

**Wichita Area Regional Intelligent Transportation
System (ITS) Architecture
Version 1.1**


**VOLUME 1
ARCHITECTURE DOCUMENT**

Submitted by










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1 Introduction

1.1 Background

In 1998, the Wichita-Sedgwick County region published the Strategic Deployment Plan for Intelligent Transportation Systems (ITS). The purpose of the study was to identify the ITS user services appropriate for the Wichita region and to develop a strategic deployment plan to provide these user services. In 2001, the Wichita region participated in the creation of an initial Wichita-Sedgwick County Regional ITS Architecture based on the National ITS Architecture and the 1998 Strategic Deployment Plan. The Strategic Deployment Plan is being followed by the region and captures the current needs and goals of the region which have not changed significantly. The currently named Wichita Regional ITS Architecture project is comprised of three volumes. This document is Volume 1 and contains the core ITS architecture stakeholders, inventory elements and transportation services. There is a companion web site with this same information in a hyperlinked format at www.iteris.com/wichitaarchitecture. An ITS Architecture provides a blueprint of how transportation systems within the region will be identified and interconnected.

This document is a direct result of stakeholder meetings held in Wichita where participants discussed in detail the existing and future information exchanges between surface transportation systems. Appendix A to this document details the participants of these meetings and their affiliations. Section 1 of this document provides an introduction to the Wichita Area Regional ITS Architecture including the background, geographic scope of the architecture and timeframes for ITS project planning. Section 2 describes each of the stakeholders represented in the architecture. Section 3 contains all of the surface transportation inventory elements identified by the region's stakeholders as important to include in the architecture as existing and future elements. Section 4 describes all of the existing and future transportation services envisioned for the region.

Volume 2 is an Implementation Planning document based on this architecture defined in Volume 1 and describes projects within the overall regional ITS architecture and their phasing or sequencing over the next 10 years. In addition, Volume 2 contains a list of necessary agency agreements for interconnecting diverse stakeholder's systems, ITS standards recommendations to help with standardizing electronic communication between stakeholders and an architecture maintenance plan which provides the process for keeping the Wichita Area Regional ITS Architecture up to date.

In addition to Volumes 1 and 2, there is a Volume 3 Communications Plan document which is based on Volumes 1 and 2 and contains the communications system requirements and framework based on the interfaces described in the regional ITS architecture. This Communications Plan will help guide the Wichita region in their planning needs for their envisioned surface transportation services.

1.2 Geographic Scope

The geographic scope for the Wichita Area Regional ITS Architecture is the Wichita Area Metropolitan Planning Area (WAMPO) overseen by the MAPD which includes the City of Wichita, Sedgwick County, City of Andover in Butler County, Town of Sedgwick and the City of Mulvane in Sumner County.

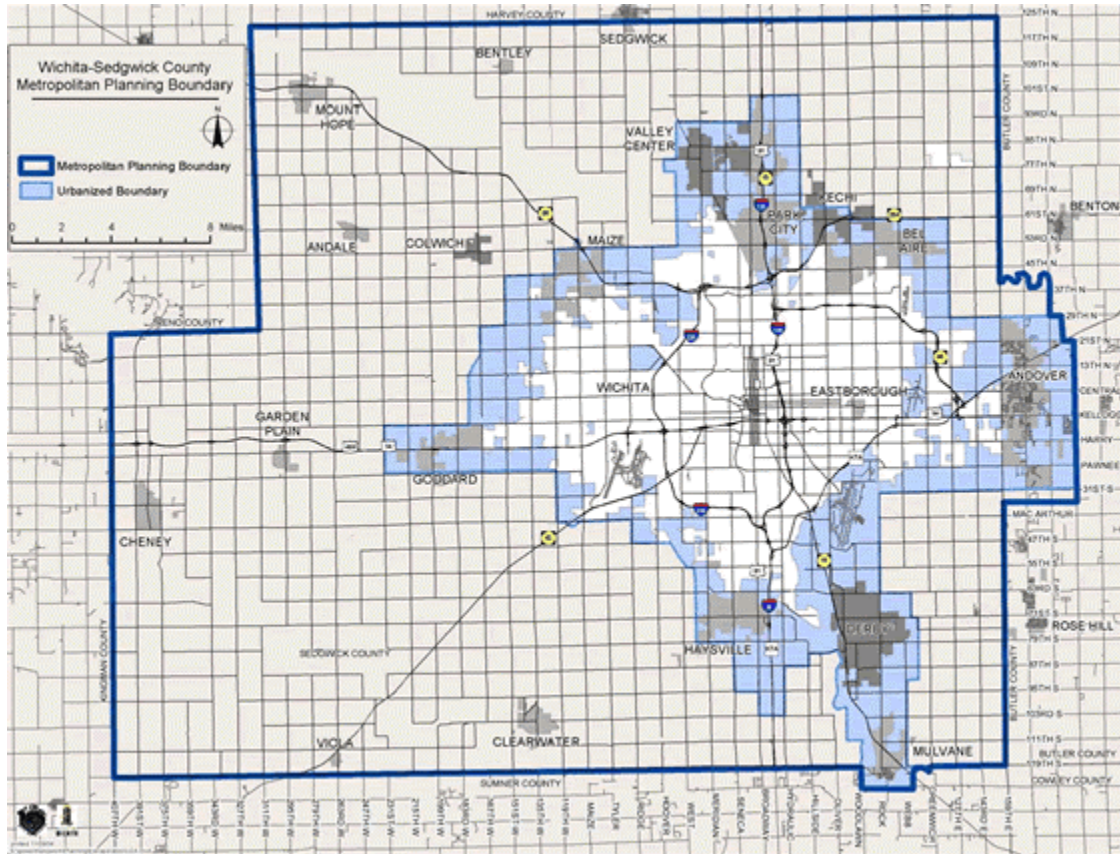


Figure 1. Wichita Area Metropolitan Planning Boundary

Although the scope of this regional ITS architecture is the MPO planning boundary, adjacent geographic areas to the planning boundary can also be included in the architecture.

Currently, there is no adjacent regional ITS or statewide ITS architectures that affect the Wichita Area Regional ITS Architecture. There are plans to create a statewide ITS architecture for Kansas as well as other regional ITS architectures. As these architectures are created it will be important for the developers to consider the boundaries of this architecture as well as the naming conventions used for stakeholder and element names. Once a Kansas Statewide ITS Architecture is created, it should be actively maintained and kept in synch with the Wichita Area Regional ITS Architecture.

1.3 Timeframe

There are five categories of time frames that were decided by the region’s stakeholders. The first category is “Existing” which represents those transportation elements and

services that currently exist in the region. The second category is “Near Term” which represents those projects and services that should be developed for the region in the next 0-5 years. The third category is “Mid Term” which represents those projects and services that should be developed for the region in the Year 6 to Year 10 timeframe. The fourth category is “Long Term” which represents those projects and services that should be developed for the region beyond the Year 10 timeframe to the year 2025. The final category is “Not Planned” which represents those projects and services that are not planned at this time and these aspects of the architecture do not appear in any of the following diagrams. Sometimes an element may have multiple timeframes (e.g., the KDOT Traffic Operations Center currently is planned near term but some of its capabilities like sending ramp metering control messages to its ramp meters is medium term) so usually the timeframe for the element is the closest to the present timeframe.

1.4 Subsystem Diagram

The overall subsystem diagram for the Wichita region is shown in Figure 2. The white rectangles indicate the subsystems that apply to one or more elements in the Wichita Area Regional ITS Architecture.

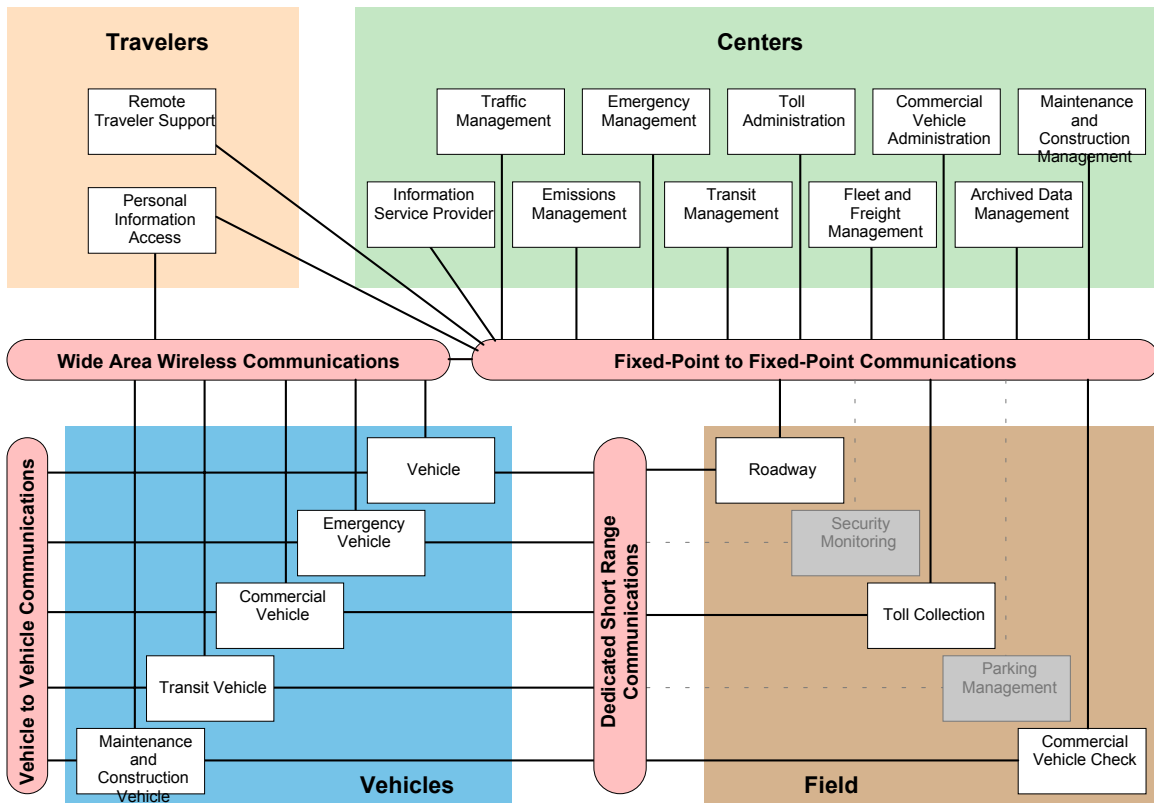


Figure 2. Wichita Area Regional ITS Architecture Subsystem Diagram

This architecture only touches upon the statewide systems like CVISN and 511. It is expected that the Kansas Statewide ITS Architecture will fully define the statewide ITS. The only subsystems not included in the region are:

- The Security Monitoring subsystem for monitoring critical assets as part of Homeland Security, and
- The Parking Management subsystem which monitors parking areas electronically.

At this time the architecture is focused on transportation services which do not include homeland security unique functions such as cameras used solely for security surveillance. Also at this time, there are no instrumented parking lots indicating available spaces or plans to have them. All other National ITS Architecture subsystems are represented by one or more elements in the inventory (Section 3 of this document). Descriptions of each subsystem are provided from the National ITS Architecture below:

1.4.1 Archived Data Management Subsystem

The Archived Data Management Subsystem collects, archives, manages, and distributes data generated from ITS sources for use in transportation administration, policy evaluation, safety, planning, performance monitoring, program assessment, operations, and research applications. The data received is formatted and tagged with attributes that define the data source, conditions under which it was collected, data transformations, and other information (i.e. meta data) necessary to interpret the data. The subsystem can fuse ITS generated data with data from non-ITS sources and other archives to generate information products utilizing data from multiple functional areas, modes, and jurisdictions. The subsystem prepares data products that can serve as inputs to federal, state, and local data reporting systems. This subsystem may be implemented in many different ways. It may reside within an operational center and provide focused access to a particular agency's data archives. Alternatively, it may operate as a distinct center that collects data from multiple agencies and sources and provides a general data warehouse service for a region.

1.4.2 Commercial Vehicle Administration Subsystem

The Commercial Vehicle Administration Subsystem will operate at one or more fixed locations within a region. This subsystem performs administrative functions supporting credentials, tax, and safety regulations. It issues credentials, collects fees and taxes, and supports enforcement of credential requirements. This subsystem communicates with the Fleet Management Subsystems associated with the motor carriers to process credentials applications and collect fuel taxes, weight/distance taxes, and other taxes and fees associated with commercial vehicle operations. The subsystem also receives applications for, and issues special Oversize/Overweight and HAZMAT permits in coordination with other cognizant authorities. The subsystem coordinates with other Commercial Vehicle Administration Subsystems (in other states/regions) to support nationwide access to credentials and safety information for administration and enforcement functions. This subsystem supports communications with Commercial Vehicle Check Subsystems operating at the roadside to enable credential checking and safety information collection. The collected safety information is processed, stored, and made available to qualified stakeholders to identify carriers and drivers that operate unsafely.

1.4.3 Commercial Vehicle Check

The Commercial Vehicle Check Subsystem supports automated vehicle identification at mainline speeds for credential checking, roadside safety inspections, and weigh-in-motion using two-way data exchange. These capabilities include providing warnings to the commercial vehicle drivers, their fleet managers, and proper authorities of any safety problems that have been identified, accessing and examining historical safety data, and automatically deciding whether to allow the vehicle to pass or require it to stop with operator manual override. The Commercial Vehicle Check Subsystem also provides supplemental inspection services to current capabilities by supporting expedited brake inspections, the use of operator hand-held devices, on-board safety database access, and the enrollment of vehicles and carriers in the electronic clearance program.

1.4.4 Commercial Vehicle Subsystem

This subsystem resides in a commercial vehicle and provides the sensory, processing, storage, and communications functions necessary to support safe and efficient commercial vehicle operations. The Commercial Vehicle Subsystem provides two-way communications between the commercial vehicle drivers, their fleet managers, attached freight equipment, and roadside officials, and provides HAZMAT response teams with timely and accurate cargo contents information after a vehicle incident. This subsystem provides 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 are supplied to inspection facilities at mainline speeds. In addition, the subsystem will automatically collect and record mileage, fuel usage, and border crossings.

1.4.5 Emergency Management Subsystem

The Emergency Management Subsystem represents public safety, emergency management, and other allied agency systems that support incident management, disaster response and evacuation, security monitoring, and other security and public safety-oriented ITS applications. The subsystem includes the functions associated with fixed and mobile public safety communications centers including public safety call taker and dispatch centers operated by police (including transit police), fire, and emergency medical services. It includes the functions associated with Emergency Operations Centers that are activated at local, regional, state, and federal levels for emergencies and the portable and transportable systems that support Incident Command System operations at an incident. This subsystem also represents other allied systems including centers associated with towing and recovery, freeway service patrols, HAZMAT response teams, and mayday service providers.

The subsystem manages sensor and surveillance equipment used to enhance transportation security of the roadway infrastructure (including bridges, tunnels, interchanges, and other key roadway segments) and the public transportation system (including transit vehicles, public areas such as transit stops and stations, facilities such as transit yards, and transit infrastructure such as rail, bridges, tunnels, or bus guideways).

The subsystem provides security/surveillance services to improve traveler security in public areas not a part of the public transportation system.

This subsystem monitors alerts, advisories, and other threat information and prepares for and responds to identified emergencies. It interfaces with other Emergency Management Subsystems to support coordinated emergency response involving multiple agencies. The subsystem stores, coordinates, and utilizes emergency response and evacuation plans to facilitate this coordinated response. As the response progresses, situation information including damage assessments, response status, evacuation information, and resource information are shared to keep all allied agencies apprised of the response. Interface with the Transit Management Subsystem allows coordinated use of transit vehicles to facilitate response to major emergencies and to support evacuation efforts. The Emergency Management Subsystem also provides a focal point for coordination of the emergency and evacuation information that is provided to the traveling public, including wide-area alerts when immediate public notification is warranted.

The subsystem tracks and manages emergency vehicle fleets using real-time road network status and routing information from the other center subsystems to aide in selecting the emergency vehicle(s) and routes that will provide the most timely response. Interface with the Traffic Management Subsystem allows strategic coordination in tailoring traffic control to support emergency vehicle ingress and egress, implementation of special traffic restrictions and closures, evacuation traffic control plans, and other special strategies that adapt the transportation system to better meet the unique demands of an emergency.

1.4.6 Emergency Vehicle Subsystem

This subsystem resides in an emergency vehicle and provides the sensory, processing, storage, and communications functions necessary to support safe and efficient incident response. The subsystem represents a range of vehicles including those operated by police, fire, and emergency medical services. In addition, this subsystem represents other incident response vehicles including towing and recovery vehicles and freeway service patrols. The Emergency Vehicle Subsystem includes two-way communications to support coordinated response to emergencies in accordance with an associated Emergency Management Subsystem. Emergency vehicles are equipped with automated vehicle location capability for monitoring by vehicle tracking and fleet management functions in the Emergency Management Subsystem. Using these capabilities, the appropriate emergency vehicle to respond to each emergency is determined. Route guidance capabilities within the vehicle enable safe and efficient routing to the emergency. In addition, the emergency vehicle may be equipped to support signal preemption through communications with the Roadway Subsystem.

1.4.7 Emissions Management Subsystem

This subsystem operates at a fixed location and may co-reside with the Traffic Management Subsystem or may operate in its own distinct location depending on regional preferences and priorities. This subsystem provides the capabilities for air

quality managers to monitor and manage air quality. These capabilities include collecting emissions data from distributed emissions sensors within the roadway subsystem. These sensors monitor general air quality within each sector of the area and also monitor the emissions of individual vehicles on the roadway. The sector emissions measures are collected, processed, and used to identify sectors exceeding safe pollution levels. This information is provided to traffic management to implement strategies intended to reduce emissions in and around the problem areas. Emissions data associated with individual vehicles, supplied by the Roadway Subsystem, is also processed and monitored to identify vehicles that exceed standards. This subsystem provides any functions necessary to inform the violators and otherwise ensure timely compliance with emissions standards.

1.4.8 Fleet and Freight Management Subsystem

The Fleet and Freight Management Subsystem provides the capability for commercial drivers and fleet or freight managers to receive real-time routing information and access databases containing vehicle and/or freight equipment locations as well as carrier, vehicle, freight equipment and driver information. In addition, the capability to purchase credentials electronically shall also be provided, with automated and efficient connections to financial institutions and regulatory agencies, along with post-trip automated mileage and fuel usage reporting. The Fleet and Freight Management Subsystem also provides the capability for fleet managers to monitor the safety and security of their commercial vehicle drivers and fleet. The subsystem also supports application for hazmat credentials and makes information about hazmat cargo available to agencies as required. Within this subsystem lies all the functionality associated with subsystems and components necessary to enroll and participate in international goods movement programs aimed at enhancing trade and transportation safety and security.

1.4.9 Information Service Provider

This subsystem collects, processes, stores, and disseminates transportation information to system operators and the traveling public. The subsystem can play several different roles in an integrated ITS. In one role, the ISP provides a general data warehousing function, collecting information from transportation system operators and redistributing this information to other system operators in the region and other ISPs. In this information redistribution role, the ISP provides a bridge between the various transportation systems that produce the information and the other ISPs and their subscribers that use the information. The second role of an ISP is focused on delivery of traveler information to subscribers and the public at large. Information provided includes basic advisories, traffic and road conditions, transit schedule information, yellow pages information, ridematching information, and parking information. The subsystem also provides the capability to provide specific directions to travelers by receiving origin and destination requests from travelers, generating route plans, and returning the calculated plans to the users. In addition to general route planning for travelers, the ISP also supports specialized route planning for vehicle fleets. In this third role, the ISP function may be dedicated to, or even embedded within, the dispatch system. Reservation services are also provided in advanced implementations. The information is provided to the traveler through the Personal Information Access Subsystem, Remote Traveler Support Subsystem, and

various Vehicle Subsystems through available communications links. Both basic one-way (broadcast) and personalized two-way information provision are supported. The subsystem provides the capability for an informational infrastructure to connect providers and consumers, and gather the market information needed to assist in the planning of service improvements and in maintenance of operations.

1.4.10 Maintenance and Construction Management Subsystem

The Maintenance and Construction Management Subsystem monitors and manages roadway infrastructure construction and maintenance activities. Representing both public agencies and private contractors that provide these functions, this subsystem manages fleets of maintenance, construction, or special service vehicles (e.g., snow and ice control equipment). The subsystem receives a wide range of status information from these vehicles and performs vehicle dispatch, routing, and resource management for the vehicle fleets and associated equipment. The subsystem participates in incident response by deploying maintenance and construction resources to an incident scene, in coordination with other center subsystems. The subsystem manages equipment at the roadside, including environmental sensors and automated systems that monitor and mitigate adverse road and surface weather conditions. The subsystem manages the repair and maintenance of both non-ITS and ITS equipment including the traffic controllers, detectors, dynamic message signs, signals, and other equipment associated with the roadway infrastructure. Additional interfaces to weather information providers (the weather service and surface transportation weather service providers) provide current and forecast weather information that can be fused with other data sources and used to support advanced decision support systems that increase the efficiency and effectiveness of maintenance and construction operations.

The subsystem remotely monitors and manages ITS capabilities in work zones, gathering, storing, and disseminating work zone information to other systems. It manages traffic in the vicinity of the work zone and advises drivers of work zone status (either directly at the roadside or through an interface with the Information Service Provider or Traffic Management subsystems.) It schedules and manages the location and usage of maintenance assets (such as portable dynamic message signs).

Construction and maintenance activities are tracked and coordinated with other systems, improving the quality and accuracy of information available regarding closures and other roadway construction and maintenance activities.

1.4.11 Maintenance and Construction Vehicle

This subsystem resides in a maintenance, construction, or other specialized service vehicle or equipment and provides the sensory, processing, storage, and communications functions necessary to support highway maintenance and construction. All types of maintenance and construction vehicles are covered, including heavy equipment and supervisory vehicles. The subsystem provides two-way communications between drivers/operators and dispatchers and maintains and communicates current location and status information. A wide range of operational status is monitored, measured, and made

available, depending on the specific type of vehicle or equipment. For example, for a snow plow, the information would include whether the plow is up or down and material usage information. The subsystem may also contain capabilities to monitor vehicle systems to support maintenance of the vehicle itself and other sensors that monitor environmental conditions including the road condition and surface weather information. This subsystem can represent a diverse set of mobile environmental sensing platforms, including wheeled vehicles and any other vehicle that collects and reports environmental information.

1.4.12 Parking Management Subsystem

The Parking Management Subsystem provides electronic monitoring and management of parking facilities. It supports a dedicated short-range communications (DSRC) link to the Vehicle Subsystem that allows electronic collection of parking fees. It also includes the instrumentation, signs, and other infrastructure that monitors parking lot usage and provides local information about parking availability and other general parking information. This portion of the subsystem functionality must be located in the parking facility where it can monitor, classify, and share information with customers and their vehicles. The subsystem also interfaces with the financial infrastructure and broadly disseminates parking information to other operational centers in the region. Note that the latter functionality may be located in a back office, remote from the parking facility.

1.4.13 Personal Information Access

This subsystem provides the capability for travelers to receive formatted traffic advisories from their homes, place of work, major trip generation sites, personal portable devices, over multiple types of electronic media. These capabilities also provide basic routing information and allow users to select those transportation modes that allow them to avoid congestion, or more advanced capabilities to allow users to specify those transportation parameters that are unique to their individual needs and receive travel information. This subsystem provides travelers with the capability to receive route planning from the infrastructure at fixed locations such as in their homes, their place of work, and at mobile locations using personal portable devices and vehicle-based devices. In addition to end user devices, this subsystem may also represent a device that is used by a merchant or other service provider to receive traveler information and relay important information to their customers. This subsystem also provides the capability to initiate a distress signal and cancel a prior-issued manual request for help.

1.4.14 Remote Traveler Support

This subsystem provides access to traveler information at transit stations, transit stops, other fixed sites along travel routes (e.g., rest stops, merchant locations), and major trip generation locations such as special event centers, hotels, office complexes, amusement parks, and theaters. Traveler information access points include kiosks and informational displays supporting varied levels of interaction and information access. At transit stops, simple displays providing schedule information and imminent arrival signals can be provided. This basic information may be extended to include multi-modal information including traffic conditions and transit schedules along with yellow pages information to support mode and route selection at major trip generation sites. Personalized route

planning and route guidance information can also be provided based on criteria supplied by the traveler. The subsystem also supports electronic payment of transit fares.

In addition to the traveler information provisions, this subsystem also supports security and safety monitoring of public areas. This monitoring includes traveler activated silent alarms, as well as surveillance and sensor equipment. The surveillance equipment includes video (e.g. CCTV cameras) and/or audio 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).

1.4.15 Roadway Subsystem

This subsystem includes the equipment distributed on and along the roadway that monitors and controls traffic and monitors and manages the roadway itself. Equipment includes traffic detectors, environmental sensors, traffic signals, highway advisory radios, dynamic message signs, CCTV cameras and video image processing systems, grade crossing warning systems, and freeway ramp metering systems. HOV lane management, reversible lane management functions, and barrier systems that control access to transportation infrastructure such as roadways, bridges and tunnels are also supported. This subsystem also provides the capability for environmental monitoring including sensors that measure road conditions, surface weather, and vehicle emissions. In adverse conditions, automated systems can be used to apply anti-icing materials, disperse fog, etc. Work zone systems including work zone surveillance, traffic control, driver warning, and work crew safety systems are also included. To enhance security, safeguard systems such as blast shields, exhaust systems and other automated and remotely controlled systems to protect transportation infrastructure is also provided. In advanced implementations, this subsystem supports automated vehicle safety systems by safely controlling access to and egress from an Automated Highway System through monitoring of, and communications with, AHS vehicles. Intersection collision avoidance functions are provided by determining the probability of a collision in the intersection and sending appropriate warnings and/or control actions to the approaching vehicles.

1.4.16 Security Management Subsystem

This subsystem includes surveillance and sensor equipment used to provide enhanced security and safety for transportation facilities or infrastructure. The equipment represented by this subsystem is located in non-public areas of transportation facilities (e.g. maintenance and transit yards) or located on or near non-roadway parts of the transportation infrastructure (e.g. transit railway and guideways). This subsystem also includes surveillance and sensor equipment located on or near major roadway features such as bridges, tunnels, and interchanges, when the equipment's primary function is one of security and safety. If the primary function of the equipment is traffic surveillance or incident detection, then the surveillance or sensors would be covered as part of the Roadway Subsystem. Similarly, the surveillance and sensor equipment for public areas of transportation facilities is covered in the Remote Traveler Support Subsystem. The surveillance equipment includes video (e.g. CCTV cameras) and/or audio systems. The

sensor equipment includes threat sensors (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), object detection (e.g. metal detectors), intrusion or motion detection, and infrastructure integrity monitoring (e.g. rail track continuity checking or bridge structural integrity monitoring). Limited processing of collected sensor and surveillance data is also included in this subsystem to support threat detection and classification.

1.4.17 Toll Administration Subsystem

The Toll Administration Subsystem provides general payment administration capabilities and supports the electronic transfer of authenticated funds from the customer to the transportation system operator. This subsystem supports traveler enrollment and collection of both pre-payment and post-payment transportation fees in coordination with the existing, and evolving financial infrastructure supporting electronic payment transactions. The system may establish and administer escrow accounts depending on the clearinghouse scheme and the type of payments involved. This subsystem posts a transaction to the customer account and generates a bill (for post-payment accounts), debits an escrow account, or interfaces to the financial infrastructure to debit a customer designated account. It supports communications with the Toll Collection Subsystem to support fee collection operations. The subsystem also sets and administers the pricing structures and includes the capability to implement road pricing policies in coordination with the Traffic Management Subsystem. The electronic financial transactions in which this subsystem is an intermediary between the customer and the financial infrastructure shall be cryptographically protected and authenticated to preserve privacy and ensure authenticity and auditability.

1.4.18 Toll Collection Subsystem

The Toll Collection Subsystem provides the capability for vehicle operators to pay tolls without stopping their vehicles using locally determined pricing structures and includes the capability to implement various variable road pricing policies. Each transaction is accompanied by feedback to the customer indicating the general status of the customer account. A record of the transactions is provided to the Toll Administration Subsystem for reconciliation and so that the customer can periodically receive a detailed record of the transactions.

1.4.19 Traffic Management Subsystem

The Traffic Management Subsystem monitors and controls traffic and the road network. It represents centers that manage a broad range of transportation facilities including freeway systems, rural and suburban highway systems, and urban and suburban traffic control systems. This subsystem communicates with the Roadway Subsystem to monitor and manage traffic flow and monitor the condition of the roadway, surrounding environmental conditions, and field equipment status. This subsystem coordinates with the Maintenance and Construction Management Subsystem to maintain the road network and coordinate and adapt to maintenance activities, closures, and detours. Incidents are detected, verified, and incident information is provided to allied agencies, drivers

(through Roadway Subsystem highway advisory radio and dynamic message signs), and information service providers. This subsystem also manages traffic and transportation resources to support allied agencies in responding to, and recovering from, incidents ranging from minor traffic incidents through major disasters. When required, special traffic management strategies are implemented to support evacuation and reentry. The Traffic Management Subsystem supports HOV lane management and coordination, road pricing, and other demand management policies that can alleviate congestion and influence mode selection. It also manages reversible lane facilities and barrier and safeguard systems that control access to transportation infrastructure. The subsystem communicates with other Traffic Management Subsystems to coordinate traffic information and control strategies in neighboring jurisdictions. It also coordinates with rail operations to support safer and more efficient highway traffic management at highway-rail intersections. Finally, the Traffic Management Subsystem provides the capabilities to exercise control over those devices utilized for automated highway system (AHS) traffic and vehicle control.

1.4.20 Transit Management Subsystem

The Transit Management Subsystem manages transit vehicle fleets and coordinates with other modes and transportation services. It provides operations, maintenance, customer information, planning and management functions for the transit property. It spans distinct central dispatch and garage management systems and supports the spectrum of fixed route, flexible route, paratransit services, transit rail, and bus rapid transit (BRT) service. The subsystem's interfaces allow for communication between transit departments and with other operating entities such as emergency response services and traffic management systems. This subsystem receives special event and real-time incident data from the traffic management subsystem. It provides current transit operations data to other center subsystems. It interfaces with the Emergency Management Subsystem to allow coordinated use of transit vehicles to facilitate response to major emergencies or evacuations. The Transit Management Subsystem collects and stores accurate ridership levels and implements corresponding fare structures. It collects operational and maintenance data from transit vehicles, manages vehicle service histories, and assigns vehicle operators and maintenance personnel to vehicles and routes. The Transit Management Subsystem also provides the capability for automated planning and scheduling of public transit operations. It furnishes travelers with real-time travel information, continuously updated schedules, schedule adherence information, transfer options, and transit routes and fares. In addition, the subsystem supports transit security features. This includes monitoring silent alarms, both passenger and operator initiated, on-board transit vehicles. It also includes the capability to support transit vehicle operator authentication and the capability to remotely disable a transit vehicle. The subsystem includes the capability to monitor for a transit vehicle being off the assigned route. The subsystem also includes the capability to alert operators and police to potential incidents identified by these security features.

1.4.21 Transit Vehicle Subsystem

This subsystem resides in a transit vehicle and provides the sensory, processing, storage, and communications functions necessary to support safe and efficient movement of passengers. The types of transit vehicles containing this subsystem include buses, paratransit vehicles, light rail vehicles, other vehicles designed to carry passengers, and supervisory vehicles. The subsystem collects accurate ridership levels and supports electronic fare collection. The subsystem supports a traffic signal prioritization function that communicates with the roadside subsystem to improve on-schedule performance. Automated vehicle location functions enhance the information available to the Transit Management Subsystem enabling more efficient operations. On-board sensors support transit vehicle maintenance. The subsystem supports on-board security and safety monitoring. This monitoring includes transit user or vehicle operator activated alarms (silent or audible), as well as surveillance and sensor equipment. 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). In addition, the subsystem supports vehicle operator authentication prior to operation of the vehicle and remote vehicle disabling. The subsystem also furnishes travelers with real-time travel information, continuously updated schedules, transfer options, routes, and fares.

1.4.22 Vehicle Subsystem

This subsystem provides the sensory, processing, storage, and communications functions necessary to support efficient, safe, and convenient travel. These functions reside in general vehicles including personal automobiles, commercial vehicles, emergency vehicles, transit vehicles, or other vehicle types. Information services provide the driver with current travel conditions and the availability of services along the route and at the destination. Both one-way and two-way communications options support a spectrum of information services from low-cost broadcast services to advanced, pay for use personalized information services. Route guidance capabilities assist in formulation of an optimal route and step by step guidance along the travel route. Advanced sensors, processors, enhanced driver interfaces, and actuators complement the driver information services so that, in addition to making informed mode and route selections, the driver travels these routes in a safer and more consistent manner. Initial collision avoidance functions provide “vigilant co-pilot” driver warning capabilities. More advanced functions assume limited control of the vehicle to maintain safe headway. Ultimately, this subsystem supports completely automated vehicle operation through advanced communications with other vehicles in the vicinity and in coordination with supporting infrastructure subsystems. Pre-crash safety systems are deployed and emergency notification messages are issued when unavoidable collisions do occur.


1.5 Wichita Area Regional Needs

This architecture provides an overall communications framework based on the stakeholder needs in the Wichita area. One of the primary needs is to reduce delays from nonrecurring congestion especially when incidents disrupt the flow of traffic. The efficient operation of the area’s freeways, turnpike and arterial roads is important to the

economy of the region. Reliable information to the traveler allows for informed decisions such as what route to take, does taking transit make sense as well as safety information like amber alerts.

The needs of the Wichita region were captured in the 1998 Strategic Deployment Plan and discussed in workshops resulting in the collection of stakeholders, their elements and the services in this document.

2 Stakeholders

This section describes the stakeholders who either participated in the creation of the Wichita Area Regional ITS Architecture or whom the participating stakeholders felt were needed to be included in the architecture. Some stakeholders have been grouped in order to better reflect mutual participation or involvement in transportation services and elements. Stakeholder groups are indicated by the  graphic. Every stakeholder in this section is related to one or more of the transportation inventory elements described in section 3 either as an individual stakeholder or as a member of a stakeholder group.

Numerous stakeholder meetings were held and there was extensive stakeholder review in the development of the Wichita Area Regional ITS Architecture. A list of participants and their affiliations can be found in Appendix A.

2.1 511 Stakeholder Group

Description: The 511 Stakeholder Group contains the primary stakeholders involved with the Kansas statewide 511 phone-based traveler information services as well as a future Wichita area 511-based traveler information website.

Stakeholders in this group:

- Kansas Highway Patrol
- Kansas Turnpike Authority (KTA)
- KDOT
- Local Media
- Sedgwick County Public Safety

Associated Element: Kansas 511 System

2.2 BNSF Railroad

Description: Burlington Northern Santa Fe Railroad

2.3 City of Andale

Description: The City of Andale stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.4 City of Andover

Description: The City of Andover stakeholder is allocated to the Suburban Communities Stakeholder Group.

Associated Elements:

- City of Andover 911
- City of Andover Public Safety Vehicles
- City of Andover Roadside Equipment
- City of Andover TOC

2.5 City of Bel Aire

Description: The City of Bel Aire stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.6 City of Bentley

Description: The City of Bentley stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.7 City of Cheney

Description: The City of Cheney stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.8 City of Clearwater

Description: The City of Clearwater stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.9 City of Colwich

Description: The City of Colwich stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.10 City of Derby

Description: The City of Derby stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.11 City of Eastborough

Description: The City of Eastborough stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.12 City of Garden Plain

Description: The City of Garden Plain stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.13 City of Goddard

Description: The City of Goddard stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.14 City of Haysville

Description: The City of Haysville stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.15 City of Kechi

Description: The City of Kechi stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.16 City of Maize

Description: The City of Maize stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.17 City of Mount Hope

Description: The City of Mount Hope stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.18 City of Mulvane

Description: The City of Mulvane stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.19 City of Park City

Description: The City of Park City stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.20 City of Sedgwick

Description: The City of Sedgwick stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.21 City of Valley Center

Description: The City of Valley Center stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.22 City of Viola

Description: The City of Viola stakeholder is allocated to the Suburban Communities Stakeholder Group.

2.23 Commercial Vehicle Operators

Description: This stakeholder represents all commercial vehicle operators traveling through Kansas.

Associated Element: Commercial Vehicles

2.24 CVISN

Description: The CVISN stakeholder group represents the stakeholders participating in the CVISN services for the state of Kansas.

Stakeholders in this group:

FMCSA

Kansas Corporation Commission

Kansas Department of Revenue

Kansas Highway Patrol

Kansas Turnpike Authority (KTA)

KDOT
KMCA

Associated Element: Kansas Trucking Connection

2.25 CVO Check Station Group

Description: The CVO Check Station Group represents the stakeholders involved with administering the CVO Check Stations.

Stakeholders in this group:

Kansas Highway Patrol
KDOT
Prepass

Associated Element: Kansas CVO Check Stations

2.26 FMCSA

Description: This stakeholder is the Federal Motor Carrier Safety Administration.

2.27 General Public

Description: This stakeholder represents the general public in the Wichita region.

Associated Elements: Personal Information Access Devices
Vehicle

2.28 Healthcare Providers

Description: This stakeholder represents all of the healthcare providers (e.g., Hospitals) in the Wichita region.

Associated Element: Healthcare Facilities

2.29 K and O Railroad

Description: This stakeholder represents the Kansas and Ohio Railroad.

2.30 Kansas Bureau of Investigation

Description: This stakeholder represents the Kansas Bureau of Investigation (KBI).

Associated Element: Kansas Criminal Justice Information System (KCJIS)

Associated Element: Kansas Bureau of Investigation (KBI) System

2.31 Kansas Corporation Commission

Description: This stakeholder represents the Kansas Corporation Commission (KCC).

2.32 Kansas Department of Emergency Management

Description: This stakeholder represents the Kansas Department of Emergency Management.

Associated Element: National Warning System (NAWAS)

2.33 Kansas Department of Revenue

Description: This stakeholder represents the Kansas Department of Revenue (KDOR).

2.34 Kansas Highway Patrol

Description: The Kansas Highway Patrol (KHP) provides law enforcement services for the State of Kansas including enforcement of traffic and other laws of the State of Kansas.

Associated Element: KHP Vehicles

Associated Element: Kansas Highway Patrol

Associated Element: *47-KHP

2.35 Kansas Turnpike Authority (KTA)

Description: This stakeholder represents the Kansas Turnpike Authority who is responsible for managing the Kansas Turnpike.

Associated Element: KTA Motorist Assistance Patrol Vehicles

Associated Element: Kansas Turnpike Authority Environmental Sensors Stations

Associated Element: KTA Maintenance Vehicle

Associated Element: Kansas Turnpike Authority Center

Associated Element: KTA Toll Collection Equipment

2.36 KDOT

Description: The Kansas Department of Transportation (KDOT) is responsible for maintaining approximately 10,000 miles of state highways and their related features across the state of Kansas. KDOT's headquarters are in Topeka with six District Offices, 26 Area Offices and 112 Sub-Area Offices across the state. KDOT is organized into numerous Bureaus with specific responsibilities.

Associated Element: KDOT Planning Archive

Associated Element: KDOT TOC (Wichita Metro) Maintenance and Construction System

Associated Element: KDOT TOC Information System

Associated Element: KDOT Maintenance Vehicle

Associated Element: KDOT TOC (Wichita Metro) Roadside Equipment

Associated Element: KDOT Traffic Operations Center (Wichita Metro)

Associated Element: KDOT TOC (Wichita Metro) Kiosks

2.37 KHP-Turnpike

Description: The Kansas Highway Patrol (KHP) Turnpike dispatchers provide dispatching services for the Kansas Highway Patrol for the turnpike.

Associated Element: KHP Turnpike Dispatch System

Associated Element: *KTA

Associated Element: KHP Turnpike Vehicles

2.38 KMCA

Description: This stakeholder represents the Kansas Motor Carriers Association (KMCA).

2.39 Local Media

Description: This stakeholder represents all of the media companies that plan to disseminate transportation-related information.

Associated Element: Media

2.40 MAP

Description: This stakeholder group represents the Motorist Assistance Patrol (MAP) stakeholders.

Stakeholders in this group:

Kansas Highway Patrol

KDOT

Associated Element: Motorist Assistance Patrol Vehicles

2.41 NOAA

Description: This stakeholder represents the National Oceanic and Atmospheric Administration (NOAA) who runs the National Weather Service (NWS).

Associated Element: National Weather Service

2.42 PrePass

Description: PrePass is an automatic vehicle identification (AVI) system that allows participating transponder equipped commercial vehicles to bypass designated weigh stations.

2.43 Private Weather Providers

Description: This stakeholder represents private weather service providers who provide value-added weather services to transportation agencies.

Associated Element: Surface Transportation Weather Service Providers

2.44 Railroad Operators

Description: This stakeholder group represents the railroad operators in the Wichita - Sedgwick County region.

Stakeholders in this group:

BNSF Railroad

K and O Railroad

Union Pacific Railroad

Associated Element: Wayside Equipment (Railroad Gates)

2.45 Sedgwick County

Description: This stakeholder represents the County of Sedgwick.

Associated Element: Sedgwick County Maintenance and Construction Vehicles

Associated Element: Sedgwick County EMS Vehicles

Associated Element: Sedgwick County Fire Vehicles

Associated Element: Sedgwick County TOC Roadside Equipment

Associated Element: Sedgwick County Government Data Repository

2.46 Sedgwick County Department on Aging

Description: The Sedgwick County Department on Aging's mission is to be the recognized leader in a collaborative effort towards assisting diverse populations of older adults and persons with disabilities to maintain their choice of lifestyle through education, advocacy and services. The Department administers the Transportation Brokerage program, which is a collective of funding and grants to provide door-to-door transportation services in the urban area of Wichita and rural areas in and adjacent to Sedgwick County to older adults and persons with disabilities. These services provide access to medical care, social services and employment. Transportation services are provided directly by the Department, and also rides are brokered through a taxi company, charitable organizations that serve persons with disabilities, and specialized private transit providers. The Brokerage's current six vendors include Timber Lines, American Cab Company, Travelin' Taxi, Gold Star Medical Transports, Wisdom Travels and Friendly Shepherd.

The Department coordinates between 20,000 and 40,000 rides annually and serves over 3,000 Sedgwick County citizens.

Associated Element: Sedgwick County Transportation Brokerage System

Associated Element: Sedgwick County Transportation Brokerage Vehicles

2.47 Sedgwick County Emergency Communications

Description: The Sedgwick County Department of Emergency Communications (SGEC) provides 9-1-1 emergency call handling and dispatching service for all Sedgwick County public safety agencies including the Wichita Police and Fire Departments and Sedgwick

County Sheriff, Fire and EMS Departments. SGEC dispatches nearly 500,000 calls for service annually. SGEC provides 9-1-1 emergency call handling and full dispatch service or some level of incident alerting service for the following Sedgwick County public safety agencies.

- Andale PD
- Bel Aire PD
- Bentley FD
- Cheney PD
- Cheney FD
- Clearwater PD
- Clearwater FD
- Clearwater EMS
- Colwich PD
- Colwich FD
- Derby PD
- Derby FD
- Eastborough PD
- Garden Plain PD
- Goddard PD
- Kechi PD
- Maize PD
- Mt Hope PD
- Mt Hope FD
- Mt Hope EMS
- Park City Police Department
- Sedgwick County EMS
- Sedgwick County FD
- Sedgwick County Sheriff
- Valley Center Fire Department
- Viola FD
- Valley Center Fire Department
- Eastborough PD
- Garden Plain PD
- Wichita Police PD
- Wichita FD
- Wichita Police PD

2.48 Sedgwick County Emergency Management

Description: Sedgwick County Emergency Management is a separate department under the Sedgwick County Division of Public Safety. The mission of Sedgwick County Emergency Management is to help citizens and local governments mitigate against, prepare for, respond to and recover from all types of emergencies and disasters (natural, technological, and national security). The agency becomes engaged in situations involving severe weather and tornados, flooding, and hazardous materials accidents.

2.49 Sedgwick County EMS

Description: Sedgwick County Emergency Medical Service (EMS) responds to calls for emergency medical assistance in Wichita and the communities of Sedgwick County. EMS provides Advanced Life Support (ALS) services. EMS receives First Responder basic life support (BLS) emergency response support from volunteer Emergency Medical Technicians (EMTs) in Derby, EMS Reserves and EMTs on the Wichita and Sedgwick County Fire Departments.

2.50 Sedgwick County Fire

Description: The Sedgwick County Fire Department, District #1 (SCFD) provides fire protection and emergency services response for approximately 640 square miles of Sedgwick County. Services include fire suppression, emergency medical first responder, citizen rescue, fire investigation, fire prevention, and hazardous materials accident handling services. Sedgwick County is served by eight county fire stations located strategically throughout the county. All stations are staffed 24 hours a day, seven days a week, 365 days a year by full-time trained firefighters and EMTs.

Service is provided primarily for the unincorporated areas of the County and the following cities: Bel Aire, Kechi, Park City, Maize, Bentley, Andale, Garden Plain, Goddard, Viola, Haysville, Furley, and Eastborough.

SCFD has an Enhanced First Responder agreement with WFD. In addition, SCFD has automatic aid agreements with Butler County Fire Districts #1 and #3,(Andover and Rose Hill) on structure fires and McConnell Airbase that will send a tanker truck on structure fires. SCFD also has numerous Mutual Aid agreements with the surrounding Sedgwick County Volunteer Fire Departments including some outside Sedgwick County like Augusta, Benton, Newton, Harvey, and Sedgwick.

The Department operates a records management system called Firehouse for fire and first responder incident reporting. The system is used by the Fire Prevention Division for fire inspection reporting and scheduling. Firehouse is also used for fire hydrant maintenance and test data, equipment maintenance and test data, firefighter and EMT training records, and public activities.

2.51 Sedgwick County Public Safety

Description: This stakeholder group represents the public safety agency of Sedgwick County.

2.52 Sedgwick County Public Works

Description: Public Works is responsible for over 600 miles of roads and 657 bridges within Sedgwick County. The Highway Department handles the operations and maintenance of roads, bridges and intersections to ensure safe passage throughout the County. The Stream Maintenance Department maintains certain watercourses to help minimize flooding, erosion and property damage. The Noxious Weed Department is responsible for the control and eradication of noxious weeds on all County property.

Associated Element: Sedgwick County Maintenance and Construction System

2.53 Sedgwick County Sheriff

Description: The Sedgwick County Sheriff's Department provides law enforcement and criminal justice services to Sedgwick County. Field operations are provided by the Department Operations Bureau that includes the Patrol Division and Investigation Division. The Department Detention Bureau operates the Sedgwick County Adult Detention Facility.

Associated Element: Sedgwick County Sheriff Vehicles

2.54 Suburban Communities

Description: This stakeholder group represents all of the suburban communities external to the City of Wichita and in the Wichita region.

Stakeholders in this group:

City of Andale
City of Andover
City of Bel Aire
City of Bentley
City of Cheney
City of Clearwater
City of Colwich
City of Derby
City of Eastborough
City of Garden Plain
City of Goddard
City of Haysville
City of Kechi
City of Maize
City of Mount Hope
City of Mulvane
City of Park City
City of Sedgwick
City of Valley Center
City of Viola

Associated Element: Suburban Public Safety Vehicles

2.55 Suburban Emergency Dispatch Agencies

Description: This stakeholder group represents all of the suburban community emergency dispatch agencies external to the Cities of Wichita and Andover in the Wichita region.

Stakeholders in this group:

City of Derby

City of Hayesville
City of Mulvane
City of Valley Center

Associated Element: Suburban Emergency Dispatch Centers

2.56 Suburban Maintenance and Construction Agencies

Description: This stakeholder group represents all of the suburban community maintenance and construction agencies external to the City of Wichita and in the Wichita region.

Associated Element: Suburban Maintenance and Construction System

2.57 Union Pacific Railroad

Description: This stakeholder represents the Union Pacific (UP) Railroad traveling through the Wichita region.

2.58 Wichita Airport Authority

Description: This stakeholder represents the Wichita Airport Authority responsible for the Wichita Mid-Continent Airport and Jabara Airport operations.

Associated Element: Wichita Mid-Continent Airport Public Safety Vehicles

Associated Element: Wichita Mid-Continent Airport

Associated Element: Jabara Airport

2.59 Wichita Area Public Safety Agencies

Description: This stakeholder group represents all of the public safety agencies in the Wichita region.

Stakeholders in this group:

Sedgwick County Emergency Communications
Sedgwick County Emergency Management
Sedgwick County EMS
Sedgwick County Fire
Sedgwick County Sheriff
Wichita Fire Department (WFD)
Wichita Police

Associated Element: Sedgwick County 911

2.60 Wichita Department of Environmental Health

Description: The Department of Environmental Health operates several programs aimed at improving and maintaining the quality of life for citizens of Wichita and Sedgwick County as well as protecting their health and lives. Most activities of the Department are

field activities and involve inspections and investigations of complaints receive from citizens or conditions seen while in the field. The Department operates these programs through specialized Sections of the Department, most with field staff assigned for specific duties. The Department programs include air quality. Air monitoring is conducted at a number of fixed sites throughout the City and MSA.

For a complete description of their services can be found on their web site at - www.wichita.gov/CityOffices/Environmental/AirQuality - or for current air quality information - www.wichita.gov/airquality/airquality_m.asp.

Associated Element: Air Quality Sensors.

Associated Element: Air Quality Alert System

2.61 Wichita Fire Department (WFD)

Description: The City of Wichita Fire Department is currently comprised of 388 members working at 18 neighborhood fire stations. Firefighters respond to over 35,000 emergencies each year and cover over 150 square miles of Wichita. The Wichita Fire Department provides fire suppression, fire investigation, fire prevention, citizen rescue, emergency medical services, and hazardous materials accident handling.

The Department utilizes a records management system called Firehouse for incident records, fire inspections, staffing, training, hydrant testing and maintenance, and equipment and apparatus testing and maintenance. The records system has several additional capabilities that are not currently being used.

Associated Element: Wichita Fire Vehicles

2.62 Wichita IT/IS

Description: This stakeholder represents the City of Wichita's (COW) information technology and information services (IT/IS).

Associated Element: Wichita Government Data Repository

2.63 Wichita Office of Central Inspection

Description: The Wichita Office of Central Inspection (OCI) is responsible for on-site inspection of all building construction and remodeling permit work in the City of Wichita, including new construction, additions, remodeling and trade work (trade work includes electrical, mechanical, plumbing, sewer and elevators). OCI also performs inspections of new or altered business wall or pole/ground signage for which permits have been issued, and inspection on code enforcement cases initiated on existing structures and land uses.

Associated Element: Office of Central Inspection (Event Permits)

2.64 Wichita Parks and Recreation

Description: The Wichita Parks and Recreation Department is responsible for city park and parkway maintenance, recreational programming and implementation, athletic programming and implementation and special events. The department supports 4,500 acres of parks and greenways, 1,300 acres of right-of-way, 3.8 million square feet of landscaped street medians, ten recreation centers, twelve swimming pools, an arts center, and numerous adult and youth-based activities and athletics programs.

Associated Element: Wichita Parks and Recreation System

2.65 Wichita Police

Description: Wichita Police Department (WPD) provides law enforcement services to the City of Wichita. The mission of the Department is "to provide professional and ethical public safety services in partnership with citizens to identify, prevent and solve the problems of crime, fear of crime, social disorder and neighborhood decay, thereby improving the quality of life in our community." The Department is comprised of numerous divisions and sections that provide specialized services.

The Divisions include Patrol Division, Support Services Division, Field Services Division among others.

Associated Element: Wichita Police Vehicles

2.66 Wichita Public Works

Description: The Wichita Public Works Department provides for the design, construction, maintenance and cleaning of the City's streets, roads, sidewalks and traffic control devices; maintenance and custodial services for City buildings; and natural resource conservation.

Associated Element: Wichita TOC Roadside Equipment

Associated Element: SCADA

Associated Element: Wichita Construction and Maintenance System

Associated Element: Wichita Traffic Operations Center

Associated Element: Wichita Construction and Maintenance Vehicles

2.67 Wichita Transit

Description: Wichita Transit provides public transportation services for the City of Wichita. This includes fixed route bus services and paratransit services for riders with a disability. Other services include special event shuttles and chartered trolley services.

Associated Element: Wichita Transit Vehicles

Associated Element: Wichita Transit Customer Information System (CIS)

Associated Element: Wichita Transit Kiosk

Associated Element: Wichita Transit Operations Center

3 Inventory

This section describes every surface transportation inventory element for the Wichita Area Regional ITS Architecture. A transportation element can be either a center, vehicle, traveler or field equipment. Each transportation element listed below has one or more stakeholders associated with it from section 2. In order to reduce the complexity of the architecture, some transportation elements with like functionality have been grouped together (e.g., The Suburban Emergency Dispatch Centers element provides public safety dispatch in the Suburban areas that are not covered by the Sedgwick County 911 system and the City of Andover 911 system. The Stakeholders in this group are: the City of Derby, City of Haysville, City of Mulvane and the City of Valley Center). Each transportation inventory element is mapped to at least one National ITS Architecture entity (e.g., the Suburban Emergency Dispatch Centers are mapped to the Emergency Management subsystem in the National ITS Architecture indicating that these Centers perform the functionality of an Emergency Management Center).

3.1 *47-KHP

Status: Existing

Description: KHP Central Dispatch which represents motorist using their cell phones to call in traffic incidents.

Associated Stakeholder: Kansas Highway Patrol - Dispatchers

Mapped to Entity: Emergency Telecommunications System

3.2 *KTA

Status: Existing

Description: This element represents motorist using their cell phones on the turnpike to report incidents to the Kansas Highway Patrol - Turnpike.

Associated Stakeholder: KHP-Turnpike

Mapped to Entity: Emergency Telecommunications System

3.3 Air Quality Alert System

Status: Near Term

Description: The Air Quality program inspects sources of air pollution in the Wichita region, conducts air monitoring, responds to hazardous materials incidences as needed, assists citizens and businesses in resolving indoor air quality problems, and provides education on all air quality issues.

Associated Stakeholder: Wichita Department of Environmental Health

Mapped to Entity: Emissions Management

3.4 Air Quality Sensors

Status: Existing

Description: The sensors are owned by Wichita Environmental Health.

Associated Stakeholder: Wichita Department of Environmental Health

Mapped to Entity: Roadway Subsystem

3.5 City of Andover 911

Status: Existing

Description: The City of Andover 911 system is responsible for 911 call-taking and dispatch of public safety vehicles in the city.

Associated Stakeholder: City of Andover

Mapped to Entity: Emergency Management

Mapped to Entity: Emergency Telecommunications System

3.6 City of Andover Public Safety Vehicles

Status: Existing

Description: The City of Andover Public Safety Vehicles represent the public safety vehicles with the jurisdiction of Andover.

Associated Stakeholder: City of Andover

Mapped to Entity: Emergency Vehicle

3.7 City of Andover Roadside Equipment

Status: Existing

Description: City of Andover's Signal System Equipment.

Associated Stakeholder: City of Andover

Mapped to Entity: Roadway Subsystem

3.8 City of Andover TOC

Status: Near Term

Description: City of Andover’s Traffic Operations Center responsible for controlling the City of Andover signal system.

Associated Stakeholder: City of Andover

Mapped to Entity: Traffic Management Subsystem

3.9 Commercial Vehicles

Status: Existing

Description: This is a generic representation of the various commercial vehicles (e.g., JB Hunt) that will traverse through the geographic scope of the Wichita Area Regional ITS Architecture.

Associated Stakeholder: Commercial Vehicle Operators

Mapped to Entity: Commercial Vehicle Subsystem

3.10 HAZMAT Response Vehicle

Status: Existing

Description: This element is a HAZMAT Response Vehicle that responds to incidents involving suspected hazardous materials. The Fire Department relies on this element to identify unknown HAZMAT and assist in other HAZMAT duties as assigned.

Associated Stakeholder: Wichita Department of Environmental Health

Mapped to Entity: Emergency Vehicle Subsystem

3.11 Healthcare Facilities

Status: Existing

Description: This element represents emergency care facilities that are in the MAPD planning area.

Associated Stakeholder: Healthcare Providers

Mapped to Entity: Care Facility

3.12 Jabara Airport

Status: Existing

Description: Jabara Airport is located approximately nine miles North-East of McConnell AFB and 2.5 miles North of Beech Field. The airport authority shares public safety vehicles with Wichita Mid-Continent airport and can dispatch vehicles from Jabara airport.


Associated Stakeholder: Wichita Airport Authority

Mapped to Entity: Multimodal Transportation Provider

3.13 Kansas 511 System

Status: Existing

Description: This element represents the 3-digit traveler information phone system for the state of Kansas.

Associated Stakeholder: 511 Stakeholder Group 

Stakeholders in this group:

- KDOT
- Kansas Turnpike Authority (KTA)
- Local Media
- Kansas Highway Patrol
- Sedgwick County Public Safety

Mapped to Entity: Telecommunications System for Traveler Information

3.14 Kansas Bureau of Investigation (KBI) System

Status: Existing

Description: This element represents the Kansas Bureau of Investigation (KBI) system which provides alerts (e.g., amber alerts) and advisories.

Associated Stakeholder: Kansas Bureau of Investigation

Mapped to Entity: Alerting and Advisory Systems

3.15 Kansas Criminal Justice Information System (KCJIS)

Status: Existing

Description: The Kansas Criminal Justice Information System (KCJIS) is responsible for sending alerts and extreme weather conditions to all public safety organizations.

Associated Stakeholder: Kansas Bureau of Investigation

Mapped to Entity: Emergency Management

3.16 Kansas CVO Check Stations

Status: Existing

Description: This element supports functionality to allow automated vehicle identification at mainline speeds for credential checking, and roadside safety inspections.

Associated Stakeholder: CVO Check Station Group 

Stakeholders in this group:

KDOT
Kansas Highway Patrol
Prepass

Mapped to Entity: Commercial Vehicle Check

3.17 Kansas Highway Patrol Dispatch

Status: Existing

Description: KHP dispatch operates throughout the state of Kansas and is organized into Troops. Patrol operates with nine troops. Troup F's region includes Sedgwick County and 12 other rural counties. The KHP also dispatches MAP vehicles.

Associated Stakeholder: Kansas Highway Patrol

Mapped to Entity: Alerting and Advisory Systems

Mapped to Entity: CVO Inspector

Mapped to Entity: Emergency Management

Mapped to Entity: Enforcement Agency

3.18 Kansas Trucking Connection

Status: Existing

Description: This element includes TruckingKS.org website. This element was previously named the Kansas CVISN System.

Associated Stakeholder: CVISN 

Stakeholders in this group:

KDOT
Kansas Turnpike Authority (KTA)
Kansas Highway Patrol
FMCSA
KMCA
Kansas Department of Revenue
Kansas Corporation Commission

Mapped to Entity: Commercial Vehicle Administration

3.19 Kansas Turnpike Authority Center

Status: Existing

Description: This center is responsible for providing public safety on the Kansas Turnpike along with managing the toll collection processes on the turnpike. This center will also provide Kansas 511 with traffic congestion information for the turnpike.

Associated Stakeholder: Kansas Turnpike Authority (KTA)

Mapped to Entity: Emergency Management

Mapped to Entity: Maintenance and Construction Management

Mapped to Entity: Toll Administration

Mapped to Entity: Traffic Management

3.20 Kansas Turnpike Authority Environmental Sensors Stations

Status: Existing

Description: Sensors are used to collect road weather conditions.

Associated Stakeholder: Kansas Turnpike Authority (KTA)

Mapped to Entity: Roadway Subsystem

3.21 KDOT Maintenance Vehicle

Status: Existing

Description: This element represents the maintenance and construction vehicles including snow plows for KDOT.

Associated Stakeholder: KDOT

Mapped to Entity: Maintenance and Construction Vehicle

3.22 KDOT Planning Archive

Status: Existing

Description: This is KDOT archiving system that collects and analyze traffic, incident, and emergency data that can be used for planning future initiatives throughout the region.

Associated Stakeholder: KDOT

Mapped to Entity: Archived Data Management Subsystem

3.23 KDOT TOC Information System

Status: Near Term

Description: This element represents the KDOT website that provides transportation related information to aid motorists in trip planning. This website will display incident, congestion levels, and weather related information.

Associated Stakeholder: KDOT

Mapped to Entity: Information Service Provider

3.24 KDOT TOC (Wichita Metro) Kiosks

Status: Near Term

Description: Kiosks are public informational displays supporting various levels of interaction and information access.

Associated Stakeholder: KDOT

Mapped to Entity: Remote Traveler Support

3.25 KDOT TOC (Wichita Metro) Maintenance and Construction System

Status: Existing

Description: This element is responsible for providing the maintenance and construction activity for KDOT including snow plow operations, traffic equipment repair, etc. KDOT also has a maintenance and construction system that performs construction inspections with over 50 field Inspectors and routine maintenance handled by work crews.

KDOT operates a Construction Management System (CMS) on a mainframe computer that was developed by KDOT for managing construction projects. Other systems used or under development by KDOT include a road condition reporting system (RCRS), a construction detour reporting system (CDRS), which is now one system under KANROAD and a truck routing information system (TRIS) also developed by KDOT. Several other systems are used for maintenance operations such as feature inventory and other functions.

Associated Stakeholder: KDOT

Mapped to Entity: Maintenance and Construction Management

3.26 KDOT TOC (Wichita Metro) Roadside Equipment

Status: Near Term

Description: Roadside Equipment includes any and all equipment distributed on and along the roadway which monitors and controls traffic. This can include equipment for ramp metering.

Associated Stakeholder: KDOT

Mapped to Entity: Roadway Subsystem

3.27 KDOT Traffic Operations Center (Wichita Metro)

Status: Near Term

Description: The KDOT TOC is responsible for managing and controlling traffic conditions on the arterials and freeways they operate. Traffic is managed through vehicle detectors, dynamic message signs, and closed circuit television.

Associated Stakeholder: KDOT

Mapped to Entity: Emergency Management

Mapped to Entity: Traffic Management

3.28 KHP Turnpike Dispatch System

Status: Existing

Description: The KHP Turnpike Dispatch System is responsible for providing law enforcement on the Turnpike.

Associated Stakeholder: KHP-Turnpike

Mapped to Entity: Emergency Management

3.29 KHP Turnpike Vehicles

Status: Existing

Description: This element represents the vehicles that are dispatched by KHP Turnpike dispatchers.

Associated Stakeholder: KHP-Turnpike

Mapped to Entity: Emergency Vehicle Subsystem

3.30 KHP Vehicles

Status: Existing

Description: This element represents the vehicles that are dispatched by KHP.

Associated Stakeholder: Kansas Highway Patrol - Dispatchers

Mapped to Entity: Emergency Vehicle Subsystem

3.31 KTA Maintenance Vehicle

Status: Existing

Description: This element represents the maintenance and construction vehicles including snow plows for KTA.

Associated Stakeholder: Kansas Turnpike Authority (KTA)

Mapped to Entity: Maintenance and Construction Vehicle

3.32 KTA Motorist Assistance Patrol Vehicles

Status: Existing

Description: This element represents the motorist assistance patrol vehicles operated by the Kansas Turnpike Authority for the turnpike.

Associated Stakeholder: Kansas Turnpike Authority (KTA)

Mapped to Entity: Emergency Vehicle Subsystem

3.33 KTA Toll Collection Equipment

Status: Existing

Description: This element represents the field equipment that is used for electronic toll collection and represents KTAG.

Associated Stakeholder: Kansas Turnpike Authority (KTA)

Mapped to Entity: Toll Collection

3.34 Media

Status: Existing

Description: This represents information systems that provide traffic reports, travel conditions, and other transportation-related news services to the traveling public through radio, TV, and other media.

Associated Stakeholder: Local Media

Mapped to Entity: Media

3.35 Motorist Assistance Patrol Vehicles

Status: Existing

Description: This element represents emergency patrol vehicles that traverse the Wichita metro area system (except the Turnpike) to assist motorists in emergency situations while also detecting incidents that may cause delays to motorists.

Associated Stakeholder: MAP 

Stakeholders in this group:

KDOT

Kansas Highway Patrol

Mapped to Entity: Emergency Vehicle Subsystem

3.36 National Warning System (NAWAS)

Status: Existing

Description: This element represents the National Warning System that provides alerts and advisories on a National basis.

Associated Stakeholder: Kansas Department of Emergency Management

Mapped to Entity: Alerting and Advisory Systems

Mapped to Entity: Emergency Management

3.37 National Weather Service

Status: Existing

Description: This element provides atmospheric weather observations and forecasts that are collected and derived by the National Weather Service.

Associated Stakeholder: NOAA

Mapped to Entity: Weather Service

3.38 Personal Information Access Devices

Status: Existing

Description: This element represents the personal information access devices used by the general public in the Wichita region.

Associated Stakeholder: General Public

Mapped to Entity: Personal Information Access Subsystem

3.39 Office of Central Inspection (Event Permits)

Status: Existing

Description: This element is responsible for reporting special event activities in the study area.

Associated Stakeholder: Wichita Office of Central Inspection

Mapped to Entity: Event Promoters

3.40 SCADA

Status: Existing

Description: This is a supervisory, control and data acquisition (SCADA) system monitoring automated pump stations, rain gauges and water levels.


Associated Stakeholder: Wichita Public Works

Mapped to Entity: Flood Control Monitoring System

3.41 Sedgwick County 911

Status: Existing

Description: The Sedgwick County Department of Emergency Communications (SGEC) provides 9-1-1 emergency call handling and dispatching service for most public safety agencies within Sedgwick County. During emergencies, this element also represents the Emergency Operations Center (EOC).

Associated Stakeholder: Wichita and Sedgwick County Public Safety Agencies 

Stakeholders in this group:

- Wichita Fire Department (WFD)
- Wichita Police
- Sedgwick County Fire
- Sedgwick County Emergency Management
- Sedgwick County Emergency Communications
- Sedgwick County Public Safety
- Sedgwick County EMS
- Sedgwick County Sheriff

Mapped to Entity: Emergency Management

Mapped to Entity: Emergency Telecommunications System

3.42 Sedgwick County EMS Vehicles

Status: Near Term

Description: This element represents vehicles that are dispatched by the Sedgwick County 911/EOC. AVL for most public safety vehicles is expected near term.

Associated Stakeholder: Sedgwick County

Mapped to Entity: Emergency Vehicle Subsystem

3.43 Sedgwick County Fire Vehicles

Status: Existing

Description: This element represents vehicles that are dispatched by the Sedgwick County 911/EOC. AVL for most public safety vehicles is expected near term.

Associated Stakeholder: Sedgwick County

Mapped to Entity: Emergency Vehicle Subsystem

3.44 Sedgwick County Government Data Repository

Status: Existing

Description: Maintain/archive data for a variety of uses and operates similar to a data clearinghouse.

Associated Stakeholder: Sedgwick County

Mapped to Entity: Archived Data Management Subsystem

Mapped to Entity: Information Service Provider

3.45 Sedgwick County Maintenance and Construction System

Status: Near Term

Description: This element is responsible for providing the maintenance and construction activities for Sedgwick County including snow plow operations, traffic equipment repair, etc.

Associated Stakeholder: Sedgwick County Public Works

Mapped to Entity: Maintenance and Construction Management

3.46 Sedgwick County Maintenance and Construction Vehicles

Status: Near Term

Description: This element represents the vehicles that are dispatched by the Sedgwick County Maintenance and Construction Division.

Associated Stakeholder: Sedgwick County

Mapped to Entity: Maintenance and Construction Vehicle

3.47 Sedgwick County Sheriff Vehicles

Status: Near Term

Description: This element represents vehicles that are dispatched by the Sedgwick County 911. AVL for most public safety vehicles is expected near term.

Associated Stakeholder: Sedgwick County Sheriff

Mapped to Entity: Emergency Vehicle Subsystem

3.48 Sedgwick County Roadside Equipment

Status: Long Term

Description: This element represents vehicle detectors and traffic controllers for Sedgwick County that sends information to the Wichita Traffic Operations Center.

Associated Stakeholder: Sedgwick County

Mapped to Entity: Roadway Subsystem

3.49 Sedgwick County Transportation Brokerage System

Status: Existing

Description: The Department on Aging administers a transportation brokerage system that provides rides through private paratransit providers.

Associated Stakeholder: Sedgwick County Department on Aging

Mapped to Entity: Transit Management

3.50 Sedgwick County Transportation Brokerage Vehicles

Status: Near Term

Description: This element represents the vehicles that are dispatched by Sedgwick County Transportation Brokerage System.

Associated Stakeholder: Sedgwick County Department on Aging

Mapped to Entity: Transit Vehicle Subsystem

3.51 Suburban Emergency Dispatch Centers

Status: Existing

Description: This element provides public safety dispatch in the Suburban areas that are not covered by the Sedgwick County 911 system or the City of Andover 911 system.

Associated Stakeholder: Suburban Emergency Dispatch Agencies 

Stakeholders in this group:

- City of Derby
- City of Hayesville
- City of Mulvane
- City of Valley Center

Mapped to Entity: Emergency Management

3.52 Suburban Maintenance and Construction System

Status: Existing

Description: This element is responsible for providing the maintenance and construction activities for the Suburban Cities including snow plow operations, traffic equipment repair, etc.

Associated Stakeholder: Suburban Maintenance and Construction Agencies

Mapped to Entity: Maintenance and Construction Management

3.53 Suburban Public Safety Vehicles

Status: Existing

Description: This element represents the public safety vehicles that service the suburban areas.

Associated Stakeholder: Suburban Communities 

Stakeholders in this group:

- City of Sedgwick
- City of Andale
- City of Andover
- City of Belaire
- City of Bentley
- City of Cheney
- City of Clearwater
- City of Colwich
- City of Derby
- City of Eastborough
- City of Garden Plain
- City of Goddard
- City of Harveyville
- City of Hayesville

City of Kechi
City of Maize
City of Mount Hope
City of Mulvane
City of Park City
City of Valley Center

Mapped to Entity: Emergency Vehicle Subsystem

3.54 Surface Transportation Weather Service Providers

Status: Existing

Description: This represents value-added private weather services (e.g., observations, nowcasts and forecasts) provided by private weather providers.

Associated Stakeholder: Private Weather Providers

Mapped to Entity: Surface Transportation Weather Service

3.55 Vehicle

Status: Existing

Description: This element represents the vehicles used by the general public in the Wichita region.


Associated Stakeholder: General Public

Mapped to Entity: Vehicle Subsystem

3.56 Wayside Equipment (Railroad Gates)

Status: Long Term

Description: This element represents equipment at a highway rail intersection providing notification of an arriving train that is operated by rail agencies.

Associated Stakeholder: Railroad Operators 

Stakeholders in this group:

K and O Railroad
Union Pacific Railroad
BNSF Railroad

Mapped to Entity: Wayside Equipment

3.57 Wichita Construction and Maintenance Vehicles

Status: Near Term

Description: This element represents the maintenance and construction vehicles including snow plows for the City of Wichita.

Associated Stakeholder: Wichita

Mapped to Entity: Maintenance and Construction Vehicle

3.58 Wichita Construction and Maintenance System

Status: Existing

Description: This element is responsible for providing the maintenance and construction activity for the City of Wichita including snow plow operations, traffic signal installation and repair, etc.

Associated Stakeholder: Wichita Public Works

Mapped to Entity: Maintenance and Construction Management

3.59 Wichita Fire Vehicles

Status: Near Term

Description: The Wichita Fire Vehicles are dispatched by Sedgwick County 911. AVL for most public safety vehicles is expected near term.

Associated Stakeholder: Wichita Fire Department (WFD)

Mapped to Entity: Emergency Vehicle Subsystem

3.60 Wichita Flood Monitoring System

Status: Existing

Description: Water level sensors in the City of Wichita tied back to the Wichita Traffic Operations Center (TOC).

Associated Stakeholder: Wichita Fire Department (WFD)

Mapped to Entity: Emergency Vehicle Subsystem

3.61 Wichita Government Data Repository

Status: Existing

Description: Maintain/archive City of Wichita data for a variety of uses and operates similar to a data clearinghouse.

Associated Stakeholder: Wichita IT/IS

Mapped to Entity: Archived Data Management Subsystem

Mapped to Entity: Information Service Provider

3.62 Wichita Mid-Continent Airport

Status: Existing

Description: This element provides airport schedule information to the public.

Associated Stakeholder: Wichita Airport Authority

Mapped to Entity: Multimodal Transportation Provider

3.63 Wichita Parks and Recreation System

Status: Existing

Description: This element is responsible for reporting special event activities in the region.

Associated Stakeholder: Wichita Parks and Recreation

Mapped to Entity: Event Promoters

3.64 Wichita Police Vehicles

Status: Existing

Description: The Wichita Police Vehicles are dispatched by the Sedgwick County 911 system. AVL for most public safety vehicles is expected near term.

Associated Stakeholder: Wichita Police

Mapped to Entity: Emergency Vehicle Subsystem

3.65 Wichita TOC Roadside Equipment

Status: Existing

Description: This element represents vehicle detectors and traffic controllers for the City of Wichita that sends information to the Wichita TOC.

Associated Stakeholder: Wichita Public Works

Mapped to Entity: Roadway Subsystem

3.66 Wichita Traffic Operations Center

Status: Existing

Description: The Wichita TOC is responsible for managing and controlling traffic conditions on the arterials they operate.

Associated Stakeholder: Wichita Public Works

Mapped to Entity: Traffic Management

3.67 Wichita Transit Customer Information System (CIS)

Status: Near Term

Description: This element represents the Wichita Transit website that provides transit related information to aid travelers in their planning. This website will display schedules, fares, and arrival times.

Associated Stakeholder: Wichita Transit

Mapped to Entity: Information Service Provider

3.68 Wichita Transit Kiosk

Status: Near Term

Description: Kiosks will be located at the airport, shopping centers, etc.

Associated Stakeholder: Wichita Transit

Mapped to Entity: Remote Traveler Support

3.69 Wichita Transit Operations Center

Status: Near Term

Description: This element is responsible for managing their transit fleet for the study area. Wichita Transit also leases their vehicles to social service agencies and allows them to use the scheduling capabilities of the CAD system.

Associated Stakeholder: Wichita Transit

Mapped to Entity: Transit Management

3.70 Wichita Transit Vehicles

Status: Near Term

Description: This elements represents the transit vehicles that are dispatched by Wichita Transit. These transit vehicles have ITS devices that support the safe and efficient movement of passengers. These systems collect, manage, and disseminate transit-related information to the driver, operations and maintenance personnel, and transit system patrons.

Associated Stakeholder: Wichita Transit

Mapped to Entity: Transit Vehicle Subsystem

4 Services

This section describes the myriad of surface transportation services for the Wichita region. Some services (e.g., City of Wichita Network Surveillance) are specific to one primary stakeholder (e.g., the City of Wichita), while other services require multiple stakeholder participation in order to accomplish the given service. An example of a region-wide service is the Regional Traffic Control service where KDOT’s freeway management is coordinated with the arterial roadway management by the City of Wichita. Each transportation service depicts multiple transportation inventory elements described in section 3 along with information flows representing information content exchanges between the elements that are necessary to accomplish different level of each service. These information flows have directionality as indicated by the arrow pointing to the destination element. Also, each information flow has been given a timeframe status (e.g., Existing, Near Term, Medium Term and Long Term) as defined in section 1.3 of this document.

4.1 City of Andover Network Surveillance

The City of Andover Network Surveillance service (Figure 3) includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the City of Andover Traffic Operations Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Andover Traffic Operations Center). The data generated by this service enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users in the Wichita Area Regional ITS Architecture.

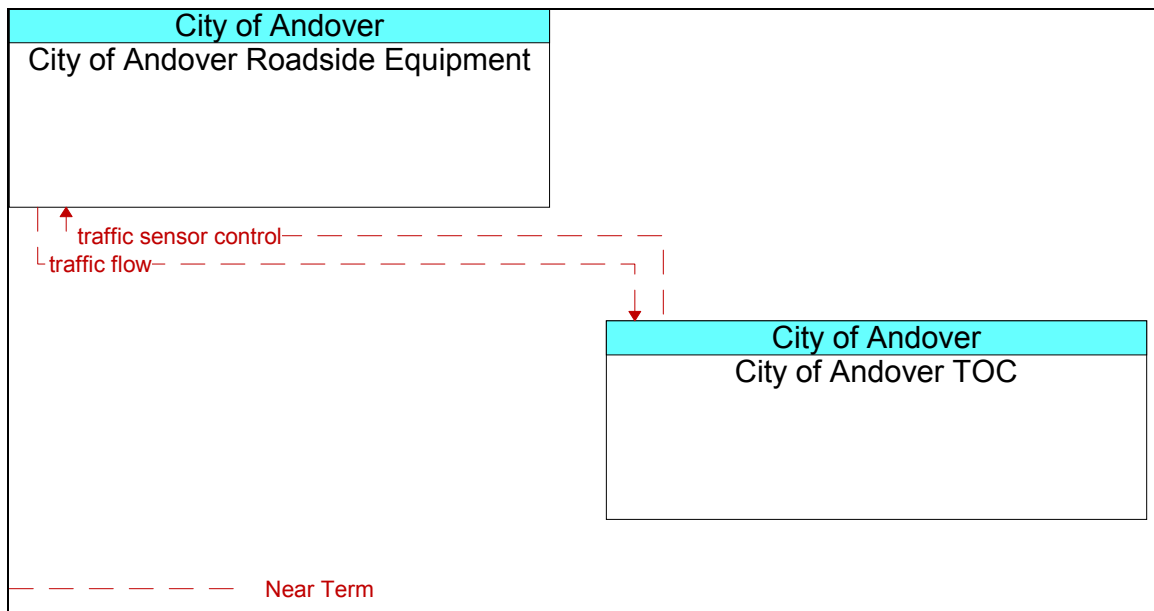


Figure 3. City of Andover Network Surveillance

4.2 City of Wichita Network Surveillance

The City of Wichita Network Surveillance service (Figure 4) includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the Wichita Traffic Operations Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Wichita Traffic Operations Center). The data generated by this service enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users in the Wichita Area Regional ITS Architecture.

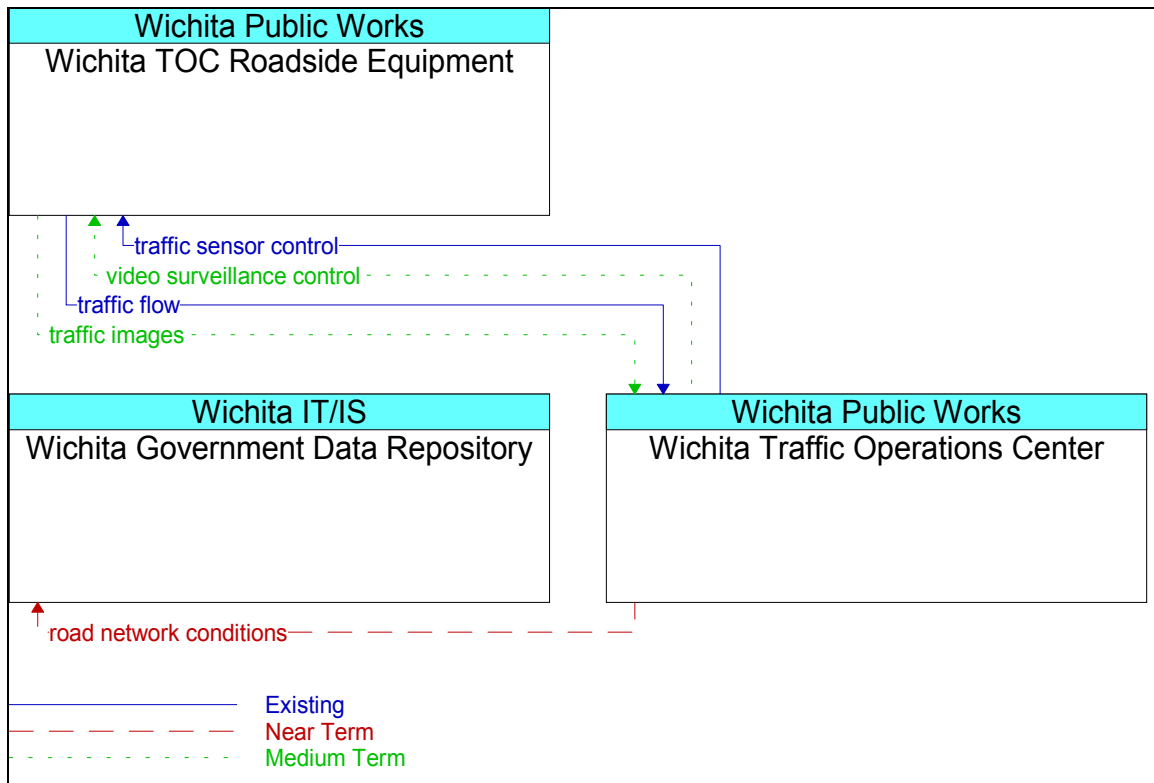


Figure 4. City of Wichita Network Surveillance

4.3 KDOT Network Surveillance

The KDOT Network Surveillance service (Figure 5) includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the KDOT Traffic Operations Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the KDOT Traffic Operations Center). The data generated by this service enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users in the Wichita Area Regional ITS Architecture.

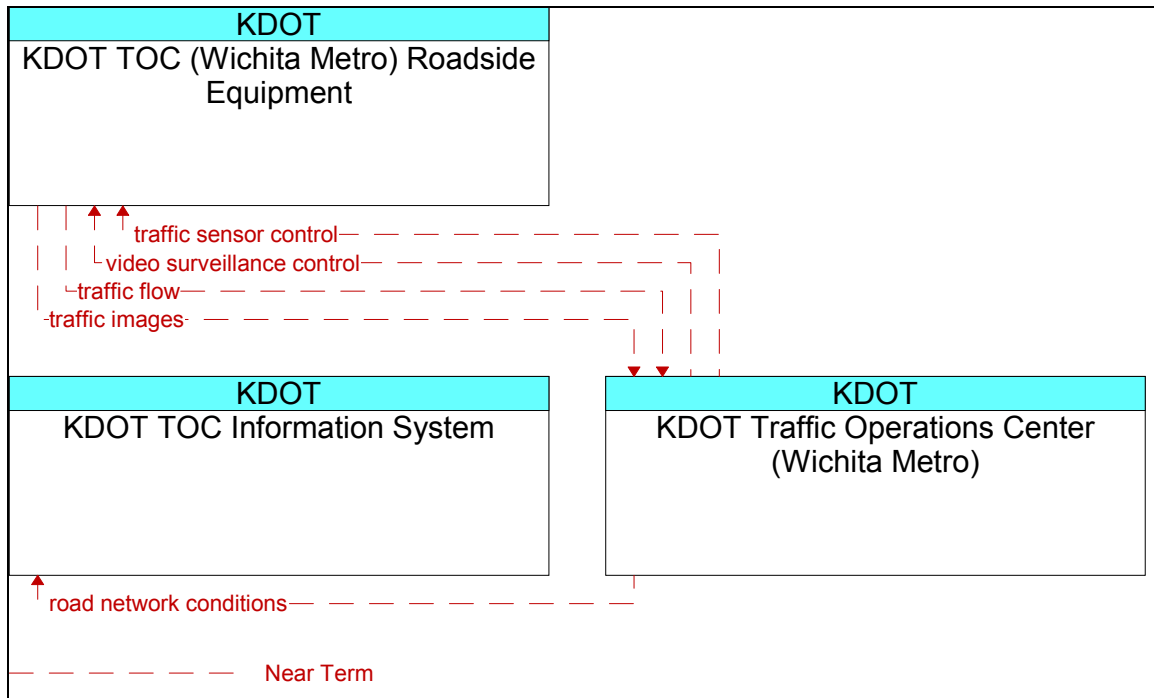


Figure 5. KDOT Network Surveillance

4.4 Sedgwick County Network Surveillance

The Sedgwick County Network Surveillance service (Figure 6) includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data from Sedgwick County field devices back to the Wichita Traffic Operations Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Wichita Traffic Operations Center). The data generated by this service enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users in the Wichita Area Regional ITS Architecture.

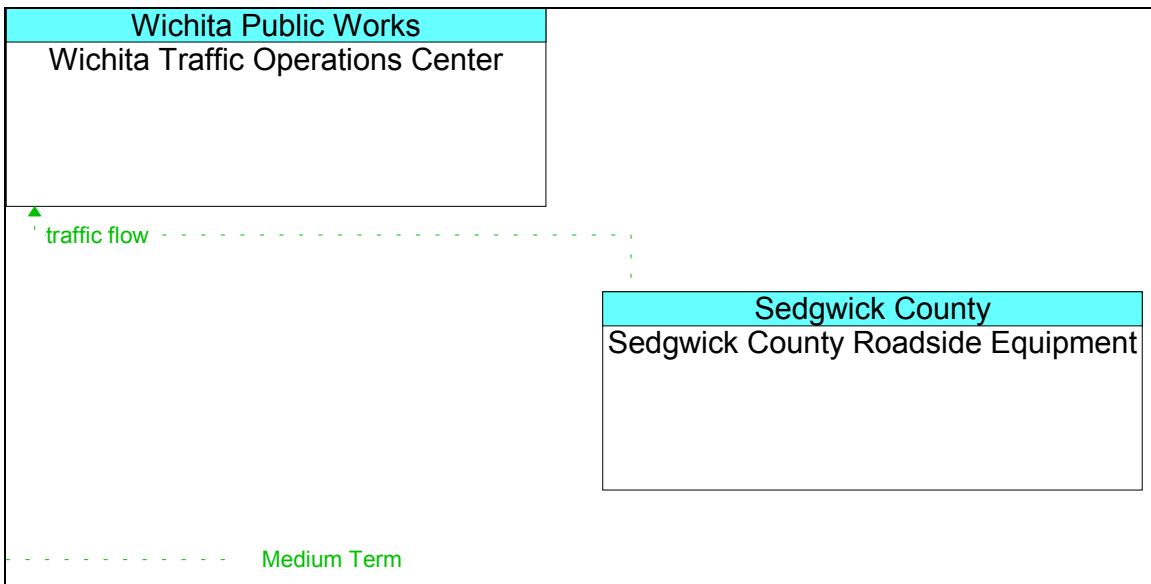


Figure 6. Sedgwick County Network Surveillance

4.5 City of Andover Surface Street Control

The City of Andover Surface Street Control service (Figure 7) provides the central control and monitoring equipment, communication links, and the signal control equipment that support local surface street control and/or arterial traffic management for the City of Andover. A range of traffic signal control systems are represented by this service ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests.

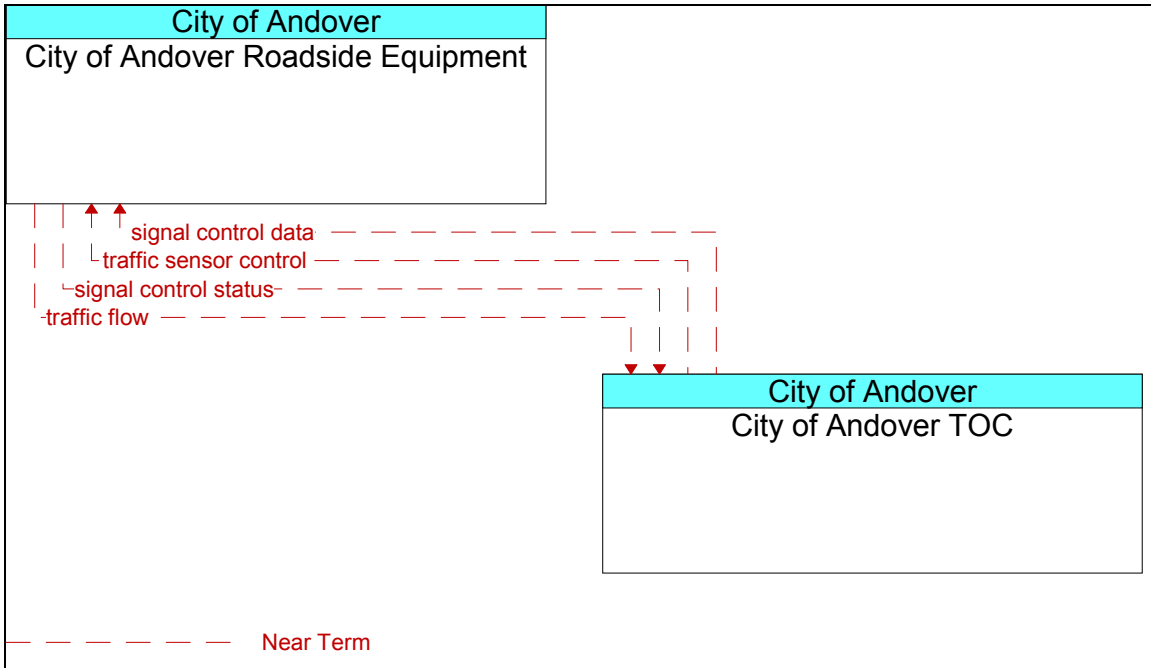


Figure 7. City of Andover Surface Street Control

4.6 City of Wichita Surface Street Control

The City of Wichita Surface Street Control service (Figure 8) provides the central control and monitoring equipment, communication links, and the signal control equipment that support local surface street control and/or arterial traffic management for the City of Wichita. A range of traffic signal control systems are represented by this service ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests.

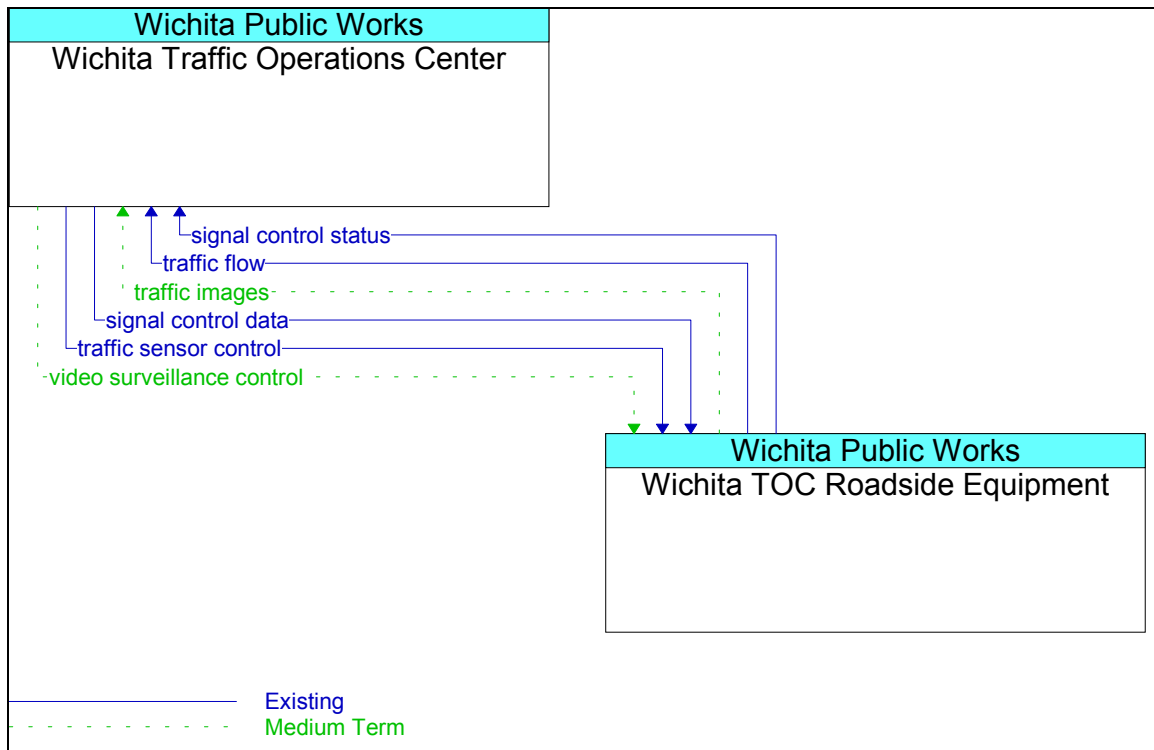


Figure 8. City of Wichita Surface Street Control

4.7 Sedgwick County Surface Street Control

The Sedgwick County Surface Street Control service (Figure 9) provides the central control and monitoring equipment, communication links, and the signal control equipment that support local surface street control and/or arterial traffic management for Sedgwick County, however, the City of Wichita will ultimately control the traffic signals through their planned traffic operations center. A range of traffic signal control systems are represented by this service ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests.

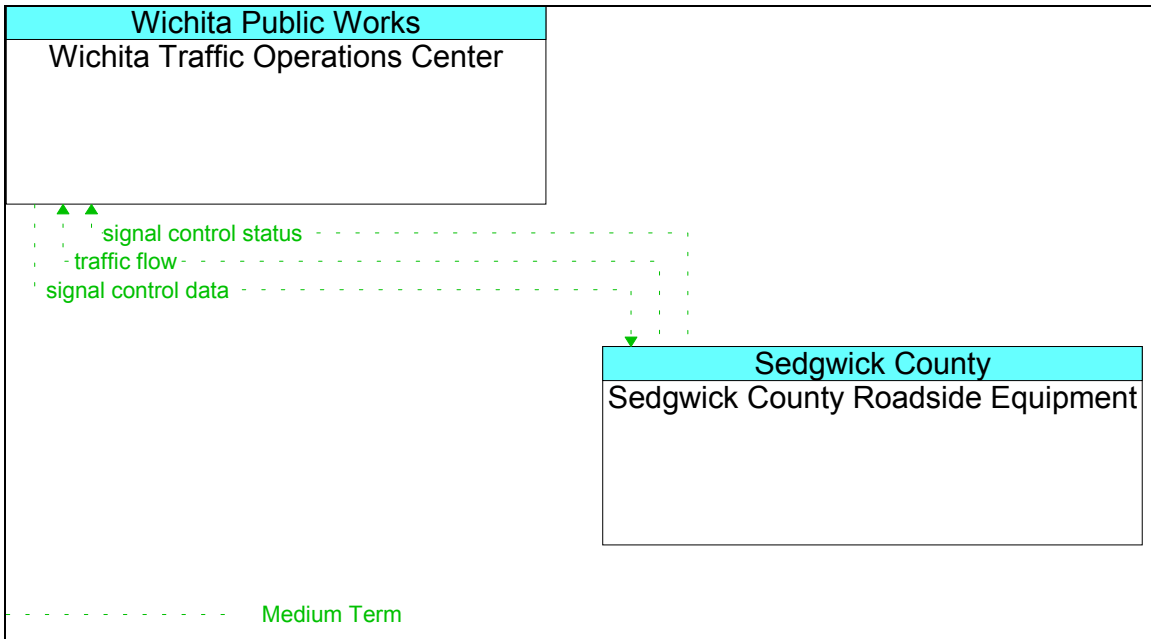


Figure 9. Sedgwick County Surface Street Control

4.8 KDOT Freeway Control

The KDOT Freeway Control service (Figure 10) provides the communications and roadside equipment to support ramp control, lane controls, and interchange control for the freeway system operated by KDOT. Coordination and integration of ramp meters are included as part of this service. This package uses the information from the City of Wichita and Sedgwick County Network Surveillance Service to support freeway monitoring and future adaptive strategies to manage traffic congestion.

This service also includes the capability to utilize surveillance information for detection of incidents. Typically, the processing would be performed at the KDOT Traffic Operations Center.

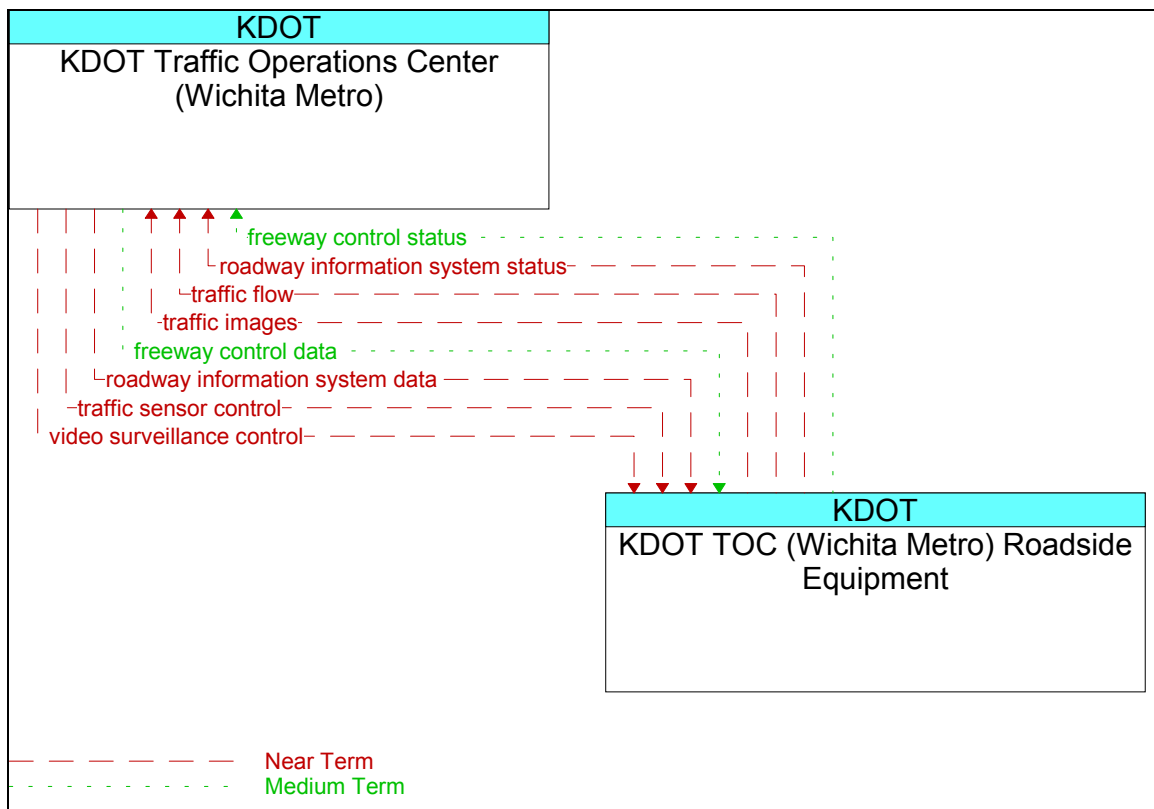


Figure 10. KDOT Freeway Control

4.9 Traffic Information Dissemination

The Traffic Information Dissemination service (Figure 11, Figure 12 and Figure 13) provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, incident information, and emergency alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information.

This service also covers the equipment and interfaces that provide traffic information from the KDOT and City of Wichita’s Traffic Operations Center to the media (for instance via a direct tie-in between these traffic management centers and radio or television station computer systems), Wichita Transit Operations Center, Wichita Transit Customer Information System, Sedgwick County 911, other Public Safety agencies, and KDOT TOC Information System. A link to the KDOT and Wichita Area Maintenance and Construction agencies allows dissemination of real time information on road closures due to maintenance and construction activities.

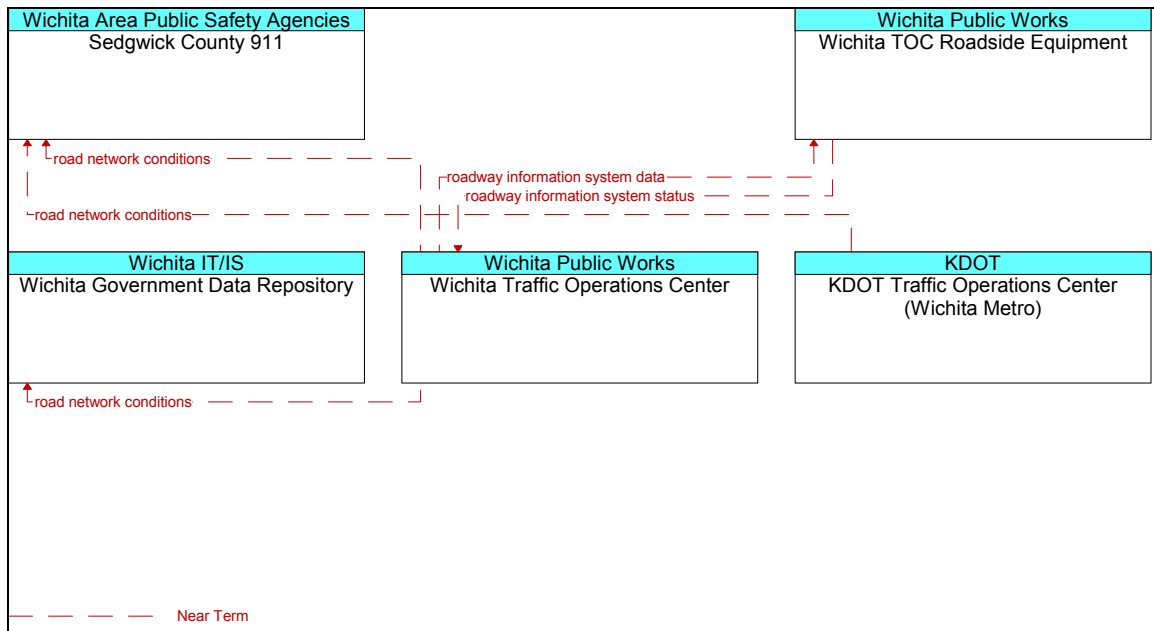


Figure 11. Traffic Information Dissemination (Part 1)

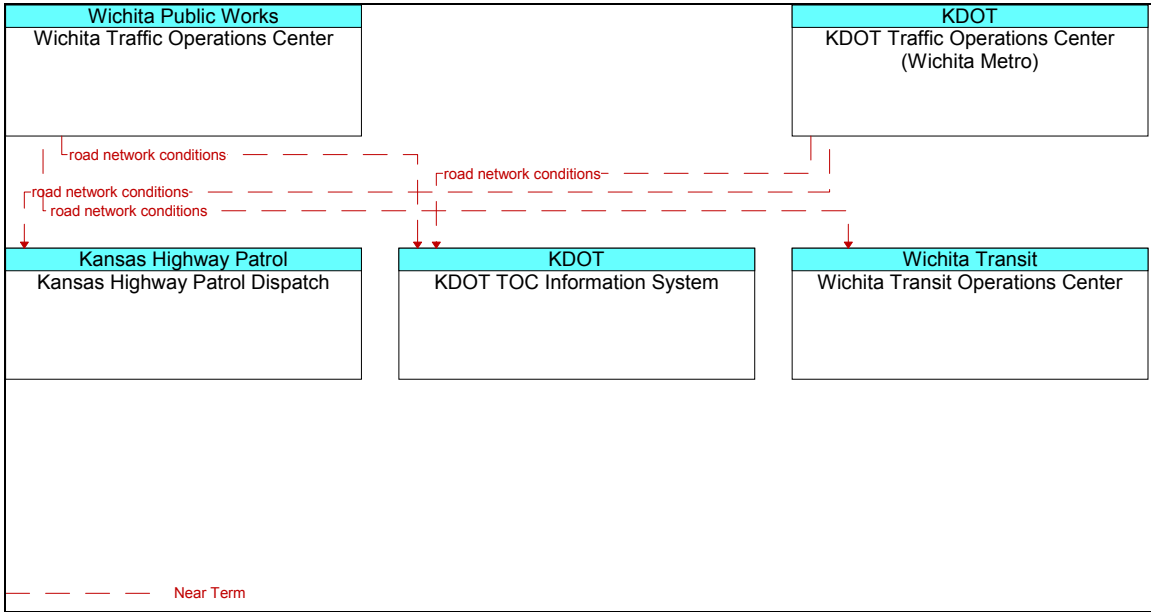


Figure 12. Traffic Information Dissemination (Part 2)

4.10 Regional Traffic Control

The Regional Traffic Control service (Figure 14) provides for the sharing of traffic information and control among the KDOT and Wichita Traffic Operations Centers to support a regional control strategy. This service advances the Surface Street Control and Freeway Control Services by adding the communications links and integrated control strategies that enable integrated inter-jurisdictional traffic control. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. This service relies principally on roadside instrumentation supported by the Surface Street Control and Freeway Control Services and adds hardware, software, and fixed-point to fixed-point communications capabilities to implement traffic management strategies that are coordinated between the KDOT and Wichita Traffic Operations Centers.

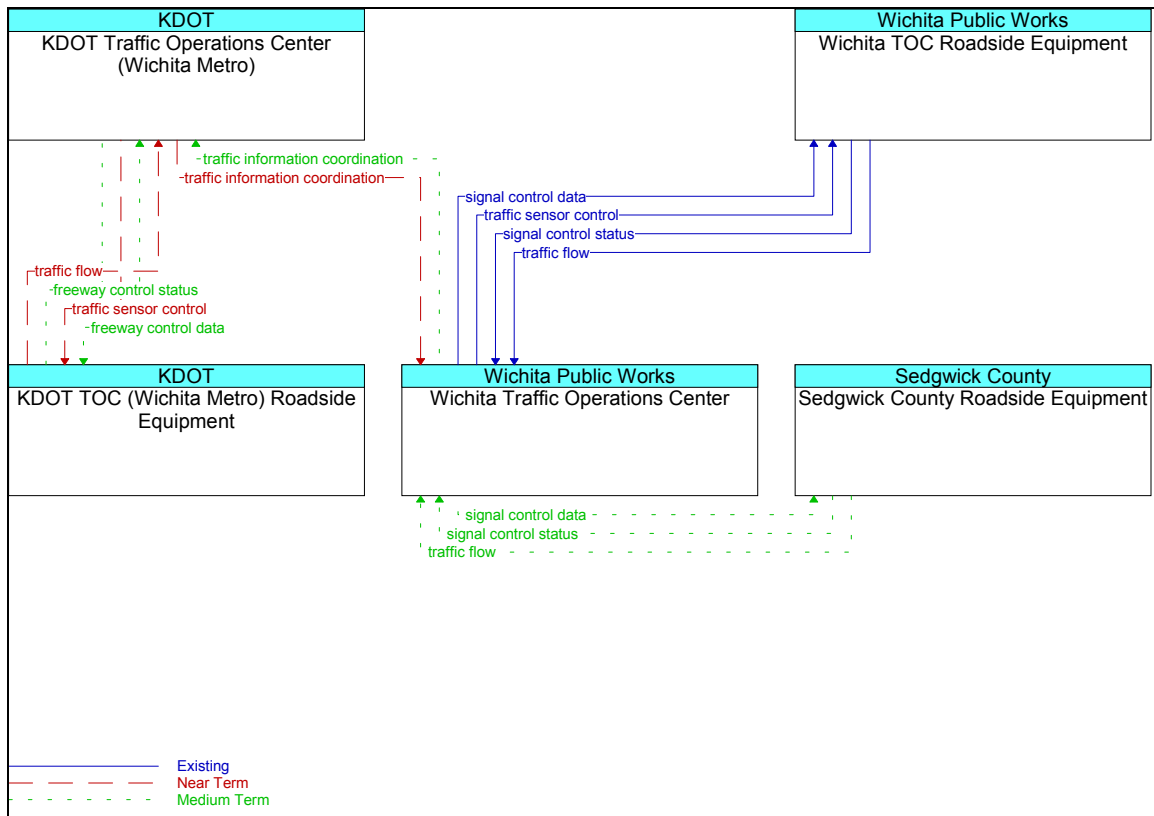


Figure 14. Regional Traffic Control

4.11 Traffic Incident Management System

The Traffic Incident Management System service (Figure 15, Figure 16, Figure 17, Figure 18 and Figure 19) manages both unexpected incidents and planned events so that the impact to the Wichita regional area and traveler safety is minimized. This service includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and through regional coordination between the KDOT and Wichita Traffic Operations Centers, Wichita-Sedgwick County Maintenance and Construction agencies, Sedgwick County 911, and other Public Safety agencies as well as Rail Operations, Office of Central Inspection and Wichita Parks and Recreation System.

Information from these diverse sources is collected and correlated by this service to detect and verify incidents and implement an appropriate response. This service supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications or resource coordination between other systems in the Wichita regional area. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination service and dissemination of incident information to travelers through the Broadcast Traveler Information or Interactive Traveler Information services.

The roadside equipment used to detect and verify incidents also allows the operator to monitor incident status as the response unfolds. The coordination with Sedgwick County 911, and other Public Safety agencies might be through a CAD system or through other communication with emergency field personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel.

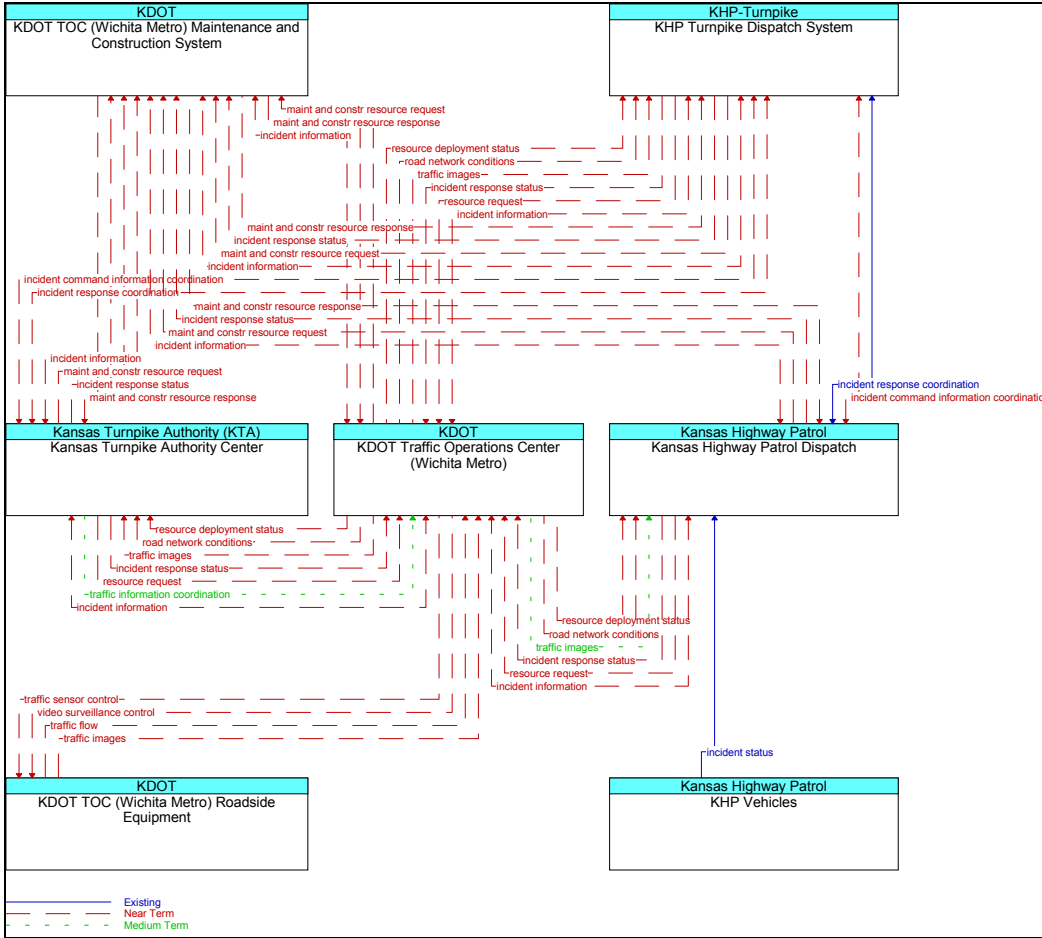


Figure 15. Traffic Incident Management System (Part 1)

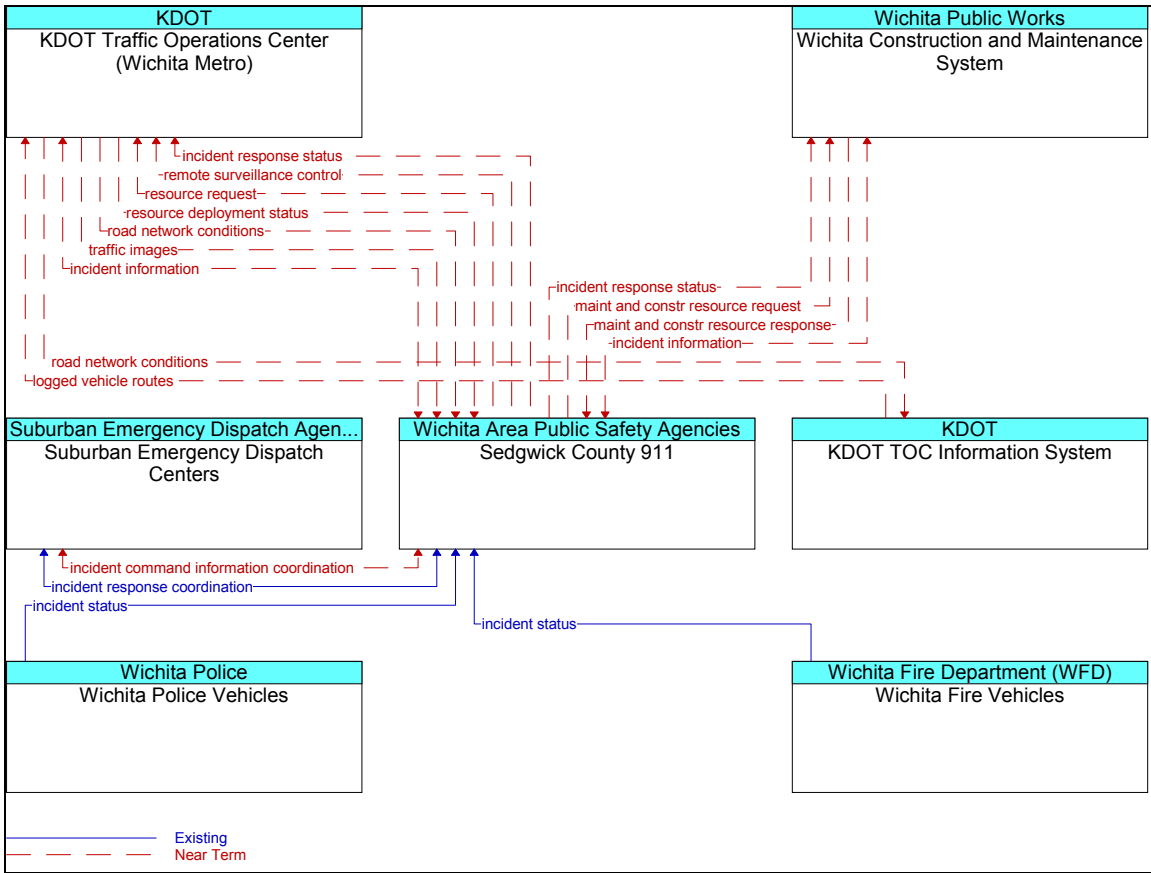


Figure 17. Traffic Incident Management System (Part 3)

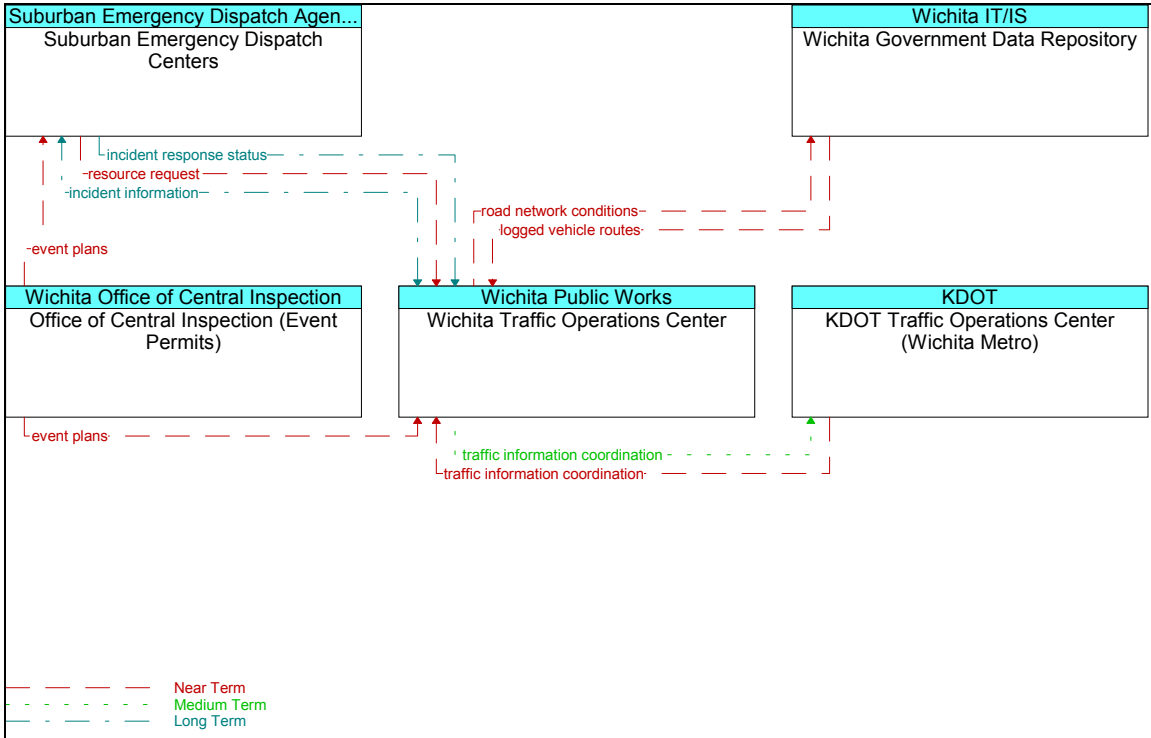


Figure 18. Traffic Incident Management System (Part 4)

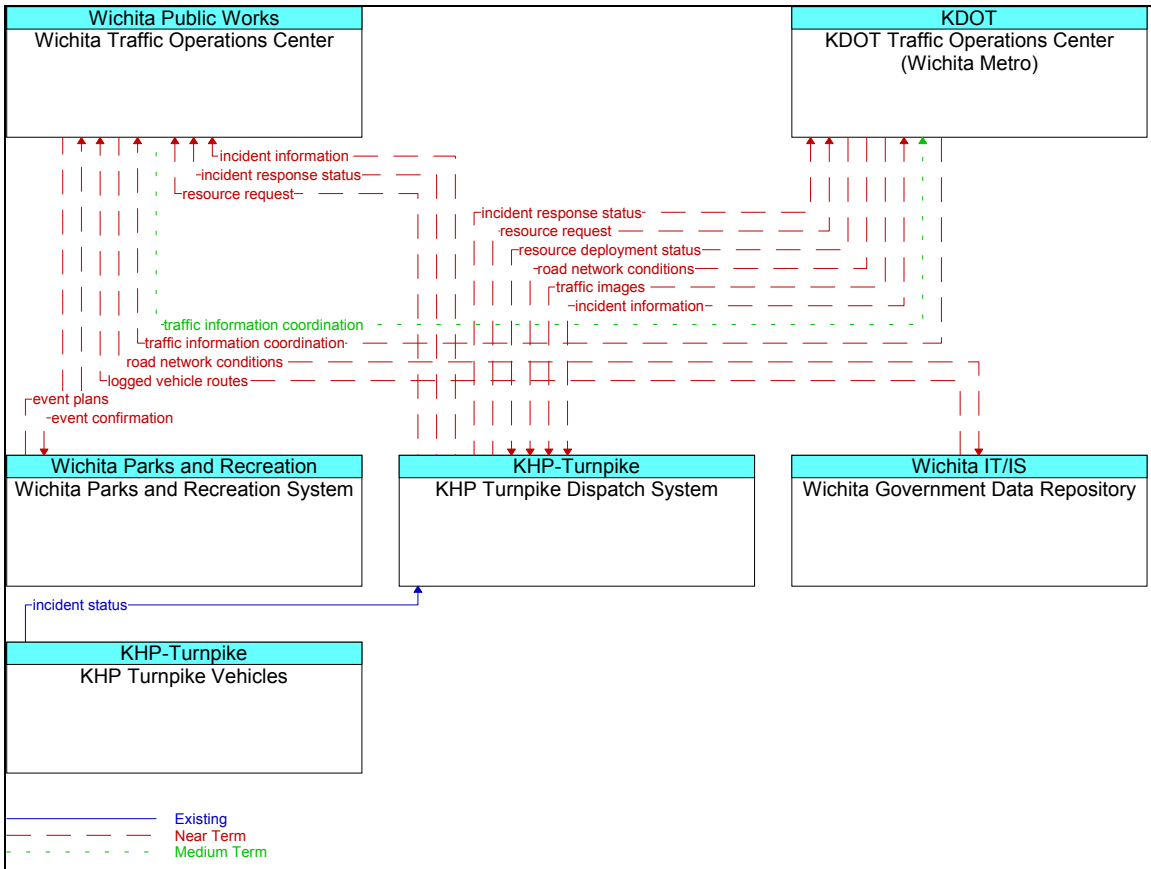


Figure 19. Traffic Incident Management System (Part 5)

4.12 Electronic Toll Collection

The Electronic Toll Collection service (Figure 20) provides the Kansas Turnpike Authority Center with the ability to collect tolls electronically and detect and process violations. The fees that are collected may be adjusted to implement demand management strategies. Dedicated short range communication between the roadway equipment and the vehicle is required as well as fixed-point to fixed-point interfaces between the toll collection equipment and the Kansas Turnpike Authority Center and the financial infrastructure that supports fee collection. Vehicle tags of toll violators are read and electronically posted to vehicle owners. Standards, inter-agency coordination, and financial clearinghouse capabilities enable regional, and ultimately national interoperability for these services. The toll tags and roadside readers that these systems utilize can also be used to collect road use statistics for highway authorities.

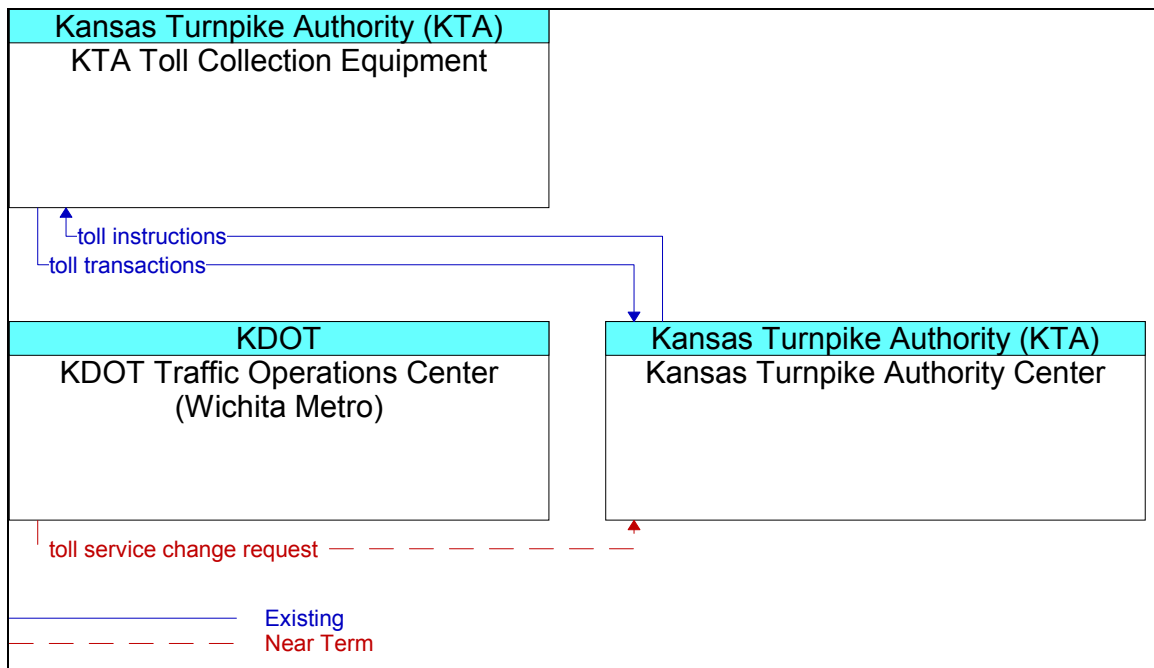


Figure 20. Electronic Toll Collection

4.13 Emissions Monitoring and Management

The Emissions Monitoring and Management service (Figure 21) monitors individual vehicle emissions and provides general air quality monitoring using distributed sensors to collect the data. The collected information is transmitted to the Air Quality Alert system for processing. Both area wide air quality monitoring and point emissions monitoring are supported by this service. For area wide monitoring, this service measures air quality, identifies sectors that are non-compliant with air quality standards, and collects, stores and reports supporting statistical data. For point emissions monitoring, this service measures tail pipe emissions and identifies vehicles that exceed emissions standards. Summary emissions information or warnings can also be displayed to drivers. The gathered information can be used to implement environmentally sensitive transportation demand programs, policies, and regulations.

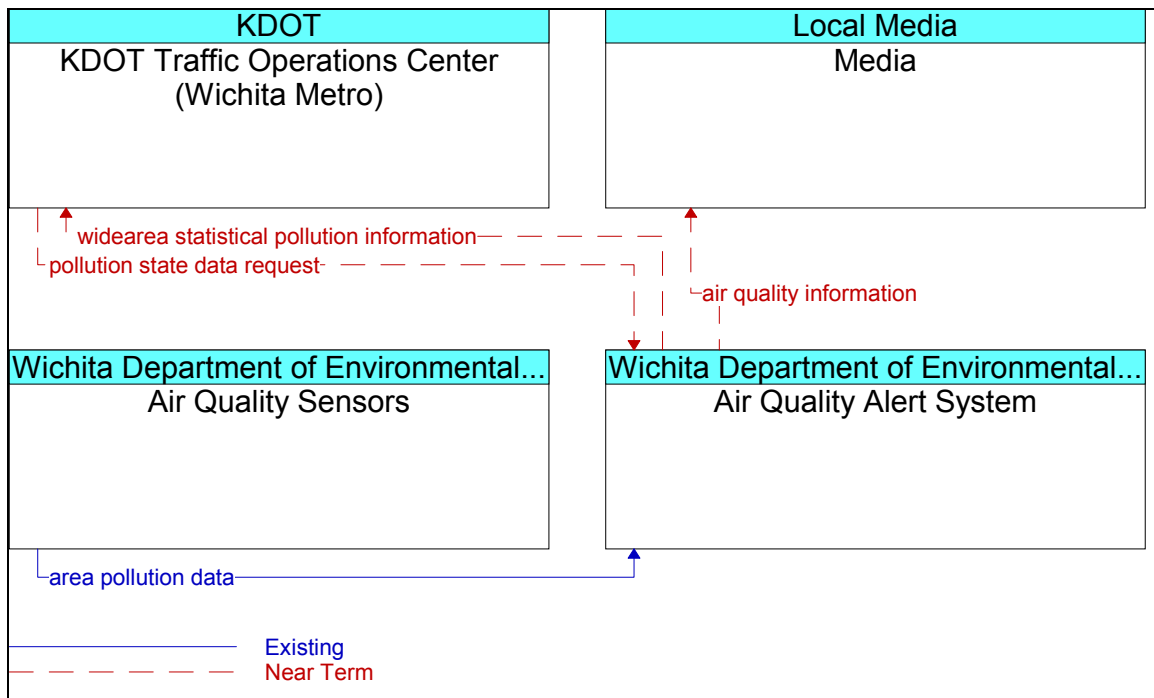


Figure 21. Emissions Monitoring and Management

4.14 Standard Railroad Grade Crossing

The Standard Railroad Grade Crossing service (Figure 22) manages highway traffic at highway-rail intersections (HRIs) in the Wichita region where operational requirements do not dictate more advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Both passive (e.g., the crossbuck sign) and active warning systems (e.g., flashing lights and gates) are supported. (Note that passive systems exercise only the single interface between the roadway subsystem and the driver in the architecture definition.) These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification by interfaced wayside equipment of an approaching train. The Wayside Equipment HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the Wayside Equipment and interfaces is performed; detected abnormalities are reported to both highway and railroad officials through wayside interfaces and interfaces to the Wichita Traffic Operations Center.

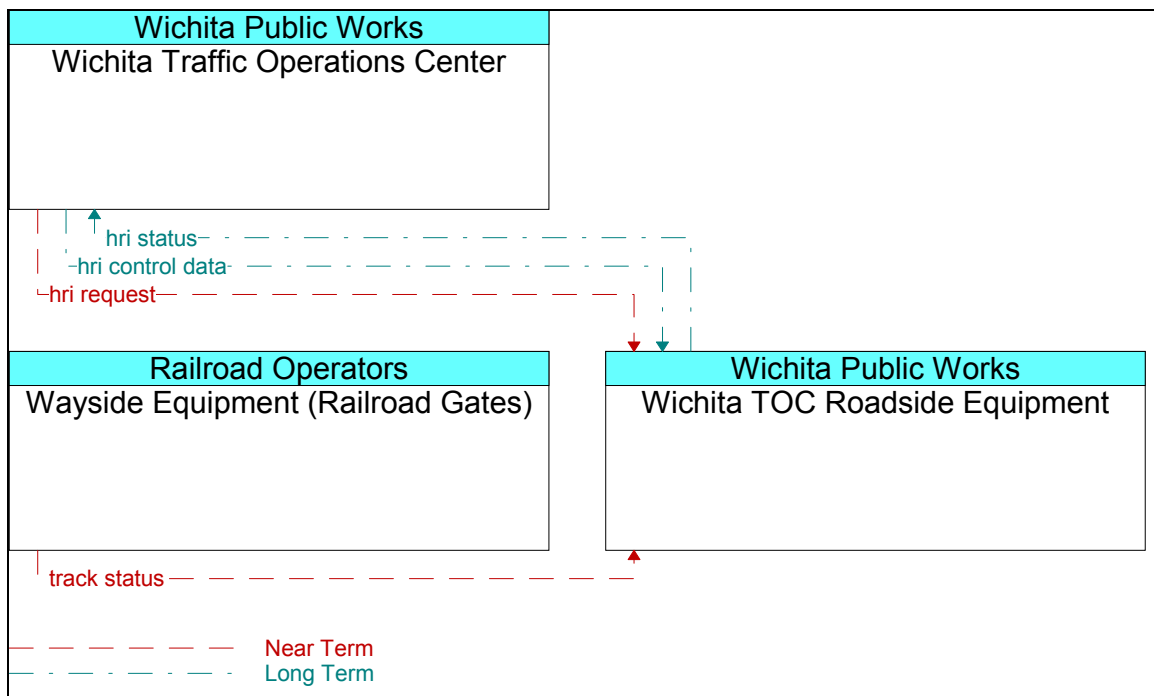


Figure 22. Standard Railroad Grade Crossing

4.15 Roadway Closure Management

The Roadway Closure Management service (Figure 23, Figure 24 and Figure 25) closes roadways to vehicular traffic when driving conditions are unsafe, maintenance must be performed, and other scenarios where access to the roadway must be prohibited. The service includes automatic or remotely controlled gates or barriers that control access to roadway segments including ramps and traffic lanes. Remote control systems allow the gates to be controlled from a central location, improving system efficiency and reducing personnel exposure to unsafe conditions during severe weather and other situations where roads must be closed. Surveillance systems allow operating personnel to visually verify the safe activation of the closure system and driver information systems (e.g., DMS) provide closure information to motorists in the vicinity of the closure. The equipment managed by this service includes the control and monitoring systems, the field devices (e.g., gates, warning lights, DMS, CCTV cameras) at the closure location(s), and the information systems that notify other systems of a closure.

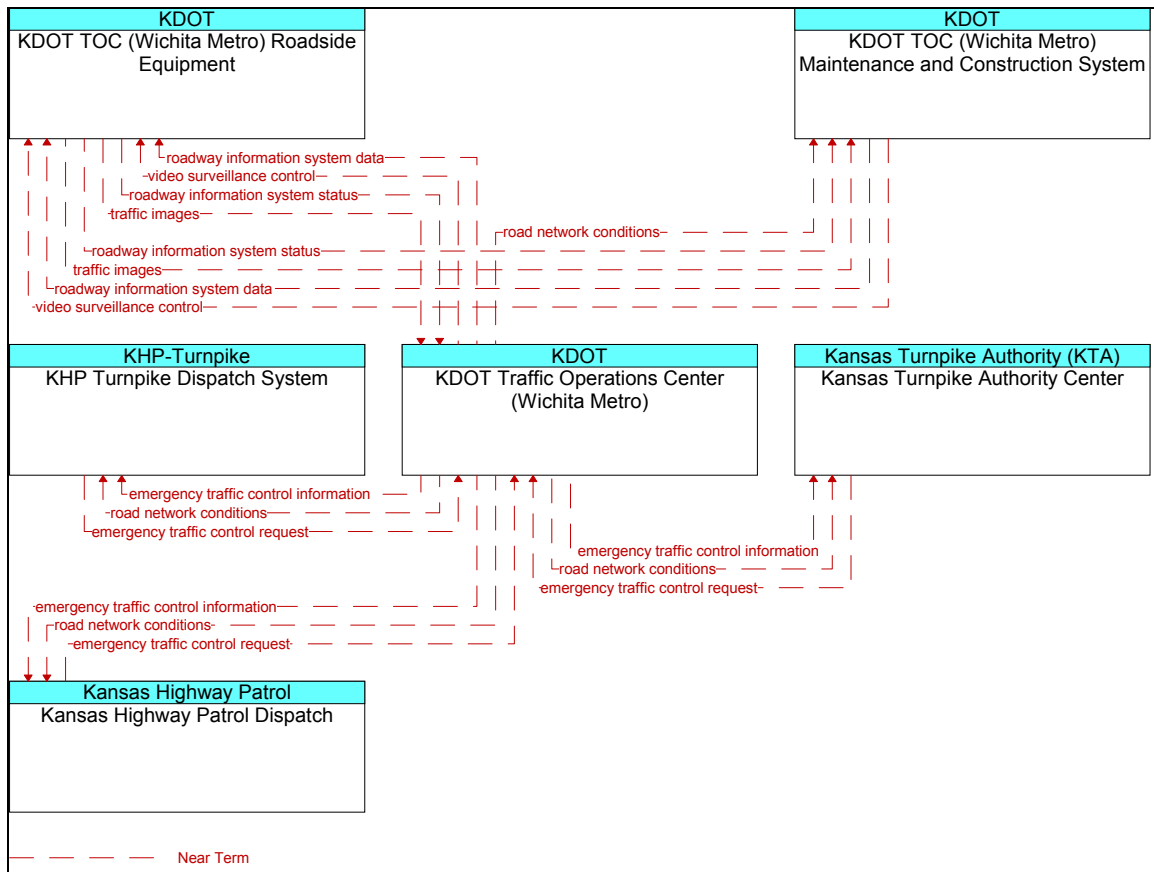


Figure 23. Roadway Closure Management (Part 1)

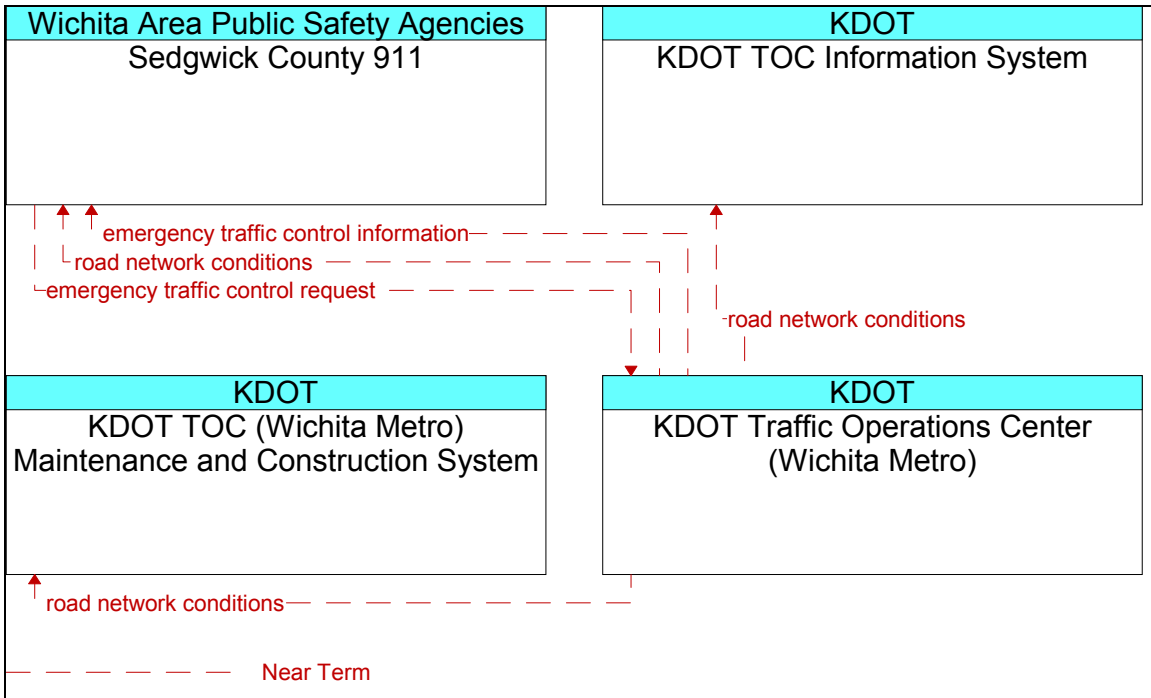


Figure 24. Roadway Closure Management (Part 2)

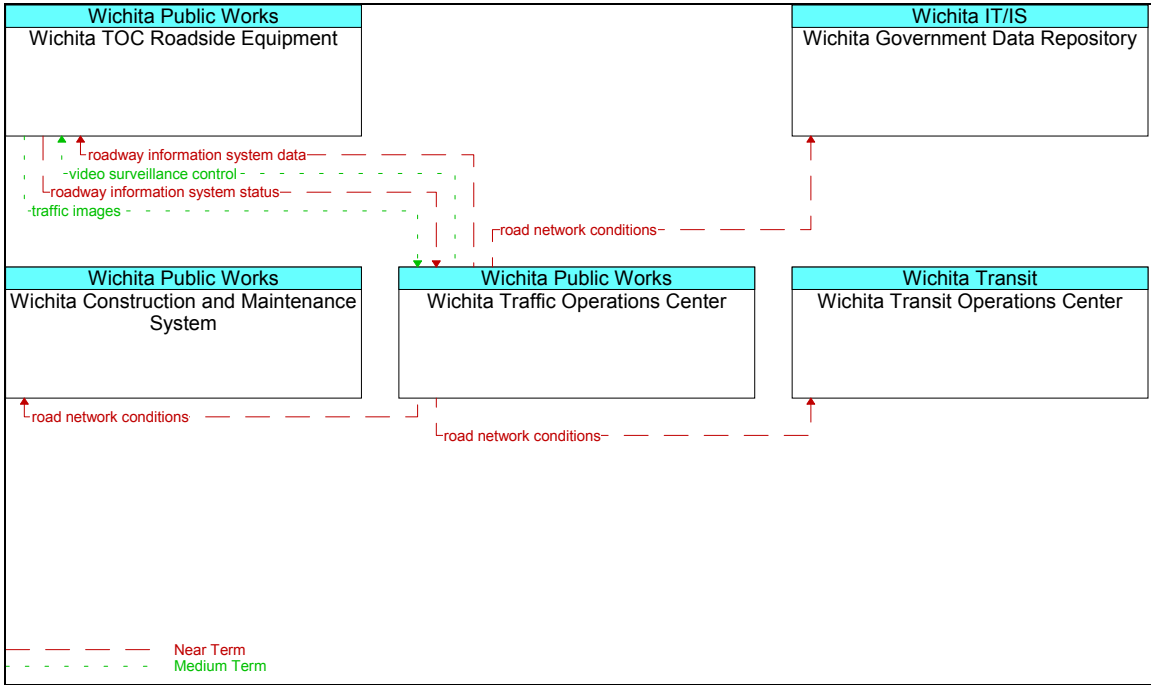


Figure 25. Roadway Closure Management (Part 3)

4.16 KDOT Maintenance and Construction Vehicle and Equipment Tracking

The KDOT Maintenance and Construction Vehicle and Equipment Tracking service (Figure 26) will track the location of KDOT maintenance and construction vehicles and other equipment to ascertain the progress of their activities. These activities can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations.

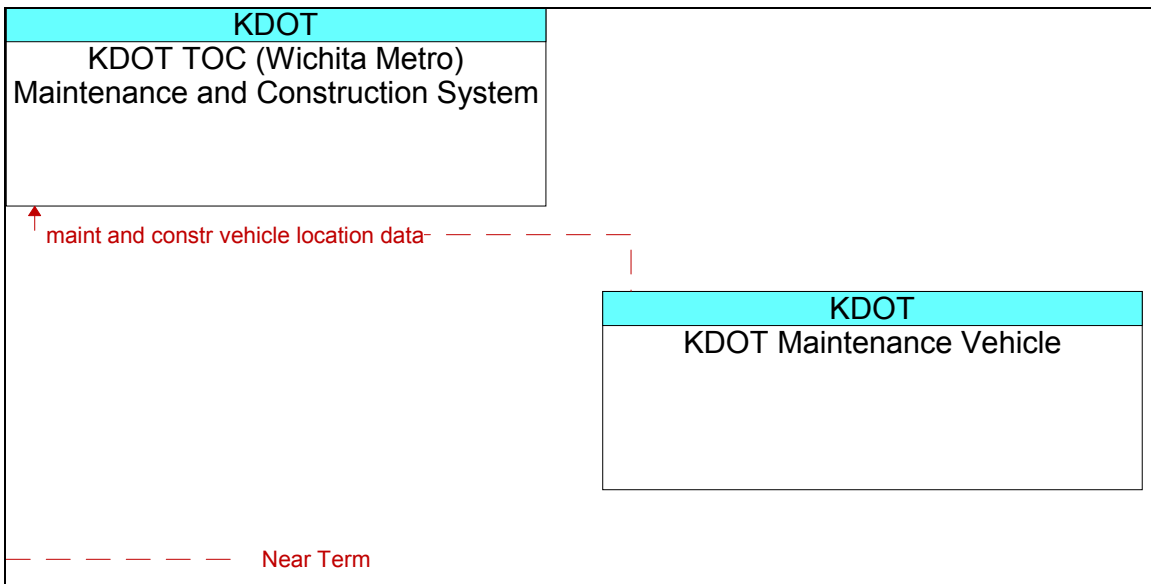


Figure 26. KDOT Maintenance and Construction Vehicle and Equipment Tracking

4.17 Sedgwick County Maintenance and Construction Vehicle and Equipment Tracking

The Sedgwick County Maintenance and Construction Vehicle and Equipment Tracking service (Figure 27) will track the location of Sedgwick County maintenance and construction vehicles and other equipment to ascertain the progress of their activities. These activities can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations.

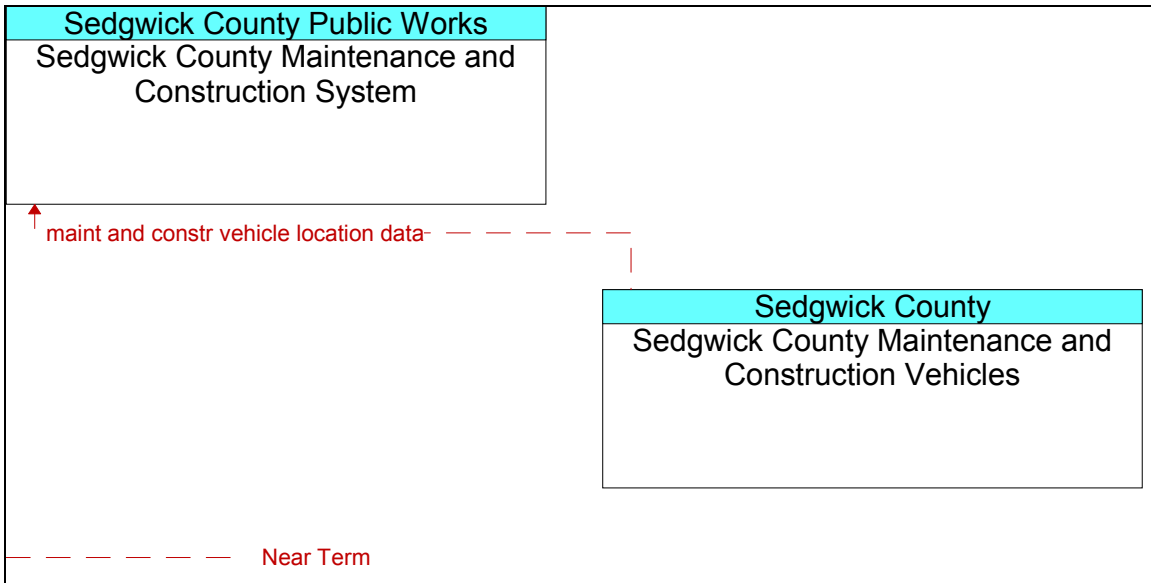


Figure 27. Sedgwick County Maintenance and Construction Vehicle and Equipment Tracking

4.18 Wichita Maintenance and Construction Vehicle and Equipment Tracking

The Wichita Maintenance and Construction Vehicle and Equipment Tracking service (Figure 28) will track the location of the City of Wichita maintenance and construction vehicles and other equipment to ascertain the progress of their activities. These activities can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations.

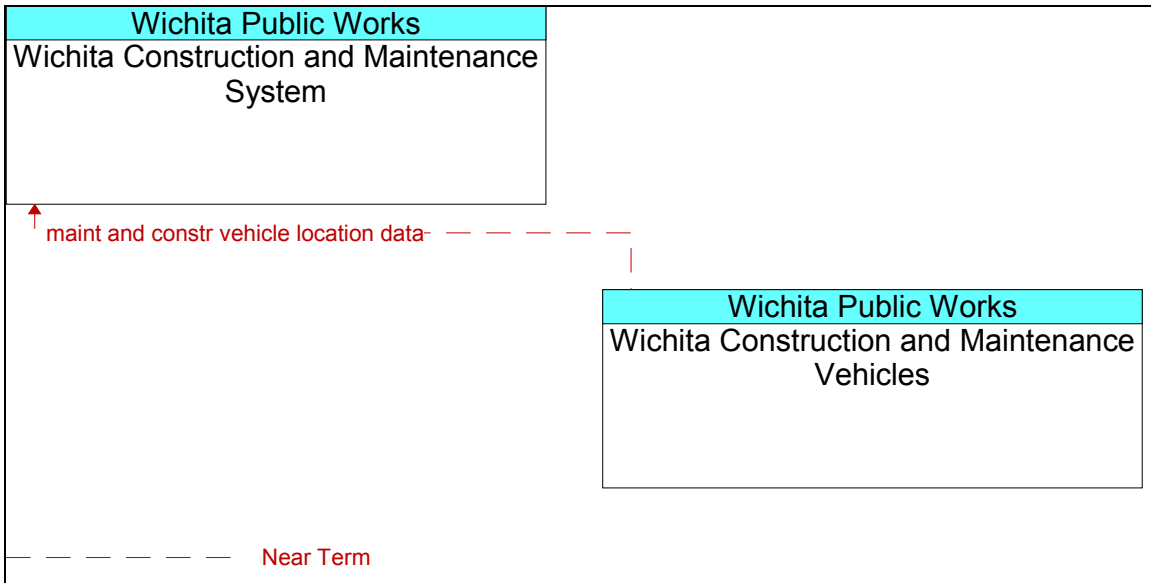


Figure 28. Wichita Maintenance and Construction Vehicle and Equipment Tracking

4.19 Road Weather Data Collection

The Road Weather Data Collection service (Figure 29) collects current road and weather conditions using data collected from KDOT and Kansas Turnpike Authority environmental sensors deployed on and about the roadway (or guideway in the case of transit related rail systems). In addition to fixed sensor stations at the roadside, sensing of the roadway environment is planned from sensor systems located on KDOT, City of Wichita, Sedgwick County, and Suburban Maintenance and Construction Vehicles and on-board sensors provided by auto manufacturers. The collected environmental data is used by the Weather Information Processing and Distribution Service to process the information and make decisions on operations.

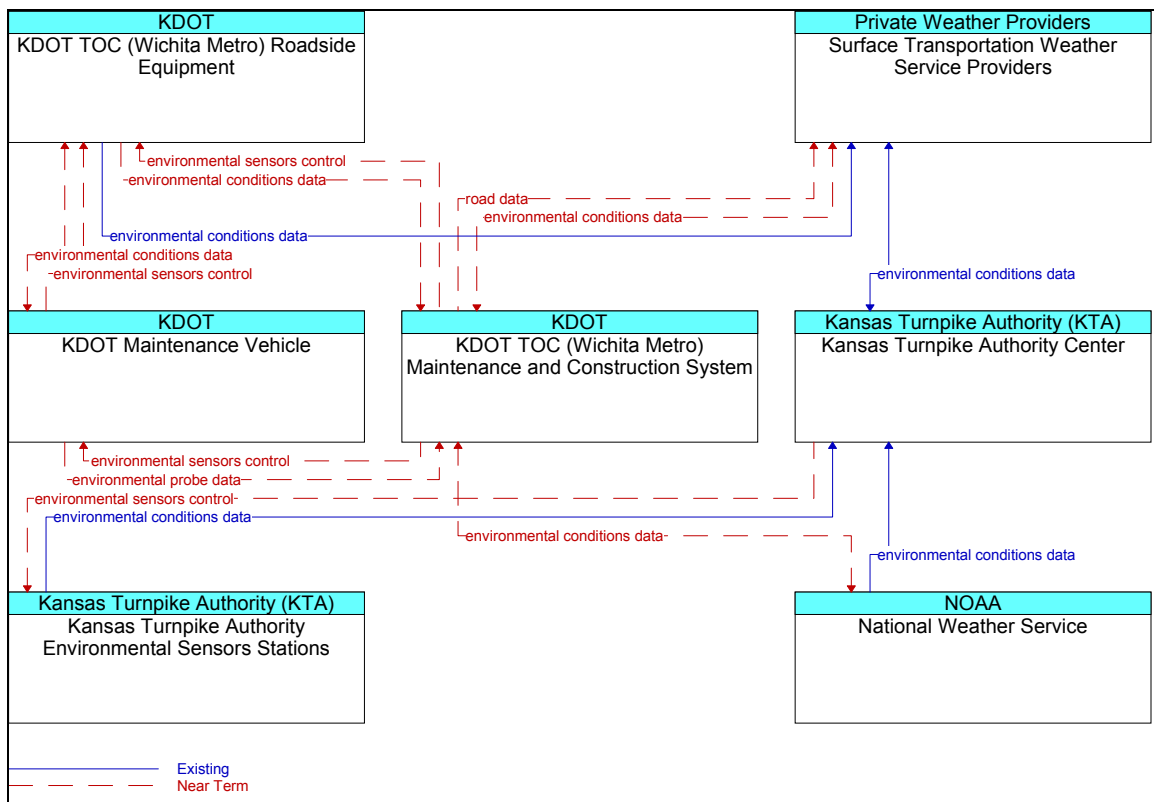


Figure 29. Road Weather Data Collection

4.20 Weather Information Processing and Distribution

The Weather Information Processing and Distribution service (Figure 30 and Figure 31) processes and distributes the environmental information collected from the Road Weather Data Collection service. This service uses the environmental data to detect environmental hazards such as icy road conditions, high winds, dense fog, etc. so system operators and decision support systems can make decision on corrective actions to take. The continuing updates of road condition information and current temperatures can be used by system operators to more effectively deploy road maintenance resources, issue general traveler advisories, issue location specific warnings to drivers using the Traffic Information Dissemination service, and aid operators in scheduling work activity.

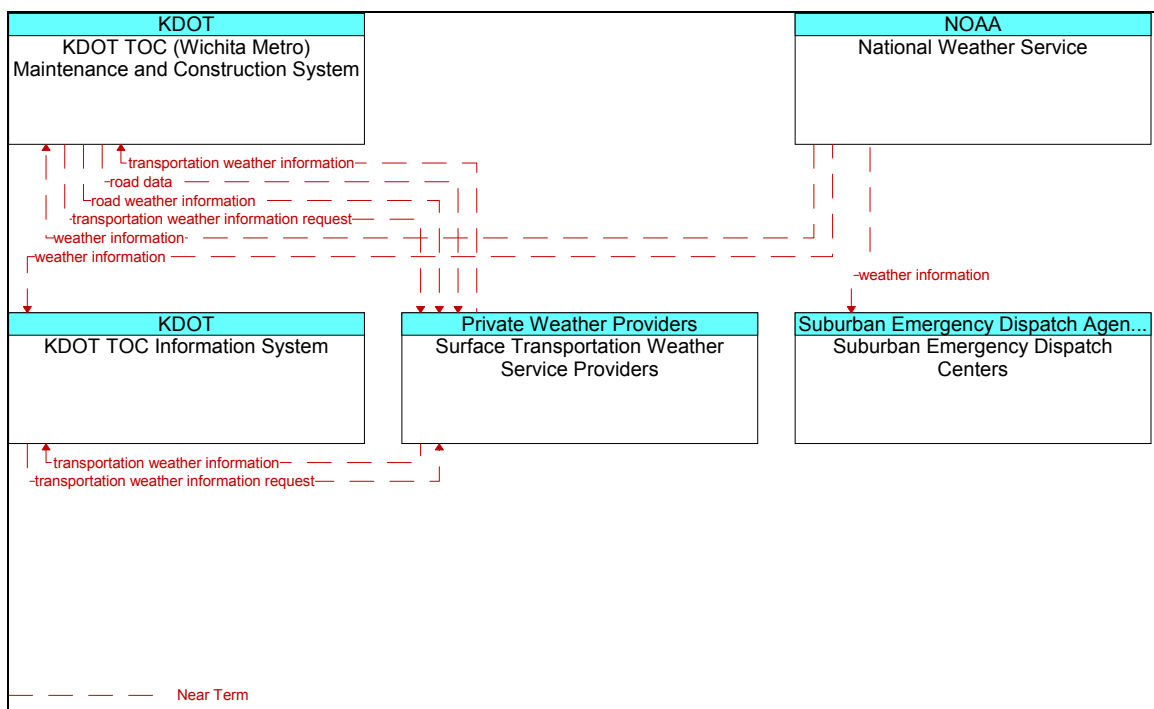


Figure 30. Weather Information Processing and Distribution (Part 1)

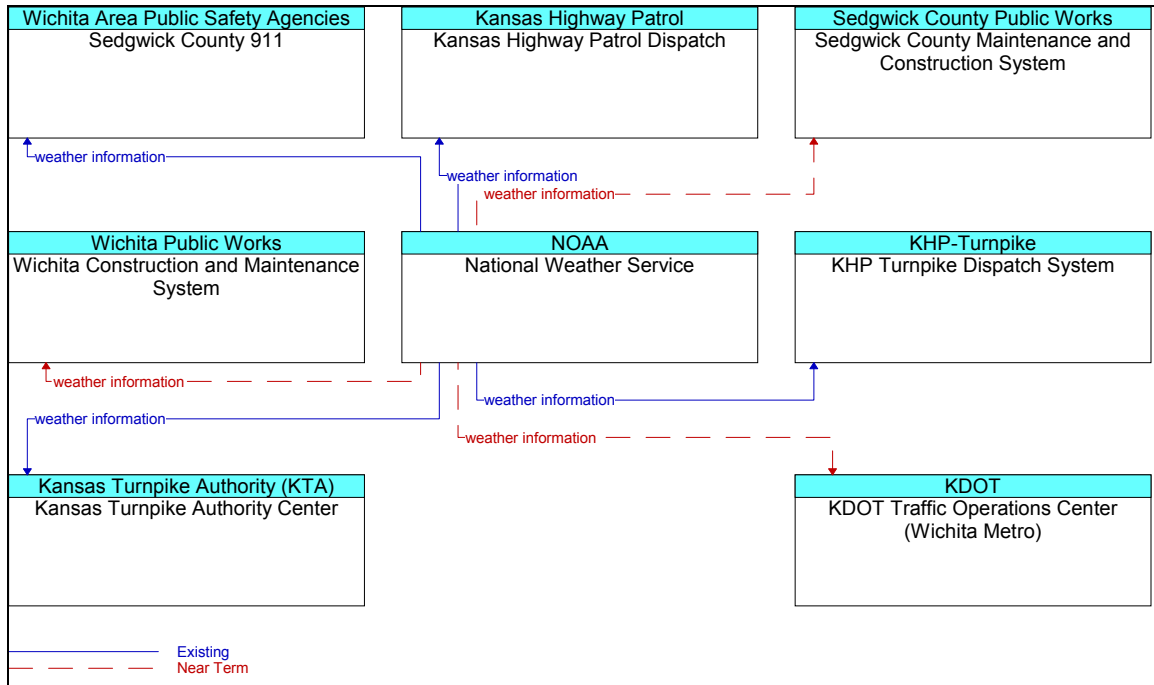


Figure 31. Weather Information Processing and Distribution (Part 2)

4.21 Roadway Automated Treatment

The Roadway Automated Treatment service (Figure 32) describes how KDOT’s roadway equipment automatically treats a roadway section based on environmental or atmospheric conditions. Treatments include fog dispersion, anti-icing chemicals, etc. The service includes KDOT’s environmental sensors that detect adverse conditions, the automated treatment system itself, and driver information systems (e.g., dynamic message signs) that warn drivers when the treatment system is activated.

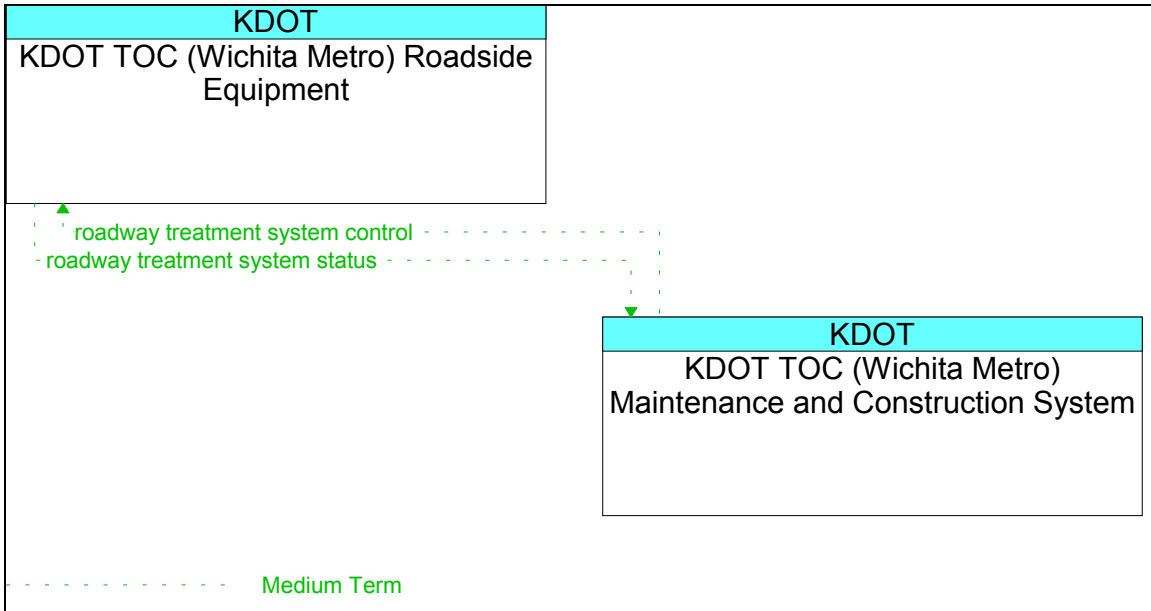


Figure 32. Roadway Automated Treatment

4.22 KDOT Winter Maintenance

The KDOT Winter Maintenance service (Figure 33) supports KDOT’s winter road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), and other snow and ice control activities. This service monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.

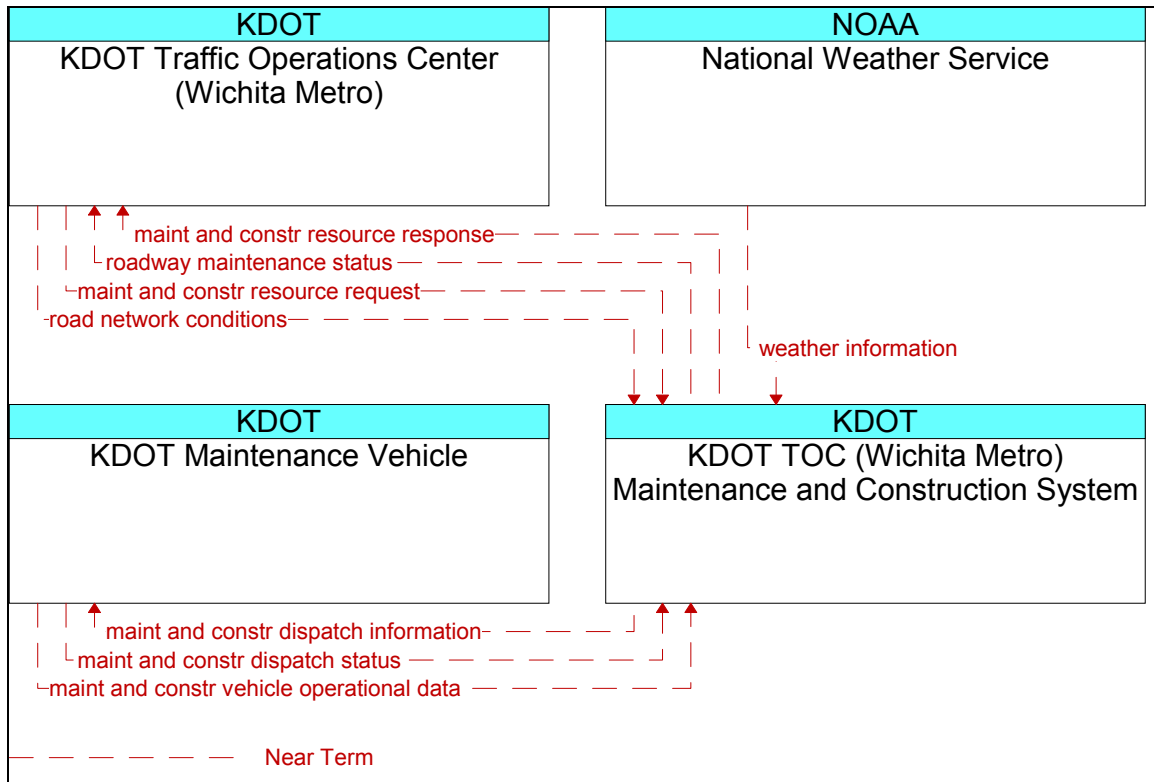


Figure 33. KDOT Winter Maintenance

4.23 Sedgwick County Winter Maintenance

The Sedgwick County Winter Maintenance service (Figure 34) supports Sedgwick County’s winter road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), and other snow and ice control activities. This service monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.

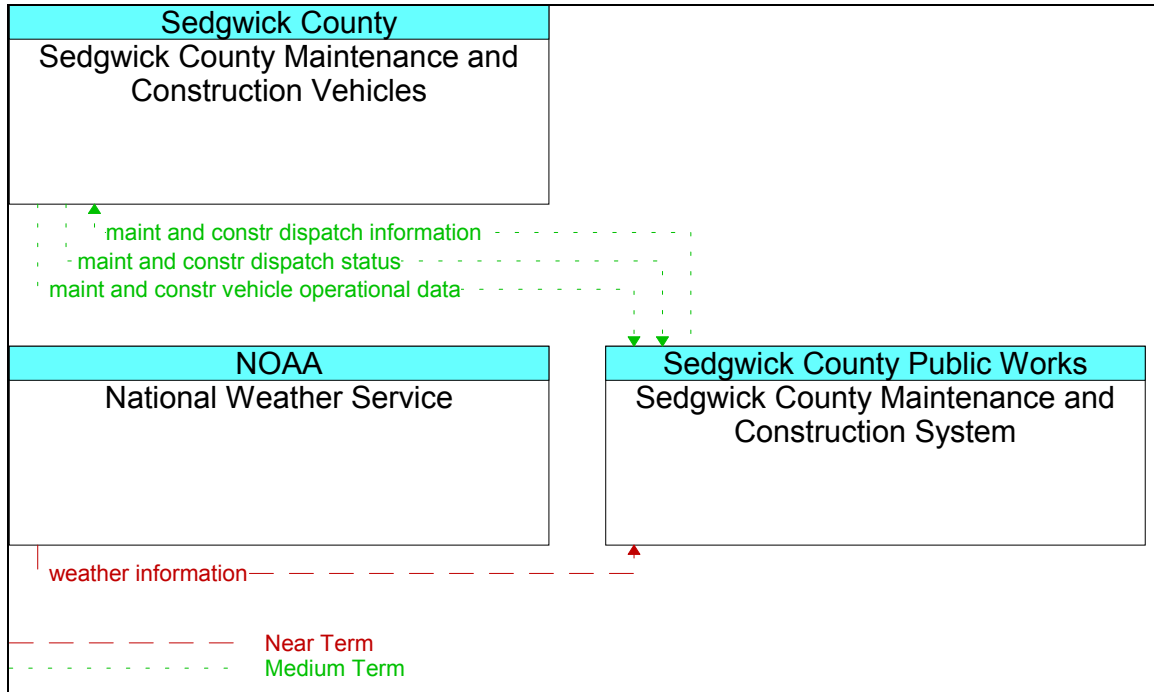


Figure 34. Sedgwick County Winter Maintenance

4.24 Wichita Winter Maintenance

The Wichita Winter Maintenance service (Figure 35) supports the City of Wichita’s winter road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), and other snow and ice control activities. This service monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.

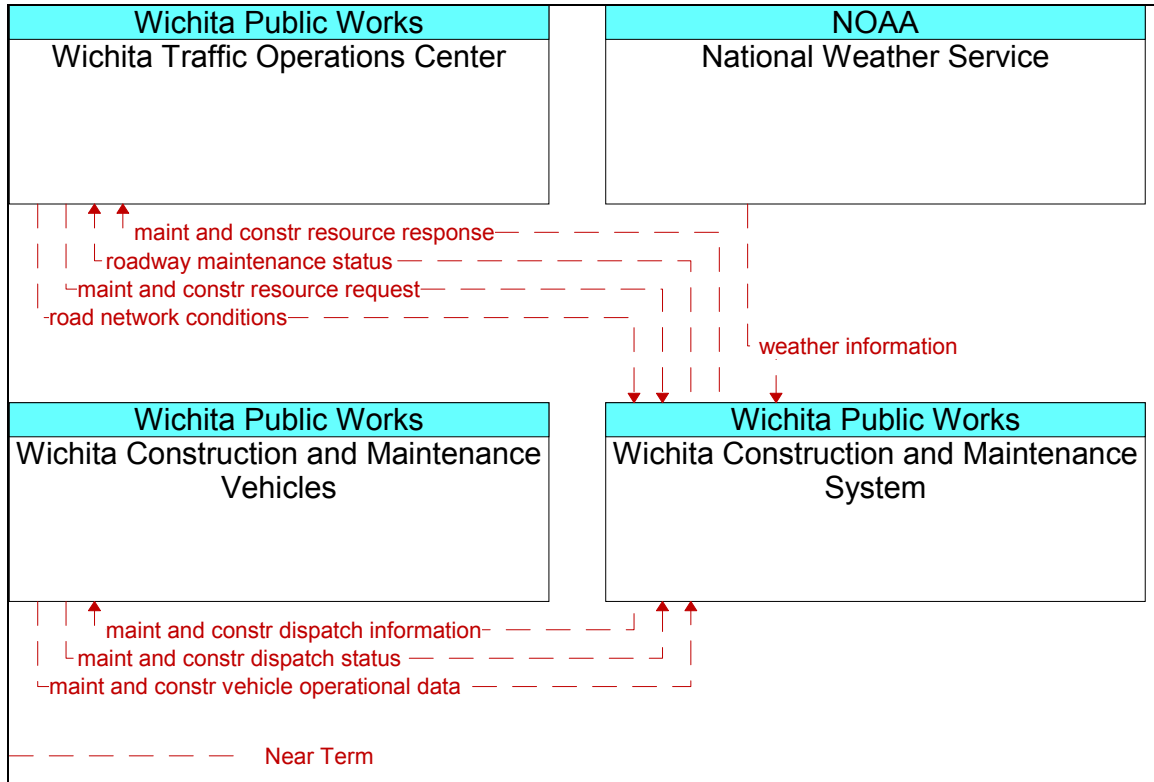


Figure 35. Wichita Winter Maintenance

4.25 KDOT Roadway Maintenance and Construction

The KDOT Roadway Maintenance and Construction service (Figure 36) supports KDOT’s numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way. Maintenance services would include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, CCTV, etc.). Environmental conditions information is also received from the National Weather Service to aid in scheduling maintenance and construction activities.

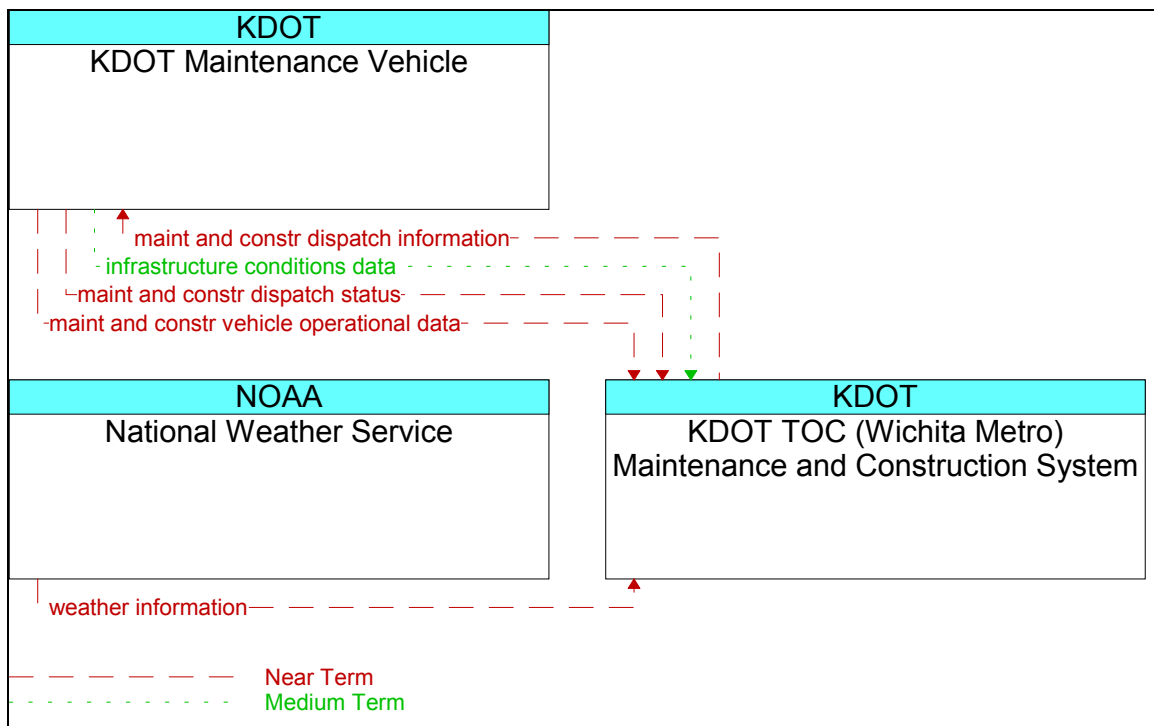


Figure 36. KDOT Roadway Maintenance and Construction

4.26 Sedgwick County Roadway Maintenance and Construction

The Sedgwick County Roadway Maintenance and Construction service (Figure 37) supports Sedgwick County’s numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way. Maintenance services would include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, CCTV, etc.).

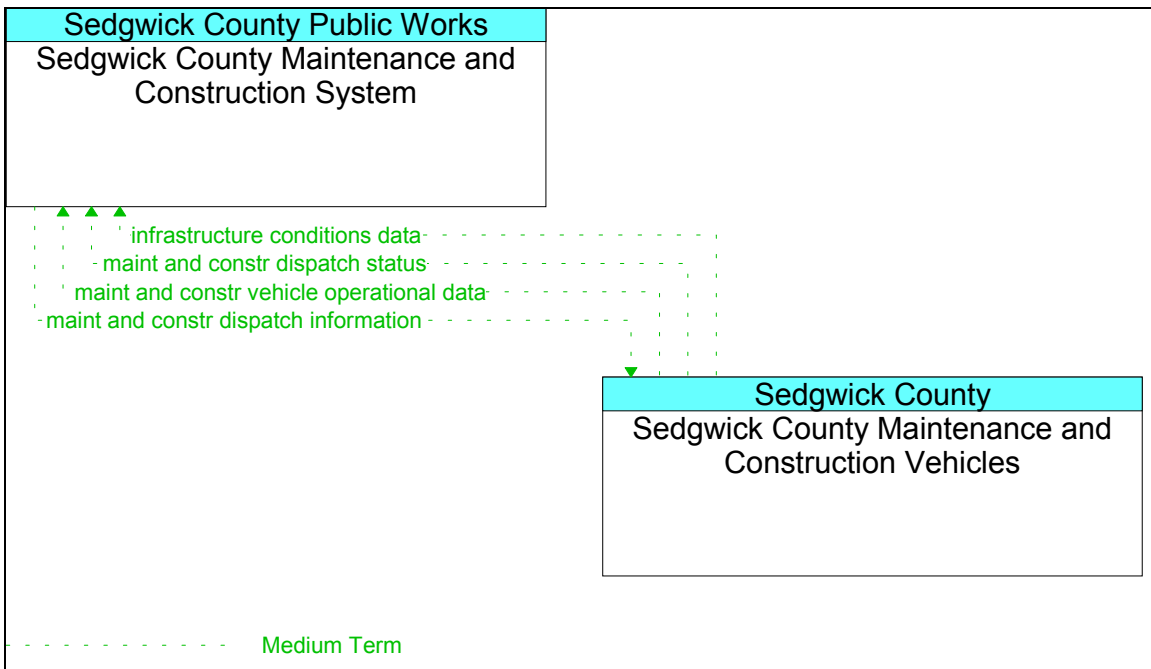


Figure 37. Sedgwick County Roadway Maintenance and Construction

4.27 Wichita Roadway Maintenance and Construction

The Wichita Roadway Maintenance and Construction service (Figure 38) supports the City of Wichita’s numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way. Maintenance services would include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, CCTV, etc.).

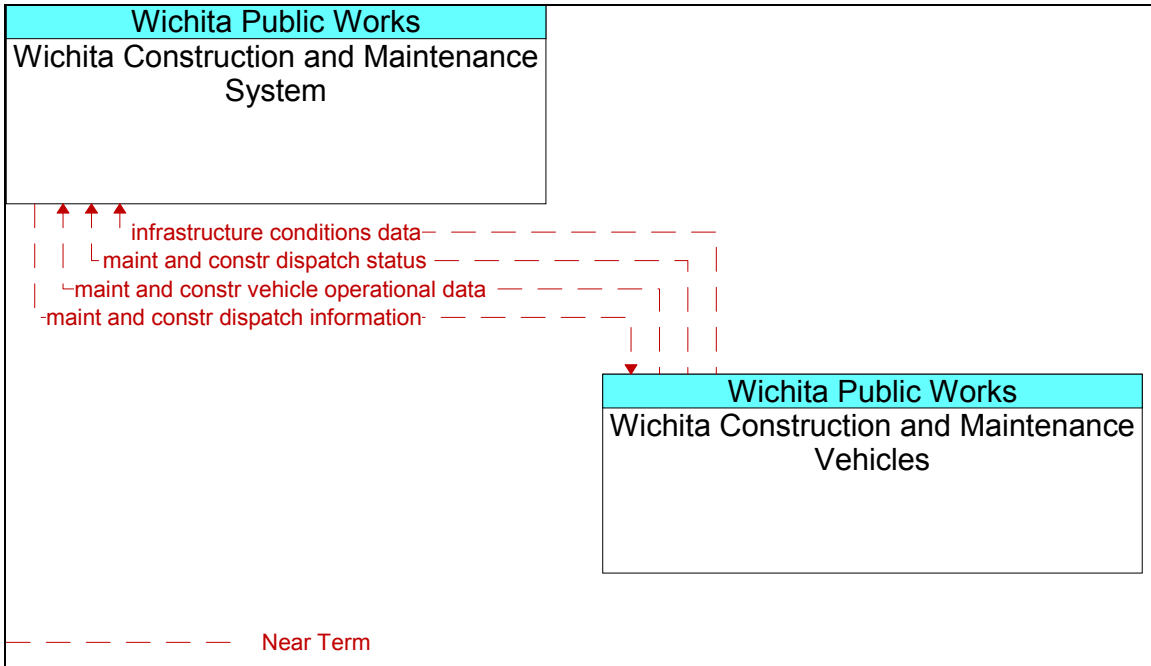


Figure 38. Wichita Roadway Maintenance and Construction

4.28 KDOT Work Zone Management

The KDOT Work Zone Management service (Figure 39, Figure 40 and Figure 41) directs activity in KDOT’s work zones, controlling traffic through portable dynamic message signs (DMS) and informing other groups of activity (e.g., KDOT TOC Information System, Wichita Traffic Operations Center, other Wichita-Sedgwick and Suburban maintenance and construction centers) for better coordination management. Work zone speeds and delays are provided to the motorist prior to the work zones.

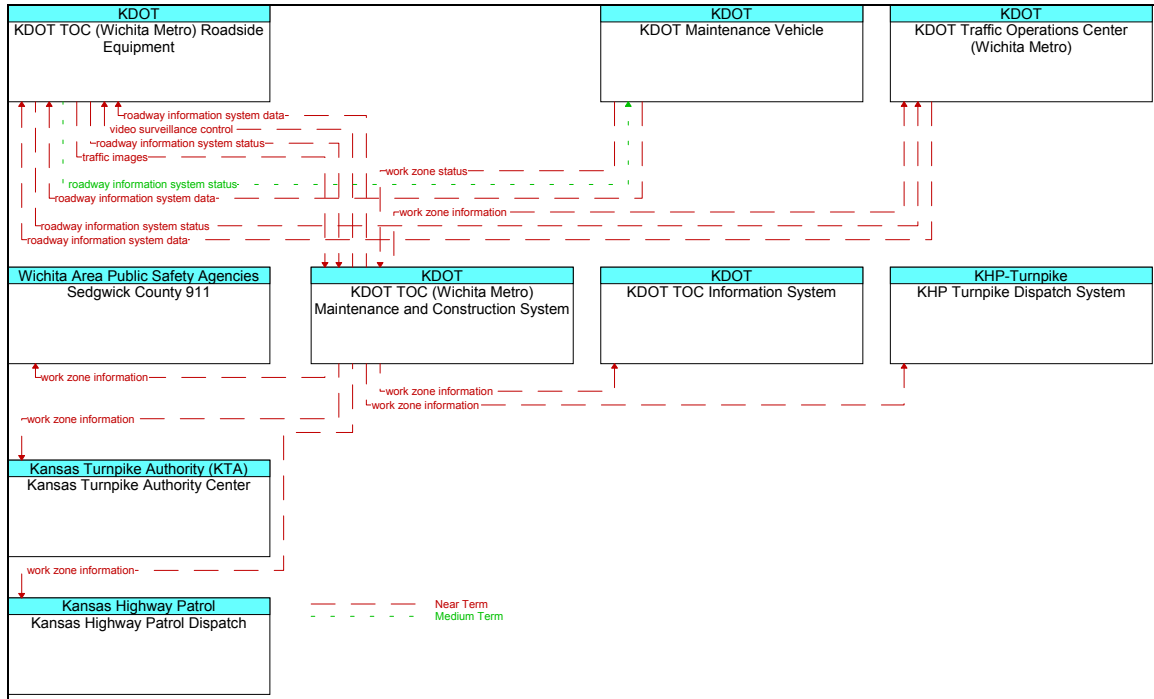


Figure 39. KDOT Work Zone Management (Part 1)

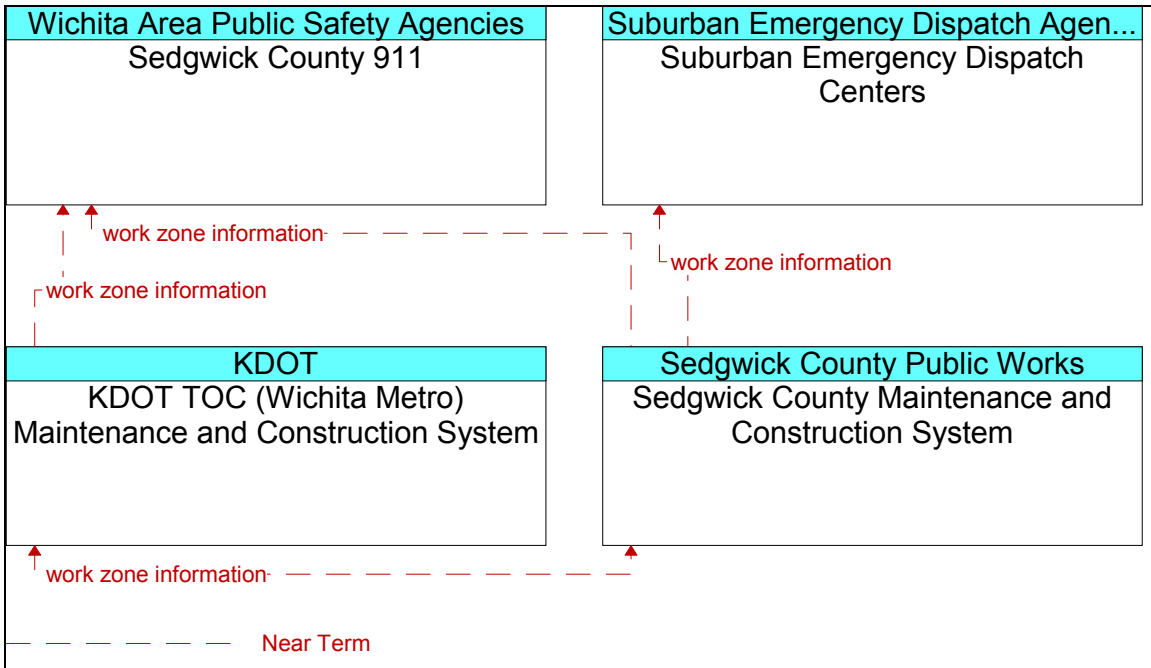


Figure 40. KDOT Work Zone Management (Part 2)

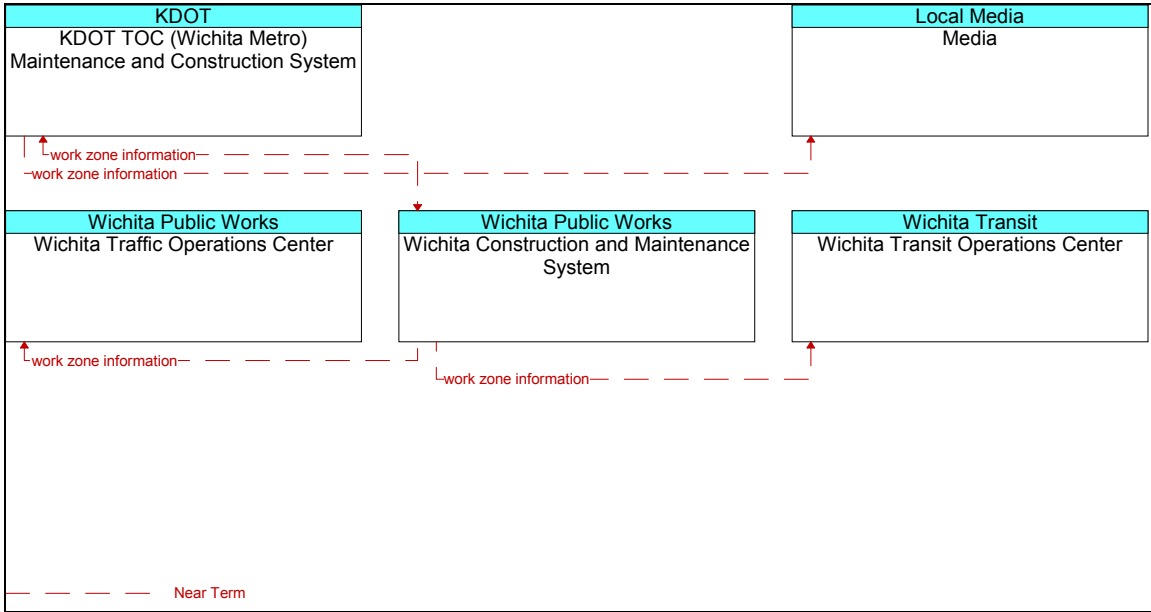


Figure 41. KDOT Work Zone Management (Part 3)

4.29 Maintenance and Construction Activity Coordination

The Maintenance and Construction Activity Coordination service (Figure 42, Figure 43 and Figure 44) supports the dissemination of maintenance and construction activity to all Wichita-Sedgwick County and Suburban centers that can utilize it as part of their operations, and also to the KDOT TOC Information System that provides the information to travelers.

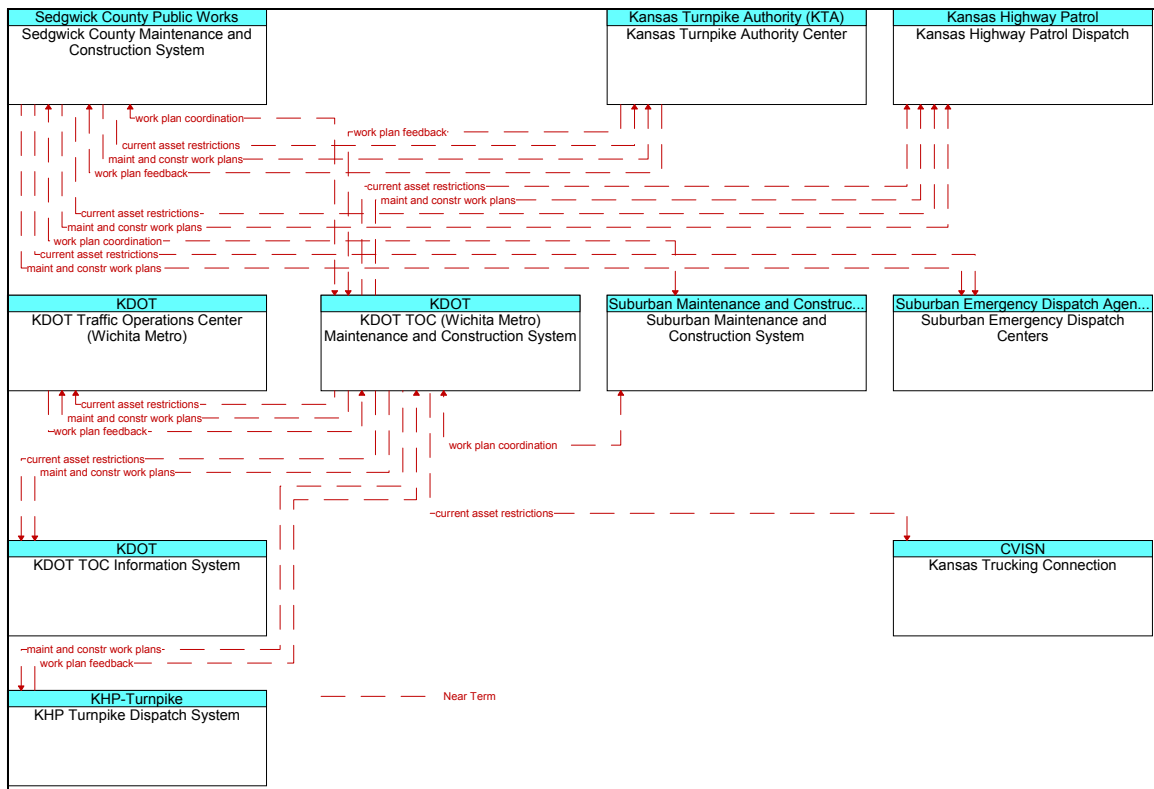


Figure 42. Maintenance and Construction Activity Coordination (Part 1)

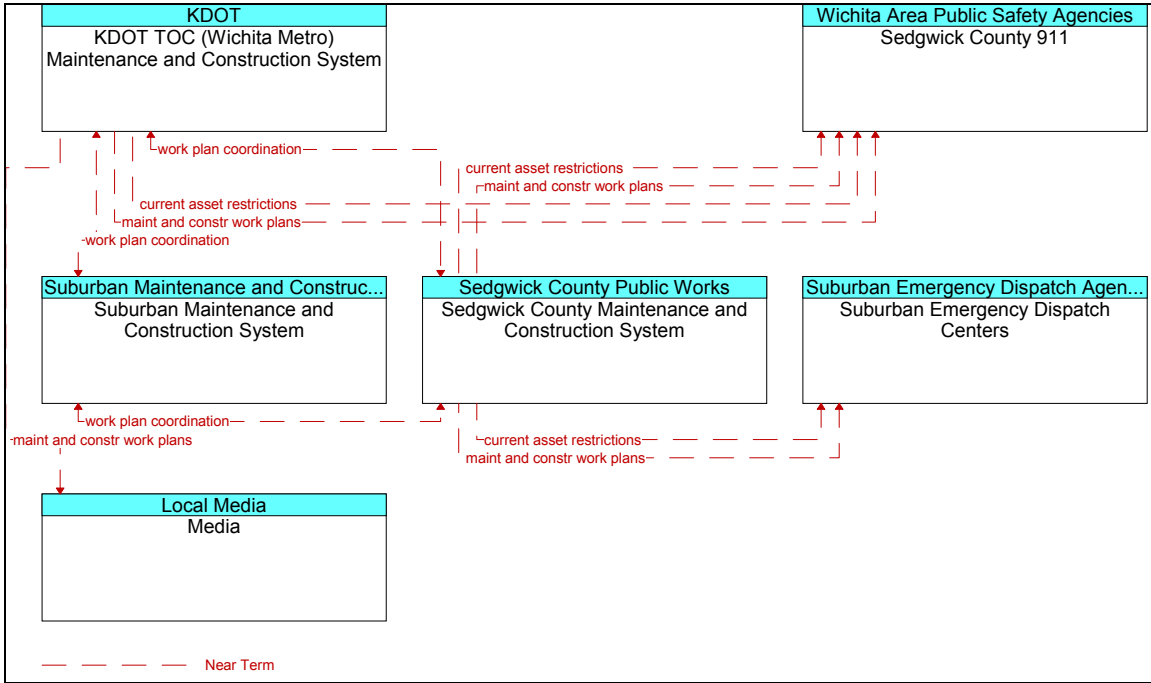


Figure 43. Maintenance and Construction Activity Coordination (Part 2)

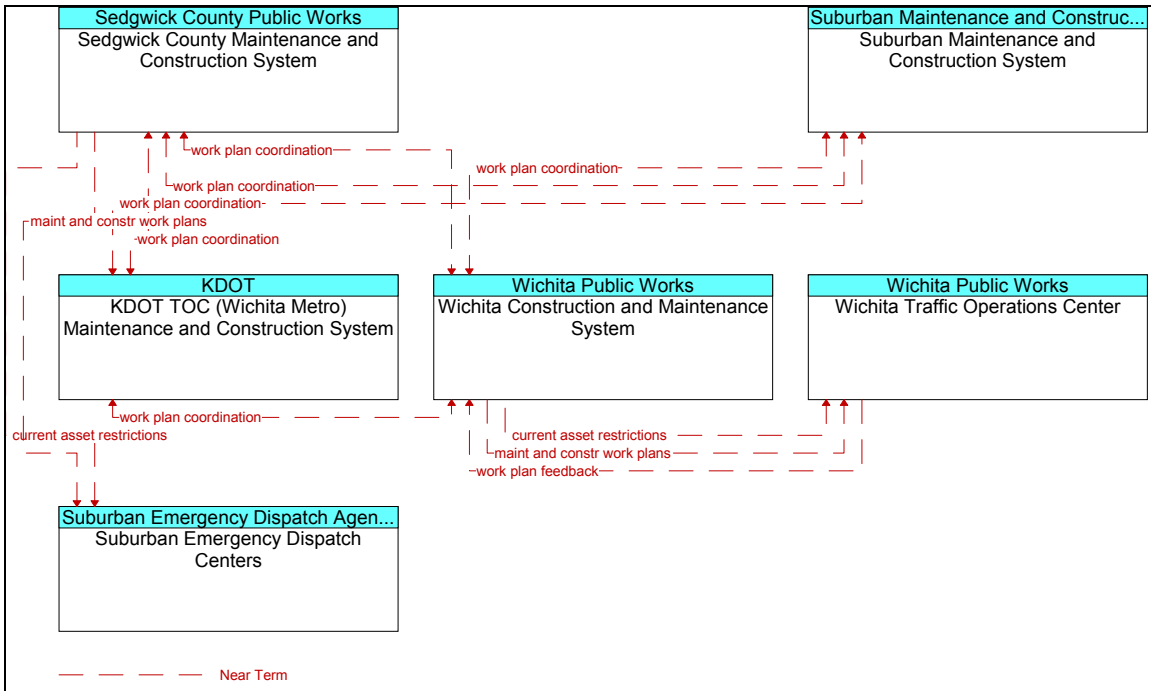


Figure 44. Maintenance and Construction Activity Coordination (Part 3)

4.30 Sedgwick County Department on Aging Transit Vehicle Tracking

The Sedgwick County Department on Aging Transit Vehicle Tracking services (Figure 45) monitors current Sedgwick County Department of Aging Transit Vehicle location using an Automated Vehicle Location System. The location data may be used to determine real time schedule adherence and update the transit system’s schedule in real-time. Vehicle position may be determined either by the vehicle (e.g., through GPS) and relayed to the infrastructure or may be determined directly by the communications infrastructure. A two-way wireless communication link with the Sedgwick County Transportation Brokerage System is used for relaying vehicle position and control measures. Fixed route transit systems may also employ beacons along the route to enable position determination and facilitate communications with each vehicle at fixed intervals. The Sedgwick County Transportation Brokerage System processes this information, updates the transit schedule and makes real-time schedule information available to users.

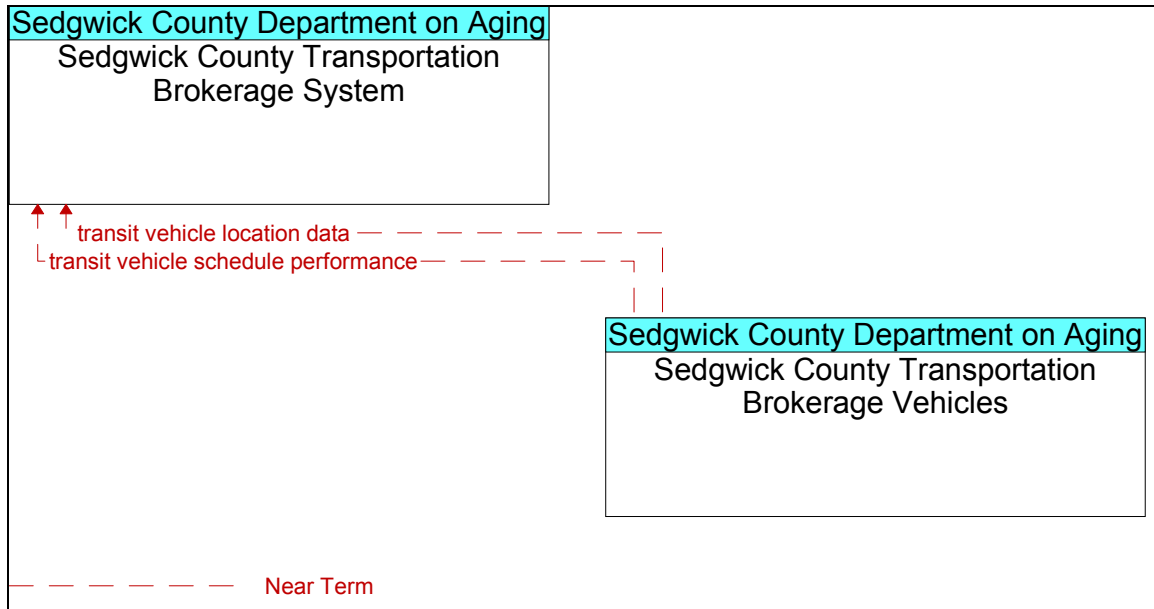


Figure 45. Sedgwick County Department on Aging Transit Vehicle Tracking

4.31 Wichita Transit Vehicle Tracking

The Wichita Transit Vehicle Tracking service (Figure 46) monitors current City of Wichita Transit Vehicle location using an Automated Vehicle Location System. The location data may be used to determine real time schedule adherence and update the transit system’s schedule in real-time. Vehicle position may be determined either by the vehicle (e.g., through GPS) and relayed to the infrastructure or may be determined directly by the communications infrastructure. A two-way wireless communication link with the Sedgwick County Transportation Brokerage System is used for relaying vehicle position and control measures. Fixed route transit systems may also employ beacons along the route to enable position determination and facilitate communications with each vehicle at fixed intervals. The Wichita Transit Operations Center processes this information, updates the transit schedule and makes real-time schedule information available to the Wichita Transit Customer Information System.

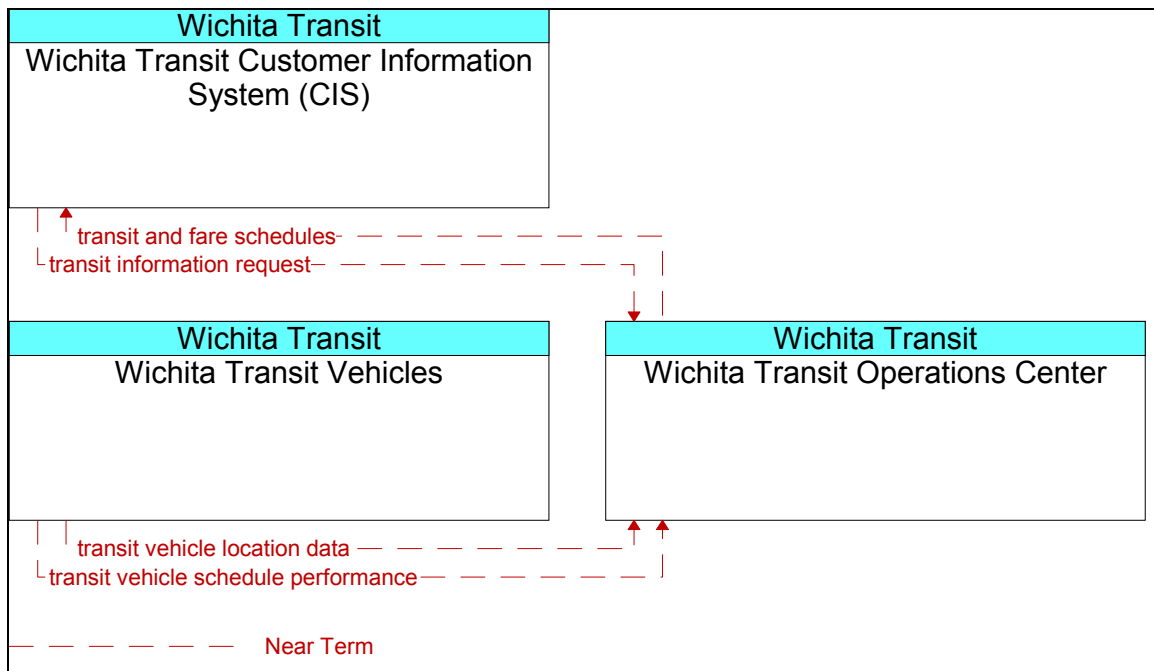


Figure 46. Wichita Transit Vehicle Tracking

4.32 Transit Fixed-Route Operations

The Transit Fixed-Route Operations service (Figure 47 and Figure 48) performs vehicle routing and scheduling for the Wichita Transit Operations Center, as well as automatic operator assignment and system monitoring for fixed-route and flexible-route transit services. This service determines current schedule performance using AVL data and provides information displays at the Wichita Transit Operations Center. Static and real time transit data is exchanged with the Wichita Transit Customer Information System where it has the ability to be integrated with other transportation modes (e.g. rail, air) to provide the public with integrated and personalized dynamic schedules.

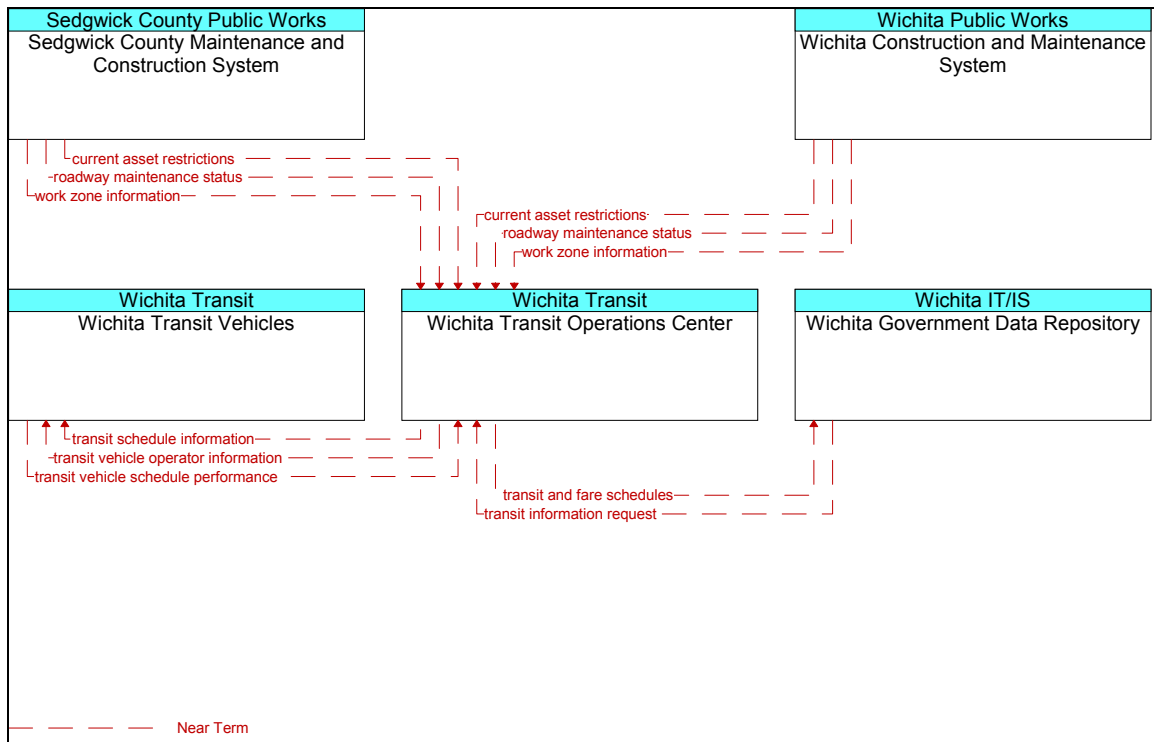


Figure 47. Transit Fixed-Route Operations (Part 1)

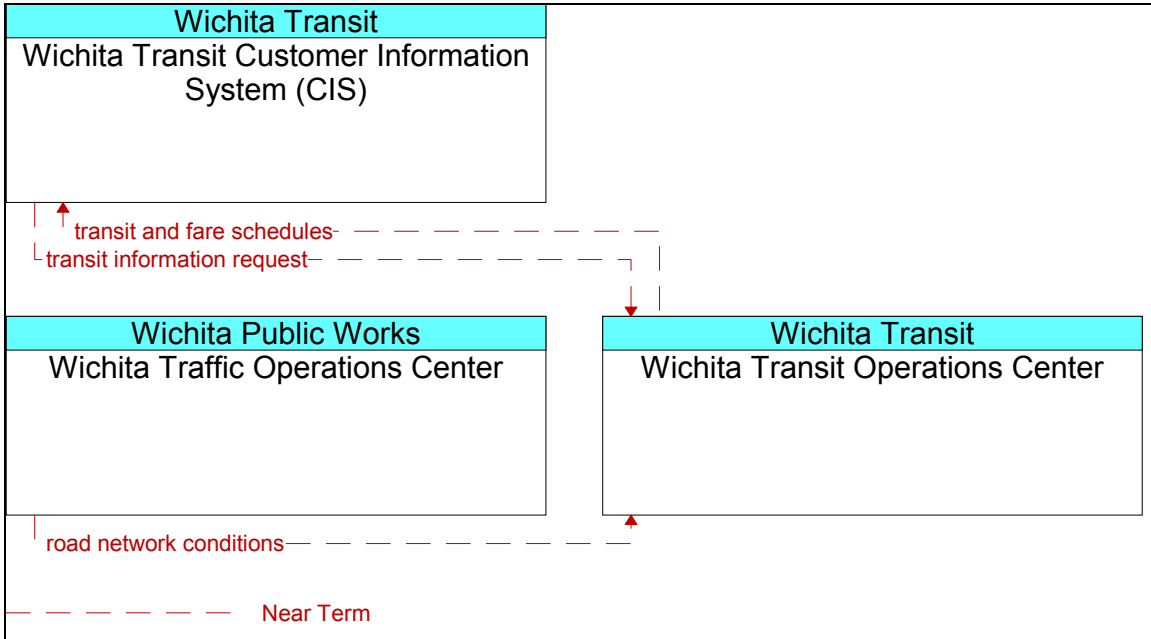


Figure 48. Transit Fixed-Route Operations (Part 2)

4.33 Sedgwick County Department on Aging Demand Response Transit Operations

The Sedgwick County Department on Aging Demand Response Transit Operations service (Figure 49) performs vehicle routing and scheduling as well as automatic operator assignment and monitoring for the Sedgwick County Transportation Brokerage System demand responsive transit services. In addition, this service performs similar functions to support dynamic features of flexible-route transit services. This package monitors the current status of the Sedgwick County Transportation Brokerage System transit fleet and supports allocation of these fleet resources to service incoming requests for transit service while also considering traffic conditions. The Sedgwick County Transportation Brokerage System provides the necessary data processing and information display to assist the transit operator in making optimal use of the transit fleet.

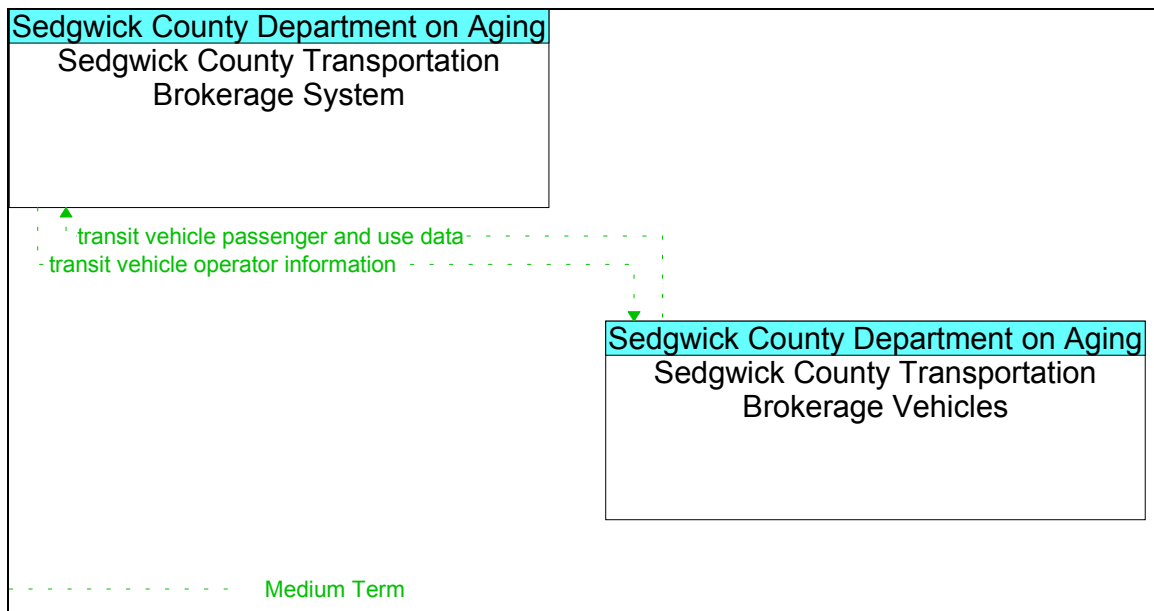


Figure 49. Sedgwick County Department on Aging Demand Response Transit Operations

4.34 Wichita Transit Demand Response Transit Operations

The Wichita Transit Demand Response Transit Operations service (Figure 50) performs vehicle routing and scheduling as well as automatic operator assignment and monitoring for the Wichita Transit Operations Center demand responsive transit services. In addition, this service performs similar functions to support dynamic features of flexible-route transit services. This package monitors the current status of the Wichita Transit Operations Center transit fleet and supports allocation of these fleet resources to service incoming requests for transit service while also considering traffic conditions. The Wichita Transit Operations Center provides the necessary data processing and information display to assist the transit operator in making optimal use of the transit fleet.

This service includes the capability for a traveler request for personalized transit services to be made through the Wichita Transit Customer Information System. The Wichita Transit Customer Information System may either be operated by the Wichita Transit Operations Center or be independently owned and operated by a separate service provider. In the first scenario, the traveler makes a direct request to a specific paratransit service. In the second scenario, a third party service provider determines that the paratransit service is a viable means of satisfying a traveler request and makes a reservation for the traveler.

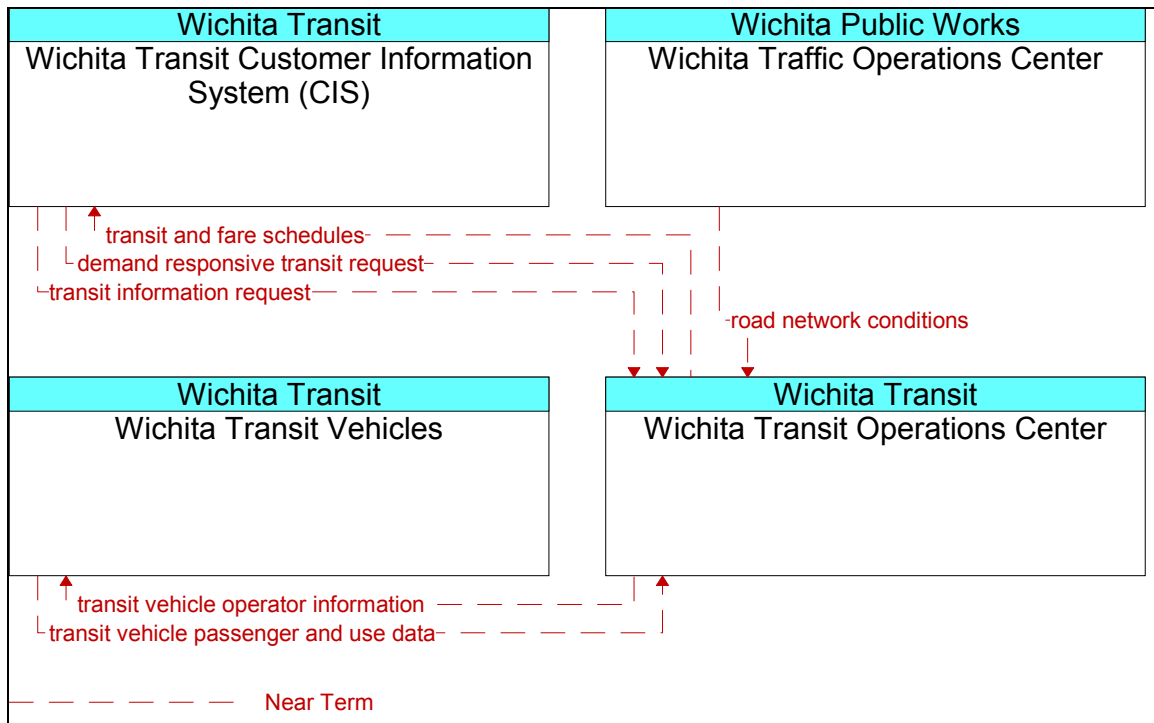


Figure 50. Wichita Transit Demand Response Transit Operations

4.35 Transit Passenger and Fare Management

The Transit Passenger and Fare Management service (Figure 51) manages passenger loading and fare payments on-board Wichita Transit vehicles using electronic means. It allows transit users to use a traveler card or other electronic payment device. Sensors mounted on the vehicle permit the operator and central operations to determine vehicle loads, and readers located either in the infrastructure or on-board the Wichita Transit vehicle allow electronic fare payment. Data is processed, stored, and displayed on the transit vehicle and communicated as needed to the Wichita Transit Operations Center.

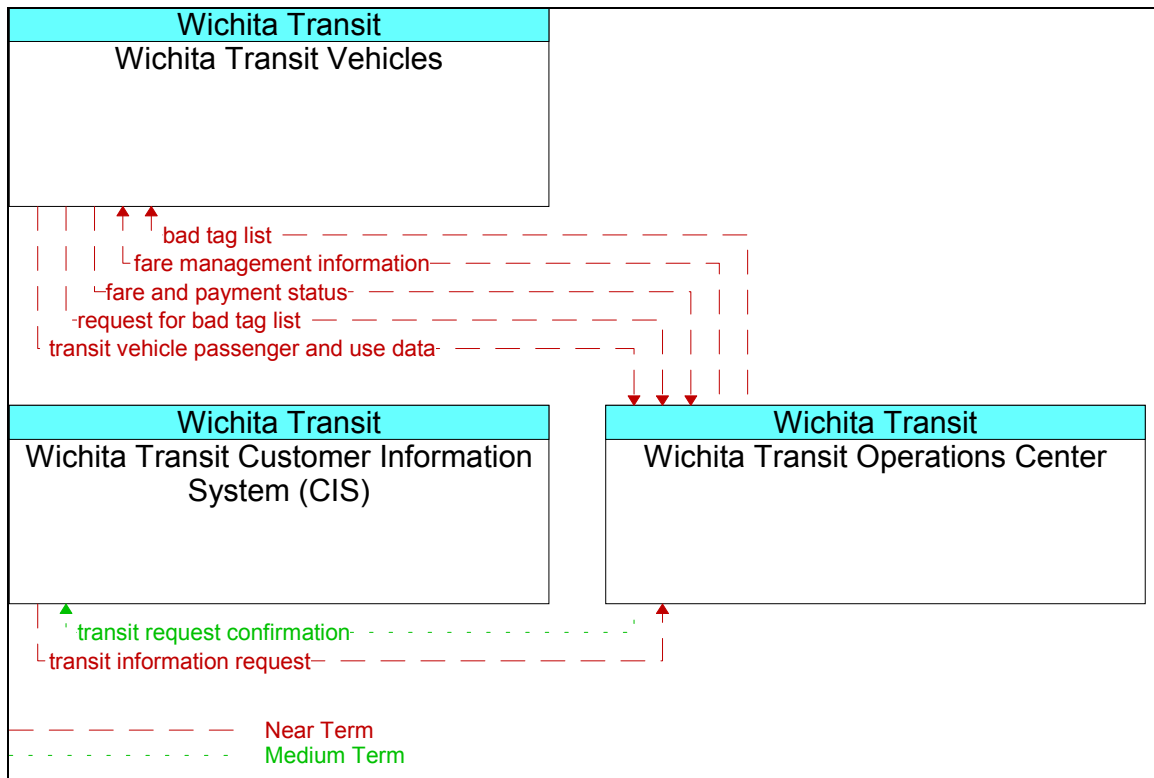


Figure 51. Transit Passenger and Fare Management

4.36 Transit Security

The Transit Security service (Figure 52) provides for the physical security of transit passengers and Wichita Transit vehicle operators. On-board equipment is deployed to perform surveillance and sensor monitoring in order to warn of potentially hazardous situations. The surveillance equipment includes video (e.g., CCTV cameras), audio systems and/or event recorder systems. The sensor equipment includes threat sensors (e.g., chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors (e.g., metal detectors). Transit user or Wichita transit vehicle operator activated alarms are provided on-board. Public areas (e.g., transit stops, park and ride lots, stations) are also monitored with similar surveillance and sensor equipment and provided with transit user activated alarms. In addition this service provides surveillance and sensor monitoring of non-public areas of Wichita transit facilities (e.g., transit yards) and transit infrastructure such as bridges and tunnels.

The surveillance and sensor information is transmitted to Wichita Area Public Safety Agencies, as are transit user activated alarms in public secure areas. On-board alarms, activated by transit users or Wichita transit vehicle operators are transmitted to both Wichita Area Public Safety Agencies and the Wichita Transit Operations Center, indicating two possible approaches to implementing this service.

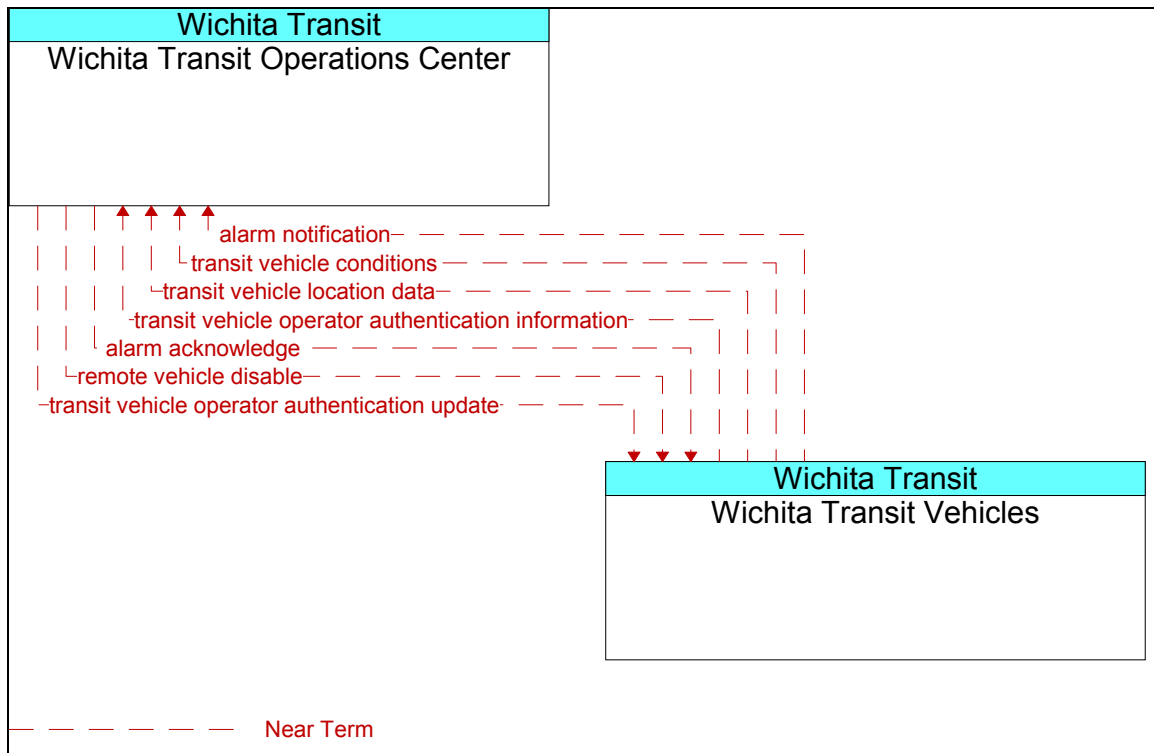


Figure 52. Transit Security

4.37 Transit Traveler Information

The Transit Traveler Information service (Figure 53) provides transit users at transit stops and on-board transit vehicles with ready access to transit information in the Wichita Area. The information services include transit stop annunciation, imminent arrival signs, and real-time transit schedule displays that are of general interest to transit users. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by this service.

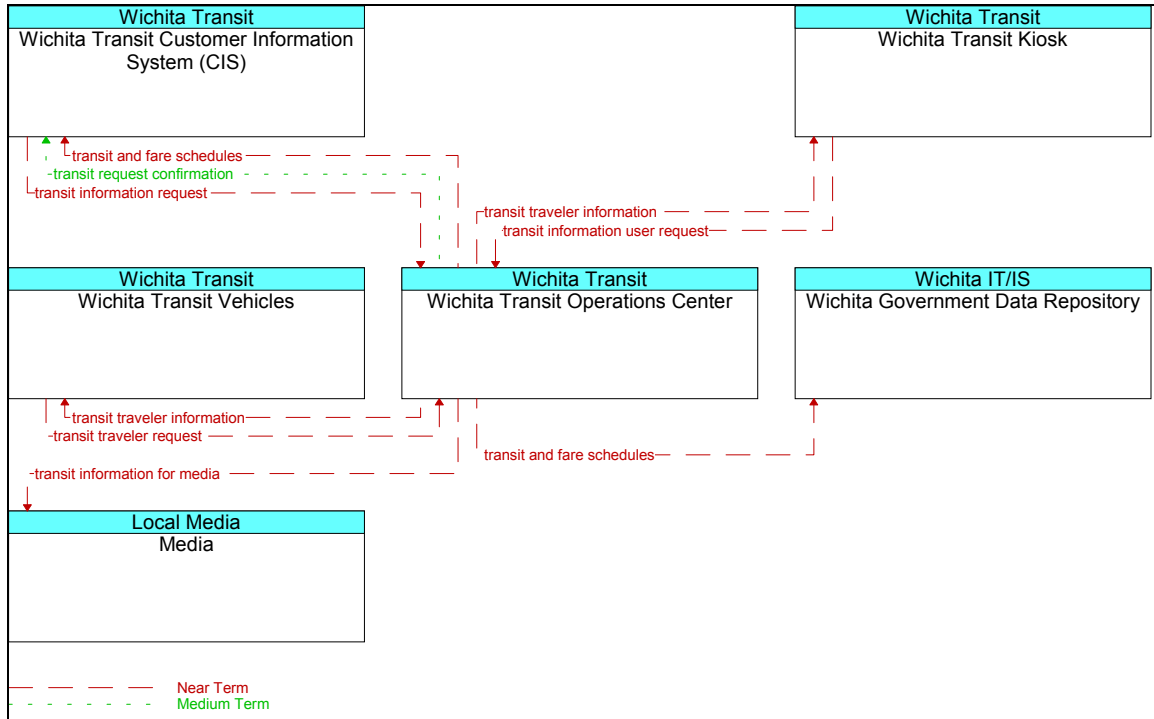


Figure 53. Transit Traveler Information

4.38 KDOT TOC Information System Broadcast Traveler Information

The KDOT TOC Information System Broadcast Traveler Information service (Figure 54) collects traffic conditions, advisories, general public transportation, incident information, roadway maintenance and construction information, air quality and weather information, and broadly disseminates this information through existing infrastructures and low cost user equipment (e.g., FM subcarrier, cellular data broadcast). The information may be provided directly to travelers or provided to merchants and other traveler service providers so that they can better inform their customers of travel conditions. Different from the Traffic Information Dissemination service, which provides localized HAR and DMS information capabilities, the KDOT TOC Information System Broadcast Traveler Information service provides a wide area digital broadcast service. Successful deployment of this service relies on availability of real-time traveler information from roadway instrumentation or other sources.

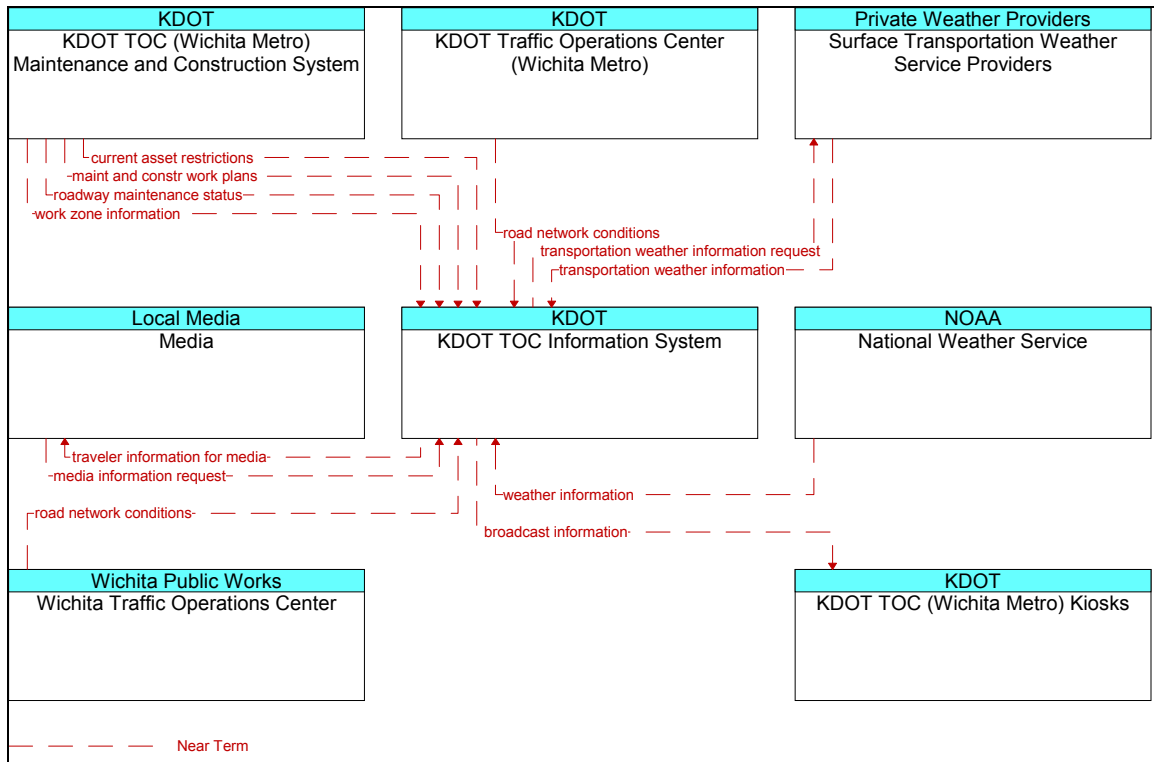


Figure 54. KDOT TOC Information System Broadcast Traveler Information

4.39 Wichita Mid-Continent Airport Broadcast Traveler Information

The Wichita Mid-Continent Airport Broadcast Traveler Information (Figure 55) collects advisories, general public transportation, parking information, roadway maintenance and construction information, and weather information, and broadly disseminates this information through existing infrastructures and low cost user equipment (e.g., FM subcarrier, cellular data broadcast) to airline patrons. The information may be provided directly to travelers or provided to merchants and other traveler service providers so that they can better inform their customers of travel conditions. Different from the Traffic Information Dissemination service, which provides localized HAR and DMS information capabilities, the Wichita Mid-Continent Airport Broadcast Traveler Information service provides a wide area digital broadcast service.

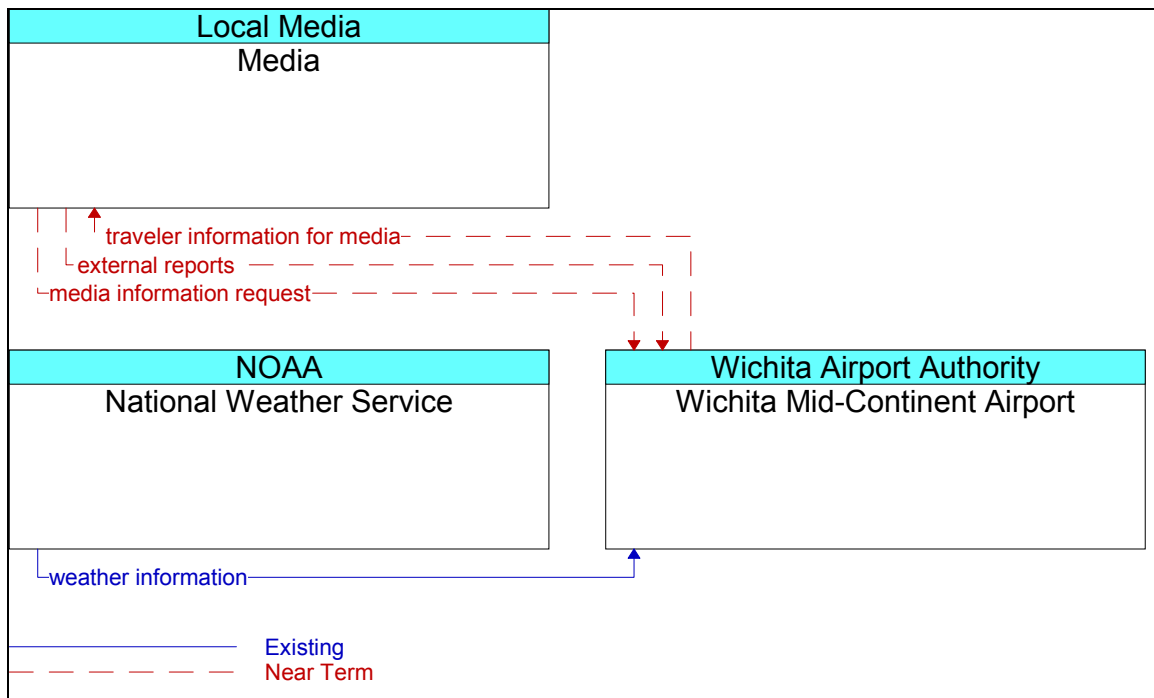


Figure 55. Wichita Mid-Continent Airport Broadcast Traveler Information

4.40 Wichita Transit CIS Broadcast Traveler Information

The Wichita Transit CIS Broadcast Traveler Information service (Figure 56) collects transit related advisories, general public transportation, air quality and weather information, and broadly disseminates this information through existing infrastructures and low cost user equipment (e.g., FM subcarrier, cellular data broadcast). The information may be provided directly to travelers or provided to merchants and other traveler service providers so that they can better inform their customers of travel conditions. Different from the Traffic Information Dissemination service, which provides localized HAR and DMS information capabilities, the Wichita Transit CIS Broadcast Traveler Information service provides a wide area digital broadcast service.

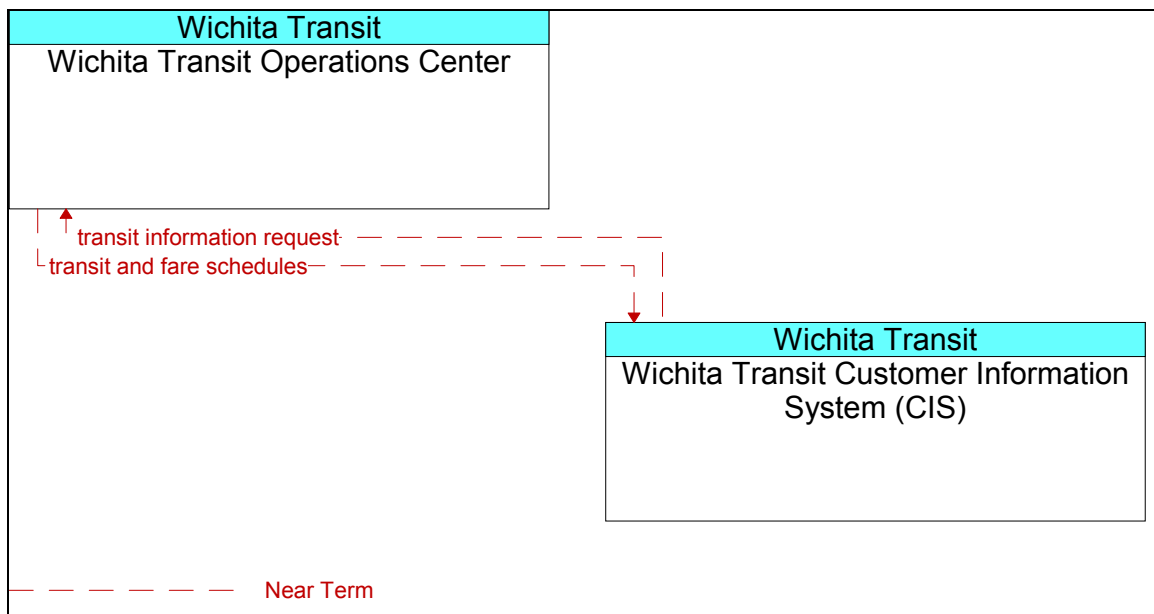


Figure 56. Wichita Transit CIS Broadcast Traveler Information

4.41 KDOT TOC Information Interactive Traveler Information

The KDOT TOC Information Interactive Traveler Information service (Figure 57) provides tailored information in response to a traveler request. Both real-time interactive request/response systems and information systems that "push" a tailored stream of information to the traveler based on a submitted profile are supported. The traveler can obtain current information regarding traffic conditions, roadway maintenance and construction, transit services, and detour information. A range of two-way wide-area wireless and fixed-point to fixed-point communications systems may be used to support the required data communications between the traveler and the KDOT TOC Information System. A variety of interactive devices may be used by the traveler to access information prior to a trip or en route including phone via the Kansas 511 system, kiosk, Personal Digital Assistant, personal computer, and a variety of in-vehicle devices. This service also allows value-added resellers to collect transportation information that can be aggregated and be available to their personal devices or remote traveler systems to better inform their customers of transportation conditions. Successful deployment of this service relies on availability of real-time transportation data from roadway instrumentation. A traveler may also input personal preferences for trip planning.

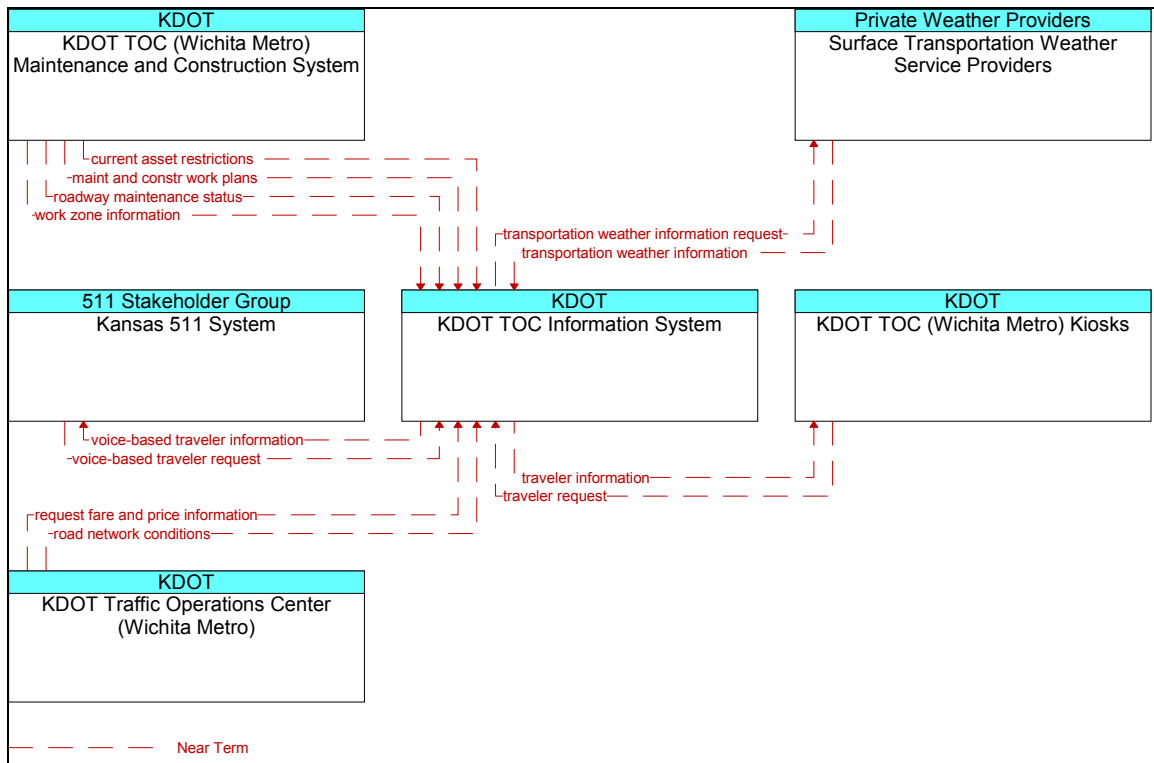


Figure 57. KDOT TOC Information Interactive Traveler Information

4.42 Wichita Transit CIS Interactive Traveler Information

The Wichita Transit CIS Interactive Traveler Information service (Figure 58) provides tailored information in response to a traveler request. Both real-time interactive request/response systems and information systems that "push" a tailored stream of information to the traveler based on a submitted profile are supported. The traveler can obtain current information regarding transit services, and detour information. A range of two-way wide-area wireless and fixed-point to fixed-point communications systems may be used to support the required data communications between the traveler and the Wichita Transit CIS. A variety of interactive devices may be used by the traveler to access information prior to a trip or en route including phone via the Kansas 511 system, kiosk, Personal Digital Assistant, personal computer, and a variety of in-vehicle devices. This service also allows value-added resellers to collect transit information that can be aggregated and be available to their personal devices or remote traveler systems to better inform their customers of transportation conditions. A traveler may also input personal preferences for trip planning.

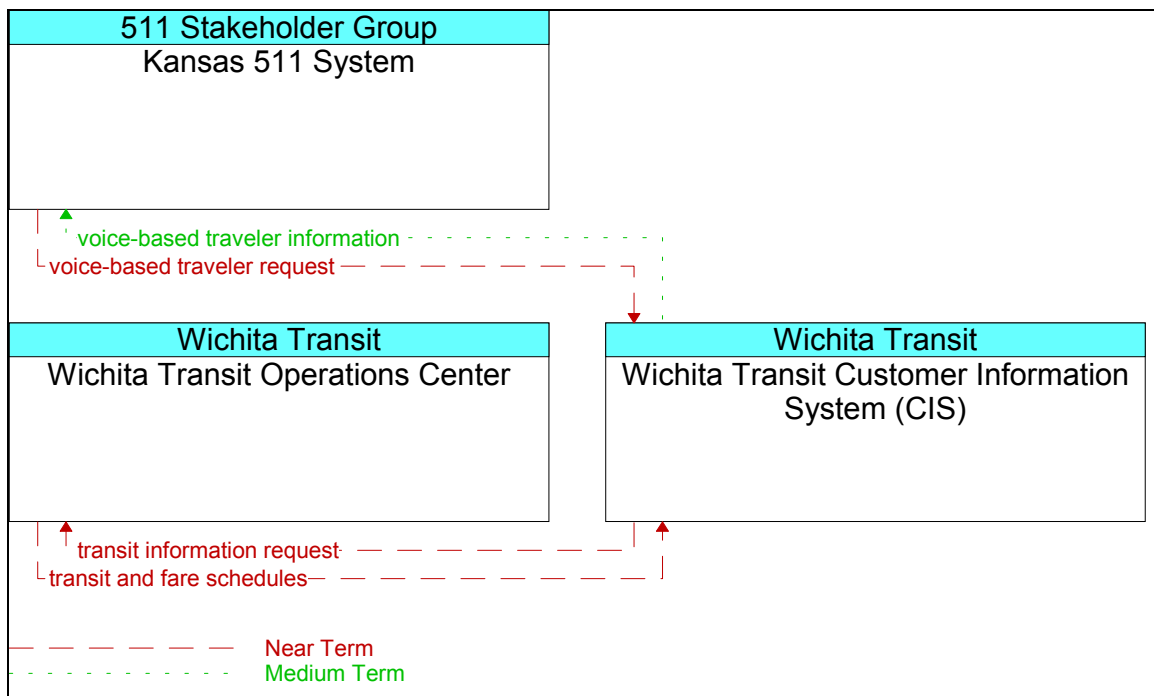


Figure 58. Wichita Transit CIS Interactive Traveler Information

4.43 Electronic Clearance

The Electronic Clearance service (Figure 59) provides for automated clearance at Kansas roadside check facilities. The roadside check facility communicates with the Kansas Trucking Connection to retrieve infrastructure snapshots of critical carrier, vehicle, and driver data to be used to sort passing vehicles. This allows a good driver/vehicle/carrier to pass roadside facilities at highway speeds using transponders and dedicated short range communications to the roadside. Results of roadside clearance activities will be passed on to the Kansas Trucking Connection. The roadside check facility may be equipped with Automated Vehicle Identification (AVI), weighing sensors, transponder read/write devices and computer workstations.

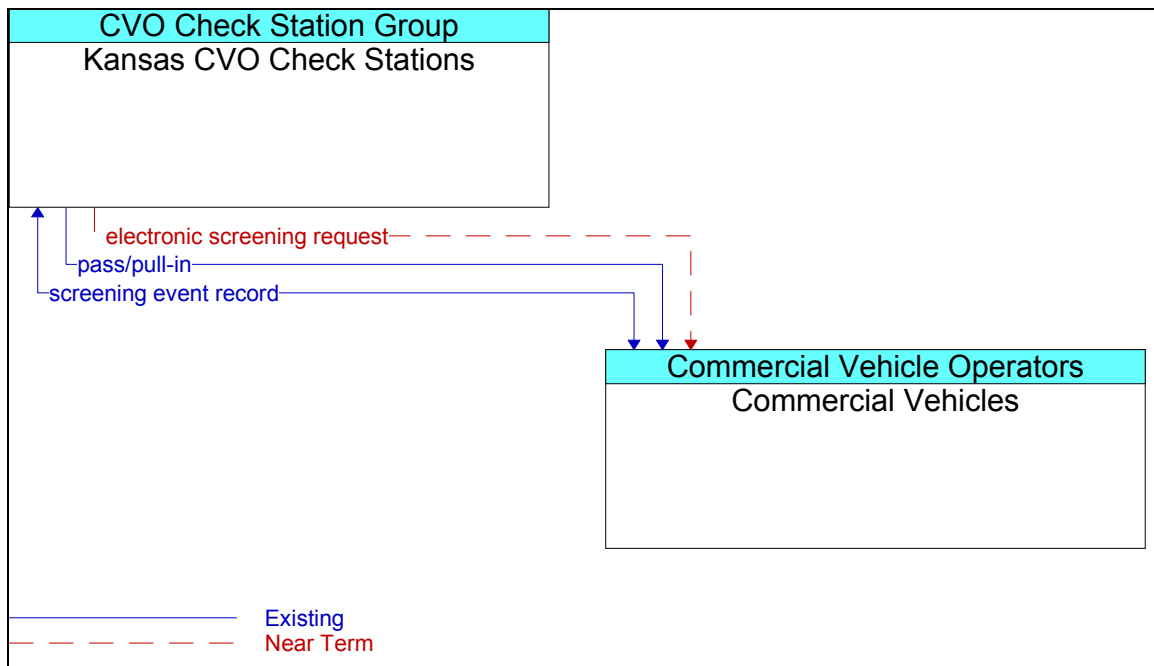


Figure 59. Electronic Clearance

4.44 Weigh-In-Motion

The Weigh-In-Motion service (Figure 60) provides for high speed weigh-in-motion with or without Automated Vehicle Identification (AVI) capabilities. This service provides the roadside equipment that could be used as a stand-alone system or to augment the Electronic Clearance service for the Kansas highway system.

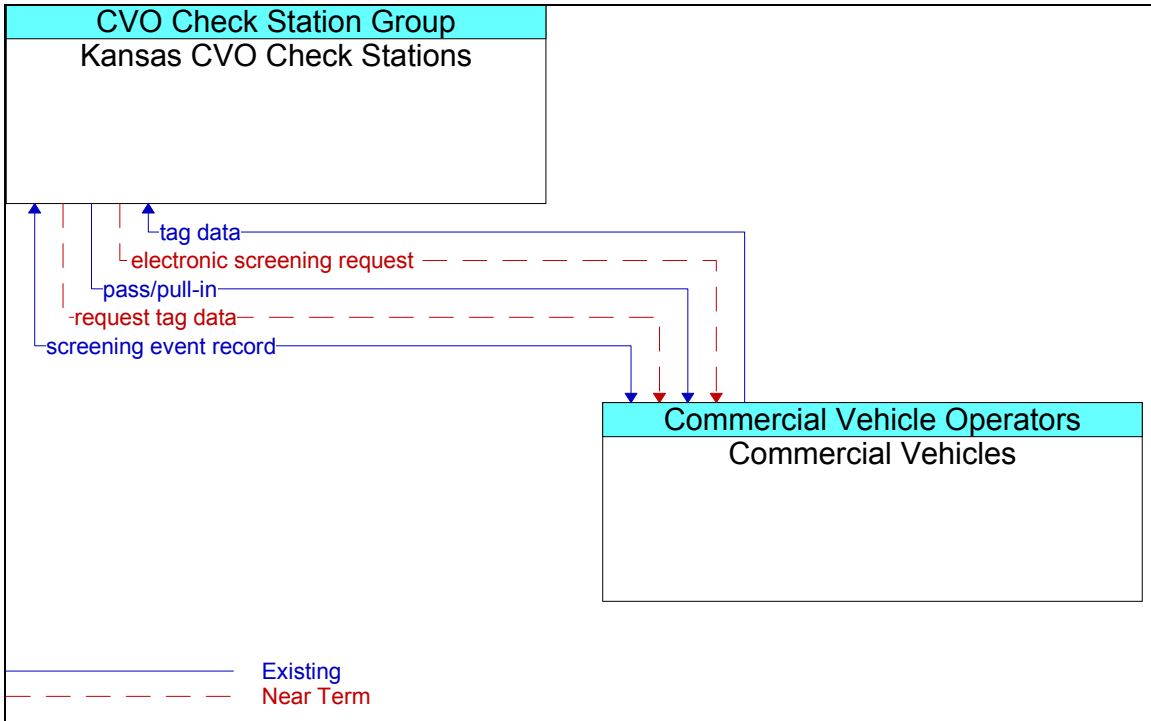


Figure 60. Weigh-In-Motion

4.45 Roadside CVO Safety

The Roadside CVO Safety service (Figure 61) provides for automated roadside safety monitoring and reporting. It automates commercial vehicle safety inspections at the Kansas roadside check facilities. The capabilities for performing the safety inspection are shared between this service and the On-board CVO and Freight Safety & Security service which enables a variety of implementation options. The basic option, directly supported by this service, facilitates safety inspection of vehicles that have been pulled in, perhaps as a result of the automated screening process provided by the Electronic Clearance service. In this scenario, only basic identification data and status information are read from the electronic tag on the commercial vehicle. The identification data from the tag enables access to additional safety data maintained in the infrastructure which is used to support the safety inspection, and may also inform the pull-in decision if system timing requirements can be met. More advanced implementations, supported by the On-board CVO and Freight Safety & Security service, utilize additional on-board vehicle safety monitoring and reporting capabilities in the commercial vehicle to augment the roadside safety check.

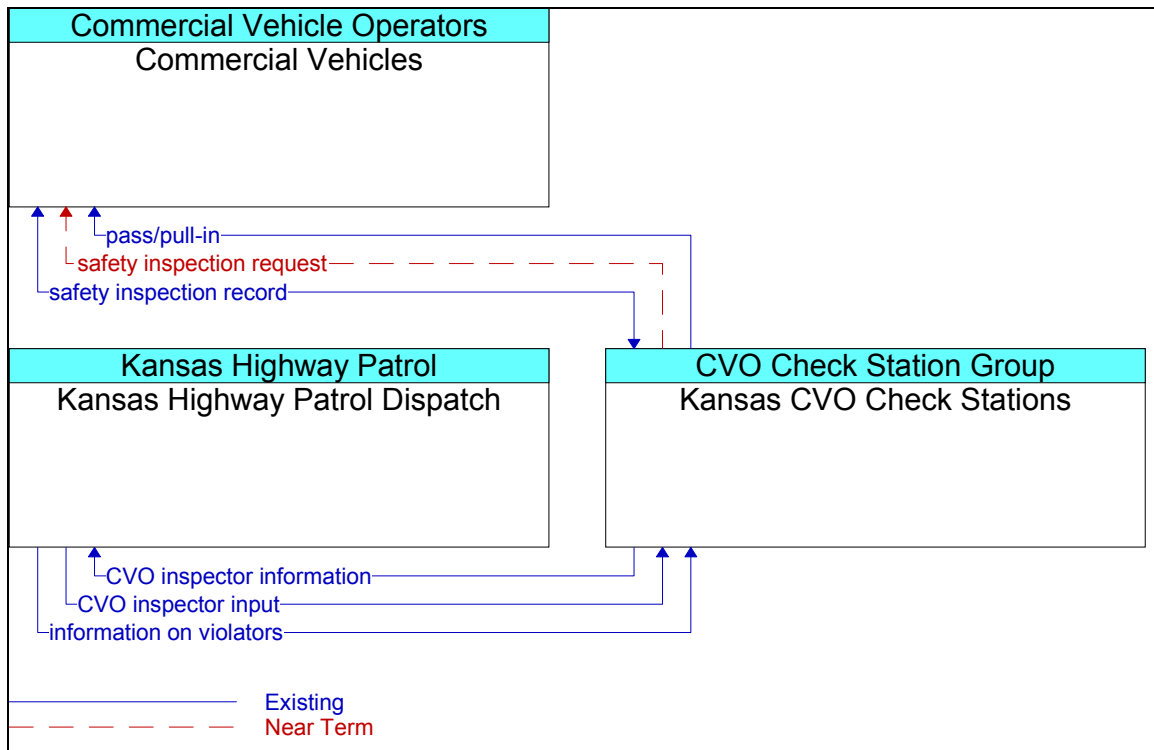


Figure 61. Roadside CVO Safety

4.46 On-board CVO and Freight Safety and Security

The On-board CVO and Freight Safety and Security service (Figure 62) provides for on-board commercial vehicle safety monitoring and reporting. It is an enhancement of the Roadside CVO Safety service and includes roadside support for reading on-board safety data via tags. Safety warnings are provided to the driver as a priority with secondary requirements to notify the Kansas CVO check stations. This service allows for Fleet and Freight systems to have access to the on-board safety data. In addition to safety data, this service provides a means for monitoring the security of the commercial vehicle along with the cargo, containers, trailers, and other equipment that are being hauled. Commercial vehicle on-board tamper and breach sensors provide an indication of any security irregularities and the sensor data is provided to Fleet and Freight systems along with particular notification of any breach alerts. Kansas commercial vehicle drivers may be aware of the sensor readings and can provide an explanation back to Fleet and Freight systems via the commercial vehicle. Commercial vehicle and freight security breaches are also sent to the Kansas CVO check stations.

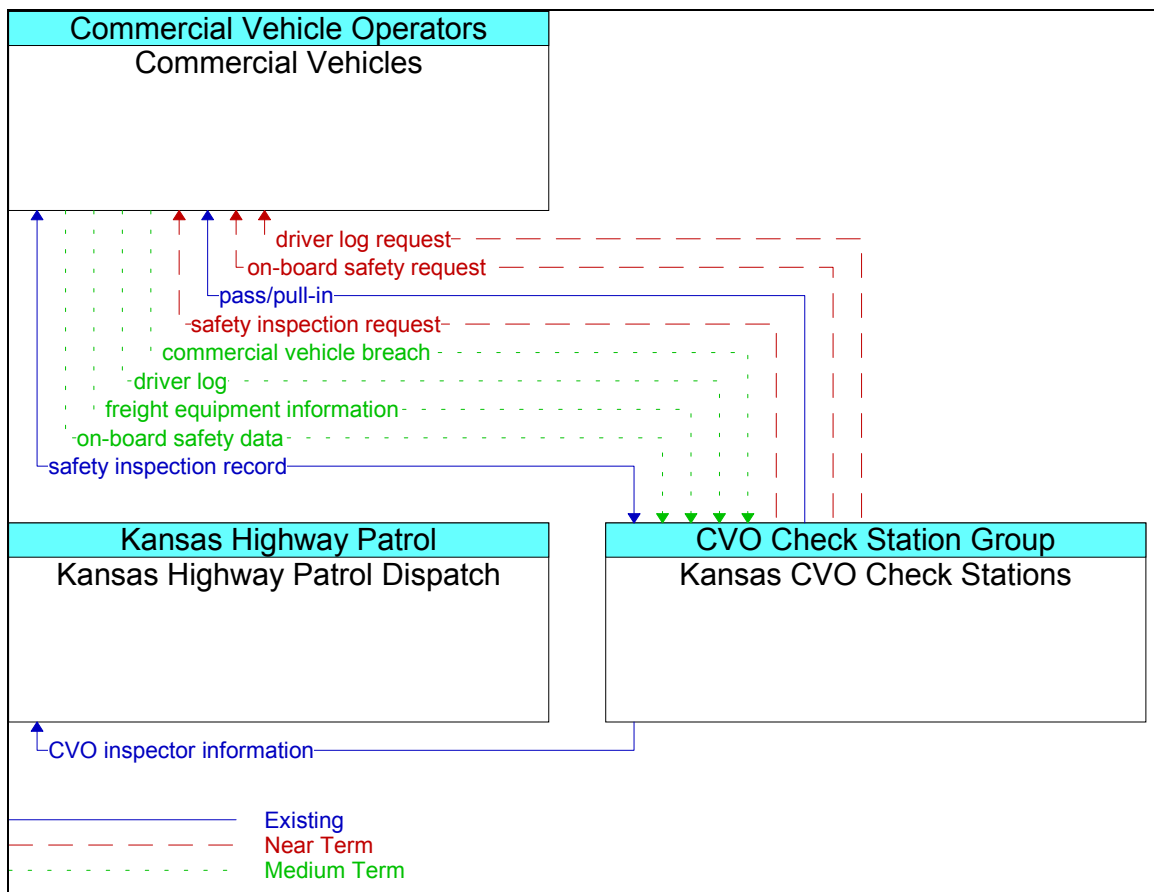


Figure 62. On-board CVO and Freight Safety and Security

4.47 HAZMAT Management

The HAZMAT Management service (Figure 63) integrates incident management capabilities with commercial vehicle tracking to assure effective treatment of HAZMAT material and incidents. HAZMAT tracking is performed by Fleet and Freight systems. The Sedgwick County 911 is notified by the Commercial Vehicle if an incident occurs and coordinates the response. The response is tailored based on information that is provided as part of the original incident notification or derived from supplemental information provided by Fleet and Freight systems. The latter information can be provided prior to the beginning of the trip or gathered following the incident depending on the selected policy and implementation.

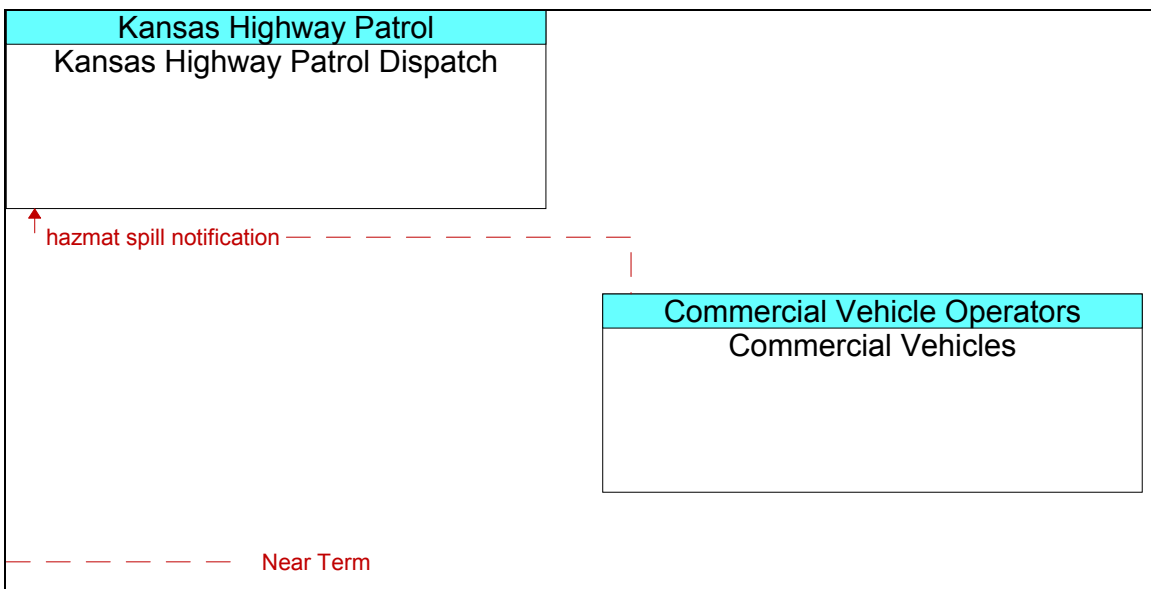


Figure 63. HAZMAT Management

4.48 City of Andover Emergency Call-Taking and Dispatch

The City of Andover Emergency Call-Taking and Dispatch service (Figure 64) provides basic call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Sedgwick County 911 supports emergency notification between agencies. Wide area wireless communications with the City of Andover Public Safety Vehicles in the Andover area support dispatch and provision of information to responding personnel.

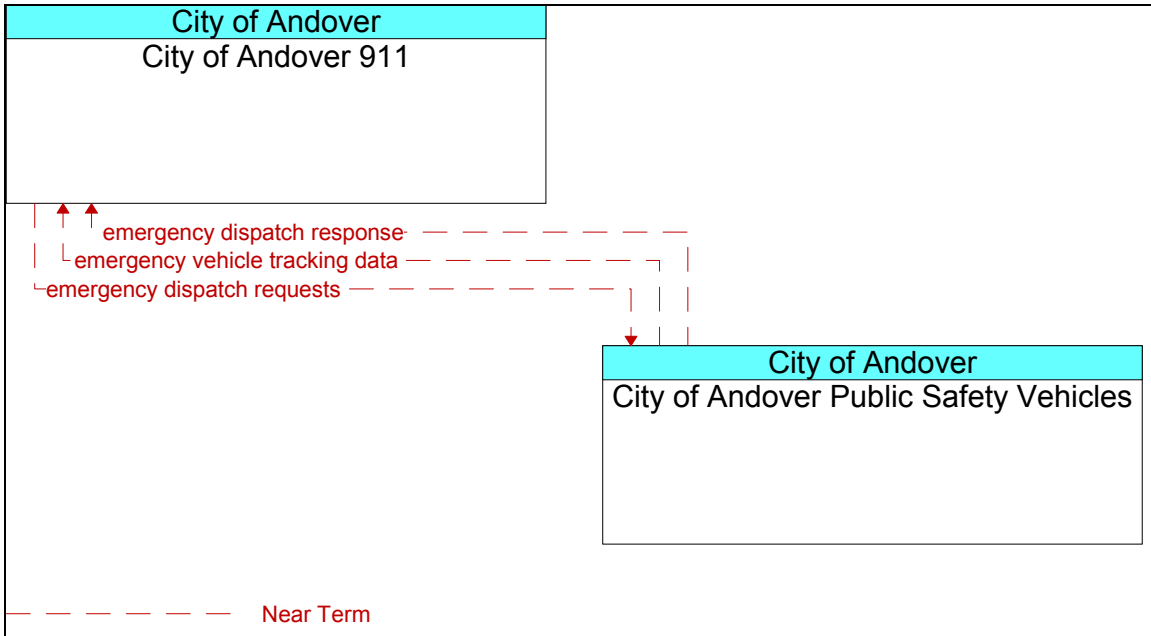


Figure 64. City of Andover Emergency Call-Taking and Dispatch

4.49 KHP Emergency Call-Taking and Dispatch

The KHP Emergency Call-Taking and Dispatch service (Figure 65) provides basic KHP call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Sedgwick County 911 supports emergency notification between agencies. Wide area wireless communications between the KHP and KHP Vehicles support dispatch and provision of information to responding personnel.

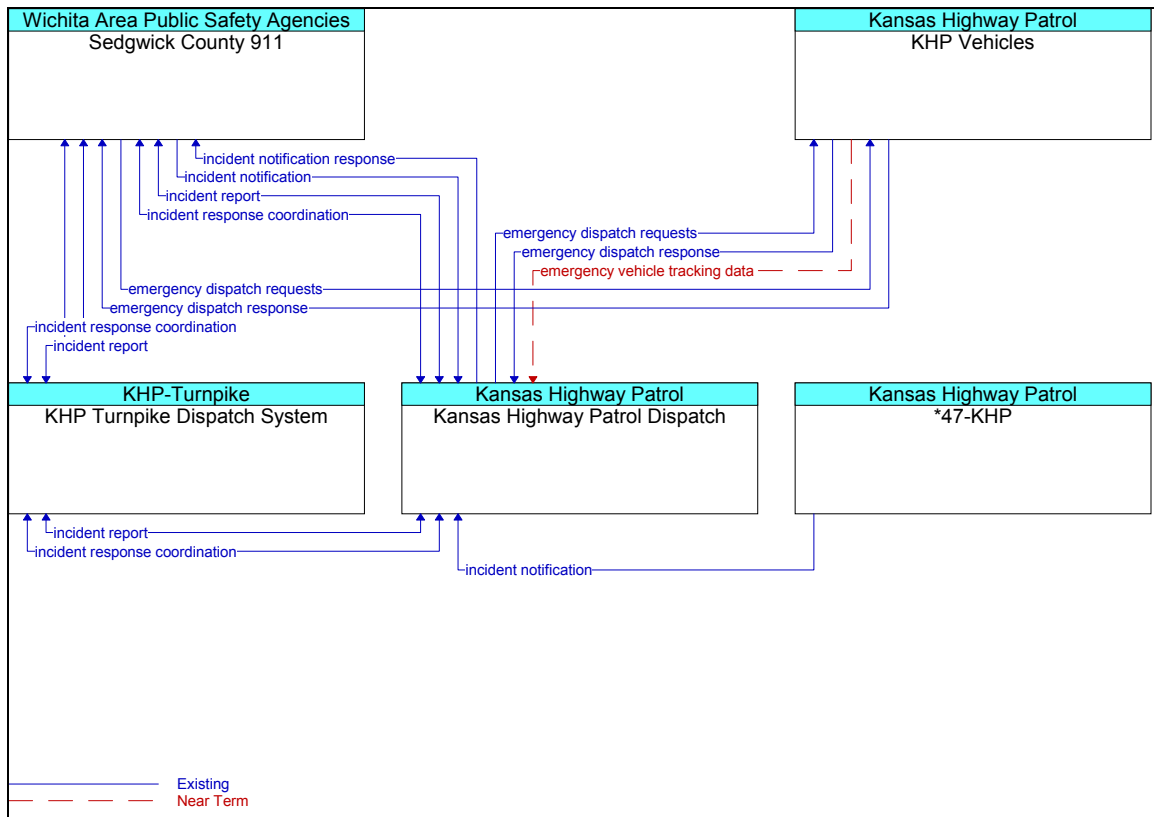


Figure 65. KHP Emergency Call-Taking and Dispatch

4.50 KTA Emergency Call-Taking and Dispatch

The KTA Emergency Call-Taking and Dispatch service (Figure 66) provides basic KTA call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Sedgwick County 911 supports emergency notification between agencies. Wide area wireless communications between the KTA and KHP Turnpike Vehicles support dispatch and provision of information to responding personnel.

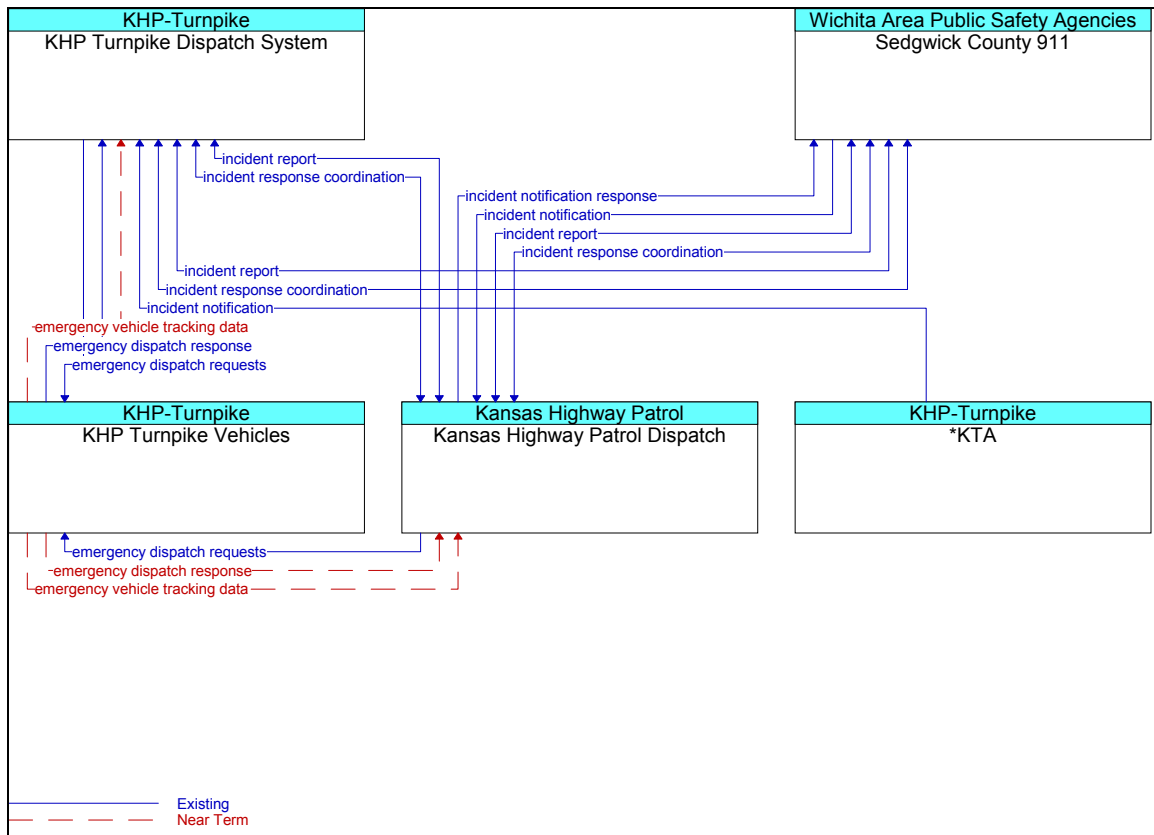


Figure 66. KTA Emergency Call-Taking and Dispatch

4.51 Sedgwick County 911/EOC Emergency Call-Taking and Dispatch

The Sedgwick County 911/EOC Emergency Call-Taking and Dispatch service (Figure 67) provides basic Sedgwick County 911 call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Sedgwick County 911 and other public safety agencies in the Wichita area supports emergency notification between agencies. Wide area wireless communications between the Sedgwick County 911 and other public safety agencies vehicles in the Wichita area support dispatch and provision of information to responding personnel.

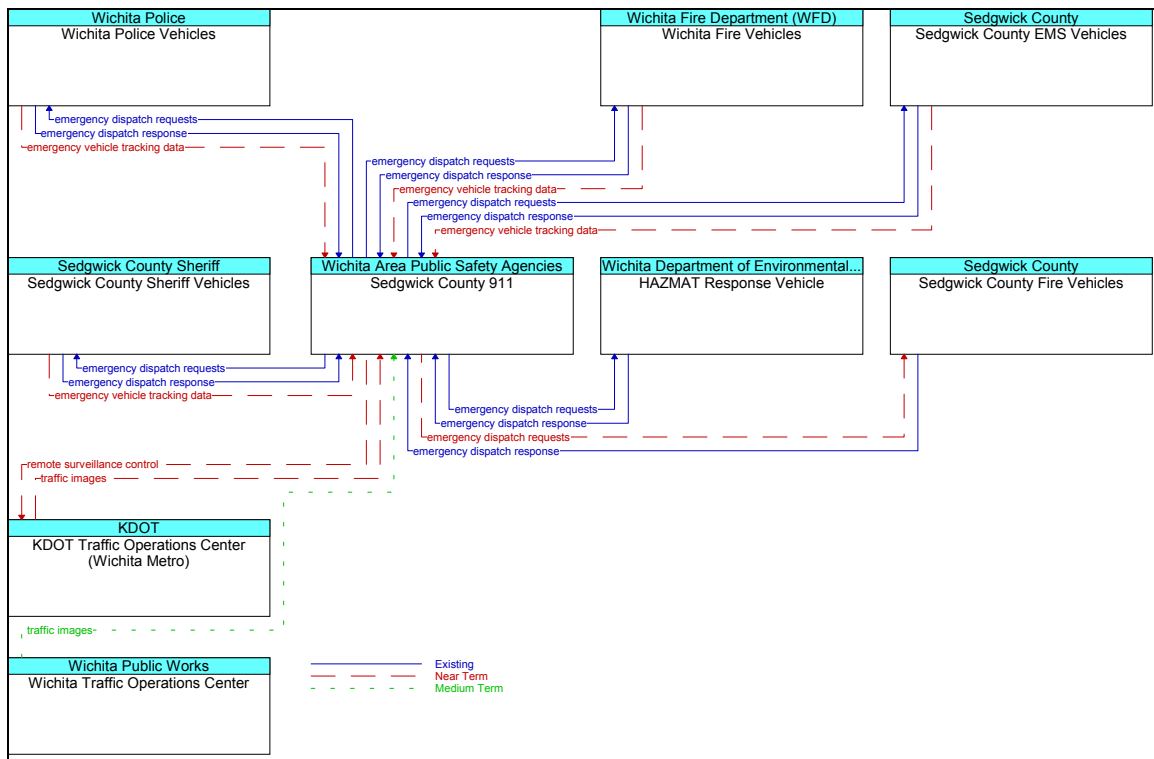


Figure 67. Sedgwick County 911/EOC Emergency Call-Taking and Dispatch

4.52 Suburban Emergency Call-Taking and Dispatch

The Suburban Emergency Call-Taking and Dispatch service (Figure 68) provides basic emergency call-taking and dispatch services for suburban communities not served by the Sedgwick County 911 system. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between the various suburban emergency call-taking and dispatch systems and the Sedgwick County 911 supports emergency notification between agencies. Wide area wireless communications between the Suburban Emergency Dispatch Center and Suburban Public Safety Vehicles support dispatch and provision of information to responding personnel.

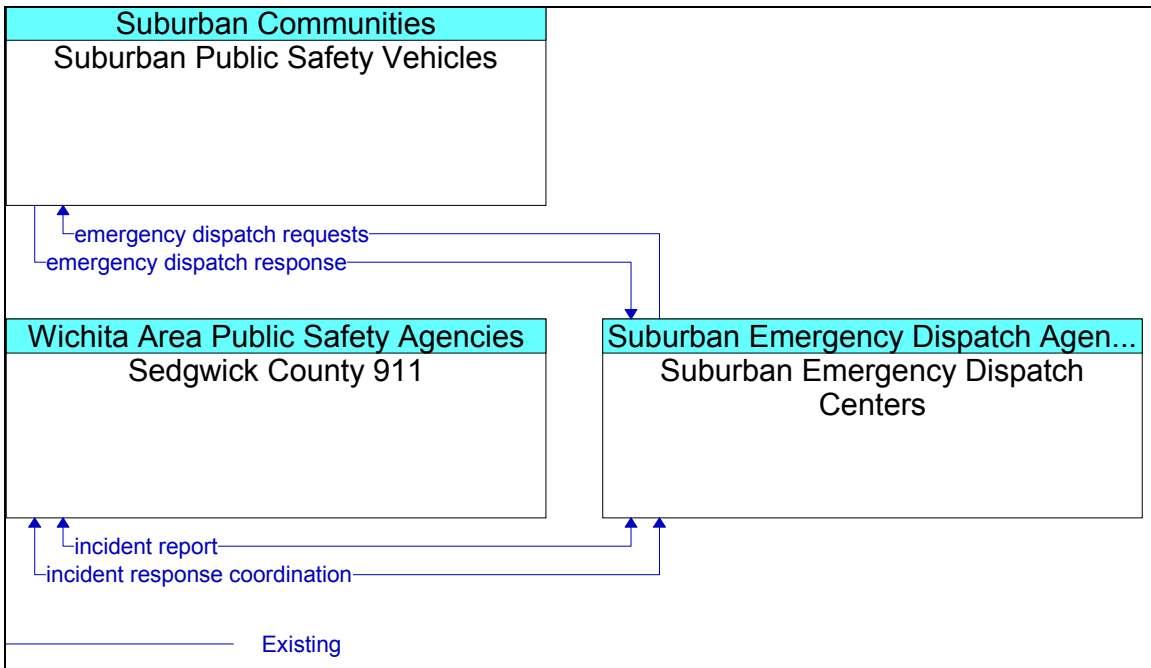


Figure 68. Suburban Emergency Call-Taking and Dispatch

4.53 KHP Emergency Routing

The KHP Emergency Routing service (Figure 69) supports automated vehicle location and dynamic routing of KHP Turnpike Vehicles and KHP Vehicles. Traffic information, road conditions, and suggested routing information are provided to enhance emergency vehicle routing. Special priority or other specific emergency traffic control strategies can be coordinated to improve the safety and time-efficiency of responding vehicle travel on the selected route(s). The Kansas Highway Patrol provides the routing for the emergency fleet based on real-time conditions and has the option of requesting a route from the KDOT Traffic Operations Center.

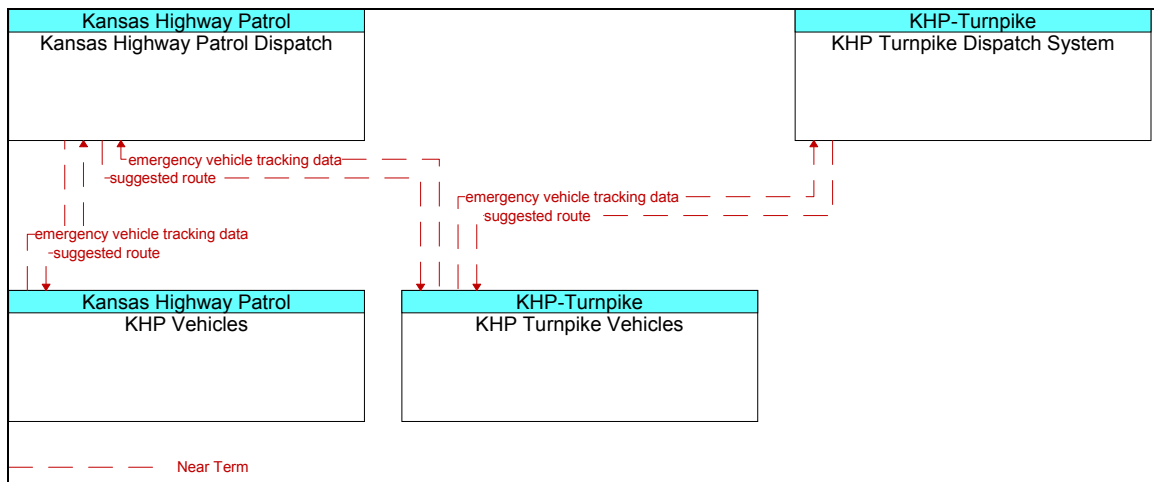


Figure 69. KHP Emergency Routing

4.54 Sedgwick County 911 Emergency Routing

The Sedgwick County 911 Emergency Routing service (Figure 70) supports automated vehicle location and dynamic routing of Wichita area public safety vehicles. Traffic information, road conditions, and suggested routing information are provided to enhance emergency vehicle routing. Special priority or other specific emergency traffic control strategies can be coordinated to improve the safety and time-efficiency of responding vehicle travel on the selected route(s). The Sedgwick County 911 provides the routing for the emergency fleet based on real-time conditions and has the option of requesting a route from the KDOT Traffic Operations Center and Wichita Traffic Operations Center. The local public safety vehicles may also be equipped with dedicated short range communications for local signal preemption.

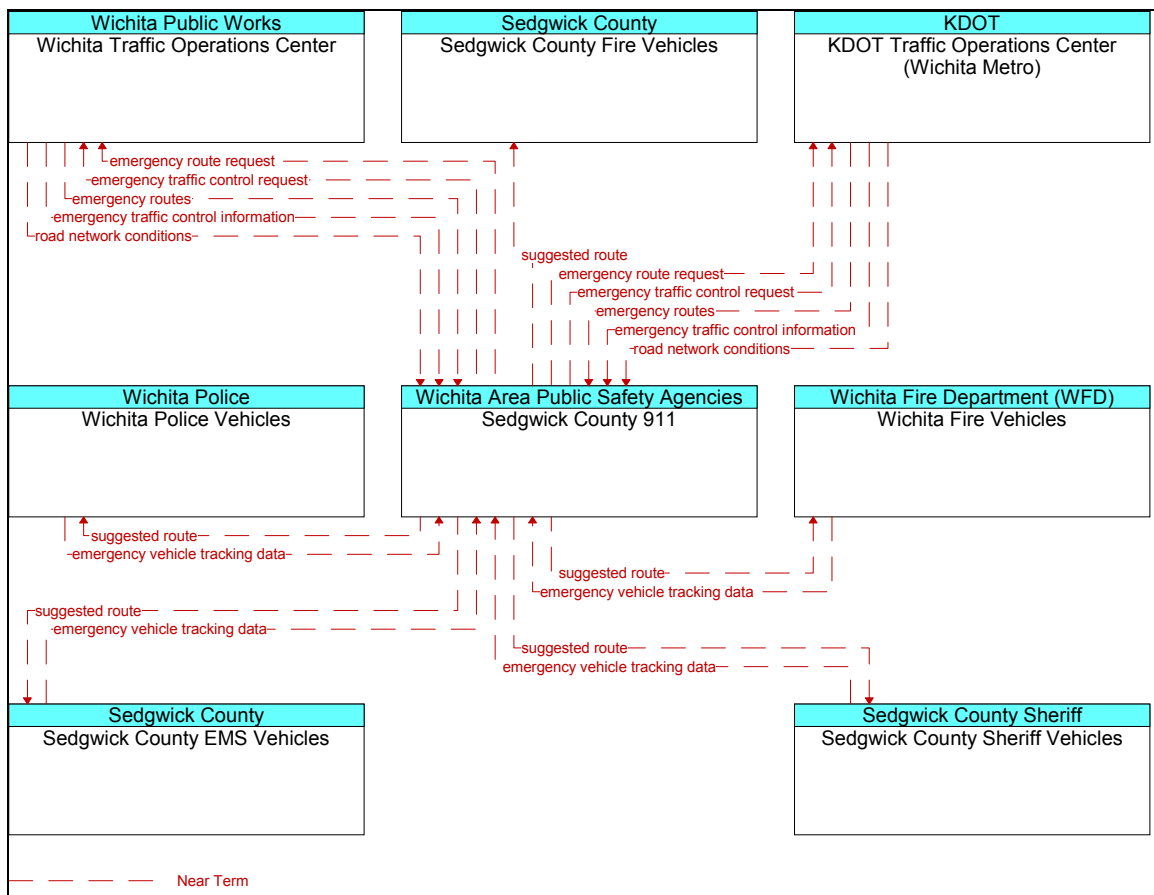


Figure 70. Sedgwick County 911 Emergency Routing

4.55 Roadway Service Patrols

The Roadway Service Patrols service (Figure 71) supports KDOT Motorist Assistance Patrol Vehicles that monitor roads, and the KTA Motorist Assistance Patrol Vehicles that monitor the turnpike, to aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. If problems are detected, the KTA and KDOT Motorist Assistance Patrol Vehicles will provide assistance to the motorist (e.g., push a vehicle to the shoulder or median). The service monitors the KTA and KDOT Motorist Assistance Patrol Vehicle locations and supports vehicle dispatch to identified incident locations. Incident information collected by the KTA and KDOT Motorist Assistance Patrol Vehicles is shared with traffic, maintenance and construction, and traveler information systems.

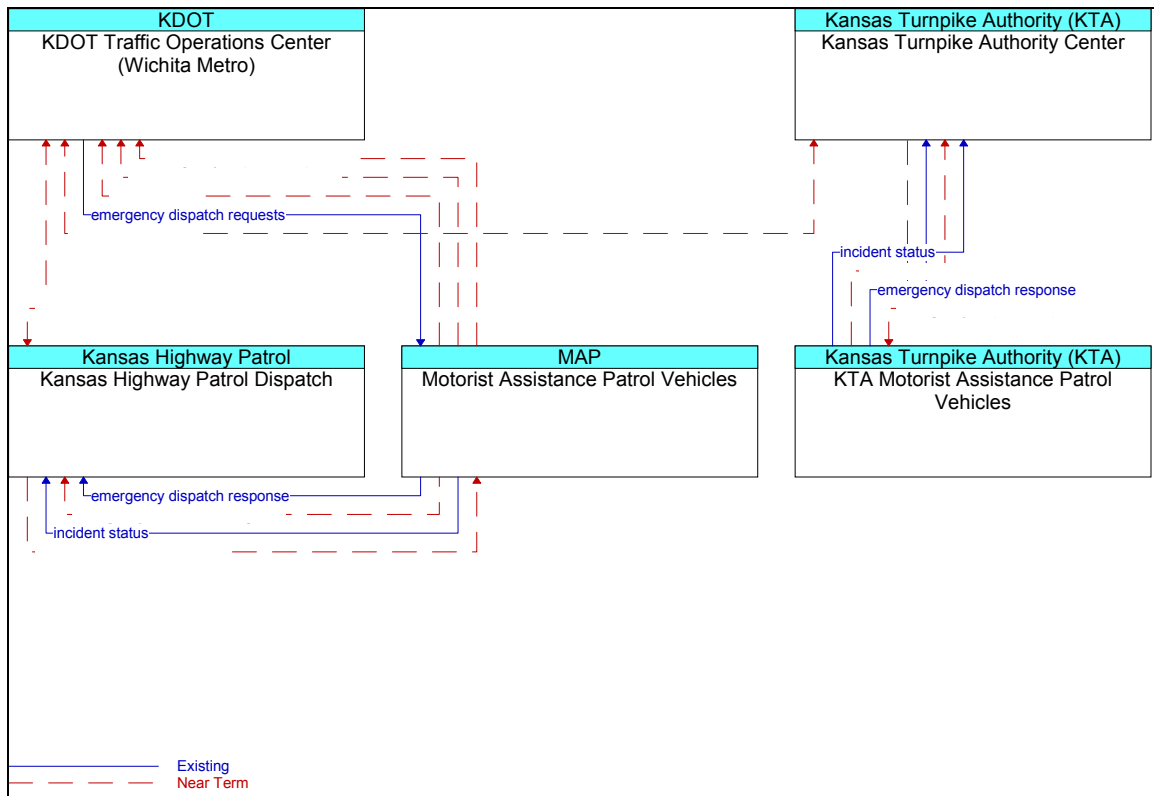


Figure 71. Roadway Service Patrols

4.56 Wide Area Alert

The Wide Area Alert service (Figure 72, Figure 73, Figure 74 and Figure 75) uses ITS driver and traveler information systems to alert the public in emergency situations such as child abductions, severe weather events, civil emergencies, and other situations that pose a threat to life and property. The alert includes information and instructions for transportation system operators and the traveling public, improving public safety and enlisting the public’s help in some scenarios. The ITS technologies will supplement and support other emergency and homeland security alert systems such as the Emergency Alert System (EAS).

When an emergency situation is reported and verified and the terms and conditions for system activation are satisfied, a designated agency broadcasts emergency information to KDOT, Wichita, and Sedgwick County traffic agencies, Wichita Transit and Sedgwick County Transportation Brokerage System, KDOT TOC Information System, Wichita Transit CIS, and KTA. The ITS systems, in turn, provide the alert information to transportation system operators and the traveling public using ITS technologies such as dynamic message signs, highway advisory radios, in-vehicle displays, transit displays, Kansas 511 Systems, and traveler information web sites (KDOT and Wichita Transit CIS).

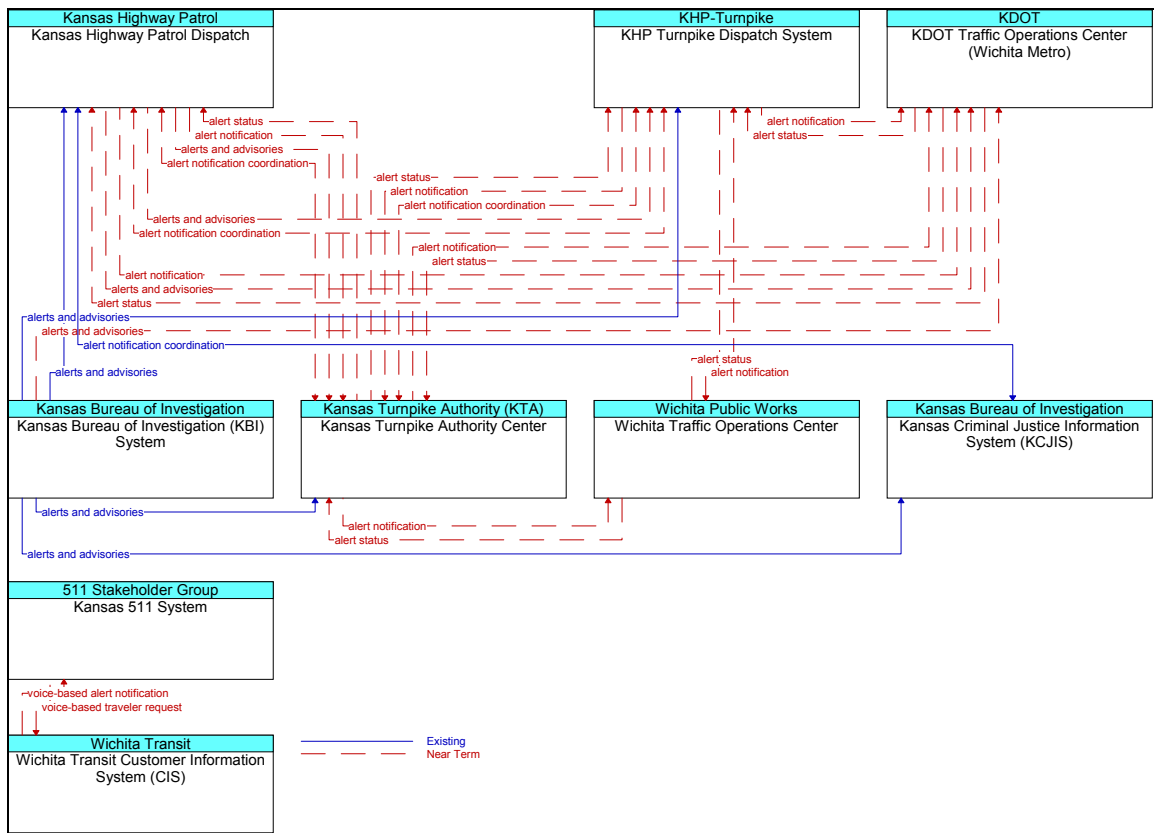


Figure 72. Wide Area Alert (Part 1)

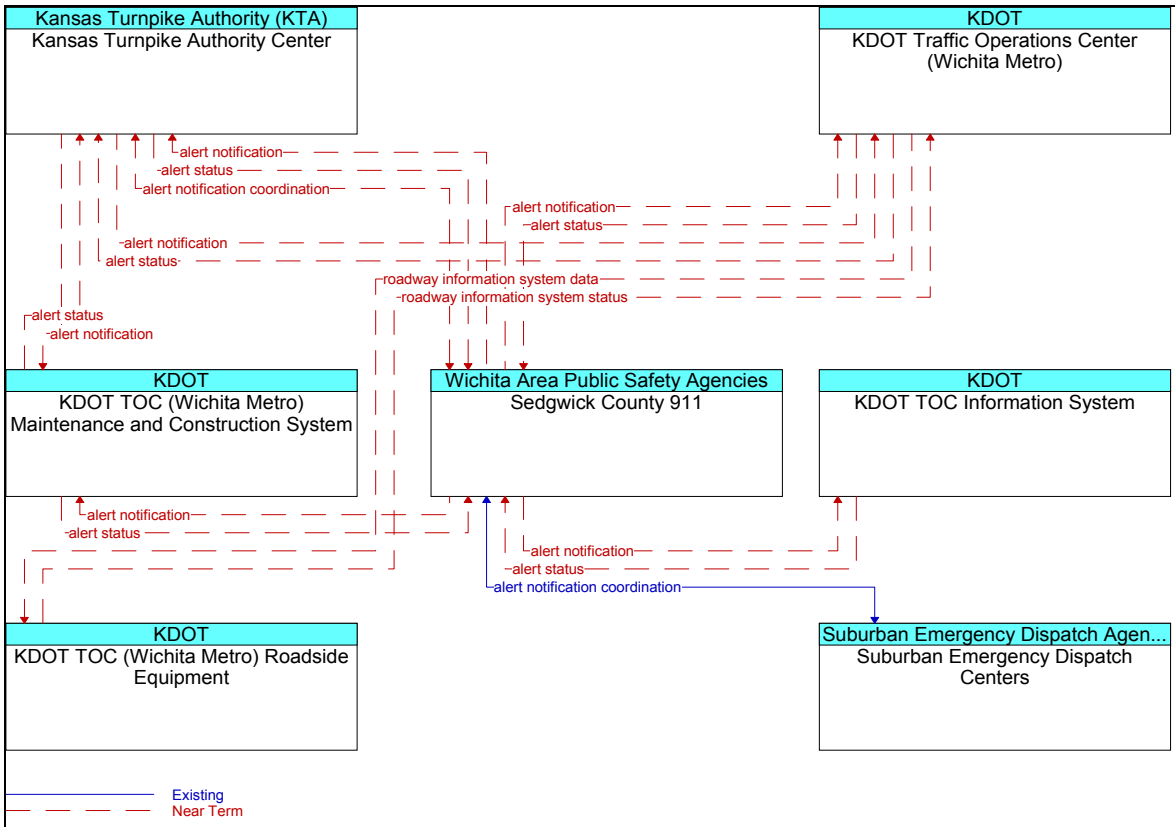


Figure 73. Wide Area Alert (Part 2)

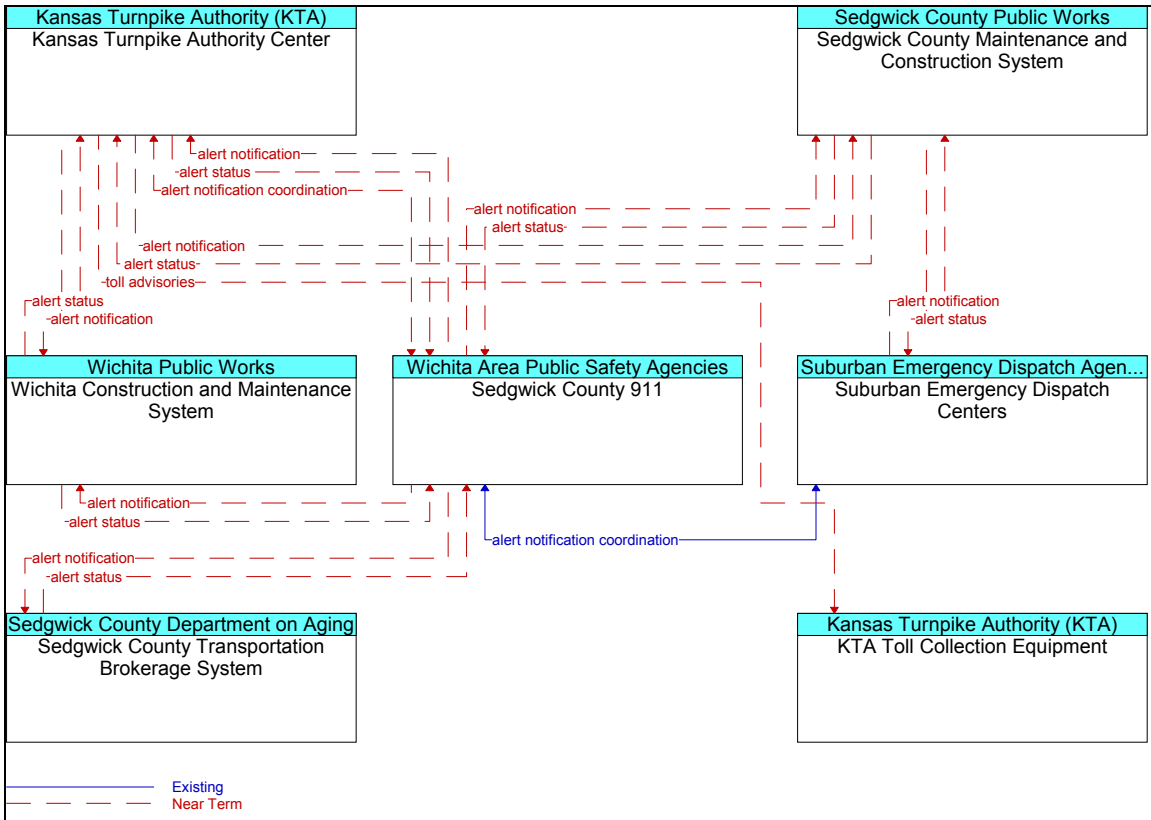


Figure 74. Wide Area Alert (Part 3)

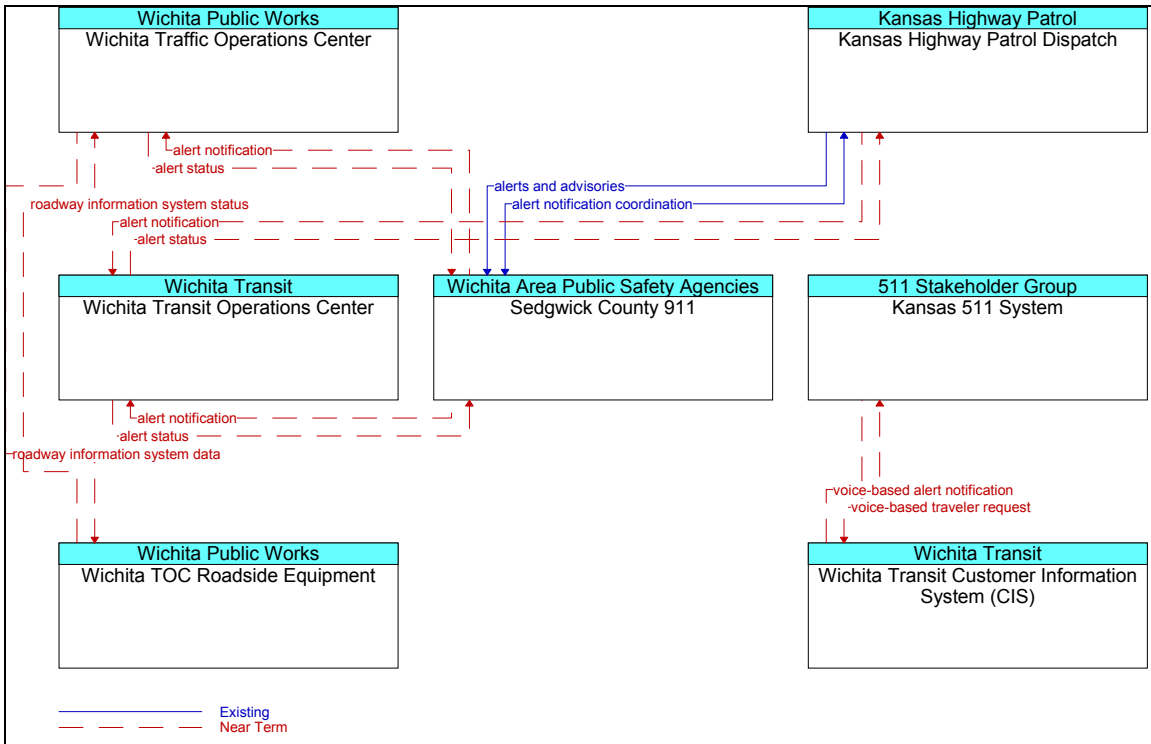


Figure 75. Wide Area Alert (Part 4)

4.57 Early Warning System

The Early Warning System service (Figure 76, Figure 77 and Figure 78) monitors and detects potential, looming, and actual disasters including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and acts of terrorism including nuclear, chemical, biological, and radiological weapons attacks. The service monitors alerting and advisory systems, KDOT ITS sensors and surveillance systems, field reports, and the Wichita area emergency call-taking systems to identify emergencies and notifies all responding agencies of detected emergencies.

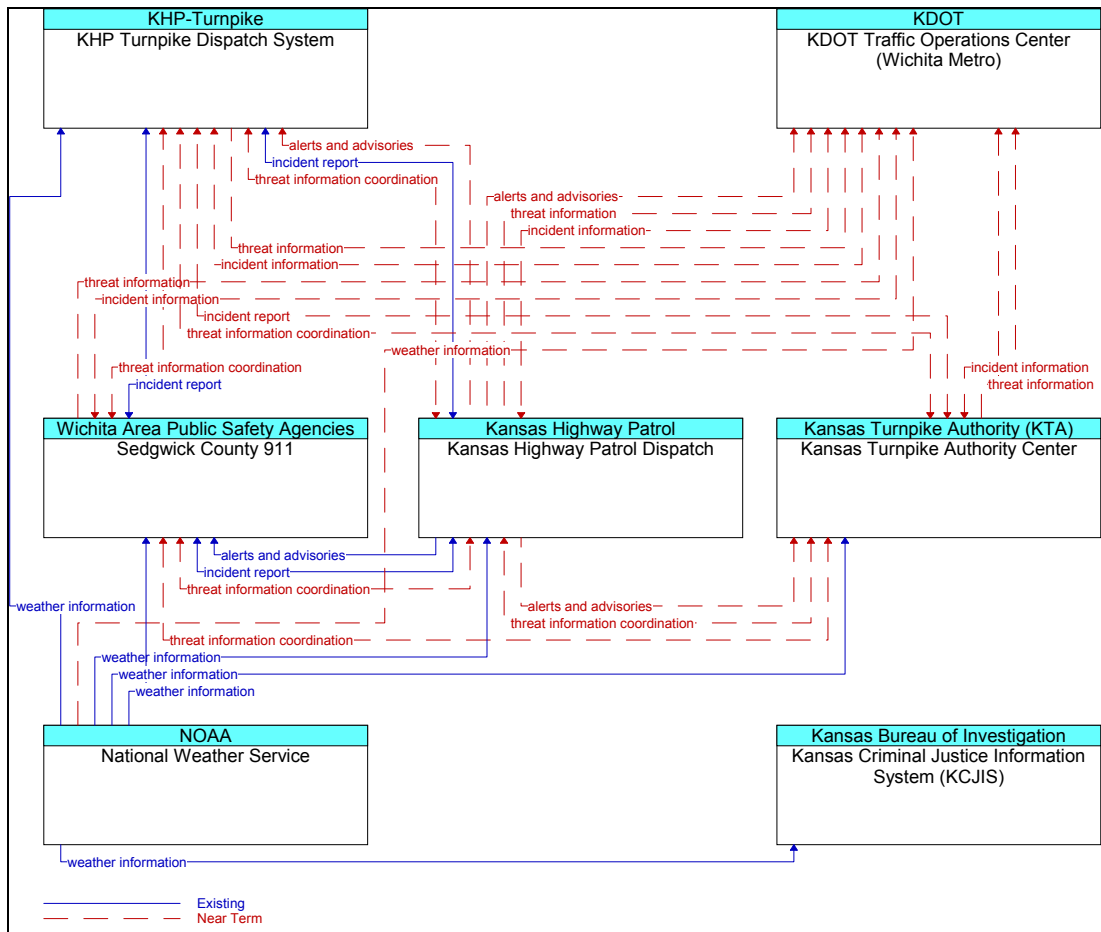


Figure 76. Early Warning System (Part 1)

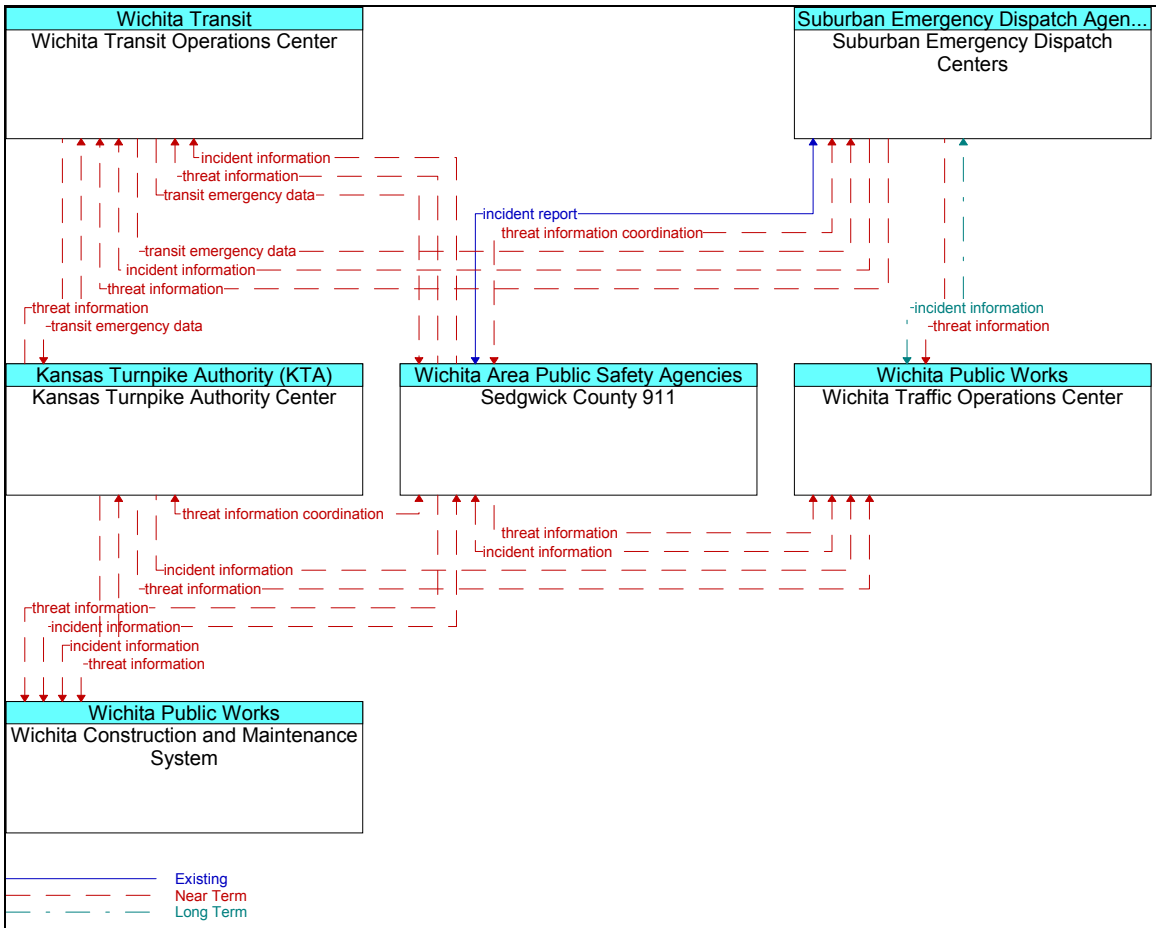


Figure 78. Early Warning System (Part 3)

4.58 Disaster Response and Recovery

The Disaster Response and Recovery service (Figure 79, Figure 80, Figure 81, Figure 82, Figure 83, Figure 84 and Figure 85) enhances the ability of the surface transportation system to respond to and recover from disasters. It addresses the most severe incidents that require an extraordinary response from outside the City of Wichita, Sedgwick County and Suburban local communities. All types of disasters are addressed including natural disasters (earthquakes, floods, winter storms, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and national security emergencies such as nuclear, chemical, biological, and radiological weapons attacks).

The service supports coordination of emergency response plans, including general plans developed before a disaster as well as specific tactical plans with short time horizon that are developed as part of a disaster response. The service provides enhanced access to the scene for response personnel and resources, provides better information about the transportation system in the vicinity of the disaster, and maintains situation awareness regarding the disaster itself. In addition, this service tracks and coordinates the transportation resources - the transportation professionals, equipment, and materials - that constitute a portion of the disaster response.

The service identifies the key points of integration between Wichita area transportation systems and the regional public safety, agencies, and other allied organizations that form the overall disaster response. The interface between the Sedgwick County 911 and the other regional agencies provides situation awareness and resource coordination among transportation and other allied response agencies. In its role, Wichita area traffic operations implements special traffic control strategies and detours and restrictions to effectively manage traffic in and around the disaster. Regional maintenance and construction agencies provide damage assessment of road network facilities and manage service restoration.

Wichita Transit and the Sedgwick County Transportation Brokerage System provide a similar assessment of status for transit facilities and modify transit operations to meet the special demands of the disaster. As immediate public safety concerns are addressed and disaster response transitions into recovery, this service supports transition back to normal transportation system operation, recovering resources, managing on-going transportation facility repair, supporting data collection and revised plan coordination, and other recovery activities.

This service builds on the basic traffic incident response service that is provided by the Traffic Incident Management service. This service addresses the additional complexities and coordination requirements that are associated with the most severe incidents that warrant an extraordinary response from outside the local jurisdictions and require special measures such as the activation of the Sedgwick County Emergency Operations Center.

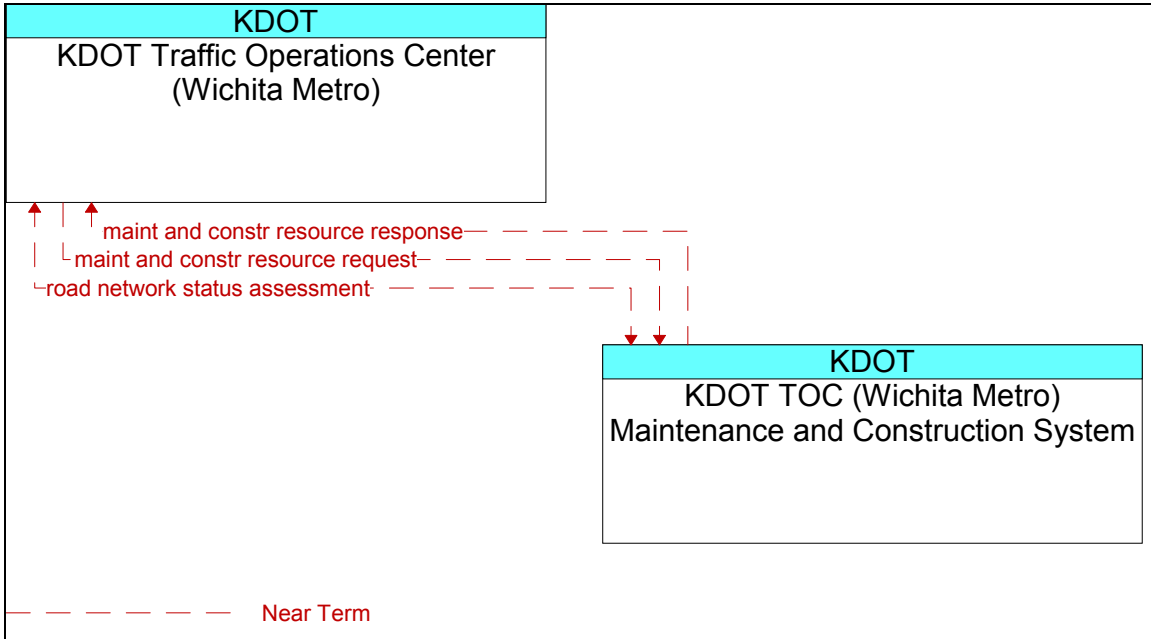


Figure 80. Disaster Response and Recovery (Part 2)

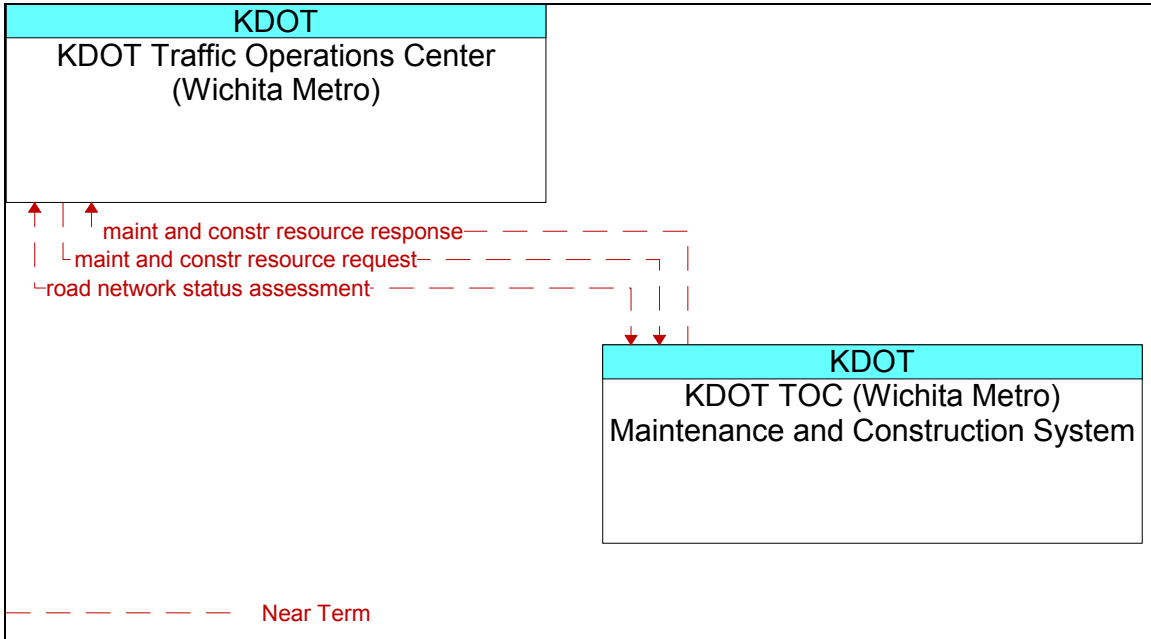


Figure 81. Disaster Response and Recovery (Part 3)

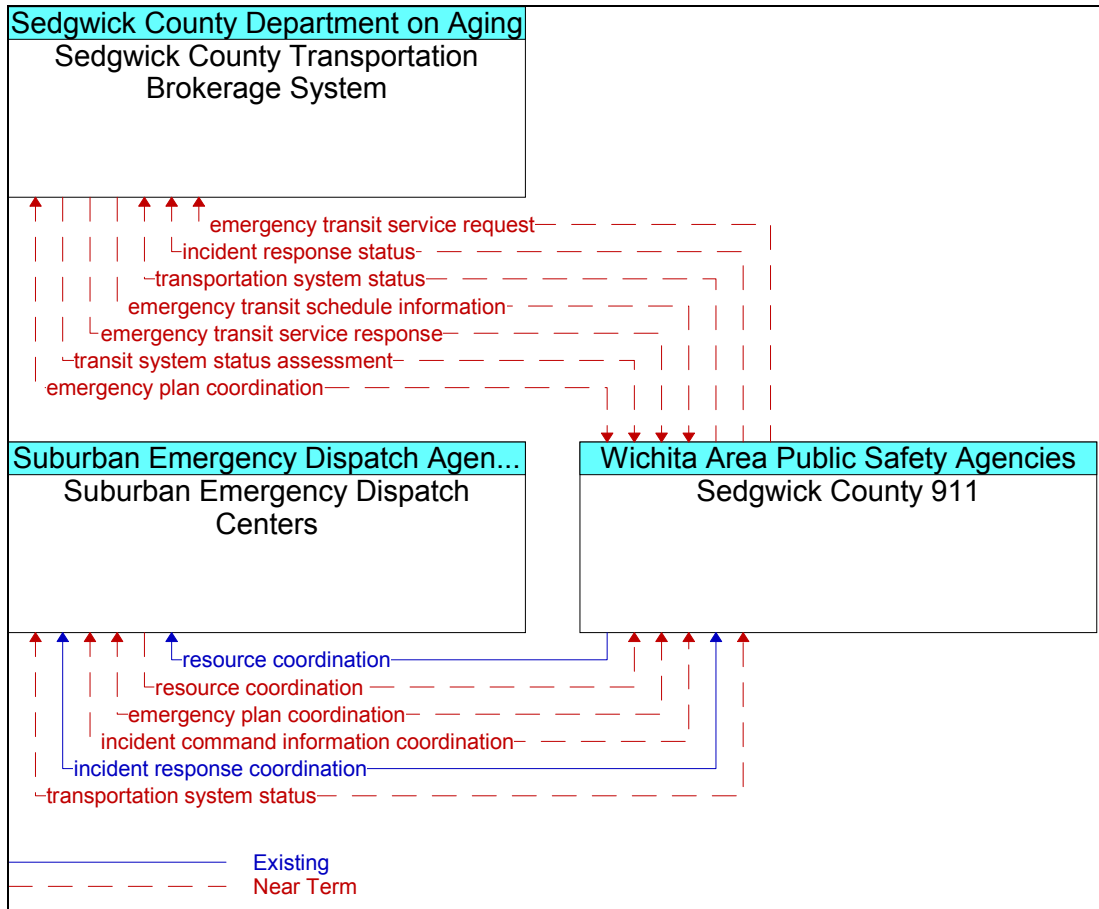


Figure 82. Disaster Response and Recovery (Part 4)

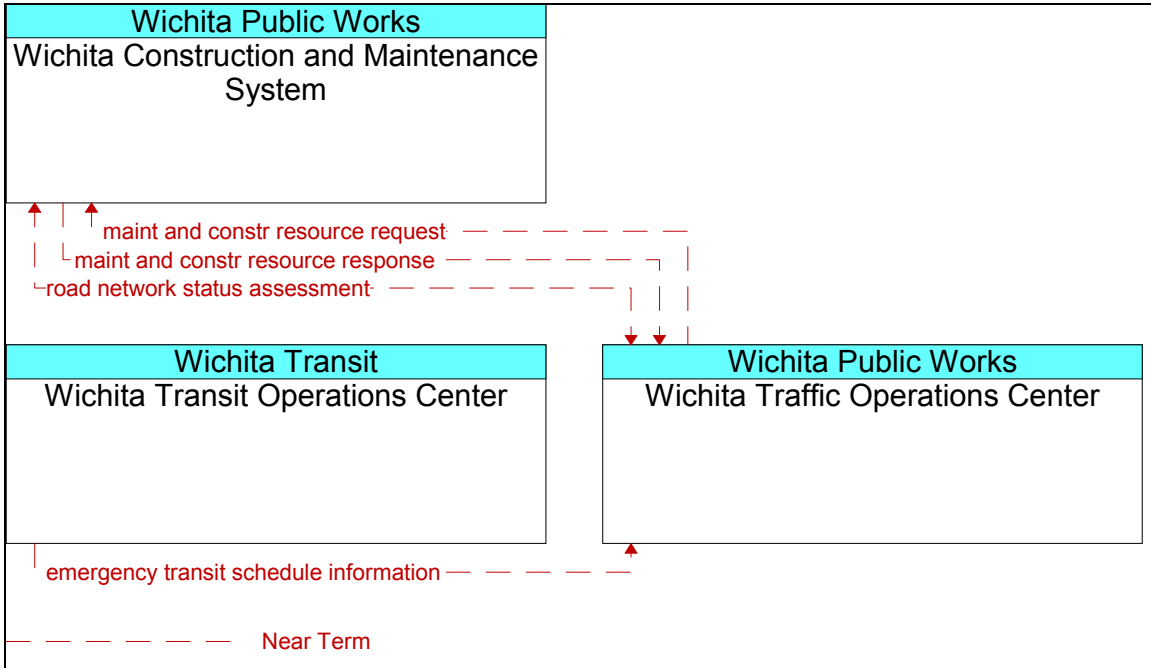


Figure 83. Disaster Response and Recovery (Part 5)

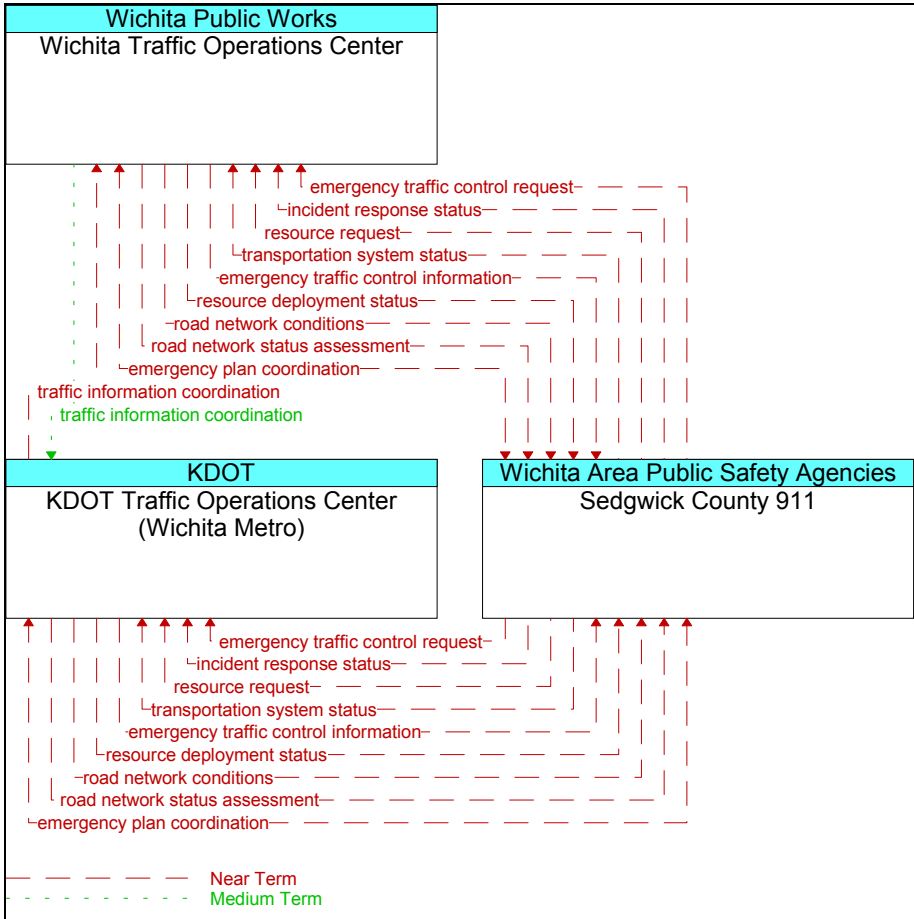


Figure 84. Disaster Response and Recovery (Part 6)

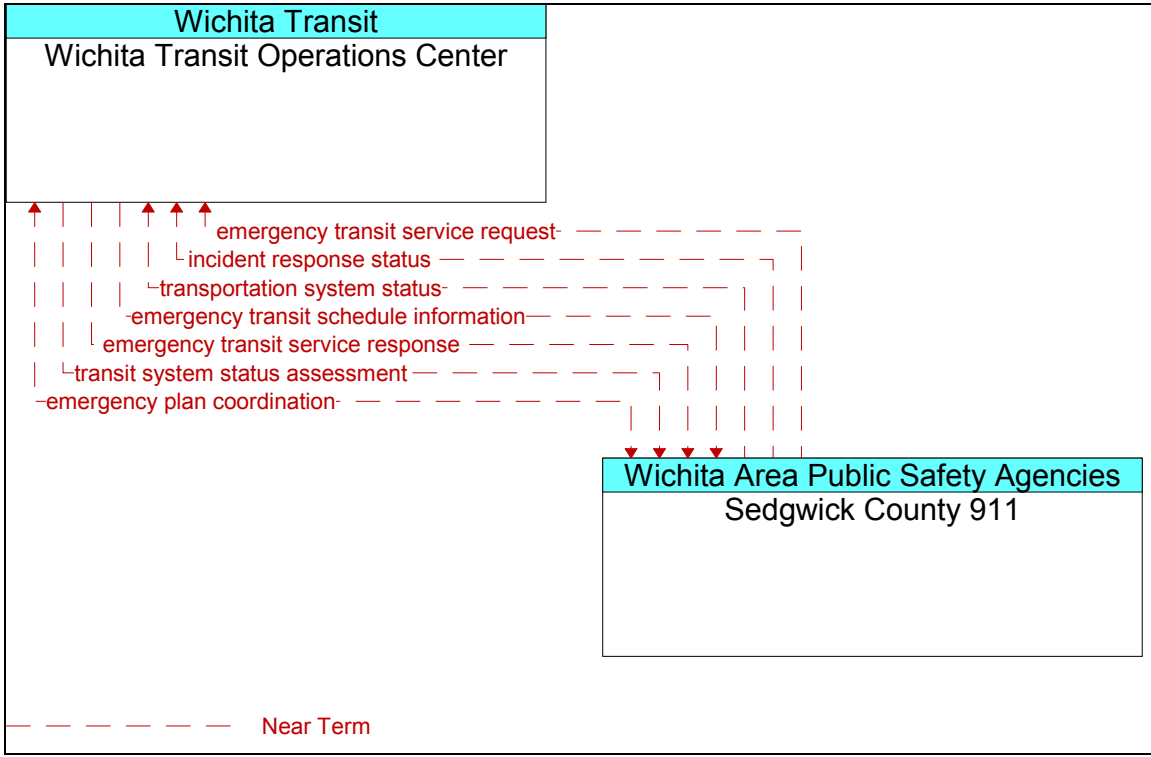


Figure 85. Disaster Response and Recovery (Part 7)

4.59 Evacuation and Reentry Management

The Evacuation and Reentry Management service (Figure 86, Figure 87, Figure 88 and Figure 89) supports evacuation of the general public from a disaster area and manages subsequent reentry to the disaster area. The service addresses evacuations for all types of disasters, including disasters that are anticipated and occur slowly, allowing a well-planned orderly evacuation, as well as disasters like terrorist acts that occur rapidly, without warning, and allow little or no time for preparation or public warning.

This service supports coordination of evacuation plans among the federal, state, and Wichita area local transportation, emergency, and law enforcement agencies that may be involved in a large-scale evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. Information is shared with Wichita area traffic agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes. Reversible lanes, shoulder use, closures, special signal control strategies, and other special strategies may be implemented to maximize capacity along the evacuation routes.

Wichita Transit and the Sedgwick County Transportation Brokerage System resources play an important role in an evacuation, removing many people from an evacuated area while making efficient use of limited capacity. Additional shared transit resources may be added and managed in evacuation scenarios. Resource requirements are forecast based on the evacuation plans and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times.

Evacuations are also supported by the "Disaster Traveler Information" service, which keeps the public informed during evacuations.

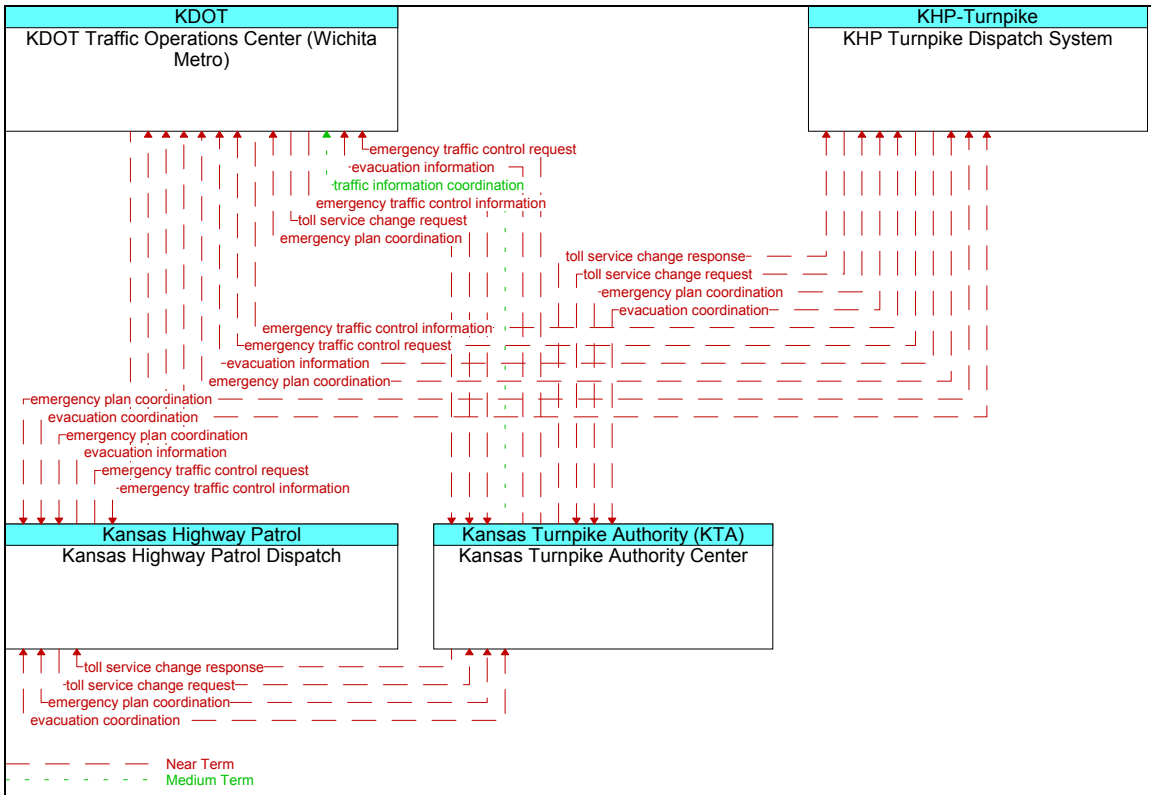


Figure 86. Evacuation and Reentry Management (Part 1)

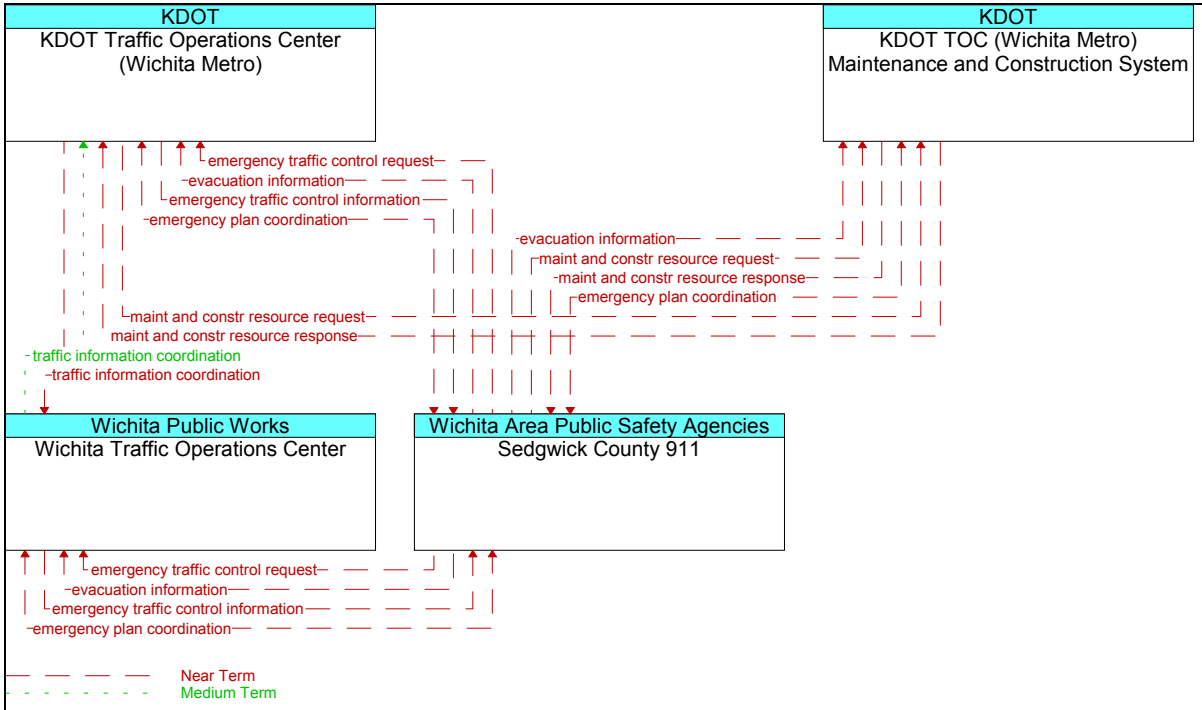


Figure 87. Evacuation and Reentry Management (Part 2)

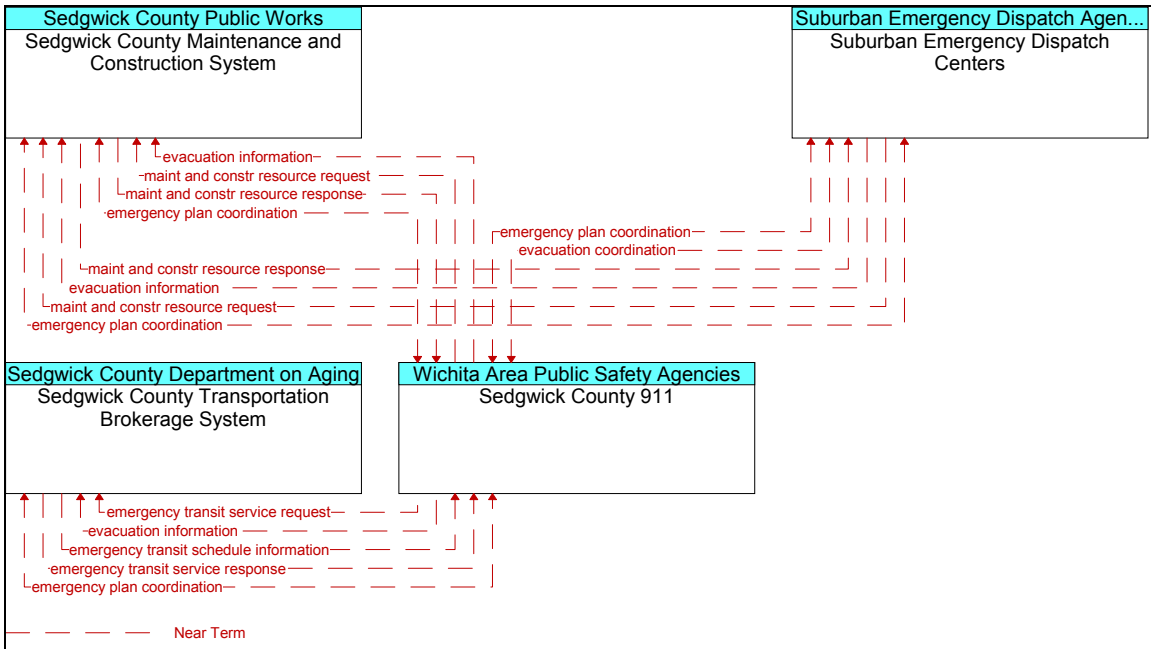


Figure 88. Evacuation and Reentry Management (Part 3)

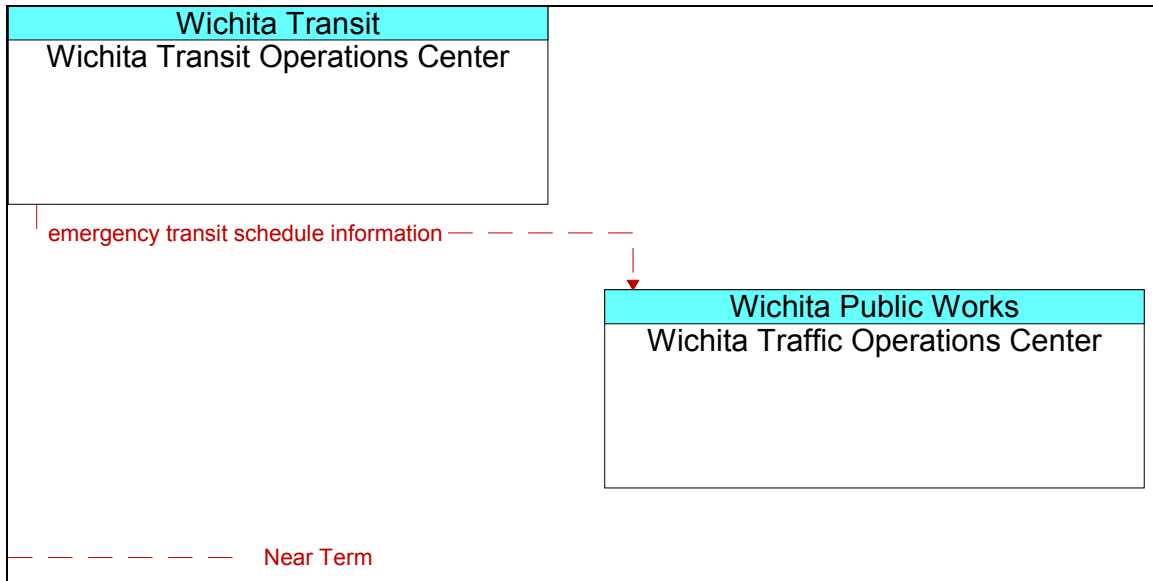


Figure 89. Evacuation and Reentry Management (Part 4)

4.60 Disaster Traveler Information

The Disaster Traveler Information service (Figure 90 and Figure 91) uses ITS to provide disaster-related traveler information to the general public, including evacuation and reentry information and other information concerning the operation of the transportation system during a disaster. This service collects information from multiple sources including Wichita area traffic agencies, Wichita Transit and the Sedgwick County Transportation Brokerage System, regional public safety agencies, Sedgwick County 911, and Healthcare Facilities. The collected information is processed and the public is provided with real-time disaster and evacuation information using ITS traveler information systems.

A disaster will stress the surface transportation system since it may damage transportation facilities at the same time that it places unique demands on these facilities to support public evacuation and provide access for emergency responders. Similarly, a disaster may interrupt or degrade the operation of many traveler information systems at the same time that safety-critical information must be provided to the traveling public. This service keeps the public informed in these scenarios, using all available means to provide information about the disaster area including damage to the transportation system, detours and closures in effect, special traffic restrictions and allowances, special transit schedules, and real-time information on traffic conditions and transit system performance in and around the disaster.

This service also provides emergency information to assist the public with evacuations when necessary. Information on mandatory and voluntary evacuation zones, evacuation times, and instructions are provided. Available evacuation routes and destinations and current and anticipated travel conditions along those routes are provided so evacuees are prepared and know their destination and preferred evacuation route. Information on available transit services and traveler services (shelters, medical services, hotels, restaurants, gas stations, etc.) is also provided. In addition to general evacuation information, this service provides specific evacuation trip planning information that is tailored for the evacuee based on origin, selected destination, and evacuee-specified evacuation requirements and route parameters.

This service augments the ATIS services that provide traveler information on a day-to-day basis for the surface transportation system. This service provides focus on the special requirements for traveler information dissemination in disaster situations.

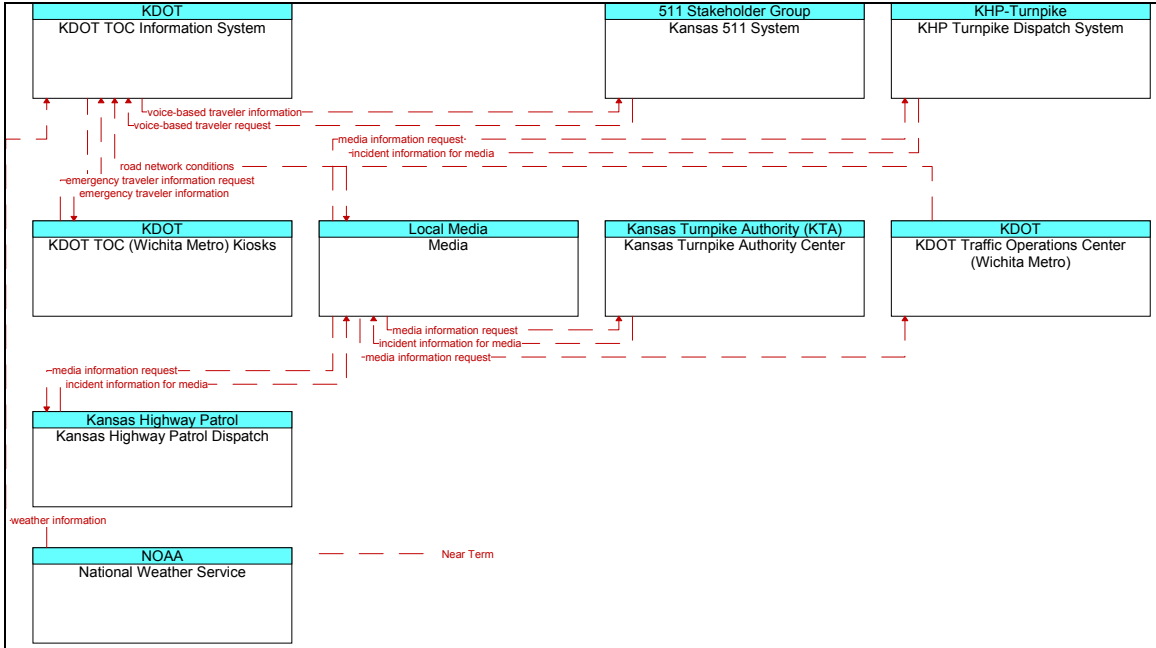


Figure 90. Disaster Traveler Information (Part 1)

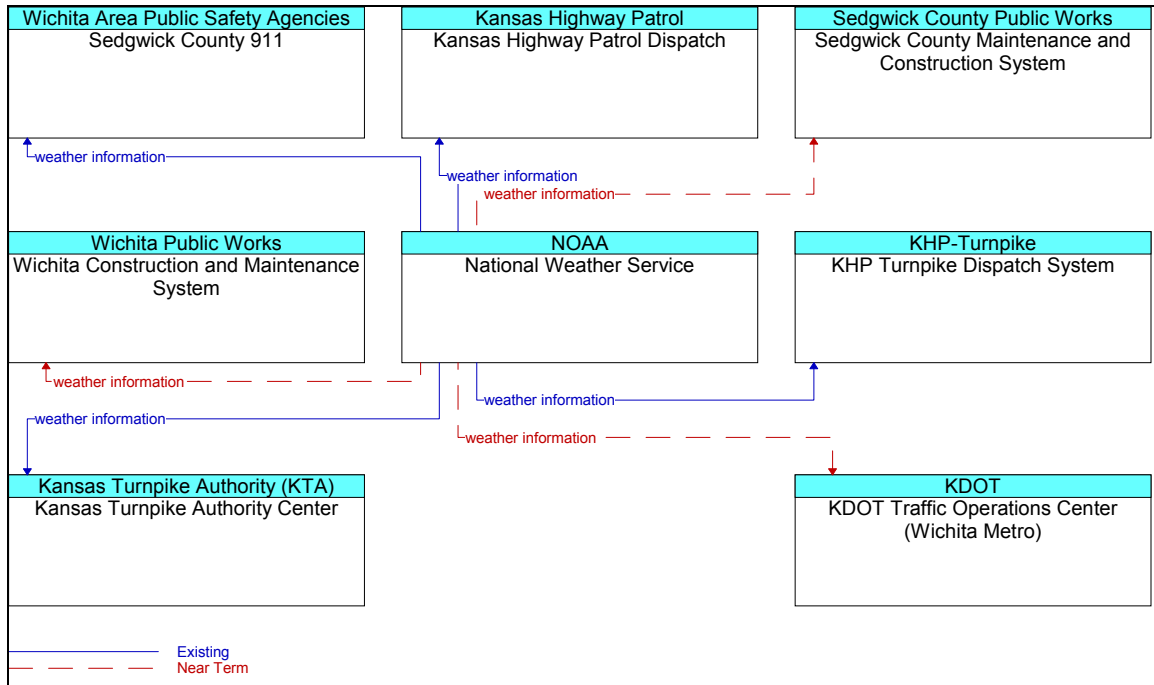


Figure 91. Disaster Traveler Information (Part 2)

4.61 ITS Data Mart

The ITS Data Mart service (Figure 92) provides a focused archive that houses data collected and owned by a single agency. The Wichita Regional ITS Architecture has three systems that operate as unique focused archives; the KDOT Planning Archive, Wichita Government Data Repository, and the Sedgwick County Government Data Repository. These archives typically include data covering a single transportation mode and one jurisdiction that is collected from an operational data store and archived for future use. It provides the basic data quality, data privacy, and metadata management and provides general query and report access to archive data users.

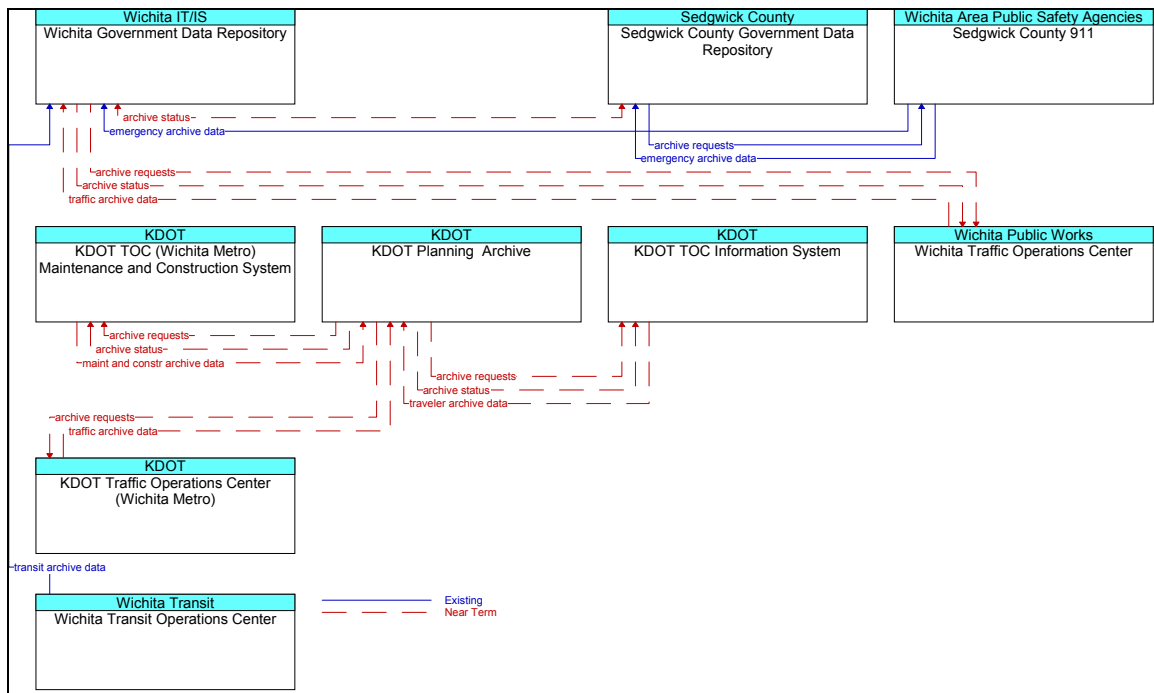


Figure 92. ITS Data Mart Services

4.62 ITS Data Warehouse

The ITS Data Warehouse service (Figure 93) includes all the data collection and management capabilities provided by the ITS Data Mart (Figure 92), and adds the functionality and interface definitions that allow collection of data from multiple agencies in the Wichita area and data sources spanning across modal and jurisdictional boundaries. It performs the additional transformations and provides the additional metadata management features that are necessary so that all the data can be managed in a single repository with consistent formats. The potential for large volumes of varied data suggests additional on-line analysis and data mining features that are also included in this service in addition to the basic query and reporting user access features offered by the ITS Data Mart.

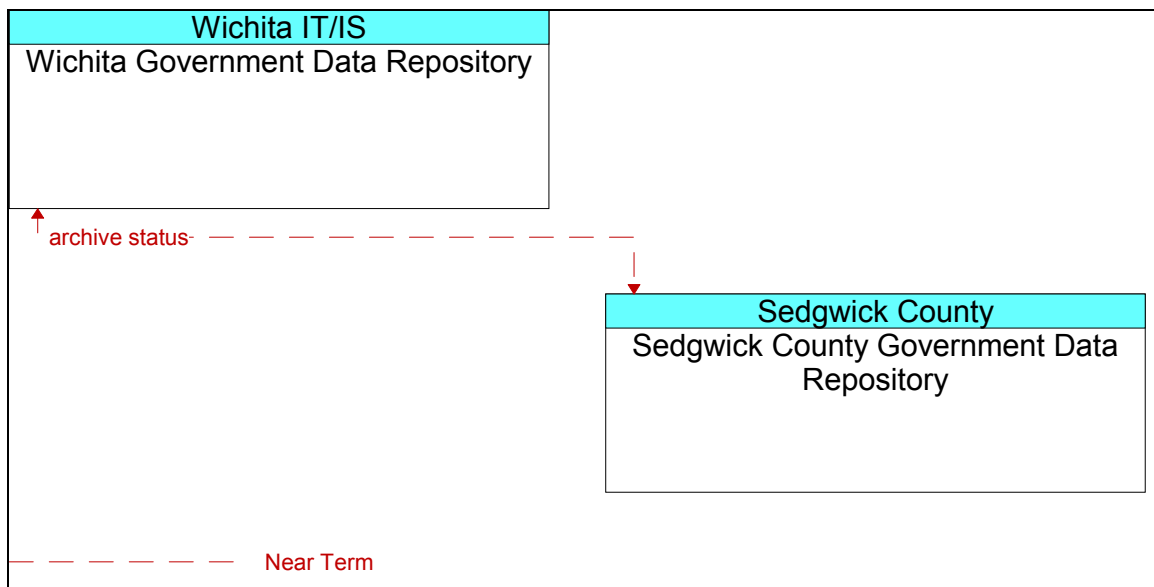


Figure 93. ITS Data Warehouse Services

A Appendix

Architecture Kick-Off Meeting (December 14, 2004)

	First Name	Last Name	Agency	Title	Division
1	Bob	Alva	FHWA	ITS/Safety Engineer	Kansas Division
2	Mark	Borst	Sedgwick County	Engineer	Public Works
3	Jeff	Brummond	Iteris	Principal Systems Architect	
4	Jeet	Desai	MAPD	Associate Planner	Transportation
5	Mike	Floberg	KDOT	State ITS Engineer	KS Bureau of Transportation Planning
6	Karen	Gilbertson	KDOT	ITS Engineer	KS Bureau of Transportation Planning
7	Paul	Gunzelman	City of Wichita	City Traffic Engineer	Public Works
8	Nancy	Harvieux	MAPD	Principal Planner	Transportation
9	Julianne	Kallman	City of Wichita	Associate City Manager	Public Works
10	Kent	Koehler	Sedgwick County	Senior Project Manager	Information & Operations-IT Development
11	Mike	Malone	Iteris	Associate Vice President	
12	Dennis	McHugh	City of Wichita	GIS Analyst	IT/IS
13	Jamsheed	Mehta	MAPD	Chief Planner	Transportation
14	Marjie	Norton	KDOT	Associate Planner	KS Bureau of Transportation Planning
15	Benny	Tarverdi	KDOT	Metro Engineer, KDOT District 5	Road Condition Reporting System (RCRS)

2-Day Architecture Stakeholder Meeting (January 18-19, 2005)

	First Name	Last Name	Agency	Title	Division
1	Purab	Adabala	MAPD	Planning Analyst	Transportation
2	James	Armour	City of Wichita	Acting City Engineer	Engineering
3	Mitch	Blackburn	City of Wichita	Banner System Analyst	IT
4	Barb	Blue	KDOT	ATIS Coordinator	KS Bureau of Transportation Information
5	Mark	Borst	Sedgwick County	Engineer	Public Works
6	Jeff	Brummond	Iteris	Principal Systems Architect	
7	Jeet	Desai	MAPD	Associate Planner	Transportation
8	Mike	Floberg	KDOT	State ITS Engineer	KS Bureau of Transportation Planning
9	Karen	Gilbertson	KDOT	ITS Engineer	KS Bureau of Transportation Planning
10	Paul	Gunzelman	City of Wichita	City Traffic Engineer	Public Works
11	Rene	Hart	KDOT	Financial Program Assistant	KS Bureau of Transportation Planning
12	Nancy	Harvieux	MAPD	Principal Planner	Transportation
13	Darrell	Haynes	City of Wichita	Captain	Wichita Police
14	Tom	Hein	KDOT	Public Affairs Manager	Division of Operations
15	Kevin	Hennes	KDOT	Application Program Analyst	Transportation Planning
16	Julianne	Kallman	City of Wichita	Associate City Manager	Public Works
17	Kent	Koehler	Sedgwick County	Senior Project Manager	Information & Operations-IT Development
18	Leo	Luttjohann	KDOT	CVISN Architect	KS Department of Revenue
19	Mike	Malone	Iteris	Associate Vice President	
20	Dennis	McHugh	City of Wichita	GIS Analyst	IT/IS
21	Bill	McKinley	City of Maize	Consultant	
22	Jamsheed	Mehta	MAPD	Chief Planner	Transportation

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	First Name	Last Name	Agency	Title	Division
23	Charles	Neal	Iteris		
24	Terry	Nicholas	City of Wichita	Signal Supervisor	Traffic
25	Marjie	Norton	KDOT	Associate Planner	KS Bureau of Transportation Planning
26	Bhupendra	Patel	MAPD	Senior Planner	Transportation
27	Aruna	Reddi	MAPD	Planning Analyst	Transportation
28	Talbert	Showalter	City of Wichita	Planning Analyst	Wichita Transit
29	Joel	Skelley	KDOT	Transportation Planner	KS Bureau of Transportation Planning
30	John	Stark	City of Wichita	Air Quality Supervisor	Environmental Health / Air Quality
31	Alan	Stoecklein	Kansas Highway Patrol	Commander	Troop F
32	Ted	Trask	Wichita Fire Department	Battalion Chief #9	Fire Department
33	Srikanth	Yamala	MAPD	Planning Analyst	Transportation

Executive Overview Architecture Stakeholder Meeting (January 20, 2005)

	First Name	Last Name	Agency	Title	Division
1	Purab	Adabala	MAPD	Planning Analyst	Transportation
2	James	Armour	City of Wichita	Acting City Engineer	Engineering
3	Karen	Bailey	City of Goddard	City Clerk	
4	Danny	Bardezbain	Sedgwick County	Major	Sheriff
5	Mitch	Blackburn	City of Wichita	Banner System Analyst	IT
6	Carol	Bloodworth	City of Maize	City Administrator	
7	Barb	Blue	KDOT	ATIS Coordinator	KS Bureau of Transportation Information
8	Mark	Borst	Sedgwick County	Engineer	Public Works
9	J. Michael	Bowen	FHWA	Division Administrator	Office of the Division Administrator
10	Diana	Brooks	City of Colwich	City Clerk	
11	Kent	Brown	City of Clearwater	City Administrator	
12	Jeff	Brummond	Iteris	Principal Systems Architect	
13	Don	Dearmont	Wichita Airport Authority	Airport Construction Superintendent	Engineering & Planning
14	Jeet	Desai	MAPD	Associate Planner	Transportation
15	Darrell	Downing	Sedgwick County	Metropolitan Area Planning Commission	Metropolitan Planning Organization
16	Laura	Fisher	City of Bentley	City Clerk	
17	Mike	Floberg	KDOT	State ITS Engineer	KS Bureau of Transportation Planning
18	Diane	Gage	Sedgwick County	Director	Emergency Communication
19	Larry	Garcia	Wichita Fire Department	Fire Chief	Fire Department
20	Gary	Gibbs	Sedgwick County	Metropolitan Area Planning Commission	Metropolitan Planning Organization
21	Karen	Gilbertson	KDOT	ITS Engineer	KS Bureau of Transportation

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	First Name	Last Name	Agency	Title	Division
					Planning
22	John	Green	Sedgwick County	Under Sheriff	Sheriff
23	Paul	Gunzelman	City of Wichita	City Traffic Engineer	Public Works
24	Nancy	Harvieux	MAPD	Principal Planner	Transportation
25	Darrell	Haynes	City of Wichita	Captain	Wichita Police
26	Terry	Heidner	KDOT	Director	Planning & Development
27	Kevin	Hennes	KDOT	Application Program Analyst	Transportation Planning
28	Cathy	Holdeman	City of Wichita	Assistant City Manager	City Managers' Office
29	Sam	Houston	Sedgwick County	Captain	Sheriff
30	Jessica	Johnson	City of Wichita	Director of Environmental Health	Department of Environmental Health
31	Julianne	Kallman	City of Wichita	Associate City Manager	Public Works
32	Kent	Koehler	Sedgwick County	Senior Project Manager	Information & Operations-IT Development
33	Robert	Lamkey	Sedgwick County	Director	Public Safety
34	Donna	Luetters	Sedgwick County	Project Management Supervisor	Information & Operations-IT Development
35	Mike	Malone	Iteris	Associate Vice President	
36	George	Mason	Sedgwick County	Lieutenant	Sheriff
37	Dennis	McHugh	City of Wichita	GIS Analyst	IT/IS
38	Bill	McKinley	City of Maize	Consultant	
39	Jamsheed	Mehta	MAPD	Chief Planner	Transportation
40	James	Mendenhall	Initial Vision		
41	Wendall	Meyer	FHWA	FHWA Assistant Division Administrator	Administration
42	Charles	Neal	Iteris		
43	Marjie	Norton	KDOT	Associate Planner	KS Bureau of Transportation Planning

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	First Name	Last Name	Agency	Title	Division
44	Michael	Oliver	Sedgwick County	Lieutenant	Sheriff
45	Joe	Pajor	City of Wichita	Director of Natural Resources	Public Works Natural Resources
46	Bhupendra	Patel	MAPD	Senior Planner	Transportation
47	Aruna	Reddi	MAPD	Planning Analyst	Transportation
48	Greg	Schauner	Sedgwick County	Captain	Sheriff
49	John	Stark	City of Wichita	Air Quality Supervisor	Environmental Health / Air Quality
50	Gary	Steed	Sedgwick County	Sheriff	Sedgwick County
51	Alan	Stoecklein	Kansas Highway Patrol	Commander	Troop F
52	Michael	Stover	Sedgwick County	Lieutenant	Sheriff
53	Jackie	Stuart	Sedgwick County	Sheriff	Patrol
54	Kirk	Swilley	City of Wichita	CIO	IT/IS
55	Benny	Tarverdi	KDOT	Metro Engineer, KDOT District 5	Road Condition Reporting System (RCRS)
56	Ted	Trask	Wichita Fire Department	Battalion Chief #9	Fire Department
57	Michael	Vinson	City of Wichita	Assistant Director	Wichita Transit
58	Richard	Vogt	Sedgwick County	Chief Technology Officer	Information & Operations
59	Srikanth	Yamala	MAPD	Planning Analyst	Transportation

Architecture Stakeholder Meeting 1a (February 1, 2005)

	First Name	Last Name	Agency	Title	Division
1	Purab	Adabala	MAPD	Planning Analyst	Transportation
2	Bob	Alva	FHWA	ITS/Safety Engineer	Kansas Division
3	Mark	Borst	Sedgwick County	Engineer	Public Works
4	Jeff	Brummond	Iteris	Principal Systems Architect	
5	John	Crosby	Sedgwick County		Emergency Management
6	Arobindu	Das	Iteris	Assistant Transportation Systems Engineer	
7	Jeet	Desai	MAPD	Associate Planner	Transportation
8	Randall	Duncan	Sedgwick County		Emergency Management
9	Mike	Floberg	KDOT	State ITS Engineer	KS Bureau of Transportation Planning
10	Paul	Gunzelman	City of Wichita	City Traffic Engineer	Public Works
11	Nancy	Harvieux	MAPD	Principal Planner	Transportation
12	Darrell	Haynes	City of Wichita	Captain	Wichita Police
13	Julianne	Kallman	City of Wichita	Associate City Manager	Public Works
14	Kent	Koehler	Sedgwick County	Senior Project Manager	Information & Operations-IT Development
15	Mike	Malone	Iteris	Associate Vice President	
16	Dennis	McHugh	City of Wichita	GIS Analyst	IT/IS
17	Jamsheed	Mehta	MAPD	Chief Planner	Transportation
18	Terry	Nicholas	City of Wichita	Signal Supervisor	Traffic
19	Joseph	Pajor	City Of Wichita		Wichita Police
20	Benny	Tarverdi	KDOT	Metro Engineer, KDOT District 5	Road Condition Reporting System (RCRS)
21	Ted	Trask	Wichita Fire Department	Battalion Chief #9	Fire Department

Architecture Stakeholder Meeting (March 8-9, 2005)

	First Name	Last Name	Agency	Title	Division
1	Bob	Alva	FHWA	ITS/Safety Engineer	Kansas Division
2	Mitch	Blackburn	City of Wichita	Application Support Manager	IT
3	Barb	Blue	KDOT	ATIS Coordinator	KS Bureau of Transportation Information
4	Mark	Borst	Sedgwick County	Engineer	Public Works
5	Jeff	Brummond	Iteris	Principal Systems Architect	
6	Dale	Coffman	Park City Police Department	Captain	
7	Mike	Floberg	KDOT	State ITS Engineer	KS Bureau of Transportation Planning
8	Karen	Gilbertson	KDOT	ITS Engineer	KS Bureau of Transportation Planning
9	Paul	Gunzelman	City of Wichita	City Traffic Engineer	Public Works
10	Tom	Hein	KDOT	Public Affairs Manager	Division of Operations
11	Julianne	Kallman	City of Wichita	Associate City Manager	Public Works
12	Kent	Koehler	Sedgwick County	Senior Project Manager	Information & Operations-IT Development
13	Mike	Malone	Iteris	Associate Vice President	
14	Dennis	McHugh	City of Wichita	Transit Analyst	IT/IS
15	Bill	McKinley	City of Maize	Consultant	
16	Jamsheed	Mehta	MAPD	Chief Planner	Transportation
17	Chuck	Miller	HNTB	Engineer	
18	Paul	Moser	City of Wichita	Captain	
19	Terry	Nicholas	City of Wichita	Signal Supervisor	Traffic
20	Marjie	Norton	KDOT	Associate Planner	KS Bureau of Transportation Planning
21	Lew	Phillips	RCC Consultants	Sr. Consultant	
22	Talbert	Showalter	City of Wichita	Planning Analyst	Wichita Transit
23	Doug	Siesel	Iteris	Sr. Systems Engineer	

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24	Benny	Tarverdi	KDOT	Metro Engineer, KDOT District 5	Road Condition Reporting System (RCRS)
25	Ted	Trask	Wichita Fire	Battalion Chief #9	Fire Department
26	Michael	Weins	RCC Consultants	Director	

Architecture Stakeholder Meeting (March 10, 2005)

	First Name	Last Name	Agency	Title	Division
1	Purab	Adabala	MAPD	Planning Analyst	Transportation
2	James	Armour	City of Wichita	Acting City Engineer	Engineering
3	Mitch	Blackburn	City of Wichita	Application Support Manager	IT
4	J. Michael	Bowen	FHWA	Division Administrator	Office of the Division Administrator
5	Jeff	Brummond	Iteris	Principal Systems Architect	
6	Andrew	Busada			
7	Chris	Carrier	City of Wichita	Director	Public Works
8	I. D	Creech	City of Valley Center	City Manager	
9	Jeet	Desai	MAPD	Associate Planner	Transportation
10	Morris K.	Dunlap	Sedgwick County	Metropolitan Area Planning Commission	Metropolitan Planning Organization
11	Mike	Floberg	KDOT	State ITS Engineer	KS Bureau of Transportation Planning
12	Diane	Gage	Sedgwick County	Director	Emergency Communication
13	Larry	Garcia	Wichita Fire Department	Fire Chief	Fire Department
14	John	Gaunt	KS Hwy Patrol Communications	Major	Dispatch
15	Karen	Gilbertson	KDOT	ITS Engineer	KS Bureau of Transportation Planning
16	Nancy	Harvieux	MAPD	Principal Planner	Transportation
17	Kent	Hixhon	City of Mulvane	City Administrator	
18	Cathy	Holdeman	City of Wichita	Assistant City Manager	City Managers' Office
19	Julianne	Kallman	City of Wichita	Associate City Manager	Public Works
20	Kent	Koehler	Sedgwick County	Senior Project Manager	Information & Operations-IT Development
21	Robert	Lamkey	Sedgwick County	Director	Public Safety

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22	Byron	Low	FHWA	Team Leader	
23	Mike	Mackay	McConnell AFB	Environmental Engineer	
24	Mike	Malone	Iteris	Associate Vice President	
25	Dennis	McHugh	City of Wichita	Transit Analyst	IT/IS
26	Jamsheed	Mehta	MAPD	Chief Planner	Transportation
27	Wendall	Meyer	FHWA	FHWA Assistant Division Administrator	Administration
28	M. S.	Mitchell	City of Wichita	Metropolitan Area Planning Commission	Metropolitan Planning Organization
29	Paul	Moser	City of Wichita	Lt.	
30	Marjie	Norton	KDOT	Associate Planner	KS Bureau of Transportation Planning
31	Michael	Oliver	Sedgwick County	Lieutenant	Sedgwick County
32	Karyn	Page	Kansas World Trade Center	Executive Director	Board of Directors
33	Joe	Pajor	City of Wichita	Director of Natural Resources	Public Works Natural Resources
34	Talbert	Showalter	City of Wichita	Planning Analyst	Wichita Transit
35	Kirk	Swilley	City of Wichita	CIO	IT/IS
36	Alan	Tigard	City of Wichita	Traffic Maint.	
37	Ted	Trask	Wichita Fire Department	Battalion Chief #9	Fire Department
38	Richard	Vogt	Sedgwick County	Chief Technology Officer	Information & Operations

Architecture Stakeholders Public Meeting (March 10, 2005)

	First Name	Last Name	Agency	Title	Division
1	Purab	Adabala	MAPD	Planning Analyst	Transportation
2	Jeff	Brummond	Iteris	Principal Systems Architect	
3	Jeet	Desai	MAPD	Associate Planner	Transportation
4	Mike	Floberg	KDOT	State ITS Engineer	KS Bureau of Transportation Planning
5	Teresa	Freed	KAKE- TV	Reporter	
6	Mike	Malone	Iteris	Associate Vice President	
7	Fred	Mann	Wichita Eagle		
8	Dennis	McHugh	City of Wichita	Transit Analyst	IT/IS
9	Larry	Ross	Greenway Alliance		