be integrated with the TPIMS for information dissemination. Parking availability information will be collected via CCTV cameras or detectors, and the information will be disseminated to truck drivers via DMS, KanDrive/511 website, and smart phone applications. The system will include information about parking along I-70 and I-135 in Kansas. The system will include a common Application Programming Interface (API) to facilitate exchanges of parking availability information between other MAASTO partners and private information providers.	KDOT	Parking Management Subsystem	Planned

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
KDOT Truck Routing Intelligent Permitting System (K-TRIPS)	K-TRIPS is a GIS based routing and bridge analysis system for oversize/overweight permits. The initial phases of deployment provided the necessary information electronically to the permit clerk for routing any permit load. K-TRIPS replaced paper maps used to verify routes.	KDOT, KDOR, KHP	Commercial Vehicle Administration	Existing
KDOT Wichita TMC	The Wichita Traffic Management Center (TMC) is located in the Sedgwick County 911 facility, and allows for co-location of transportation and emergency dispatch. The center provides travel information to the public via WICHway website. The center communicates transportation related information to other agencies and utilizes ATMS software to monitor traffic and post messages to DMS to improve the efficiency of the transportation system.	KDOT, KTA, KHP, Counties and Cities	Traffic Management, Other Traffic Management	Existing
KDOT Work Zone Intrusion Detection System	This element represents field devices that detect vehicle intrusions in work zones and warns crew workers and drivers of imminent encroachment.	KDOT	Roadway Subsystem	Planned
KHP *47	The KHP Communications Center receives incident/emergency calls from travelers who dial *47 (HP) or the listed KHP telephone number.	KHP	Emergency Telecommunica-tions System, Emergency Management	Existing
KHP Communications Center	The KHP operates a statewide central call taking and dispatching center in Salina. The center receives incident/emergency calls from travelers who dial *47 (HP) or the listed KHP telephone number. The center also receives calls related to state highway incidents and emergencies which are transferred by county Public Safety Answering Points (PSAPs). The center dispatches the full range of emergency medical, towing and other incident response personnel. KHP communicates with KDOT's District, Area, or Sub-Area offices when KDOT personnel, equipment, or materials are needed to support incident management and/or clearance.	KHP	Emergency Management	Existing
KHP Database	This element represents KHP archive for emergency and accident data. KHP plans to enhance the data management system to provide general query and reporting functions and advanced data analysis.	KHP	Archived Data Management Subsystem	Existing
KHP Field Troops	KHP Troop Commands are responsible for incident and emergency management and enforcement of Kansas Interstate highways. Eight Troop Commands serve the East, Central, West regions throughout the state, and the Kansas Turnpike Troop G.	KHP	Emergency Management	Existing
KHP Motor Carrier Inspectors	Motor Carrier Inspectors perform roadside inspections, and enforce state laws and federal regulations that promote the safe operation of commercial motor vehicles. Motor Carrier Inspectors work at established scale houses throughout the state, and MCI Law Enforcement Officers are provided agency-owned vehicles to conduct mobile inspections.	KHP	CVO Inspector, Enforcement Agency	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
KHP Motorist Assistance Patrol Vehicles	These are emergency patrol vehicles that assist motorists in emergency situations while also detecting incidents that may cause delays to motorists. The KHP vehicles provide rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. Incident information is collected by the motorist assistance patrol vehicles, reported back to the KHP dispatch, and then shared with traffic, maintenance & construction. The Motorist Assistance Patrol Program provided services in Kansas City, Topeka, Salina and Wichita areas.	KHP Interstate Troops	Emergency Vehicle Subsystem	Existing
KHP Road Status System	This system reports road conditions three times a day on a routine basis, and more frequently if the status of the road changes. KHP Central Communications sends the Road Report using the KANS.NOAA message key to Kansas Criminal Justice Information System (KCJIS) Message Switch. Road Report is broadcast to KCJIS using the NWSSWI broadcast code. Road Report is sent to NWS Central Region Headquarters (CRH) via FTP. CRH puts the report into the NOAA weather wire service. Satellite receiver for NOAA weather wire service transmits the report to News Media and other subscribers to the NOAA weather wire. General public users can get road reports at: http://www.weather.gov/view/prodsByState.php?state=KS&prodtype=public	KHP	Information Service Provider, Telecommunica-tions System for Traveler Information, Archived Data Management Subsystem	Existing
KHP Scales and Weigh Stations	Weigh stations and scales in Kansas.	KHP	Commercial Vehicle Check	Existing
KHP Security Monitoring Field Equipment	KHP owns and operates field equipment in and around KHP facilities for the purposes of security monitoring.	KHP	Security Monitoring Subsystem	Existing
KHP Troop G	Troop G patrols the Turnpike 24 hours a day. While covering the 236.6 miles and 11 counties between the Oklahoma border south of Wellington and Kansas City, Troop G also provides security at the interchange and service areas, deals with unpaid tolls, and performs special projects for the Kansas Turnpike Authority (KTA), which contracts with the Patrol for Troop G's services. Troop G has its own dispatch center, which communicates with the Patrol, the toll plazas, and KTA maintenance personnel. These dispatchers are also responsible for reporting weather conditions and monitoring security systems.	KHP Troop G	Emergency Management, Enforcement Agency	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
KHP Troop G Motorist Assist Vehicles	KHP Troop G Motorist Assist Vehicles aid motorists along the Kansas Turnpike when assistance is needed while also detecting incidents that may cause delays to motorists. Similar to KHP motorist assistance patrol vehicles, they provide rapid response to minor incidents, report incident information back to dispatch, and share the incident information with traffic, maintenance & construction. Motorist assistance patrol vehicles look for motorists in need while patrolling and are also dispatched by KTA dispatchers when a call is received receive calls from motorists who dial *582 (*KTA).	KHP Troop G	Vehicle Subsystem	Existing
KHP Weigh-in-Motion Stations	KDOT owns 10 permanent and 3 mobile weigh-in-motion (WIM) stations throughout the state that are operated by KHP. The WIM stations are designed to measure truck weights and axle configuration for enforcing law and regulations. A mainline WIM system is planned on US 69. This planned system will allow KHP to remotely monitor commercial vehicle compliance. When an overweight truck is detected by the system, 10 alarms will be sent to the nearby KHP dispatch/trooper to alert them of the violation.	KDOT, KHP	Commercial Vehicle Check	Existing
KMCA Information Exchange Center	In association with the American Trucking Association (ATA), the Kansas Motor Carriers Association (KMCA) has developed a system for distributing road-related information to member trucking companies via e-mail and broadcast fax.	KMCA	Information Service Provider	Existing
KTA *582	The KTA Operations Center receives call from the public who dial *582 (*KTA) which is an automated number for motorists using their cell phones to call in traffic incidents along the Kansas Turnpike and also using social media to communicated road way issues, both schedule and non-scheduled events.	KTA	Emergency Telecommunica-tions System	Existing
KTA CCTV	CCTV cameras used to monitor traffic conditions on roadways where maintenance, construction, and utility work activities are underway only at Toll Plaza and selected locations.	KTA	Roadway Subsystem	Existing
KTA Database	The database stores traffic, maintenance and construction, and accident/incident data. The system has the capability of performing general query and reporting functions. It can also perform advanced data analysis.	KTA	Archived Data Management Subsystem	Existing
KTA Dynamic Message Signs	Permanent and Portable DMSs are used to direct traffic for special events, maintenance and construction, incident management, and AMBER Alerts.	KTA	Roadway Subsystem	Existing
KTA K-Tag Roadside Equipment	Roadside equipment that recognizes K-Tag Electronic Tags attached on the inside of vehicle windshields traveling along the Kansas Turnpike. Also, reading Oklahoma electronic tags in coordination with other states.	KTA	Toll Collection	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
KTA Maintenance and Construction Vehicles	A collection of maintenance vehicles that are utilized to support road maintenance, such as snow plow trucks, salt/sand trucks, and road repair trucks for the Kansas Turnpike Authority. These vehicles support communications with the KTA operations center to receive information and instructions that are provided to vehicle operators. AVL system and automated vehicle maintenance scheduling system may be planned.	KTA	Maintenance and Construction Vehicle	Existing
KTA Operations Center	Located in Wichita, the Kansas Turnpike Authority (KTA) operations center manages the toll collection process on the Kansas Turnpike. The center also receives call from KHP Salina central dispatch (transferring 911 calls) and from the public who dial *582 (*KTA) which is an automated number for motorists using their cell phones to call in traffic incidents along the Kansas Turnpike. The KTA center dispatches KHP Troop G and KTA's maintenance, as well as emergency and towing services as necessary. The KTA center also communicates with KDOT's RCRS by providing up to date road and road surface conditions. The center operates a Traveler Advisory Radio system along the route to disseminate motorist information and has deployed variable message signs along the Turnpike.	KTA	Emergency Management, Information Service Provider, Toll Administration, Traffic Management, Maintenance and Construction Management	Existing
KTA RWIS Stations	KTA owns and operates RWIS Stations along the Kansas Turnpike. The sensors are mounted in the road surface as well as mounted away from the road to determine pavement temperature, subsurface temperature, ambient temperature, wind speed, wind direction, pavement wet/dry, precipitation, and relative humidity.	KTA, KDOT	Roadway Subsystem	Existing
KTA Security/Traffic Cameras	These cameras are primarily located at toll plazas for toll enforcement.	KTA	Security Monitoring Subsystem	Existing
KTA Service Area Kiosks	KTA has kiosks in their service areas to provide travel information to motorists traveling along the Kansas Turnpike.	KTA	Remote Traveler Support	Existing
KTA Travel Information Website	The KTA Travel Information website provides weather information, traffic alerts and advisories, toll schedules, and construction information to users planning to travel along the Kansas Turnpike.	KTA	Information Service Provider	Existing
Media	This element 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.	Media Outlets	Media	Existing
MPO Databases	This element represents databases for various information and data collected and distributed by MPOs.	Kansas Metropolitan Planning Organizations	Other Archives	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
National Weather Service	The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life.	NOAA	Weather Service	Existing
ODOT Traffic Management System	This element represents the traffic management system operated by the Oklahoma DOT (ODOT). ODOT is interested in sharing the operations of the system with KDOT.	State of Oklahoma	Other Traffic Management	Existing
Operation Greenlight	Operation Green Light is a cooperative effort to improve the coordination of traffic signals and incident response on major routes throughout the Kansas City area on both sides of the state line.	Mid-America Regional Council	Traffic Management, Emissions Management	Existing
Other States Truck Parking Information and Management Systems	This element represents the Truck Parking Information and Management Systems (TPIMS) in other MAASTO states that exchange parking information with the KDOT TPIMS. Other MAASTO states that plan to deploy TPIMS including Indiana, Iowa, Kentucky, Michigan, Minnesota, Ohio and Wisconsin.	MAASTO	Parking Management Subsystem, Other Parking	Planned
Preclearance System	The PrePass System in Kansas is offered through a partnership of the Kansas Corporation Commission (KCC), Kansas Department of Revenue (KDOR), the Information Networks of Kansas Inc., and KDOT. PrePass is an automatic vehicle identification system that allows participating transponder-equipped commercial vehicles to bypass designated weigh stations and port-of-entry facilities across the United States. Passes and permits are available through Kansas Trucking Connection" by phone or on the website at http://www.truckingks.org/. A small percentage of trucks are randomly pulled in as samples for pass verification. Drivewyze preclearance technology has been implemented at KHP scale facilities. This technology complements PrePass providing carriers a second option to bypass scales based upon predetermined law enforcement practices rules and regulations.	KDOT, KDOR, KCC, INK, Inc.	Commercial Vehicle Check	Existing
Private Towing Companies	Private companies that contract with KDOT, KHP, KTA, and Kansas Counties and Cities for vehicle towing services.	Private Towing Companies	Other Emergency Management	Existing
Private Towing Company Vehicles	Private Towing Companies contract with KDOT, KHP, KTA, and Kansas Counties and Cities for vehicles traveling along Kansas interstate highways that require towing. Towing companies are dispatched by either the Kansas Highway Patrol or the Kansas Turnpike Authority Troop G Dispatch office depending on where towing services are required.	Private Towing Companies	Emergency Vehicle Subsystem	Existing
Private Trucking Companies	Private trucking companies represent those companies that own and manage their own commercial fleets of vehicles traveling through the state of Kansas.	Private Trucking Companies	Fleet and Freight Management	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
Private Trucking Companies Commercial Vehicles	This ITS element represents commercial vehicles equipped with the sensory, processing, storage, and communications functions to promote the safe and efficient operation of commercial vehicles in the state of Kansas. These vehicles may be equipped with two-way communications allowing commercial vehicle drivers to communicate with their fleet managers, and roadside officials. The vehicle may also have the capability to collect and process vehicle, cargo information from the attached freight equipment, and driver safety data and status and alert the driver whenever there is a potential safety or security problem. Basic identification, security and safety status data may be supplied to inspection facilities at mainline speeds.	Private Trucking Companies	Commercial Vehicle Subsystem	Existing
Rail Operation Wayside Equipment	This element represents rail roadside equipment communicating with traffic signal systems or other traffic control devices at highway-rail intersections.	Railroad Companies	Wayside Equipment	Existing
Rural Transit Central Control Server System Operations and Archived Data Management	The central control server is the component that provides the complete transit system functionality for dispatch reporting and writer information shown by architecture flows among numerous local transit agencies. This element represents the archived data management system that collects and manages operations data from rural transit systems. Data archived may include route and schedule information, AVL data, schedule performance, and vehicle maintenance records.	Rural Transit Providers	Archived Data Management Subsystem	Existing
Rural Transit Systems Kiosks	Kiosks will be installed at major transit stations and stops to disseminate transit related information. Finney County Committee on Aging is interested in such deployment. Other rural transit systems may also deploy similar systems.	Rural Transit Providers	Remote Traveler Support	Planned
Rural Transit Systems Maintenance Facilities	This element represents maintenance facilities that provide advanced maintenance functions for the rural transit providers' property. It collects operational and maintenance data from transit vehicles, manages vehicle service histories, and monitors operators and vehicles.	Rural Transit Providers	Transit Management	Planned
Rural Transit Systems Operations Centers	This element represents operations/dispatch centers of rural transit systems. The centers perform automated dispatch and system monitoring for fixed-route and flexible-route transit services. The centers performs scheduling activities including the creation of schedules, blocks and runs, as well as operator assignment. Several rural transit providers have installed CAD, AVL and MDT on their transit fleets. Such systems will continue expanding to other rural transit systems.	Rural Transit Providers	Emergency Management	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
Rural Transit Systems Security Monitoring System	Security cameras to monitor transit yards and bus stops.	Rural Transit Providers	Remote Traveler Support, Security Monitoring Subsystem	Planned
Rural Transit Systems Transit Vehicles	Rural transit providers have installed CAD, AVL and MDT on their transit fleets. It is planned to expand such systems to other rural transit systems. In addition, fixed cameras are planned to be installed on-board in rural transit areas. A test will be performed on a small number of vehicles.	Rural Transit Providers	Transit Vehicle Subsystem	Existing
Rural Transit Systems Traveler Card	This terminator represents the entity that enables the actual transfer of electronic information from the user of a service (I.e. a traveler) to the provider of the service. This may include the transfer of funds through means of an electronic payment instrument. The device, like a smart card, may also hold and update the traveler's information such as personal profiles or trip histories.	Rural Transit Providers	Traveler Card	Planned
Rural Transit Systems Websites	Provides transit route, schedule, fare, hours of operation and other information on fixed-route and demand responsive service.	Rural Transit Providers	Information Service Provider	Existing
School District Transportation Departments	School District Transportation Departments support emergency and incident management activities within a school district.	School District Transportation Departments	Transit Management	Existing
Special Event Promoters	Special Event Sponsors that have knowledge of events that may impact travel on roadways or other modal means.	Special Event Promoters	Event Promoters	Existing
Surface Transportation Weather Services	Providers of value-added sector specific meteorological services. These providers utilize National Weather Service data and predictions, road condition information and local environmental data to provide weather observations and forecasts.	Private Information Service Providers	Surface Transportation Weather Service	Existing
TPIMS Central Data Repository	This element represents the central data repository for the Truck Parking Information and Management Systems (TPIMS) deployed by the states participated in the TPIMS Initiative. This central data repository gathers and stores parking information from the TPIMS and supports data exchanges among participating states.	MAASTO	Archived Data Management Subsystem	Planned
Traveler	Representing any individual who uses transportation services.	Travelers	Traveler	Existing
Trucking KS	The website maintained by the Kansas Department of Revenue provides commercial vehicle operation and management information, as well as electronic permit application, license renewals, and IRP and IFTA electronic applications. The system includes the processes for accepting and reviewing applications issuing credentials, auditing, and reporting.	KDOR, KDOT, KHP, KCC, KTA	Commercial Vehicle Administration	Existing

Table 5-1. (Continued)

ITS Element	Description	Stakeholder	Subsystems / Terminators	Status
Urban Transit Systems Operations Centers	Transit systems operating in larger urbanized areas of Kansas. These systems include the Kansas City Area Transportation Authority (KCATA), Wichita Transit, Topeka Metropolitan Transit Authority, Flint Hills Area Transit Agency (ATA Bus), and T-Lawrence Transit. The systems dispatch fixed-route and demand responsive transit services throughout urbanized areas. KCATA has deployed CAD, AVL and MDT. KCATA and Wichita Transit have installed electronic fare payment systems. A Bus Rapid Transit (BRT) service, MAX (Metro Area Express), is provided on various routes in Kansas City area including one route in Kansas City, Kansas.	Urban Transit Providers	Other Transit Management	Existing
User Personal Computing Devices	User Personal Computing Devices refers to equipment an individual owns and can personalize with their choices for information about transportation. An Internet-connected computer, smart phones, and tablets are examples.	Travelers	Personal Information Access	Existing
Vehicle	Represents vehicles traveling along Kansas roads and highways.	Travelers	Vehicle, Other Vehicle	Existing

6. USER SERVICES AND SERVICE PACKAGES

The next two steps in the process to develop the Kansas Statewide ITS Architecture are to convert the local/regional/statewide transportation needs and problems into user services and then to select service packages that support the applicable user services.

User services are specific services and benefits that can be offered to users. The user service approach is intended to place the emphasis of discussions about ITS on the development and deployment of useful ITS products and services for a range of defined users to meet specified needs. Thirty-three (33) user services have been defined and developed through the Federal program planning process. These user services form the basis of the user service requirements employed in the development of the National ITS Architecture.

Service packages provide an accessible deployment-oriented perspective to the National ITS Architecture. They are packages tailored to fit, separately or in combination, real-world transportation problems and needs. Service packages address the specific service requirements of traffic managers, transit operators, travelers, and other ITS shareholders.

Once defined, user services together with service packages form a bridge or link between the stated goals, objectives, and transportation deficiencies of a region to development of the regional ITS architecture and implementation strategies.

6.1 User Service Plan

The User Service Plan is the documentation of the process which identified and prioritized the ITS needs throughout the areas covered by the Kansas Statewide ITS Architecture. This plan summarizes the results of data collection, interview and survey efforts and prioritizes transportation needs. This User Service Plan draws from these activities and applies the information gathered to the planning framework established by the National ITS Architecture.

The identification of appropriate user services based on transportation needs is a critical step in the development of the Kansas Statewide ITS Architecture. The national ITS program focuses on the development and deployment of a collection of inter-related User Services. The current list of 33 user services is expected to expand as new ITS applications develop. The services that have been defined are also expected to evolve over time.

6.1.1 Characters of User Services

User services are defined, not along lines of common technologies, but to meet the safety, mobility, comfort and other transportation-related needs of transportation users and providers. User services are closely related to achieving the goals and objectives for ITS and are an integral part of the national ITS architecture.

The 33 user services defined in the National ITS Architecture covering a wide breadth of surface transportation needs. Since many of the user service share common infrastructure elements, such as communications, they have been grouped together into eight “bundles” of services. The services within these bundles may be related in a number of different ways. In some cases, the institutional perspectives of organizations that will deploy the services provided the relational for the formation of a specific bundle. In other cases, bundles were organized around common technical functionalities. Although each user service is unique, they share several common characteristics. User services are:

- **Composed of Multiple Technological Elements** - A single user service will usually depend upon several technologies such as advanced communications, mapping, and surveillance.
- **Building Blocks** - Once the basic technological functions, such as communications or surveillance, have been deployed for one or more user services, the additional functions needed

by related services may entail only a small incremental cost, while producing comparable benefits.

- **Adaptable to Rural, Urban and Suburban Settings** - ITS user services are not specific to a particular location. Rather, the function of the service can be adapted to meet local needs, issues, and conditions.

6.1.2 Identification of User Needs

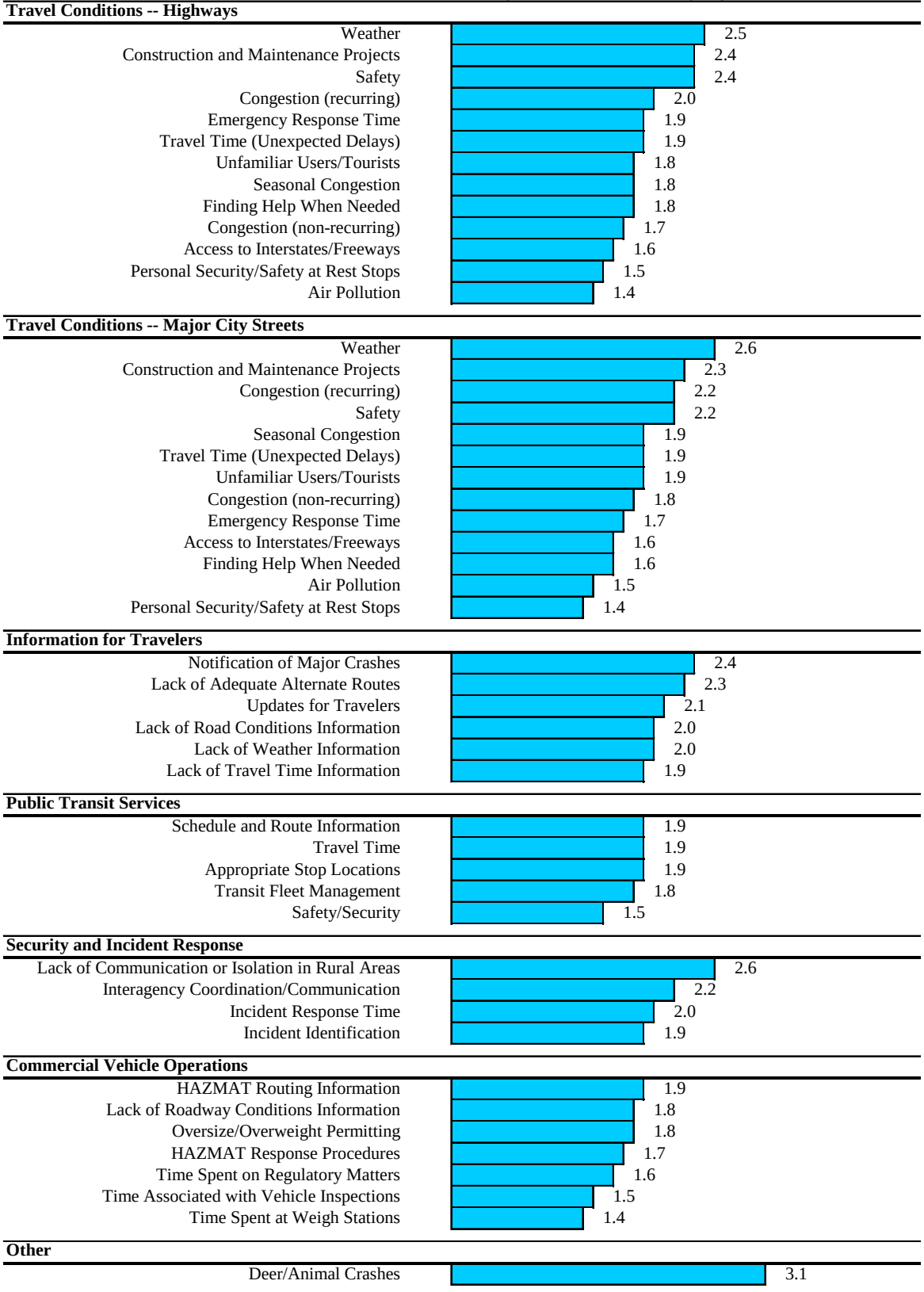
An extensive stakeholder outreach process was conducted as part of the architecture development. The stakeholder outreach process included three main components: workshops, surveys, and in-person and telephone interviews. The outreach activities were intended to identify existing and planned ITS components in the state and solicit input on a wide range of local/regional/statewide issues and problems.

Six stakeholder workshops were held between October 26 and November 3, 2006. The purpose of these workshops was to educate stakeholders on the subjects of ITS and ITS architecture, as well as to identify transportation issues and discuss prospective ITS solutions. Approximately 90 individuals from a variety of federal, state, and local organizations participated in the workshop.

Surveys were distributed to 543 stakeholders throughout the state representing Federal, state and local government agencies, elected officials, planning organizations, private organizations, and universities. Approximately 100 responses were returned. Table 6-1 illustrates the needs and problem areas identified by the stakeholders as a result of the survey.

Table 6-1. Survey Ranking of Issues and Problems

1-Not a Problem 2-Occational Problem 3-General Problem 4-Significant Problem 5-Very Significant Problem



6.1.3 Identification of User Services

Identification of users services for the Kansas Statewide ITS Architecture help to highlight the problems with transportation systems and the associated needs of stakeholders and to assist in selecting service packages which should support the locally applicable user services. Table 6-2 presents the bundling of user services included in the National ITS Architecture. The table also identifies the user services that are applicable to the Kansas Statewide ITS Architecture based upon the information obtained from the ITS inventory, stakeholder surveys, existing planning documents. Among the 21 applicable user services, six user services were identified to be most critical for mitigating transportation problems and issues in respondents' respective jurisdictions according to the stakeholder survey. The top six user services are listed as follows:

- Pre-Trip Information
- En-Route Driver Information
- Emergency Notification and Personal Security
- Incident Management
- Traffic Control
- Maintenance and Construction Operations

Table 6-2. User Service Bundles and User Services

User services applicable to the Kansas Statewide ITS Architecture are in bold.

User Service Bundle	User Service
1. Travel and Traffic Management	**1.1 Pre-Trip Information**
	1.2 En-Route Driver Information
	1.3 Route Guidance
	1.4 Ride Matching and Reservation
	1.5 Traveler Services Information
	1.6 Traffic Control
	1.7 Incident Management
	1.8 Travel Demand Management
	1.9 Emissions Testing and Mitigation
	1.10 Highway Rail Intersection
2. Public Transportation Management	**2.1 Public Transportation Management**
	2.2 En-Route Transit Information
	2.3 Personalized Public Transit
	2.4 Public Travel Security
3. Electronic Payment	**3.1 Electronic Payment Services**
4. Commercial Vehicle Operations	**4.1 Commercial Vehicle Electronic Clearance**
	4.2 Automated Roadside Safety Inspections
	4.3 On-board Safety and Security Monitoring
	4.4 Commercial Vehicle Administration Processes
	4.5 Hazardous Material Security and Incident Response
	4.6 Freight Mobility
5. Emergency Management	**5.1 Emergency Notification and Personal Security**
	5.2 Emergency Vehicle Management
	5.3 Disaster Response and Evacuation
6. Advanced Vehicle Safety Systems	**6.1 Longitudinal Collision Avoidance**
	6.2 Lateral Collision Avoidance
	6.3 Intersection Collision Avoidance
	6.4 Vision Enhancement for Crash Avoidance
	6.5 Safety Readiness
	6.6 Pre-Crash Restraint Deployment
	6.7 Automated Vehicle Operation
7. Information Management	**7.1 Archived Data**
8. Maintenance and Construction Management	**8.1 Maintenance and Construction Operations**

6.2 Service Package Plan

Service packages provide an accessible, deployment-oriented perspective to the National ITS Architecture. They are tailored to fit—separately or in combination—real world transportation problems and needs. Service packages enable transportation planners and decision makers to determine appropriate ITS services that satisfy local and statewide needs. Service packages are comprised of one or more equipment packages that work together to deliver a given transportation service and the architecture flows that connect them and other important external systems.

6.2.1 Mapping User Services to Service Packages

As illustrated in Table 6-3, all 97 service packages in National ITS Architecture (Version 7.1) were considered for their applicability to all 33 user services. The user services, service packages and associated mapping relationships, which are applicable for the Kansas Statewide ITS Architecture, have been identified through the mapping exercise. A complete list of service package definitions can be obtained via the National ITS Architecture website at http://itsarch.iteris.com/itsarch/.

Table 6-3. User Services Mapping to Service Packages

Note: User Services and Service Packages in **Bold** indicated that they are applicable to the Kansas Statewide ITS Architecture.

	Service Packages: The service packages provide an accessible, deployment oriented perspective to the National ITS Architecture. They are tailored to fit - separately or in combination - real world transportation problems and needs. Service packages collect together one or more Equipment Packages that must work together to deliver a given transportation service and the Architecture Flows that connect them and other important external systems. In other words, they identify the pieces of the Physical Architecture that are required to implement a particular transportation service.	**1.1 Pre-Trip Information**	**1.2 En-Route Driver Information**	1.3 Route Guidance	1.4 Ride Matching and Reservation	1.5 Traveler Services Information	**1.6 Traffic Control**	**1.7 Incident Management**	1.8 Travel Demand Management	**1.9 Emissions Testing and Mitigation**	**1.10 Highway Rail Intersection**	**2.1 Public Transportation Management**	**2.2 En-Route Transit Information**	**2.3 Personalized Public Transit**	**2.4 Public Travel Security**	**3.1 Electronic Payment Services**	**4.1 Commercial Vehicle Electronic Clearance**	**4.2 Automated Roadside Safety Inspections**	4.3 On-board Safety and Security Monitoring	**4.4 Commercial Vehicle Administration Processes**	**4.5 Hazardous Material Security and Incident Response**	**4.6 Freight Mobility**	**5.1 Emergency Notification and Personal Security**	**5.2 Emergency Vehicle Management**	**5.3 Disaster Response and Evacuation**	**6.1 Longitudinal Collision Avoidance**	**6.2 Lateral Collision Avoidance**	**6.3 Intersection Collision Avoidance**	6.4 Vision Enhancement for Crash Avoidance	**6.5 Safety Readiness**	**6.6 Pre-Crash Restraint Deployment**	**6.7 Automated Vehicle Operation**	**7.1 Archived Data**	**8.1 Maintenance and Construction Operations**
AD	**ITS Data Mart**																																		x	
AD	**ITS Data Warehouse**																																		x	
AD	**ITS Virtual Data Warehouse**																																		x	
APTS	**Transit Vehicle Tracking**											x			x																				
APTS	**Transit Fixed Route Operations**											x																							
APTS	**Demand Response Transit Operations**											x		x																					
APTS	**Transit Fare Collection Management**								x			x				x																			
APTS	**Transit Security**											x			x								x												
APTS	**Transit Fleet Management**											x																							
APTS	**Multi-Modal Coordination**						x					x																							
APTS	**Transit Traveler Information**											x	x	x		x																			
APTS	Transit Signal Priority						x					x																							
APTS	Transit Passenger Counting											x																							
APTS	Multimodal Connection Protection											x	x																						
ATIS	**Broadcast Traveler Information**	x	x										x																						
ATIS	**Interactive Traveler Information**	x	x		x	x		x					x			x																			
ATIS	Autonomous Route Guidance			x																															
ATIS	Dynamic Route Guidance			x		x																													
ATIS	ISP Based Trip Planning and Route Guidance	x		x																															
ATIS	Transportation Operations Data Sharing						x	x				x				x						x			x									x
ATIS	Travel Services Information and Reservation	x				x										x																			
ATIS	Dynamic Ridesharing				x				x					x																					
ATIS	**In Vehicle Signing**		x									x												x										
ATIS	**Short Range Communications Traveler Information**		x			x	x																		x									x

Table 6-3. (Continued)

Note: User Services and Service Packages in **Bold** indicated that they are applicable to the Kansas Statewide ITS Architecture.

	Service Packages: The service packages provide an accessible, deployment oriented perspective to the National ITS Architecture. They are tailored to fit - separately or in combination - real world transportation problems and needs. Service packages collect together one or more Equipment Packages that must work together to deliver a given transportation service and the Architecture Flows that connect them and other important external systems. In other words, they identify the pieces of the Physical Architecture that are required to implement a particular transportation service.	**1.1 Pre-Trip Information**	**1.2 En-Route Driver Information**	1.3 Route Guidance	1.4 Ride Matching and Reservation	1.5 Traveler Services Information	**1.6 Traffic Control**	**1.7 Incident Management**	1.8 Travel Demand Management	**1.9 Emissions Testing and Mitigation**	**1.10 Highway Rail Intersection**	**2.1 Public Transportation Management**	**2.2 En-Route Transit Information**	**2.3 Personalized Public Transit**	**2.4 Public Travel Security**	**3.1 Electronic Payment Services**	**4.1 Commercial Vehicle Electronic Clearance**	**4.2 Automated Roadside Safety Inspections**	4.3 On-board Safety and Security Monitoring	**4.4 Commercial Vehicle Administration Processes**	**4.5 Hazardous Material Security and Incident Response**	**4.6 Freight Mobility**	**5.1 Emergency Notification and Personal Security**	**5.2 Emergency Vehicle Management**	**5.3 Disaster Response and Evacuation**	**6.1 Longitudinal Collision Avoidance**	**6.2 Lateral Collision Avoidance**	**6.3 Intersection Collision Avoidance**	6.4 Vision Enhancement for Crash Avoidance	**6.5 Safety Readiness**	**6.6 Pre-Crash Restraint Deployment**	**6.7 Automated Vehicle Operation**	**7.1 Archived Data**	**8.1 Maintenance and Construction Operations**
ATMS	**Network Surveillance**						x	x																												
	Traffic Probe Surveillance						x																													
	Traffic Signal Control						x	x			x																									
	Traffic Metering						x	x																												
	HOV Lane Management						x		x																											
	Traffic Information Dissemination		x				x	x																												
	Regional Traffic Management						x																													
	Traffic Incident Management System							x																x	x											
	Transportation Decision Support and Demand Management						x		x																											
	Electronic Toll Collection								x							x																				
	Emissions Monitoring and Management								x	x																											
	Roadside Lighting System Control						x																x													
	Standard Railroad Grade Crossing										x																									
	Advanced Railroad Grade Crossing										x																									
	Railroad Operations Coordination										x																									
	Parking Facility Management		x													x																				
	Regional Parking Management		x						x																											
	Reversible Lane Management						x																													
	Speed Warning and Enforcement						x																													x
	Drawbridge Management						x																													
	Roadway Closure Management						x	x			x										x		x	x	x											
	Variable Speed Limits						x																													
	Dynamic Lane Management and Shoulder Use						x																													
	Dynamic Roadway Warning						x	x																												
	VMT Road User Payment								x							x																				
	Mixed Use Warning Systems						x																													

Table 6-3. (Continued)

Note: User Services and Service Packages in **Bold** indicated that they are applicable to the Kansas Statewide ITS Architecture.

	Service Packages: The service packages provide an accessible, deployment oriented perspective to the National ITS Architecture. They are tailored to fit - separately or in combination - real world transportation problems and needs. Service packages collect together one or more Equipment Packages that must work together to deliver a given transportation service and the Architecture Flows that connect them and other important external systems. In other words, they identify the pieces of the Physical Architecture that are required to implement a particular transportation service.	**1.1 Pre-Trip Information**	**1.2 En-Route Driver Information**	1.3 Route Guidance	1.4 Ride Matching and Reservation	1.5 Traveler Services Information	**1.6 Traffic Control**	**1.7 Incident Management**	1.8 Travel Demand Management	**1.9 Emissions Testing and Mitigation**	**1.10 Highway Rail Intersection**	**2.1 Public Transportation Management**	**2.2 En-Route Transit Information**	**2.3 Personalized Public Transit**	**2.4 Public Travel Security**	**3.1 Electronic Payment Services**	**4.1 Commercial Vehicle Electronic Clearance**	**4.2 Automated Roadside Safety Inspections**	4.3 On-board Safety and Security Monitoring	**4.4 Commercial Vehicle Administration Processes**	**4.5 Hazardous Material Security and Incident Response**	**4.6 Freight Mobility**	**5.1 Emergency Notification and Personal Security**	**5.2 Emergency Vehicle Management**	**5.3 Disaster Response and Evacuation**	**6.1 Longitudinal Collision Avoidance**	**6.2 Lateral Collision Avoidance**	**6.3 Intersection Collision Avoidance**	6.4 Vision Enhancement for Crash Avoidance	**6.5 Safety Readiness**	**6.6 Pre-Crash Restraint Deployment**	**6.7 Automated Vehicle Operation**	**7.1 Archived Data**	**8.1 Maintenance and Construction Operations**
AVSS	**Vehicle Safety Monitoring**																													**x**				
	Driver Safety Monitoring																													x				
	Longitudinal Safety Warning																								**x**					**x**				
	Lateral Safety Warning																									**x**				**x**				
	Intersection Safety Warning																										**x**			**x**				
	Pre-Crash Restraint Deployment																														**x**			
	Driver Visibility Improvement																												x					
	Advanced Vehicle Longitudinal Control																								**x**									
	Advanced Vehicle Lateral Control																									**x**								
	Intersection Collision Avoidance																										**x**							
	Automated Vehicle Operations																															**x**		
	Cooperative Vehicle Safety Systems																								**x**	**x**								
CVO	Carrier Operations and Fleet Management																				x													
	Freight Administration																				x													
	Electronic Clearance															**x**			**x**															
	CV Administrative Processes															**x**			**x**		**x**													
	International Border Electronic Clearance															x			x		x													
	Weigh-In-Motion															**x**																		
	Roadside CVO Safety															**x**	**x**				**x**													
	On-board CVO Safety																	x																
	CVO Fleet Maintenance																x	x			x													
	HAZMAT Management																		**x**	**x**	**x**	**x**	**x**											
	Roadside HAZMAT Security Detection and Mitigation																			x	x													
	CV Driver Security Authentication																	x		x														
	Freight Assignment Tracking																	x		x	x													

Table 6-3. (Continued)

Note: User Services and Service Packages in **Bold** indicated that they are applicable to the Kansas Statewide ITS Architecture.

Service Packages: The service packages provide an accessible, deployment oriented perspective to the National ITS Architecture. They are tailored to fit - separately or in combination - real world transportation problems and needs. Service packages collect together one or more Equipment Packages that must work together to deliver a given transportation service and the Architecture Flows that connect them and other important external systems. In other words, they identify the pieces of the Physical Architecture that are required to implement a particular transportation service.		**1.1 Pre-Trip Information**	**1.2 En-Route Driver Information**	1.3 Route Guidance	1.4 Ride Matching and Reservation	1.5 Traveler Services Information	**1.6 Traffic Control**	**1.7 Incident Management**	1.8 Travel Demand Management	**1.9 Emissions Testing and Mitigation**	**1.10 Highway Rail Intersection**	**2.1 Public Transportation Management**	**2.2 En-Route Transit Information**	**2.3 Personalized Public Transit**	**2.4 Public Travel Security**	**3.1 Electronic Payment Services**	**4.1 Commercial Vehicle Electronic Clearance**	**4.2 Automated Roadside Safety Inspections**	4.3 On-board Safety and Security Monitoring	**4.4 Commercial Vehicle Administration Processes**	**4.5 Hazardous Material Security and Incident Response**	**4.6 Freight Mobility**	**5.1 Emergency Notification and Personal Security**	**5.2 Emergency Vehicle Management**	**5.3 Disaster Response and Evacuation**	**6.1 Longitudinal Collision Avoidance**	**6.2 Lateral Collision Avoidance**	**6.3 Intersection Collision Avoidance**	6.4 Vision Enhancement for Crash Avoidance	**6.5 Safety Readiness**	**6.6 Pre-Crash Restraint Deployment**	**6.7 Automated Vehicle Operation**	**7.1 Archived Data**	**8.1 Maintenance and Construction Operations**
EM	**Emergency Call-Taking and Dispatch**																				x			x										
	Emergency Routing			x			x																	x										
	Mayday and Alarms Support																						x										
	Roadway Service Patrols																							x										
	Transportation Infrastructure Protection																						x		x									
	Wide-Area Alert												x										x											
	Early Warning System																								x									
	Disaster Response and Recovery																								x									
	Evacuation and Reentry Management																								x									
	Disaster Traveler Information																								x									
MCM	**Maintenance and Construction Vehicle and Equipment Tracking**																																	x
	Maintenance and Construction Vehicle Maintenance																																	x
	Road Weather Data Collection																																	x
	Weather Information Processing and Distribution	x																																x
	Roadway Automated Treatment																																	x
	Winter Maintenance																																	x
	Roadway Maintenance and Construction																																	x
	Work Zone Management																																	x
	Work Zone Safety Monitoring																																	x
	Maintenance and Construction Activity Coordination																							x										x
	Environmental Probe Surveillance																																	x
	Infrastructure Monitoring																																	x

Table 6-4 summarizes a list of service packages that are identified through the mapping process.

Table 6-4. List of Service Packages for Kansas Statewide ITS Architecture

Category	Service Package	Service Package Name	Status
Archived Data Management (AD)	AD1	ITS Data Mart	Existing
	AD2	ITS Data Warehouse	Existing
	AD3	ITS Virtual Data Warehouse	Planned
Advanced Public Transportation Systems (APTS)	APTS1	Transit Vehicle Tracking	Existing
	APTS2	Transit Fixed Route Operations	Existing
	APTS3	Demand Response Transit Operations	Existing
	APTS4	Transit Fare Collection Management	Existing
	APTS5	Transit Security	Planned
	APTS6	Transit Fleet Management	Existing
	APTS7	Multi-Modal Coordination	Existing
	APTS8	Transit Traveler Information	Existing
Advanced Traveler Information Systems (ATIS)	ATIS01	Broadcast Traveler Information	Existing
	ATIS02	Interactive Traveler Information	Existing
	ATIS09	In Vehicle Signing	Planned
	ATIS10	Short Range Communications Traveler Information	Planned
Advanced Traffic Management Systems (ATMS)	ATMS01	Network Surveillance	Existing
	ATMS03	Traffic Signal Control	Existing
	ATMS06	Traffic Information Dissemination	Existing
	ATMS07	Regional Traffic Management	Existing
	ATMS08	Traffic Incident Management System	Existing
	ATMS10	Electronic Toll Collection	Existing
	ATMS11	Emissions Monitoring and Management	Existing
	ATMS13	Standard Railroad Grade Crossing	Existing
	ATMS14	Advanced Railroad Grade Crossing	Planned
	ATMS15	Railroad Operations Coordination	Planned
	ATMS16	Parking Facility Management	Planned
	ATMS17	Regional Parking Management	Planned
	ATMS19	Speed Warning and Enforcement	Existing
	ATMS22	Variable Speed Limits	Planned
Advanced Vehicle Safety Systems (AVSS)	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
Commercial Vehicle Operations (CVO)	CVO03	Electronic Clearance	Existing
	CVO04	CV Administrative Processes	Existing
	CVO06	Weigh-In-Motion	Existing
	CVO07	Roadside CVO Safety	Existing
	CVO10	HAZMAT Management	Existing
Emergency Management (EM)	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

Category	Service Package	Service Package Name	Status
	EM09	Evacuation and Reentry Management	Existing
	EM10	Disaster Traveler Information	Existing
Maintenance & Construction Management (MC)	MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing
	MC02	Maintenance and Construction Vehicle Maintenance	Planned
	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

6.2.2 Customization of Service Packages

Service packages, customized for the specific requirements of each stakeholder, represent the information that will be exchanged between specific stakeholder elements. The above service packages selected for the Kansas Statewide ITS Architecture were customized to correspond with the existing ITS system elements and operations as well as future deployment and planned operations. Customization of service packages requires tailoring the elements (subsystems or terminators) in these service packages, along with associated architecture flows. In addition, architecture flows deemed by the stakeholders as not relevant to the deployment need to be removed. The results of such customization are summarized in terms of ITS elements and their deployment status as presented in Table 6-5.

Customized diagrams for service packages applicable to the Kansas Statewide ITS Architecture are included in Appendix B. Each service package diagram depicts ITS inventory elements along with information flows representing information content exchanges between the elements to deliver the needed service and functions. These information flows have directionality as indicated by the arrow pointing to the destination element. In addition, the status (i.e. existing and planned) of each information flow is also identified.

Table 6-5. List of Service Packages by Architecture Elements

Service Package	Service Package Name	Included Elements
AD1	ITS Data Mart	County and City 911 Dispatch Centers
		County and City Databases
		County Emergency Operations Centers
		County Engineering and City Public Works Offices
		County Sheriff and City Police Offices
		Kansas Travel and Tourism
		Kansas Travel and Tourism TravelKS.com
		Kansas Accident Reporting System (KCARS)
		KDOT District Maintenance and Construction Management Systems
		KDOT ITS Archive
		KDOT KanPlan
		KDOT Roadside Equipment for Connected Vehicles
		KDOT Statewide Virtual TMC
		KDOT Telecommunications Infrastructure GIS Database
		KDOT Traffic Detection and Data Collection Equipment
		KDOT Transportation Database (CANSYS)
		KHP Communications Center
		KHP Database
		KHP Road Status System
		KHP Field Troops
		KHP Troop G
		KTA Database
		KTA Operations Center
		Rural Transit Central Control Server System Operations and Archived Data Management
		Rural Transit Systems Operations Centers
AD2	ITS Data Warehouse	County and City Databases
		ITS Heartland Multistate Corridor Operations and Management Program (MCOMP)
		Kansas CVIEW-Plus
		KC Scout Operations Center
		KCC Motor Carrier Database
		Trucking KS
		Kansas Accident Reporting System (KCARS)
		KDOT District Maintenance and Construction Management Systems
		KDOT KanRoad Reporting System
		KDOT Roadside Equipment for Connected Vehicles
		KDOT RWIS Central Server
		KDOT Statewide Virtual TMC
		KDOT Telecommunications Infrastructure GIS Database
		KDOT Traffic Detection and Data Collection Equipment
		KDOT Transportation Database (CANSYS)
		KDOT Truck Parking Information and Management System
		KDOT Wichita TMC
		KTA Operations Center
		Other States Truck Parking Information and Management Systems
		Rural Transit Systems Operations Centers
		TPIMS Central Data Repository
AD3	ITS Virtual Data Warehouse	County and City Databases
		Kansas Traffic Records System
		KCC Motor Carrier Database
		Kansas Accident Reporting System (KCARS)
		KDOT KanRoad Reporting System
		KDOT Statewide Virtual TMC

Service Package	Service Package Name	Included Elements
		KDOT Transportation Database (CANSYS)
		KHP Database
		KTA Database
		MPO Databases
		Rural Transit Central Control Server System Operations and Archived Data Management
APTS01	Transit Vehicle Tracking	Rural Transit Systems Operations Centers
		Rural Transit Systems Transit Vehicles
APTS02	Transit Fixed-Route Operations	County Engineering and City Public Works Offices
		KDOT District Maintenance and Construction Management Systems
		Rural Transit Systems Operations Centers
		Rural Transit Systems Transit Vehicles
		Rural Transit Systems Websites
APTS03	Demand Response Transit Operations	County Engineering and City Public Works Offices
		KDOT District Maintenance and Construction Management Systems
		Rural Transit Systems Operations Centers
		Rural Transit Systems Transit Vehicles
		Rural Transit Systems Websites
APTS04	Transit Fare Collection Management	Rural Transit Systems Operations Centers
		Rural Transit Systems Transit Vehicles
		Rural Transit Systems Traveler Card
APTS05	Transit Security	County and City 911 Dispatch Centers
		Media
		Rural Transit Systems Operations Centers
		Rural Transit Systems Security Monitoring System
		Rural Transit Systems Transit Vehicles
APTS06	Transit Fleet Management	Rural Transit Systems Maintenance Facilities
		Rural Transit Systems Operations Centers
		Rural Transit Systems Transit Vehicles
APTS07	Multi-modal Coordination	Coordinated Transit District Offices
		Rural Transit Systems Operations Centers
		Urban Transit Systems Operations Centers
APTS08	Transit Traveler Information	Coordinated Transit District Offices
		Rural Transit Systems Kiosks
		Rural Transit Systems Operations Centers
		Rural Transit Systems Transit Vehicles
		Rural Transit Systems Websites
		Traveler
		Urban Transit Systems Operations Centers
		User Personal Computing Devices
ATIS01	Broadcast Traveler Information	AAA Dispatch Center
		Airports
		County and City Websites
		County Engineering and City Public Works Offices
		ITS Heartland Multistate Corridor Operations and Management Program (MCOMP)
		Kansas Travel and Tourism
		Kansas Travel and Tourism TravelKS.com
		KDOT District Maintenance and Construction Management Systems
		KDOT KanRoad Reporting System
		KDOT KanDrive Traveler Information Website
		KDOT Rest Area Kiosks
		KDOT Rest Area Weather Radio Equipment
		KDOT Rest Area WiFi
		KDOT Truck Parking Information and Management System
		KMCA Information Exchange Center

Service Package	Service Package Name	Included Elements
		KTA Operations Center
		KTA Service Area Kiosks
		KTA Travel Information Website
		Media
		National Weather Service
		NOAA Weather Radio
		Surface Transportation Weather Services
		Traveler
		User Personal Computing Devices
ATIS02	Interactive Traveler Information	KDOT 511 Telephone Information System
		KDOT KanRoad Reporting System
		KDOT KanDrive Traveler Information Website
		KDOT Rest Area WiFi
		KHP Road Status System
		Media
		National Weather Service
		Traveler
		User Personal Computing Devices
ATIS09	In Vehicle Signing	KDOT Connected Vehicles
		KDOT Roadside Equipment for Connected Vehicles
		KDOT Statewide Virtual TMC
ATIS10	Short Range Communications Traveler Information	KDOT Connected Vehicles
		KDOT Roadside Equipment for Connected Vehicles
		KDOT Statewide Virtual TMC
ATMS01	Network Surveillance	County and City CCTV
		County and City Traffic Data Collection Equipment
		County Engineering and City Public Works Offices
		KC Scout Operations Center
		KDOT CCTV
		KDOT District Maintenance and Construction Management Systems
		KDOT Kansas Speedway Traffic Management System
		KDOT Kansas Speedway Traffic Management System Field Equipment
		KDOT Statewide Virtual TMC
		KDOT Traffic Detection and Data Collection Equipment
ATMS03	Traffic Signal Control	County and City Traffic Signal Systems
		County Engineering and City Public Works Offices
		KDOT District Maintenance and Construction Management Systems
		KDOT Statewide Virtual TMC
		KDOT Traffic Signal Systems
ATMS06	Traffic Information Dissemination	County and City Portable DMS
		County and City Websites
		County Engineering and City Public Works Offices
		KDOT District Maintenance and Construction Management Systems
		KDOT Dynamic Message Signs
		KDOT Highway Advisory Radio
		KDOT KanRoad Reporting System
		KDOT Kansas Speedway Traffic Management System
		KDOT Kansas Speedway Traffic Management System Field Equipment
		KDOT Statewide Virtual TMC
		KTA Dynamic Message Signs
		KTA Operations Center
		KTA Travel Information Website
		Media
ATMS07	Regional Traffic Management	County and City Traffic Signal Systems
		County Engineering and City Public Works Offices
		KC Scout Operations Center

Service Package	Service Package Name	Included Elements
		KDOT District Maintenance and Construction Management Systems
		KDOT Statewide Virtual TMC
		KDOT Traffic Signal Systems
		KDOT Wichita TMC
		KTA Operations Center
		ODOT Traffic Management System
ATMS08	Traffic Incident Management System	County and City 911 Dispatch Centers
		County and City CCTV
		County and City Emergency Vehicles
		County Emergency Operations Centers
		County Engineering and City Public Works Offices
		County Sheriff and City Police Offices
		KC Scout Operations Center
		KDOT CCTV
		KDOT District Maintenance and Construction Management Systems
		KDOT Kansas Speedway Traffic Management System
		KDOT Kansas Speedway Traffic Management System Field Equipment
		KDOT Statewide Virtual TMC
		KDOT Wichita TMC
		KHP Communications Center
		KHP Field Troops
		KHP Motorist Assistance Patrol Vehicles
		KHP Troop G
		KHP Troop G Motorist Assist Vehicles
		KTA CCTV
		KTA Operations Center
		Media
		Private Towing Companies
		Private Towing Company Vehicles
		Rural Transit Systems Operations Centers
		Special Event Promoters
ATMS10	Electronic Toll Collection	KHP Troop G
		KTA K-Tag Roadside Equipment
		KTA Operations Center
		Vehicle
ATMS11	Emissions Monitoring and Management	KC Scout Operations Center
		Operation Greenlight
ATMS13	Standard Railroad Grade Crossing	County and City Traffic Signal Systems
		County Engineering and City Public Works Offices
		Driver
		KDOT District Maintenance and Construction Management Systems
		KDOT HRI ITS System
		KDOT Railroad Wayside Horn System (WHS)
		KDOT Statewide Virtual TMC
		KDOT Traffic Signal Systems
		Rail Operation Wayside Equipment
ATMS14	Advanced Railroad Grade Crossing	KDOT District Maintenance and Construction Management Systems
		KDOT HRI ITS System
		KDOT Statewide Virtual TMC
		KDOT Traffic Signal Systems
		Rail Operation Wayside Equipment
ATMS15	Railroad Operations Coordination	KDOT District Maintenance and Construction Management Systems
		KDOT HRI ITS System
		KDOT Statewide Virtual TMC
		Rail Operations Centers
ATMS16	Parking Facility Management	Driver

Service Package	Service Package Name	Included Elements
		KDOT Truck Parking Information and Management System
ATMS17	Regional Parking Management	KDOT KanDrive Traveler Information Website
		KDOT Truck Parking Information and Management System
		Other States Truck Parking Information and Management Systems
ATMS19	Speed Warning and Enforcement	County and City Mobile Speed Monitoring Trailers
		County Engineering and City Public Works Offices
		County Sheriff and City Police Offices
		Driver
		KDOT District Maintenance and Construction Management Systems
		KDOT Mobile Speed Monitoring Trailers
ATMS22	Variable Speed Limits	Driver
		KDOT Condition-based Variable Speed Limit Sign System Field Equipment
		KDOT Statewide Virtual TMC
AVSS01	Vehicle Safety Monitoring	KDOT Connected Vehicles
		Driver
AVSS03	Longitudinal Safety Warning	KDOT Connected Vehicles
		Driver
		Potential Obstacles
AVSS04	Lateral Safety Warning	KDOT Connected Vehicles
		Driver
		Potential Obstacles
AVSS05	Intersection Safety Warning	KDOT Connected Vehicles
		Driver
		KDOT Roadside Equipment for Connected Vehicles
		Potential Obstacles
		Vehicle
AVSS06	Pre-Crash Restraint Deployment	KDOT Connected Vehicles
		Potential Obstacles
		Vehicle
AVSS08	Advanced Vehicle Longitudinal Control	KDOT Connected Vehicles
		Driver
		Potential Obstacles
AVSS09	Advanced Vehicle Lateral Control	KDOT Connected Vehicles
		Driver
		Potential Obstacles
AVSS10	Intersection Collision Avoidance	KDOT Connected Vehicles
		KDOT Roadside Equipment for Connected Vehicles
		Potential Obstacles
		Vehicle
AVSS11	Automated Vehicle Operations	KDOT Connected Vehicles
		Driver
		KDOT Roadside Equipment for Connected Vehicles
		KDOT Statewide Virtual TMC
		Potential Obstacles
		Vehicle
AVSS12	Cooperative Vehicle Safety Systems	KDOT Connected Vehicles
		Driver
		KDOT Roadside Equipment for Connected Vehicles
		Vehicle
CVO03	Electronic Clearance	FMCSA Motor Carrier Management System
		FMCSA Safety and Fitness Electronic Records System
		IFTA Clearinghouse
		IRP Clearinghouse
		Kansas Commercial Vehicle Administration Legacy Systems
		Kansas CVIEW-Plus

Service Package	Service Package Name	Included Elements
		KHP Motor Carrier Inspectors
		KHP Troop G
		Preclearance System
		Private Trucking Companies
		Private Trucking Companies Commercial Vehicles
CVO04	CV Administrative Processes	CVO Information Requestor
		FMCSA Motor Carrier Management System
		FMCSA Safety and Fitness Electronic Records System
		IFTA Clearinghouse
		IRP Clearinghouse
		IRS
		Kansas Commercial Vehicle Administration Legacy Systems
		Kansas CVIEW-Plus
		Kansas Truck Routing Intelligent Permitting System (K-TRIPS)
		Trucking KS
		KDOT District Maintenance and Construction Management Systems
		KHP Motor Carrier Inspectors
		KHP Troop G
		Private Trucking Companies
CVO06	Weigh-In-Motion	KHP Weigh-in-Motion Stations
		Private Trucking Companies Commercial Vehicles
CVO07	Roadside CVO Safety	FMCSA Safety and Fitness Electronic Records System
		Kansas Commercial Vehicle Administration Legacy Systems
		Kansas CVIEW-Plus
		KHP Motor Carrier Inspectors
		KHP Scales and Weigh Stations
		KHP Troop G
		Preclearance System
		Private Trucking Companies
		Private Trucking Companies Commercial Vehicles
CVO10	HAZMAT Management	County and City 911 Dispatch Centers
		County Emergency Operations Centers
		County Sheriff and City Police Offices
		KHP Communications Center
		KHP Field Troops
		KHP Troop G
		KTA Operations Center
		Private Trucking Companies
		Private Trucking Companies Commercial Vehicles
EM01	Emergency Call-Taking and Dispatch	AAA Dispatch Center
		Airports
		County and City 911 Dispatch Centers
		County and City Emergency Vehicles
		County Emergency Operations Centers
		County Engineering and City Public Works Offices
		County Sheriff and City Police Offices
		KC Scout Operations Center
		KDOT Statewide Virtual TMC
		KDOT Wichita TMC
		KHP *47
		KHP Communications Center
		KHP Motorist Assistance Patrol Vehicles
		KHP Troop G
		KHP Troop G Motorist Assist Vehicles
		KTA *582
		KTA Operations Center

Service Package	Service Package Name	Included Elements
		Private Towing Company Vehicles
		Rural Transit Systems Operations Centers
EM02	Emergency Routing	County and City 911 Dispatch Centers
		County and City Emergency Vehicles
		County and City Traffic Signal Systems
		County Engineering and City Public Works Offices
		KDOT District Maintenance and Construction Management Systems
		KDOT Traffic Signal Systems
		KDOT Wichita TMC
		KHP Communications Center
		KHP Troop G Motorist Assist Vehicles
		KTA Operations Center
EM04	Roadway Service Patrols	KC Scout Operations Center
		KDOT District Maintenance and Construction Management Systems
		KDOT Statewide Virtual TMC
		KDOT Wichita TMC
		KHP Communications Center
		KHP Motorist Assistance Patrol Vehicles
		KHP Troop G Motorist Assist Vehicles
		KTA Operations Center
EM05	Transportation Infrastructure Protection	County and City 911 Dispatch Centers
		County Emergency Operations Centers
		County Sheriff and City Police Offices
		KDEM State Emergency Operations Center
EM06	Wide-Area Alert	Airports
		ATA Highway Information Sharing and Analysis Center
		Coordinated Transit District Offices
		County and City 911 Dispatch Centers
		County and City Portable DMS
		County and City Websites
		County Emergency Operations Centers
		County Engineering and City Public Works Offices
		County Sheriff and City Police Offices
		KBI AMBER Alert System
		KC Scout Operations Center
		KDEM Alternate State Emergency Operations Center
		KDEM National Warning System
		KDEM State Emergency Operations Center
		KDEM Web Emergency Operations Center
		KDOT 511 Telephone Information System
		KDOT District Maintenance and Construction Management Systems
		KDOT Dynamic Message Signs
		KDOT Highway Advisory Radio
		KDOT KanRoad Reporting System
		KDOT KanDrive Traveler Information Website
		KDOT Kansas Speedway Traffic Management System
		KDOT Kansas Speedway Traffic Management System Field Equipment
		KDOT Rest Area Kiosks
		KDOT Statewide Virtual TMC
		KDOT Wichita TMC
		KHP Communications Center
		KHP Field Troops
		KHP Troop G
		KTA Dynamic Message Signs
		KTA Operations Center
		KTA Service Area Kiosks

Service Package	Service Package Name	Included Elements
		KTA Travel Information Website
		Rural Transit Systems Kiosks
		Rural Transit Systems Operations Centers
		Rural Transit Systems Websites
		User Personal Computing Devices
EM07	Early Warning System	Airports
		ATA Highway Information Sharing and Analysis Center
		County and City 911 Dispatch Centers
		County Emergency Operations Centers
		County Engineering and City Public Works Offices
		County Sheriff and City Police Offices
		KC Scout Operations Center
		KDEM Alternate State Emergency Operations Center
		KDEM National Warning System
		KDEM State Emergency Operations Center
		KDEM Web Emergency Operations Center
		KDOT District Maintenance and Construction Management Systems
		KDOT Statewide Virtual TMC
		KDOT Wichita TMC
		KHP Communications Center
		KHP Field Troops
		KHP Security Monitoring Field Equipment
		KHP Troop G
		KTA Operations Center
		KTA Security/Traffic Cameras
		National Weather Service
		Rural Transit Systems Operations Centers
		Surface Transportation Weather Services
EM08	Disaster Response and Recovery	Airports
		Coordinated Transit District Offices
		County and City 911 Dispatch Centers
		County Emergency Operations Centers
		County Engineering and City Public Works Offices
		County Sheriff and City Police Offices
		KC Scout Operations Center
		KDEM Alternate State Emergency Operations Center
		KDEM State Emergency Operations Center
		KDEM Web Emergency Operations Center
		KDOT District Maintenance and Construction Management Systems
		KDOT Statewide Virtual TMC
		KDOT Wichita TMC
		KHP Communications Center
		KHP Field Troops
		KHP Troop G
		KTA Operations Center
		Rural Transit Systems Operations Centers
		School District Transportation Departments
		Urban Transit Systems Operations Centers
EM09	Evacuation and Reentry Management	Airports
		County and City 911 Dispatch Centers
		County Emergency Operations Centers
		County Engineering and City Public Works Offices
		County Sheriff and City Police Offices
		KC Scout Operations Center
		KDEM Alternate State Emergency Operations Center
		KDEM State Emergency Operations Center

Service Package	Service Package Name	Included Elements
		KDEM Web Emergency Operations Center
		KDOT District Maintenance and Construction Management Systems
		KDOT Statewide Virtual TMC
		KDOT Wichita TMC
		KHP Communications Center
		KHP Field Troops
		KHP Troop G
		KTA Operations Center
		Rural Transit Systems Operations Centers
		School District Transportation Departments
EM10	Disaster Traveler Information	County and City 911 Dispatch Centers
		County and City Websites
		County Emergency Operations Centers
		County Engineering and City Public Works Offices
		County Sheriff and City Police Offices
		KC Scout Operations Center
		KDEM Alternate State Emergency Operations Center
		KDEM State Emergency Operations Center
		KDEM Web Emergency Operations Center
		KDOT 511 Telephone Information System
		KDOT District Maintenance and Construction Management Systems
		KDOT KanRoad Reporting System
		KDOT KanDrive Traveler Information Website
		KDOT Rest Area Kiosks
		KDOT Rest Area WiFi
		KDOT Statewide Virtual TMC
		KHP Communications Center
		KHP Field Troops
		KHP Troop G
		KTA Operations Center
		KTA Service Area Kiosks
		KTA Travel Information Website
		Media
		National Weather Service
		Rural Transit Systems Kiosks
		Rural Transit Systems Operations Centers
		Rural Transit Systems Websites
		Surface Transportation Weather Services
		User Personal Computing Devices
MC01	Maintenance and Construction Vehicle and Equipment Tracking	County and City Maintenance and Construction Vehicles
		County Engineering and City Public Works Offices
		KDOT District Maintenance and Construction Management Systems
		KDOT Maintenance and Construction Vehicles
MC02	Maintenance and Construction Vehicle Maintenance	KDOT District Maintenance and Construction Management Systems
		KDOT Maintenance and Construction Vehicles
MC03	Road Weather Data Collection	Airports
		Airports Automated Weather Stations
		County and City RWIS Stations
		County Engineering and City Public Works Offices
		KDOT District Maintenance and Construction Management Systems
		KDOT Maintenance and Construction Vehicles
		KDOT RWIS Central Server
		KDOT RWIS Stations
		KTA Operations Center
		KTA RWIS Stations

Service Package	Service Package Name	Included Elements
		National Weather Service
		Surface Transportation Weather Services
MC04	Weather Information Processing and Distribution	AAA Dispatch Center
		Airports
		County and City 911 Dispatch Centers
		County Emergency Operations Centers
		County Engineering and City Public Works Offices
		County Sheriff and City Police Offices
		KDOT 511 Telephone Information System
		KDOT District Maintenance and Construction Management Systems
		KDOT KanRoad Reporting System
		KDOT KanDrive Traveler Information Website
		KDOT RWIS Central Server
		KDOT Snow Route Design Optimization System
		KDOT Statewide Virtual TMC
		KHP Communications Center
		KTA Operations Center
		Media
		National Weather Service
		Rural Transit Systems Operations Centers
		Surface Transportation Weather Services
MC05	Roadway Automated Treatment	County and City Automated Bridge Anti-/De-icing Systems
		County Engineering and City Public Works Offices
MC06	Winter Maintenance	County and City Maintenance and Construction Vehicles
		County Engineering and City Public Works Offices
		KDOT District Maintenance and Construction Management Systems
		KDOT Maintenance and Construction Vehicles
		KDOT Snow Route Design Optimization System
		KTA Maintenance and Construction Vehicles
		KTA Operations Center
		National Weather Service
		Surface Transportation Weather Services
MC07	Roadway Maintenance and Construction	County and City CCTV
		County and City Maintenance and Construction Vehicles
		County and City RWIS Stations
		County and City Traffic Signal Systems
		County Engineering and City Public Works Offices
		KDOT CCTV
		KDOT District Maintenance and Construction Management Systems
		KDOT Dynamic Message Signs
		KDOT Highway Advisory Radio
		KDOT HRI ITS System
		KDOT Maintenance and Construction Vehicles
		KDOT Railroad Wayside Horn System (WHS)
		KDOT RWIS Stations
		KDOT Statewide Virtual TMC
		KDOT Traffic Detection and Data Collection Equipment
		KDOT Traffic Signal Systems
		KTA CCTV
		KTA Dynamic Message Signs
		KTA Maintenance and Construction Vehicles
		KTA Operations Center
		KTA RWIS Stations
		National Weather Service
		Surface Transportation Weather Services
MC08	Work Zone Management	Coordinated Transit District Offices

Service Package	Service Package Name	Included Elements
		County and City 911 Dispatch Centers
		County and City Maintenance and Construction Vehicles
		County and City Portable DMS
		County and City Websites
		County Engineering and City Public Works Offices
		Driver
		KDOT District Maintenance and Construction Management Systems
		KDOT Dynamic Message Signs
		KDOT Highway Advisory Radio
		KDOT KanRoad Reporting System
		KDOT Maintenance and Construction Vehicles
		KDOT Smart Work Zones
		KDOT Statewide Virtual TMC
		KHP Communications Center
		KHP Field Troops
		KHP Troop G
		KTA CCTV
		KTA Dynamic Message Signs
		KTA Maintenance and Construction Vehicles
		KTA Operations Center
		KTA Travel Information Website
		Media
		Rural Transit Systems Operations Centers
MC09	Work Zone Safety Monitoring	KDOT District Maintenance and Construction Management Systems
		KDOT Maintenance and Construction Vehicles
		KDOT Work Zone Intrusion Detection System
MC10	Maintenance and Construction Activity Coordination	Airports
		Coordinated Transit District Offices
		County and City 911 Dispatch Centers
		County and City Websites
		County Engineering and City Public Works Offices
		County Sheriff and City Police Offices
		KDOT District Maintenance and Construction Management Systems
		KDOT KanRoad Reporting System
		KDOT Statewide Virtual TMC
		KHP Communications Center
		KHP Field Troops
		KHP Troop G
		KTA Operations Center
		KTA Travel Information Website
		Media
		Rural Transit Systems Operations Centers

7. EQUIPMENT PACKAGES AND FUNCTIONAL REQUIREMENTS

A service package is implemented with a combination of interrelated equipment; this equipment often resides in several different subsystems within the architecture framework and may be operated by different stakeholders. For instance, the Transit Vehicle Tracking service package includes vehicle location equipment in the Transit Vehicle Subsystem and a base station element in the Transit Management Subsystem. In this example, all service package elements are owned and operated by the same transit stakeholder.

In other cases, the service package elements are owned and operated by different stakeholders. Many of the Advanced Traveler Information Systems (ATIS) service packages require equipment in the Information Service Provider Subsystem that is owned and operated by a public or private information provider and equipment that is acquired and operated by the consumer as part of the Vehicle Subsystem or Personal Information Access Subsystem. Since equipment in different subsystems may be purchased and operated by different end-users, these subsystem-specific components may encounter varied deployment.

To understand and analyze these potential deployment variations, the defined service packages must be decomposed to their constituent elements. The portion of the service package capabilities that are allocated to each subsystem are segregated and defined as equipment packages to support this additional resolution. An equipment package represents a set of equipment/capabilities that are likely to be purchased by an end-user as a component to an overall system. It should be noted that there are no equipment packages defined for the terminators of the National ITS Architecture, as they represent systems on the boundary of the architecture and do not have functional descriptions within the architecture.

7.1 Mapping of Service Packages to Subsystems and Equipment Packages

Table 7-1 illustrates the subsystems and equipment packages that are mapped to the customized list of service packages. The table illustrates the specific service packages in the Kansas Statewide ITS Architecture, the subsystems that are part of the service packages, and the equipment packages that make up the service packages. As indicated in the table, the architecture provides a means to map the service package to appropriate subsystems (components) and equipment packages (technology). The equipment packages identified in Table 7-1 were used to develop the specific functional requirements of each element. The definitions of the equipment packages can be found via the National ITS Architecture website at http://itsarch.iteris.com/itsarch/.

Table 7-1. Service Packages, Subsystems and Equipment Packages

Service Package	Service Package Name	Subsystem	Equipment Package
AD1	ITS Data Mart	Archived Data Management Subsystem	Government Reporting Systems Support
			ITS Data Repository
			Traffic and Roadside Data Archival
		Commercial Vehicle Administration	CV Data Collection
		Emergency Management	Emergency Data Collection
		Maintenance and Construction Management	MCM Data Collection
		Roadway Subsystem	Roadway Data Collection
		Traffic Management	Traffic Data Collection

Table 7-1. (Continued)

Service Package	Service Package Name	Subsystem	Equipment Package
AD2	ITS Data Warehouse	Archived Data Management Subsystem	Government Reporting Systems Support
			ITS Data Repository
			On-Line Analysis and Mining
			Traffic and Roadside Data Archival
		Emergency Management	Emergency Data Collection
		Maintenance and Construction Management	MCM Data Collection
		Parking Management	Parking Data Collection
		Roadway Subsystem	Roadway Data Collection
		Toll Administration	Toll Data Collection
		Traffic Management	Traffic Data Collection
		Transit Management	Transit Data Collection
AD3	ITS Virtual Data Warehouse	Archived Data Management Subsystem	ITS Data Repository
			Virtual Data Warehouse Services
APTS1	Transit Vehicle Tracking	Transit Management	Transit Center Vehicle Tracking
		Transit Vehicle Subsystem	On-board Transit Trip Monitoring
		Vehicle	Vehicle Location Determination
APTS2	Transit Fixed-Route Operations	Transit Management	Transit Center Fixed-Route Operations
			Transit Vehicle Operator Scheduling
		Transit Vehicle Subsystem	On-board Fixed Route Schedule Management
APTS3	Demand Response Transit Operations	Transit Management	Transit Center Paratransit Operations
			Transit Vehicle Operator Scheduling
		Transit Vehicle Subsystem	On-board Paratransit Operations
APTS4	Transit Fare Collection Management	Transit Management	Transit Center Fare Management
		Transit Vehicle Subsystem	On-board Transit Fare Management
		Remote Traveler Support	Remote Transit Fare Management
APTS5	Transit Security	Transit Management	Transit Center Security
		Transit Vehicle Subsystem	On-board Transit Security
		Emergency Management	Center Secure Area Surveillance
			Emergency Response Management
APTS6	Transit Fleet Management	Transit Management	Transit Garage Maintenance
		Transit Vehicle Subsystem	On-board Maintenance
ATPS7	Multi-modal Coordination	Transit Management	Transit Center Multi-Modal Coordination
		Transit Vehicle Subsystem	On-board Transit Signal Priority
		Traffic Management	TMC Signal Control
		Roadway Subsystem	Roadway Signal Priority
APTS8	Transit Traveler Information	Transit Management	Transit Center Information Services
		Transit Vehicle Subsystem	On-board Transit Information Services
		Remote Traveler Support	Remote Transit Information Services
		Information Service Provider	ISP Traveler Data Collection
			Infrastructure Provided Trip Planning
ATIS01	Broadcast Traveler Information	Information Service Provider	Basic Information Broadcast
			ISP Traveler Data Collection
		Personal Information Access	Personal Basic Information Reception
		Remote Traveler Support	Remote Basic Information Reception
ATIS02	Interactive Traveler Information	Information Service Provider	Traveler Telephone Information
			ISP Traveler Data Collection
		Personal Information Access	Personal Interactive Information Reception
		Remote Traveler Support	Remote Interactive Information Reception

Table 7-1. (Continued)

Service Package	Service Package Name	Subsystem	Equipment Package
ATIS09	In Vehicle Signing	Roadway Subsystem	Roadway Short Range Traveler Information communications
		Traffic Management	TMC In-Vehicle Signing Management
		Vehicle	Vehicle Short Range Traveler Information Reception
ATIS10	Short Range Communications Traveler Information	Information Service Provider	ISP Short Range Communications Traveler Information Distribution
		Roadway Subsystem	Roadway Short Range Traveler Information communications
		Vehicle	Vehicle Short Range Traveler Information Reception
ATMS01	Network Surveillance	Traffic Management	Collect Traffic Surveillance
			Traffic Maintenance
		Roadway Subsystem	Roadway Basic Surveillance
ATMS03	Traffic Signal Control	Traffic Management	Collect Traffic Surveillance
			TMC Signal Control
			Traffic Maintenance
		Roadway Subsystem	Roadway Signal Controls
			Roadway Basic Surveillance
			Roadway Equipment Coordination
ATMS06	Traffic Information Dissemination	Traffic Management	TMC Traffic Information Dissemination
		Roadway Subsystem	Roadway Traffic Information Dissemination
ATMS07	Regional Traffic Management	Traffic Management	TMC Regional Traffic Management
ATMS08	Traffic Incident Management System	Traffic Management	TMC Incident Detection
			TMC Incident Dispatch Coordination/Communication
		Roadway Subsystem	Roadway Incident Detection
		Emergency Management	Emergency Response Management
			Incident Command
		Maintenance and Construction Management	MCM Incident Management
		Emergency Vehicle	On-board EV Incident Management Communication
ATMS10	Electronic Toll Collection	Toll Administration	Toll Administration
		Toll Collection	Toll Plaza Toll Collection
		Vehicle Subsystem	Vehicle Toll/Parking Interface
ATMS11	Emissions Monitoring and Management	Emissions Management	Emissions Data Management
ATMS13	Standard Railroad Grade Crossing	Traffic Management	HRI Traffic Management
		Roadway Subsystem	Standard Rail Crossing
ATMS14	Advanced Railroad Grade Crossing	Traffic Management	HRI Traffic Management
		Roadway Subsystem	Advanced Rail Crossing
ATMS15	Railroad Operations Coordination	Traffic Management	Rail Operations Coordination
ATMS16	Parking Facility Management	Parking Management	Parking Management
ATMS17	Regional Parking Management	Parking Management	Parking Coordination
ATMS19	Speed Monitoring	Traffic Management	TMC Speed Monitoring
		Roadway Subsystem	Roadway Speed Monitoring
			Roadway Equipment Coordination

Table 7-1. (Continued)

Service Package	Service Package Name	Subsystem	Equipment Package
ATMS22	Variable Speed Limits	Traffic Management	Collect Traffic Surveillance
			TMC Traffic Information Dissemination
			TMC Variable Speed Limits
			Traffic Equipment Maintenance
		Roadway Subsystem	Roadway Basic Surveillance
			Roadway Equipment Coordination
			Roadway Traffic Information Dissemination
			Roadway Variable Speed Limits
AVSS01	Vehicle Safety Monitoring	Vehicle	Vehicle Safety Monitoring System
AVSS03	Longitudinal Safety Warning	Vehicle	Vehicle Location Determination
			Vehicle Longitudinal Warning System
AVSS04	Lateral Safety Warning	Vehicle	Vehicle Lateral Warning System
AVSS05	Intersection Safety Warning	Roadway Subsystem	Roadway Equipment Coordination
		Roadway Subsystem	Roadway Intersection Safety Warning
		Vehicle	Vehicle Intersection Safety Warning
		Vehicle	Vehicle Location Determination
AVSS06	Pre-Crash Restraint Deployment	Vehicle	Vehicle Pre-Crash Safety Systems
			Vehicle Warning System
AVSS08	Advanced Vehicle Longitudinal Control	Vehicle	Vehicle Location Determination
			Vehicle Longitudinal Control
AVSS09	Advanced Vehicle Lateral Control	Vehicle	Vehicle Lateral Control
AVSS10	Intersection Collision Avoidance	Roadway Subsystem	Roadway Equipment Coordination
		Roadway Subsystem	Roadway Intersection Safety Warning
		Vehicle	Vehicle Intersection Control
		Vehicle	Vehicle Location Determination
AVSS11	Automated Vehicle Operations	Roadway Subsystem	Roadway Automated Vehicle Operations
		Traffic Management	TMC Automated Vehicle Operations
		Vehicle	Vehicle Automated Operations
AVSS12	Cooperative Vehicle Safety Systems	Roadway Subsystem	Roadway Equipment Coordination
		Roadway Subsystem	Roadway Safety Warning System
		Vehicle	Vehicle Warning System
CVO03	Electronic Clearance	Commercial Vehicle Administration	CV Information Exchange
			CV Safety Administration
		Commercial Vehicle Check	Citation and Accident Electronic Recording
			Roadside Electronic Screening
		Commercial Vehicle Subsystem	On-board CV Electronic Data
CVO04	CV Administrative Processes	Commercial Vehicle Administration	Credentials and Taxes Administration
			CV Information Exchange
		Fleet and Freight Management	Fleet Administration
			Fleet Credentials and Taxes Management and Reporting
CVO06	Weigh-In-Motion	Commercial Vehicle Check	Roadside WIM
		Commercial Vehicle Subsystem	On-board CV Electronic Data

Table 7-1. (Continued)

Service Package	Service Package Name	Subsystem	Equipment Package
CVO07	Roadside CVO Safety	Commercial Vehicle Administration	CV Information Exchange
			CV Safety Administration
		Commercial Vehicle Check	Roadside Safety and Security Inspection
			Citation and Accident Electronic Recording
			Roadside Electronic Screening
		Fleet and Freight Management	Fleet Administration
		Commercial Vehicle Subsystem	On-board CV Electronic Data
CVO10	HAZMAT Management	Commercial Vehicle Subsystem	On-board Cargo Monitoring
		Emergency Management	Emergency Commercial Vehicle Response
		Fleet and Freight Management	Fleet HAZMAT Management
		Vehicle Subsystem	Vehicle Location Determination
EM01	Emergency Call-Taking and Dispatch	Emergency Management	Emergency Call-Taking
			Emergency Dispatch
		Emergency Vehicle Subsystem	On-board EV En Route Support
EM02	Emergency Routing	Emergency Management	Emergency Routing
		Emergency Vehicle Subsystem	On-board EV En Route Support
		Roadway Subsystem	Roadway Signal Priority
		Traffic Management	TMC Incident Dispatch Coordination/Communication
		Vehicle Subsystem	Vehicle Location Determination
EM04	Roadway Service Patrols	Emergency Management	Service Patrol Management
		Emergency Vehicle Subsystem	On-board EV En Route Support
			On-board EV Incident Management Communication
EM05	Transportation Infrastructure Protection	Emergency Management	Center Secure Area Surveillance
		Security Monitoring Subsystem	Field Secure Area Surveillance
EM06	Wide-Area Alert	Emergency Management	Emergency Early Warning System
		Information Service Provider	ISP Emergency Traveler Information
			ISP Traveler Data Collection
			Traveler Telephone Information
		Traffic Management	TMC Traffic Information Dissemination
			TMC Incident Dispatch Coordination/Communication
		Roadway Subsystem	Roadway Traffic Information Dissemination
		Remote Traveler Support	Remote Basic Information Reception
		Transit Management	Transit Center Information Services
			Transit Center Security
EM07	Early Warning System	Emergency Management	Center Secure Area Surveillance
			Emergency Early Warning System
			Emergency Environmental Monitoring
		Maintenance and Construction Management	MCM Incident Management
		Security Monitoring Subsystem	Field Secure Area Sensor Monitoring
			Field Secure Area Surveillance
		Traffic Management	TMC Incident Detection
		Transit Management	Transit Center Security

Table 7-1. (Continued)

Service Package	Service Package Name	Subsystem	Equipment Package
EM08	Disaster Response and Recovery	Emergency Management	Emergency Response Management
			Incident Command
		Maintenance and Construction Management	MCM Incident Management
			MCM Roadway Maintenance and Construction
		Traffic Management	TMC Incident Dispatch Coordination/Communication
		Transit Management	Transit Center Security
EM09	Evacuation and Reentry Management	Emergency Management	Emergency Evacuation Support
		Traffic Management	TMC Evacuation Support
		Transit Management	Transit Evacuation Support
		Maintenance and Construction Management	MCM Incident Management
EM10	Disaster Traveler Information	Emergency Management	Emergency Evacuation Support
			Emergency Response Management
		Information Service Provider	ISP Emergency Traveler Information
			ISP Traveler Data Collection
			Traveler Telephone Information
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Maintenance and Construction Management	MCM Vehicle Tracking
		Maintenance and Construction Vehicle	MCV Vehicle Location Tracking
		Vehicle	Vehicle Location Determination
MC02	Maintenance and Construction Vehicle Maintenance	Maintenance and Construction Management	MCM Vehicle and Equipment Maintenance Management
		Maintenance and Construction Vehicle	MCV Vehicle System Monitoring and Diagnostics
MC03	Road Weather Data Collection	Emergency Management	Emergency Environmental Monitoring
		Maintenance and Construction Management	MCM Environmental Information Collection
		Maintenance and Construction Vehicle	MCV Environmental Monitoring
		Roadway Subsystem	Roadway Environmental Monitoring
MC04	Weather Information Processing and Distribution	Maintenance and Construction Management	MCM Environmental Information Processing
		Traffic Management	TMC Environmental Monitoring
		Emergency Management	Emergency Environmental Monitoring
		Information Service Provider	ISP Traveler Data Collection
		Transit Management	Transit Environmental Monitoring
		Maintenance and Construction Management	MCM Maintenance Decision Support
			MCM Winter Maintenance Management
		Maintenance and Construction Vehicle	MCV Winter Maintenance
		Traffic Management	TMC Incident Dispatch Coordination/Communication
MC05	Roadway Automated Treatment	Maintenance and Construction Management	MCM Automated Treatment System Control
		Roadway Subsystem	Roadway Automated Treatment
			Roadway Equipment Coordination
			Roadway Traffic Information Dissemination

Table 7-1. (Continued)

Service Package	Service Package Name	Subsystem	Equipment Package
MC06	Winter Maintenance	Maintenance and Construction Management	MCM Maintenance Decision Support
			MCM Winter Maintenance Management
		Maintenance and Construction Vehicle	MCV Winter Maintenance
		Traffic Management	TMC Incident Dispatch Coordination/Communication
MC07	Roadway Maintenance and Construction	Maintenance and Construction Management	MCM Maintenance Decision Support
			MCM Roadway Maintenance and Construction
		Maintenance and Construction Vehicle	MCV Roadway Maintenance and Construction
		Traffic Management	Traffic Maintenance
MC08	Work Zone Management	Maintenance and Construction Management	MCM Work Zone Management
		Maintenance and Construction Vehicle	MCV Work Zone Support
		Traffic Management	TMC Work Zone Traffic Management
		Roadway Subsystem	Roadway Work Zone Traffic Control
MC09	Work Zone Safety Monitoring	Maintenance and Construction Management	MCM Work Zone Safety Management
		Maintenance and Construction Vehicle	MCV Vehicle Safety Monitoring
		Roadway Subsystem	Roadway Work Zone Safety
MC10	Maintenance and Construction Activity Coordination	Maintenance and Construction Management	MCM Work Activity Coordination
		Emergency Management	Emergency Response Management
		Transit Management	Transit Center Multi-Modal Coordination
		Traffic Management	TMC Work Zone Traffic Management

7.2 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 region to provide the required regional ITS services. In the National ITS Architecture, each functional area (i.e. equipment package) has defined several specific functional requirements that are required for performing the equipment package capabilities. These specific functional requirements of the National ITS Architecture are commonly used as a baseline to develop the functional requirements of an ITS architecture.

The process to develop the functional requirements of the Kansas Statewide ITS Architecture begins with the mapping of functional areas (equipment packages) to service packages and associated elements as an initial definition of the functions being performed by each element. The functional requirements of each equipment package were then tailored to provide a more accurate picture of the functions performed. Using Turbo Architecture, functional requirements that support the ITS systems and projects covered in the Kansas Statewide ITS Architecture were identified. The complete list of functional requirements can be found in the companion turbo architecture database for the Kansas Statewide ITS Architecture.

Example:
To illustrate functions and functional requirements, the ITS element "KDOT Dynamic Message Signs" is used as an example. The element "KDOT Dynamic Message Signs" represents both permanent and portable dynamic message signs (DMSs) owned by KDOT. In the Statewide ITS Architecture, this element is mapped to the Roadway Subsystem and is associated with three service packages: ATMS06 – Traffic Information Dissemination; EM06 – Wide Area Alert; and MC08 – Work Zone Management. Two functional areas (equipment packages) are required for this element to perform the capabilities associated with these service packages. They are:

- Roadway Traffic Information Dissemination: This equipment package includes field elements that provide information to drivers, including dynamic message signs and highway advisory radio.
- Roadway Work Zone Traffic Control: This equipment package controls traffic in areas of the roadway where maintenance and construction activities are underway, monitoring and controlling traffic using field equipment such as CCTV cameras, dynamic messages signs, and gates/barriers. Work zone speeds and delays are provided to the motorist prior to the work zones.

In the National ITS Architecture, the Roadway Traffic Information Dissemination equipment package contains five specific functional requirements and the Roadway Work Zone Traffic Control equipment package has six. However, not all of the functional requirements are applicable to the KDOT Dynamic Message Signs element. The identification of applicable functional requirements is illustrated in Table 7-2.

Table 7-2. Functional Requirements Example: KDOT Dynamic Message Signs

Functional Area	Functional Requirements	Status
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	Existing
	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.	Not Planned
	3. The field element shall include pedestrian information systems under center control (e.g. warning pedestrians of a potential hazard, or providing mandatory instructions as to the availability of pedestrian access).	Not Planned
	4. The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center.	Existing
	5. The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair.	Existing
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.	Not Planned
	2. Under traffic and maintenance center control, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around the work zone through which they are currently passing.	Existing
	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
	4. The field element shall control access to the work zone using automated gate or barrier systems. This includes automated flagger assistance devices that include automated gate arms and other automated gate/barrier systems.	Not Planned
	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
	6. The field element shall provide fault data for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center for repair.	Existing

8. INTERCONNECTS AND ARCHITECTURE FLOWS

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

- **Architecture Interconnects** define an ITS Architecture from a physical perspective, which shows the connections that can be established between equipment and systems which may be deployed by different organizational or operating agencies throughout the region.
- **Architecture Flows** define an ITS Architecture from a logical perspective, which identify a high level information exchange associated with each interconnect between equipment and systems.

8.1 Architecture Interconnects

Based on subsystems and service packages that are selected for each ITS inventory element, a set of interconnects between the elements have been identified. As shown in Figure 8-1, a high-level interconnect diagram for the Kansas Statewide ITS Architecture, often referred to as a "sausage diagram," illustrates the subsystems and primary types of interconnections (or communications) between these subsystems. The sausage diagram was customized to reflect the systems of the Kansas Statewide ITS Architecture. The shaded areas in Figure 8-1 indicate the functions and services that are not currently existing and planned in the state.

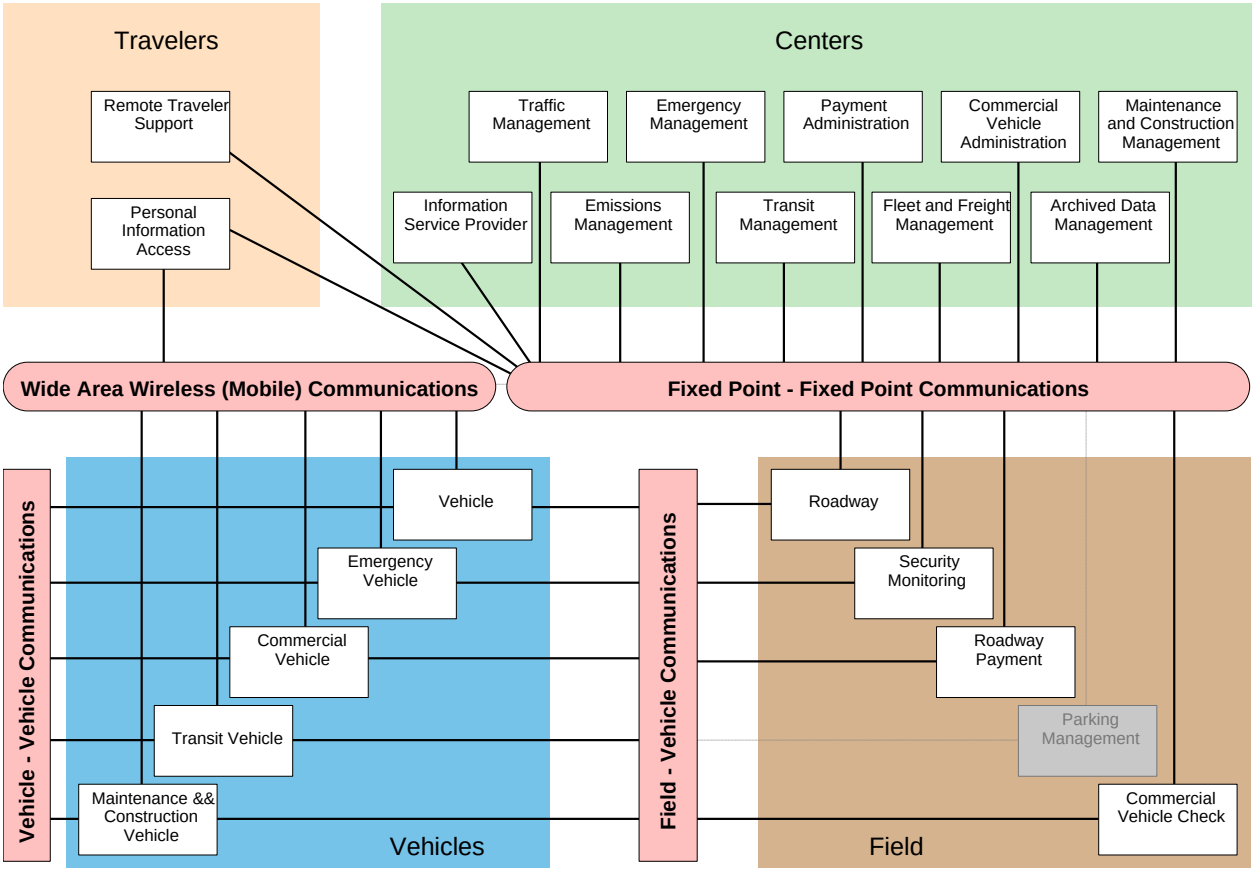


Figure 8-1. Kansas Statewide ITS Architecture Sausage Diagram

The sausage diagram identifies four basic types of communications used to interconnect the elements within Kansas. The definitions of the three types of communications are:

- **Fixed Point to Fixed Point Communications:** A communications link that provides communications among stationary entities. It may be implemented using a variety of public or private communication networks and technologies. These links support a variety of maintenance, monitoring and management services. It can include, but is not limited to, twisted pair, coaxial cable, fiber optic, microwave relay networks, spread spectrum, etc. Since the transportation layer defines all information flow as point-to-point transfers between source and destination entities, the architecture appears to recommend a point-to-point network topology. This is not the case. Any physical network topology (including all three provided examples) that can support the identified information transfers is consistent with the communications layer and the National ITS Architecture.
- **Wide-Area Wireless (Mobile) Communications:** A wireless communications system that offers broad coverage, enabling communications with vehicles and traveler mobile devices at any location on or off the road network. Both broadcast (one-way) and interactive (two-way) communications services are grouped into wide-area wireless communications in the National ITS Architecture. These links support a range of services in the National ITS Architecture including real-time traveler information and various forms of fleet communications. Technologies supporting this type of link include cellular networks, WiMAX, wireless mesh networks, and any other wireless network technology that offers broad regional coverage.
- **Field to Vehicle Communications:** A wireless communications channel used for broadcast and interactive close-proximity communications between vehicles and the immediate infrastructure. It supports location-specific and situation relevant communications for ITS capabilities such as toll collection, transit vehicle management, driver information, and automated commercial vehicle operations as well as connected vehicle applications. This communication channel is supported by technologies such as 5.9 GHz Band Wireless Access in Vehicular Environments (WAVE) / Dedicated Short Range Communications (DSRC), Wi-Fi, WiMAX, and wireless mesh networks.
- **Vehicle to Vehicle Communications:** A short range wireless communications link among vehicles (e.g. mobile system to mobile systems). Advanced vehicle services may use this link in the future to support advanced collision avoidance implementations, road condition information sharing, and active coordination between advanced vehicle control systems. Technologies that could support this communications channel include 5.9 GHz Band Wireless Access in WAVE / DSRC.

On a more specific level, interconnect diagrams can depict the interactions between a specific element and other associated agencies and their systems within the architecture. Figure 8-2 illustrates interconnects between the KDOT KanRoad and other elements.

8.2 Architecture Flows

Architecture flows provide a high level description of information exchange associated with each interconnect between equipment and systems. Through the architecture flows, 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. Figure 8-3 illustrates the architecture flow diagram for the KDOT KanRoad System. A complete list of architecture flows for the Statewide ITS Architecture can be found in the Turbo Architecture database.

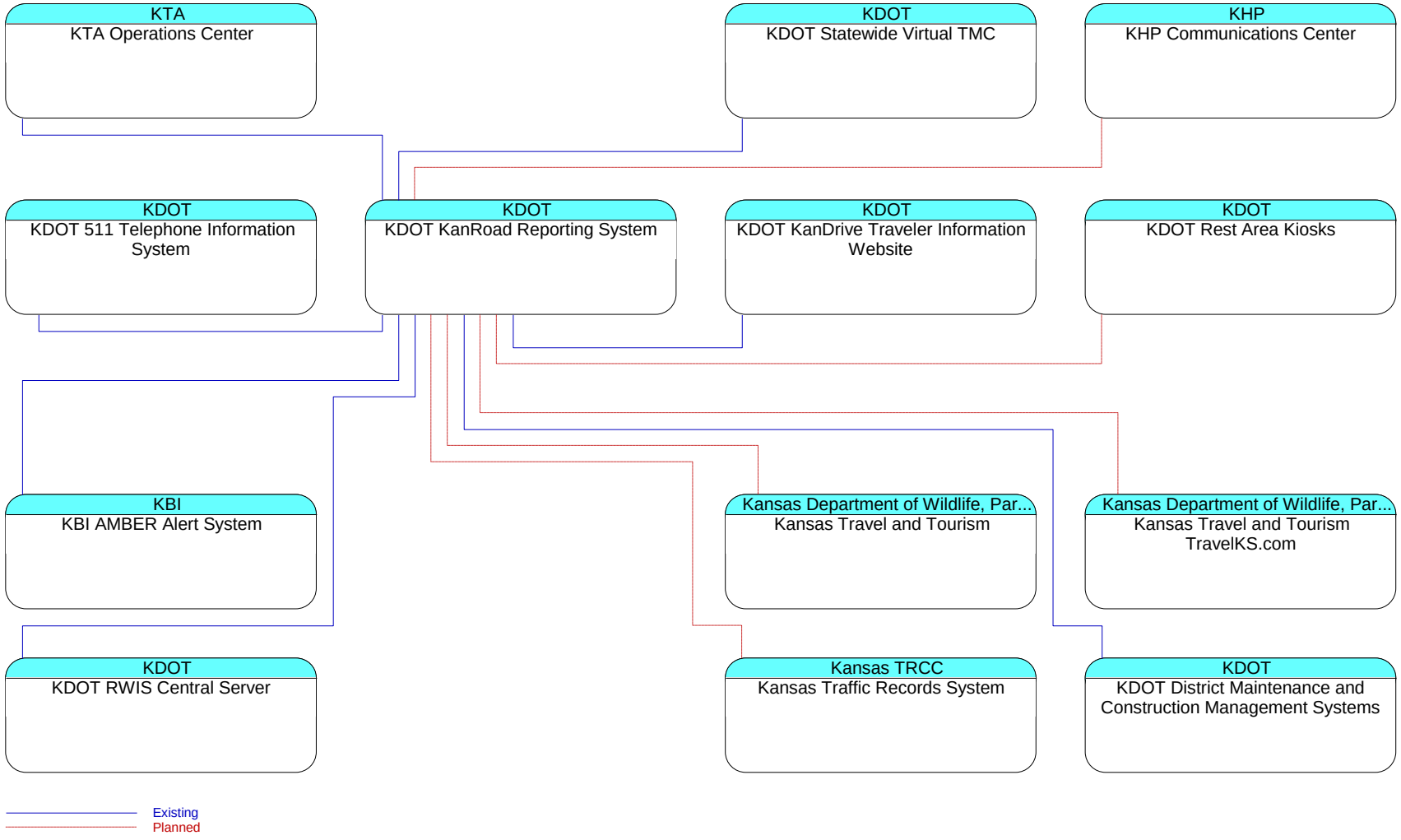


Figure 8-2. Interconnect Diagram: KDOT KanRoad Reporting System

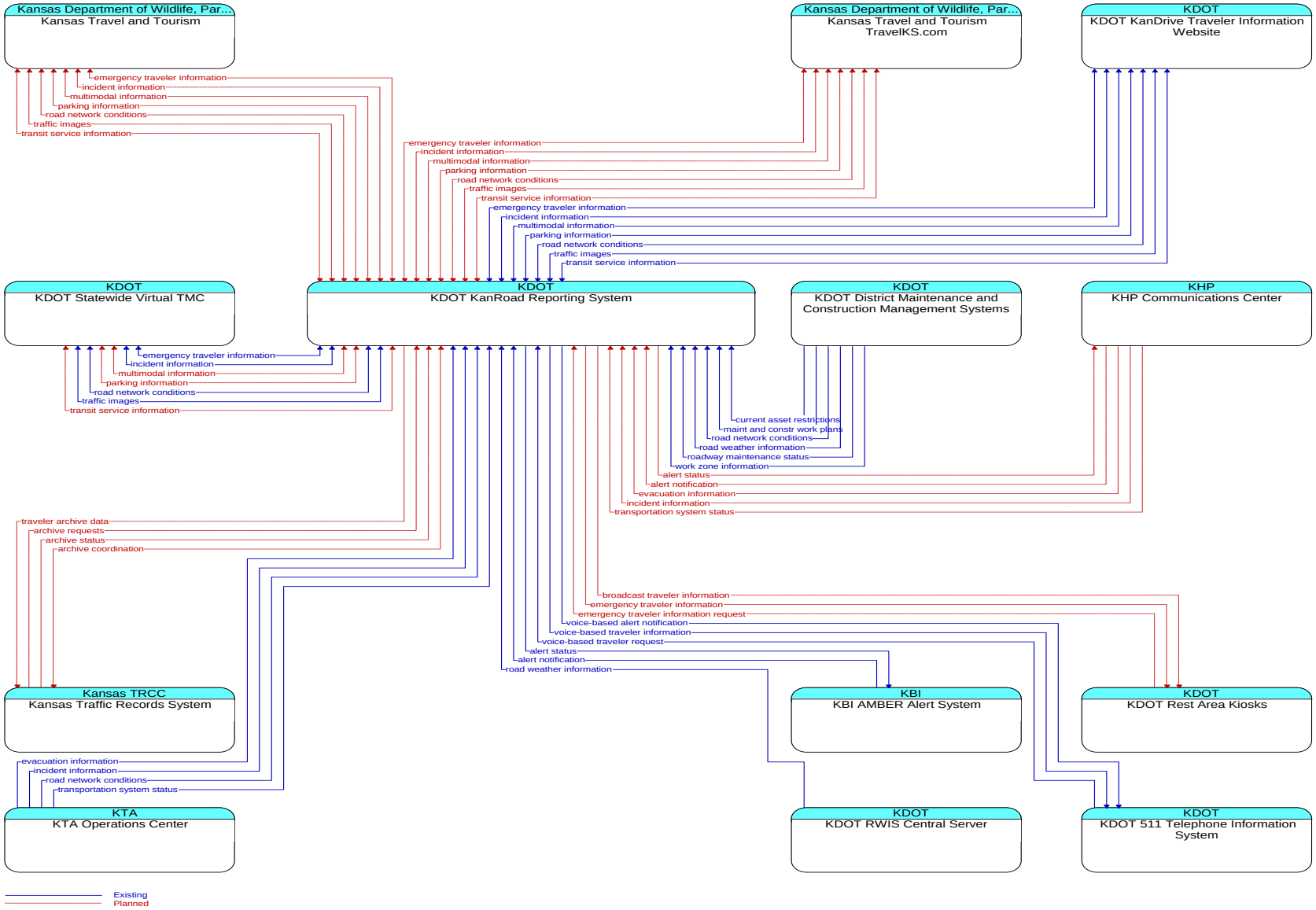


Figure 8-3. Architecture Flow Diagram: KDOT KanRoad Reporting System

APPENDIX A: STAKEHOLDER SURVEY QUESTIONNAIRE

Before completing this survey, please provide the following information:

Name: _____

Title: _____

Agency: _____

Division: _____

Phone: _____

Fax: _____

E-mail: _____

Questionnaire

The questionnaire is organized by the following sections:

Problems, Issues and Needs
Data Management and Archiving
Roadway Operations – including freeway and arterial management and operations
Roadway Maintenance – including general roadway maintenance, winter maintenance, and work zone activities
Transportation Security
Incident & Emergency Management
Transit Operations
Commercial Vehicle Operations
General Questions

Instructions

You are not required to fill out the entire survey questionnaire. To save your time, a matrix shown below is developed to instruct which sections of the questionnaire you should complete. Please fill out the sections of the questionnaire that are applicable to you. You are certainly welcome to fill out other sections and provide additional information.

Type of Agency	Section								
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Transportation Operations and Maintenance Agency (District Office, Project Office, Maintenance Office, Traffic and Safety Office, Public Works Department, Engineers Office, etc.)	X	X	X	X	X				X
Roadway Service Patrol	X	X			X	X			X
Law Enforcement and Emergency Management Agency (State Patrol, Sheriff Department, Police Department, Fire Department, Emergency Management Agency, Emergency Medical Services, etc.)	X	X			X	X			X
Planning	X	X	X	X	X	X	X	X	X
Public Transportation Agency	X	X					X		X
Data Archives/Data Management Agency	X	X							X
Others	X	X							X

A. Problems, Issues and Needs

The following table includes common transportation issues that have been effectively addressed through the use of ITS technologies. Considering the existing conditions within your community or region, please rank the severity of the issue using the scale provided. Leave the ranking blank if you have no opinion.

1-Not a Problem	**2**-Occasional Problem	**3**-General Problem	**4**-Significant Problem	**5**-Very Significant Problem

Problem Area		**Ranking**				
Travel Conditions (For Highways)	Congestion *(Recurring – rush hour traffic)*	1	2	3	4	5
	Congestion *(Non-recurring – stalled vehicles)*	1	2	3	4	5
	Safety	1	2	3	4	5
	Travel Time *(Unexpected Delays)*	1	2	3	4	5
	Unfamiliar Users/Tourists	1	2	3	4	5
	Emergency Response Time	1	2	3	4	5
	Personal Security/Safety at Rest Stops	1	2	3	4	5
	Finding Help When Needed	1	2	3	4	5
	Construction and Maintenance Projects	1	2	3	4	5
	Seasonal Congestion	1	2	3	4	5
	Weather	1	2	3	4	5
	Access to Interstates/Freeways	1	2	3	4	5
	Air Pollution	1	2	3	4	5
	Other (please specify)	1	2	3	4	5
Travel Conditions (For Major City Streets)	Congestion *(Recurring – rush hour traffic)*	1	2	3	4	5
	Congestion *(Non-recurring – stalled vehicles)*	1	2	3	4	5
	Safety	1	2	3	4	5
	Travel Time *(Unexpected Delays)*	1	2	3	4	5
	Unfamiliar Users/Tourists	1	2	3	4	5
	Emergency Response Time	1	2	3	4	5
	Personal Security/Safety at Rest Stops	1	2	3	4	5
	Finding Help When Needed	1	2	3	4	5
	Construction and Maintenance Projects	1	2	3	4	5
	Seasonal Congestion	1	2	3	4	5
	Weather	1	2	3	4	5
	Access to Freeways	1	2	3	4	5
	Air Pollution	1	2	3	4	5
	Other (please specify)	1	2	3	4	5
Information for Travelers	Lack of Travel Time Information	1	2	3	4	5
	Lack of Road Condition Information	1	2	3	4	5
	Lack of Weather Condition Information	1	2	3	4	5
	Lack of Adequate Alternate Routes	1	2	3	4	5
	Notification of Major Crashes	1	2	3	4	5
	Updates for Travelers	1	2	3	4	5
	Other (please specify)	1	2	3	4	5
Public Transit Services	Transit Fleet Management	1	2	3	4	5
	Travel Time	1	2	3	4	5
	Safety/Security	1	2	3	4	5
	Schedule and Route Information	1	2	3	4	5
	Appropriate Stop Locations	1	2	3	4	5
	Other (please specify)	1	2	3	4	5

1-Not a Problem	**2**-Occasional Problem	**3**-General Problem	**4**-Significant Problem	**5**-Very Significant Problem

Problem Area		**Ranking**				
Security and Incident Response	Incident Identification	1	2	3	4	5
	Incident Response Time	1	2	3	4	5
	Interagency Coordination/Communication	1	2	3	4	5
	Lack of communication or isolation in rural areas	1	2	3	4	5
	Other (please specify)	1	2	3	4	5
Commercial Vehicle Operations	Time Associated with Vehicle Inspections	1	2	3	4	5
	Time Spent on Regulatory Matters	1	2	3	4	5
	Hazardous Materials Response Procedures	1	2	3	4	5
	Hazardous Materials Routing Information	1	2	3	4	5
	Oversize/Overweight Permitting	1	2	3	4	5
	Time Spent at Weigh Stations	1	2	3	4	5
	Lack of Roadway Conditions Information	1	2	3	4	5
	Other (please specify)	1	2	3	4	5
Other	Deer/Animal Crashes	1	2	3	4	5
	Other (please specify)	1	2	3	4	5
	Other (please specify)	1	2	3	4	5

Please identify the top three transportation problems in your area and provide a short description of the problem (please specify the location using the nearest roads, section lines, etc.). Also describe any concerns or issues you may have related to these problems.

Problem #1: _____

Description and Related Concerns: _____

Problem #2: _____

Description and Related Concerns: _____

Problem #3: _____

Description and Related Concerns: _____

B. Data Management and Archiving

Existing	Planned	
☐	☐	1. Does your agency collect and store data (data archiving)?
		If **EXISTING** or **PLANNED**, please select all that apply:
☐	☐	• Traffic Data
☐	☐	• Emergency/Accident Data
☐	☐	• Maintenance and Construction Data
☐	☐	• Public Transportation Data
☐	☐	• Commercial Vehicle Data
☐	☐	• Emission Data
☐	☐	• Parking Data
☐	☐	• Other_____ _____
☐	☐	2. Does your archived data management system provide general query and report functionality?
☐	☐	3. Does your archived data management system provide advanced features such as data analysis, summarization, and data mining to facilitate discovery of information, patterns, and correlations in large data sets?
☐	☐	4. Does your organization or agency use Geographic Information Systems (GIS) for data management?

C. Roadway Operations

Existing	Planned	
		1. Does your agency use any of the following real-time traffic data collection technologies?
☐	☐	• Loop Detectors that provide volume and speed data at midblock locations (this **excludes** actuators on intersection approaches)
☐	☐	• CCTV Cameras
☐	☐	• Vehicle Probe Readers to estimate travel times on arterials
☐	☐	• Other_____ _____
☐	☐	2. Does your agency detect and verify traffic incidents using sensors and surveillance equipment?
☐	☐	3. Does your agency control any signalized intersections?
		If NO, skip to Section D.
		If YES, do any of your signalized intersections have (or plan to have):
☐	☐	• Closed Loop or Centralized Control
☐	☐	• Real-Time traffic adaptive control such as SCOOT/SCATS or similar

Existing	Planned	
☐	☐	• Signal Preemption for emergency vehicles
☐	☐	• Signal Priority for transit vehicles
☐	☐	• Other_____
		_____
☐	☐	4. Does your agency have any signalized intersections that are interconnected with active railroad crossing devices?
		5. Does your agency monitor highway-rail intersections with any of the following technologies?
☐	☐	• Vehicle Detectors
☐	☐	• Video Surveillance/Detection
☐	☐	• Train Arrival Prediction (Predict Train Arrival Electronically)
☐	☐	• Electronic Traffic Violator Devices
☐	☐	• Other_____
		_____

D. Roadway Maintenance

Existing	Planned	
☐	☐	1. Does your agency manage a maintenance/construction vehicle fleet?
		If NO, skip to question #6.
☐	☐	2. Does your agency operate a dispatch facility?
☐	☐	If EXISTING or PLANNED, does you agency perform Computer Aided Dispatch (CAD) of maintenance and construction vehicles?
☐	☐	3. Does your agency use an Automated Vehicle Location (AVL) system?
☐	☐	4. Does your agency use on-board sensors or devices to monitor vehicles' operating conditions?
☐	☐	5. Does your agency have the capability to automate vehicle maintenance scheduling and manage both routine and corrective maintenance activities on vehicles?
☐	☐	6. Does your agency collect road and weather conditions data from environmental sensors located on or near the roadway?
☐	☐	7. Does your agency use environmental data to detect environmental hazards such as icy road conditions, high winds, or dense fog?
☐	☐	8. Does your agency have automated roadway deicing systems?
☐	☐	9. Does your agency manage roadway work zone activities?

Existing **Planned**

If YES, please identify below the devices or systems currently deployed or planned for work zone monitoring.

- ☐ ☐ • Dynamic Message Signs (DMS)
- ☐ ☐ • Closed Circuit Television (CCTV)
- ☐ ☐ • Vehicle Speed Monitoring using Remote Devices (i.e. Sensors/Detectors)
- ☐ ☐ • Work Zone Intrusions (Detection system on/near the roadway or on-board of maintenance vehicles)
- ☐ ☐ • Other _____

E. Transportation Security

Existing **Planned**

☐ ☐ 1. Does your agency use sensors and surveillance equipment to monitor the transportation infrastructure (e.g., bridges, tunnels, and management centers) for potential threats?

☐ ☐ 2. Does your agency remotely control barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate the impact of an incident?

☐ ☐ 3. Does your agency monitor public travel-related areas such as transit stations, transit stops, rest stops, and kiosk locations for potential threats using sensors and surveillance equipment?

☐ ☐ 4. Does your agency use traveler information systems (such as dynamic message signs, highway advisory radio, 511 or other telephone services, TV/radios, Internet, e-mail, and kiosks) 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?

☐ ☐ 5. Does your agency use sensors and surveillance equipment to monitor and detect potential, looming, and actual disasters including natural disasters and technological and man-made disasters (hazardous materials incidents, nuclear, chemical, biological, and radiological attacks) and notify all responding agencies of detected emergencies?

☐ ☐ 6. Does your agency support disaster response and recovery, including coordination of emergency response plans and resources, damage assessment, service restoration, and transition back to normal operation?

☐ ☐ 7. Does your agency support evacuation of the general public from a disaster area and manage subsequent reentry to the disaster area using transportation resources?

☐ ☐ 8. Does your agency provide disaster-related traveler information to the general public, regarding evacuation and reentry information and other information concerning the operation and availability of the transportation system during a disaster?

F. Incident/Emergency Management

Existing	Planned	
☐	☐	1. Does your agency perform Computer Aided Dispatch (CAD) of emergency vehicles?
☐	☐	2. Does your agency use an Automated Vehicle Location (AVL) system?
☐	☐	3. Does your agency have preemption lights for signalized intersections?
☐	☐	4. Does your agency receive real-time traffic information and conditions from transportation agencies to support and enhance emergency vehicle routing?

G. Transit Operations

Existing	Planned	
		1. What types of transit services does your agency operate?
☐	☐	• Fixed Route
☐	☐	• Demand Responsive (Paratransit)
☐	☐	• Rail
☐	☐	• Other _____
☐	☐	2. Does your agency perform Computer Aided Dispatch (CAD) of transit vehicles?
☐	☐	3. Does your agency use an Automated Vehicle Location (AVL) system?
☐	☐	4. Does your agency use on-board sensors or devices to monitor vehicles' operating conditions?
☐	☐	5. Does your agency have the capability to automate vehicle maintenance scheduling and manage both routine and corrective maintenance activities on vehicles?
☐	☐	6. Does your agency have security monitoring systems <u>on-board transit vehicles</u>?
☐	☐	7. Does your agency monitor public areas (e.g. stops, park & ride lots, stations) using <u>sensors and surveillance equipment</u>?
☐	☐	8. Does your agency use <u>sensors and surveillance equipment</u> to perform security monitoring non-public areas (e.g. transit yards, garages, or other infrastructure)?
☐	☐	9. Does your agency directly or indirectly (i.e., thru another agency/) provide transit information to the public?
		If **YES**, please identify below the method(s) currently used or planned for provide transit information:

Existing	Planned	
☐	☐	• Internet Web Page
☐	☐	• Pagers or Personal Data Assistants
☐	☐	• Kiosks
☐	☐	• Display/Audio in Transit Vehicles
☐	☐	• E-mail or other direct PC communications
☐	☐	• Electronic Displays/Audio Announcements at Transit Stops and Stations (includes video monitors)
☐	☐	• TV (interactive or dedicated Cable)
☐	☐	• Other _____

☐ ☐ 10. Does your agency provide (or plan to provide) transit trip planning capabilities?

If **YES**, please identify below the method(s) currently used or planned for provide the trip planning information:

☐	☐	• Internet
☐	☐	• E-mail or other direct PC communications
☐	☐	• Kiosks
☐	☐	• Other _____

☐ ☐ 11. Does your agency have an Electronic Fare Payment System (smart card, swipe card, credit card, etc.)?

☐ ☐ 12. Do your transit vehicles have the capability to receive priority lights at signalized intersections?

H. Commercial Vehicle Operations

Existing	Planned	
☐	☐	1. Does your agency perform electronic credential administrative services for commercial vehicles?
☐	☐	2. Does your agency participate in roadside commercial vehicle inspection?

If NO, no further responses are required in this section.

☐ ☐ 3. Does your agency perform electronic screening?

☐ ☐ 4. Does your agency exchange safety and/or security information?

☐ ☐ 5. Does your agency perform a high speed weigh-in-motion service?

☐ ☐ 6. Does your agency participate in HAZMAT detection?

If **EXISTING or PLANNED**, please list any handheld or roadside equipment for detection and classification of security sensitive HAZMAT on commercial vehicles, and for accessing credentials information on driver verification.

_____

_____

I. General Questions

Yes	No	
☐	☐	1. Does your agency plan to deploy any ITS projects, including but not limited to traffic management centers, dispatch centers, transit vehicles, communications infrastructure, etc.

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

_____

_____

_____

_____

2. Does your agency exchange voice or data information (including by telephone or fax) with any of the following types of organizations/agencies? Please select all that apply and list the appropriate organizations/agencies by name.

☐ ☐ Incident/Emergency_____

_____

_____

☐ ☐ Traffic Management_____

_____

_____

☐ ☐ Maintenance and Construction_____

_____

_____

☐ ☐ Public Transportation_____

_____

_____

☐ ☐ Commercial Vehicle Operations/Inspection_____

_____

_____

3. What specific types of information do you share with these agencies?

Incident/Emergency_____

_____

Traffic Management_____

_____

Maintenance and Construction_____

_____

Public Transportation_____

_____

Commercial Vehicle Operations/Inspection_____

_____

Existing	**Planned**	
☐	☐	4. Does your agency disseminate traffic or weather condition information to the public in any of the following ways? • Dynamic Message Signs (DMS) (permanent or portable)
☐	☐	• Highway Advisory Radio (HAR)
☐	☐	• In-Vehicle Navigation Systems
☐	☐	• TV/Radio
☐	☐	• Internet
☐	☐	• Kiosks
☐	☐	• E-mail
☐	☐	• 511 or Other Telephone Services
☐	☐	• Pager or Personal Data Assistants (PDAs)
☐	☐	• Other_____
☐	☐	5. Does your agency receive information from the National Weather Service?
☐	☐	6. Does your agency receive surface transportation specific weather information from a value-added sector specific meteorological service provider?

7. Please list any current agreements or memoranda of understanding that your agency has in place with any other organizations/agencies (e.g., maintenance of traffic signals, media agreements).

_____

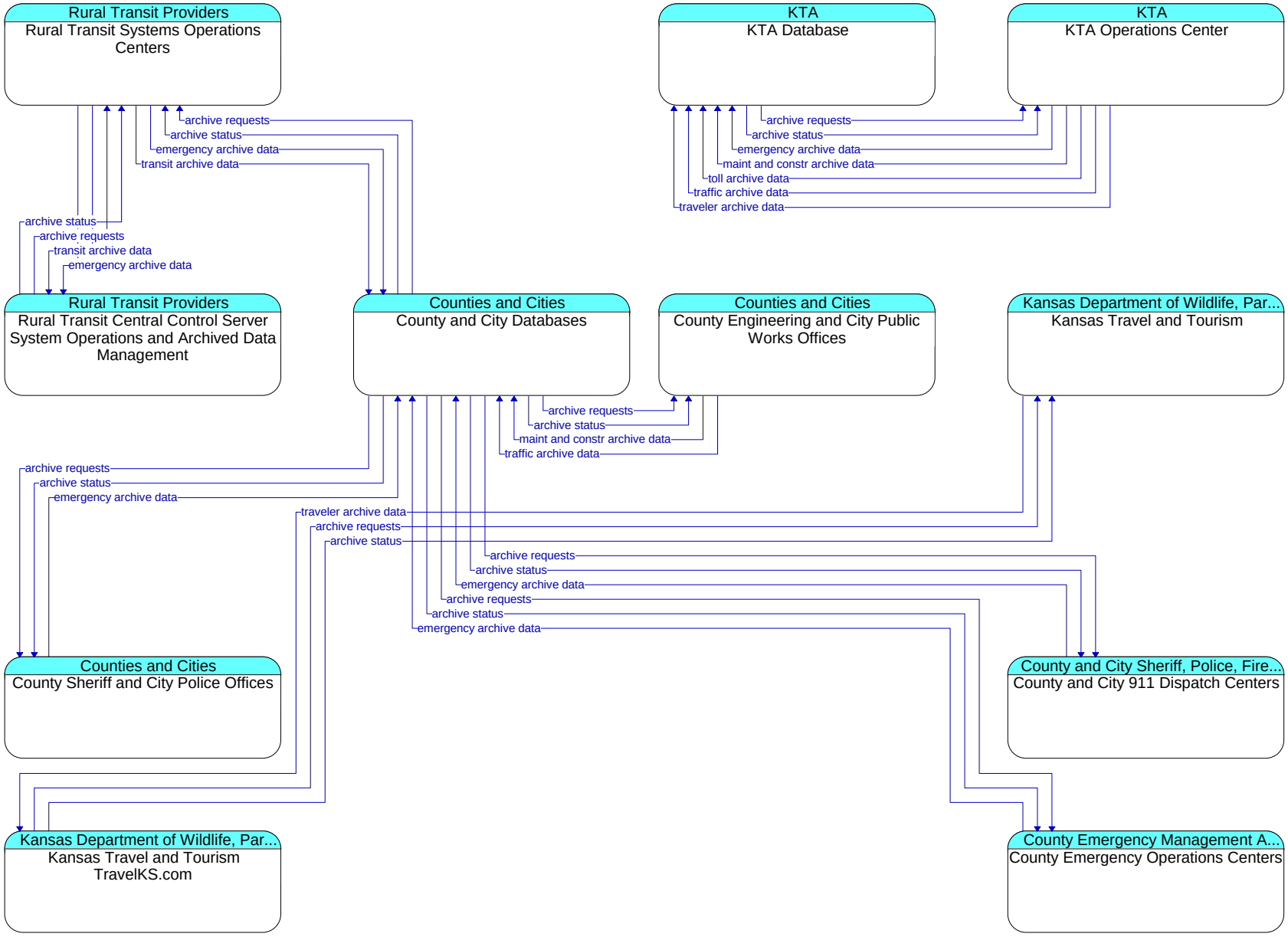
_____

_____

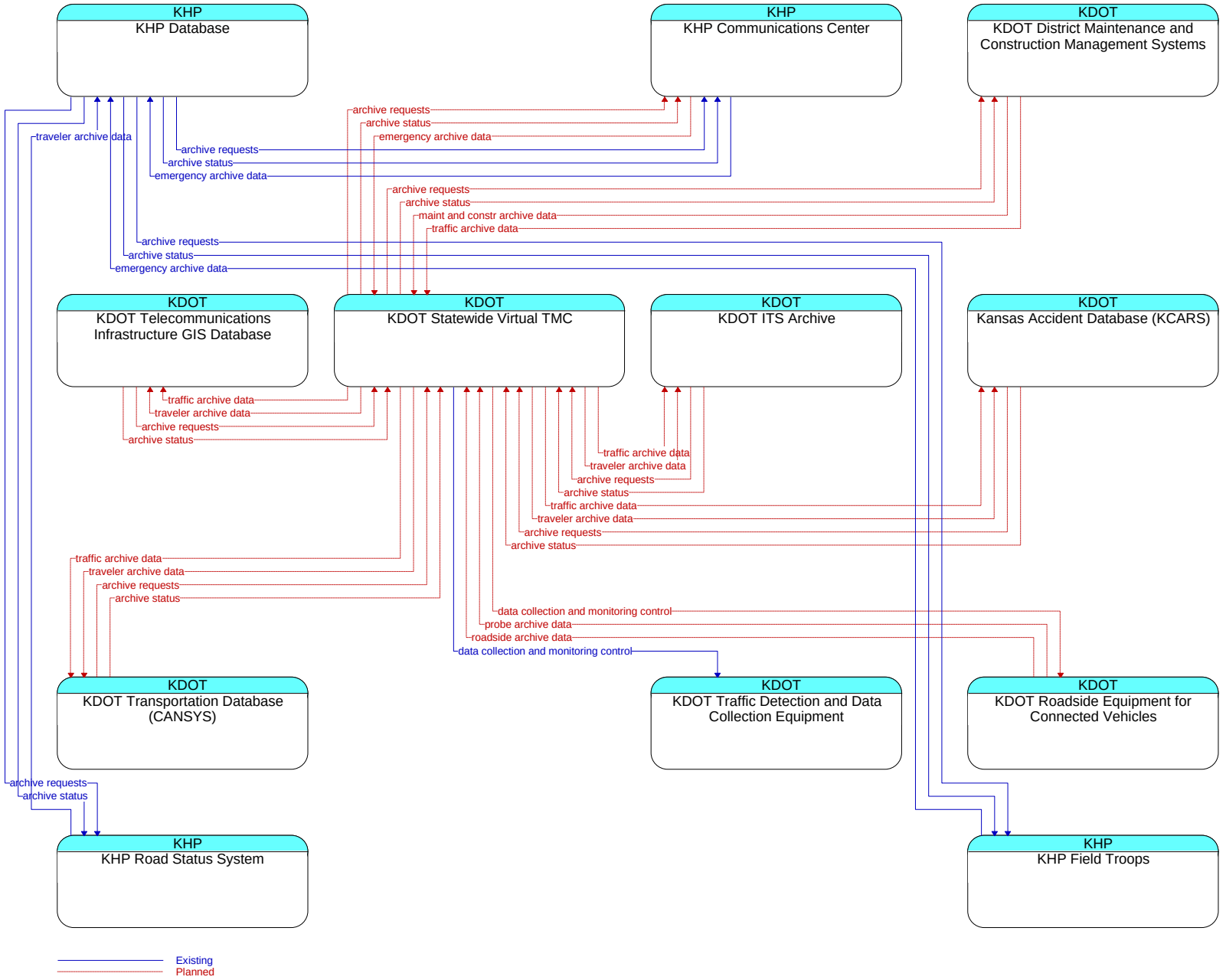
_____

APPENDIX B: SERVICE PACKAGE DIAGRAMS

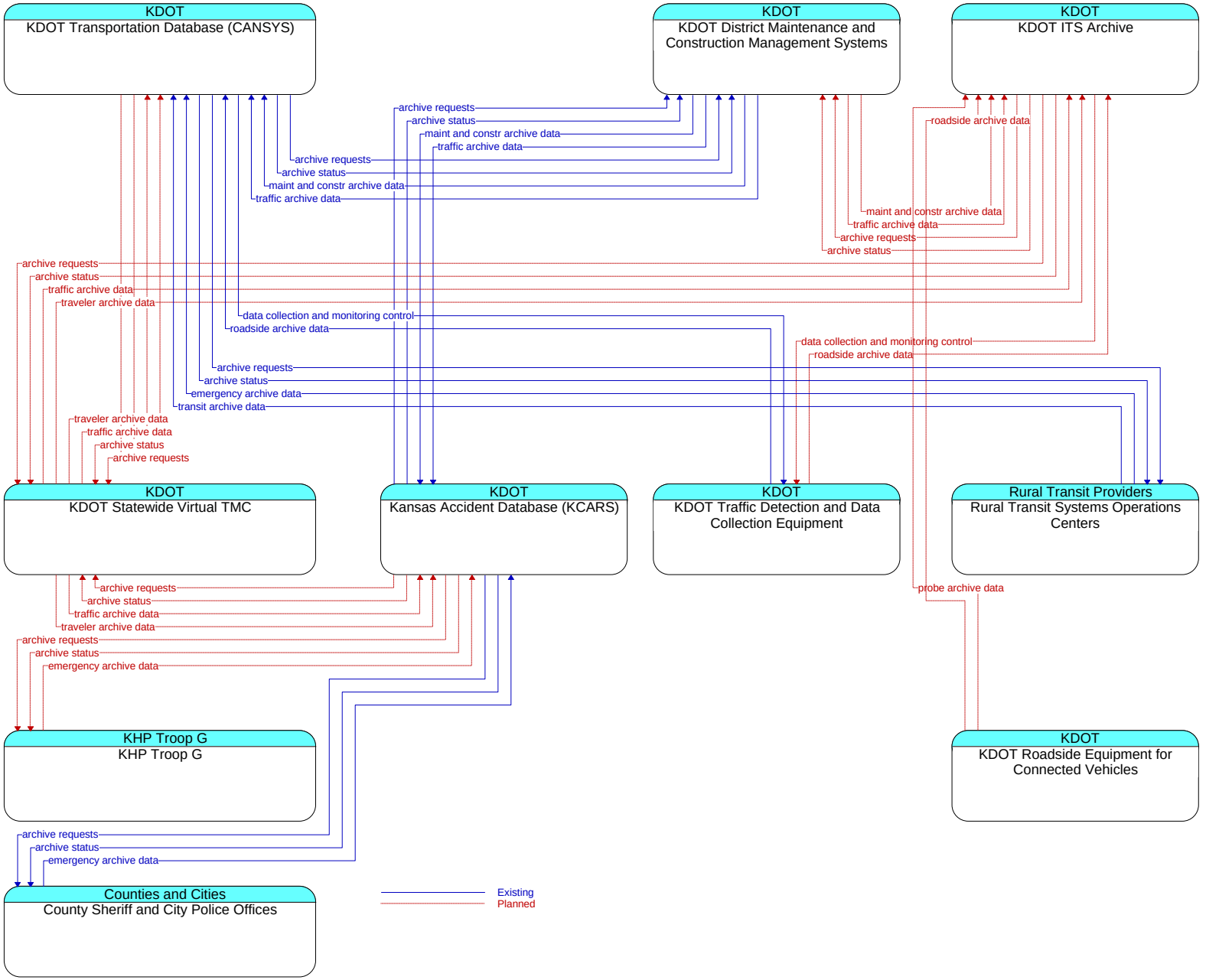
AD1 - ITS Data Mart (Part 1)



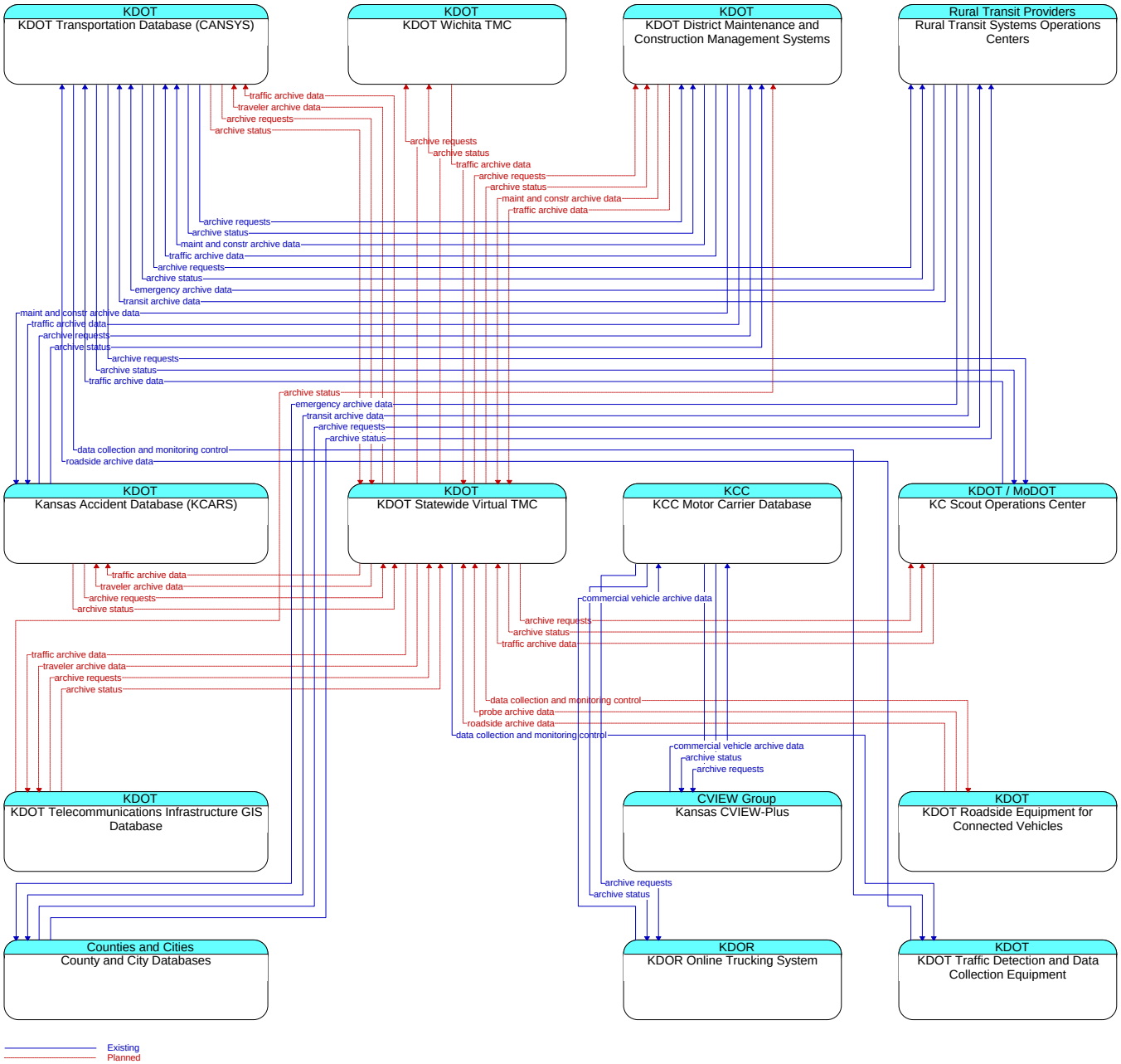
AD1 - ITS Data Mart (Part 2)



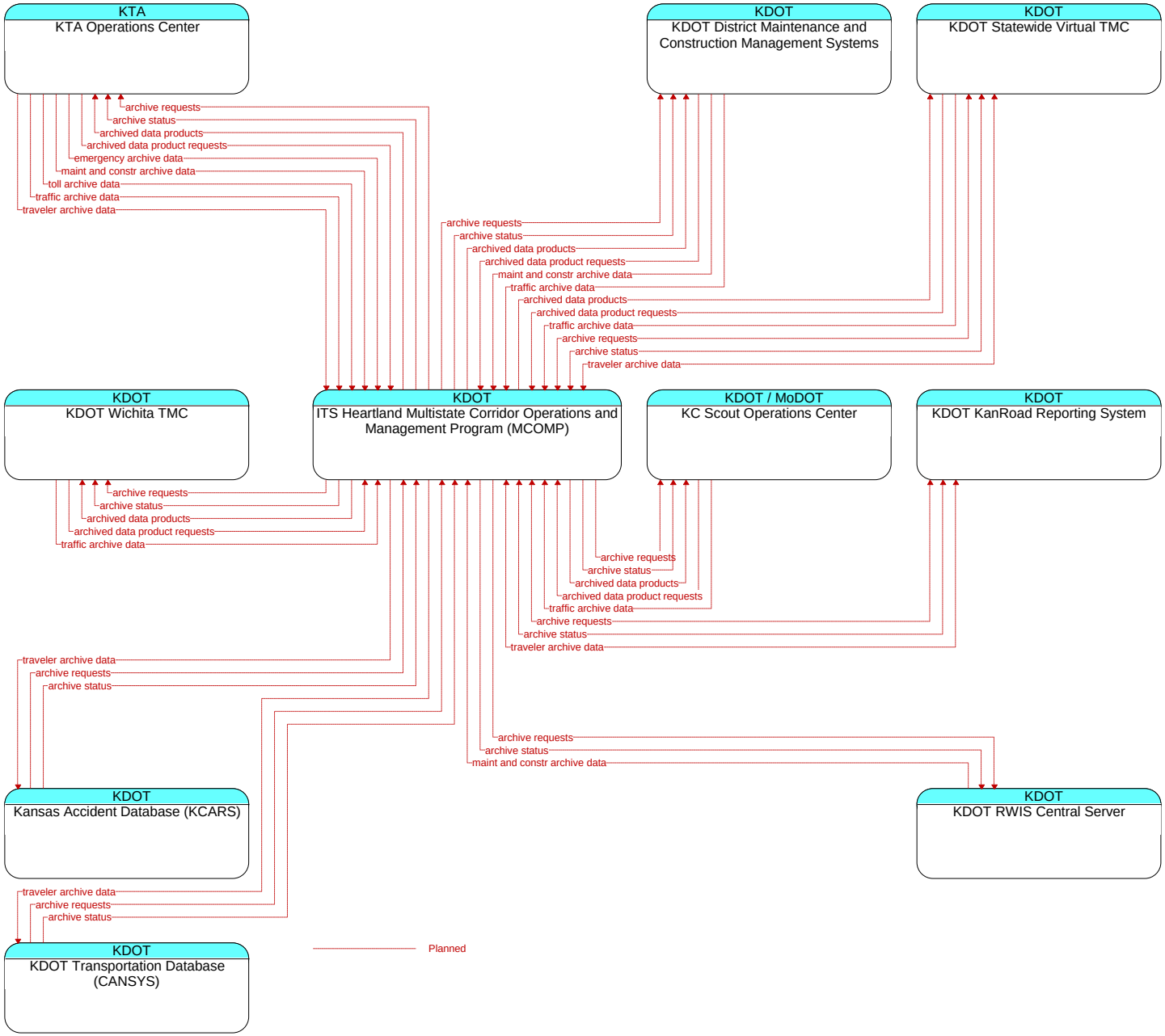
AD1 - ITS Data Mart (Part 3)



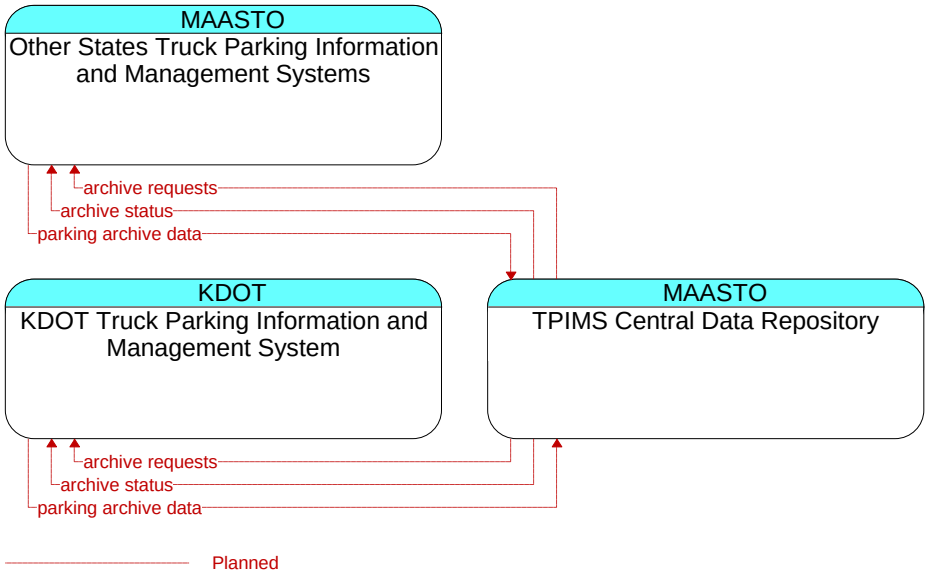
AD2 - ITS Data Warehouse (Part 1)



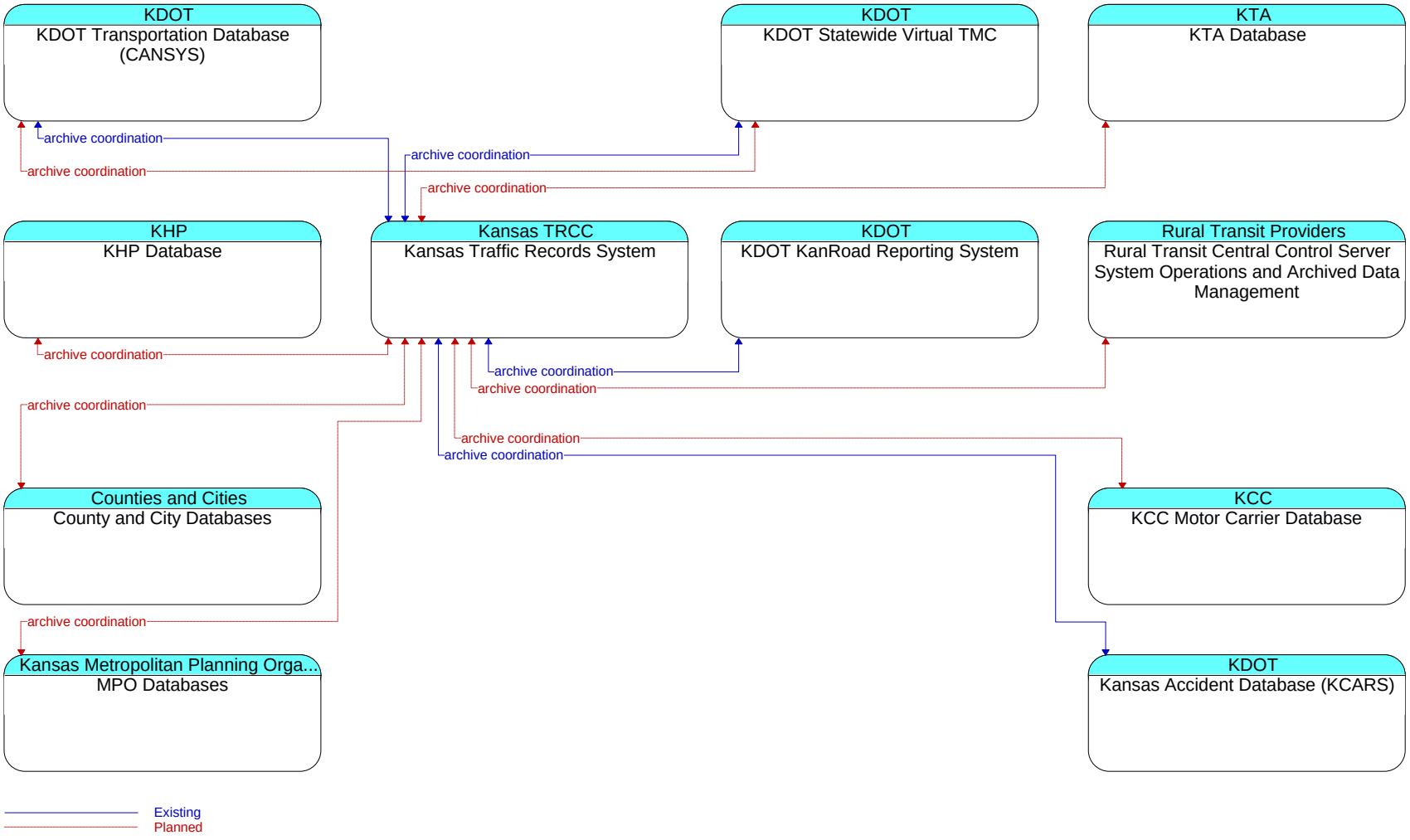
AD2 - ITS Data Warehouse (Part 2)



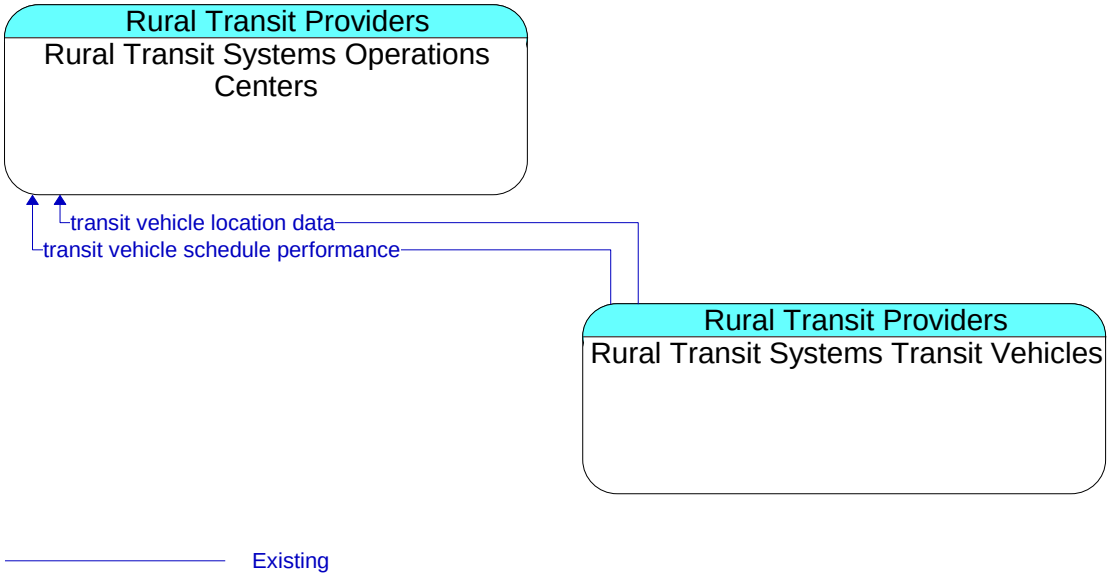
AD2 - ITS Data Warehouse (Part 3)



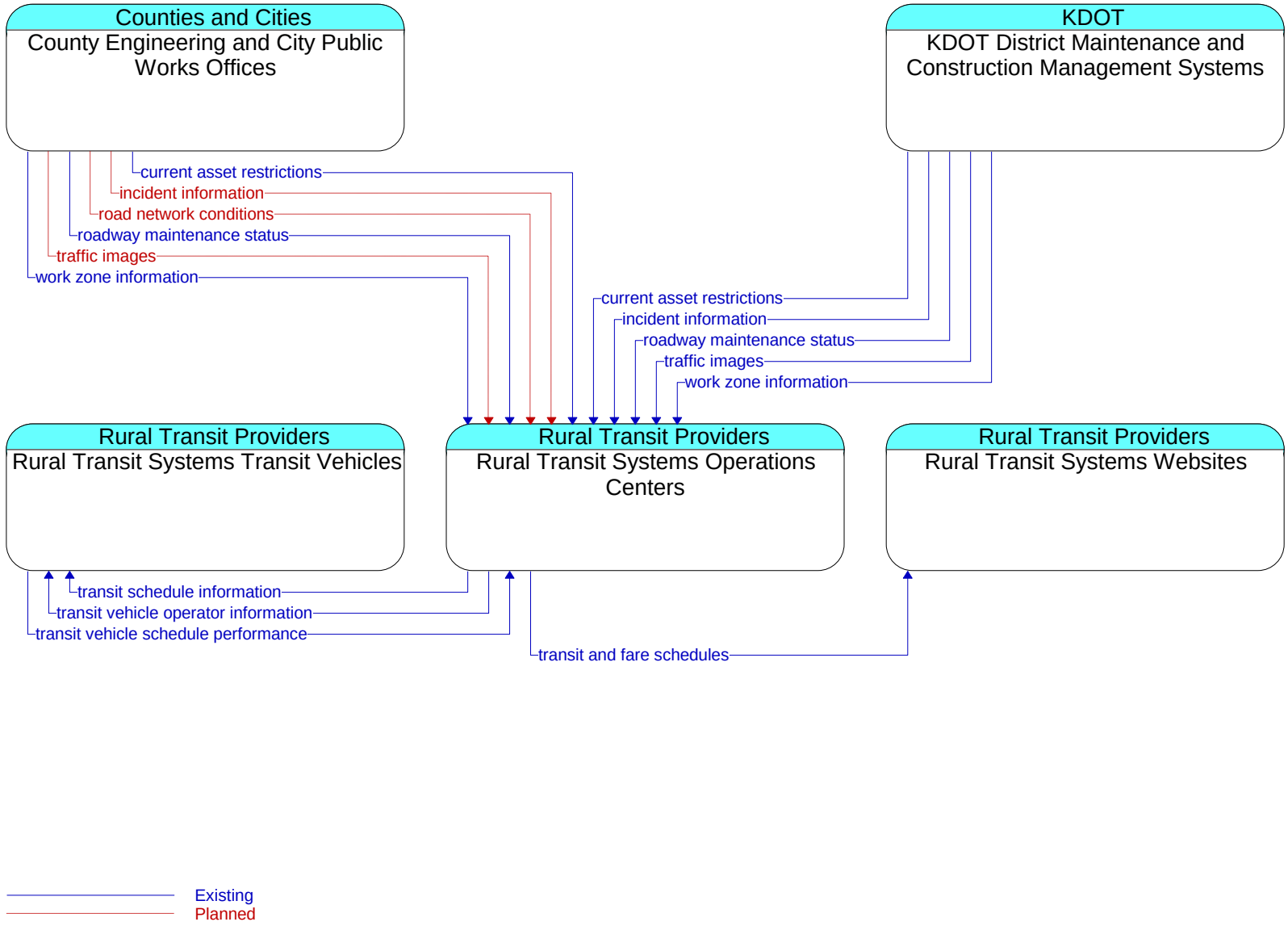
AD3 – Virtual ITS Data Warehouse



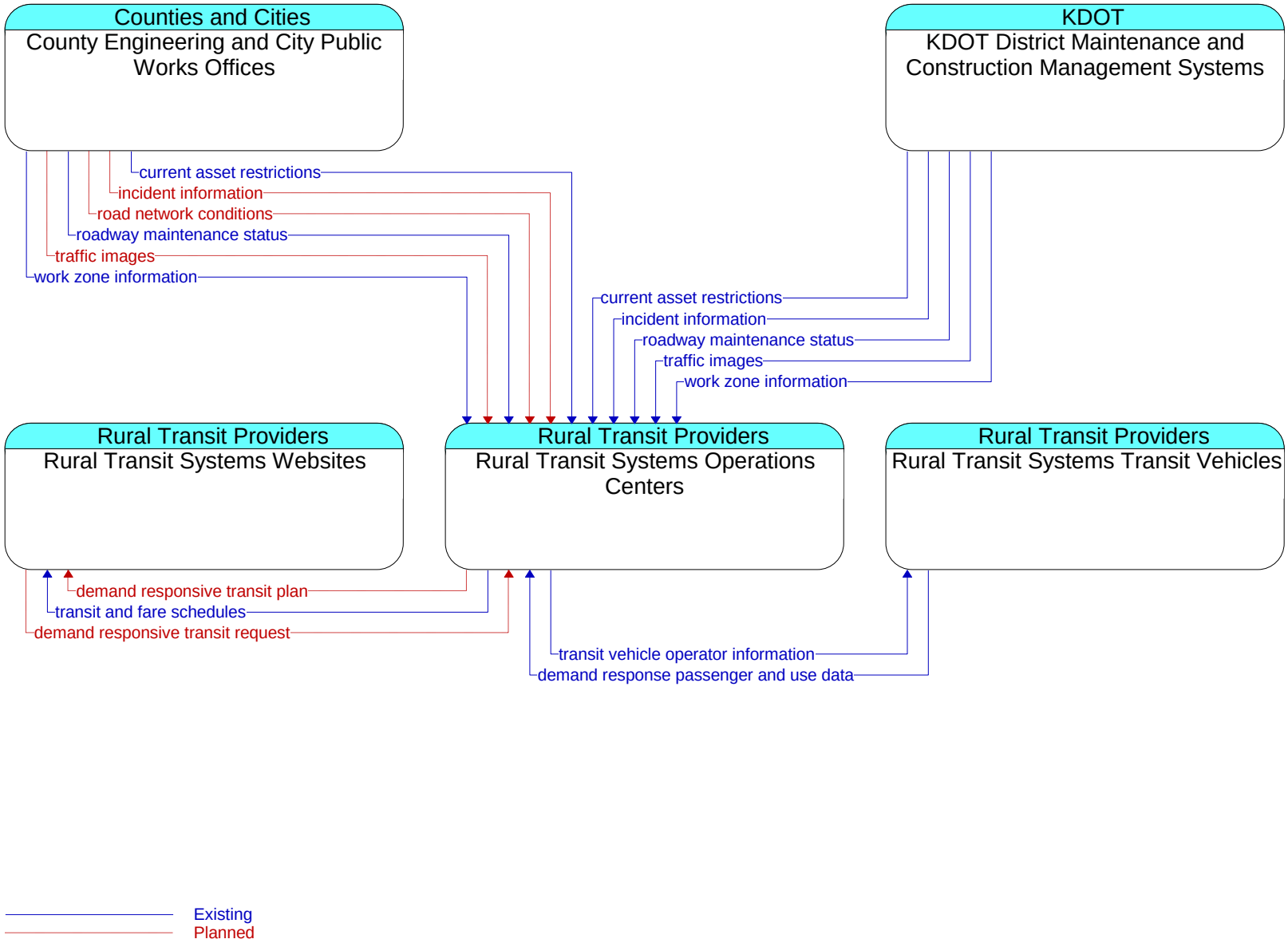
APTS1 – Transit Vehicle Tracking



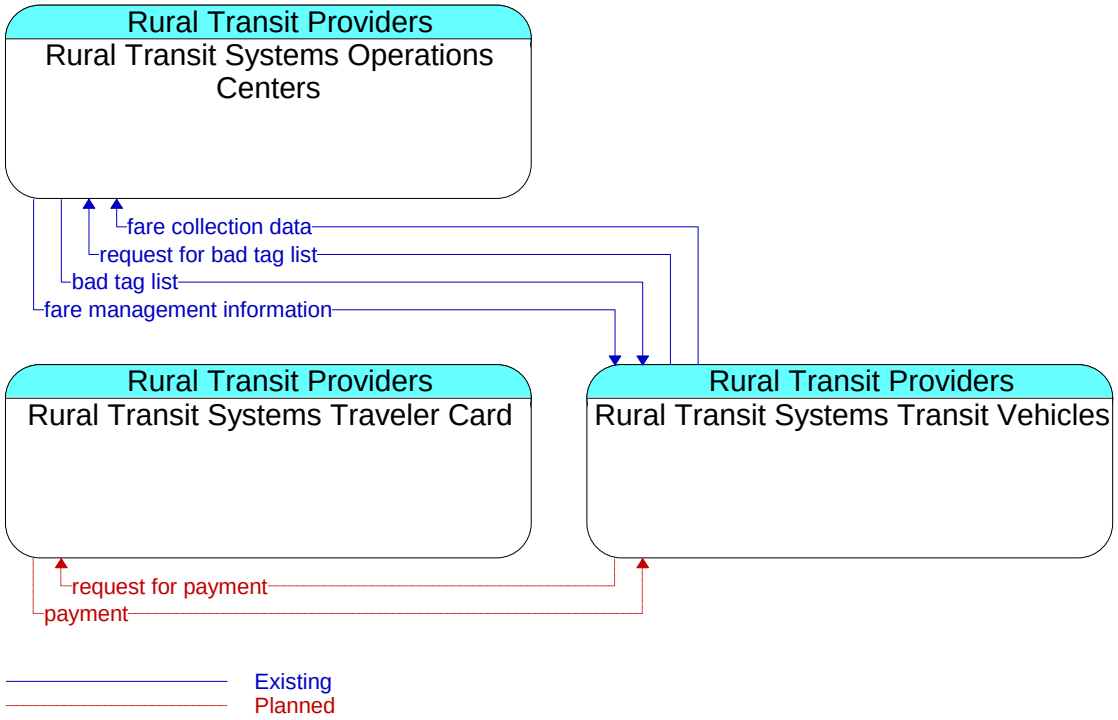
APTS2 – Transit Fixed-Route Operations



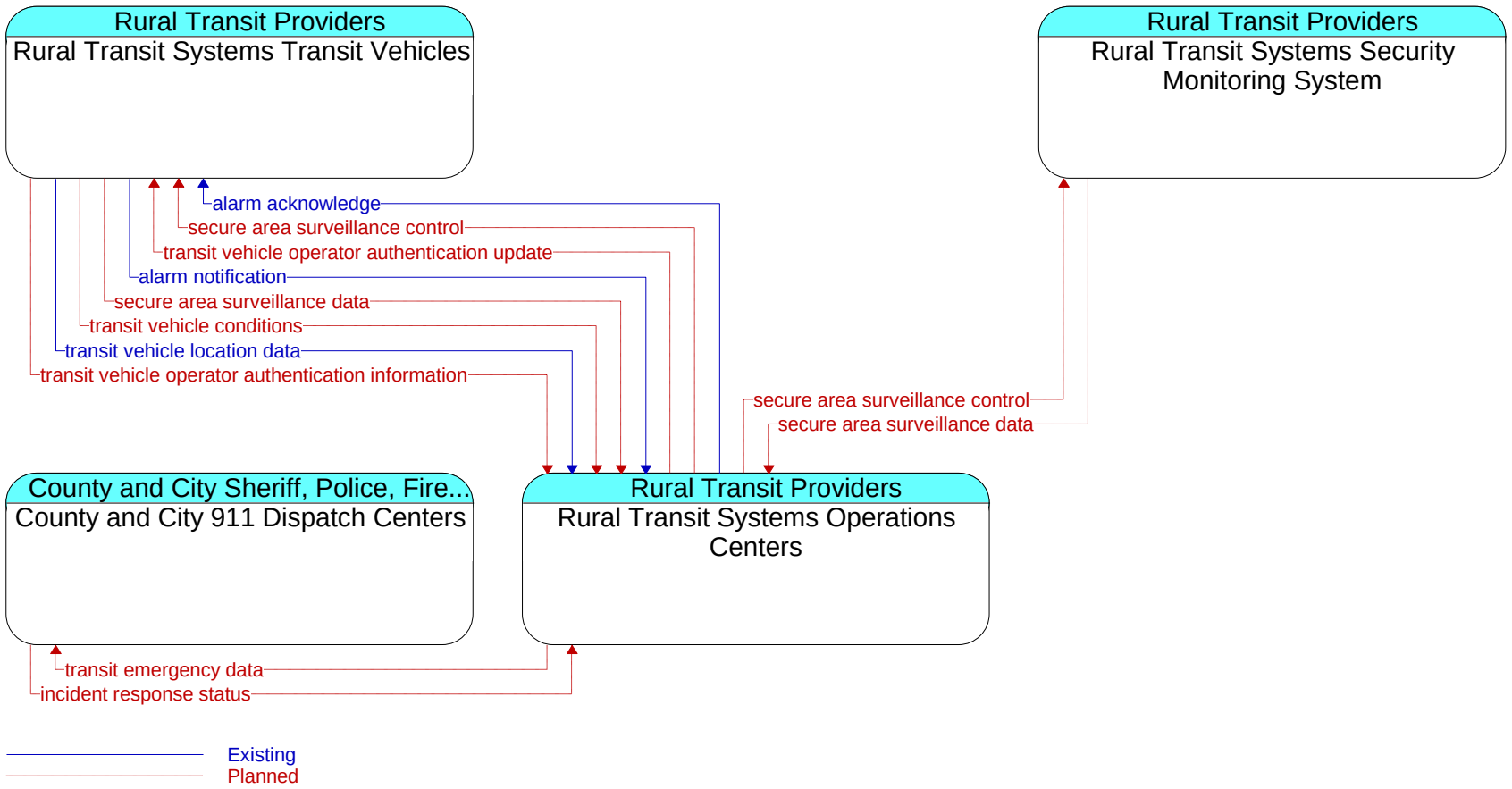
APTS3 - Demand Response Transit Operations



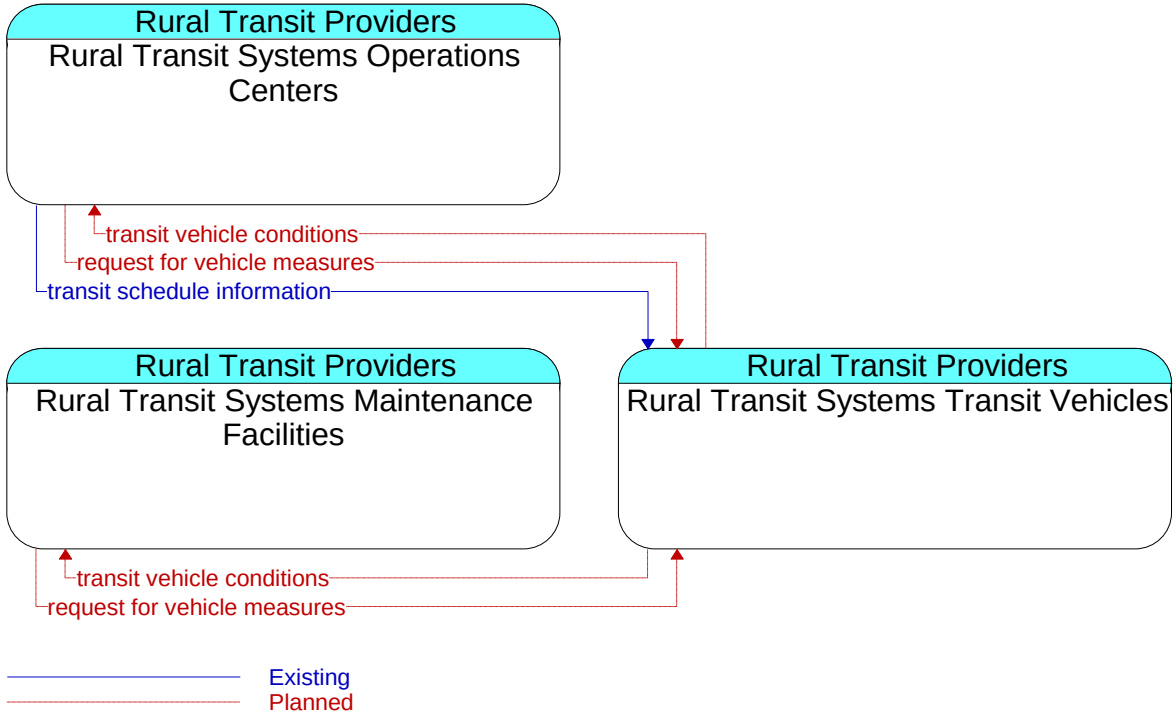
APTS4 - Transit Fare Collection Management



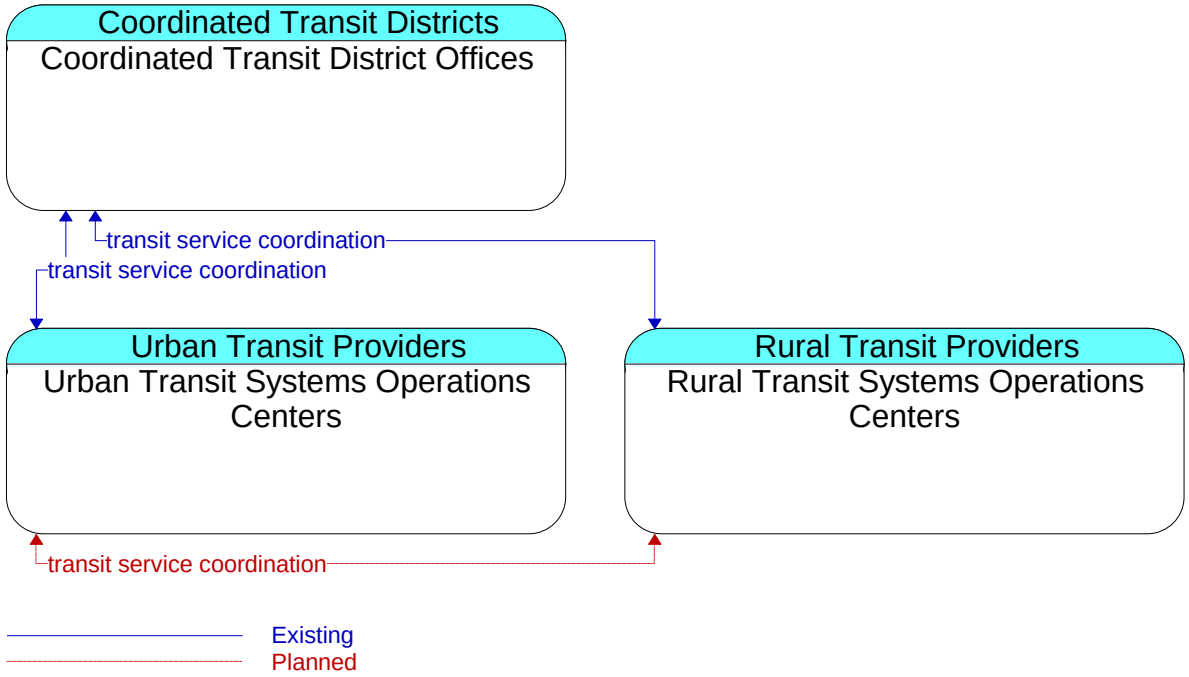
APTS5 - Transit Security



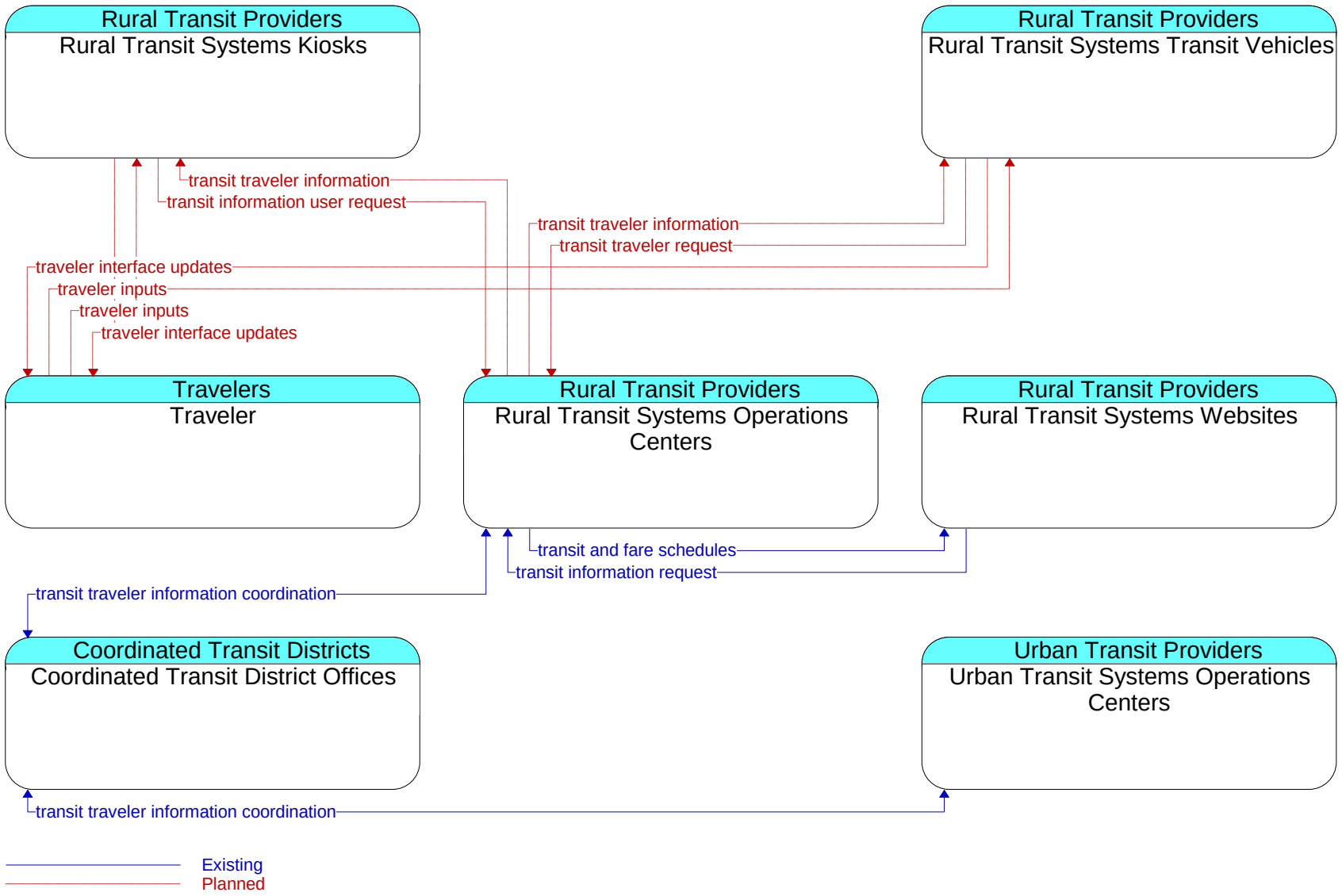
APTS6 - Transit Fleet Management



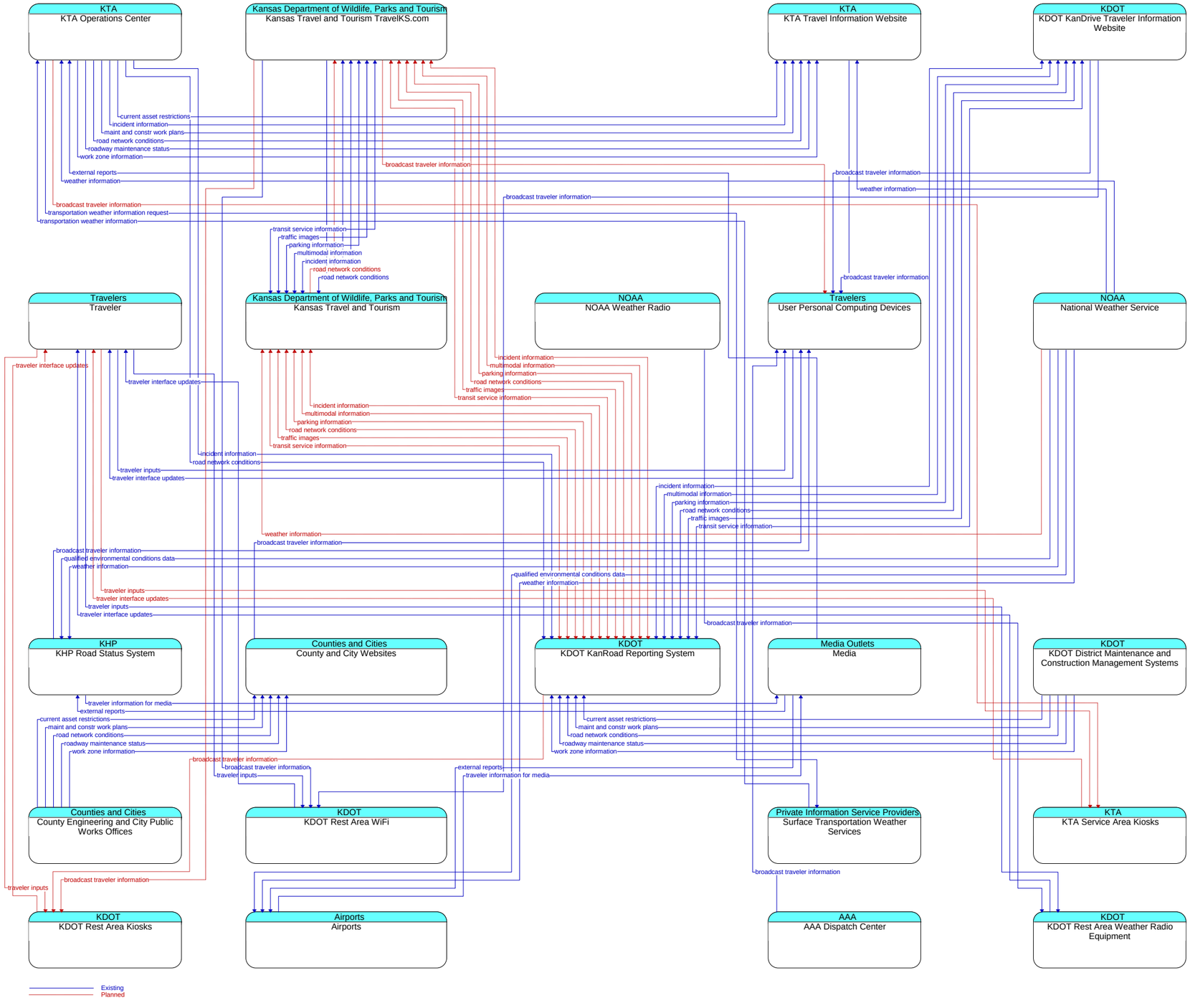
APTS7 - Multi-Modal Coordination



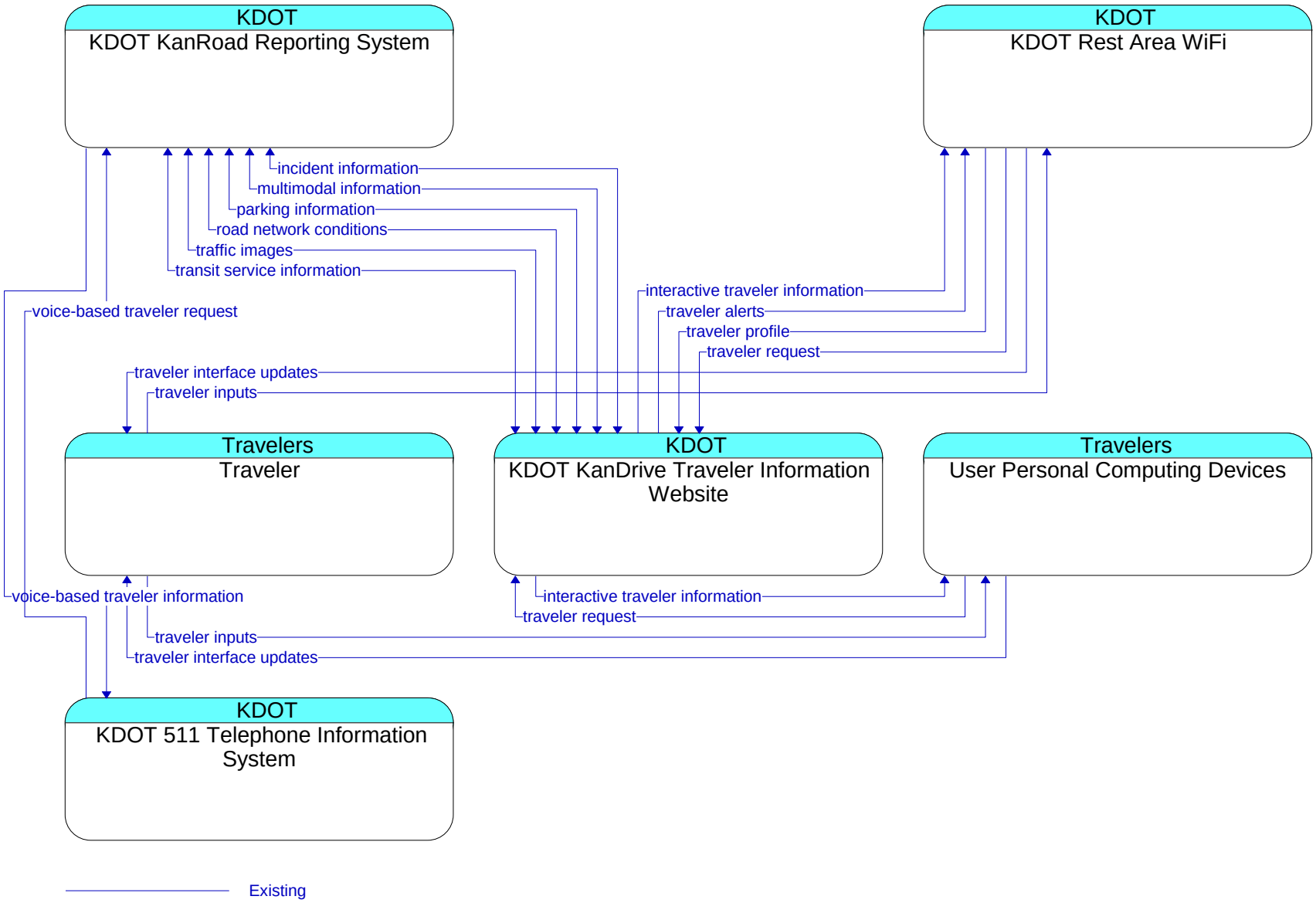
APTS8 - Transit Traveler Information



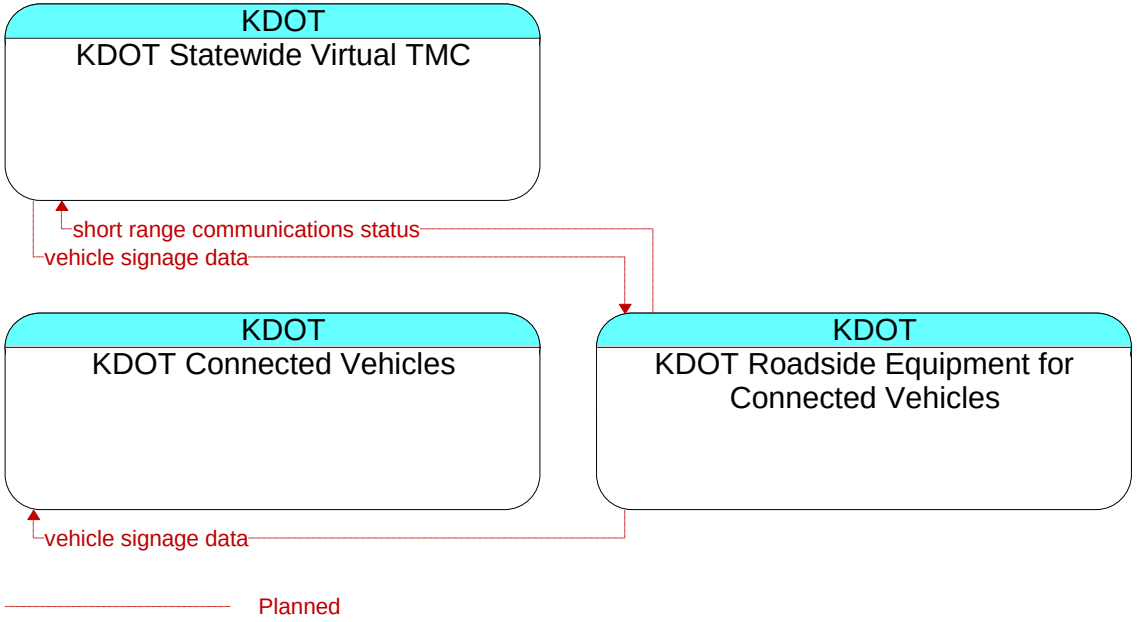
ATIS1 - Broadcast Traveler Information



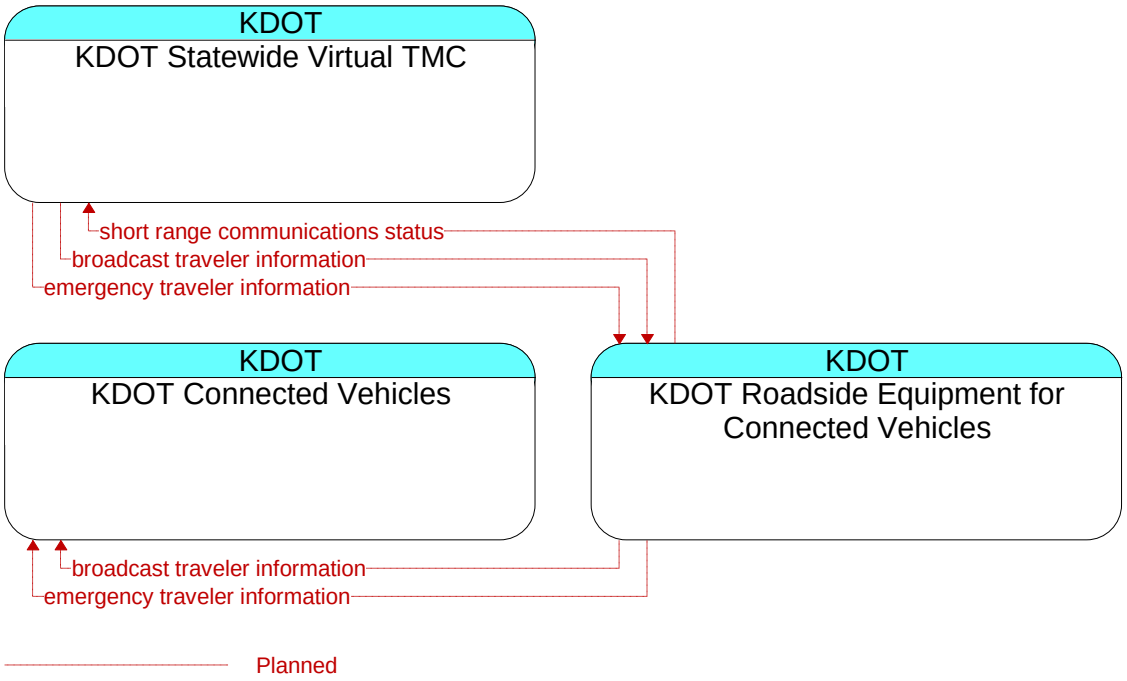
ATIS2 - Interactive Traveler Information



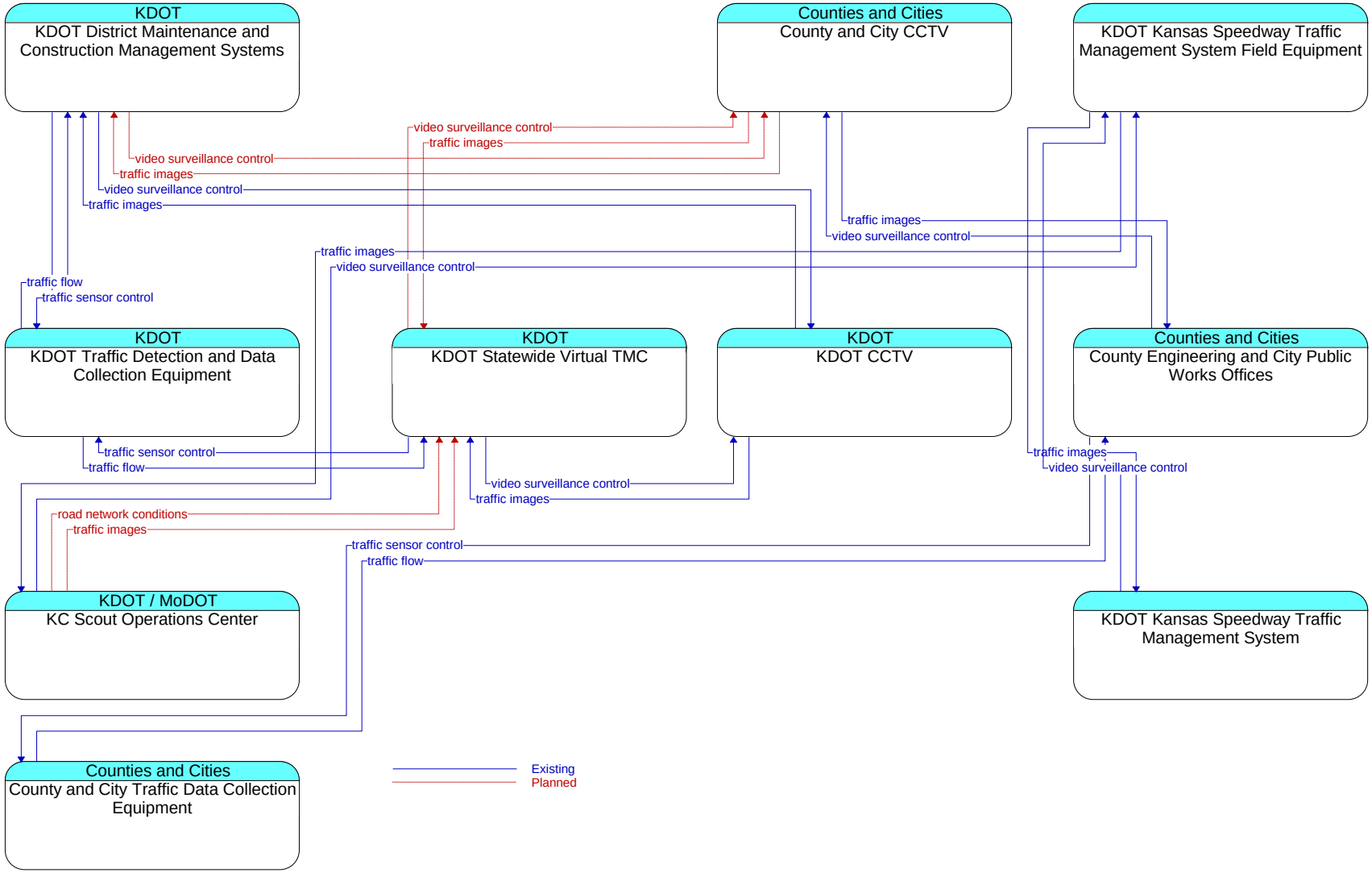
ATIS9 – In Vehicle Signing



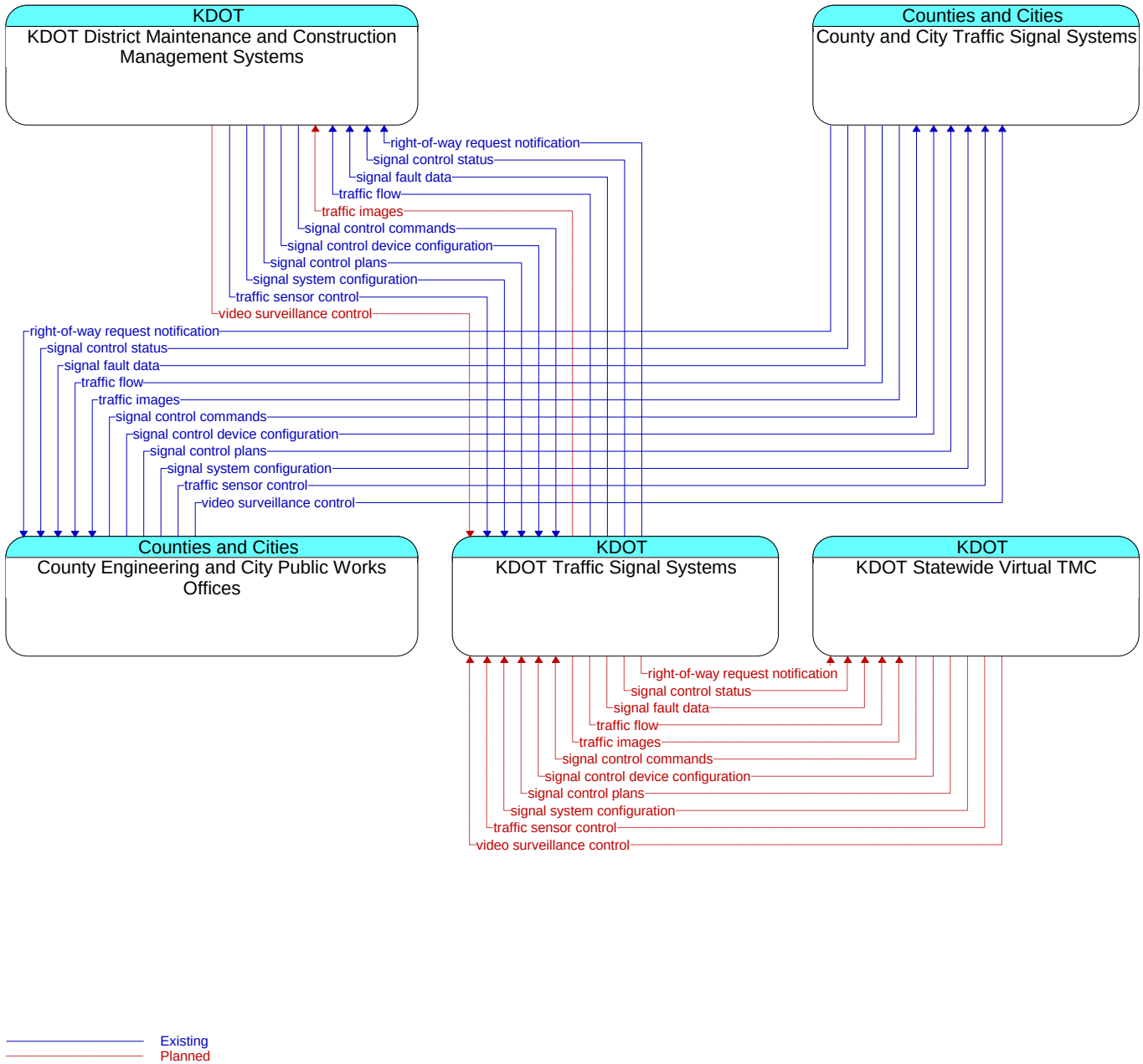
ATIS10 - Short Range Communications Traveler Information



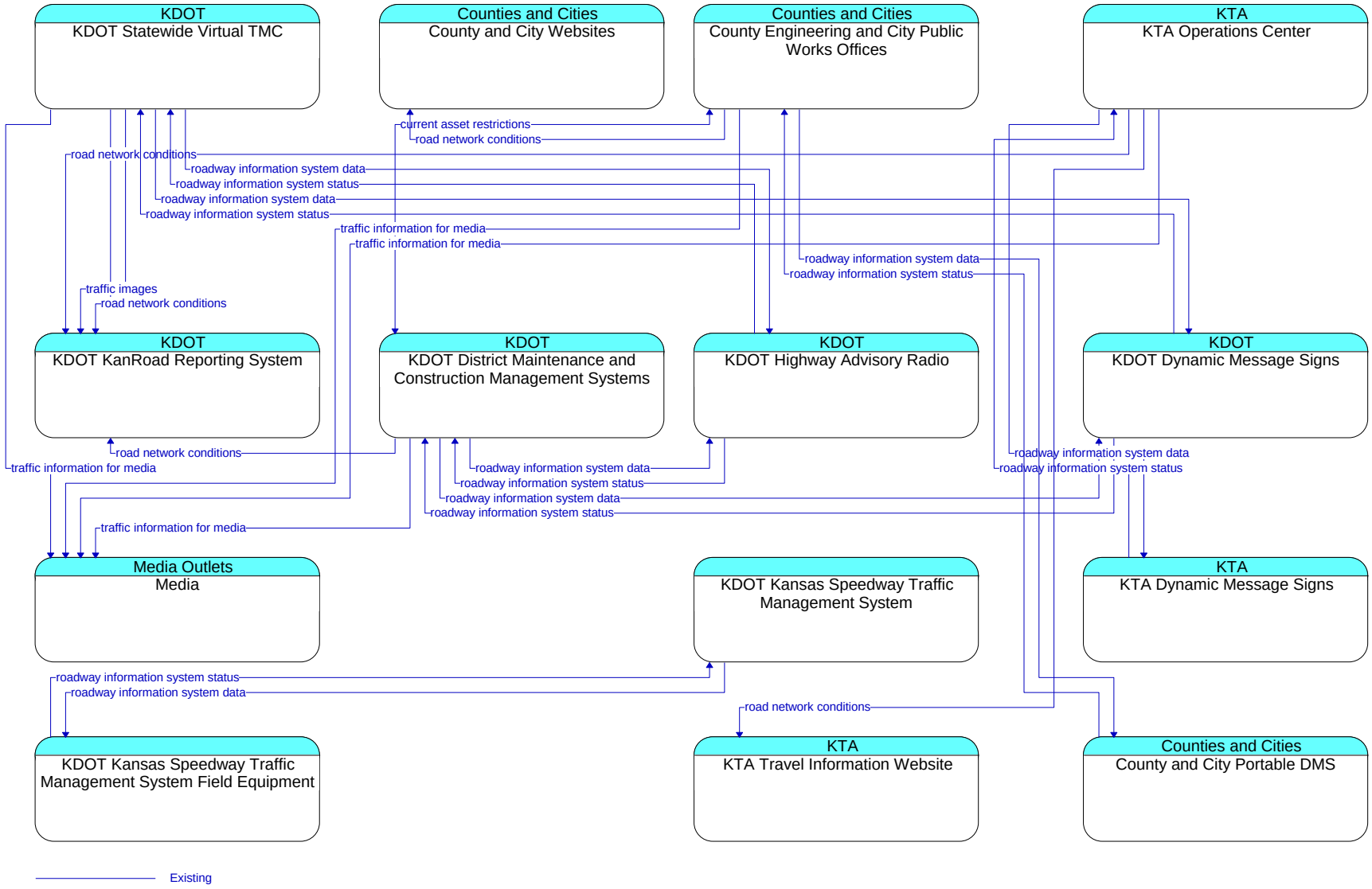
ATMS01 - Network Surveillance



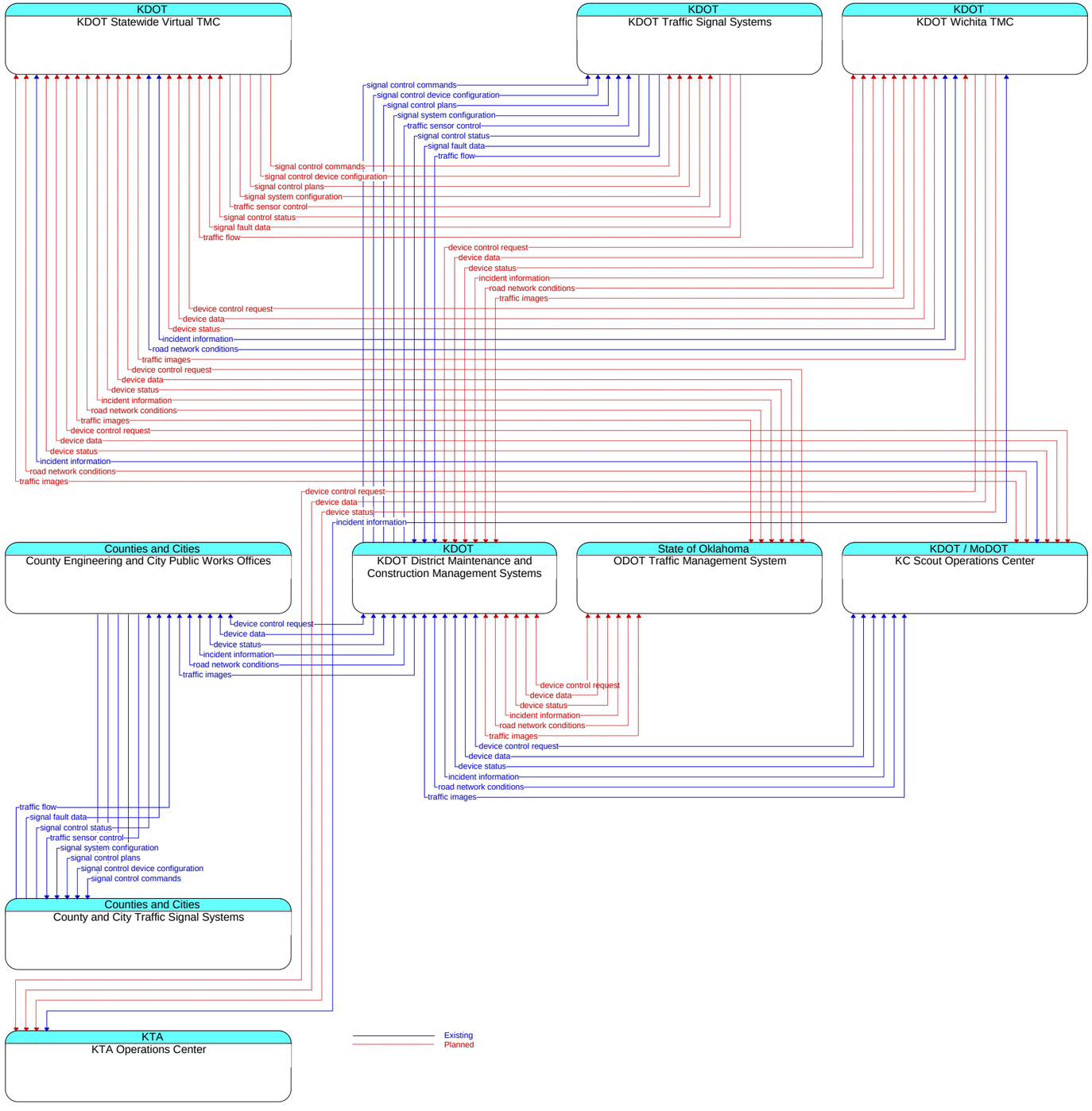
ATMS03 – Traffic Signal Control



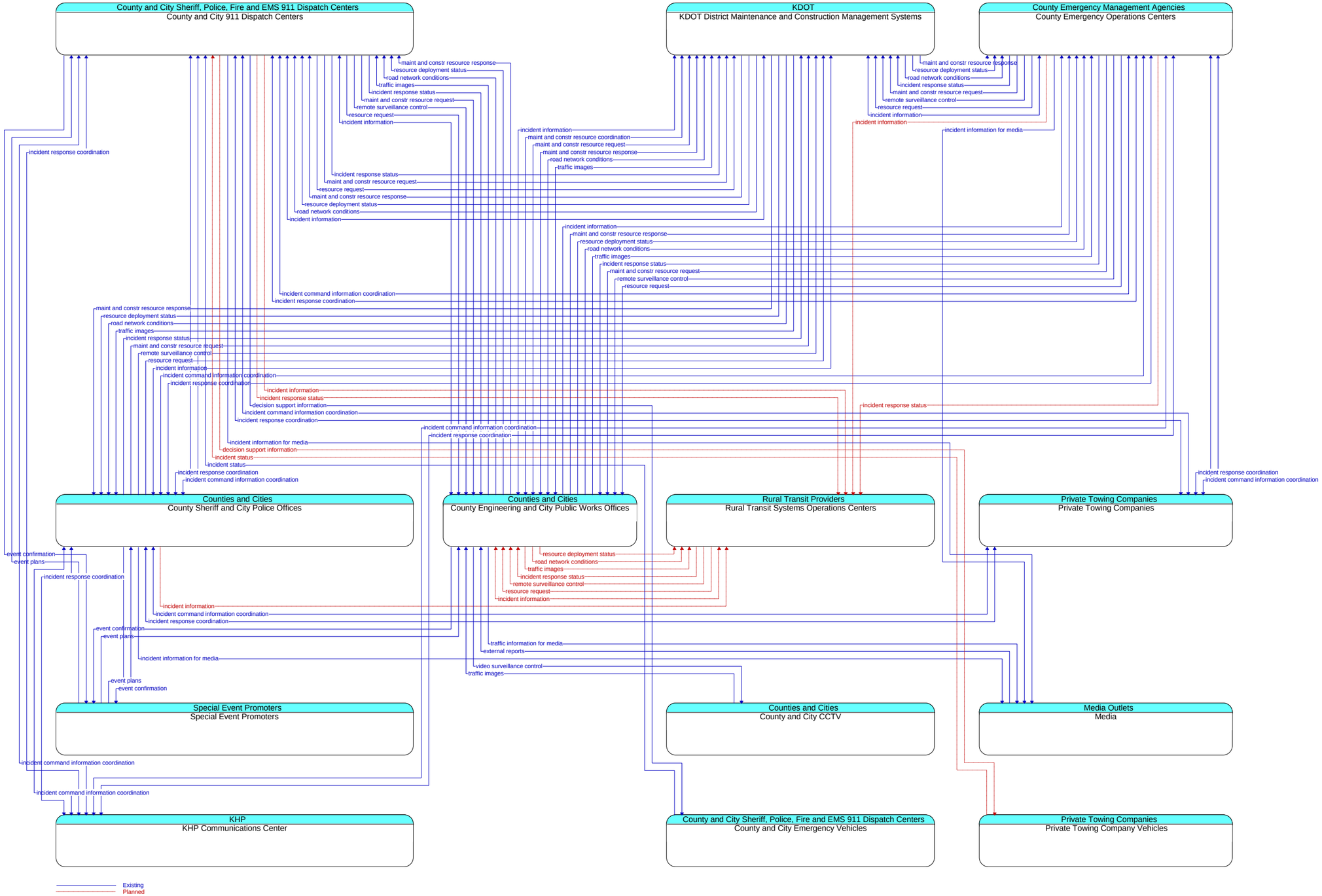
ATMS06 - Traffic Information Dissemination



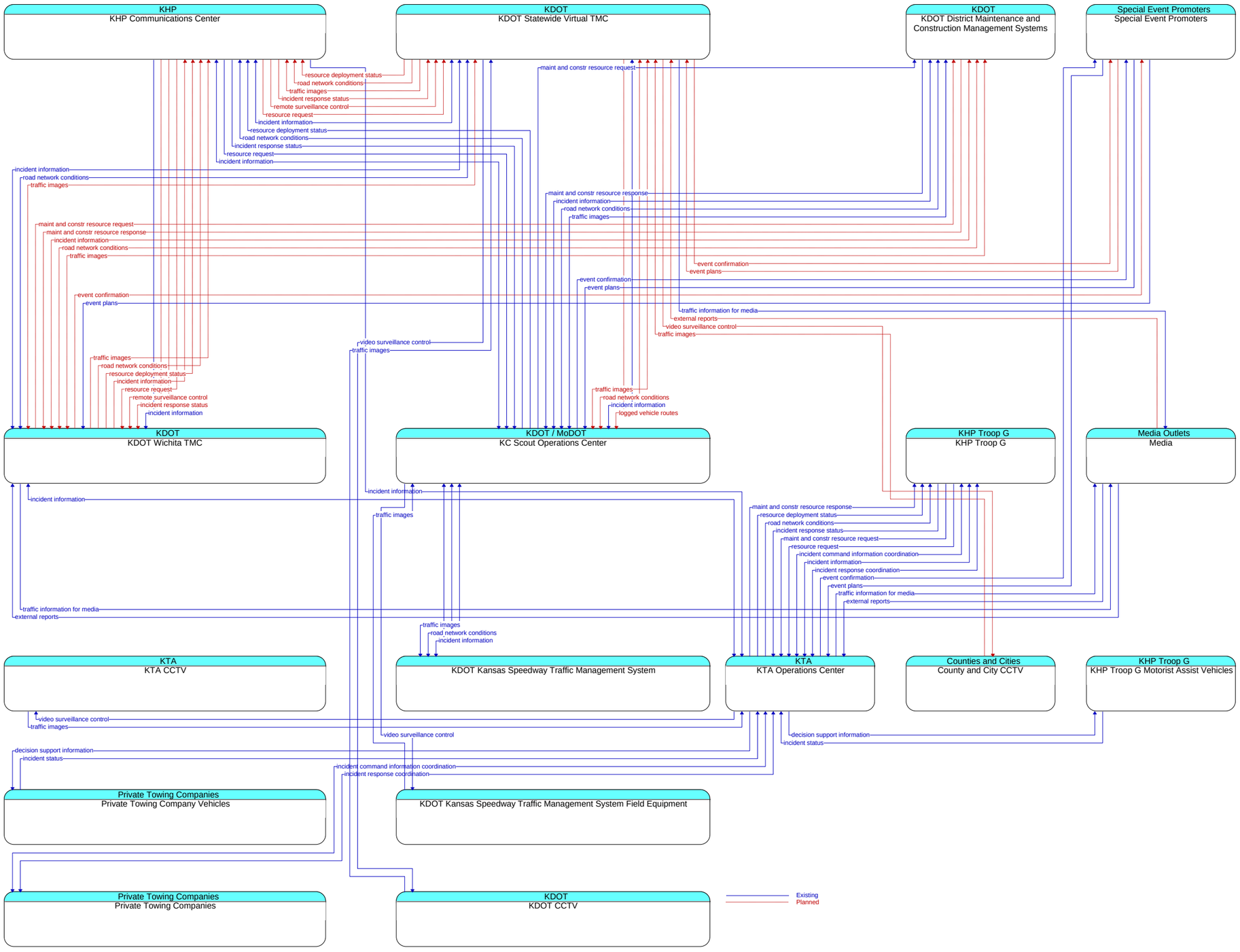
ATMS07 - Regional Traffic Management



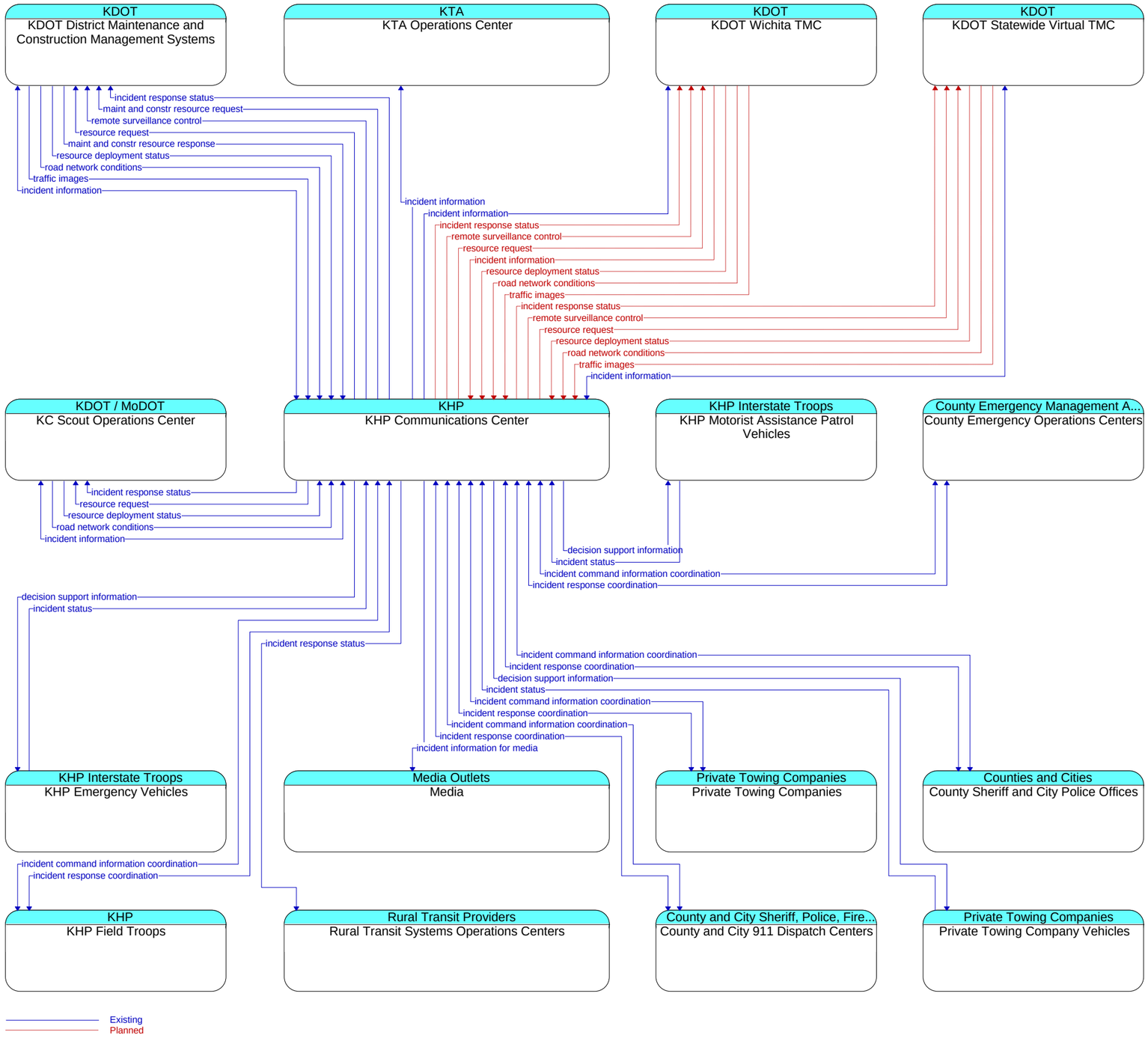
ATMS08 - Traffic Incident Management System (Part 1)



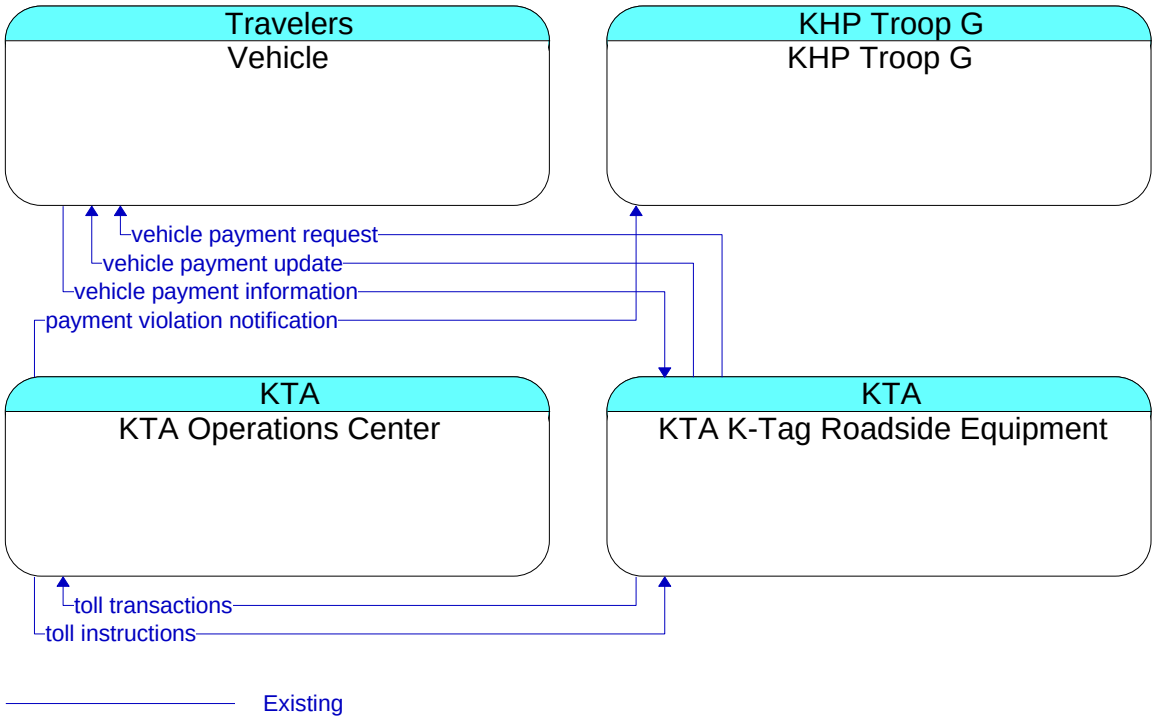
ATMS08 - Traffic Incident Management System (Part 2)



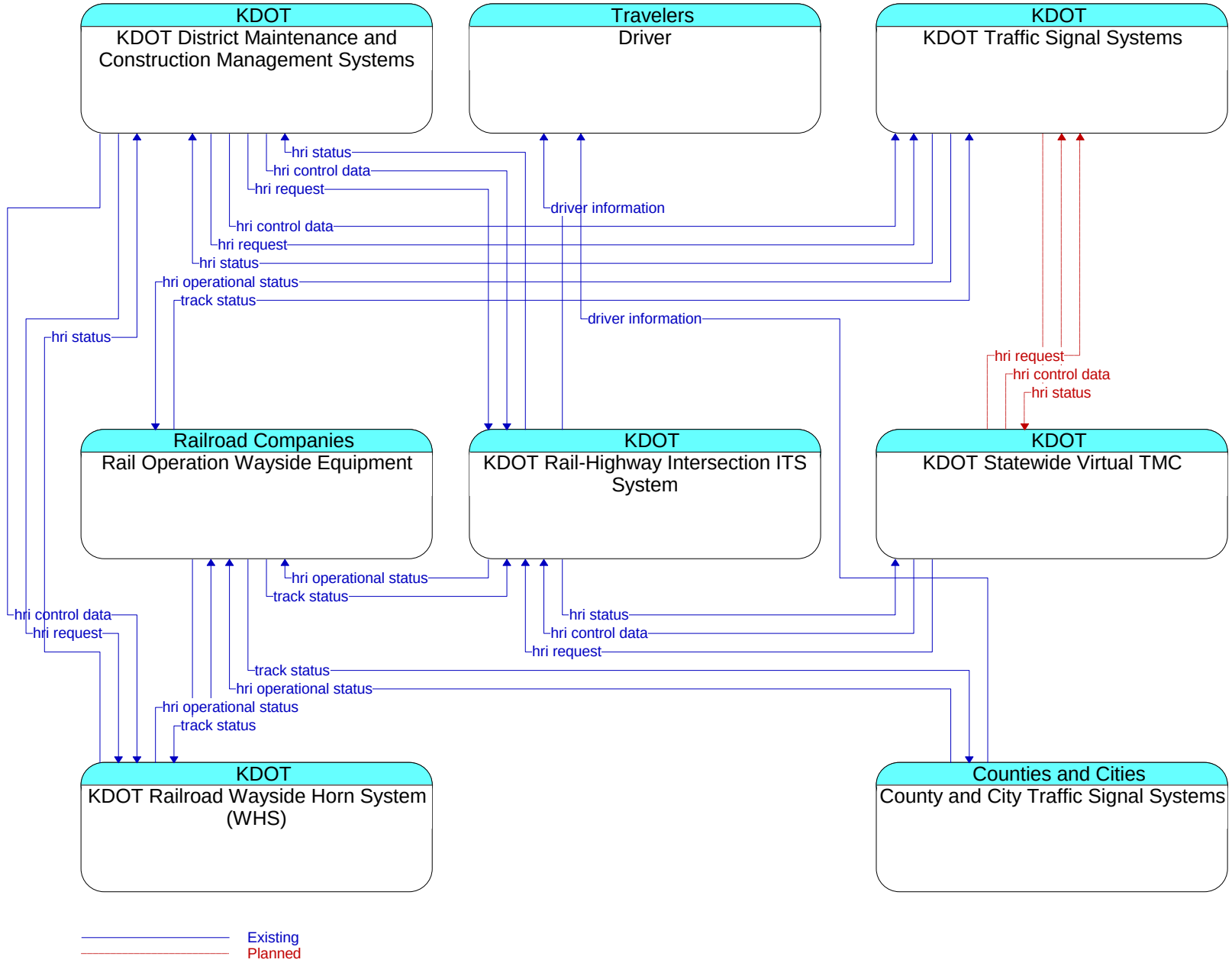
ATMS08 - Traffic Incident Management System (Part 3)



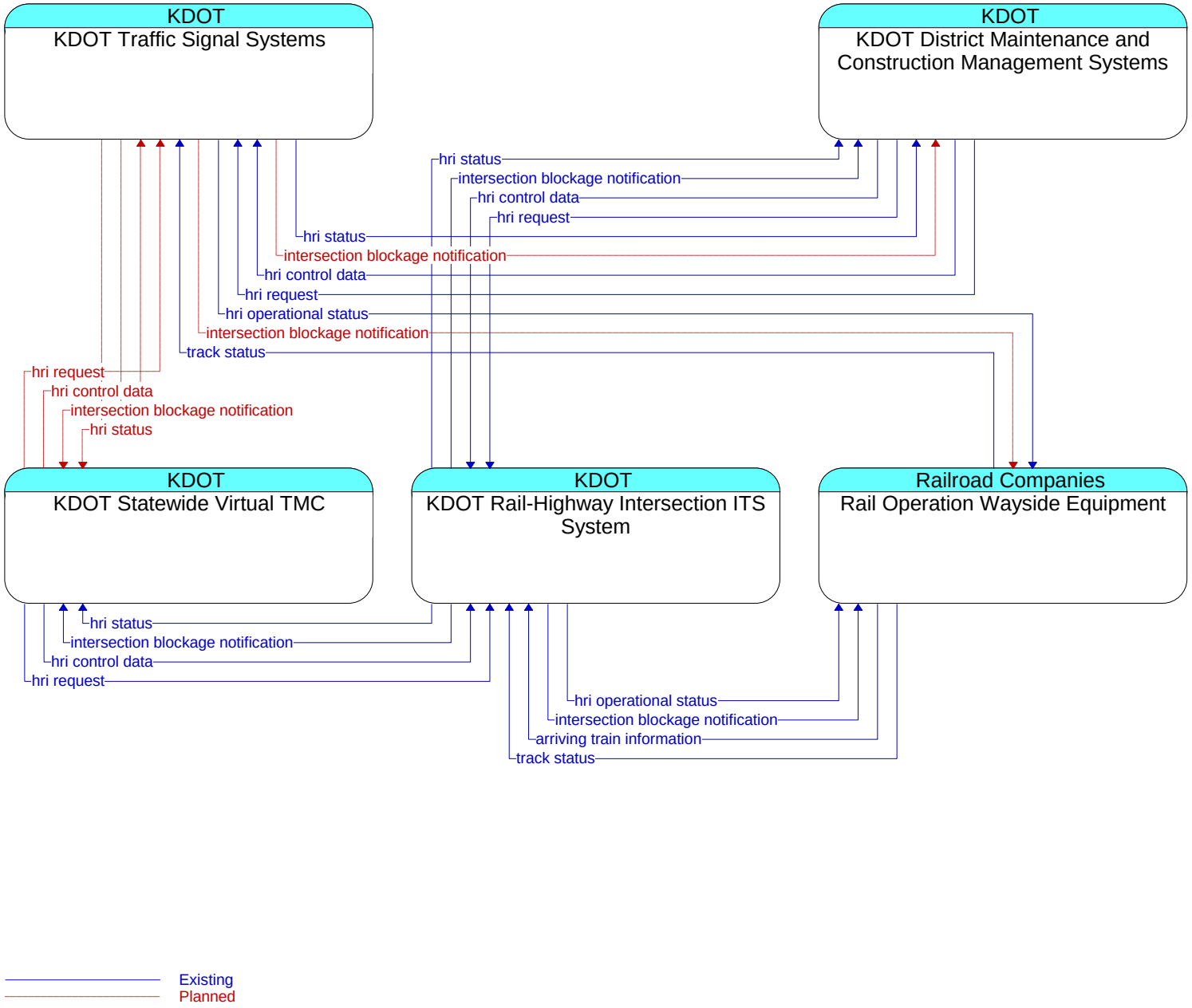
ATMS10 - Electronic Toll Collection



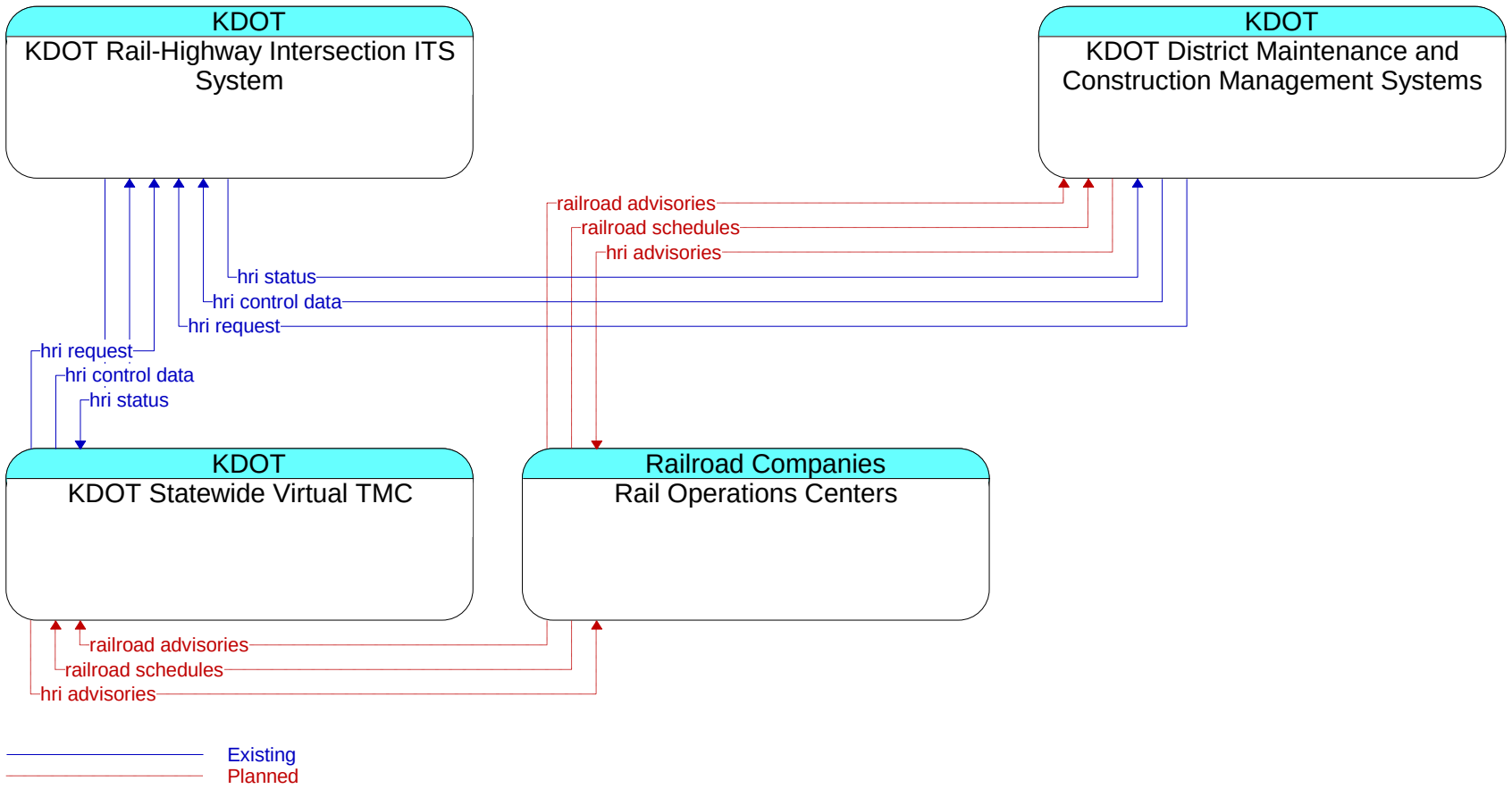
ATMS13 - Standard Railroad Grade Crossing



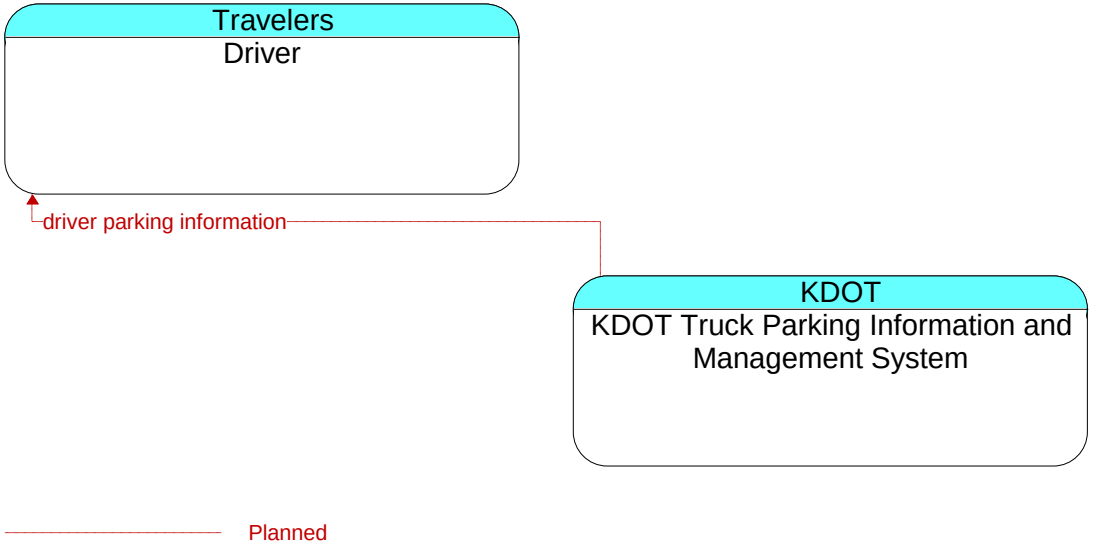
ATMS14 - Advanced Railroad Grade Crossing



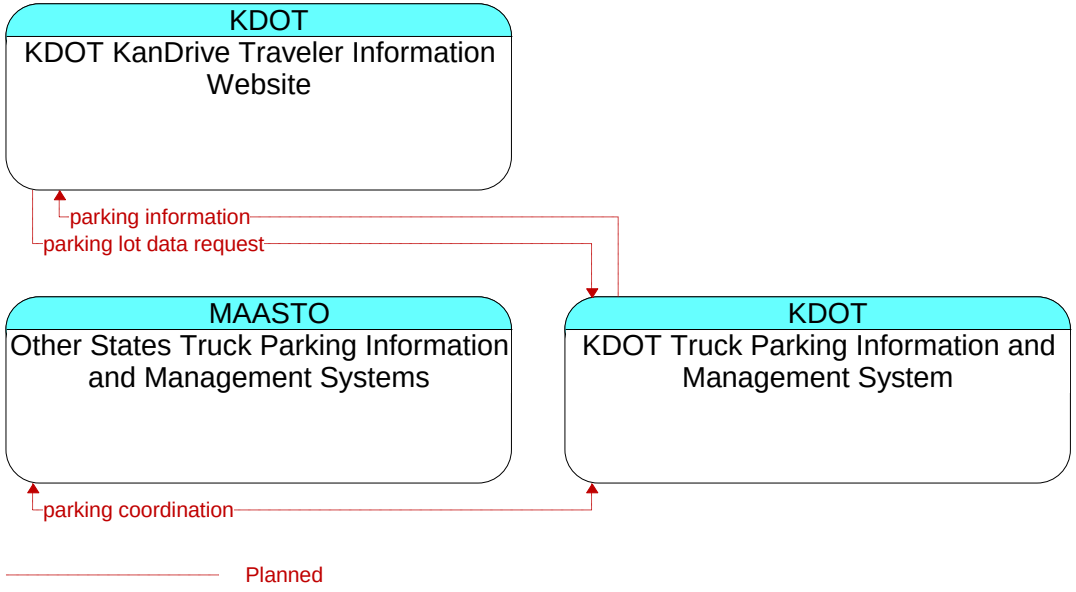
ATMS15 – Railroad Operations Coordination



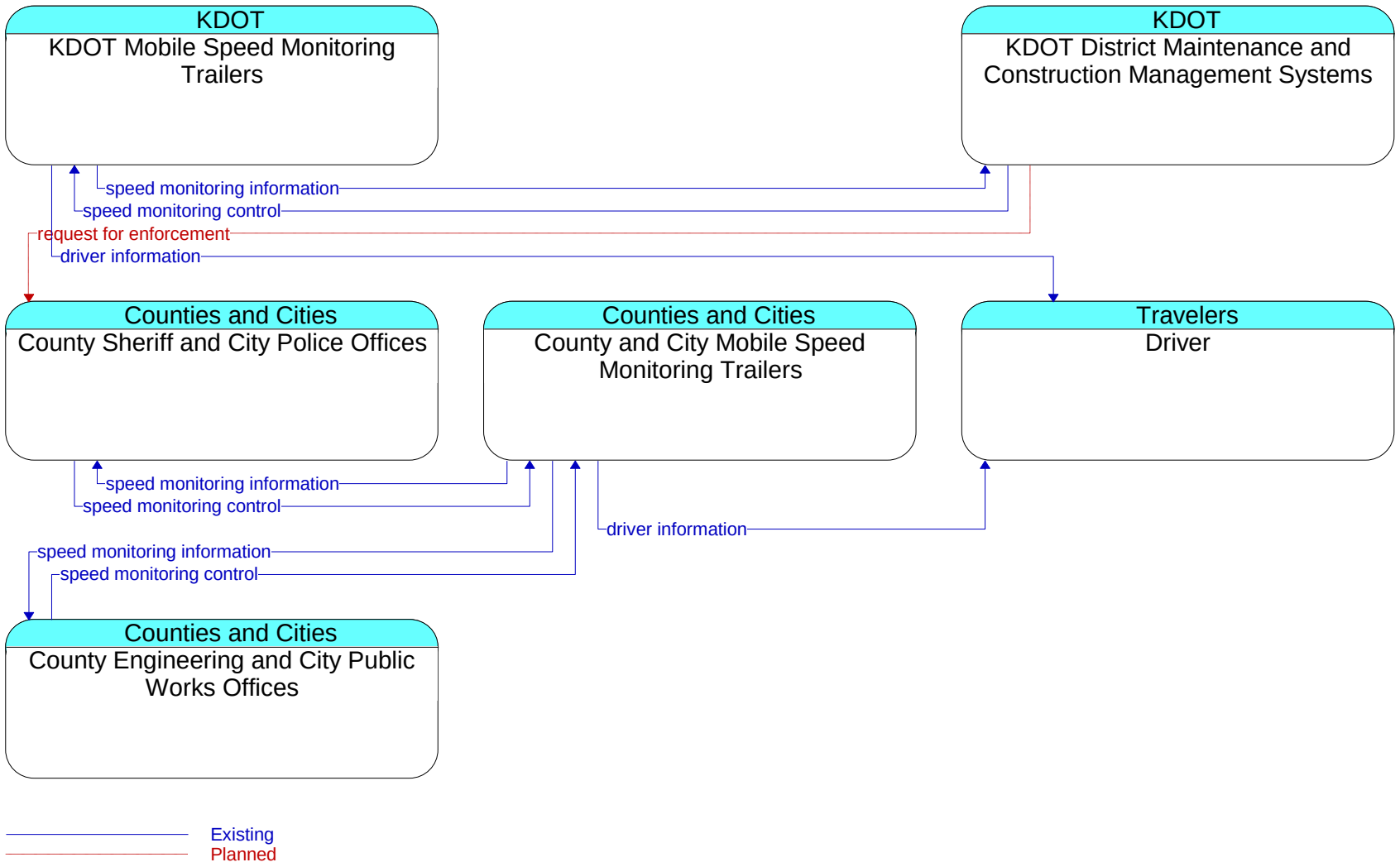
ATMS16 – Parking Facility Management



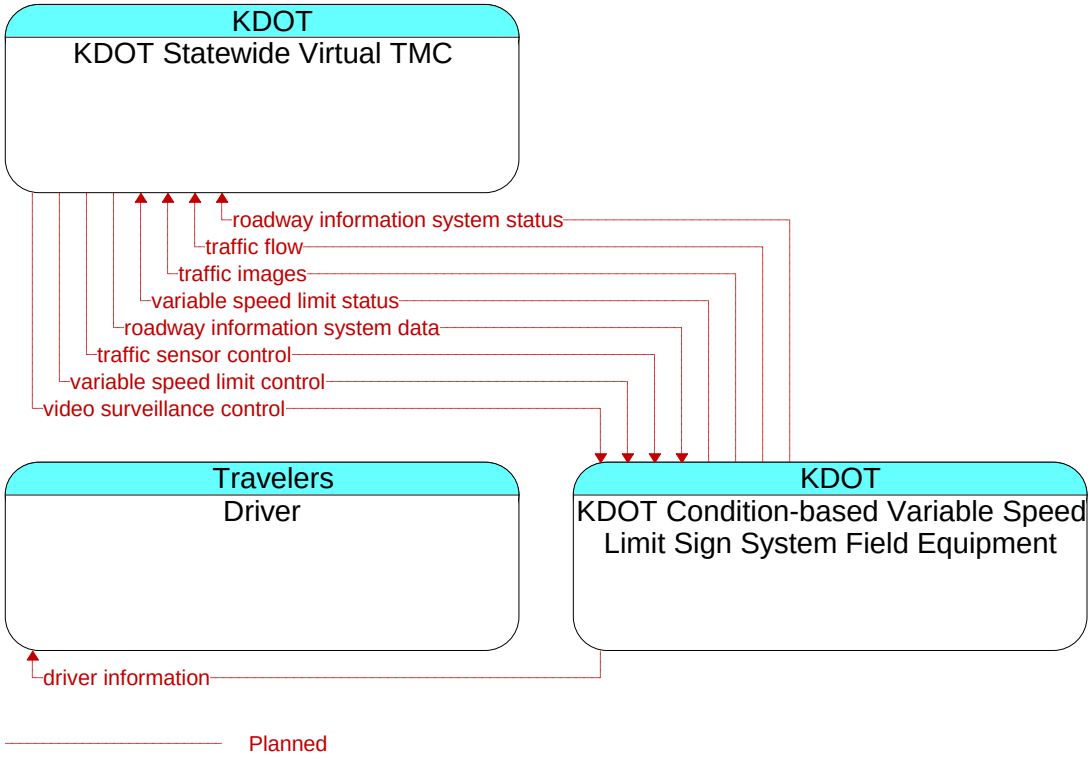
ATMS17 – Regional Parking Management



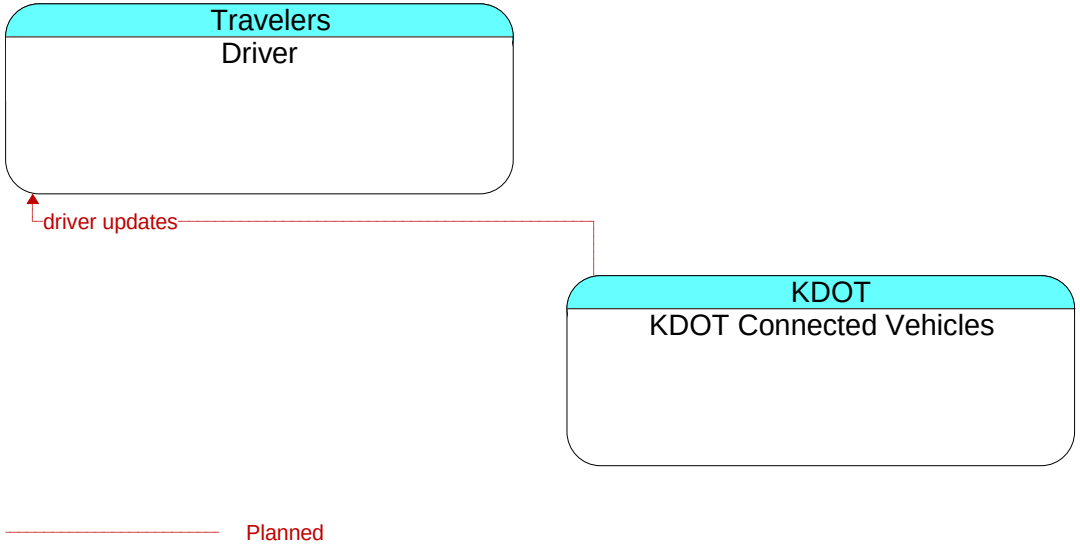
ATMS19 - Speed Monitoring



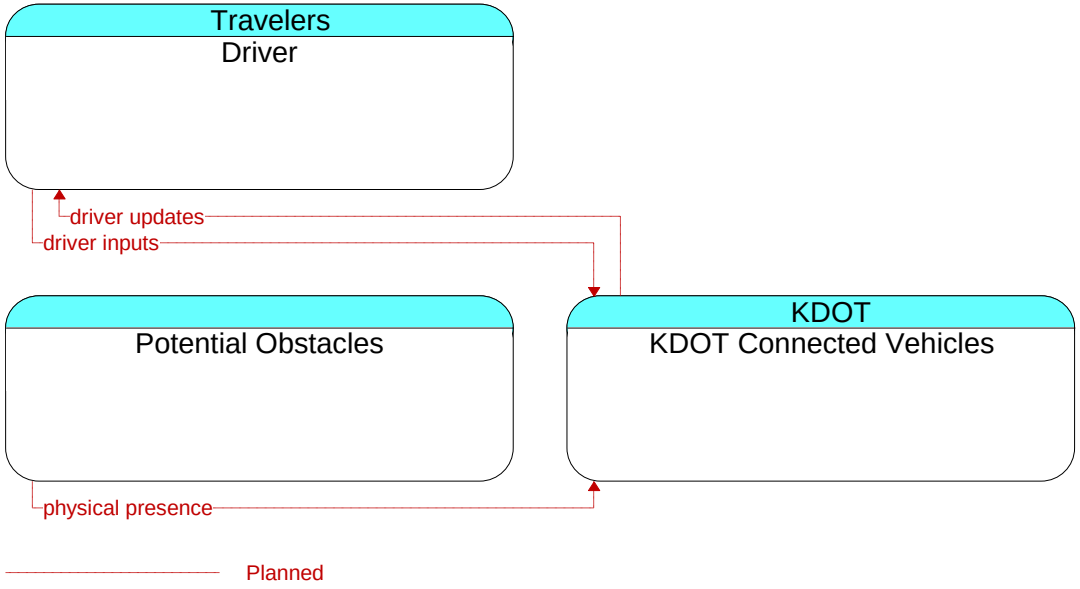
ATMS22 – Variable Speed Limits



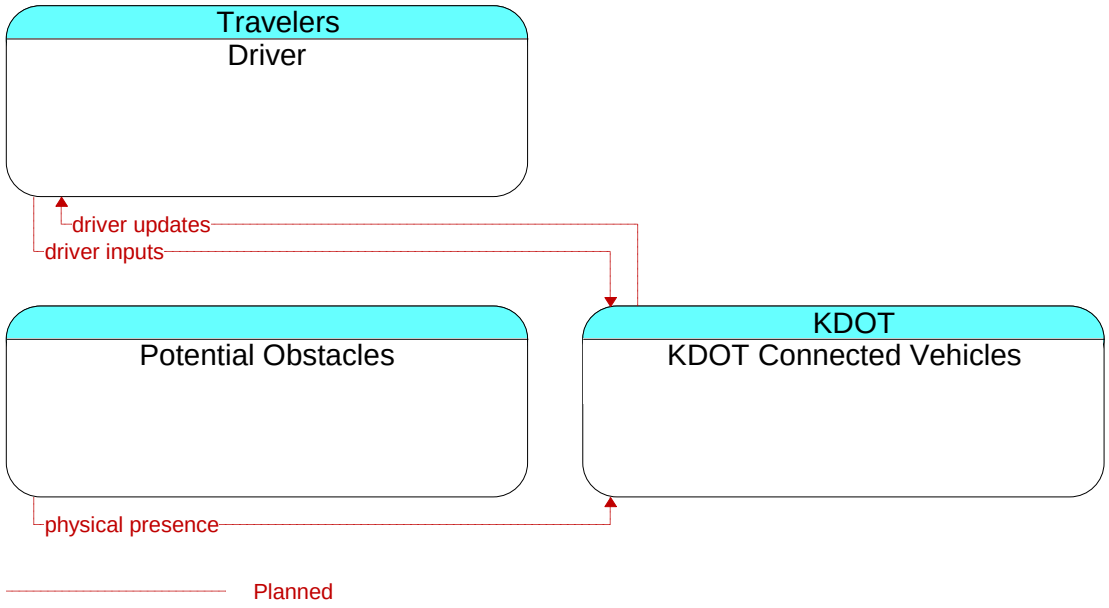
AVSS01 - Vehicle Safety Monitoring



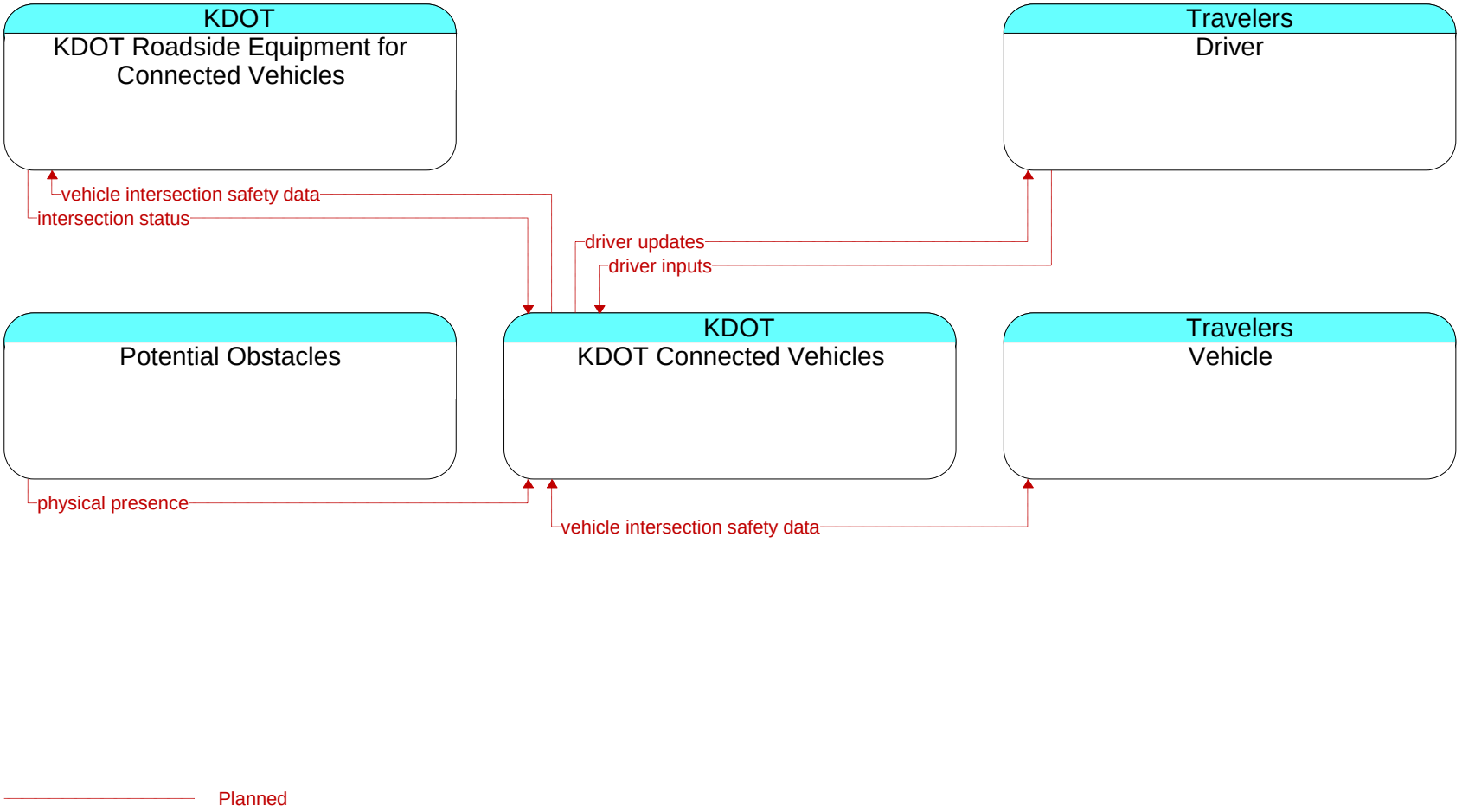
AVSS03 - Longitudinal Safety Warning



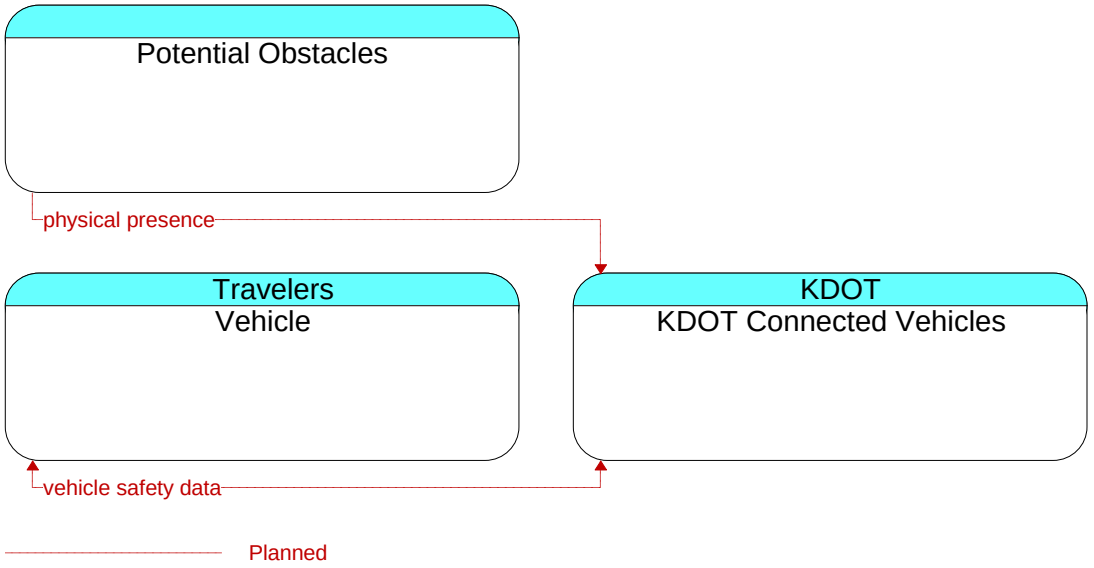
AVSS04 - Lateral Safety Warning



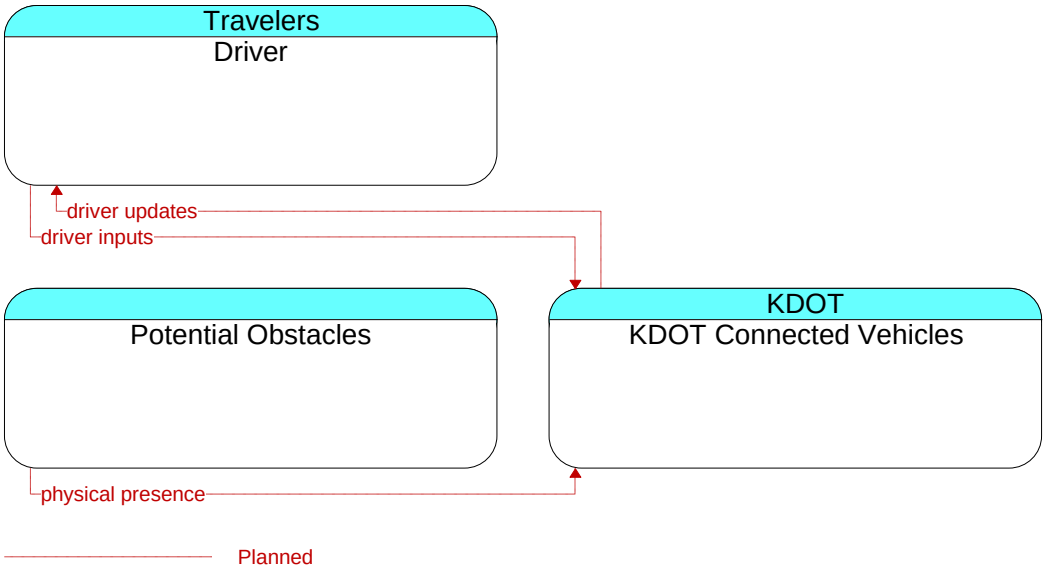
AVSS05 - Intersection Safety Warning



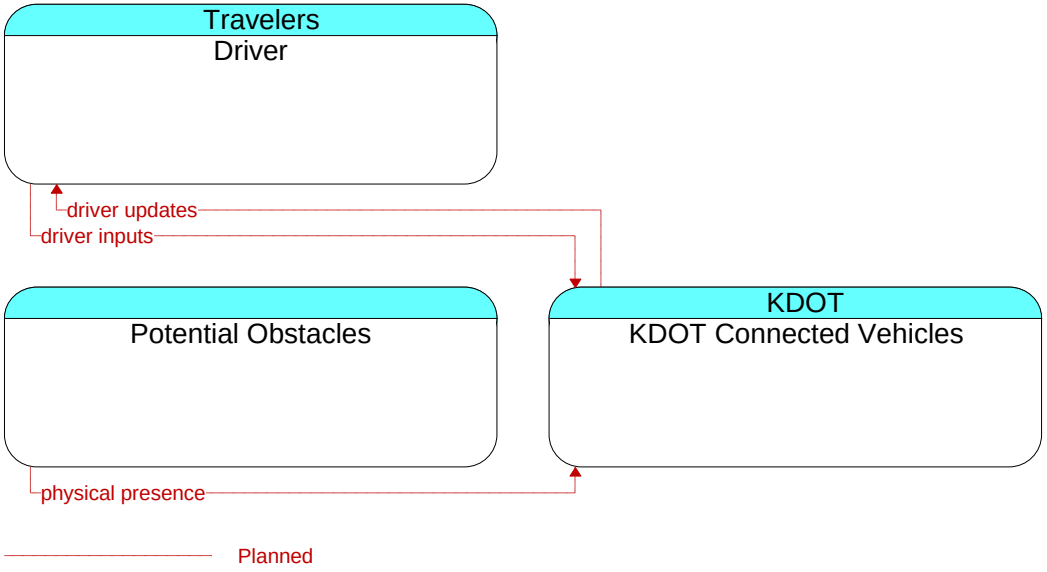
AVSS06 - Pre-Crash Restraint Deployment



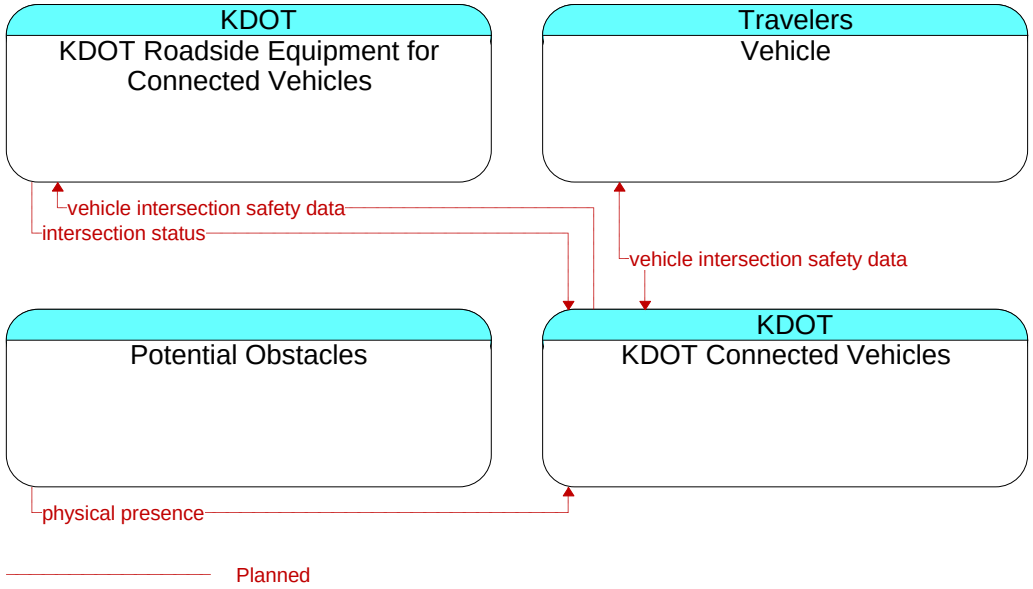
AVSS08 - Advanced Vehicle Longitudinal Control



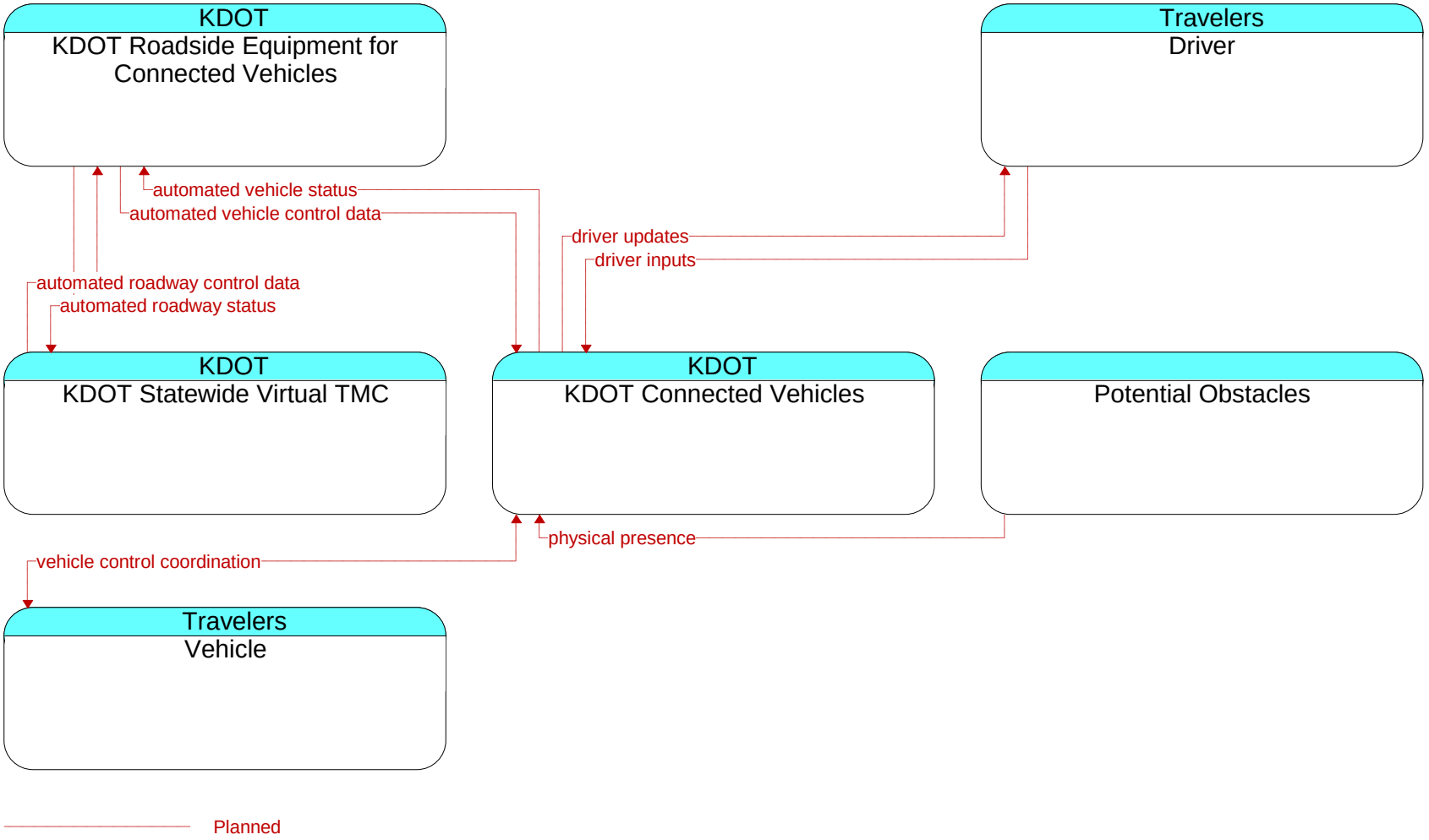
AVSS09 - Advanced Vehicle Lateral Control



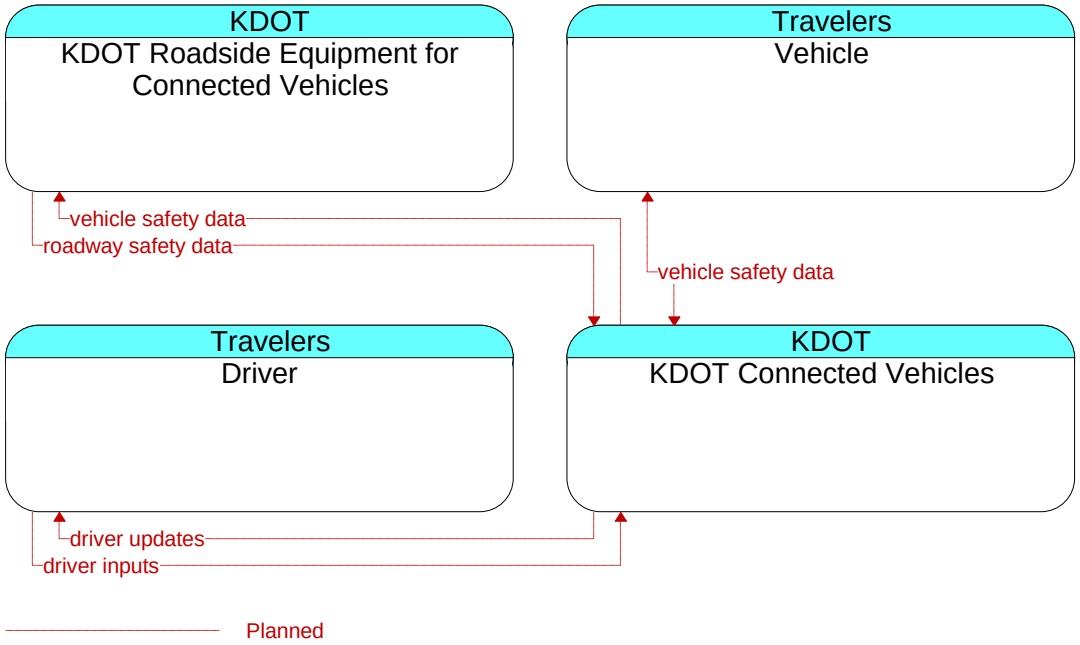
AVSS10 - Intersection Collision Avoidance



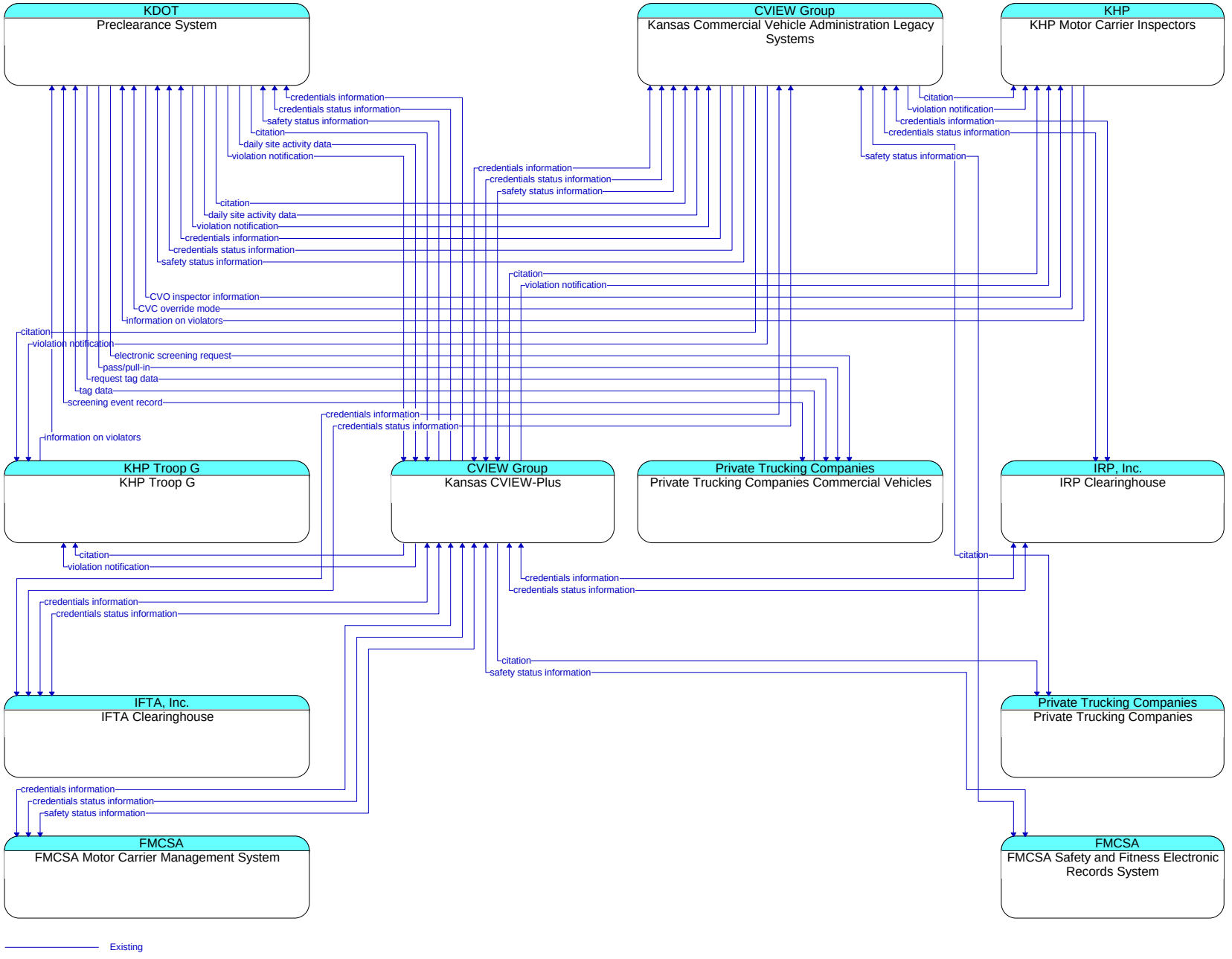
AVSS11 - Automated Vehicle Operations



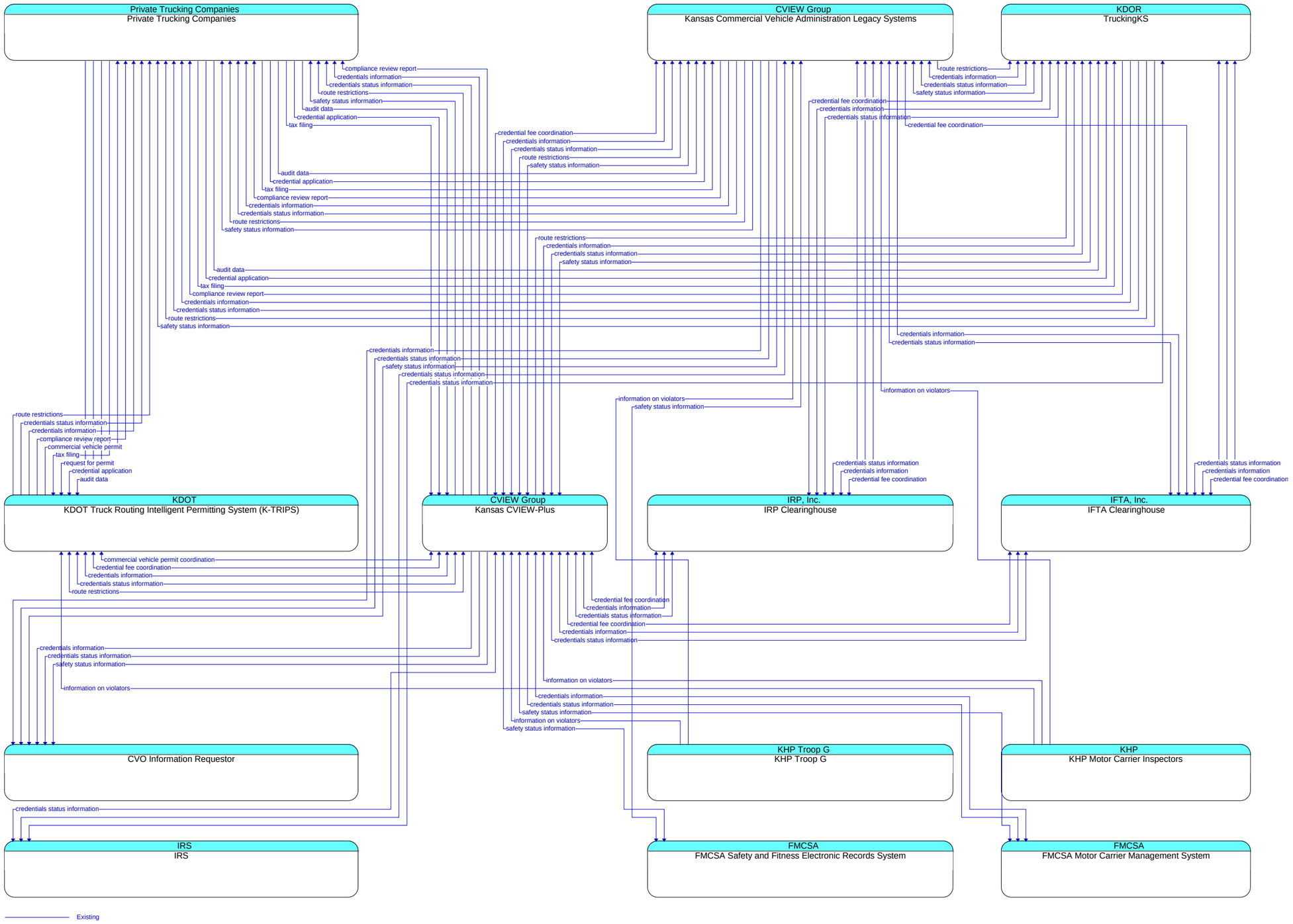
AVSS12 - Cooperative Vehicle Safety Systems



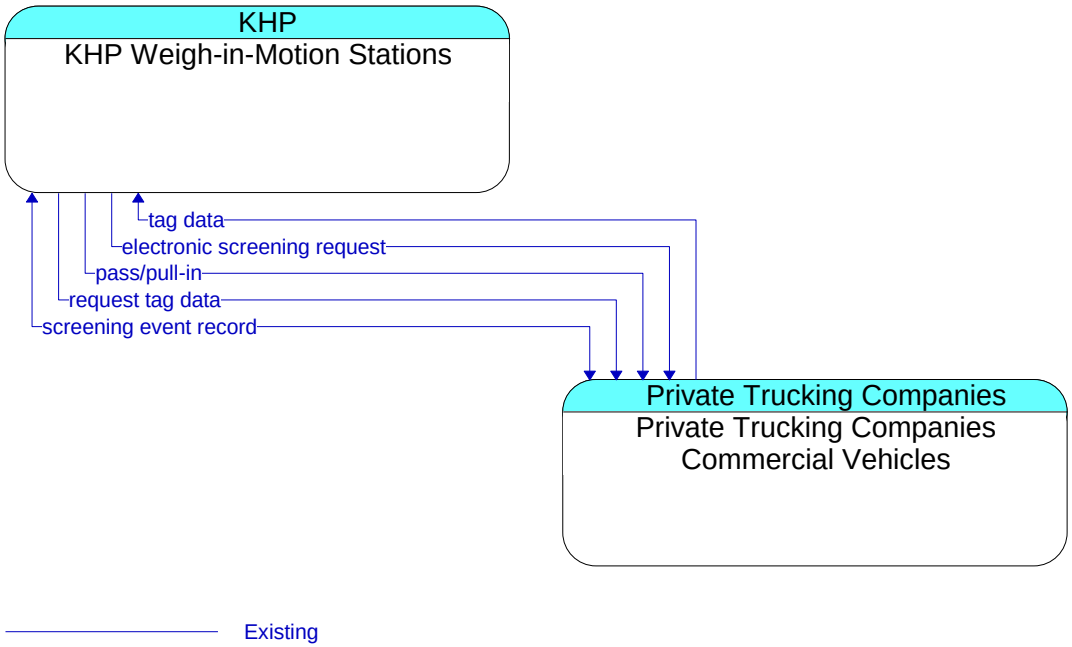
CVO03 - Electronic Clearance



CVO04 - CV Administrative Processes



CVO06 - Weigh-in-Motion



CVO07 - Roadside CVO Safety

CVIEW Group
Kansas CVIEW-Plus

CVIEW Group
Kansas Commercial Vehicle Administration Legacy Systems

KDOT
Preclearance System

KHP
KHP Motor Carrier Inspectors

KHP
KHP Scales and Weigh Stations

Private Trucking Companies
Private Trucking Companies Commercial Vehicles

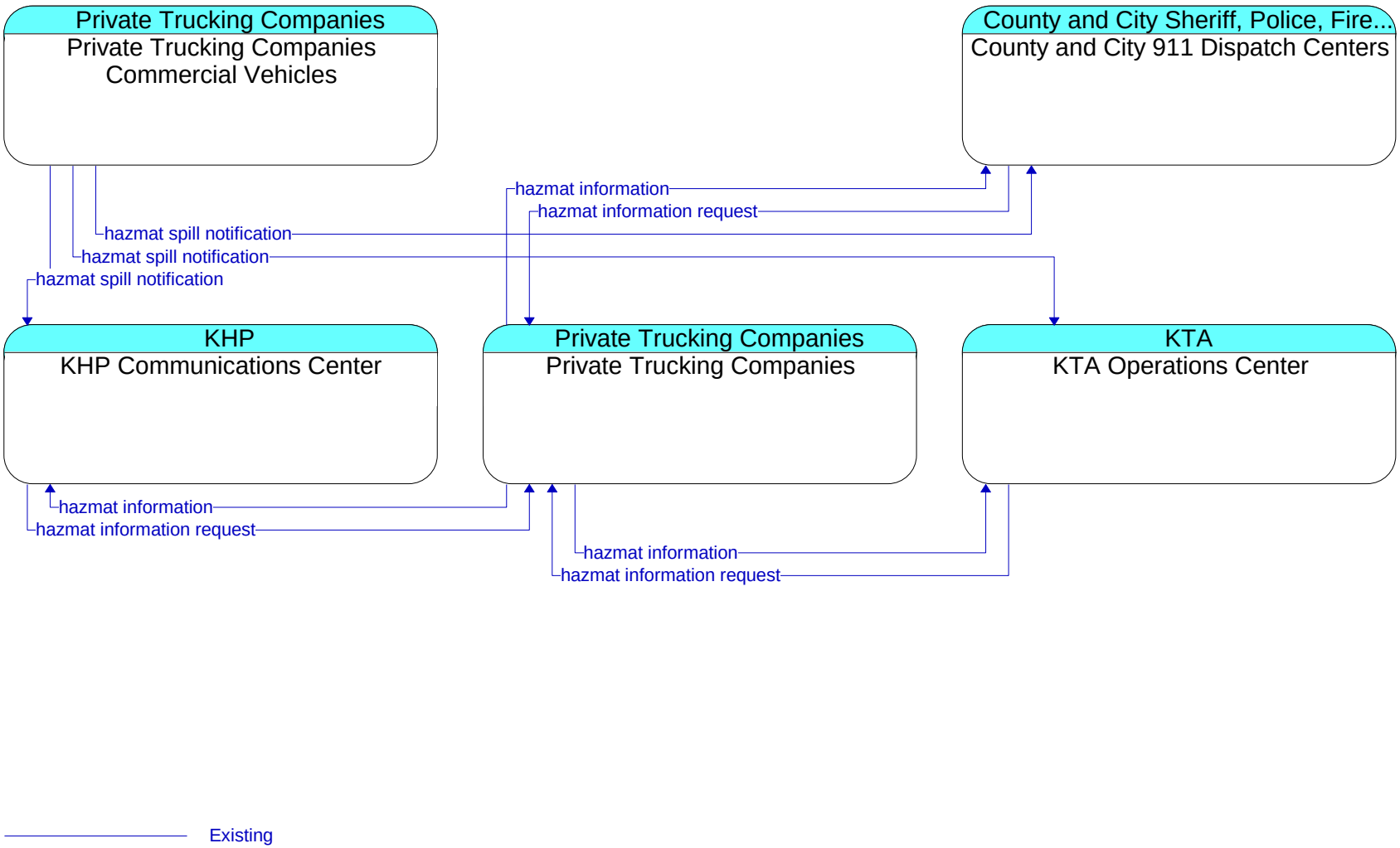
KHP Troop G
KHP Troop G

Private Trucking Companies
Private Trucking Companies

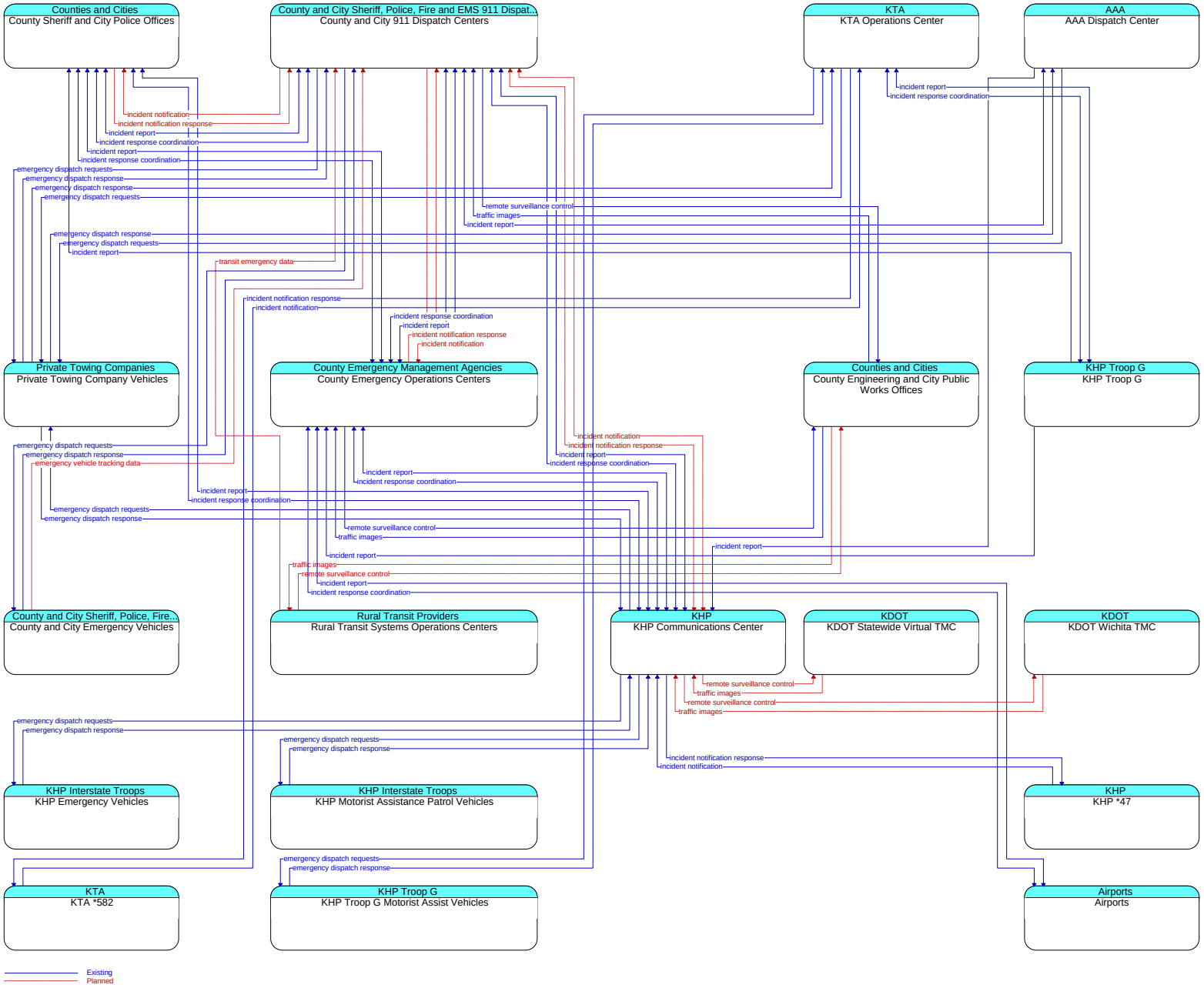
FMCSA
FMCSA Safety and Fitness Electronic Records System

accident report
citation
daily site activity data
violation notification
credentials information
credentials status information
safety status information
safety inspection report
safety inspection report
safety status information
accident report
citation
violation notification
CVO inspector information
CVC override mode
information on violators
accident report
citation
violation notification
violation notification
citation
accident report
accident report
citation
safety inspection report
safety inspection report
safety status information
safety inspection report
safety status information
credentials information
credentials status information
safety inspection report
safety status information
citation
daily site activity data
violation notification
accident report
citation
daily site activity data
violation notification
credentials information
credentials status information
safety status information
safety inspection report
credentials information
credentials status information
safety status information
citation
daily site activity data
violation notification
pass/pull-in
request tag data
safety inspection request
tag data
safety inspection record
accident report
citation
violation notification
information on violators
CVO inspector information
CVC override mode
CVO inspector input
information on violators
accident report
citation
electronic lock data request
pass/pull-in
request tag data
safety inspection request
electronic lock data
tag data
safety inspection record
information on violators
Existing

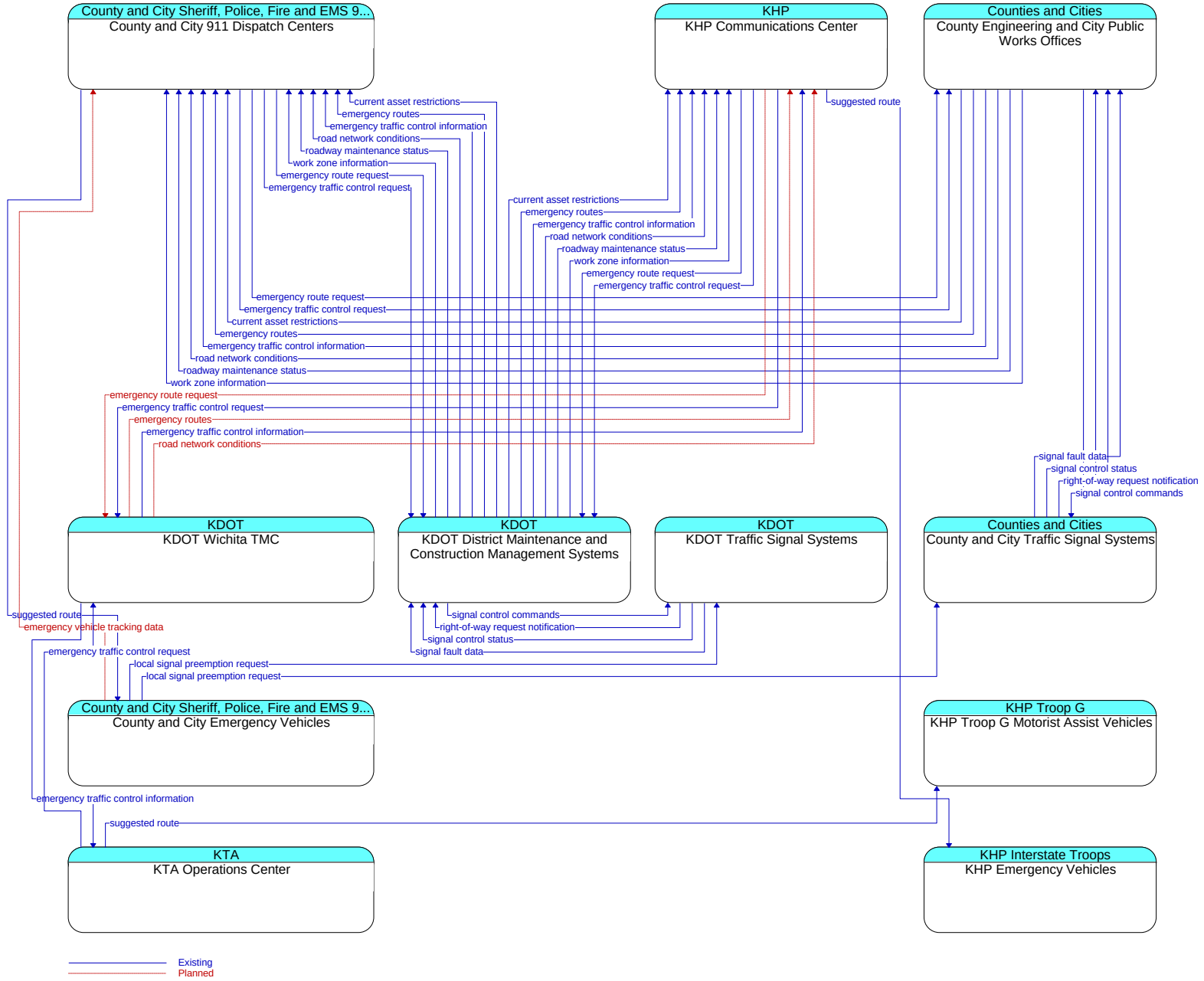
CVO10 - HAZMAT Management



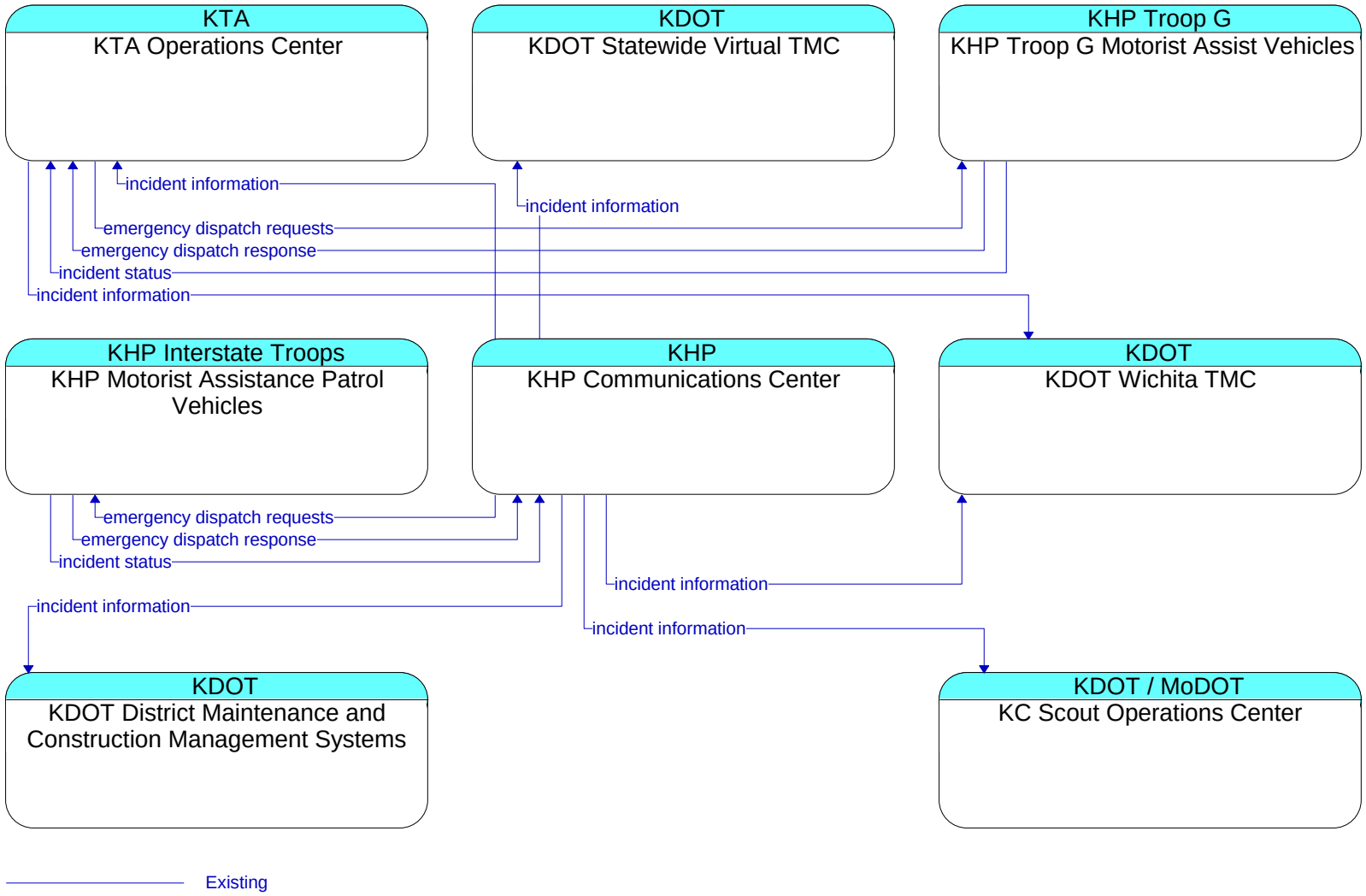
EM01 - Emergency Call-Taking and Dispatch



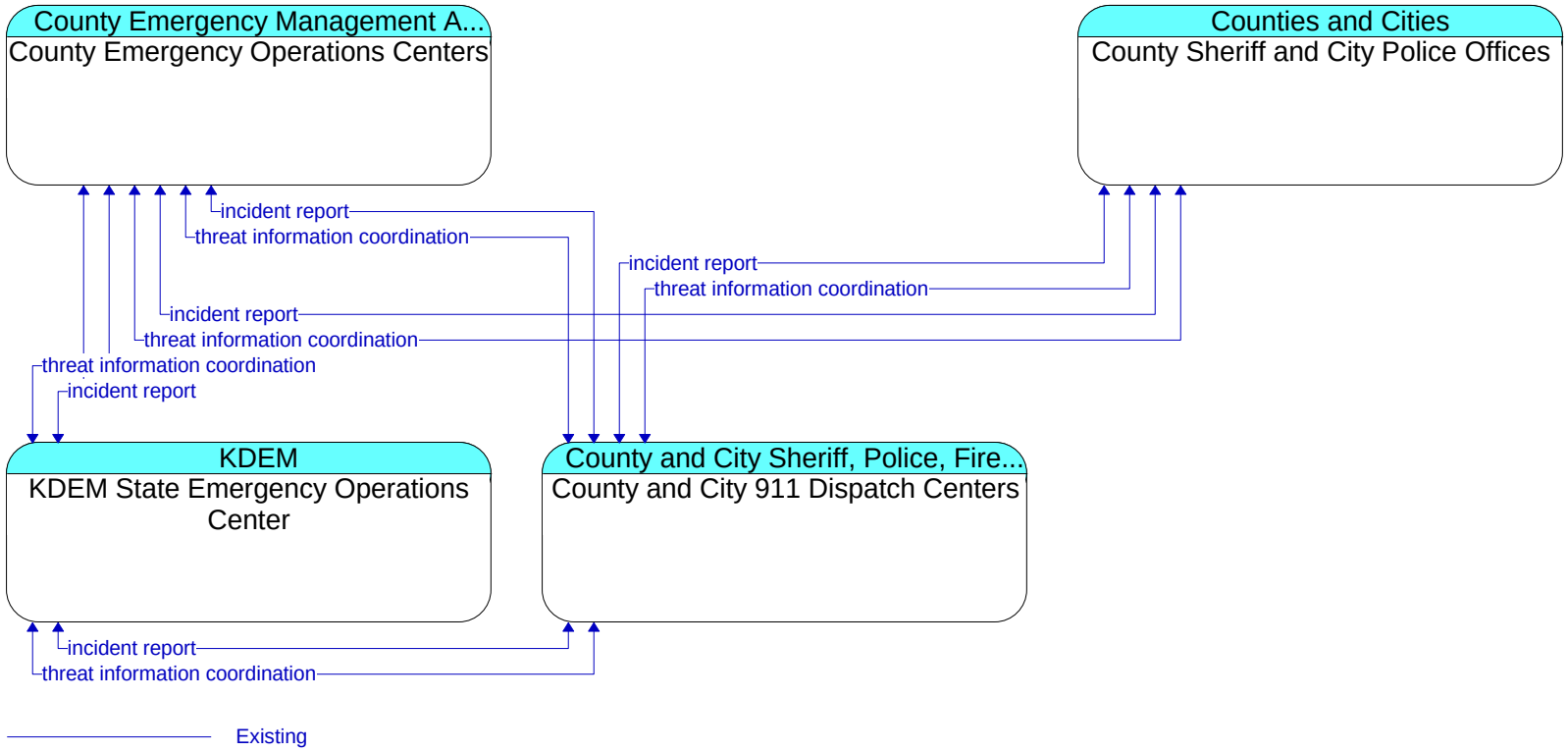
EM02 – Emergency Routing



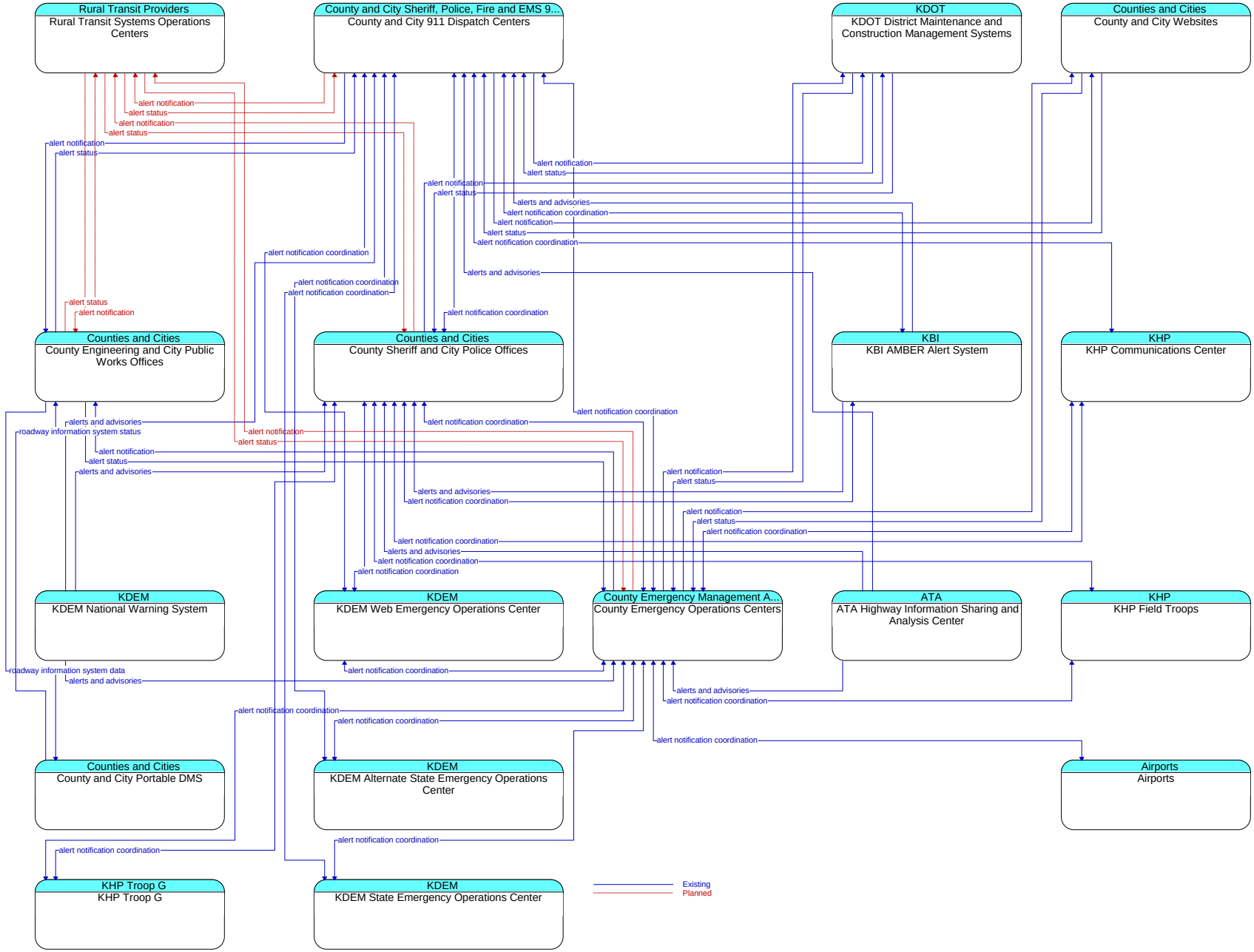
EM04 - Roadway Service Patrols



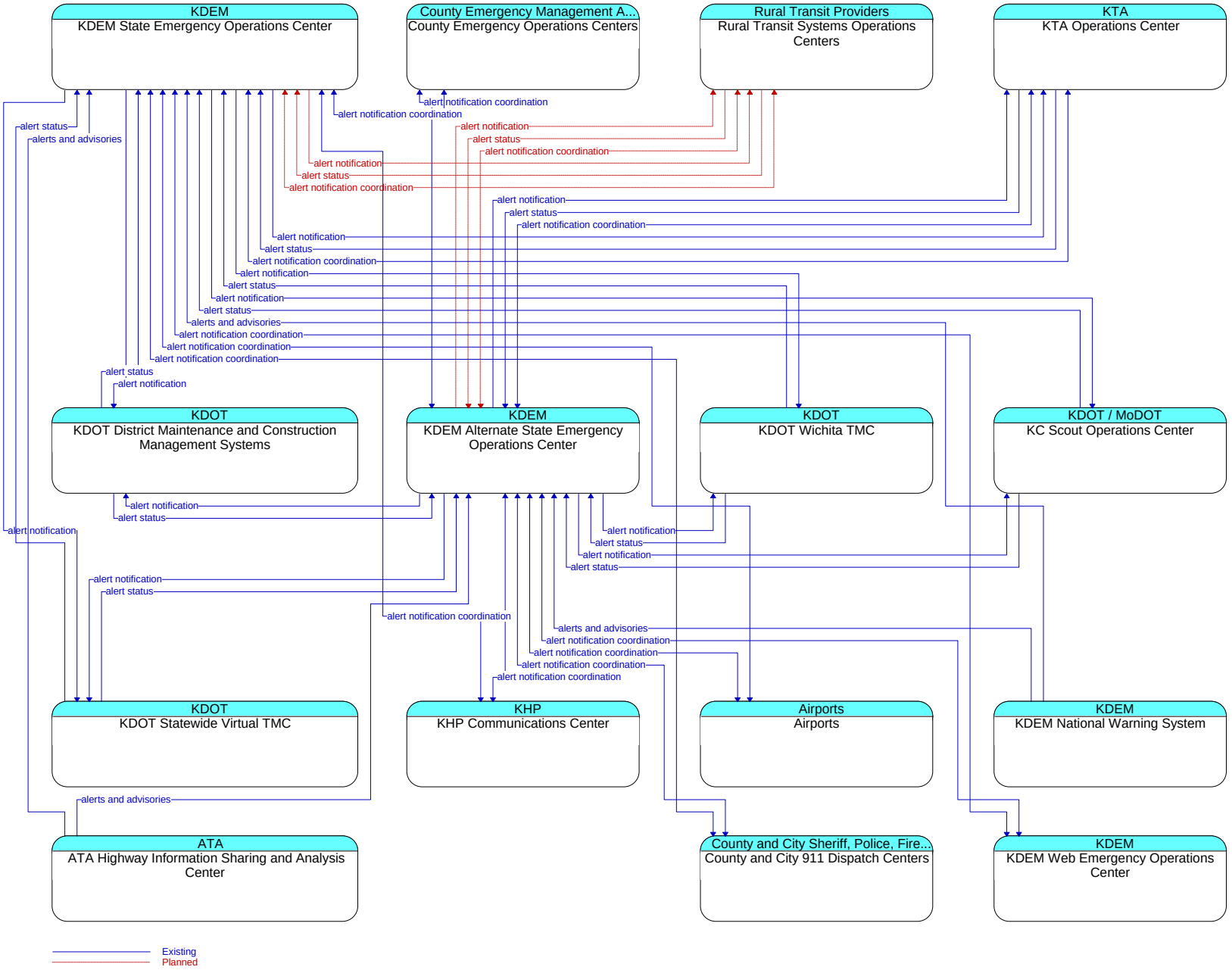
EM05 - Transportation Infrastructure Protection



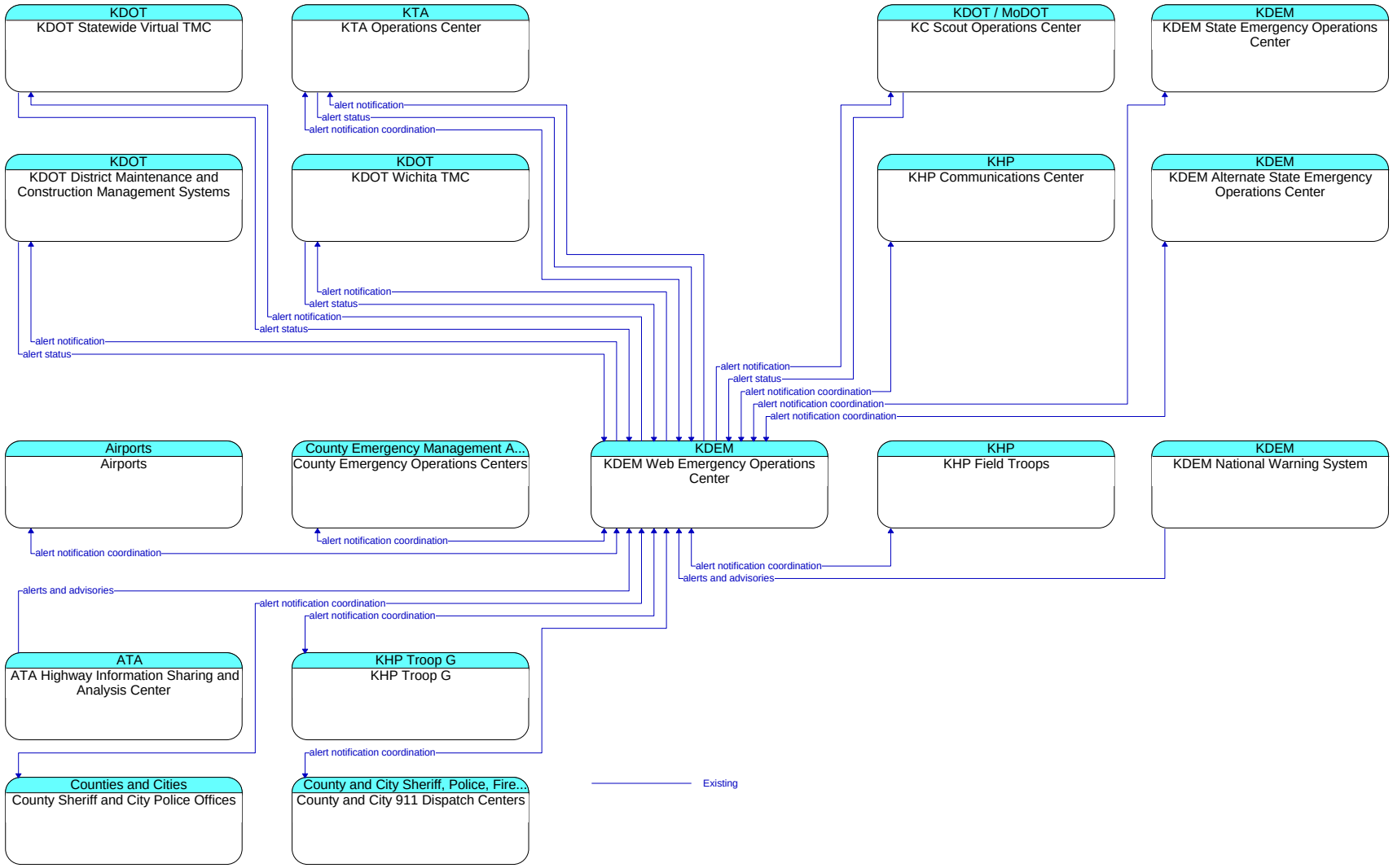
EM06 - Wide-Area Alert (Part 1)



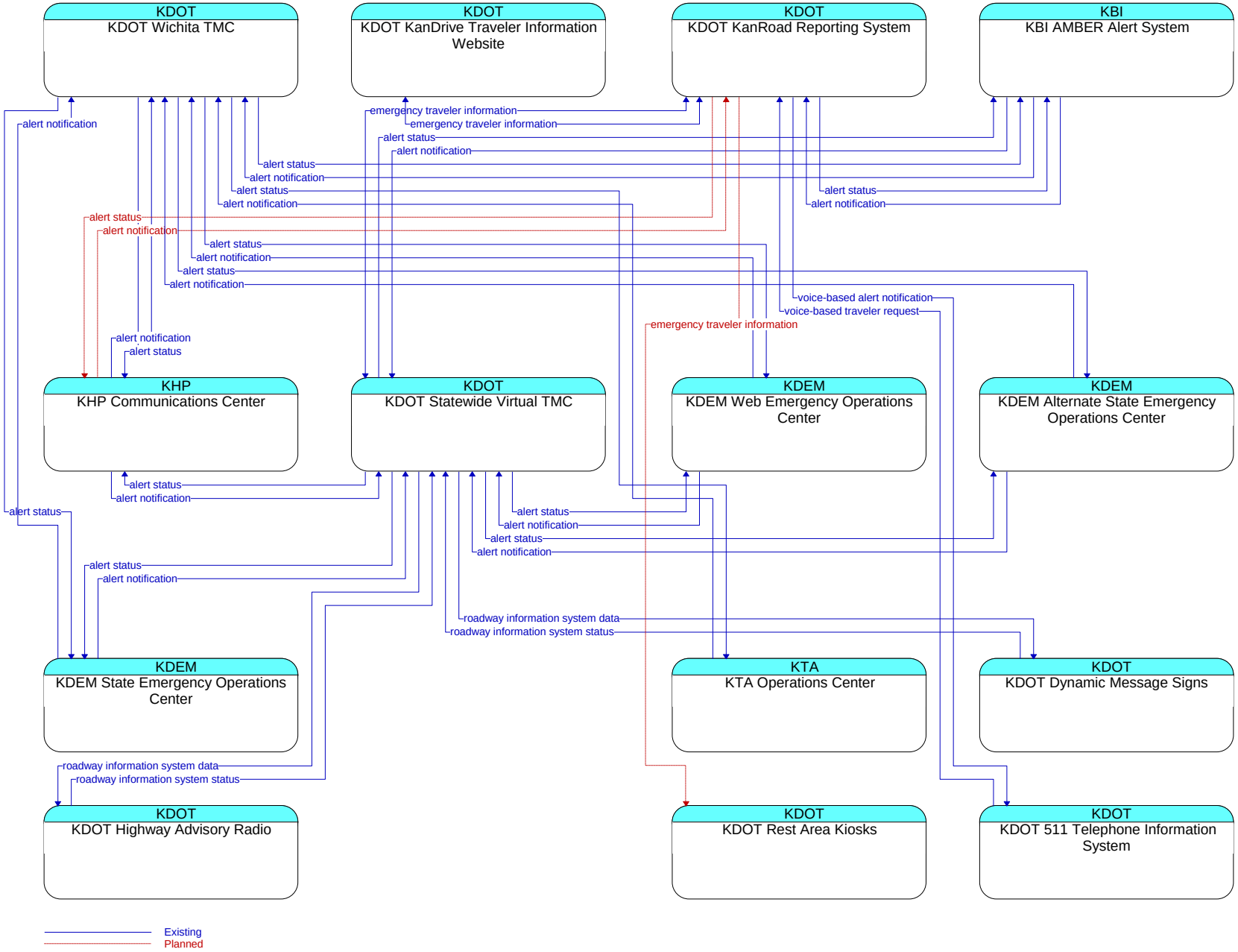
EM06 - Wide-Area Alert (Part 2)



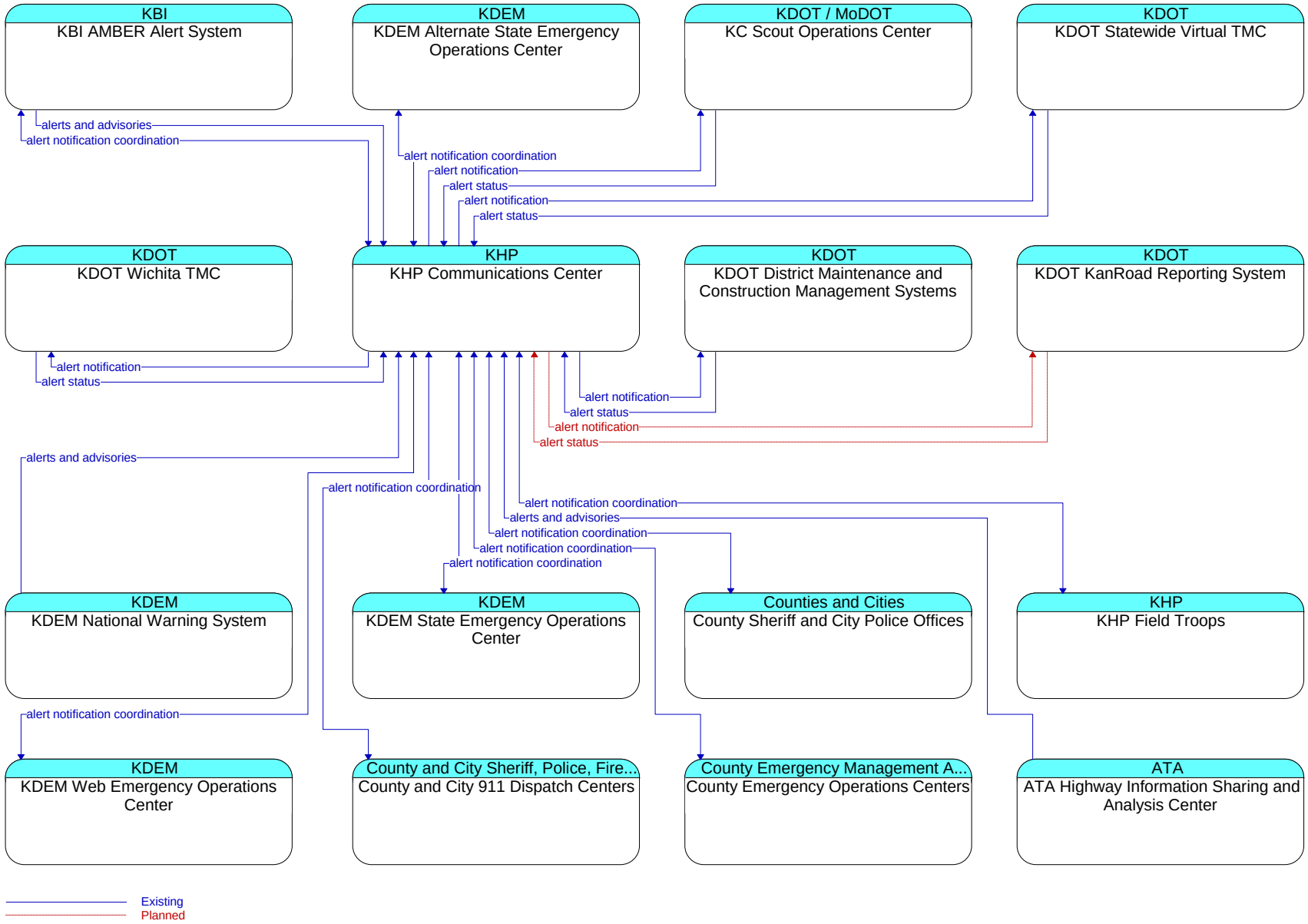
EM06 - Wide-Area Alert (Part 3)



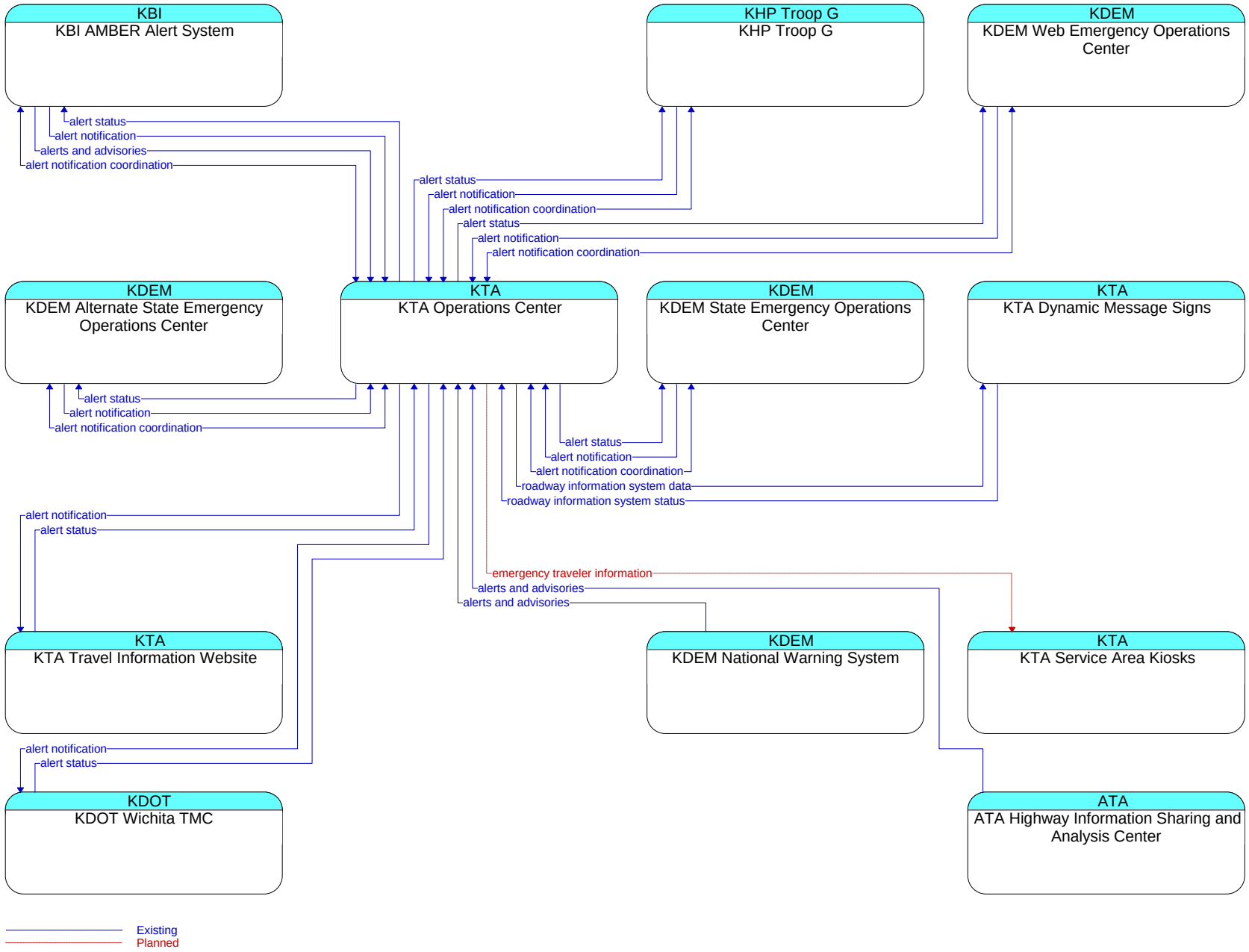
EM06 - Wide-Area Alert (Part 4)



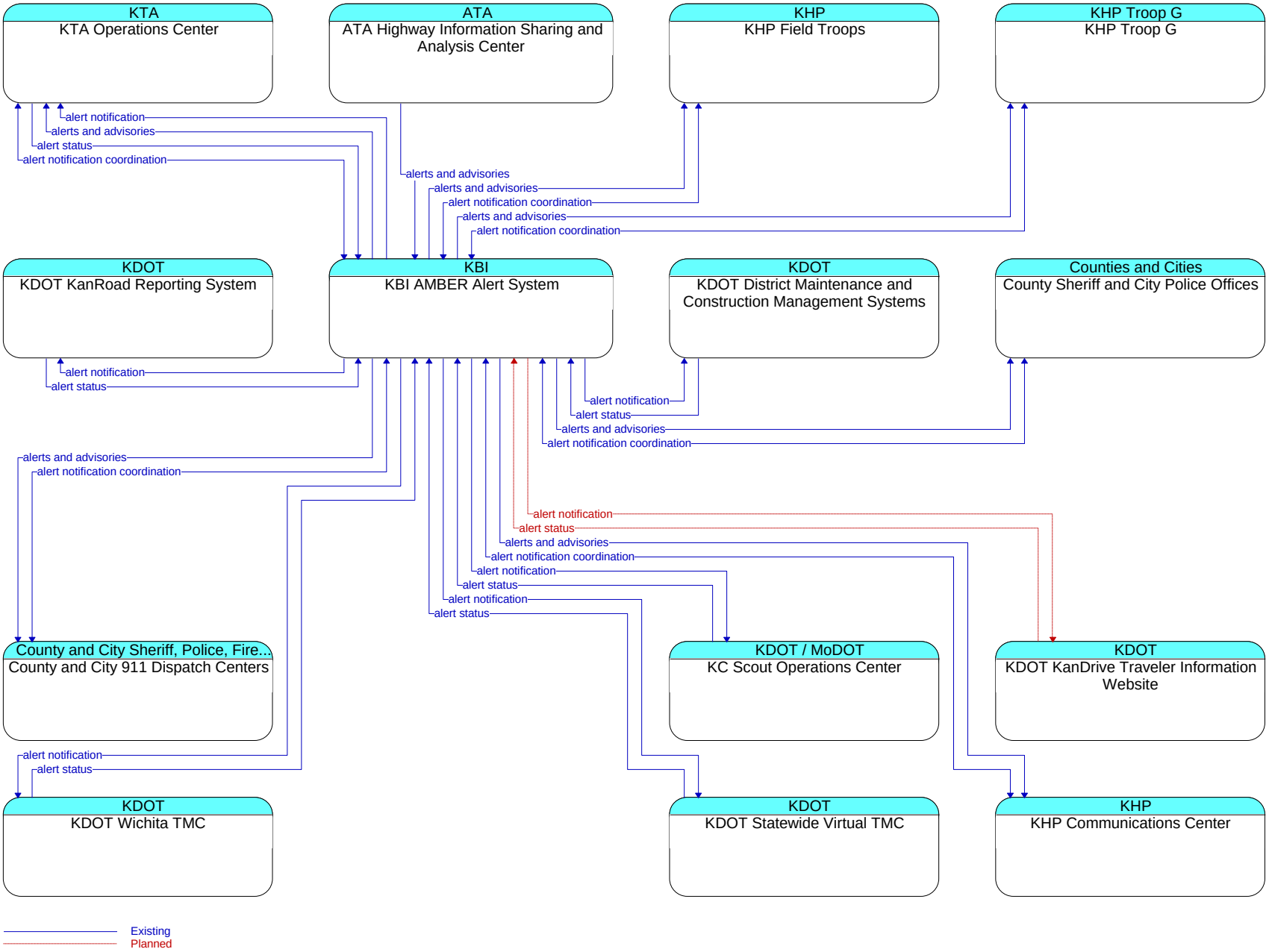
EM06 - Wide-Area Alert (Part 5)



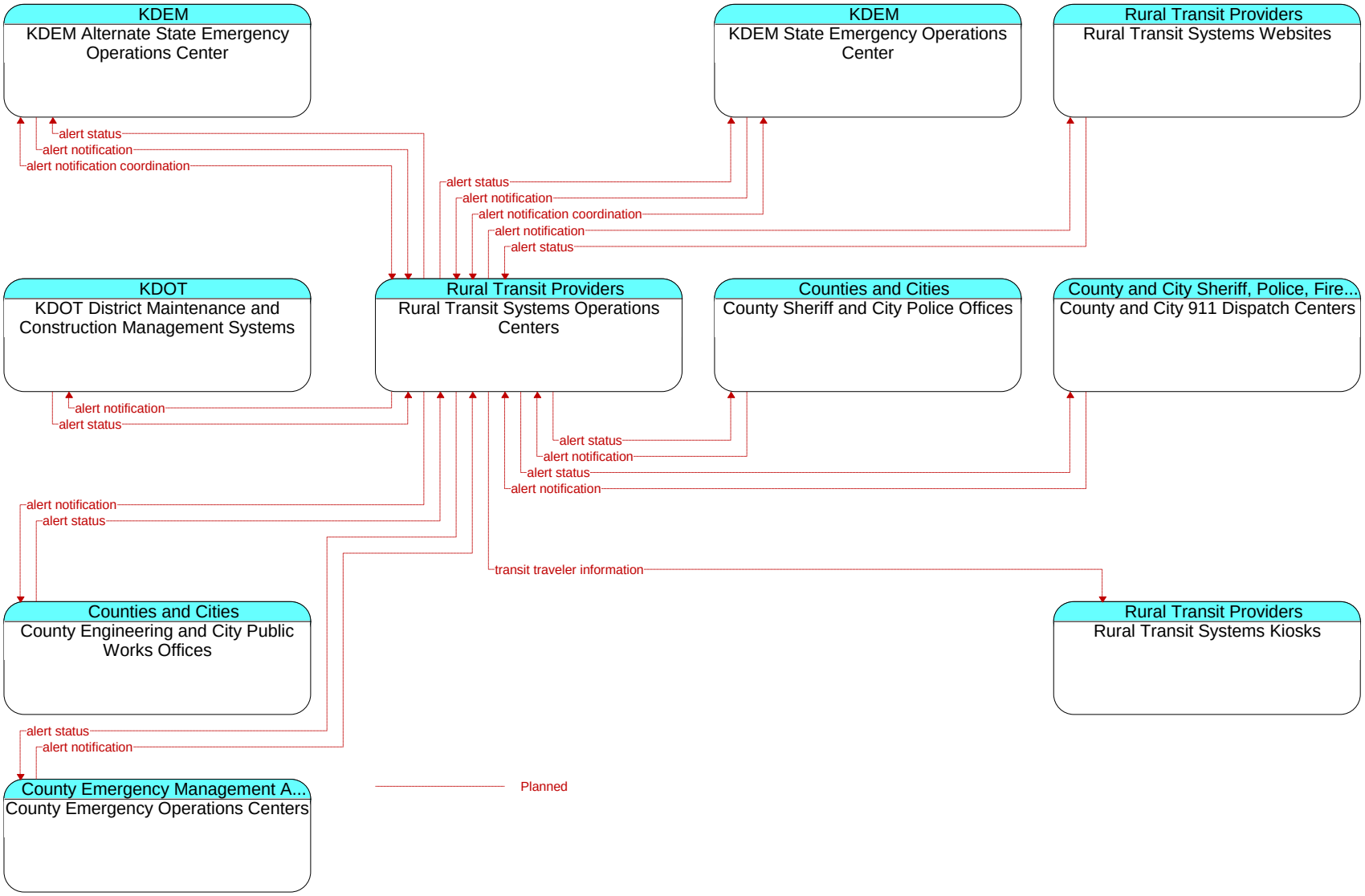
EM06 - Wide-Area Alert (Part 6)



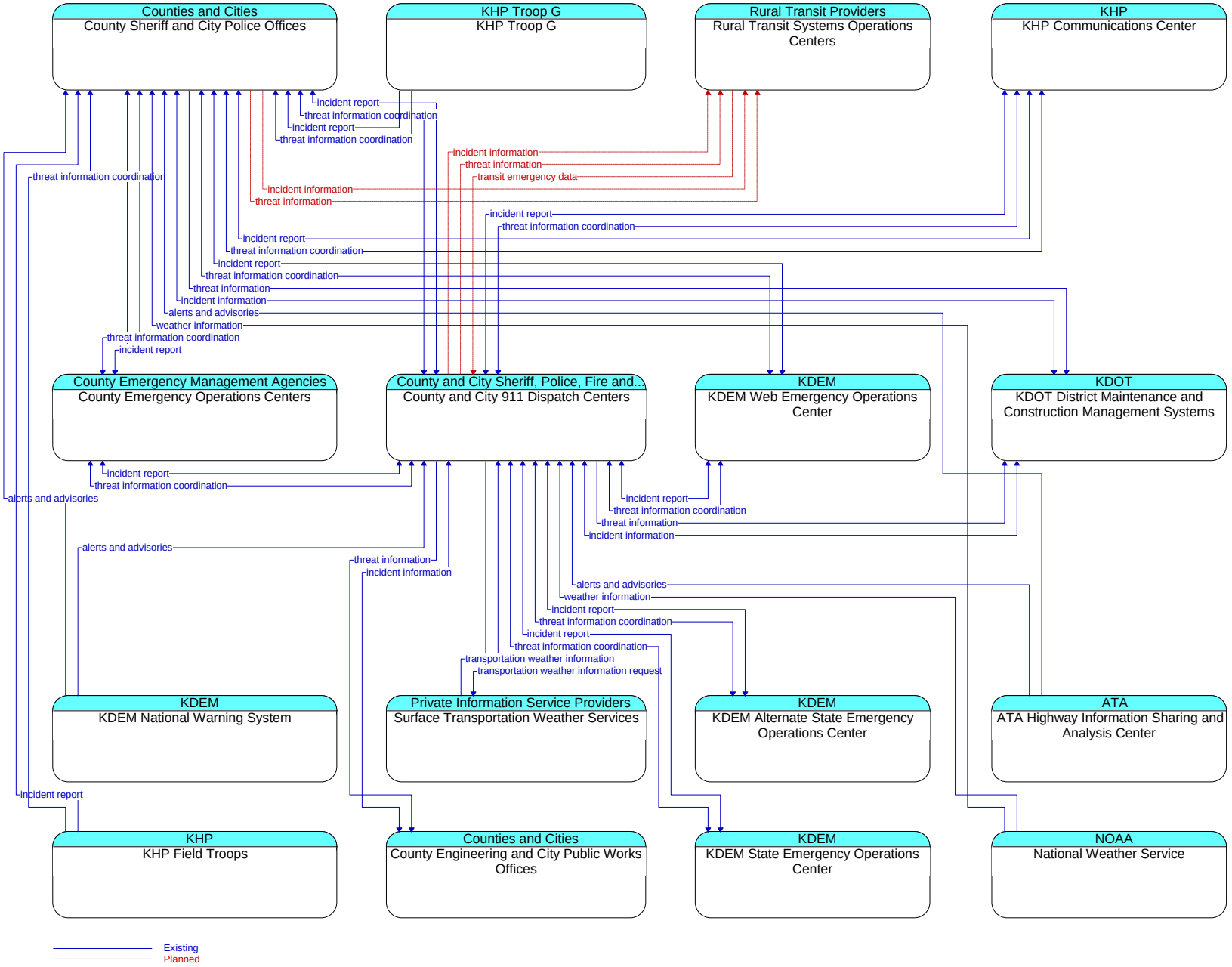
EM06 - Wide-Area Alert (Part 7)



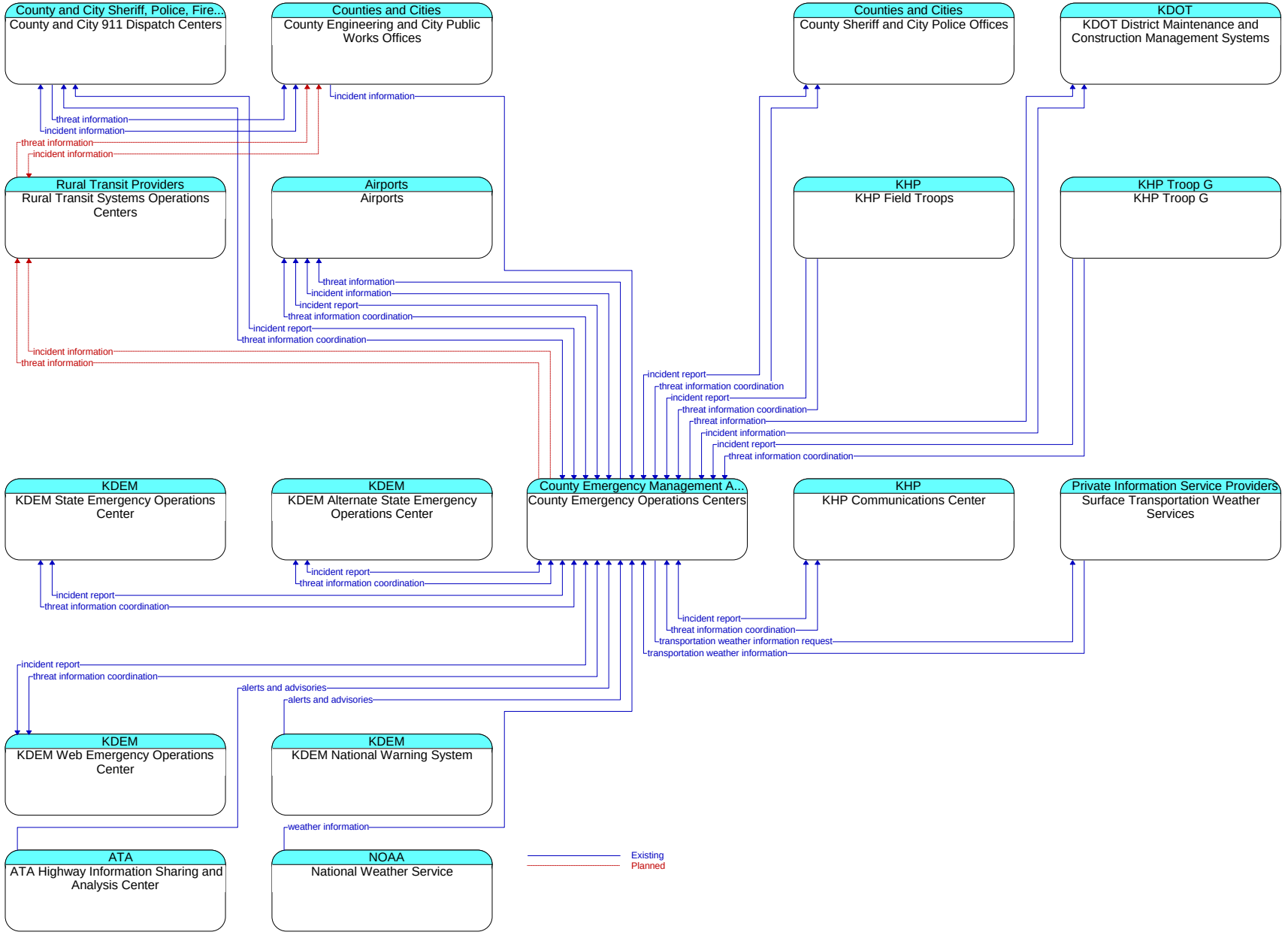
EM06 - Wide-Area Alert (Part 8)



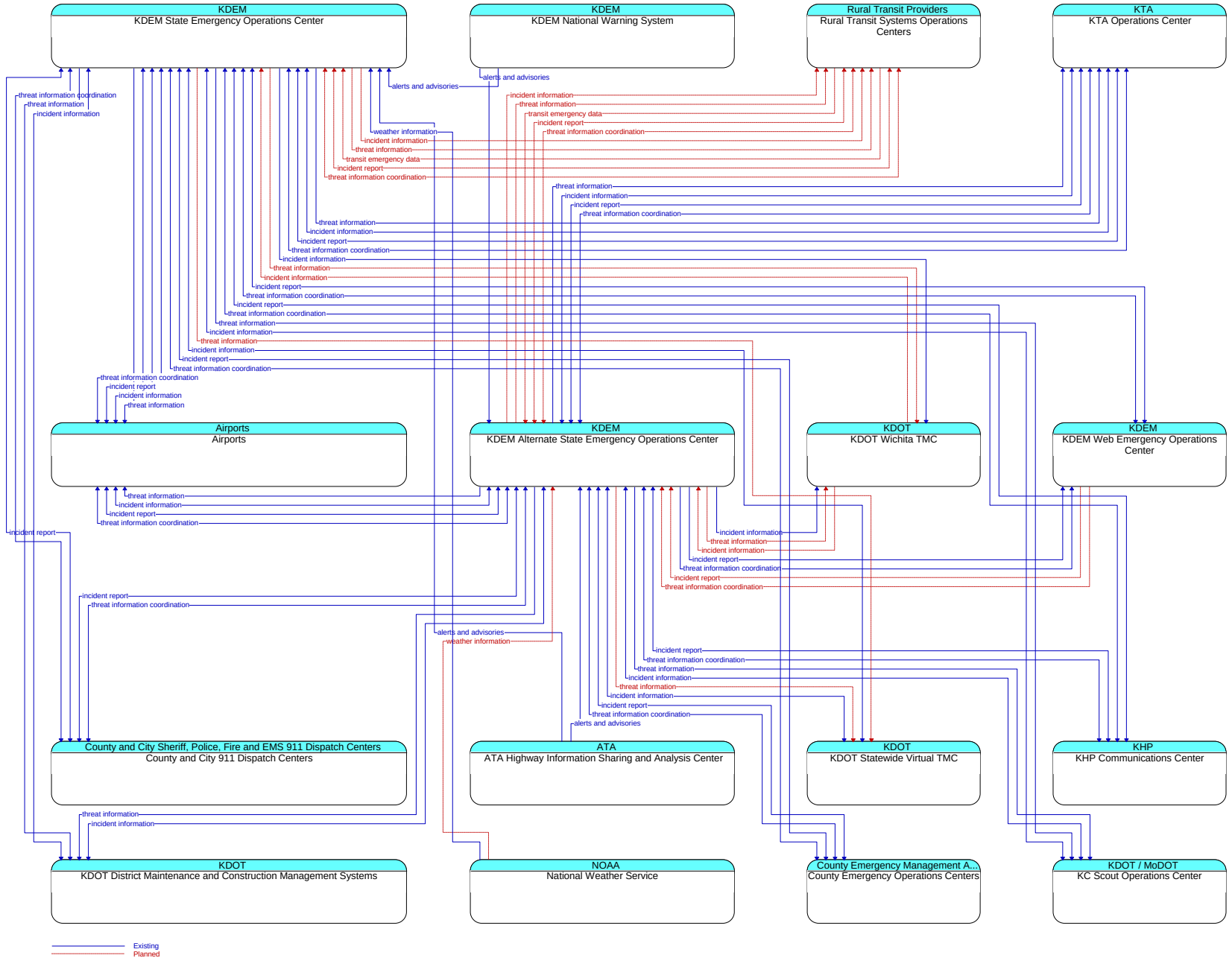
EM07 - Early Warning System (Part 1)



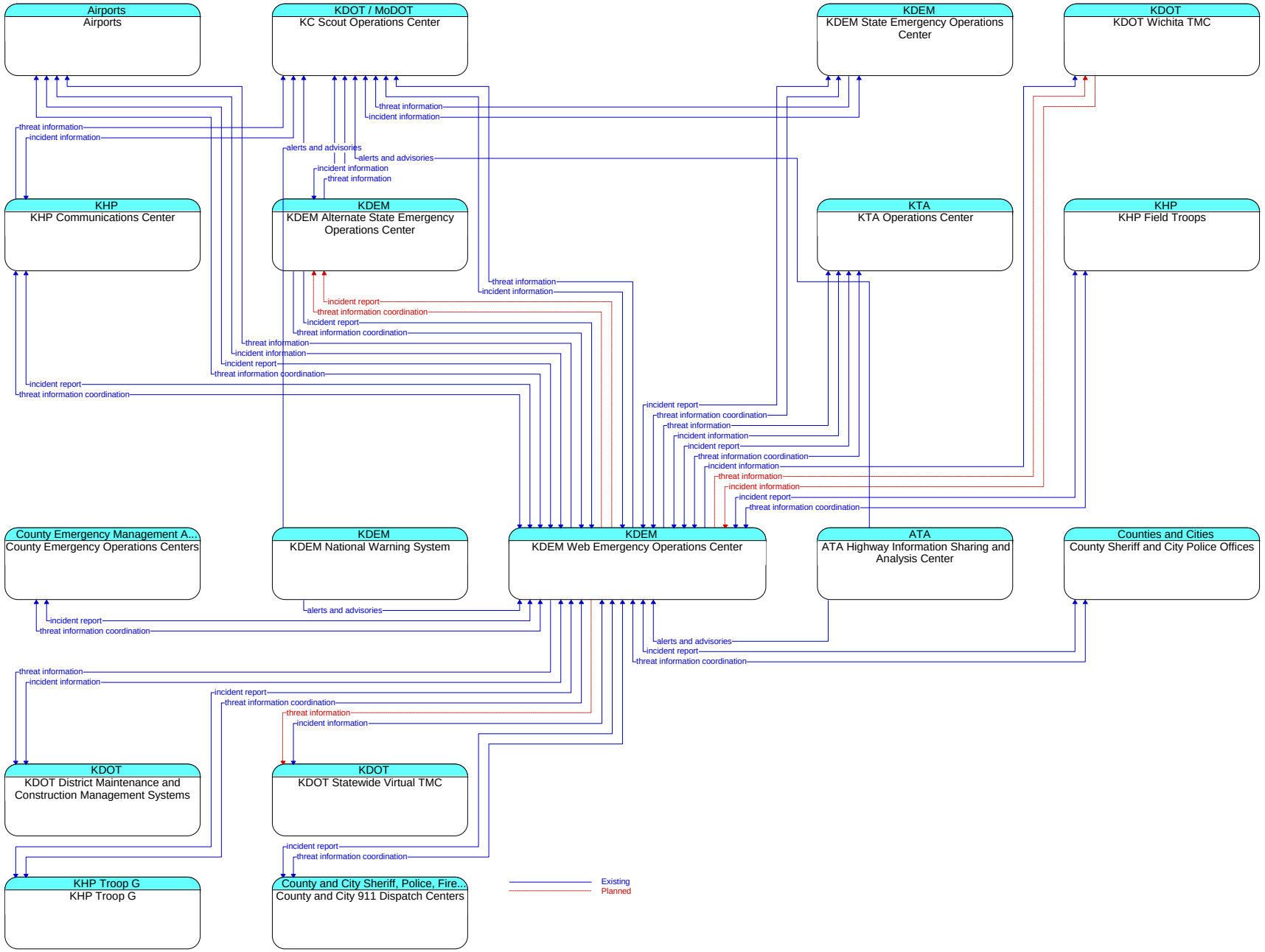
EM07 - Early Warning System (Part 2)



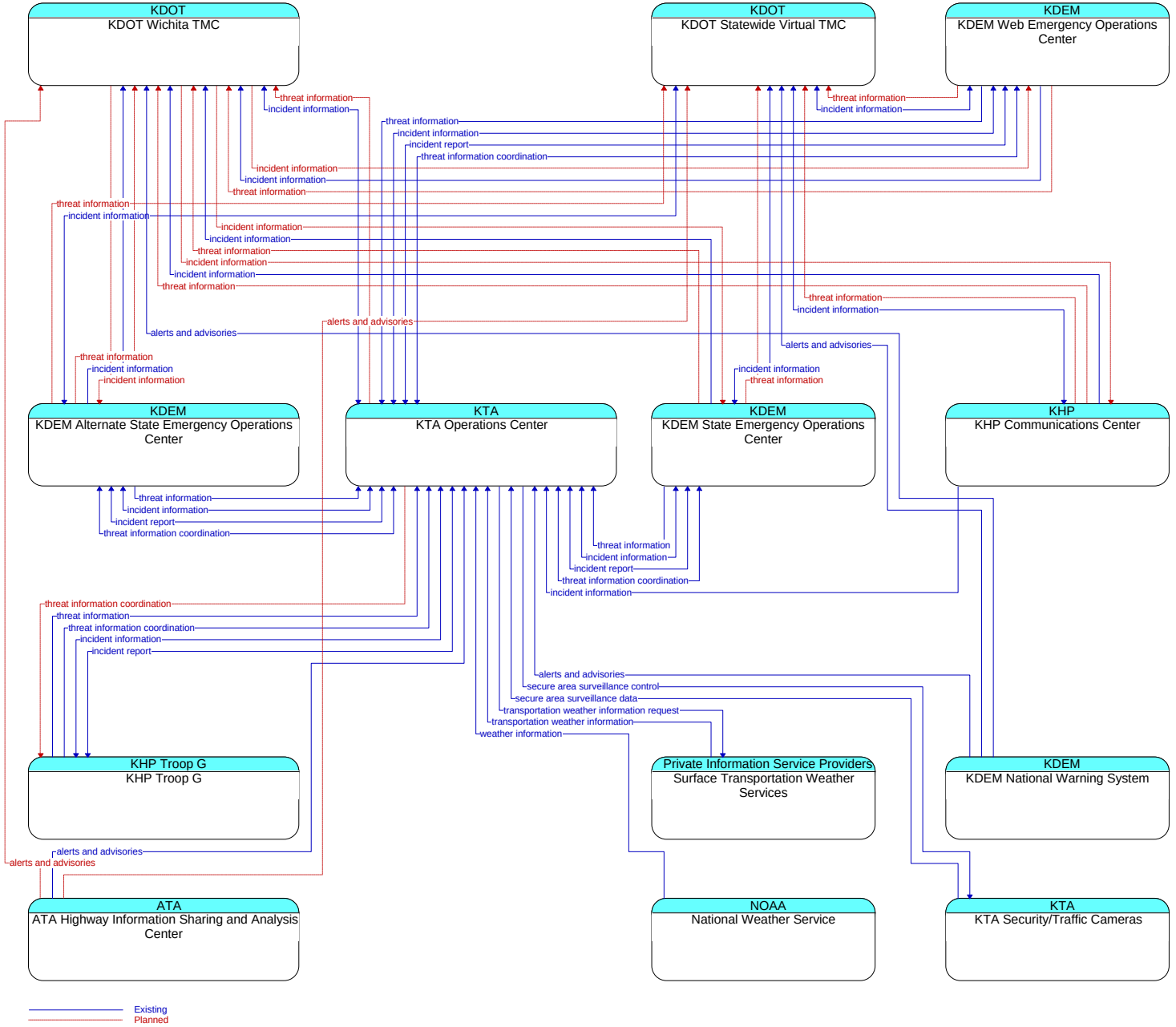
EM07 - Early Warning System (Part 3)



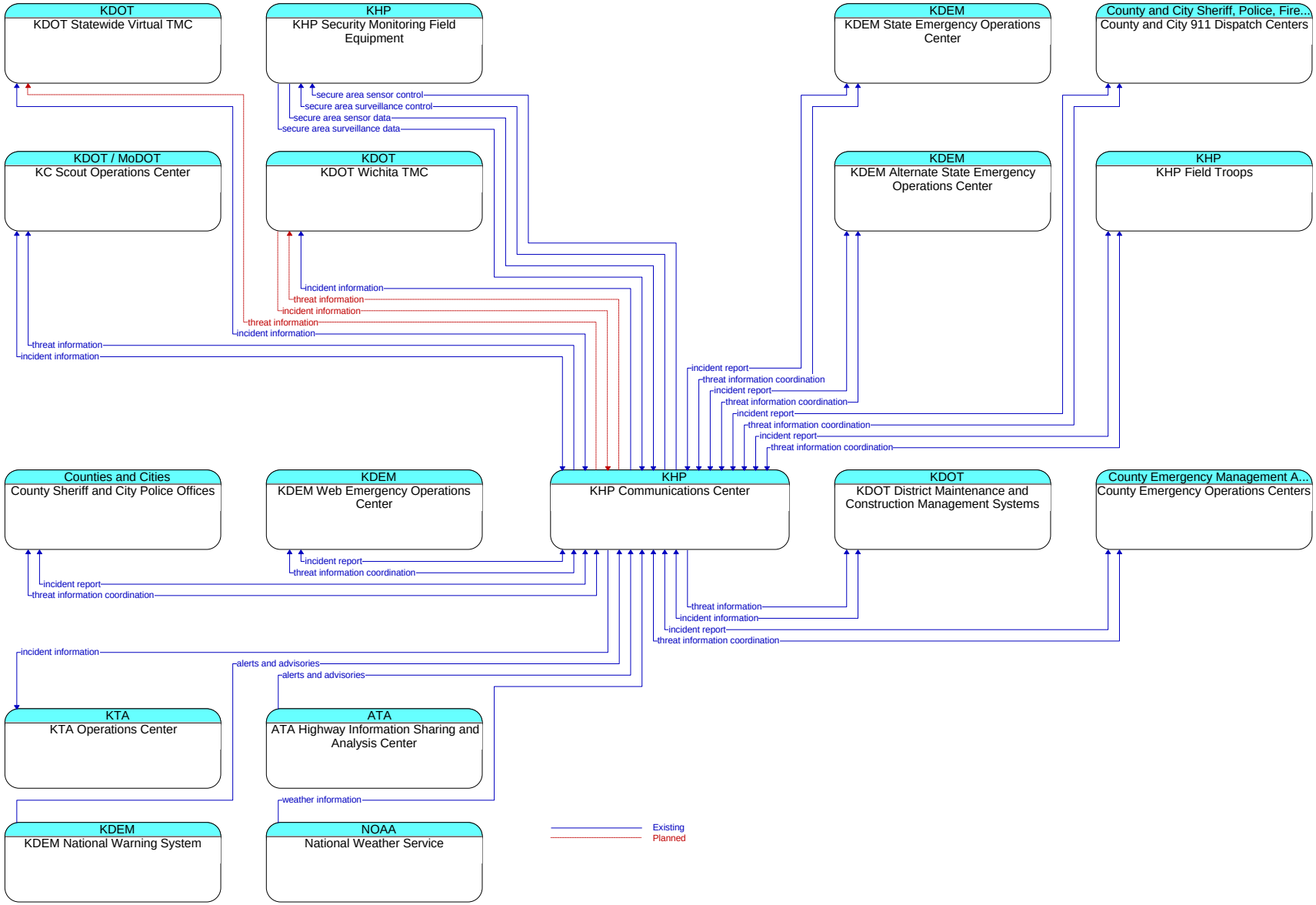
EM07 - Early Warning System (Part 4)



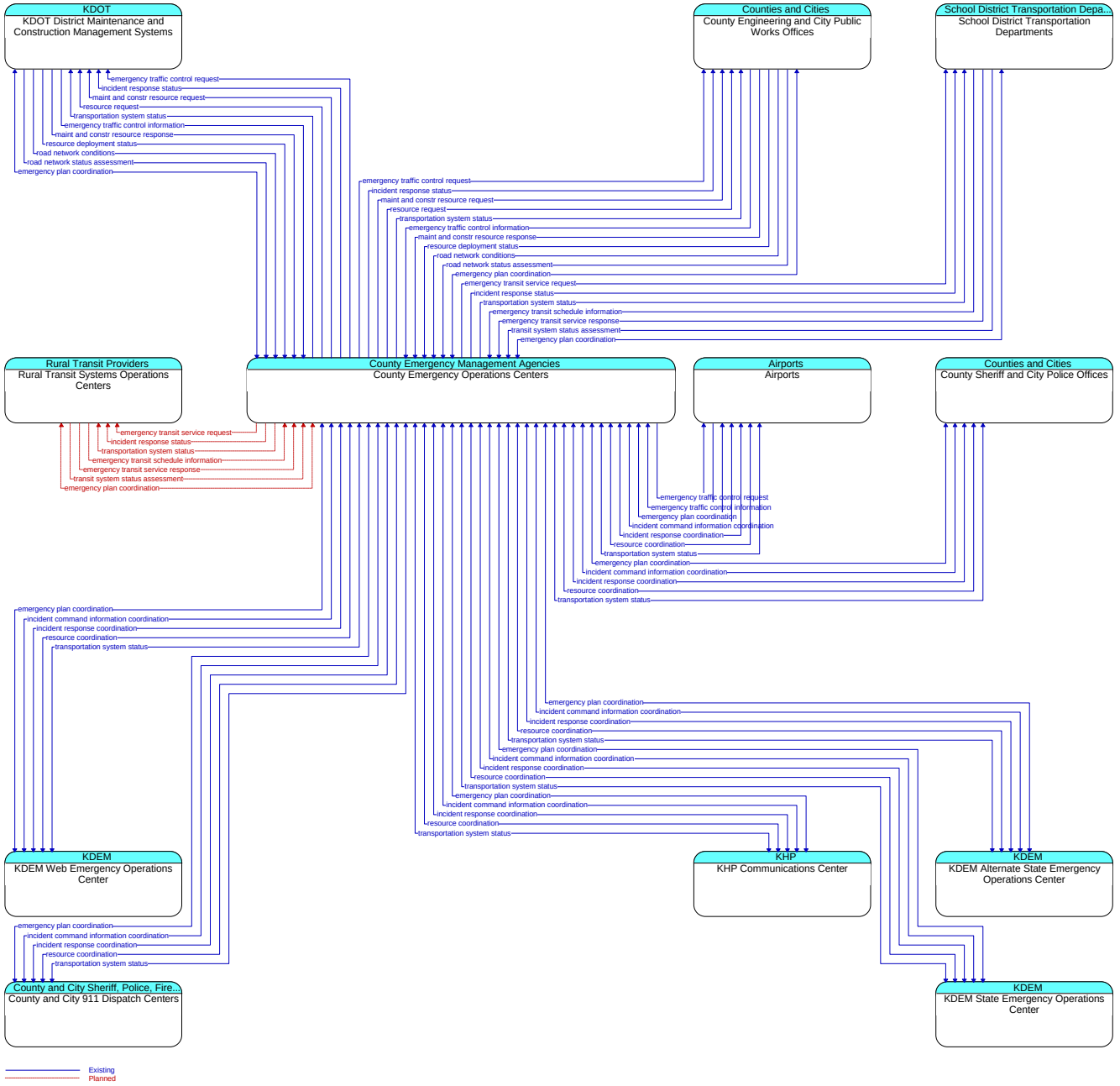
EM07 - Early Warning System (Part 5)



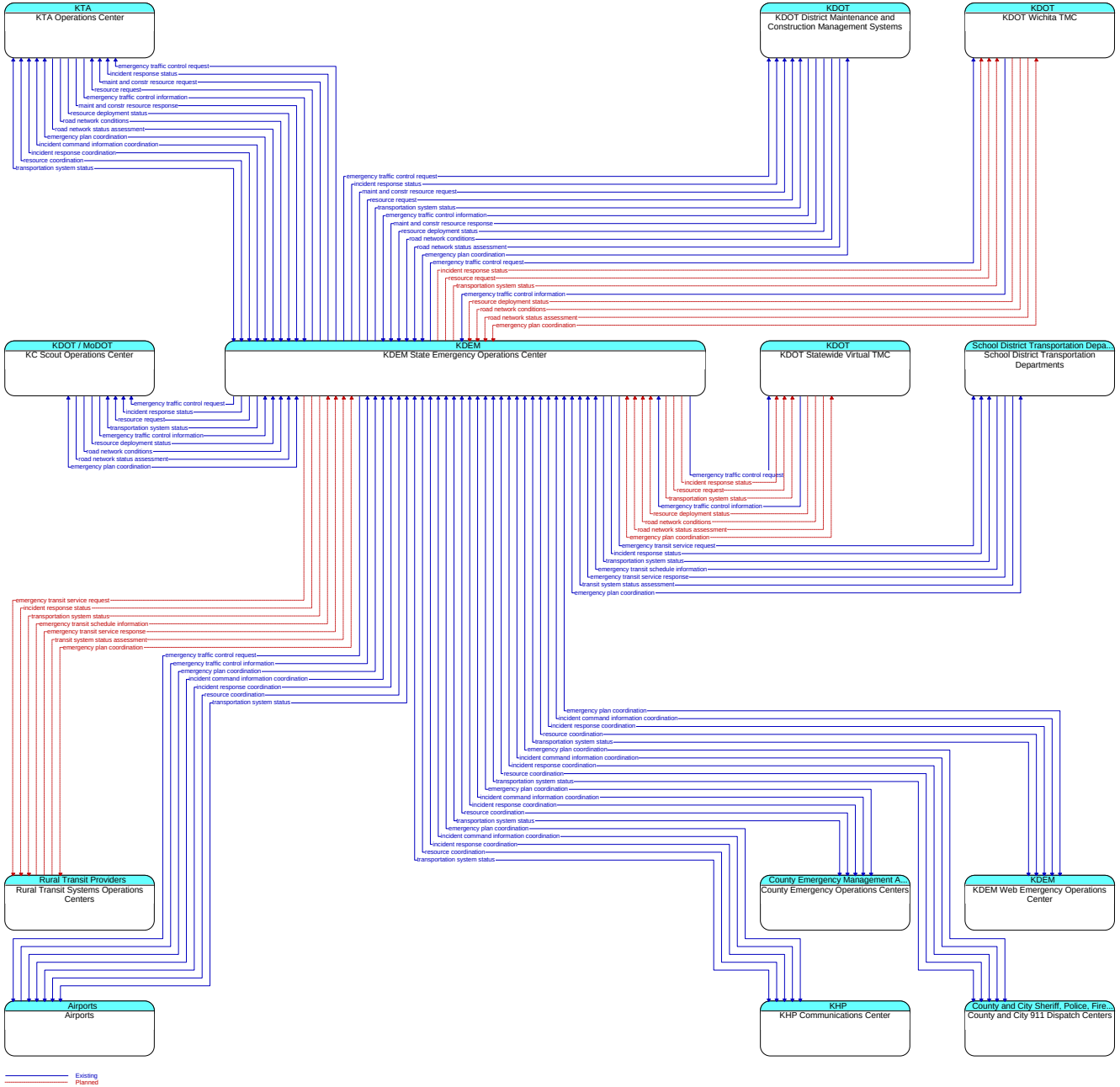
EM07 - Early Warning System (Part 6)



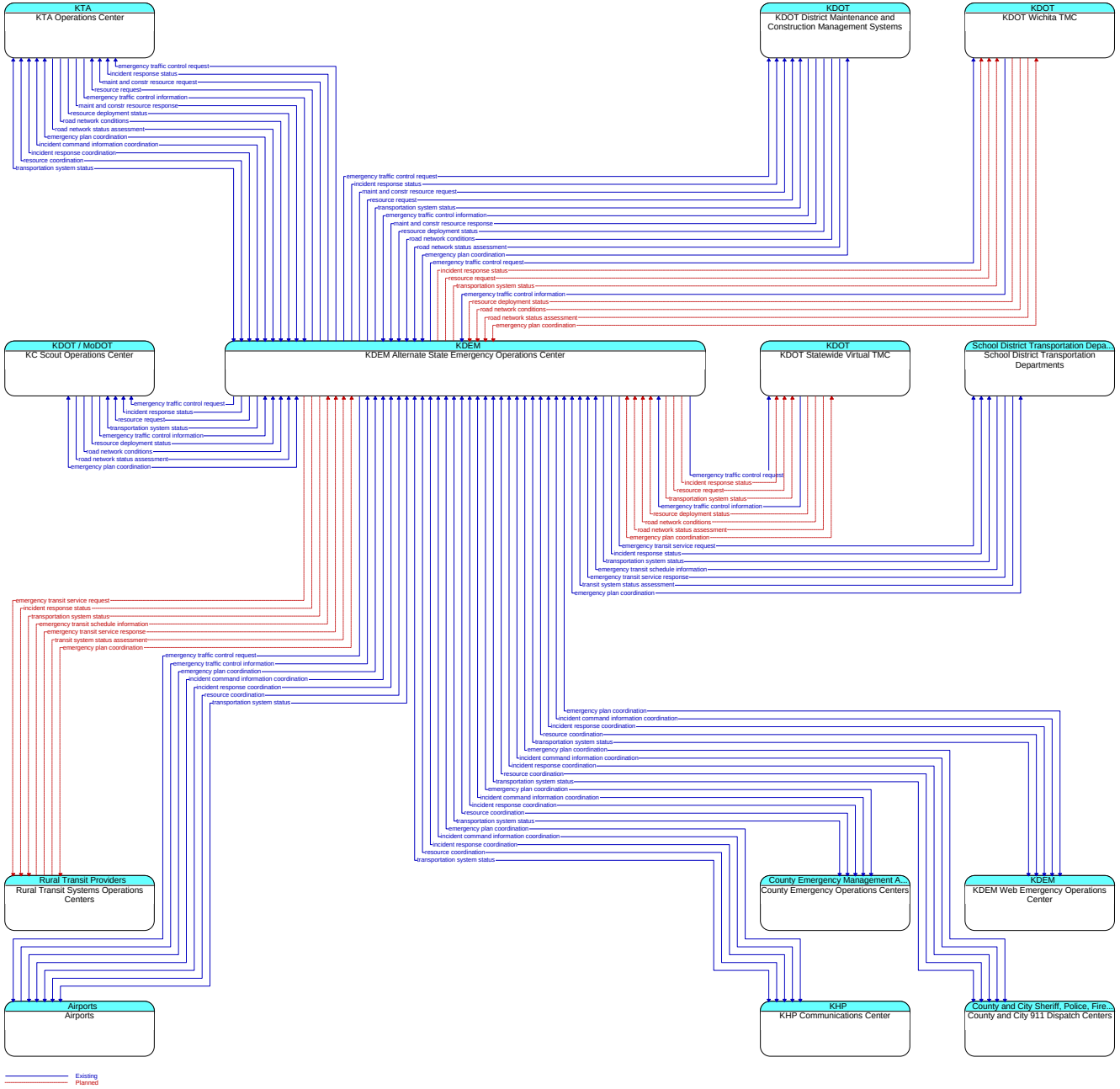
EM08 - Disaster Response and Recovery (Part 1)



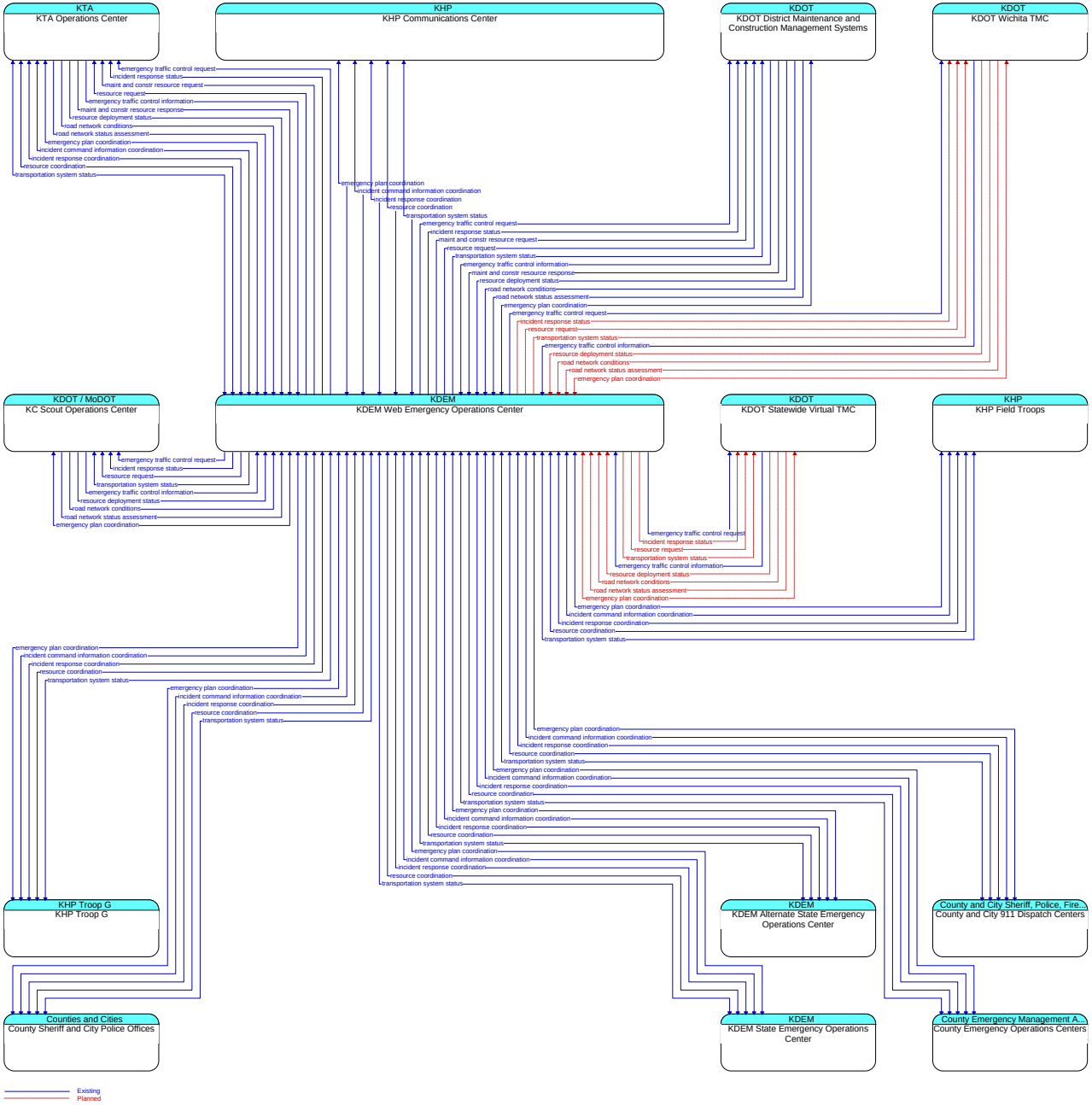
EM08 - Disaster Response and Recovery (Part 2)



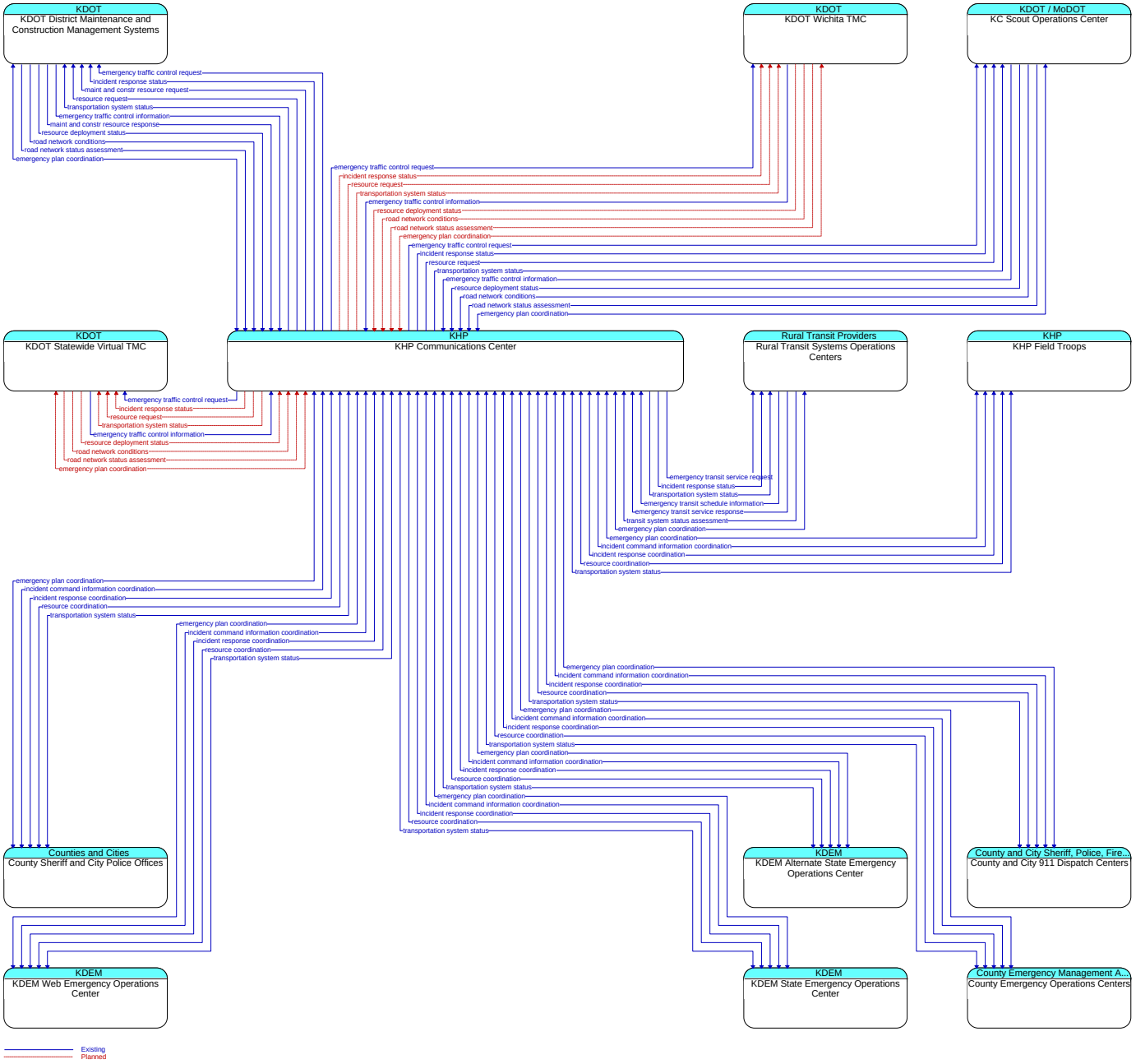
EM08 - Disaster Response and Recovery (Part 3)



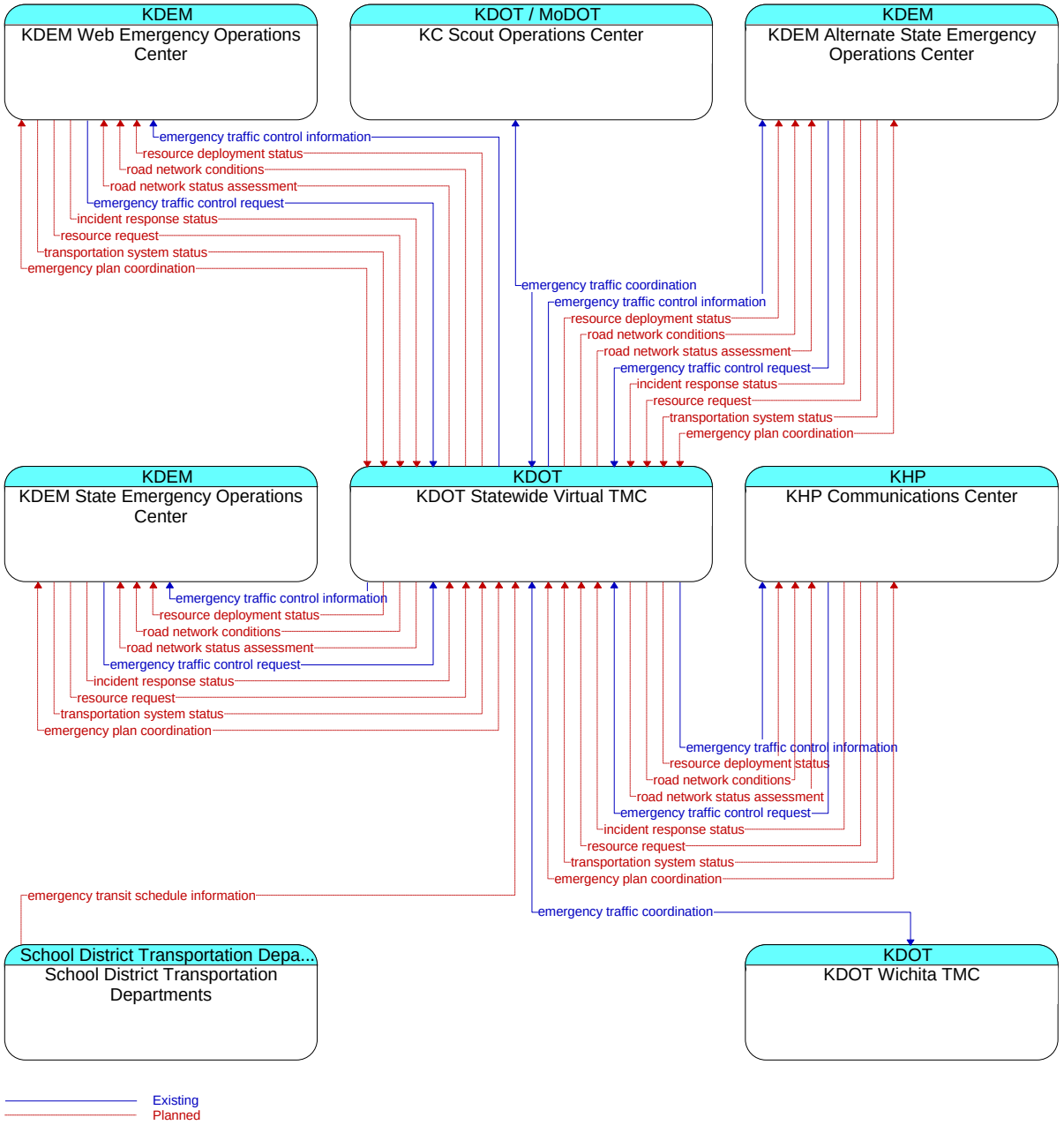
EM08 - Disaster Response and Recovery (Part 4)



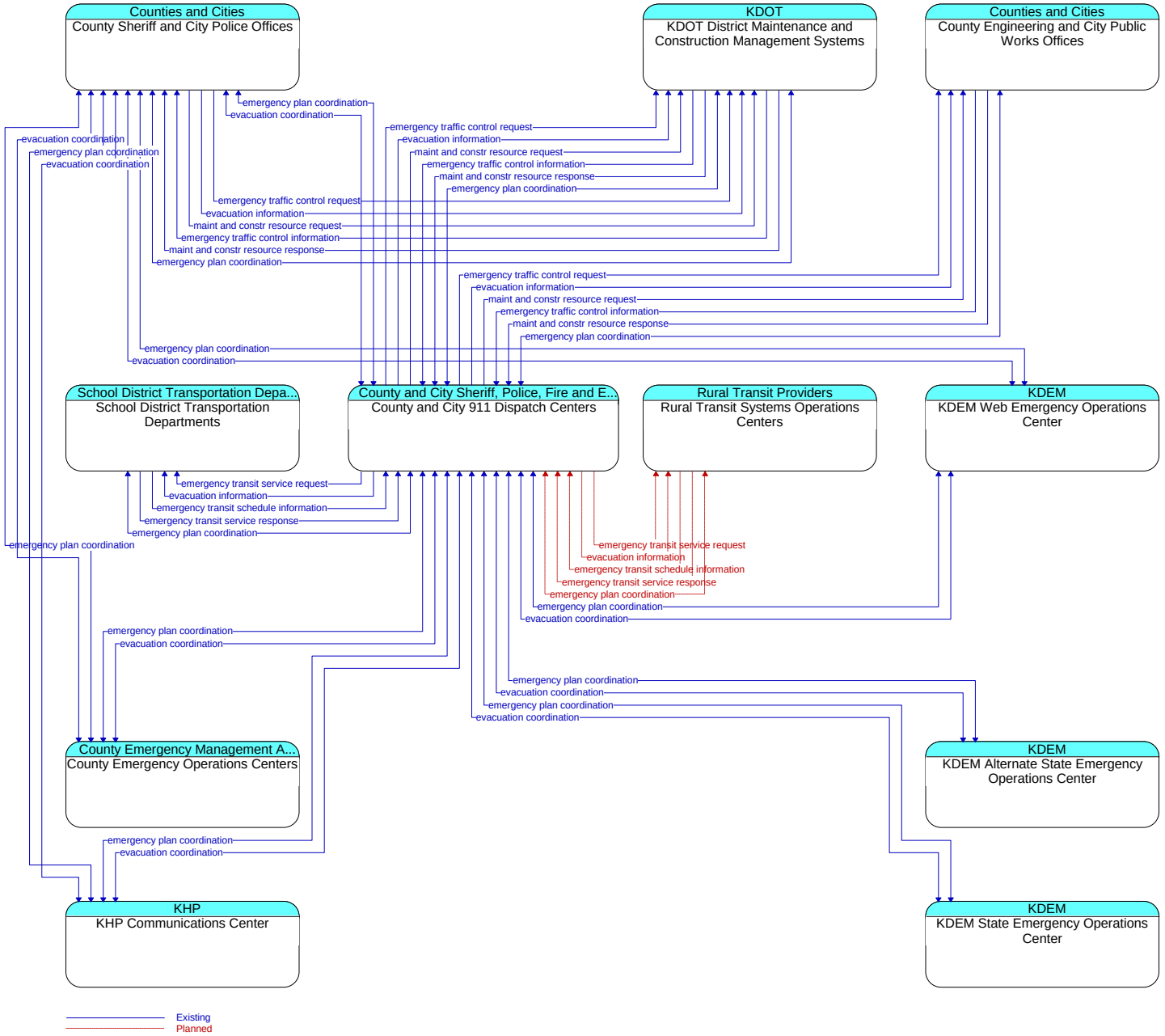
EM08 - Disaster Response and Recovery (Part 5)



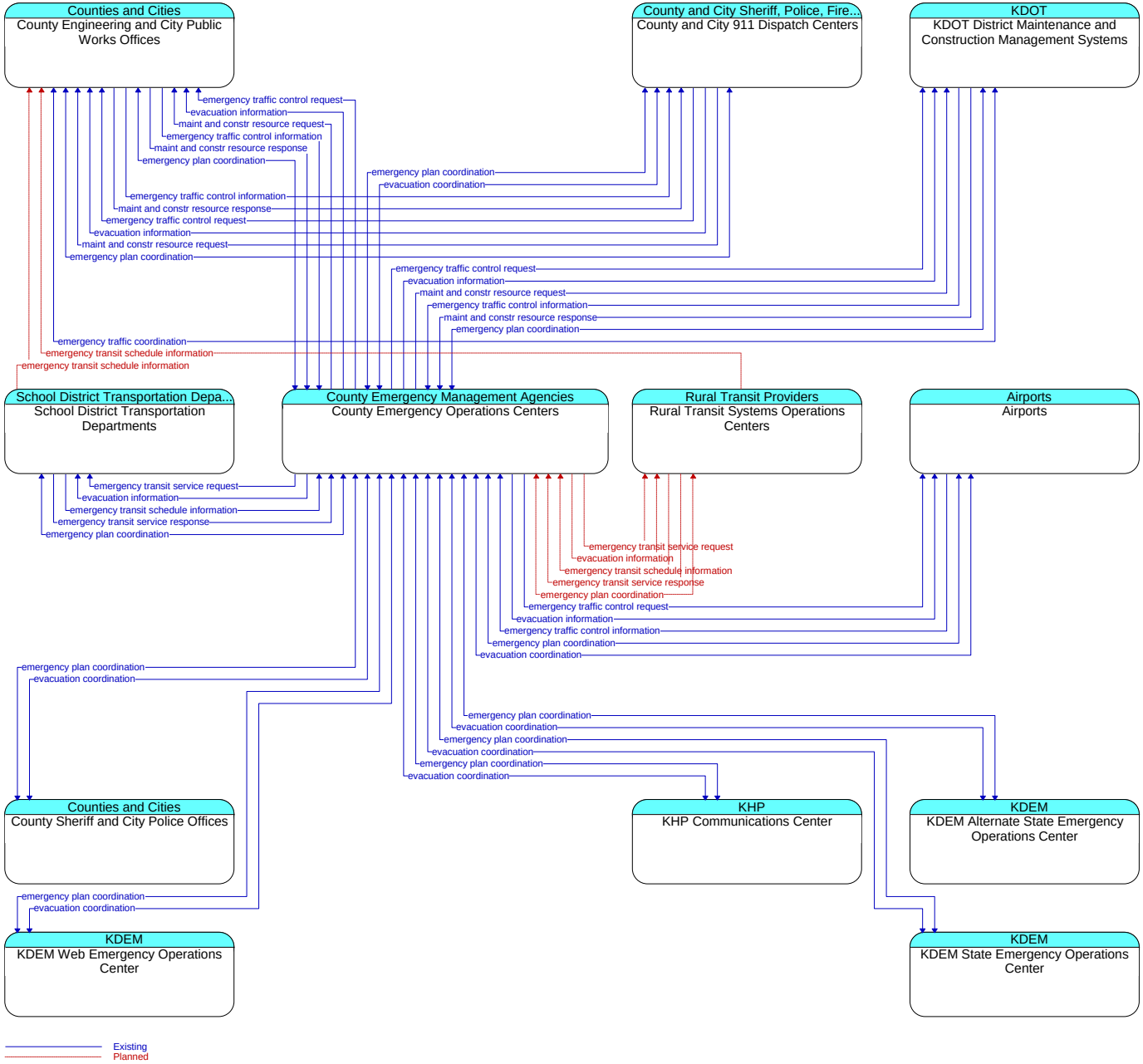
EM08 - Disaster Response and Recovery (Part 6)



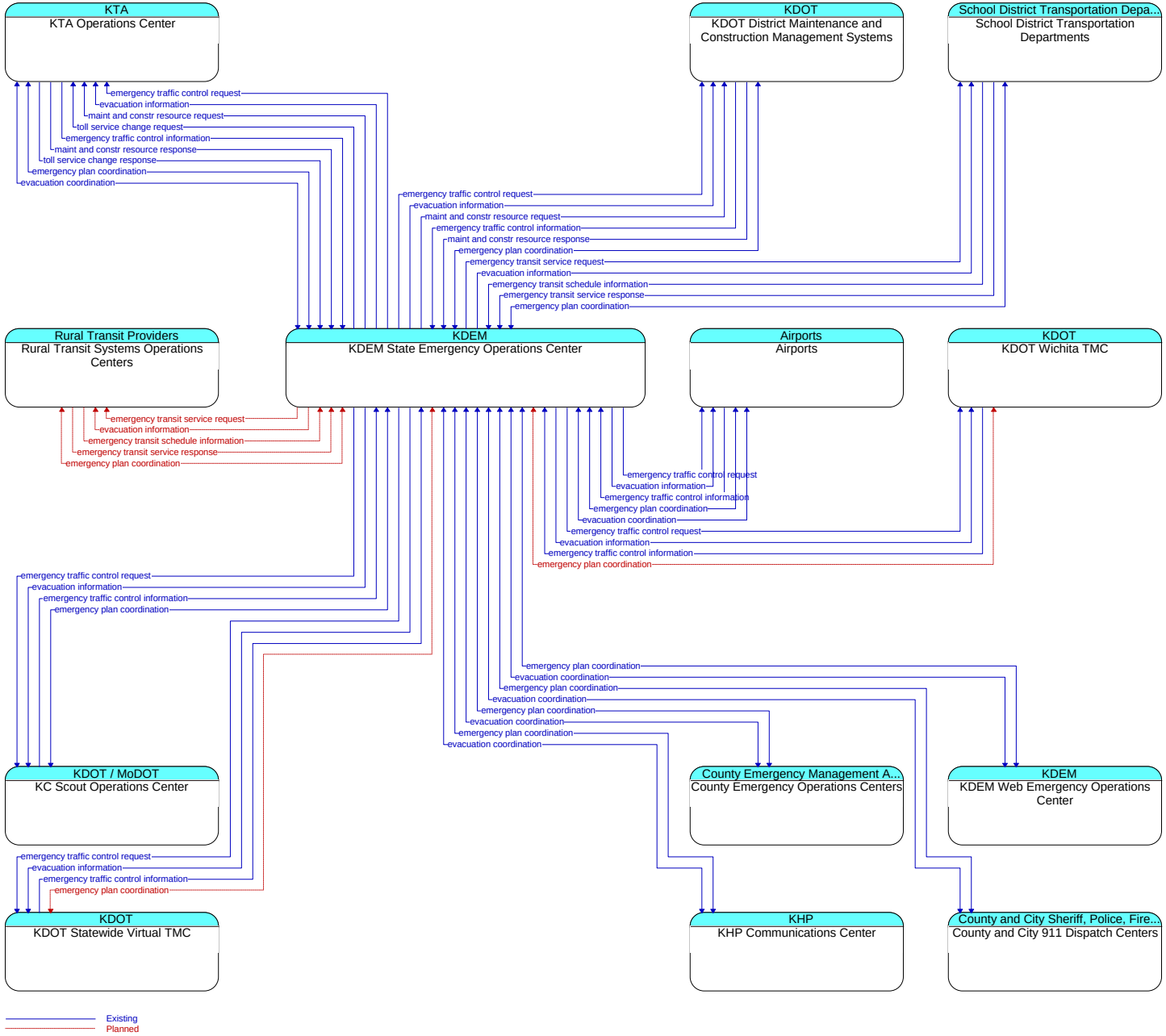
EM09 – Evacuation and Reentry Management (Part 1)



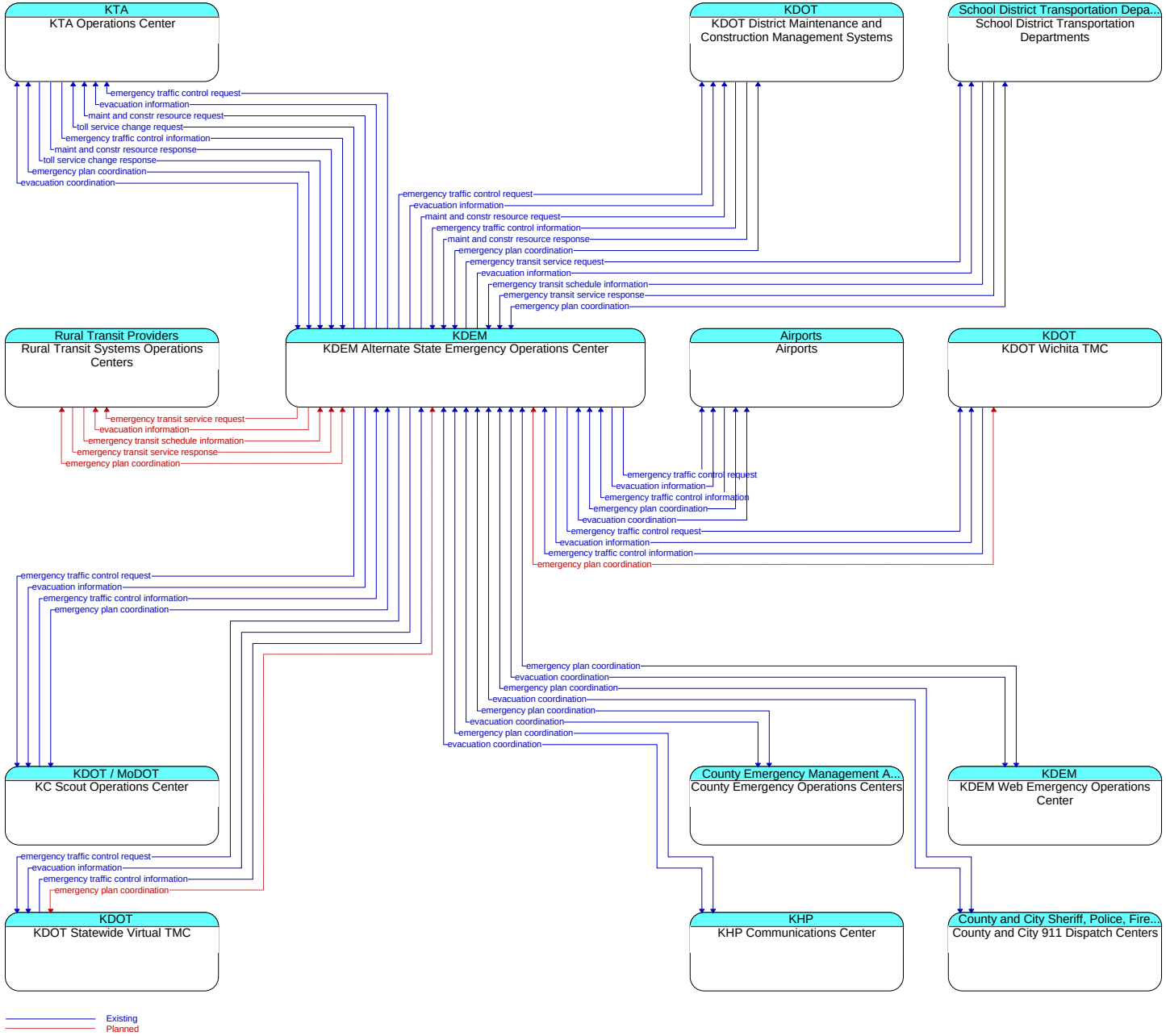
EM09 – Evacuation and Reentry Management (Part 2)



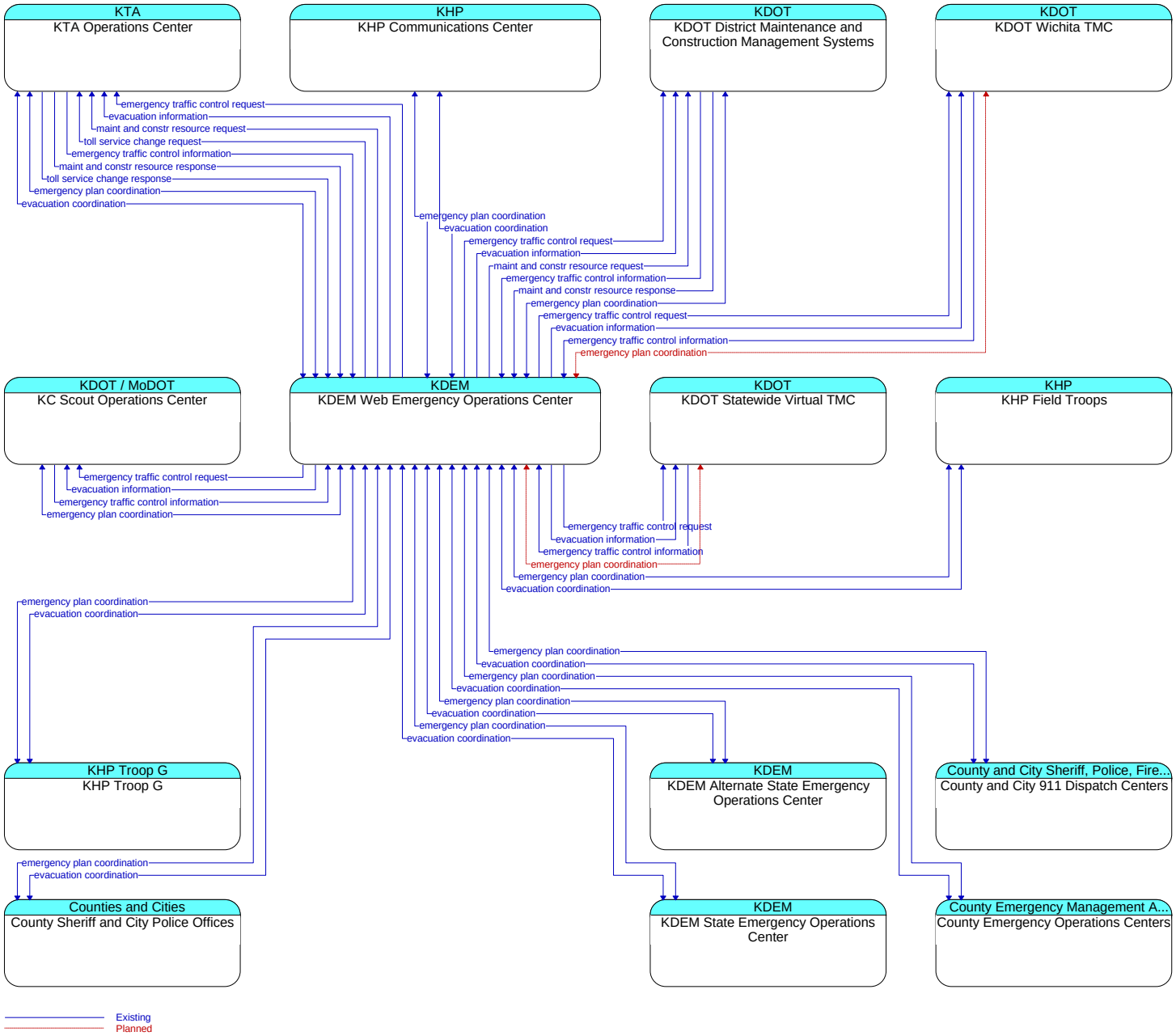
EM09 – Evacuation and Reentry Management (Part 3)



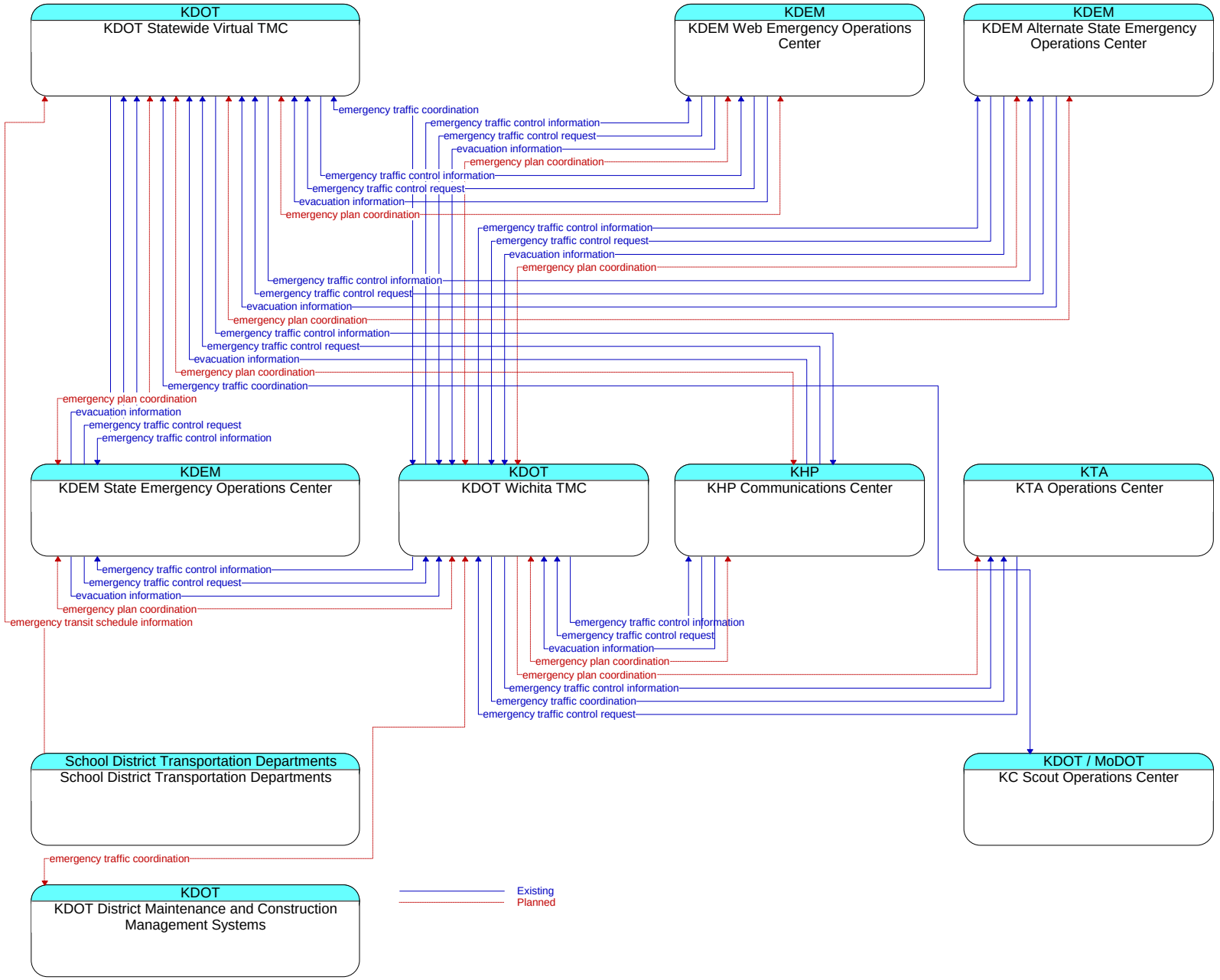
EM09 – Evacuation and Reentry Management (Part 4)



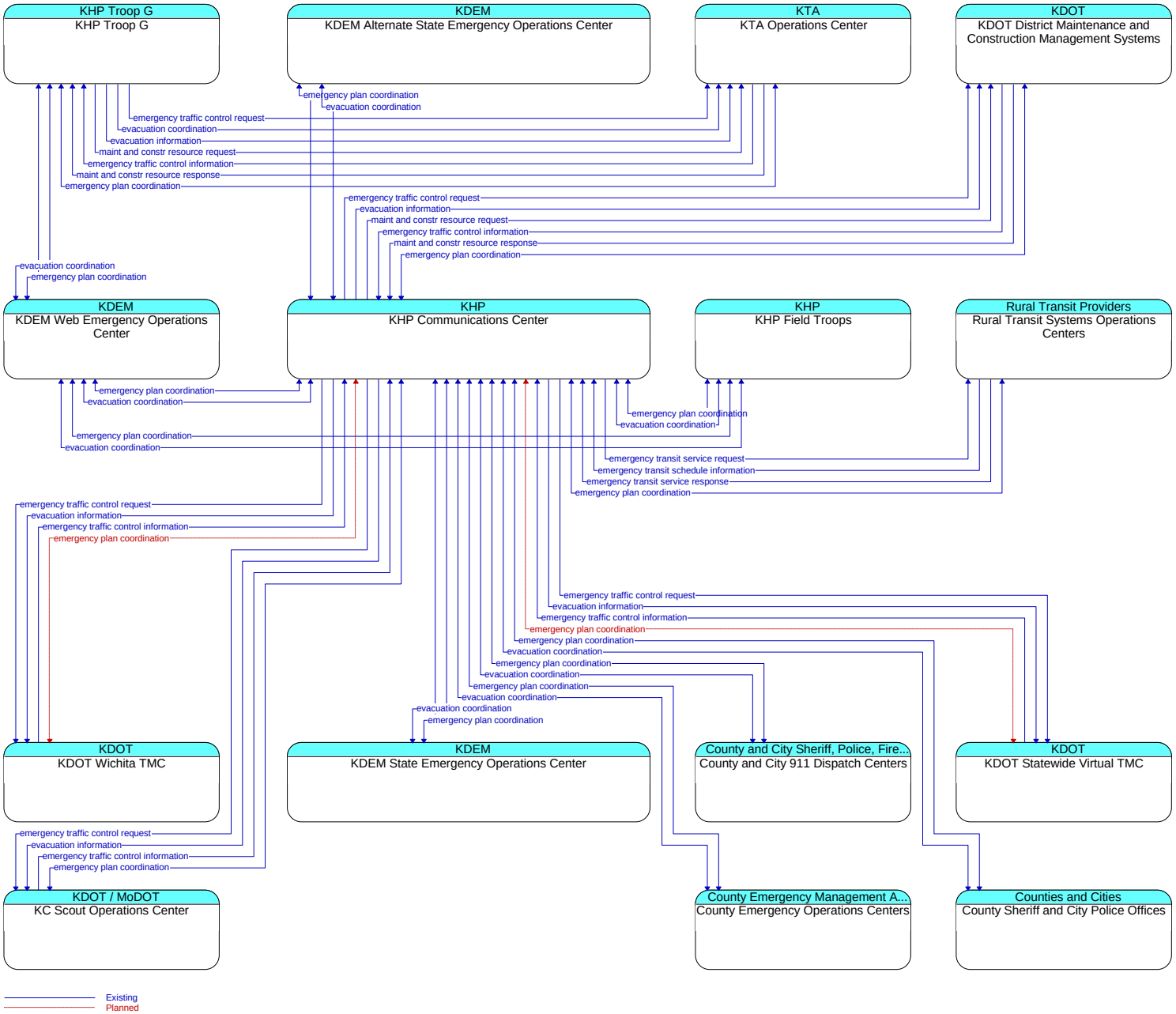
EM09 – Evacuation and Reentry Management (Part 5)



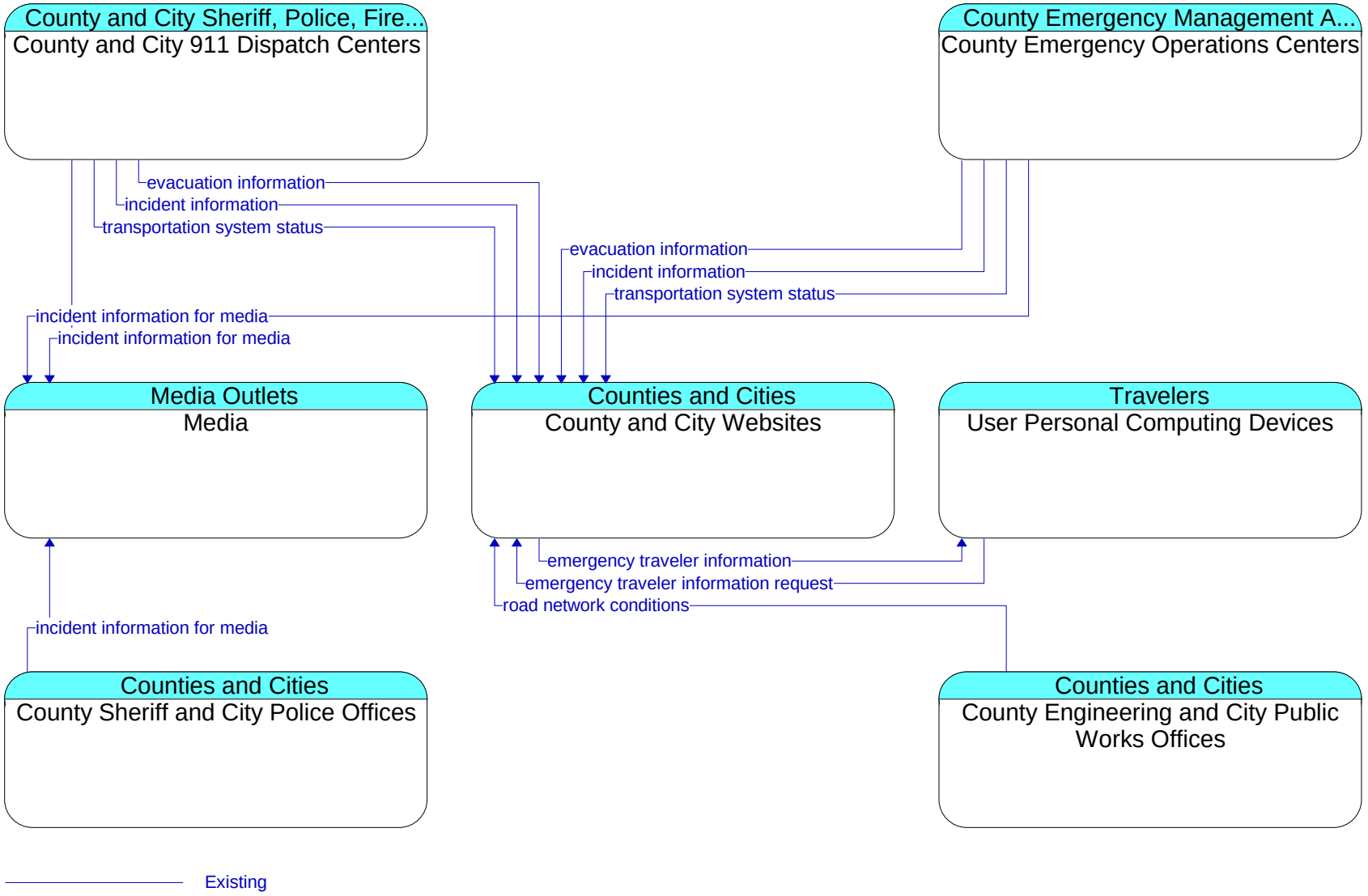
EM09 – Evacuation and Reentry Management (Part 6)



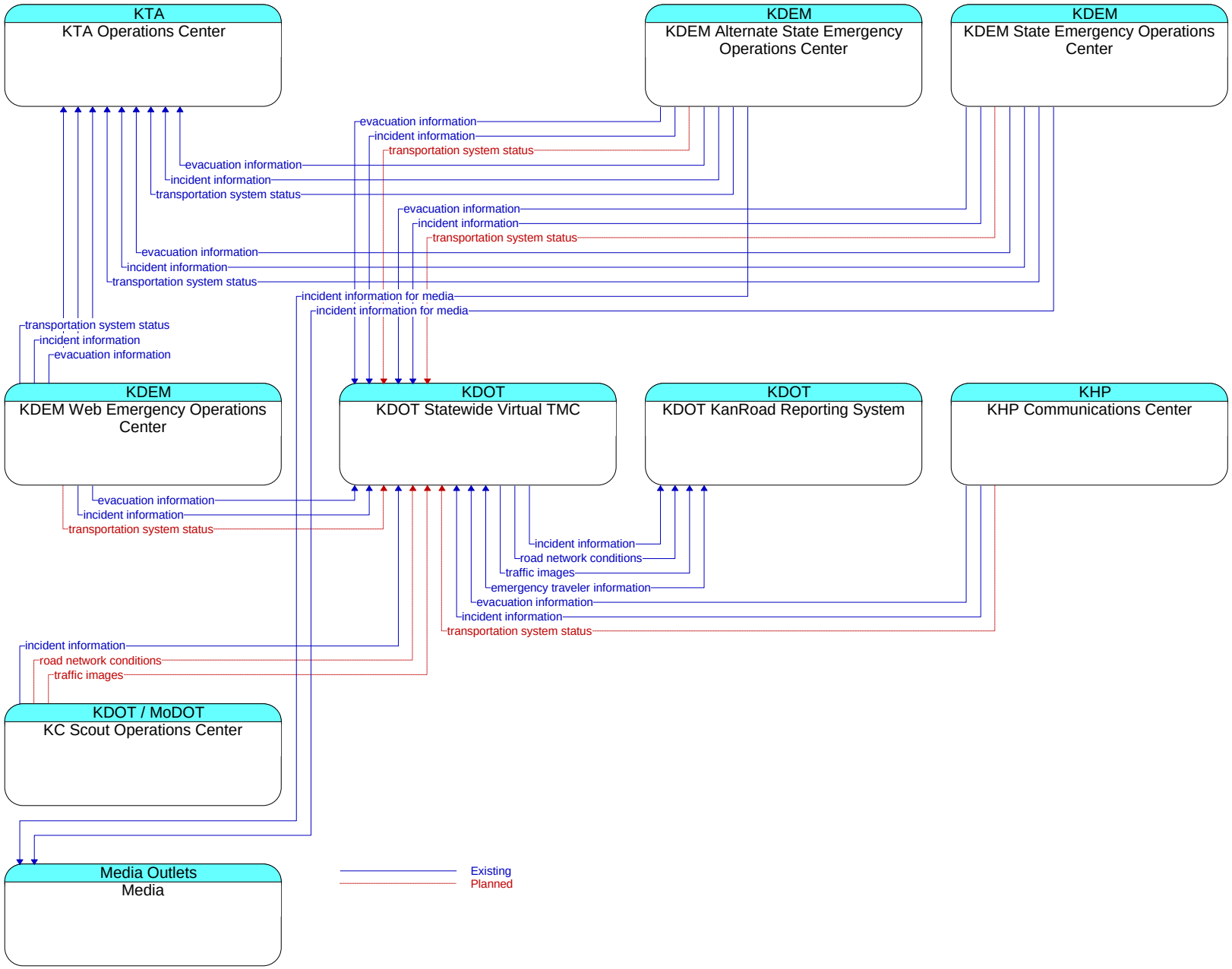
EM09 – Evacuation and Reentry Management (Part 7)



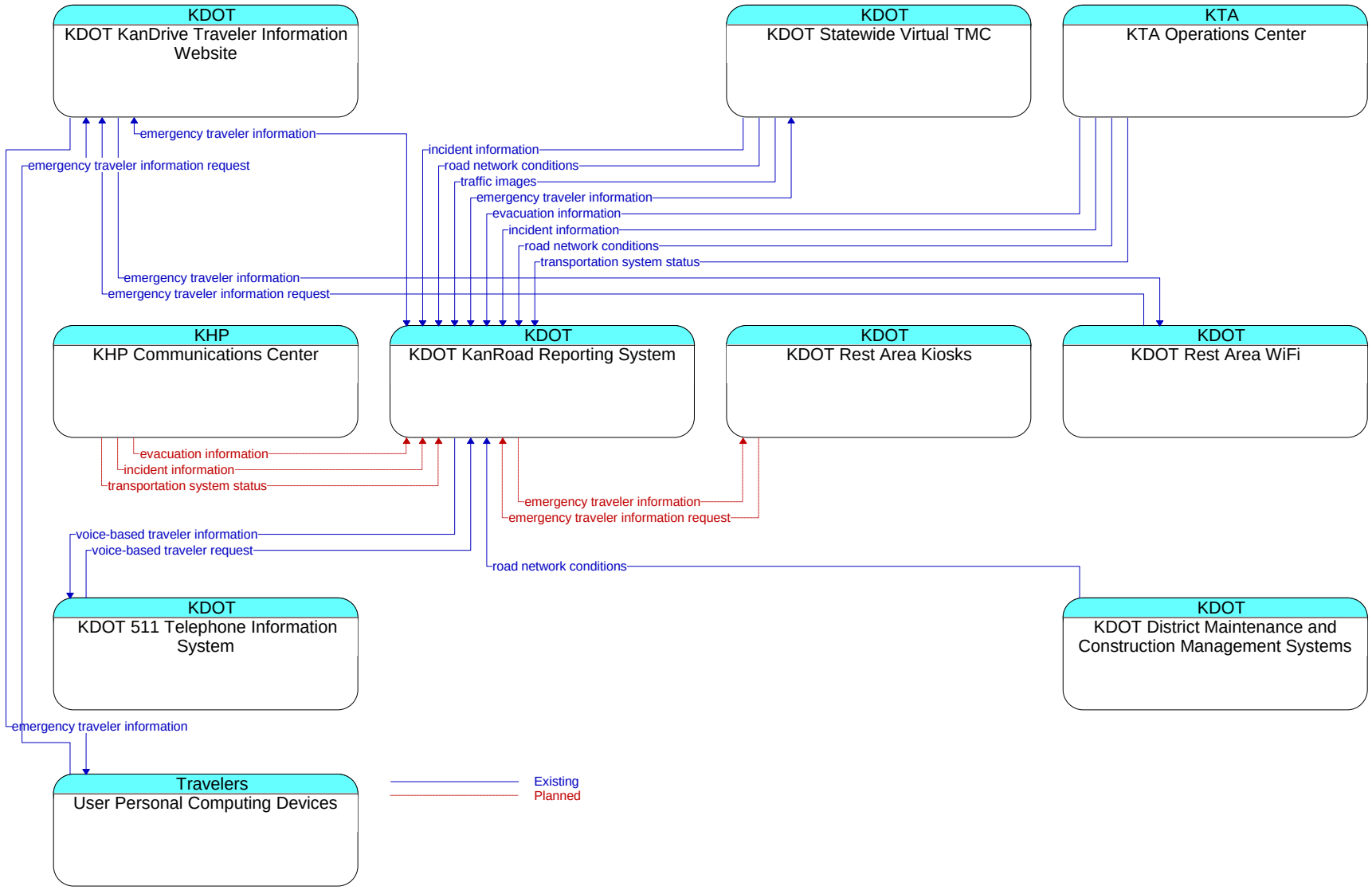
EM10 – Disaster Traveler Information (Part 1)



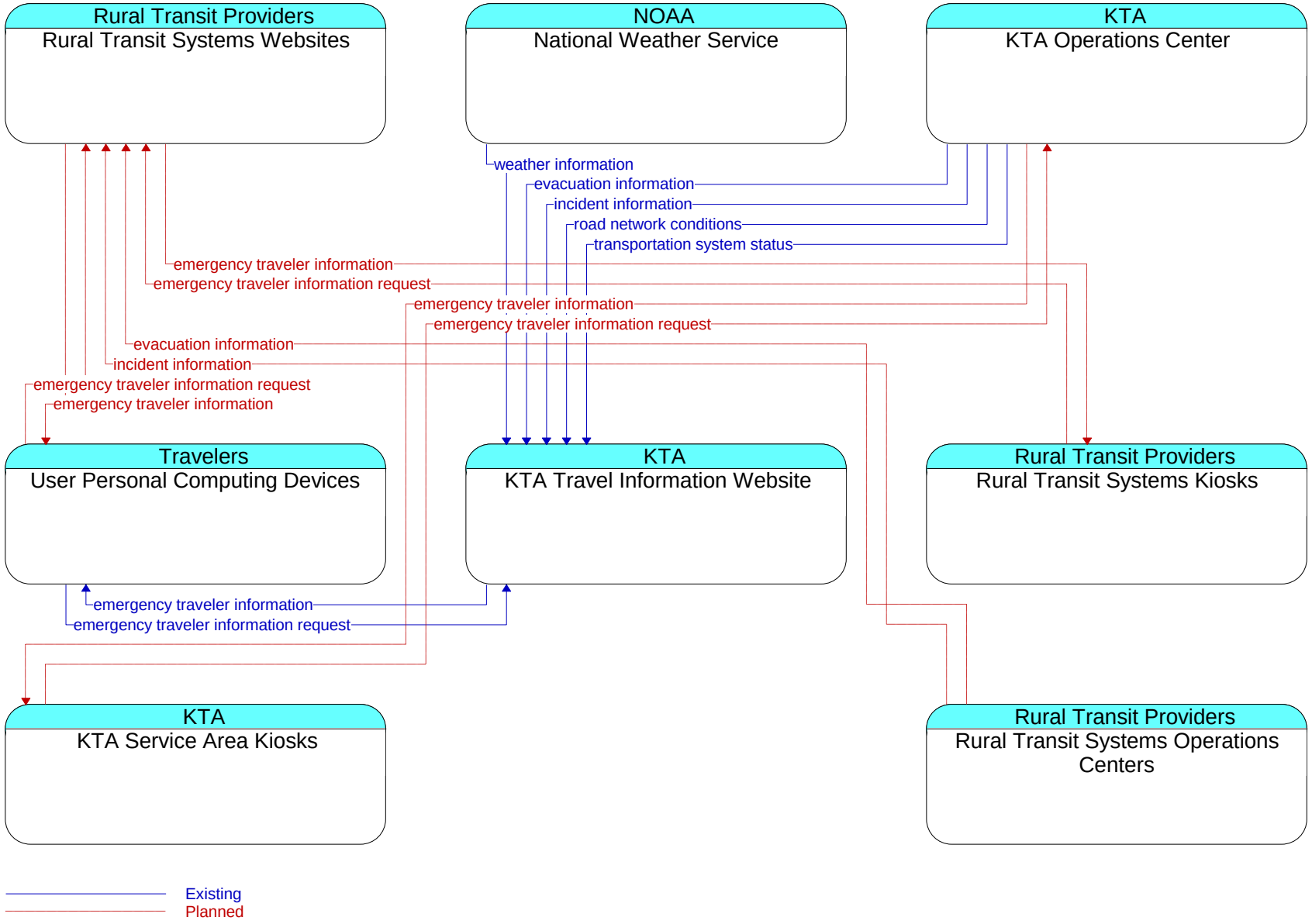
EM10 – Disaster Traveler Information (Part 2)



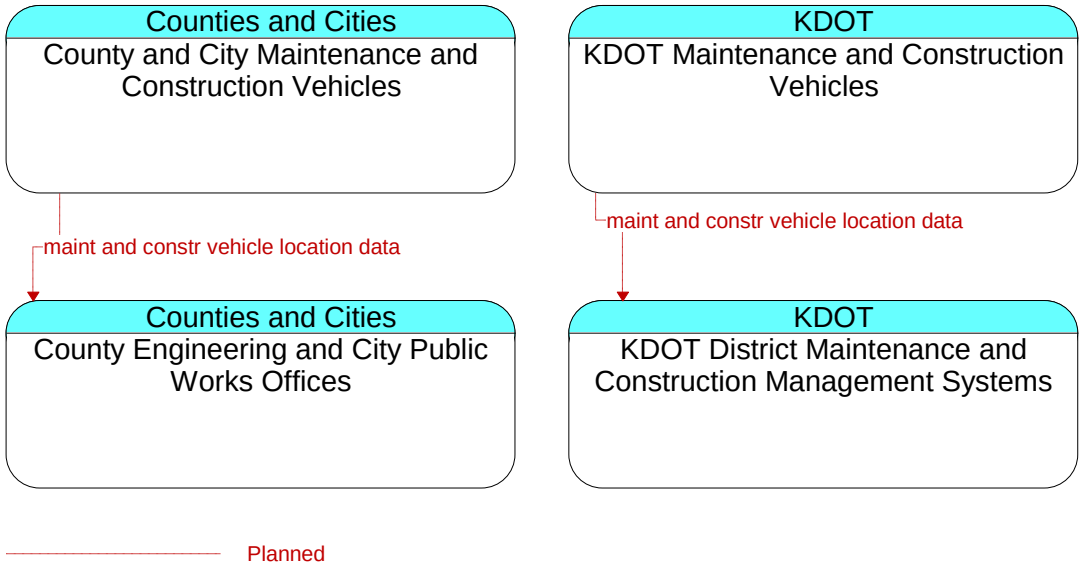
EM10 – Disaster Traveler Information (Part 3)



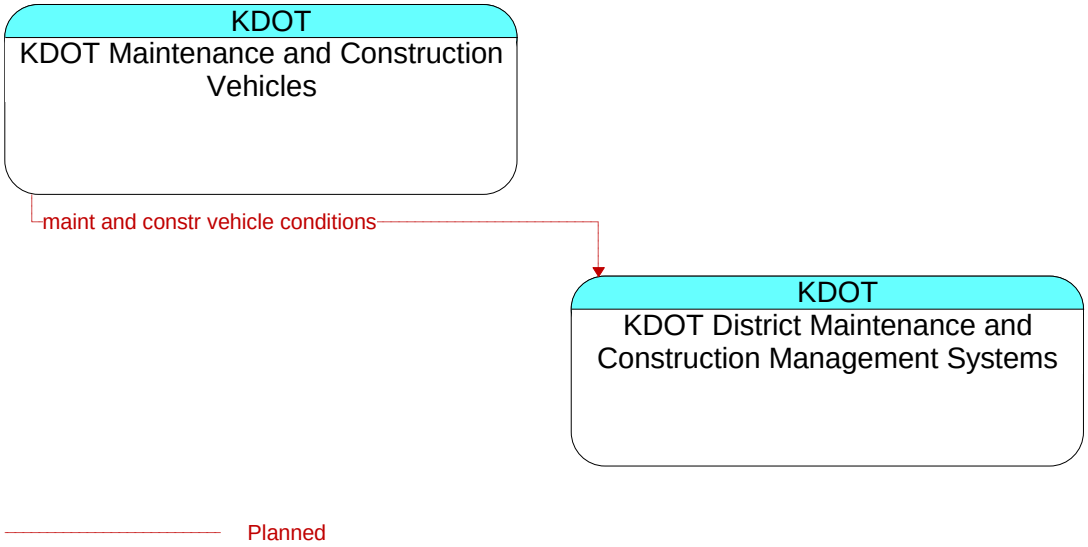
EM10 – Disaster Traveler Information (Part 4)



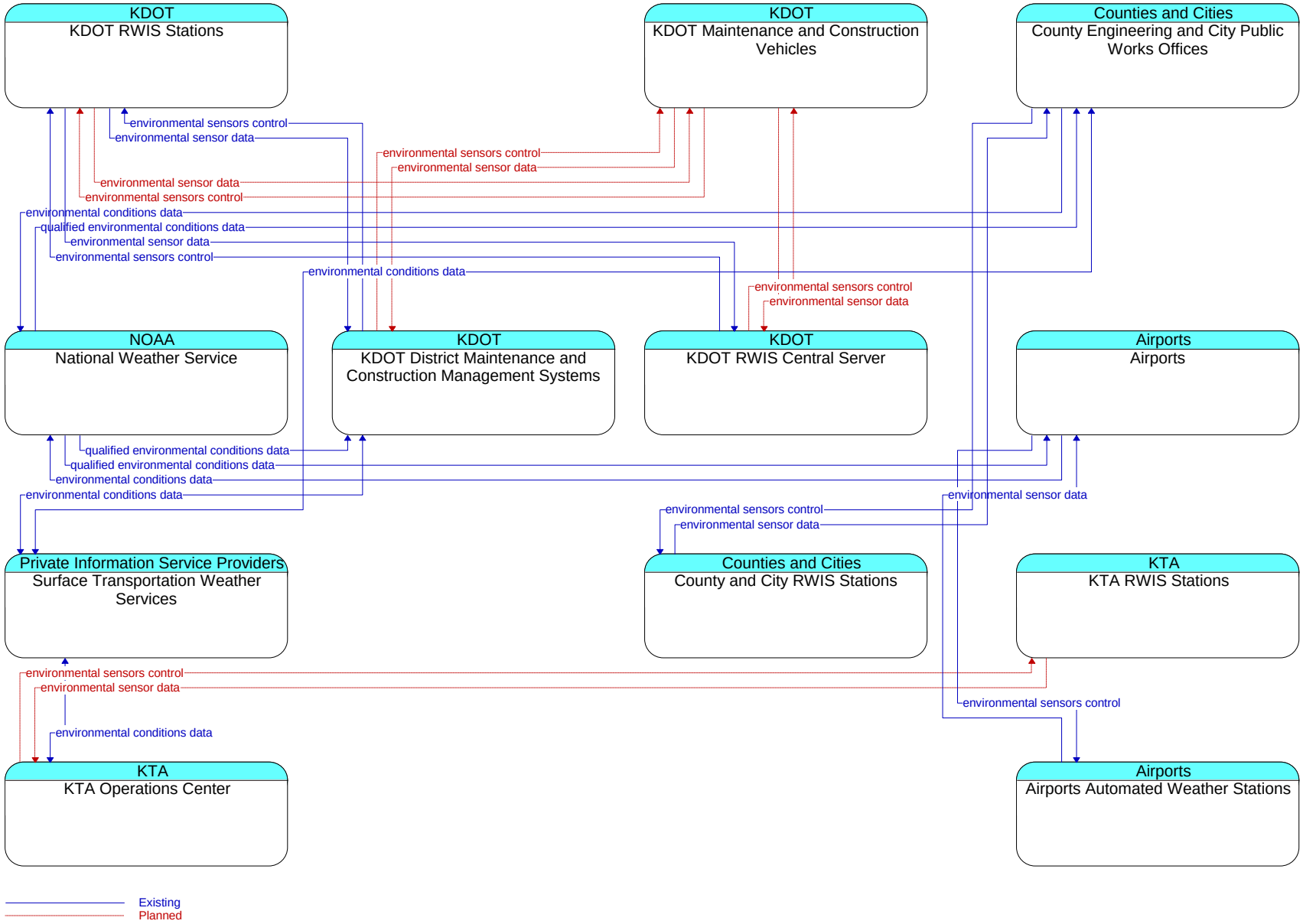
MC01 – Maintenance and Construction Vehicle and Equipment Tracking



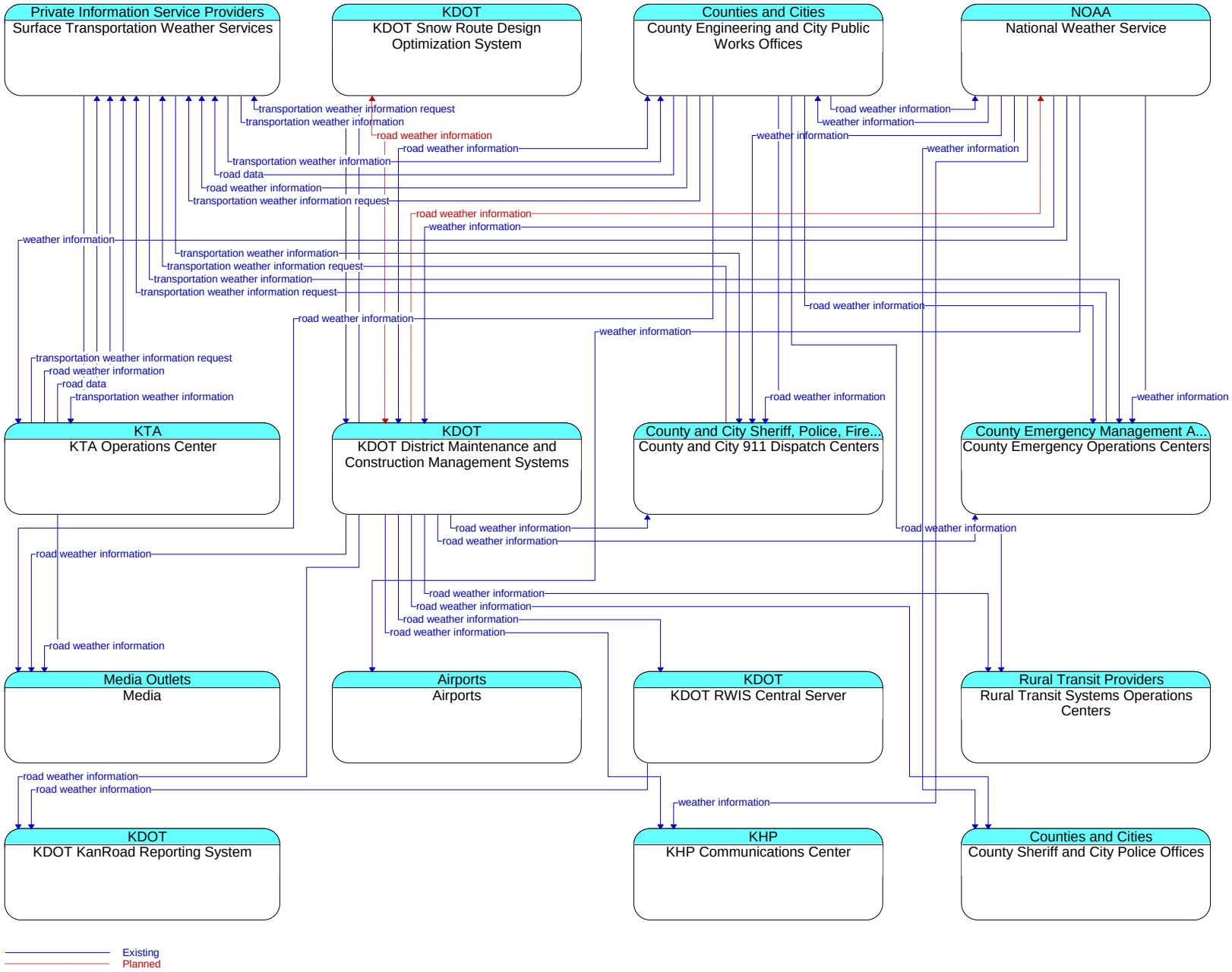
MC02 – Maintenance and Construction Vehicle Maintenance



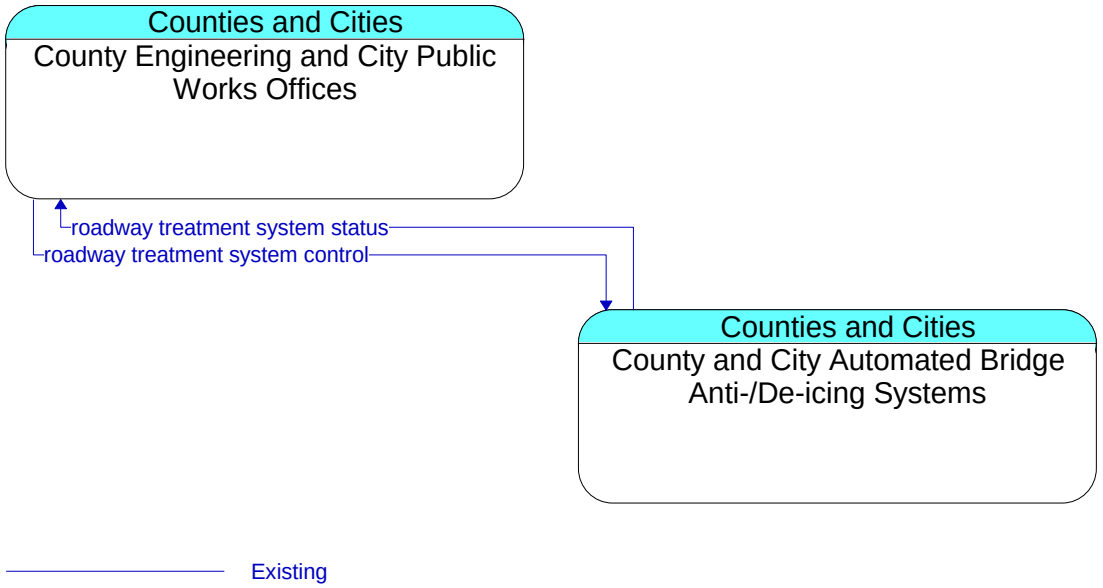
MC03 – Road Weather Data Collection



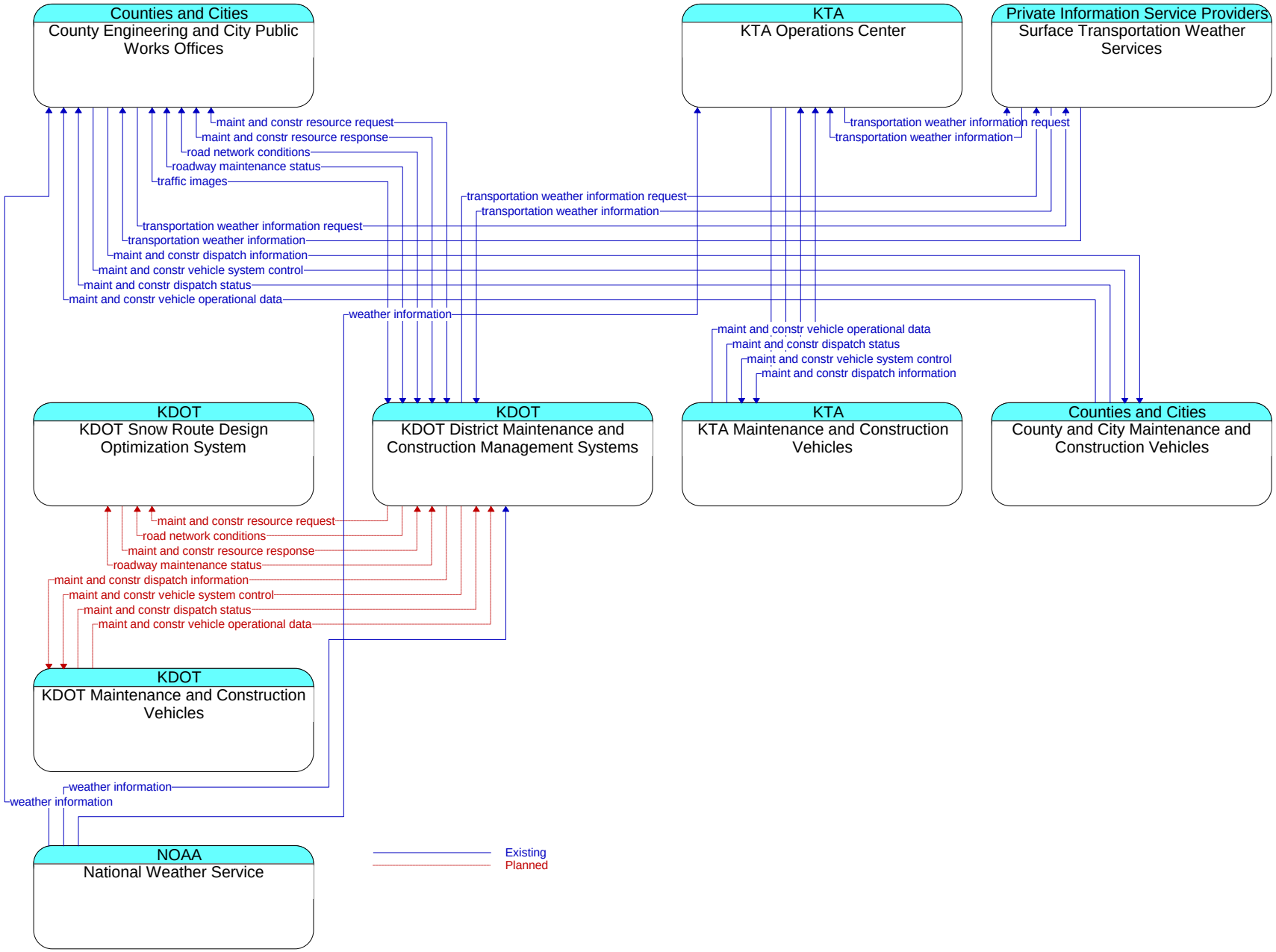
MC04 – Weather Information Processing and Distribution



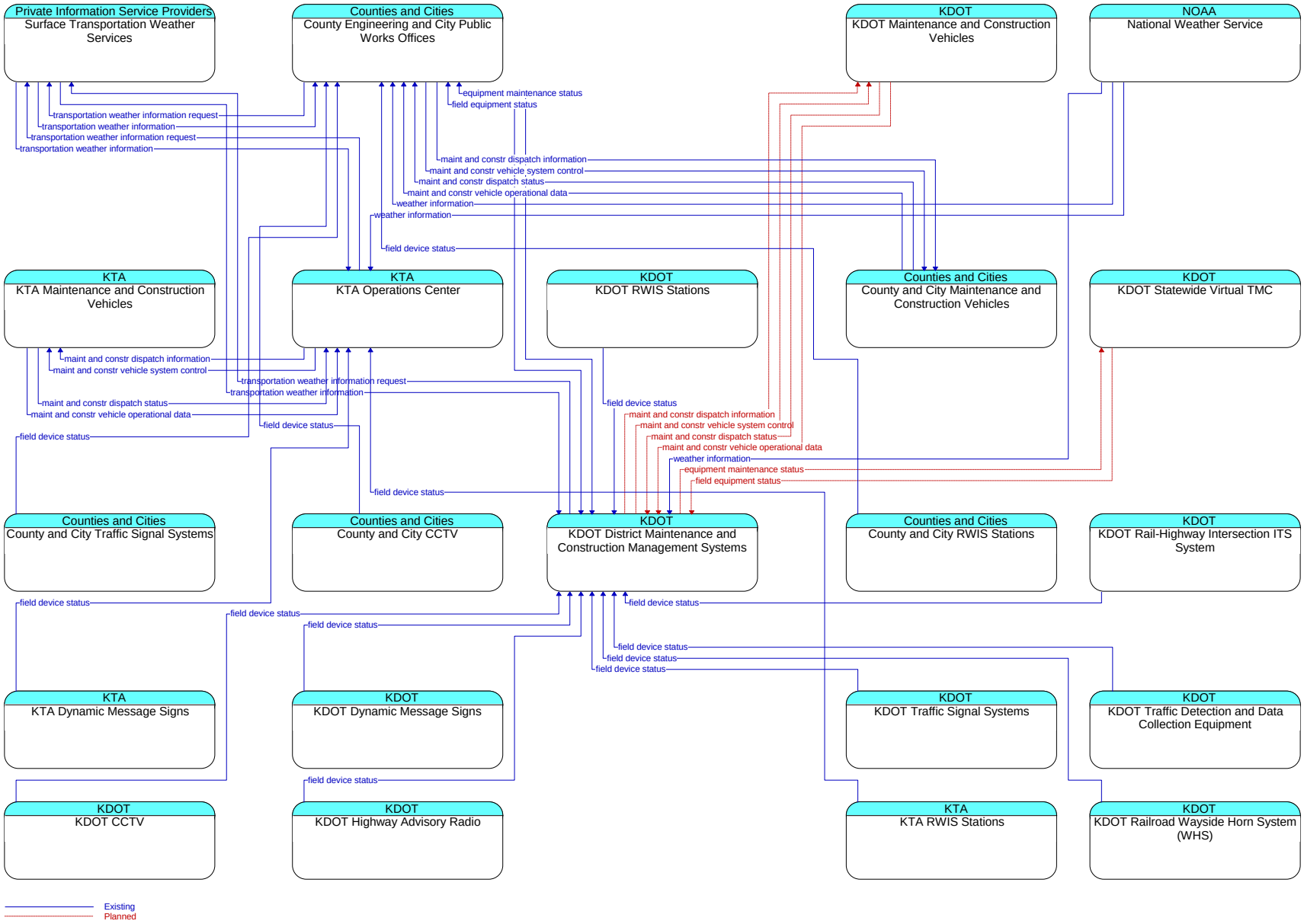
MC05 – Roadway Automated Treatment



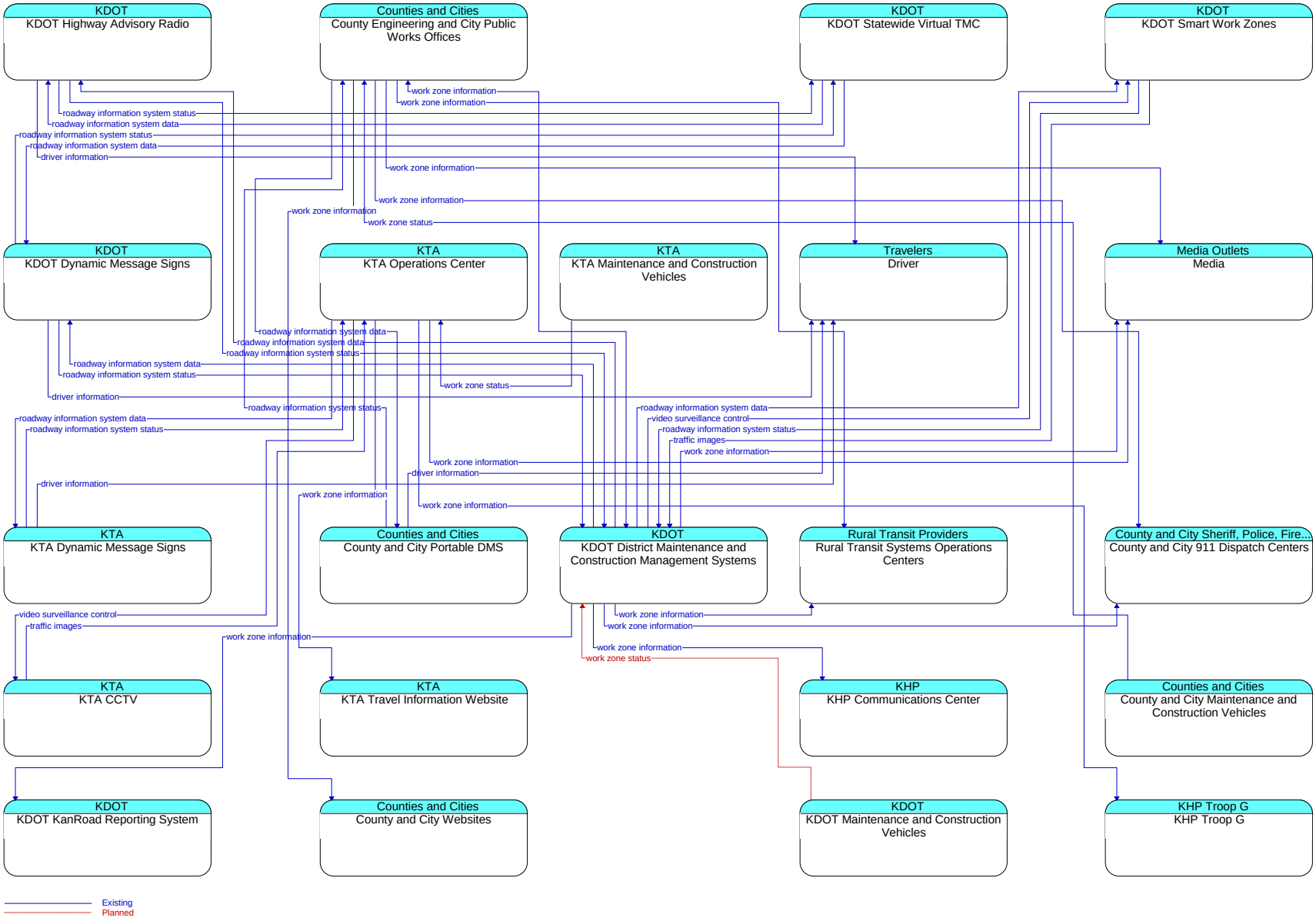
MC06 – Winter Maintenance



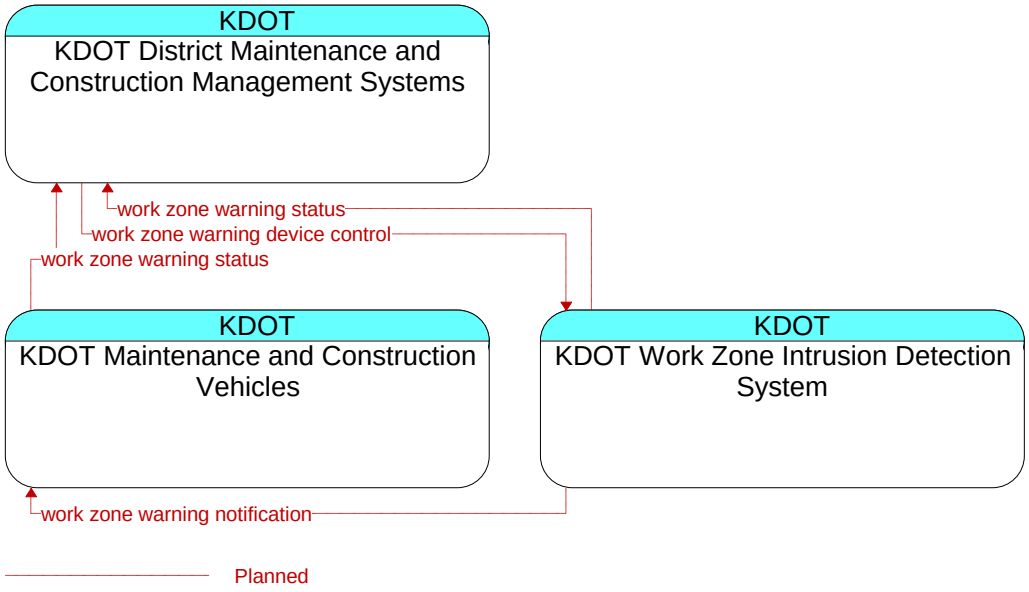
MC07 – Roadway Maintenance and Construction



MC08 – Work Zone Management



MC09 – Work Zone Safety Monitoring



MC10 – Maintenance and Construction Activity Coordination