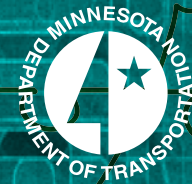
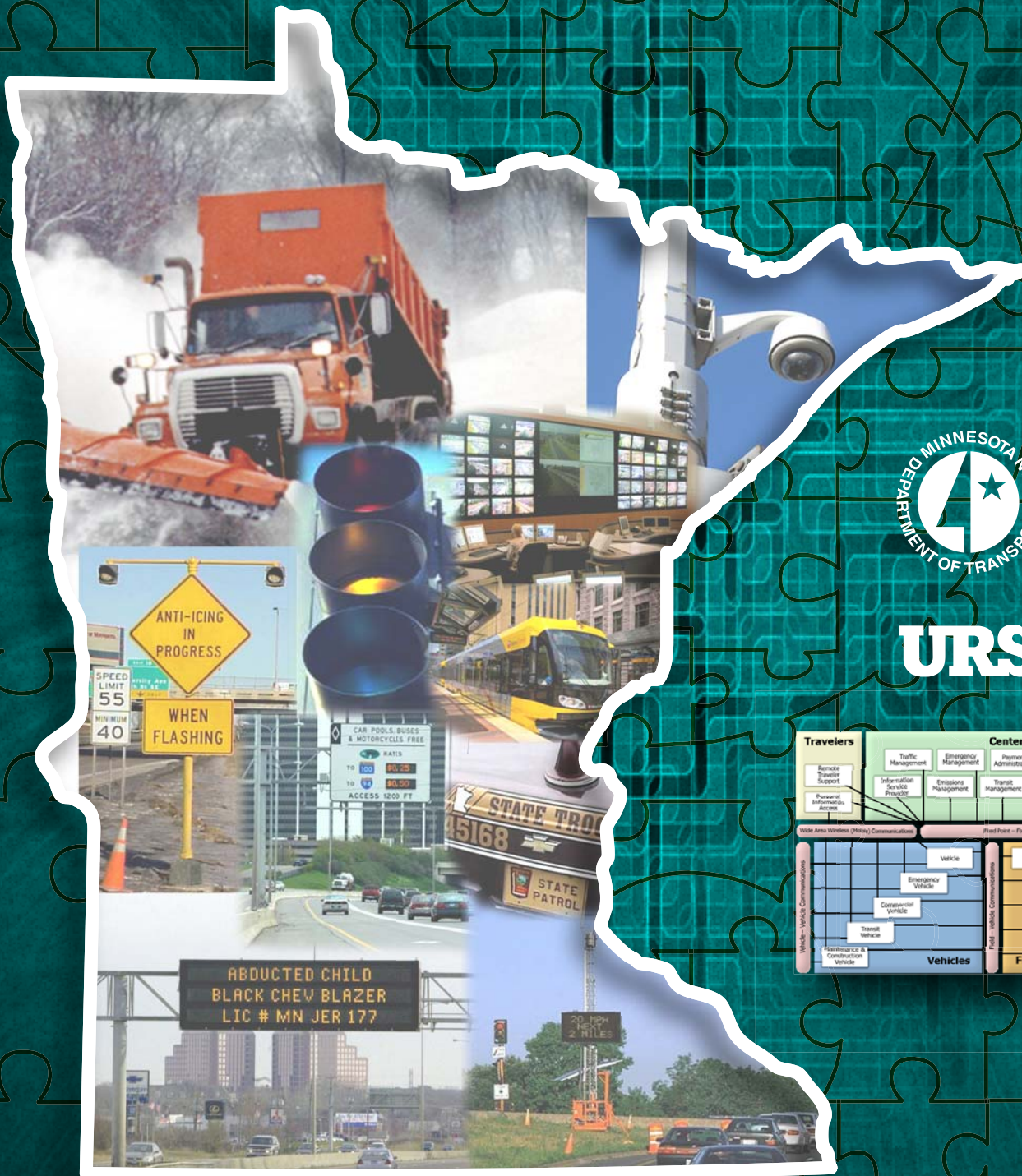


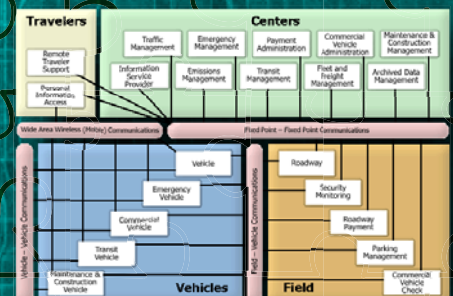
MINNESOTA STATEWIDE REGIONAL ITS ARCHITECTURE

Version 2014

Volume 10:
Turbo Architecture Outputs of the Regional ITS Architecture



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Minnesota Statewide Regional ITS Architecture Version 2014

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of the Regional ITS Architecture**

An abstract graphic at the bottom of the page consisting of several overlapping, semi-transparent 3D rectangular blocks in shades of light blue and grey, creating a sense of depth and architectural structure.

September 2014

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1 Introduction

The Minnesota Statewide Regional Intelligent Transportation Systems (ITS) Architecture Version 2014 is an update of the previous version that was developed in 2009. It conforms with the National ITS Architecture and the Federal Highway Administration (FHWA) Final Rule 940 and Federal Transit Administration (FTA) Final Policy on ITS Architecture and Standards. The Final Rule and the Final Policy ensure that ITS projects carried out using funds from the Highway Trust Fund including the Mass Transit Account conform to the National ITS Architecture and applicable ITS standards.

The Minnesota Statewide Regional ITS Architecture represents a shared vision of how each agency's systems work together by sharing information and resources to enhance transportation safety, efficiency, capacity, mobility and security. The information exchange among the many transportation stakeholders helps illustrate various integration options, gain consensus on cost-effective ITS technologies and systems to be considered prior to investing in design, development and deployment of ITS.

The Regional ITS Architecture is a living document and will evolve as needs, technology, stakeholders and funding change. The National ITS Architecture is a resource to the Minnesota Statewide Regional Architecture providing framework for planning, defining and integrating ITS.

The Minnesota Statewide Regional ITS Architecture is organized as follows:

- **Overview:** The Overview document identifies the purpose/need, a general description of the region, development objectives, and performance measures for the Minnesota Statewide Regional ITS Architecture.
- **Volumes 1 thru 8 – Development and Documentation of Service Package Bundles:** Each volume is specific to the corresponding Service Package Bundle and includes: a description of the Service Package Bundle, ITS development objectives, a summary of needs and services, and a detailed description of needs and services (consisting of the operational concept, inventory, specific service packages to address needs and services, interconnects and architecture flows, and research and development needs).
- **Volume 9 – ITS Initiatives and Project Concepts for Implementation:** This volume serves as long-range guidance to systematically and cost-effectively implement the ITS initiatives and project concepts for the next 15 to 20 years in Minnesota based on funding availability. It lists specific ITS needs that are further prioritized into ITS initiatives and project concepts. It also provides the corresponding details for each initiative or project concept which include project concept descriptions, agency involved, champion, implementation timeframe, technology readiness, dependencies, benefits, service packages, estimated costs, and agreements needed.
- **Volume 10 – Turbo Architecture Outputs for the Regional ITS Architecture:** Volume 10 consists of a Turbo Architecture generated report for the Minnesota Statewide Regional ITS Architecture.

Development of Volume 10 – Regional ITS Architecture entailed the entry of all existing and planned ITS elements identified in Appendix A for Volumes 1 through 8 into Turbo

Architecture Software Version 7.0. This information included the ITS element names, descriptions, appropriate stakeholders, existing/planned status, and relevant market packages in which the ITS elements can be categorized. Additional inputs into Turbo Architecture not included in Volumes 1 through 8 consist of Operational Concepts, in which all ITS stakeholders are assigned roles and responsibilities for operating and maintaining ITS elements.

Given the ITS elements in Appendix A of Volumes 1 through 8, Turbo Architecture identifies all potential flows of communication between ITS elements. These flows are based on the categorization of ITS elements into the Service Packages identified in Appendix A and the assignment of ITS elements as a subsystem(s) and/or terminator(s).

The reports generated by Turbo Architecture are designed to meet FHWA Rule 940 which requires agencies to develop a regional ITS architecture based on the National ITS Architecture that reflects the local needs, issues, and objectives for ITS implementation and is consistent with the transportation planning process for statewide, metropolitan and local planning practice. ITS projects receiving federal-aid funding are required to have developed a regional ITS architecture for the projects, systems integration, and future implementation.

2 Architecture Scope

The Minnesota Statewide Regional ITS Architecture is a roadmap for transportation systems integration. The architecture was developed through a cooperative effort by the region's transportation agencies, covering all modes and all roads in the region. It represents a shared vision of how each agency's systems will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in the region.

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

Description

The Minnesota Statewide Regional ITS Architecture represents a shared vision of how each agency's system works together by sharing information and resources to enhance transportation safety, efficiency, capacity, mobility, and security. The information exchange among the many transportation stakeholders helps illustrate various integration options, gain consensus on cost-effective ITS technologies and systems to be considered prior to investing in the design, development and deployment of ITS.

Timeframe

2015 - 2030

Geographic Scope

Entire State of Minnesota

Service Scope

Archived Data Management Systems (ADMS), Advanced Public Transportation Systems (APTS), Advanced Traveler Information Systems (ATIS), Advanced Traffic Management Systems (ATMS), Advanced Vehicle Safety Systems (AVSS), Commercial Vehicle Operations (CVO), Emergency Management (EM), and Maintenance and Construction Management (MCM).

3 Relationship to Regional Planning

The Minnesota Statewide Regional ITS Architecture is an integral part of planning for the operations and maintenance strategies that are addressed by the regional transportation planning process. The architecture provides a framework that connects operations and maintenance objectives and strategies with the integrated transportation system improvements that are implemented as a progressive series of ITS projects. The architecture also is used to define the data needs associated with performance monitoring that supports an informed planning process. The planning objectives, strategies, and associated performance measures from the regional plan are detailed in the **Overview Volume**. The high-level Minnesota ITS Development Objectives are categorized in eight areas and are presented below. These planning elements are connected with ITS services in the Minnesota Statewide Regional ITS Architecture.

Minnesota ITS Development Objectives

A. Improve the Safety of the State's Transportation System

- A-1 Reduce crash frequency (*ATIS, ATMS, APTS, CVO, EM, MCM & AVSS*)
- A-2 Reduce fatalities and life changing injuries (*ATIS, ATMS, APTS, CVO, EM, MCM & AVSS*)
- A-3 Reduce crashes in work zones (*ATIS, ATMS, EM, MCM & AVSS*)

B. Increase Operational Efficiency and Reliability of the Transportation System

- B-1 Reduce overall delay associated with congestion (*ATIS, ATMS, MCM & AVSS*)
- B-2 Increase average vehicle occupancy and facility throughput (*ATMS & APTS*)
- B-3 Reduce delays due to work zones (*ATIS, ATMS, EM, MCM & AVSS*)
- B-4 Reduce traffic delays during evacuation from homeland security and Hazmat incidents (*ATIS, ATMS, APTS, CVO, EM, MCM & AVSS*)

C. Enhance Mobility, Convenience, and Comfort for Transportation System Users

- C-1 Reduce congestion and incident-related delay for travelers (*ATIS, ATMS, APTS, EM & AVSS*)
- C-2 Improve travel time reliability (*ATIS, ATMS, APTS & AVSS*)
- C-3 Increase choice of travel modes (*ATIS, ATMS & APTS*)
- C-4 Reduce stress caused by transportation (*ATIS, ATMS, APTS, EM, MCM & AVSS*)

Minnesota ITS Development Objectives (Continued)

D. Improve the Security of the Transportation System

- D-1 Enhance traveler security (*APTS & EM*)
- D-2 Safeguard the motoring public from homeland security and/or Hazmat incidents (*ATIS, ATMS, APTS, CVO, EM, MCM & AVSS*)

E. Support Regional Economic Productivity and Development

- E-1 Reduce travel time for freight, transit and businesses (*ATIS, ATMS, APTS, CVO & AVSS*)
- E-2 Improve the efficiency of freight movement, permitting and credentials process (*ATIS & CVO*)
- E-3 Improve travel time reliability for freight, transit and businesses (*ATMS, APTS, CVO & AVSS*)
- E-4 Increase agency efficiency (*ADMS, ATMS, APTS, CVO, EM & MCM*)
- E-5 Reduce vehicle operating costs (*ATMS, APTS, CVO & AVSS*)
- E-6 Enhance efficiency at borders (*ATIS & CVO*)

F. Preserve the Transportation System

- F-1 Safeguard existing infrastructure (*ATMS, CVO, EM & MCM*)

G. Enhance the Integration and Connectivity of the Transportation System

- G-1 Aid in transportation infrastructure and operations planning (*All*)
- G-2 Reduce need for new facilities (*ATMS, CVO, MCM & AVSS*)

H. Reduce Environmental Impacts

- H-1 Reduce emissions/energy impacts and use associated with congestion (*ATIS, ATMS, CVO & AVSS*)
- H-2 Reduce negative impacts of the transportation system on communities (*ATMS, APTS, EM & MCM*)

4 ITS Stakeholders

Identifying stakeholders is an important task in ITS architecture development since effective ITS involves the integration of multiple stakeholders and their transportation systems. This section describes the stakeholders who either participated in the creation of the Minnesota Statewide 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. Every stakeholder in this section is related to one or more of the transportation inventory elements described in the next chapter, either as an individual stakeholder or as a member of a stakeholder group.

Table 1: ITS Stakeholders

Stakeholder Name	Stakeholder Description
Account Management Providers	Provide invoicing and payment tracking services for private companies or public agencies. Examples of the Account Management Provider include: Service Billing Companies and Credit Card Companies.
Airports	Represents airports throughout the state of Minnesota. Airports receive important traveler, weather, and construction information from other agencies, and coordinate with emergency management.
City of Minneapolis	City of Minneapolis is a part of the Minneapolis-St. Paul MPO. City operates a traffic management center through which CCTV cameras and traffic signal timings are controlled and traffic flows are monitored. City also participates in Integrated Corridor Traffic Management (ICTM) program. City operates a parking management system and uses dynamic message signs to notify drivers of parking space availability.
Event Promoters	Special Event Sponsors that have knowledge of events that may impact travel on roadways or other modal means.
FHWA	This represents the Federal Highway Administration (FHWA). This agency leads the Clarus Initiative, which is an initiative to develop and demonstrate an integrated surface transportation weather observing, forecasting and data management system.
FMCSA	Federal Motor Carrier Safety Administration (FMCSA) is a federal agency responsible for the administration of safety-related initiatives and programs for the motor carrier industry.
IFTA, Inc.	The IFTA, Inc. (International Fuel Tax Association) administers the International Fuel Tax Agreement.
Intercity Transit Providers	This stakeholder represents Northstar Commuter Coach traveling between Elk River and Minneapolis and Greyhound and Jefferson Lines buses traveling throughout the state.
IRP, Inc.	The IRP (International Registration Plan), Inc. administers International Registration Plan. For motor carriers operating under the International Registration Plan, registering a fleet of inter-jurisdictional vehicles becomes a one-stop process for motor
Local Agencies	This represents Minnesota county-level and city-level agencies.
Local Media	Represents all local media outlets.
Local Transit Providers	This stakeholder group includes the St. Cloud Metropolitan Transit Commission (MTC), Duluth Transit Authority (DTA), City of Rochester Public Transit, Metro Area Transit (MAT -- serving Moorhead), Cities Area Transit (CAT -- serving East Grand Forks), and various county and city-level transit operations centers.
Major Employers	This represents major employers in large and small urban areas of Minnesota.
Map Update Providers	Agencies that provide information to, or receive information from, Minnesota public agencies and private companies providing ITS services.
Metro Area Transit Providers	This stakeholder group includes Metro Transit and Suburban Transit Providers, independent of Metro Transit, that connect outer-ring metro-area suburbs with Minneapolis and St. Paul metro areas.
Metro Transit	Provides fixed-route and demand response public transit service for the Minneapolis-St. Paul metro area. This is a service of the Metropolitan Council of the Twin Cities.
Metropolitan Council	The Metropolitan Council is the regional planning agency serving the Twin Cities seven-county metropolitan area and providing essential services to the region, such as public transportation (Metro Transit), wastewater collection and treatment, and planning for housing and community development.

Stakeholder Name	Stakeholder Description
Minnesota Ambulance Association	Minnesota Ambulance Association
Minnesota Chiefs of Police Association	Minnesota Chiefs of Police Association
Minnesota DPS	The Minnesota Department of Public Safety (DPS) is comprised of several divisions and services, including the Minnesota State Patrol, Driver and Vehicle Services, and Homeland Security and Emergency Management.
Minnesota DVS	This stakeholder represents the Driver and Vehicle Services Division of the Minnesota Department of Public Safety, which sends commercial vehicle operations credentials information to the Truck Center.
Minnesota EMSRB	The Minnesota Emergency Medical Services Regulatory Board (EMSRB) is the state agency responsible for licensing ambulance services, certifying emergency medical personnel, approving emergency medical services training programs, designating and funding eight regional EMS organizations that support emergency medical services, funding the Comprehensive Advanced Life Support (CALS) Program for training rural emergency room teams, and administering the volunteer ambulance training grant program, the longevity program for volunteer ambulance personnel and the EMS for Children (EMSC) grant program.
Minnesota Homeland Security and Emergency Management	This agency is responsible for operating the Minnesota AMBER Alert System and the Minnesota State Emergency Operations Center (SEOC).
Minnesota State Fire Chiefs Association	Minnesota State Fire Chiefs Association
Minnesota State Patrol	Represents the 12 State Patrol districts that manage resources and communicate incident data and resource requests to other public and private agencies.
MnDOT	Department of Transportation for the State of Minnesota. MnDOT operates a Regional Transportation Management Center (RTMC) for the metro area and nine Transportation and Operation Communication Centers (TOCCs) throughout the state.
MnDOT OFCVO	MnDOT Office of Freight and Commercial Vehicles (OFCVO).
MnDOT Office of Aeronautics	MnDOT Office of Aeronautics Navigation Systems Section has installed Automated Weather Observation Systems (AWOS) and Automated Surface Observation Systems (ASOS) throughout the state. The equipment, installation, and maintenance of these systems is funded entirely by this office.
MnDOT Office of Maintenance	MnDOT Office of Maintenance coordinates roadway maintenance and construction activity throughout Minnesota.
MnDOT OTDS	MnDOT Office of Transportation Data and Analysis is responsible for the collection, creation, storage, maintenance, and dissemination of transportation-related data to the general public through various means.
Neighboring States	This group includes agencies representing the states of Iowa, Wisconsin, North Dakota and South Dakota. Agencies coordinate traffic management, emergency management, and roadway information systems with MnDOT and Minnesota State Patrol.
NOAA	The National Weather Service, a branch of the National Oceanic and Atmospheric Administration (NOAA), provides weather forecast and issues warnings related to adverse weather conditions.
North/West Passage Corridor Members	The North/West Passage Corridor encompasses the states along I-90/I-94 from Wisconsin to Washington. The eight states are: Wisconsin, Minnesota, North Dakota, South Dakota, Montana, Idaho, Wyoming, and Washington.
Northstar Corridor Development Authority	This stakeholder represents the agency primarily responsible for commuter rail operations extending northwest from downtown Minneapolis to Big Lake.
Private Information Service Providers	Private Information Service Providers that provide value-added information, such as Rideshare Matching Services.
Private Mayday Service Providers	This stakeholder represents private mayday service providers, such as the OnStar system.
Private Parking Operators	Operate Parking Management Systems for public or private parking facilities, including park-and-ride facilities.
Private Trucking Companies	Private trucking companies represent those companies that own and manage their own commercial fleets of vehicles traveling through the state of Minnesota.
Private Weather Service Providers	This stakeholder represents private weather service providers.

Stakeholder Name	Stakeholder Description
Railroad Companies	Railroad Companies include the Twin Cities and Western Railroad (TCW). Companies operate and maintain railroad wayside equipment at highway-railroad intersections.
Traveler Information Kiosks Operators	This stakeholder group represents agencies and municipalities that provide traveler information services to the traveling public. This group includes MnDOT, Explore Minnesota Tourism, North/West Passage Corridor Members, private information service providers, and counties and cities throughout Minnesota.
Travelers	Travelers on Minnesota roads and highways.
University of Minnesota CTS ITS Institute	University of Minnesota Center for Transportation Studies (CTS) ITS Institute operates the Research Lab Network Surveillance Archive and Research Lab Network Surveillance Roadside Equipment.
University of Minnesota Duluth	University of Minnesota Duluth houses the Transportation Data Research Laboratory (TDRL).
US Customs and Border Protection	US Customs and Border Protection

5 ITS Inventory

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

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

Table 2: ITS Inventory

Element Name	Element Description	Stakeholder	Element Status
511 Telephone Information Service	Minnesota launched its 511 telephone information service in July 2002. Callers can obtain the following information for all state maintained roadways: road conditions, construction, incidents, and urban area congestion among other information.	MnDOT	Existing
511 Traveler Information Website	The MnDOT 511 Traveler Information Website provides real time traveler information including road conditions, construction detours, road congestion, and travel weather information for all state maintained roadways. The 511 system features an alert system that enables it to broadcast AMBER Alerts and General Transportation and Homeland Security Alerts as needed. The website also provides a link to the MnDOT traffic flow map that provides travelers with traffic congestion information based on data from MnDOT loop detectors in the roadway.	MnDOT	Existing
911 Dispatch Center	This element represents the dispatch centers that receives 911 calls and dispatch the appropriate sheriff, police, fire and EMS for traffic incidents. Some centers are equipped with computer aided dispatch (CAD) systems. Dispatch centers coordinate traffic incident responses and exchange mutual aid and incident information with agencies as necessary. Future coordination with Minnesota CARS is planned.	Minnesota State Patrol	Existing
Account Management Providers	Provide invoicing and payment tracking services for private companies or public agencies. Examples of the Account Management Provider include: Service Billing Companies and Credit Card Companies	Account Management Providers	Existing
Advance Warning Flasher Roadside Equipment	Advance Warning Flasher Roadside Equipment is located upstream from traffic signal roadside equipment on high-speed approaches to warn drivers of changes in signal phases from green to red.	MnDOT	Existing
Advanced Pavement Condition and Visibility Warning System Roadside Equipment	This element represents the roadside equipment of the proposed automated warning system. The roadside equipment would consist of pavement sensors, visibility sensors, and either changeable message signs or static warning signs with flashing beacons located upstream from the problem area. MnDOT District 6 TOCC personnel and the State Patrol would have remote access and capability to override the messages being sent.	MnDOT	Planned

Element Name	Element Description	Stakeholder	Element Status
Airport	Located throughout the state, Minnesota Airports receive important traveler, weather, and construction information from other agencies, and coordinate with emergency management.	Airports	Existing
Animal Crossing Warning Roadside Equipment	This represents roadside equipment that includes laser/light emitters along the roadway, along with a series of static deer warning signs with light flashers. When an animal breaks the beam, the flashers on the three signs nearest the deer are activated, providing additional warning to motorists. Equipment is installed near Camden State Park in MnDOT District 8 along TH 23.	MnDOT	Existing
Automated Crash Notification System	This system provides immediate notification of crashes to responders and provides access to driver, passenger, and vehicle information. This would assist emergency responders in quickly and efficiently locating crash or other road safety related incidents.	MnDOT	Planned
Automated Permit Routing System	This element represents an automated system that will allow for the provision of real time route information data to commercial vehicle operators. Permitted commercial vehicle operators and oversize/ overweight vehicles currently use the Automated Permit Routing System to generate route information based on size and weight requirements.	MnDOT OFCVO	Existing
AWOS Central Control System	MnDOT Office of Aeronautics has installed and currently maintains Automated Weather Observation Systems (AWOS) throughout the state. AWOS data is gathered and re-distributed over the Federal Aviation Administration (FAA) National Airspace Data Interchange Network (NADIN), allowing these reports to become available through computer weather systems. Current weather information can be obtained by telephoning the AWOS site, where a computer generated voice relays up-to-the-minute observations. The AWOS data is visually displayed on a remote computer monitor at local airports, and is simultaneously broadcast over the local radio navigation aid or a VHF transmitter for in-flight use.	MnDOT Office of Aeronautics	Existing
AWOS Roadside Equipment	This element represents the roadside equipment of AWOS.	MnDOT Office of Aeronautics	Existing
Basic Vehicle	This represents the basic vehicle platform that interfaces with and hosts ITS electronics. It provides an interface to the drive train, driver convenience and entertainment systems, and other non-ITS electronics on-board the vehicle. This interface allows general vehicle systems (e.g., the stereo speaker system) to be shared by ITS and non-ITS systems. It also allows monitoring and control of the vehicle platform for advanced vehicle control system applications.	Travelers	Existing
Bridge Inspection / Structural Monitoring Roadside Equipment	This element represents roadside cameras and sensors that are planned to be utilized for maintenance inspections of key bridges in Minnesota. Roadside equipment is planned to be controlled by MnDOT RTMC, TOCCs, and Maintenance and Construction Management Centers for maintenance inspections. Initial testing on I-35W bridge in Minneapolis will test sensors such as linear potentiometers to measure bridge movements, accelerometers to monitor bridge deflections under loads, and acoustical sensors to detect unusual sounds of a specific frequency. Data on inspection activity can be archived to indicate dates of inspection and exactly what was inspected.	MnDOT	Planned
CCTV Roadside Equipment	This element represents CCTV cameras deployed along the roadside by various agencies and municipalities throughout Minnesota. Cameras are controlled and monitored by TMCs.	MnDOT	Existing

Element Name	Element Description	Stakeholder	Element Status
Clarus Weather System	The Clarus Weather System is an FHWA-led initiative that plans to collect atmospheric and surface weather data from environmental sensor stations throughout the US and Canada and share the data with the general public and private information service providers. Eight U.S. states, including Minnesota and three Canadian territories, currently upload information to a map interface on the Clarus Initiative project website.	FHWA	Existing
Commercial Vehicle Administration Center	This center accepts and investigates all complaints made against carriers and service providers under its jurisdiction. The center reviews and issues transportation permits for oversized and/or overweight load movements which meet appropriate requirements and restrictions for travel on MN Trunk Highways.	MnDOT OFCVO	Existing
Commercial Vehicles	This ITS element represents commercial vehicles equipped with the sensory, processing, storage, and communications functions to promote the safe and efficient operation of commercial vehicles in the state of Minnesota. These vehicles may be equipped with two-way communications allowing commercial vehicle drivers to communicate with their fleet managers, and roadside officials. The vehicle may also have the capability to collect and process vehicle, cargo information from the attached freight equipment, and driver safety data and status and alert the driver whenever there is a potential safety or security problem. Basic identification, security and safety status data may be supplied to inspection facilities at mainline speeds.	Private Trucking Companies	Existing
Commuter Rail Operations Center	This element represents the Northstar Commuter Rail operations center that will operate and maintain commuter rail vehicles between downtown Minneapolis and Big Lake beginning in 2009. Commuter rail vehicle maintenance facility will be located in Big Lake. Stations are planned in Minneapolis, Fridley, Coon Rapids, Anoka, Elk River, and Big Lake. Future plans are to expand the commuter rail line northwest to downtown Saint Cloud and the VA Medical Center.	Northstar Corridor Development Authority	Planned
Condition Acquisition and Reporting System (CARS)	This system represents a central source of roadway event information for both the management and dissemination of traffic-related information to the traveling public. The system is maintained by the MnDOT OTSO (Office of Traffic, Safety, and Operations) and data is input throughout MnDOT at District Offices and District TOCC's. Minnesota State Patrol users also enter information to CARS on road conditions and incidents each day. CARS also manages automated data entry for congestion in the Twin Cities metro area based on information from loop detector roadside equipment. Data entered into CARS is available to the public to use for traveler information services through an XML feed. In MnDOT District 7, data entry occurs via web-enabled cellular telephones with approximately 75 users, primarily snow plow operators. Similar deployment is planned for MnDOT District 6. Integration of CARS with 911 Computer Aided Dispatch System is planned.	MnDOT Office of Maintenance	Existing
County Emergency Operations Centers	Each Minnesota county and various Minnesota cities have an emergency operations center (EOC). These EOCs range from minimally equipped, stand-by facilities to centers that operate on a daily basis. The EOCs operate for emergency operations and homeland security practices during emergencies and disasters.	Local Agencies	Existing
County Sheriff and City Police Offices	This element represents local law enforcement agencies throughout the state of Minnesota at the county and city level.	Local Agencies	Existing

Element Name	Element Description	Stakeholder	Element Status
CVO Information Requestor	This terminator represents any organization requesting information from the Minnesota CVIEW. It typically represents insurance companies requesting safety information on carriers etc.		Existing
Data Distribution Server	The Data Distribution Server (DDS) is a custom designed, real-time data distribution system used at the MnDOT RTMC from which data is shared with other agencies.	MnDOT	Existing
Driver	Drivers along Minnesota roads and highways.		Existing
Dynamic Late Merge Central Control System	This system is placed in advance of lane closures due to roadway maintenance and construction and consists of three portable Dynamic Message Signs (DMS) and a Remote Traffic Microwave Sensor (RTMS) detector. As traffic congestion begins to form, the DMS are activated to provide lane use instructions to drivers. System is self-contained with the possibility of remote operator override from the RTMC/ TOCC.	MnDOT	Existing
Dynamic Late Merge Roadside Equipment	This roadside equipment consists of three portable Dynamic Message Signs (DMS) and a Remote Traffic Microwave Sensor (RTMS) detector.	MnDOT	Existing
Dynamic Message Sign Roadside Equipment	This element represents portable and permanent Dynamic Message Signs (DMS) operated throughout the state used to convey driver information on special events, maintenance and construction activity, incident management, AMBER Alerts, and transportation and national emergencies. Permanent signs include existing signs managed by the MnDOT RTMC.	MnDOT	Existing
Emergency Vehicle Equipment	This element represents vehicle equipment on emergency vehicles that communicates with 911 centers (e.g. AVL, MDT, voice/video/data communications, transponder/transmitter for signal pre-emption). Agencies operating emergency vehicles include Minnesota State Patrol, and various counties and cities throughout Minnesota.	Minnesota State Patrol	Existing
Event Promoters	Special Event Sponsors that have knowledge of events that may impact travel on roadways or other modal means.	Event Promoters	Existing
FAST Compliance Management System	FAST (Free and Secure Trade) supports moving pre-approved eligible goods across the border quickly and verifying trade compliance away from the border. FAST Location exists at the Fort Frances Bridge in International Falls, MN. FAST is a commercial process offered to pre-approved importers, carriers, and registered drivers. Shipments for approved companies, transported by approved carriers using registered drivers, will be cleared into either country with greater speed and certainty, and at a reduced cost of compliance. This is achieved through electronic data transmissions and transponder technology within Commercial Vehicles.	US Customs and Border Protection	Existing
FIRST Emergency Vehicles	The Freeway Incident Response Safety Team (FIRST) is an incident management measure designed to assist disabled vehicles along congested freeway segments and relieve peak period non-recurrent congestion through quick detection, verification, and removal of freeway incidents. The primary purpose of the FIRST Program is to alleviate congestion and to prevent secondary crashes. Each FIRST truck is equipped with a changeable message sign and AVL system. The FIRST Dispatch Center is located at the RTMC.	MnDOT	Existing
Highway Advisory Radio Roadside Equipment	This element represents roadside equipment that facilitates the operation of highway advisory radio (HAR) throughout Minnesota. HAR is controlled by MnDOT District Offices throughout the state.	MnDOT	Existing

Element Name	Element Description	Stakeholder	Element Status
IFTA Clearinghouse	The IFTA Clearinghouse supports the IFTA base state agreement electronically. The IFTA Clearinghouse coordinates IFTA carrier information and transmittal records between participated jurisdictions.	IFTA, Inc.	Existing
In Vehicle Signing Roadside Equipment	This represents roadside equipment that emits a radio signal to In-Vehicle Signing Vehicle Equipment equipped with the proper receivers at railroad crossings and other intersections.	Railroad Companies	Existing
In Vehicle Signing Vehicle Equipment	This represents an in-vehicle signing system that was installed in 29 school buses in the City of Glencoe. The system is activated when a receiver on the school bus traveling toward the crossing comes within range of a radio signal emitted at the crossing. The system operates by providing the school bus driver with two types of information on rail crossings: the bus's proximity to an at-grade railroad crossing (crossing alert) and whether or not a train is present at or near the crossing (train warning). Both visual and variable audio signals are given. The system was operational for the 1997/1998 school year. The system was initially installed at signalized railroad crossings but the test was later expanded to evaluate the technology for use at unsignalized or passive crossings.	MnDOT	Existing
Infrastructure GIS Database Systems	This represents GIS mapping systems utilized by MnDOT and local agencies. It is planned to enhance these systems by adding infrastructure data. The enhanced systems will keep up-to-date records and allow agencies and contractors to use the data to target and record replacement and repair of infrastructure.	MnDOT	Planned
Intelligent Work Zone System Roadside Equipment	This element represents an automated system of devices that provides motorists and/or workers real-time information for improved safety and mobility through a work zone. The information is categorized into 3 levels: (1) Conflict Warning - high priority information to warn motorists of eminent traffic and roadway hazards; (2) Traffic Control - provides important driving information such as advisory speeds, merging instructions, and lane control directions; and (3) Travel Information - provides information which the motorist may use to make route decisions, such as travel times, alternate route info, incident warnings and work zone staging information.	MnDOT	Existing
Intercity Transit Management Centers	This element represents transit management centers that operate intercity fixed routes traveling long distances. These centers include the Northstar Commuter Coach traveling between Elk River and Minneapolis and Greyhound and Jefferson Lines buses traveling throughout the state.	Intercity Transit Providers	Existing
Intermodal Freight Depots	This represents a depot operated either by a depot manager or an alternate mode freight shipper which represents the point of exchange where freight is moved from one mode to another. The depot has knowledge about activities that may impact travel on roadways such as large groups of trucks entering the highway after unloading a ship or freight train. The depot coordinates freight movement with Fleet-Freight Managers, gathers information on traffic conditions affecting the depot, and provides information on intermodal freight activities that is pertinent to traffic movement in the surrounding area.	Private Trucking Companies	Planned
Intersection Collision Warning Roadside Equipment	This represents roadside equipment that provides drivers on rural roadways with advance warning information, indicating when entry into an intersection is not safe. Roadside equipment will be designed to detect vehicles within a specified zone and send messages to other roadside equipment located upstream of the detection zone, which will alert oncoming motorists of vehicle presence that cannot be seen by the driver on the roadway.	MnDOT	Planned

Element Name	Element Description	Stakeholder	Element Status
IRP Clearinghouse	The IRP Clearinghouse supports the IRP base state agreement electronically. The Clearinghouse supports exchange of motor carrier and financial information between participating jurisdictions.	IRP, Inc.	Existing
Lane Control Roadside Equipment	This element represents roadside equipment that warns drivers with electronic displays about the open or closed status of traffic lanes along the roadway.	MnDOT	Existing
Lane/Ramp Access Control Roadside Equipment	This represents existing and planned automated gate closure systems along interstate highways. Existing system located on I-90 in Jackson, MN is activated during severe weather events and other severe incidents requiring freeway closures for winter roadway maintenance and snow plowing. The system includes automated gates, CCTV cameras that monitor each direction of travel at the intersection, and automated signs that warn drivers that the road ahead is closed. All components of this system are monitored and controlled by the MnDOT District 7B Office in Windom, MN. A planned gate system will be installed along I-35W at 46th St. S. in Minneapolis for a Bus Rapid Transit station. Buses will be able to activate the system with on-board equipment for automated entry and exit into and out of the station.	MnDOT	Existing
Lift Bridge Traffic Control Central System	This represents the control center used to operate the Stillwater Lift Bridge. The bridge carries Minnesota Trunk Highway Route 36 and Wisconsin Highway 64 over the St. Croix River at the City of Stillwater, MN. An operator uses a portable traffic control station to operate the traffic gates while standing outside the control house. Indicator lights are used to display alarms and the positions and status of devices on the bridge.	MnDOT	Existing
Lift Bridge Traffic Control Roadside Equipment	This represents roadside equipment controlled by an operator at the Lift Bridge Traffic Control Central System in Stillwater.	MnDOT	Existing
Light Rail Operations Center	This element represents the Metro Transit light rail transit operations center. This center dispatches and maintains all light rail transit vehicles running between downtown Minneapolis and the Mall of America in Bloomington and between Minneapolis and Saint Paul. Other light rail transit lines connecting suburbs with Minneapolis and Saint Paul are in early planning stages.	Metro Transit	Existing
Local Agency Traveler Information Website	This element represents websites that broadcast information on traveler services to the general public. This includes various county and city websites.	Local Agencies	Existing
Local TMCs	This element represents local centers that facilitate traffic management on a roadway network from a central location that provides roadway monitoring, signal system control, remote equipment control, and communications with field personnel and other agencies.	Local Agencies	Existing

Element Name	Element Description	Stakeholder	Element Status
Local Transit Management Centers	This element represents local transit management centers operating outside of the Twin Cities metropolitan area that operate fixed route and demand responsive public transit services. These centers include the St. Cloud Metropolitan Transit Commission (MTC), Duluth Transit Authority (DTA), City of Rochester Public Transit, Metro Area Transit (MAT -- serving Moorhead), Cities Area Transit (CAT -- serving East Grand Forks), and various county and city-level transit operations centers. St. Cloud MTC operates Transit Signal Priority (TSP), electronic fare collection, and on-board surveillance systems. DTA disseminates real-time bus arrival information at bus stops, via the internet, and via on-board enunciators. DTA manages electronic fare collection with smart "touch" cards that are integrated with U of M student ID cards. DTA also operates surveillance systems on-board all buses and at transit centers/ garages. City of Rochester manages electronic fare collection and plans to operate TSP at all signalized intersections that serve emergency vehicles with traffic signal preemption within the City. MAT currently operates electronic fare collection and plans to operate TSP on Traffic Signal System Roadside Equipment operated by MnDOT. CAT currently operate TSP on Traffic Signal System Roadside Equipment operated by MnDOT. Rural transit agencies within MnDOT District 6 plan to implement a shared CAD/AVL system. Rural transit agencies within MnDOT District 7 plan to implement an automated transit vehicle maintenance monitoring program.	Local Transit Providers	Existing
Maintenance and Construction Field Personnel	Represents the MnDOT field personnel that perform maintenance and construction field activities including vehicle and equipment operators, field supervisory personnel, field crews, and work zone safety personnel. In MnDOT District 7, field personnel, primarily snow plow operators, perform data entry via web-enabled cellular telephones as a part of the MDARS (Mobile Data Acquisition Reporting System) project.		Existing
Maintenance and Construction Management Center	This element represents maintenance office, truck stations and garages of transportation agencies that perform the maintenance and construction activity including planned activities (road maintenance, snow plowing, etc.) and unplanned incidents within the jurisdiction area, and communicate maintenance and construction schedules and other related information to other agencies.	MnDOT	Existing
Maintenance and Construction Vehicle Equipment	This element represents maintenance vehicles that are utilized by the MnDOT and City and County Public Works/Highway Departments to support road maintenance. Automatic Vehicle Location (AVL) systems deployed on snow removal/highway maintenance vehicles within the metro area and several MnDOT Districts assist in overall snow fighting techniques, decision support systems, and area-wide highway maintenance issues for winter and summer operations. It is planned to expand the deployment of AVL systems statewide. Pilot projects conducted by MnDOT Office of Maintenance include vehicle-mounted electro-luminescence signs (Metro Area), full-matrix LED vehicle-mounted DMS (District 1/Virginia), Mold Board Lights (District 2/Crookston), and Guidance Lasers (District 7/Mankato). Other municipalities utilize vehicle ITS equipment to varying extents that provides the processing, sensory, storage, and communications functions necessary to support road maintenance and construction.	MnDOT	Existing

Element Name	Element Description	Stakeholder	Element Status
Maintenance Decision Support System	Maintenance Decision Support System (MDSS) is a server- and Client-side hardware and software package that provides winter maintenance support. MDSS offers visualizations of the real time maintenance data integrated from many sources and reports actual road conditions to establish appropriate maintenance treatments. It enables weather and roadway conditions predictions and identifies an optimal maintenance plan given user-configurable resources. Road and weather conditions, location of snowplows, and recommended chemical type and application rate are available to supervisors and dispatchers on desk-top computers. The same information is available to snow plow operators via on-board equipment.	MnDOT	Existing
Mayday System	Mayday System can provide data to the State Patrol and emergency hospitals in the Twin Cities and Greater Minnesota.	Private Mayday Service Providers	Existing
Mayday System Vehicle Equipment	These are vehicles equipped with Mayday systems.	Travelers	Existing
MCMIS	Motor Carrier Management Information System (MCMIS) is a national system to consolidate and process motor carrier safety data from sources throughout the US. MCMIS contains safety records of active intrastate and interstate motor carriers, safety and compliance reviews, and roadside inspection records and crash records. MCMIS also carries a Safety Fitness Rating based on algorithms that evaluate all of a carrier's safety data. It supplies carrier ID and safety data history for each interstate carrier via the SAFER system to the Aspen ISS.	FMCSA	Existing
Media Information Release System	This system has been created to keep the media and the public more up to date in case of serious and fatal accidents that happen within the state of Minnesota. This system contains only those accidents in which the Minnesota State Patrol is the primary reporting law enforcement agency. Records displayed here are as current as the last time State Patrol Personnel edited data. However due to extenuating circumstances such as heavy-accident periods like ice and snow storms, data entry may get back-logged and may not be up to the minute.	Minnesota State Patrol	Existing
Media Outlets	Represents the information systems that provide traffic reports, travel conditions, and other transportation-related news services to the traveling public through radio, TV, and other media.	Local Media	Existing

Element Name	Element Description	Stakeholder	Element Status
Metro Area Transit Management Centers	This element represents transit management centers operating within the Twin Cities metropolitan area that operate fixed route and demand responsive public transit services. This includes the Metro Transit Control Center and Suburban Transit Provider Operations Centers, independent of Metro Transit, that connect outer-ring metro-area suburbs with Minneapolis and St. Paul metro areas. Metro Transit Control Center utilizes Global Position System (GPS) technology to identify the location of all transit vehicles and also uses an 800-megahertz regional radio system, which allows Metro Transit to interact with police and fire departments and emergency response teams. Within the metro area, door-to-door demand response transit service is provided by Metro Mobility (serving Minneapolis, St. Paul and many surrounding suburbs), Anoka County Traveler (serving Anoka County), DARTS (serving Dakota County), Scott County (Scott County) and H.S.I. (serving Washington County). Transit fare coordination exists between Metro Transit and all Suburban Transit Providers. As a suburban transit provider, Minnesota Valley Transit Authority implemented Bus Rapid Transit components, such as transit signal priority and transit kiosks at transit stations along the Cedar Avenue/I-35W Corridor. Other Suburban Transit Providers include Maple Grove Transit, Southwest Metro Transit Commission, Prior Lake Laker Lines, Plymouth Transit, and Scott County Transit.	Metro Area Transit Providers	Existing
Minneapolis TMC	The City of Minneapolis operates a Traffic Management Center that provides traffic-responsive and time-of-day operation and an extensive selection of on-line database operations. City of Minneapolis plans to upgrade signal controllers throughout the City, implement an adaptive signal timing plan generation algorithm for the existing traffic control system in Minneapolis, and allow for CCTV video sharing between key stakeholders.	City of Minneapolis	Existing
Minnesota CVIEW	Minnesota's Commercial Vehicle Information Exchange Window (CVIEW) allows users to search for information pertaining to: For-Hire and Private Motor Carriers, Household Goods Movers, Building or House Movers, Limousine Operators, Special Transportation Service (STS) Providers, and Motor Carrier of Passengers. Minnesota CVIEW query results provide a snapshot of the following motor carrier information: Company name, address, and telephone number; USDOT, MnDOT, and ICC numbers; Safety fitness and ratings as provided by FMCSA; and Minnesota operating authority status. Minnesota CVIEW has been in continuous operation since 2000, and holds Federal and state data on more than 1.5 million carriers and 2.2 million vehicles.	MnDOT OFCVO	Existing
Minnesota CVO Online	Minnesota CVO Online is a collaboration of the MnDOT OFCVO and the Minnesota Department of Public Safety. This website provides commercial vehicle operation and management information, as well as electronic permit application, license renewals, and IRP and IFTA electronic applications. The system includes the processes for accepting and reviewing applications issuing credentials, auditing, and reporting.	MnDOT OFCVO	Existing
Minnesota Emergency Alert System	Information system to alert the public in emergency situations such as child abductions. 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. Minnesota Homeland Security and Emergency Management and Minnesota Bureau of Criminal Apprehension are key stakeholders of this system.	Minnesota Homeland Security and Emergency Management	Existing

Element Name	Element Description	Stakeholder	Element Status
Minnesota Emergency Responder Database	This element represents an online database to route on-the-scene incident data, road condition, or other data through a single dispatch center or system for processing. The project area would include the seven-county metro area and 10 out-state counties.	Minnesota EMSRB	Planned
Minnesota State Emergency Operations Center (SEOC)	Through the Minnesota DPS Office of Homeland Security and Emergency Management, the state EOC coordinates notifications to the public with county EOCs through the Emergency Alert System (EAS). Personnel from state agencies report to the SEOC to be a liaison between the EOC and their agency and to aid in any decisions. County EOCs coordinate with the SEOC and the nuclear power plants to perform actions needed to ensure public safety. Local police, fire, and other public agencies may be called upon. A county EOC may request assistance from the state.	Minnesota Homeland Security and Emergency Management	Existing
Minnesota State Patrol Databases	This represents Minnesota State Patrol databases that contains information on crash and dispatching. An Automated Field Reporting (AFR) System is planned to interface with the Records Management System (RMS). With the implementation of the AFR System, four documents that are currently manually filled out and submitted by the Troopers will be electronically transferred from Troopers' laptop computers (called Mobile Data Computers or MDC's) to a central repository.	Minnesota State Patrol	Existing
Minnesota State Patrol District Office	This element represents the 12 State Patrol district offices that manage resources and communicate incident data and resource requests to other public and private agencies. Emergency vehicle components are connected to and operated by the State Patrol Dispatch Center. Central office in St. Paul coordinates alert notifications and emergency plans with the NDDDES SOC and also coordinates incident response and threat information with the North Dakota State Radio. It is planned to monitor information received from the Minnesota State Patrol Computer Aided Dispatching (CAD) System and process the transmission of this information to the MnDOT 511 Telephone Information Service and Traveler Information Website (511mn.org). Integration of State Patrol CAD system with MnDOT CARS is planned.	Minnesota State Patrol	Existing
MnPASS Roadside Equipment	Roadside equipment includes variable message signs to display toll amounts that vary by time of day and/or levels of traffic congestion on toll facility and flashing roadside beacons to indicate that proper toll amounts have been paid for use of the HOT (High-Occupancy Toll) Lane facility. Equipment also includes ramp access controls to prevent drivers from entering the HOT Lane facility. MnPASS is designed to improve I-394 efficiency by increasing person and vehicle-carrying capabilities in the HOV lane. The High-Occupancy Vehicle (HOV) lanes along I-35W between I-494 and Burnsville Parkway were converted into HOT lanes. In addition, the HOT Lanes were extended north from I-494 to 46th Street. HOT lane tolls were priced dynamically based on the level of demand for the HOT lanes.	MnDOT	Existing
MnPASS Service Center	This element represents the center that performs administrative functions relating to I-394 and I-35W MnPASS operations.	MnDOT	Existing
MnPASS Vehicle Equipment	This element represents the transponder that supports automated payment of tolls along the I-394 and I-35W MnPASS Lanes.	Travelers	Existing

Element Name	Element Description	Stakeholder	Element Status
Motor Carrier Registration System	This system is responsible for the administration of Minnesota's driver's license and vehicle registration programs. Its primary functions include driver's license testing and issuance, driver safety compliance, motor vehicle title and registration, commercial vehicle registration, and auto dealer licensing and regulation. The Motor Carrier Registration System sends commercial vehicle operations credentials information to Truck Center.	Minnesota DVS	Existing
National Weather Service	The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas.	NOAA	Existing
Neighboring State CARS/ Roadway Information Systems	This element represents an existing Conditions Acquisition and Reporting System (CARS) for the state of Iowa and a planned CARS for the state of Wisconsin. This also represents an roadway information systems for North Dakota and South Dakota. ISP coordination with the MnDOT CARS is planned.	Neighboring States	Existing
Neighboring State Emergency Management Agencies	This element represents neighboring state agencies that coordinate alert notifications, emergency plans, evacuation plans, incident response, resources, and incident command information with Minnesota State Patrol and MnDOT District TOCCs. These agencies include: Iowa State Patrol, Wisconsin State Patrol, North Dakota State Operations Center, Northwest Wisconsin Emergency Service Providers, and US Coast Guard.	Neighboring States	Existing
Neighboring State Traffic Management Centers	This element represents traffic management centers located outside the state of Minnesota that plan to coordinate traffic control and information in border areas. This includes the North Dakota DOT Traffic Operations Center, the North Dakota DOT Maintenance Office, the Fargo Traffic Operations Center, the Wisconsin DOT Traffic Operations Center in Superior, and the Iowa DOT.	Neighboring States	Existing
Neighboring State Traffic Management Centers Roadside Equipment	This element represents roadside equipment whose control plans to be shared between Minnesota Traffic Management Centers and Neighboring State Traffic Management Centers. This includes signal system roadside equipment in Fargo, ND and additional roadside equipment operated by the North Dakota and Wisconsin DOT's.	Neighboring States	Existing
North/West Passage Corridor Traveler Information Website	As a project included in the North/West Passage Corridor Phase 3 Work Plan, the initial information presented for the website would focus on Major Event Descriptions (also a project defined in the Phase 3 Work Plan) affecting travel along the Corridor. The website would be linked to/from each of the individual state 511 (or related state-wide traveler information) web sites to encourage use. The site could also be developed to serve as a foundation for providing similar information at kiosks in rest areas, restaurants or other venues along the corridor. The North/West Passage Corridor encompasses eight states along the I-90/I-94 Corridor (WI, MN, ND, SD, MT, WY, ID, WA).	North/West Passage Corridor Members	Planned
Oversize Warning Roadside Equipment	This represents roadside detectors and electronic warning signs that warn drivers of vehicles that are too tall or too wide to pass under bridges or through tunnels. Operated by MnDOT District 7 TOCC.	MnDOT	Existing
Park-and-Ride Parking Information System Roadside Equipment	Real-time information on availability of parking spaces at Metro Transit Park-and-Rides will be displayed to drivers via electronic message signs at various Metro Transit park-and-ride stations.	Metro Transit	Existing

Element Name	Element Description	Stakeholder	Element Status
Parking Management Roadside Equipment	This represents roadside equipment that detects vehicle traffic in parking facilities and informs motorists of parking space availability. Roadside equipment is controlled by Parking Management Systems.	Local Agencies	Existing
Parking Management System	This represents the central control system of the parking management system. This system monitors parking operations and controls electronic display signs to notify drivers of parking availability.	Local Agencies	Existing
Parking Operator	Parking Operator that controls electronic display signs to notify drivers of parking availability.	Private Parking Operators	Existing
PRISM	Links to interstate commercial motor vehicle registration to safety and safety fitness of motor carriers. Identifies motor carriers and improves safety through a comprehensive system of education, awareness, performance monitoring, and treatment.	FMCSA	Existing
Private Fleet and Freight Management Center	Private trucking companies represent those companies that own and manage their own commercial fleets of vehicles traveling through the state of Minnesota. They provide route plans for oversized and overweight vehicles based on information received from the CARS database.	Private Trucking Companies	Existing
Private Information Service Providers	This element represents private information service providers that provide specific directions to travelers by receiving origin and destination requests from travelers, generate route plans, and return the calculated plans to travelers.	Private Information Service Providers	Existing
Queue Detection Roadside Equipment	This element represents roadside equipment that detects lengthy queues of traffic downstream of Ramp Meter Roadside Equipment, incident locations, and work zones.	MnDOT	Existing
Railroad Active Warning Roadside Equipment	This element represents roadside equipment that alerts motorists of railroad crossings at at-grade intersections. Gates are activated and de-activated as trains are detected approaching and clearing the intersection.	MnDOT	Existing
Railroad Wayside Equipment	This element represents wayside equipment at various highway-railroad crossing systems.	Railroad Companies	Existing
Ramp Meter Roadside Equipment	This element represents the system of ramp meters used by the RTMC to increase freeway volumes, trip reliability, and freeway speeds, while decreasing travel time and crashes. Ramp meters have the potential to operate during the morning and evening peak traffic periods. Timing and operation of ramp meters is controlled by Intelligent Roadway Information System at the MnDOT RTMC.	MnDOT	Existing
Real-Time Bus Arrival Time Display Roadside Equipment	Real-time information on bus and light rail arrival/departure times is displayed to passengers via electronic message signs at Metro Transit bus stops and light rail stations. Signs are also installed at key decision points for drivers along arterial roads and freeways prior to entrances to park-and-ride facilities. Commuter rail arrival/departure times could also be displayed to travelers in the future.	Metro Transit	Existing
Real-Time Transit Travel Time Notification	Real-time information on transit travel times as compared passenger-vehicle travel times is displayed to passengers via dynamic message signs prior to arriving at select Metro Transit park-and-ride locations.	Metro Transit	Existing
Red Light Monitoring/Enforcement Roadside Equipment	This element represents portable or permanent photo/surveillance systems located at intersections with high crash rates. Purpose is to inform and educate the traveling public of the dangers of running red lights. Planned for MnDOT District 6.	MnDOT	Planned

Element Name	Element Description	Stakeholder	Element Status
Research Lab Network Surveillance Archive	This represents the data archive maintained by Minnesota Traffic Observatory (MTO). The archive stores data on freeway traffic flows through a fully independent network of video detectors covering the I-35W/I-94 Commons freeway area in Minneapolis. Portable monitoring stations deployed on the roofs of several high-rise buildings overlooking the freeway transmit data back to the MTO.	University of Minnesota CTS ITS Institute	Existing
Research Lab Network Surveillance Roadside Equipment	This element represents the network of video detectors providing space- and time-continuous coverage of the I-35W/I-94 Commons freeway area in Minneapolis (the Beholder system). Portable monitoring stations deployed on the roofs of several high-rise buildings overlooking the freeway transmit data back to the MTO via a high-speed IEEE 802.16 wireless network.	University of Minnesota CTS ITS Institute	Existing
Research Lab New Surveillance Control System	This represents the Minnesota Traffic Observatory (MTO) - a transportation laboratory that gathers data on freeway traffic flows through a fully independent network of video detectors providing space- and time-continuous coverage of the I-35W/I-94 Commons freeway area in Minneapolis. Portable monitoring stations deployed on the roofs of several high-rise buildings overlooking the freeway transmit data back to the MTO via a high-speed IEEE 802.16 wireless network. MnDOT supplies eight switchable compressed/streamed Internet video feeds to the MTO. Researchers have the ability to switch between any of the MnDOT CCTV cameras monitoring the metropolitan freeway network.	University of Minnesota CTS ITS Institute	Existing
Rest Area Wi-Fi	RASAWI (Rest Area Sponsorship, Advertising, and Wireless Internet) Program aims to deploy wireless internet access at a number of rest areas throughout the state of Minnesota.	MnDOT	Planned
Roadway Automated Treatment System	Automated treatment systems remotely apply roadway chemicals due to ice conditions that may form on bridges, bridge approaches, or curves. Systems can also be controlled and operated by a system operator at either the RTMC or TOCCs throughout the state. Treatment systems exist in the metro area and MnDOT Districts 1 (Duluth), 6, (Rochester and Winona) and 7 (Worthington and Beaver Creek). Similar systems are planned for MnDOT Districts 2 and 4. Treatment systems in the metro area are connected to Advanced Warning Flashers to alert drivers of system operation. Further deployment is planned in District 6 on I-35 on the Albert Lea Lake Bridge. Mobile anti-icing systems are being tested in the metro area. Hennepin County and City of Duluth currently operate roadway automated treatment systems. Cities of Moorhead and East Grand Forks plan to operate roadway automated treatment systems.	MnDOT	Existing
Roadway Environment	Roadway Environment includes weather and other roadway information that can be used to send notifications to roadway equipment for traffic control strategies.		Existing
Roadway Flooding Warning Roadside Equipment	This element represents roadside equipment on TH 59 and TH 60 near Worthington that automatically detects a rise in water level and issues an alert based on commands from the Mankato Signal Center in District 7. It also represents planned roadside equipment in Mower County that would alert the Mower County dispatch center and trigger advanced warning signs (static signs with flashing beacons) to alert approaching vehicles. The proposed equipment includes sensors in the field which report to a central receiver/decoder located which would likely be located at the Mower County dispatch center. The system would also include communication and utilities at both the flood-warning sensor and the static warning signs with flashing beacons.	Local Agencies	Existing

Element Name	Element Description	Stakeholder	Element Status
Roadway Lighting Management Central Monitoring Equipment	This element represents the central location at which Roadway Lighting Management Roadside Equipment is monitored.	City of Minneapolis	Planned
Roadway Lighting Management Roadside Equipment	This represents roadside equipment that will apply an optimal amount of roadway lighting based on current road and weather conditions. System is planned in the City of Minneapolis, which will allow operational control of the City's street lighting system from a central location, delivering light intelligently based upon real-time conditions. Through a wireless network and existing power and cable lines, the user can efficiently and effectively control the operation of all street lights maintained by the City of Minneapolis from one central location, mobile or stationary.	City of Minneapolis	Planned
RTMC	The Traffic Operations unit is responsible for managing traffic on the Twin Cities metro freeways with the use of ramp meters, variable message signs, lane control signals and loop detectors. Additional RTMC components include the HOV system, MnPASS, and airborne surveillance systems. They monitor traffic conditions, assist in incident management and provide traveler information. Traffic Operations staff also continually perform systems analysis of field equipment, the ramp meter algorithm and Operations Center equipment. They also analyze and research traffic flow trends, new technologies and other issues that affect congestion. RTMC Maintenance Dispatch provides maintenance communications for the Metro District. Staff handles phone calls and monitor electronic communications and bridge anti-icing systems, roadway surface and sub-surface systems. RTMC Maintenance dispatches appropriate personnel for road emergencies such as snow and ice, potholes and incidents that may affect traffic flow. Maintenance Dispatch coordinates and initiates traffic management systems with the RTMC, traffic management personnel and the State Patrol. The RTMC integrates MnDOT's Metro District Maintenance Dispatch and MnDOT's Office of Traffic, Security and Operations with the Minnesota State Patrol Dispatch into a unified communications center. The integration provides the communications and computer infrastructure necessary for coordinated transportation management on metro freeways during normal commuting periods, as well as during special events and major incidents. In addition, the RTMC houses the FIRST Dispatch Center. The RTMC is also designated as the primary EOC for the Metro area.	MnDOT	Existing
RWIS Central Control System	The RWIS Central Control System collects, verifies, processes, and formats environmental and road pavement surface condition data. Data is then made available to maintenance personnel, law enforcement, vendors providing value-added services, and the general public via the 511 information system. It is planned to send RWIS data to the MnCARS database.	MnDOT Office of Maintenance	Existing
RWIS Stations	MnDOT's RWIS Stations include 96 environmental sensor sites, designed to measure environmental conditions and road pavement surface conditions, and over 50 airport sites, designed just to measure environmental conditions, connected via statewide network. Environmental sensors are planned to be equipped with pan/tilt cameras to provide maintenance crews with additional road condition data. All data is communicated to the MnDOT RWIS Central Control System for verification, processing, and formatting. Camera images from RWIS stations are posted on the MnDOT 511 Traveler Information Website (www.511mn.org).	MnDOT Office of Maintenance	Existing

Element Name	Element Description	Stakeholder	Element Status
SAFER	The FMCSA Safety and Fitness Electronic Records (SAFER) System offers company safety data and related services to industry and the public over the Internet. Users can search FMCSA databases, register for a USDOT number, pay fines online, order company safety profiles, challenge FMCSA data using the DataQs system, access the Hazardous Material Route registry, obtain National Crash and Out of Service rates for Hazmat Permit Registration, get printable registration forms and find information about other FMCSA Information Systems.	FMCSA	Existing
Security Monitoring Roadside Equipment	This element represents threat detection, CCTV surveillance, and emergency alert systems at critical infrastructure areas (bridges, ports, tunnels, etc...) throughout the state. Surveillance cameras and threat sensors will monitor critical facilities and when suspicious activity or objects in restricted areas detected an alert will automatically be sent to RTMC, TOCC, and emergency management personnel. This element includes the Tunnel Alarm Monitoring System is currently operated by MnDOT District 1 and the State Patrol dispatchers and includes the monitoring of the Lief Erickson Tunnel within Segment 10 and the Silver Creek and Lafayette Bluff tunnels along Highway 61 north of Duluth (along the North Shore). Roadside equipment monitors for carbon monoxide (CO) levels, fire, fan and generator operation and communications and power.	MnDOT	Planned
Speed Monitoring Roadside Equipment	This system will provide photo enforcement for speeding at locations where there is a history of crashes with excessive speed as a contributing factor or in work zones.	Minnesota State Patrol	Planned
Surface Transportation Weather Service Providers	Providers of value-added sector specific meteorological services. These providers utilize National Weather Service data and predictions, road condition information and local environmental data to provide weather observations and forecasts. Examples include the Data Transmission Network (DTN).	Private Weather Service Providers	Existing
TOCCs	MnDOT District TOCCs (Transportation and Communication Centers) are regional centers for 24-hour incident and emergency response, multi-agency dispatching and fleet management, interagency communications, and collection and dissemination of road conditions. TOCCs are located in Duluth, Baxter, St. Cloud, Detroit Lakes, Rochester, Mankato, Virginia, Marshall, and Thief River Falls. TOCCs dispatch MnDOT Maintenance Dispatch Vehicles.	MnDOT	Existing
Traffic	Traffic characteristics		Existing
Traffic Data and Video Archive	This element represents the database in which Automated Traffic Recorder (ATR) data is stored. The ATR data is compiled from several sources into a single accessible database managed by the MnDOT Office of Transportation Data Analysis to answer data requests and provide reports to others. This element also represents the database in which CCTV video is stored.	MnDOT	Existing
Traffic Detector Roadside Equipment	This element represents roadside equipment that collects data on traffic patterns and volumes. Data is communicated back to the Automated Traffic Recorder (ATR) central systems reside in TMCs (i.e. RTMC, TOCCs, and local TMCs). Data is also collected, processed, and archived by TMCs.	MnDOT	Existing

Element Name	Element Description	Stakeholder	Element Status
Traffic Signal Roadside Equipment	This element represents traffic signals in Minnesota that are controlled by traffic management centers - RTMC, TOCCs, Minneapolis TMC, and Local TMCs. This element supports surface street control and arterial traffic management. It represents traffic signal systems 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.	MnDOT	Existing
Transit Center and Station Surveillance System Roadside Equipment	These systems represent surveillance and security monitoring at transit centers, garages, stations, and park and ride lots. The systems have been implemented at centers and garages for the Saint Cloud Metropolitan Transit Commission, Duluth Transit Authority, and Metro Transit. Park and ride surveillance system and light rail boarding area surveillance systems are deployed by Metro Transit.	Metro Area Transit Providers	Existing
Transit Data Archives	Transit data archives will store automated data generated by metro area transit providers, as well as local transit providers. It is planned to upgrade existing or install new scheduling software systems as determined by transit agencies. The automated archiving system will provide the capability to automate real time, interactive and/or batch scheduling functions and increase the efficiency of service. The basic program features will include vehicle management, driver management, trip reservations, automated scheduling and routing, coordination, dispatching, reporting, geo-coding, and mapping.	Metro Area Transit Providers	Planned
Transit Information Telephone Systems	This element represents telephone systems that allow users to utilize a touchtone phone to access transit schedule information. Metro Transit currently operates a TransitLine phone system that gives transit related information such as State Fair transit information, and Snow Reroute information when applicable. TransitLine provides visually impaired customers with equal access to schedules. It is planned to upgrade this system with limited voice response technology and real-time bus arrival and departure information.	Metro Area Transit Providers	Existing
Transit Information Websites	This element represents websites that provide general route and schedule information to travelers. Metro Transit, Duluth Transit Authority, and Cities Area Transit websites support transit trip planner functions. Metro Transit website also supports trip planning and dynamic ridesharing functions.	Metro Area Transit Providers	Existing
Transit Kiosks	This element represents existing and planned transit kiosks that manage electronic fare payment and provide real-time stop arrival notifications. Kiosks are currently in operation along the Metro Transit Hiawatha Light Rail line. Kiosks are planned as part of the Minnesota Valley Transit Authority Bus Rapid Transit project along Cedar Avenue and I-35W. This also represents existing and planned kiosks for Metro Area Transit and City of Rochester Transit that provide transit information to passengers at transit stops and stations.	Metro Area Transit Providers	Existing

Element Name	Element Description	Stakeholder	Element Status
Transit Vehicle Equipment	This element represents all transit vehicles operated by transit service providers. This element also represents ITS equipment on board of transit vehicles, including AVL, MDT, radio communications, TSP, passenger counter, electronic fare collection equipment, surveillance and security monitoring devices, and traveler information annunciation. Transit Signal Priority (TSP) exists on vehicles serving St. Cloud and East Grand Forks. TSP is planned for vehicles serving Minneapolis, Rochester, Duluth, and Moorhead. Transit vehicles for Metro Transit, MTC, and DTA support on-board surveillance cameras. Transit vehicles for Metro Transit, MTC, and DTA support on-board Automated Vehicle Location (AVL) devices. Transit vehicles for Metro Transit, MTC, DTA, MAT, CAT, and Rochester support electronic fare collection devices. Transit vehicles for Metro Transit and DTA support automated passenger counting. Light Rail transit vehicles support automated next stop annunciation. Metro Transit plans to deploy transit vehicle lateral and longitudinal vehicle safety warning systems for shoulder-running buses to improve transit travel safety.	Metro Area Transit Providers	Existing
Transit Vehicle Operator	This element represents operators of transit vehicles.		Existing
Transportation Information System (TIS)	MnDOT Office of Transportation Data Analysis (OTDS) is responsible for the collection, creation, storage, maintenance, and dissemination of transportation-related data to the general public through various means. Interconnects with MnDOT RTMC and TOCCs, RWIS Central Server, and MnCARS. Archive coordination exists with the RTMC, TOCCs, and RWIS.	MnDOT OTDS	Existing
Traveler	Travelers along Minnesota roads and highways.	Travelers	Existing
Traveler Cards	This element represents traveler cards that facilitate electronic payment of transit fares on board Transit Vehicles. Traveler cards are also used in the electronic payment of parking fees at parking ramps.	Travelers	Existing
Traveler Information and Parking Kiosks	MnDOT Traveler Information Kiosks at major parking ramps.	MnDOT	Planned
Truck Center	Collects and distributes planned event information (i.e., road maintenance) and unplanned event information (i.e., road surface conditions). It is also responsible for granting trucking permits for oversized and overweight vehicles and provides route plans for oversized and overweight vehicles based on information it receives from CARS. Examples of the Truck Center include: MnDOT Metro Region Truck Center) and Other Regional Truck Centers.	MnDOT OFCVO	Existing
UMD Transportation Data Research Laboratory (TDRL)	Transportation Data Research Laboratory (TDRL) server located at the University of Minnesota-Duluth (UMD) campus downloads data from the MnDOT RWIS Central Server. The TDRL server daily archives this RWIS data using the Unified Transportation Sensor Data Format (UTSDF) and makes them available to the public through Internet. This archived historic data is presently only available through TDRL.	University of Minnesota Duluth	Existing
User Personal Portable and Computing Devices	This element represents personal computers and other personal devices (such as PDA's and cell phones) used by travelers to obtain travel-related information. It is planned to obtain traffic data from cell phone usage on roads and highways.	Travelers	Existing

Element Name	Element Description	Stakeholder	Element Status
Variable Speed Limit Roadside Equipment	This element represents Variable Speed Limit (VSL) systems that will provide real-time information on appropriate speed for current conditions based on traffic flow, traffic speed, weather and other inputs and integration with law enforcement. Can be used to manage traffic under a number of variable conditions. MnDOT will select a corridor for deployment of VSL system in conjunction with a dynamic lane control system based on traffic data analysis.	MnDOT	Planned
Vehicle	In-vehicle systems may record vehicle operating information, including speed, seat belt use, brake use, impact, etc. Operational Test is being conducted by MnDOT to utilize vehicles as traffic sensors to gather travel time estimations. It is planned to develop in-vehicle safety systems as part of the Minnesota ITS Safety Plan over the coming years. These systems include ignition interlocks with seat belt systems, BAC (Blood-Alcohol Content) measurements for repeat offender drunk drivers, and driver distraction detection systems. The area along the I-94 corridor between Saint Cloud, MN and Maple Grove, MN is being considered as a test bed for Vehicle-Infrastructure Integration projects involving vehicle to roadside communications. High-speed, Dedicated Short-Range Communications (DSRC) systems needed for vehicle-roadside safety-critical communications will require substantial network speed.	Travelers	Existing
Vehicle Occupancy Monitoring/Enforcement Roadside Equipment	This element represents roadside equipment that is planned to monitor vehicle occupancies along designated HOV/MnPASS lanes and signal for enforcement when violations are detected.	MnDOT	Planned
Virtual Weigh Stations	Virtual Weigh-in-Motion (WIM) Stations will allow for real-time identification of trucks violating weight restrictions using a weigh-in-motion (WIM) scale and other enhancements. Virtual WIM sites will flag potential violators for enforcement officers to perform further checks. Virtual WIM sites can either act as standalone WIM sites or be connected to a central operating network. Virtual WIM Stations will also investigate the use of a dynamic feedback system that will present a weight compliance message to vehicles immediately after they have passed over a WIM scale.	MnDOT OFCVO	Existing
Weigh In Motion (WIM) Stations	This element represents scales that weigh trucks while they are moving so that they do not have to pull off the road.	MnDOT OFCVO	Existing
Weigh Station Roadside Equipment	This element represents roadside equipment operated by the Minnesota State Patrol that ensures commercial vehicles comply with weight restrictions along Minnesota roads and highways. These stations do not have the functionality of Weigh-in-Motion (WIM) Stations deployed elsewhere in Minnesota.	Minnesota State Patrol	Existing

6 Service Packages

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

Table 3: Service Packages

Service Package	Service Package Name	Service Package Status	Included Elements
AD1	ITS Data Mart	Existing	911 Dispatch Center
AD1	ITS Data Mart	Existing	Condition Acquisition and Reporting System (CARS)
AD1	ITS Data Mart	Existing	Data Distribution Server
AD1	ITS Data Mart	Existing	Intercity Transit Management Centers
AD1	ITS Data Mart	Existing	Local Transit Management Centers
AD1	ITS Data Mart	Existing	Maintenance and Construction Management Center
AD1	ITS Data Mart	Existing	Media Information Release System
AD1	ITS Data Mart	Existing	Metro Area Transit Management Centers
AD1	ITS Data Mart	Existing	Minnesota State Patrol Databases
AD1	ITS Data Mart	Existing	Minnesota State Patrol District Office
AD1	ITS Data Mart	Existing	Research Lab Network Surveillance Archive
AD1	ITS Data Mart	Existing	Research Lab New Surveillance Control System
AD1	ITS Data Mart	Existing	RTMC
AD1	ITS Data Mart	Existing	RWIS Central Control System
AD1	ITS Data Mart	Existing	Traffic Data and Video Archive
AD1	ITS Data Mart	Existing	Transit Data Archives
AD1	ITS Data Mart	Existing	UMD Transportation Data Research Laboratory (TDRL)
AD2	ITS Data Warehouse	Existing	Condition Acquisition and Reporting System (CARS)
AD2	ITS Data Warehouse	Existing	Local TMCs
AD2	ITS Data Warehouse	Existing	Local Transit Management Centers
AD2	ITS Data Warehouse	Existing	Metro Area Transit Management Centers
AD2	ITS Data Warehouse	Existing	Minnesota Emergency Responder Database
AD2	ITS Data Warehouse	Existing	Minnesota State Emergency Operations Center (SEOC)
AD2	ITS Data Warehouse	Existing	Minnesota State Patrol Databases
AD2	ITS Data Warehouse	Existing	RTMC
AD2	ITS Data Warehouse	Existing	TOCCs
AD2	ITS Data Warehouse	Existing	Traffic Data and Video Archive
AD2	ITS Data Warehouse	Existing	Transit Data Archives
AD2	ITS Data Warehouse	Existing	Transportation Information System (TIS)
AD3	ITS Virtual Data Warehouse	Existing	RTMC
AD3	ITS Virtual Data Warehouse	Existing	RWIS Central Control System
AD3	ITS Virtual Data Warehouse	Existing	TOCCs

Service Package	Service Package Name	Service Package Status	Included Elements
AD3	ITS Virtual Data Warehouse	Existing	Transportation Information System (TIS)
APTS01	Transit Vehicle Tracking	Existing	Local Transit Management Centers
APTS01	Transit Vehicle Tracking	Existing	Metro Area Transit Management Centers
APTS01	Transit Vehicle Tracking	Existing	Transit Vehicle Equipment
APTS02	Transit Fixed-Route Operations	Existing	Commuter Rail Operations Center
APTS02	Transit Fixed-Route Operations	Existing	Intercity Transit Management Centers
APTS02	Transit Fixed-Route Operations	Existing	Light Rail Operations Center
APTS02	Transit Fixed-Route Operations	Existing	Local Transit Management Centers
APTS02	Transit Fixed-Route Operations	Existing	Maintenance and Construction Management Center
APTS02	Transit Fixed-Route Operations	Existing	Metro Area Transit Management Centers
APTS02	Transit Fixed-Route Operations	Existing	RWIS Central Control System
APTS02	Transit Fixed-Route Operations	Existing	Transit Vehicle Equipment
APTS02	Transit Fixed-Route Operations	Existing	Transit Vehicle Operator
APTS03	Demand Response Transit Operations	Existing	Local Transit Management Centers
APTS03	Demand Response Transit Operations	Existing	Maintenance and Construction Management Center
APTS03	Demand Response Transit Operations	Existing	Metro Area Transit Management Centers
APTS03	Demand Response Transit Operations	Existing	Transit Information Websites
APTS03	Demand Response Transit Operations	Existing	Transit Vehicle Equipment
APTS04	Transit Fare Collection Management	Existing	Account Management Providers
APTS04	Transit Fare Collection Management	Existing	Commuter Rail Operations Center
APTS04	Transit Fare Collection Management	Existing	Intercity Transit Management Centers
APTS04	Transit Fare Collection Management	Existing	Local Transit Management Centers
APTS04	Transit Fare Collection Management	Existing	Metro Area Transit Management Centers
APTS04	Transit Fare Collection Management	Existing	Transit Kiosks
APTS04	Transit Fare Collection Management	Existing	Transit Vehicle Equipment
APTS04	Transit Fare Collection Management	Existing	Traveler
APTS04	Transit Fare Collection Management	Existing	Traveler Cards
APTS05	Transit Security	Existing	County Emergency Operations Centers
APTS05	Transit Security	Existing	County Sheriff and City Police Offices
APTS05	Transit Security	Existing	Intercity Transit Management Centers
APTS05	Transit Security	Existing	Light Rail Operations Center
APTS05	Transit Security	Existing	Local Transit Management Centers
APTS05	Transit Security	Existing	Metro Area Transit Management Centers
APTS05	Transit Security	Existing	Transit Center and Station Surveillance System Roadside Equipment
APTS05	Transit Security	Existing	Transit Vehicle Equipment
APTS06	Transit Fleet Management	Existing	Commuter Rail Operations Center
APTS06	Transit Fleet Management	Existing	Light Rail Operations Center
APTS06	Transit Fleet Management	Existing	Local Transit Management Centers
APTS06	Transit Fleet Management	Existing	Metro Area Transit Management Centers
APTS06	Transit Fleet Management	Existing	Transit Vehicle Equipment
APTS07	Multi-modal Coordination	Planned	Commuter Rail Operations Center
APTS07	Multi-modal Coordination	Planned	Intercity Transit Management Centers

Service Package	Service Package Name	Service Package Status	Included Elements
APTS07	Multi-modal Coordination	Planned	Local Transit Management Centers
APTS07	Multi-modal Coordination	Planned	Metro Area Transit Management Centers
APTS08	Transit Traveler Information	Existing	Intercity Transit Management Centers
APTS08	Transit Traveler Information	Existing	Local Transit Management Centers
APTS08	Transit Traveler Information	Existing	Media Outlets
APTS08	Transit Traveler Information	Existing	Metro Area Transit Management Centers
APTS08	Transit Traveler Information	Existing	Real-Time Bus Arrival Time Display Roadside Equipment
APTS08	Transit Traveler Information	Existing	Transit Information Telephone Systems
APTS08	Transit Traveler Information	Existing	Transit Information Websites
APTS08	Transit Traveler Information	Existing	Transit Kiosks
APTS08	Transit Traveler Information	Existing	Transit Vehicle Equipment
APTS08	Transit Traveler Information	Existing	Traveler
APTS08	Transit Traveler Information	Existing	User Personal Portable and Computing Devices
APTS09	Transit Signal Priority	Existing	Local TMCs
APTS09	Transit Signal Priority	Existing	Local Transit Management Centers
APTS09	Transit Signal Priority	Existing	Metro Area Transit Management Centers
APTS09	Transit Signal Priority	Existing	Minneapolis TMC
APTS09	Transit Signal Priority	Existing	RTMC
APTS09	Transit Signal Priority	Existing	Traffic Signal Roadside Equipment
APTS09	Transit Signal Priority	Existing	Transit Vehicle Equipment
APTS10	Transit Passenger Counting	Existing	Local Transit Management Centers
APTS10	Transit Passenger Counting	Existing	Metro Area Transit Management Centers
APTS10	Transit Passenger Counting	Existing	Transit Vehicle Equipment
APTS10	Transit Passenger Counting	Existing	Traveler
APTS11	Multimodal Connection Protection	Planned	Intercity Transit Management Centers
APTS11	Multimodal Connection Protection	Planned	Light Rail Operations Center
APTS11	Multimodal Connection Protection	Planned	Local Transit Management Centers
APTS11	Multimodal Connection Protection	Planned	Metro Area Transit Management Centers
ATIS01	Broadcast Traveler Information	Existing	511 Telephone Information Service
ATIS01	Broadcast Traveler Information	Existing	511 Traveler Information Website
ATIS01	Broadcast Traveler Information	Existing	AWOS Central Control System
ATIS01	Broadcast Traveler Information	Existing	Condition Acquisition and Reporting System (CARS)
ATIS01	Broadcast Traveler Information	Existing	Local Agency Traveler Information Website
ATIS01	Broadcast Traveler Information	Existing	Local TMCs
ATIS01	Broadcast Traveler Information	Existing	Maintenance and Construction Management Center
ATIS01	Broadcast Traveler Information	Existing	Media Outlets
ATIS01	Broadcast Traveler Information	Existing	Minnesota State Emergency Operations Center (SEOC)
ATIS01	Broadcast Traveler Information	Existing	MnPASS Service Center
ATIS01	Broadcast Traveler Information	Existing	National Weather Service
ATIS01	Broadcast Traveler Information	Existing	North/West Passage Corridor Traveler Information Website
ATIS01	Broadcast Traveler Information	Existing	Parking Management System
ATIS01	Broadcast Traveler Information	Existing	Rest Area Wi-Fi
ATIS01	Broadcast Traveler Information	Existing	RTMC

Service Package	Service Package Name	Service Package Status	Included Elements
ATIS01	Broadcast Traveler Information	Existing	Surface Transportation Weather Service Providers
ATIS01	Broadcast Traveler Information	Existing	Transit Information Websites
ATIS01	Broadcast Traveler Information	Existing	User Personal Portable and Computing Devices
ATIS02	Interactive Traveler Information	Existing	511 Telephone Information Service
ATIS02	Interactive Traveler Information	Existing	511 Traveler Information Website
ATIS02	Interactive Traveler Information	Existing	Condition Acquisition and Reporting System (CARS)
ATIS02	Interactive Traveler Information	Existing	Media Outlets
ATIS02	Interactive Traveler Information	Existing	National Weather Service
ATIS02	Interactive Traveler Information	Existing	Transit Information Websites
ATIS02	Interactive Traveler Information	Existing	Traveler
ATIS02	Interactive Traveler Information	Existing	Traveler Information and Parking Kiosks
ATIS02	Interactive Traveler Information	Existing	User Personal Portable and Computing Devices
ATIS05	ISP Based Trip Planning and Route Guidance	Existing	511 Traveler Information Website
ATIS05	ISP Based Trip Planning and Route Guidance	Existing	Private Information Service Providers
ATIS05	ISP Based Trip Planning and Route Guidance	Existing	User Personal Portable and Computing Devices
ATIS05	ISP Based Trip Planning and Route Guidance	Existing	Vehicle
ATIS06	Transportation Operations Data Sharing	Existing	911 Dispatch Center
ATIS06	Transportation Operations Data Sharing	Existing	Condition Acquisition and Reporting System (CARS)
ATIS06	Transportation Operations Data Sharing	Existing	Minnesota State Patrol District Office
ATIS06	Transportation Operations Data Sharing	Existing	Neighboring State CARS / Roadway Information Systems
ATIS06	Transportation Operations Data Sharing	Existing	RTMC
ATIS08	Dynamic Ridesharing	Existing	Transit Information Websites
ATIS08	Dynamic Ridesharing	Existing	Traveler
ATIS08	Dynamic Ridesharing	Existing	User Personal Portable and Computing Devices
ATIS09	In Vehicle Signing	Existing	Driver
ATIS09	In Vehicle Signing	Existing	In Vehicle Signing Roadside Equipment
ATIS09	In Vehicle Signing	Existing	In Vehicle Signing Vehicle Equipment
ATMS01	Network Surveillance	Existing	Animal Crossing Warning Roadside Equipment
ATMS01	Network Surveillance	Existing	CCTV Roadside Equipment
ATMS01	Network Surveillance	Existing	Local TMCs
ATMS01	Network Surveillance	Existing	Minneapolis TMC
ATMS01	Network Surveillance	Existing	Neighboring State Traffic Management Centers Roadside Equipment
ATMS01	Network Surveillance	Existing	Research Lab Network Surveillance Roadside Equipment
ATMS01	Network Surveillance	Existing	Research Lab New Surveillance Control System
ATMS01	Network Surveillance	Existing	RTMC
ATMS01	Network Surveillance	Existing	TOCCs
ATMS01	Network Surveillance	Existing	Traffic
ATMS01	Network Surveillance	Existing	Traffic Detector Roadside Equipment

Service Package	Service Package Name	Service Package Status	Included Elements
ATMS03	Traffic Signal Control	Existing	Advance Warning Flasher Roadside Equipment
ATMS03	Traffic Signal Control	Existing	Local TMCs
ATMS03	Traffic Signal Control	Existing	Minneapolis TMC
ATMS03	Traffic Signal Control	Existing	RTMC
ATMS03	Traffic Signal Control	Existing	Traffic Signal Roadside Equipment
ATMS04	Traffic Metering	Existing	Driver
ATMS04	Traffic Metering	Existing	Ramp Meter Roadside Equipment
ATMS04	Traffic Metering	Existing	RTMC
ATMS04	Traffic Metering	Existing	Traffic
ATMS05	HOV Lane Management	Planned	Minnesota State Patrol District Office
ATMS05	HOV Lane Management	Planned	RTMC
ATMS05	HOV Lane Management	Planned	Vehicle Occupancy Monitoring/Enforcement Roadside Equipment
ATMS06	Traffic Information Dissemination	Existing	Advanced Pavement Condition and Visibility Warning System Roadside Equipment
ATMS06	Traffic Information Dissemination	Existing	Animal Crossing Warning Roadside Equipment
ATMS06	Traffic Information Dissemination	Existing	Condition Acquisition and Reporting System (CARS)
ATMS06	Traffic Information Dissemination	Existing	Driver
ATMS06	Traffic Information Dissemination	Existing	Dynamic Message Sign Roadside Equipment
ATMS06	Traffic Information Dissemination	Existing	Highway Advisory Radio Roadside Equipment
ATMS06	Traffic Information Dissemination	Existing	Local TMCs
ATMS06	Traffic Information Dissemination	Existing	Media Outlets
ATMS06	Traffic Information Dissemination	Existing	Metro Area Transit Management Centers
ATMS06	Traffic Information Dissemination	Existing	Minneapolis TMC
ATMS06	Traffic Information Dissemination	Existing	Neighboring State Traffic Management Centers Roadside Equipment
ATMS06	Traffic Information Dissemination	Existing	Real-Time Transit Travel Time Notification
ATMS06	Traffic Information Dissemination	Existing	RTMC
ATMS06	Traffic Information Dissemination	Existing	TOCCs
ATMS07	Regional Traffic Management	Existing	Dynamic Message Sign Roadside Equipment
ATMS07	Regional Traffic Management	Existing	Local TMCs
ATMS07	Regional Traffic Management	Existing	Minneapolis TMC
ATMS07	Regional Traffic Management	Existing	Neighboring State Traffic Management Centers
ATMS07	Regional Traffic Management	Existing	RTMC
ATMS07	Regional Traffic Management	Existing	TOCCs
ATMS08	Traffic Incident Management System	Existing	911 Dispatch Center
ATMS08	Traffic Incident Management System	Existing	CCTV Roadside Equipment
ATMS08	Traffic Incident Management System	Existing	County Emergency Operations Centers
ATMS08	Traffic Incident Management System	Existing	County Sheriff and City Police Offices
ATMS08	Traffic Incident Management System	Existing	Emergency Vehicle Equipment
ATMS08	Traffic Incident Management System	Existing	Event Promoters
ATMS08	Traffic Incident Management System	Existing	Local TMCs
ATMS08	Traffic Incident Management System	Existing	Metro Area Transit Management Centers
ATMS08	Traffic Incident Management System	Existing	Minneapolis TMC
ATMS08	Traffic Incident Management System	Existing	Minnesota State Patrol District Office
ATMS08	Traffic Incident Management System	Existing	Neighboring State Traffic Management Centers

Service Package	Service Package Name	Service Package Status	Included Elements
ATMS08	Traffic Incident Management System	Existing	Neighboring State Traffic Management Centers Roadside Equipment
ATMS08	Traffic Incident Management System	Existing	Roadway Flooding Warning Roadside Equipment
ATMS08	Traffic Incident Management System	Existing	RTMC
ATMS08	Traffic Incident Management System	Existing	TOCCs
ATMS10	Electronic Toll Collection	Existing	Account Management Providers
ATMS10	Electronic Toll Collection	Existing	MnPASS Roadside Equipment
ATMS10	Electronic Toll Collection	Existing	MnPASS Service Center
ATMS10	Electronic Toll Collection	Existing	MnPASS Vehicle Equipment
ATMS11	Emissions Monitoring and Management	Existing	TOCCs
ATMS12	Roadside Lighting System Control	Planned	Roadway Lighting Management Central Monitoring Equipment
ATMS12	Roadside Lighting System Control	Planned	Roadway Lighting Management Roadside Equipment
ATMS13	Standard Railroad Grade Crossing	Existing	Driver
ATMS13	Standard Railroad Grade Crossing	Existing	Railroad Active Warning Roadside Equipment
ATMS13	Standard Railroad Grade Crossing	Existing	Railroad Wayside Equipment
ATMS16	Parking Facility Management	Existing	Account Management Providers
ATMS16	Parking Facility Management	Existing	Driver
ATMS16	Parking Facility Management	Existing	Park-and-Ride Parking Information System Roadside Equipment
ATMS16	Parking Facility Management	Existing	Parking Management Roadside Equipment
ATMS16	Parking Facility Management	Existing	Parking Management System
ATMS16	Parking Facility Management	Existing	Parking Operator
ATMS16	Parking Facility Management	Existing	Traveler Cards
ATMS16	Parking Facility Management	Existing	Vehicle
ATMS18	Reversible Lane Management	Existing	Lane/Ramp Access Control Roadside Equipment
ATMS18	Reversible Lane Management	Existing	RTMC
ATMS19	Speed Warning and Enforcement	Existing	Driver
ATMS19	Speed Warning and Enforcement	Existing	Dynamic Message Sign Roadside Equipment
ATMS19	Speed Warning and Enforcement	Existing	Maintenance and Construction Management Center
ATMS19	Speed Warning and Enforcement	Existing	Minneapolis TMC
ATMS19	Speed Warning and Enforcement	Existing	Minnesota State Patrol District Office
ATMS19	Speed Warning and Enforcement	Existing	Oversize Warning Roadside Equipment
ATMS19	Speed Warning and Enforcement	Existing	Red Light Monitoring/Enforcement Roadside Equipment
ATMS19	Speed Warning and Enforcement	Existing	RTMC
ATMS19	Speed Warning and Enforcement	Existing	Speed Monitoring Roadside Equipment
ATMS19	Speed Warning and Enforcement	Existing	TOCCs
ATMS19	Speed Warning and Enforcement	Existing	Traffic
ATMS19	Speed Warning and Enforcement	Existing	Vehicle
ATMS20	Drawbridge Management	Existing	Driver
ATMS20	Drawbridge Management	Existing	Lift Bridge Traffic Control Central System
ATMS20	Drawbridge Management	Existing	Lift Bridge Traffic Control Roadside Equipment
ATMS21	Roadway Closure Management	Existing	Driver
ATMS21	Roadway Closure Management	Existing	Lane/Ramp Access Control Roadside Equipment
ATMS21	Roadway Closure Management	Existing	TOCCs

Service Package	Service Package Name	Service Package Status	Included Elements
ATMS22	Variable Speed Limits	Planned	RTMC
ATMS22	Variable Speed Limits	Planned	TOCCs
ATMS22	Variable Speed Limits	Planned	Variable Speed Limit Roadside Equipment
ATMS23	Dynamic Lane Management and Shoulder Use	Existing	Driver
ATMS23	Dynamic Lane Management and Shoulder Use	Existing	Lane Control Roadside Equipment
ATMS23	Dynamic Lane Management and Shoulder Use	Existing	MnPASS Roadside Equipment
ATMS23	Dynamic Lane Management and Shoulder Use	Existing	RTMC
ATMS23	Dynamic Lane Management and Shoulder Use	Existing	Vehicle
ATMS24	Dynamic Roadway Warning	Existing	Advance Warning Flasher Roadside Equipment
ATMS24	Dynamic Roadway Warning	Existing	Advanced Pavement Condition and Visibility Warning System Roadside Equipment
ATMS24	Dynamic Roadway Warning	Existing	Animal Crossing Warning Roadside Equipment
ATMS24	Dynamic Roadway Warning	Existing	CCTV Roadside Equipment
ATMS24	Dynamic Roadway Warning	Existing	Driver
ATMS24	Dynamic Roadway Warning	Existing	Queue Detection Roadside Equipment
ATMS24	Dynamic Roadway Warning	Existing	Roadway Flooding Warning Roadside Equipment
ATMS24	Dynamic Roadway Warning	Existing	RTMC
ATMS24	Dynamic Roadway Warning	Existing	TOCCs
ATMS24	Dynamic Roadway Warning	Existing	Traffic
ATMS24	Dynamic Roadway Warning	Existing	Traffic Detector Roadside Equipment
AVSS01	Vehicle Safety Monitoring	Planned	Basic Vehicle
AVSS01	Vehicle Safety Monitoring	Planned	Driver
AVSS01	Vehicle Safety Monitoring	Planned	Vehicle
AVSS02	Driver Safety Monitoring	Planned	Basic Vehicle
AVSS02	Driver Safety Monitoring	Planned	Driver
AVSS02	Driver Safety Monitoring	Planned	Vehicle
AVSS03	Longitudinal Safety Warning	Planned	Basic Vehicle
AVSS03	Longitudinal Safety Warning	Planned	Driver
AVSS03	Longitudinal Safety Warning	Planned	Transit Vehicle Equipment
AVSS03	Longitudinal Safety Warning	Planned	Vehicle
AVSS04	Lateral Safety Warning	Planned	Basic Vehicle
AVSS04	Lateral Safety Warning	Planned	Driver
AVSS04	Lateral Safety Warning	Planned	Roadway Environment
AVSS04	Lateral Safety Warning	Planned	Transit Vehicle Equipment
AVSS05	Intersection Safety Warning	Planned	Driver
AVSS05	Intersection Safety Warning	Planned	Intersection Collision Warning Roadside Equipment
CVO01	Carrier Operations and Fleet Management	Existing	511 Traveler Information Website
CVO01	Carrier Operations and Fleet Management	Existing	Automated Permit Routing System
CVO01	Carrier Operations and Fleet Management	Existing	Commercial Vehicle Administration Center
CVO01	Carrier Operations and Fleet Management	Existing	Commercial Vehicles

Service Package	Service Package Name	Service Package Status	Included Elements
CVO01	Carrier Operations and Fleet Management	Existing	Condition Acquisition and Reporting System (CARS)
CVO01	Carrier Operations and Fleet Management	Existing	Private Fleet and Freight Management Center
CVO01	Carrier Operations and Fleet Management	Existing	Truck Center
CVO02	Freight Administration	Planned	Commercial Vehicles
CVO02	Freight Administration	Planned	Intermodal Freight Depots
CVO02	Freight Administration	Planned	Private Fleet and Freight Management Center
CVO03	Electronic Clearance	Existing	Commercial Vehicle Administration Center
CVO03	Electronic Clearance	Existing	Commercial Vehicles
CVO03	Electronic Clearance	Existing	IFTA Clearinghouse
CVO03	Electronic Clearance	Existing	IRP Clearinghouse
CVO03	Electronic Clearance	Existing	MCMIS
CVO03	Electronic Clearance	Existing	Minnesota CVIEW
CVO03	Electronic Clearance	Existing	Private Fleet and Freight Management Center
CVO03	Electronic Clearance	Existing	SAFER
CVO03	Electronic Clearance	Existing	Weigh Station Roadside Equipment
CVO04	CV Administrative Processes	Existing	Account Management Providers
CVO04	CV Administrative Processes	Existing	CVO Information Requestor
CVO04	CV Administrative Processes	Existing	IFTA Clearinghouse
CVO04	CV Administrative Processes	Existing	IRP Clearinghouse
CVO04	CV Administrative Processes	Existing	MCMIS
CVO04	CV Administrative Processes	Existing	Minnesota CVIEW
CVO04	CV Administrative Processes	Existing	Minnesota CVO Online
CVO04	CV Administrative Processes	Existing	Motor Carrier Registration System
CVO04	CV Administrative Processes	Existing	PRISM
CVO04	CV Administrative Processes	Existing	Private Fleet and Freight Management Center
CVO04	CV Administrative Processes	Existing	SAFER
CVO04	CV Administrative Processes	Existing	Truck Center
CVO05	International Border Electronic Clearance	Existing	Commercial Vehicle Administration Center
CVO05	International Border Electronic Clearance	Existing	Commercial Vehicles
CVO05	International Border Electronic Clearance	Existing	FAST Compliance Management System
CVO06	Weigh-In-Motion	Existing	Commercial Vehicles
CVO06	Weigh-In-Motion	Existing	Virtual Weigh Stations
CVO06	Weigh-In-Motion	Existing	Weigh In Motion (WIM) Stations
CVO07	Roadside CVO Safety	Existing	Commercial Vehicles
CVO07	Roadside CVO Safety	Existing	Minnesota CVIEW
CVO07	Roadside CVO Safety	Existing	Minnesota State Patrol District Office
CVO07	Roadside CVO Safety	Existing	Private Fleet and Freight Management Center
CVO07	Roadside CVO Safety	Existing	SAFER
CVO07	Roadside CVO Safety	Existing	Virtual Weigh Stations
CVO07	Roadside CVO Safety	Existing	Weigh In Motion (WIM) Stations
CVO10	HAZMAT Management	Existing	Commercial Vehicles
CVO10	HAZMAT Management	Existing	County Emergency Operations Centers

Service Package	Service Package Name	Service Package Status	Included Elements
CVO10	HAZMAT Management	Existing	Minnesota State Emergency Operations Center (SEOC)
CVO10	HAZMAT Management	Existing	Minnesota State Patrol District Office
CVO10	HAZMAT Management	Existing	Private Fleet and Freight Management Center
EM01	Emergency Call-Taking and Dispatch	Existing	911 Dispatch Center
EM01	Emergency Call-Taking and Dispatch	Existing	County Emergency Operations Centers
EM01	Emergency Call-Taking and Dispatch	Existing	Emergency Vehicle Equipment
EM01	Emergency Call-Taking and Dispatch	Existing	FIRST Emergency Vehicles
EM01	Emergency Call-Taking and Dispatch	Existing	Minnesota State Patrol District Office
EM01	Emergency Call-Taking and Dispatch	Existing	RTMC
EM01	Emergency Call-Taking and Dispatch	Existing	TOCCs
EM02	Emergency Routing	Existing	911 Dispatch Center
EM02	Emergency Routing	Existing	Emergency Vehicle Equipment
EM02	Emergency Routing	Existing	Minneapolis TMC
EM02	Emergency Routing	Existing	RTMC
EM02	Emergency Routing	Existing	TOCCs
EM02	Emergency Routing	Existing	Traffic Signal Roadside Equipment
EM03	Mayday and Alarms Support	Existing	911 Dispatch Center
EM03	Mayday and Alarms Support	Existing	Automated Crash Notification System
EM03	Mayday and Alarms Support	Existing	Driver
EM03	Mayday and Alarms Support	Existing	Mayday System
EM03	Mayday and Alarms Support	Existing	Mayday System Vehicle Equipment
EM03	Mayday and Alarms Support	Existing	Vehicle
EM04	Roadway Service Patrols	Existing	FIRST Emergency Vehicles
EM04	Roadway Service Patrols	Existing	RTMC
EM05	Transportation Infrastructure Protection	Existing	911 Dispatch Center
EM05	Transportation Infrastructure Protection	Existing	RTMC
EM05	Transportation Infrastructure Protection	Existing	Security Monitoring Roadside Equipment
EM05	Transportation Infrastructure Protection	Existing	TOCCs
EM06	Wide-Area Alert	Existing	511 Telephone Information Service
EM06	Wide-Area Alert	Existing	511 Traveler Information Website
EM06	Wide-Area Alert	Existing	911 Dispatch Center
EM06	Wide-Area Alert	Existing	Airport
EM06	Wide-Area Alert	Existing	Condition Acquisition and Reporting System (CARS)
EM06	Wide-Area Alert	Existing	County Emergency Operations Centers
EM06	Wide-Area Alert	Existing	County Sheriff and City Police Offices
EM06	Wide-Area Alert	Existing	Dynamic Message Sign Roadside Equipment
EM06	Wide-Area Alert	Existing	Highway Advisory Radio Roadside Equipment
EM06	Wide-Area Alert	Existing	Local TMCs
EM06	Wide-Area Alert	Existing	Maintenance and Construction Management Center
EM06	Wide-Area Alert	Existing	Metro Area Transit Management Centers
EM06	Wide-Area Alert	Existing	Minnesota Emergency Alert System

Service Package	Service Package Name	Service Package Status	Included Elements
EM06	Wide-Area Alert	Existing	Minnesota State Emergency Operations Center (SEOC)
EM06	Wide-Area Alert	Existing	Minnesota State Patrol District Office
EM06	Wide-Area Alert	Existing	Neighboring State Emergency Management Agencies
EM06	Wide-Area Alert	Existing	RTMC
EM06	Wide-Area Alert	Existing	TOCCs
EM06	Wide-Area Alert	Existing	User Personal Portable and Computing Devices
EM07	Early Warning System	Existing	911 Dispatch Center
EM07	Early Warning System	Existing	Airport
EM07	Early Warning System	Existing	County Emergency Operations Centers
EM07	Early Warning System	Existing	County Sheriff and City Police Offices
EM07	Early Warning System	Existing	Maintenance and Construction Management Center
EM07	Early Warning System	Existing	Metro Area Transit Management Centers
EM07	Early Warning System	Existing	Minnesota Emergency Alert System
EM07	Early Warning System	Existing	Minnesota State Emergency Operations Center (SEOC)
EM07	Early Warning System	Existing	Minnesota State Patrol District Office
EM07	Early Warning System	Existing	National Weather Service
EM07	Early Warning System	Existing	RTMC
EM07	Early Warning System	Existing	Security Monitoring Roadside Equipment
EM07	Early Warning System	Existing	TOCCs
EM08	Disaster Response and Recovery	Existing	County Emergency Operations Centers
EM08	Disaster Response and Recovery	Existing	County Sheriff and City Police Offices
EM08	Disaster Response and Recovery	Existing	Maintenance and Construction Management Center
EM08	Disaster Response and Recovery	Existing	Minnesota State Emergency Operations Center (SEOC)
EM08	Disaster Response and Recovery	Existing	Neighboring State Emergency Management Agencies
EM08	Disaster Response and Recovery	Existing	RTMC
EM09	Evacuation and Reentry Management	Existing	County Emergency Operations Centers
EM09	Evacuation and Reentry Management	Existing	County Sheriff and City Police Offices
EM09	Evacuation and Reentry Management	Existing	Maintenance and Construction Management Center
EM09	Evacuation and Reentry Management	Existing	Minnesota State Emergency Operations Center (SEOC)
EM09	Evacuation and Reentry Management	Existing	Minnesota State Patrol District Office
EM09	Evacuation and Reentry Management	Existing	Neighboring State Emergency Management Agencies
EM09	Evacuation and Reentry Management	Existing	RTMC
EM09	Evacuation and Reentry Management	Existing	TOCCs
EM10	Disaster Traveler Information	Existing	511 Telephone Information Service
EM10	Disaster Traveler Information	Existing	511 Traveler Information Website

Service Package	Service Package Name	Service Package Status	Included Elements
EM10	Disaster Traveler Information	Existing	Condition Acquisition and Reporting System (CARS)
EM10	Disaster Traveler Information	Existing	County Emergency Operations Centers
EM10	Disaster Traveler Information	Existing	County Sheriff and City Police Offices
EM10	Disaster Traveler Information	Existing	Maintenance and Construction Management Center
EM10	Disaster Traveler Information	Existing	Media Outlets
EM10	Disaster Traveler Information	Existing	Minnesota State Emergency Operations Center (SEOC)
EM10	Disaster Traveler Information	Existing	National Weather Service
EM10	Disaster Traveler Information	Existing	Rest Area Wi-Fi
EM10	Disaster Traveler Information	Existing	RTMC
EM10	Disaster Traveler Information	Existing	TOCCs
EM10	Disaster Traveler Information	Existing	User Personal Portable and Computing Devices
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing	Maintenance and Construction Management Center
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing	Maintenance and Construction Vehicle Equipment
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing	RTMC
MC01	Maintenance and Construction Vehicle and Equipment Tracking	Existing	TOCCs
MC03	Road Weather Data Collection	Existing	Advanced Pavement Condition and Visibility Warning System Roadside Equipment
MC03	Road Weather Data Collection	Existing	AWOS Central Control System
MC03	Road Weather Data Collection	Existing	AWOS Roadside Equipment
MC03	Road Weather Data Collection	Existing	Clarus Weather System
MC03	Road Weather Data Collection	Existing	Maintenance and Construction Vehicle Equipment
MC03	Road Weather Data Collection	Existing	RWIS Central Control System
MC03	Road Weather Data Collection	Existing	RWIS Stations
MC03	Road Weather Data Collection	Existing	TOCCs
MC04	Weather Information Processing and Distribution	Existing	AWOS Central Control System
MC04	Weather Information Processing and Distribution	Existing	Clarus Weather System
MC04	Weather Information Processing and Distribution	Existing	Condition Acquisition and Reporting System (CARS)
MC04	Weather Information Processing and Distribution	Existing	Maintenance and Construction Management Center
MC04	Weather Information Processing and Distribution	Existing	Media Outlets
MC04	Weather Information Processing and Distribution	Existing	National Weather Service
MC04	Weather Information Processing and Distribution	Existing	RTMC
MC04	Weather Information Processing and Distribution	Existing	RWIS Central Control System
MC04	Weather Information Processing and Distribution	Existing	Surface Transportation Weather Service Providers
MC04	Weather Information Processing and Distribution	Existing	TOCCs
MC05	Roadway Automated Treatment	Existing	Driver

Service Package	Service Package Name	Service Package Status	Included Elements
MC05	Roadway Automated Treatment	Existing	Maintenance and Construction Management Center
MC05	Roadway Automated Treatment	Existing	Roadway Automated Treatment System
MC05	Roadway Automated Treatment	Existing	RTMC
MC05	Roadway Automated Treatment	Existing	TOCCs
MC06	Winter Maintenance	Existing	Condition Acquisition and Reporting System (CARS)
MC06	Winter Maintenance	Existing	Maintenance and Construction Management Center
MC06	Winter Maintenance	Existing	Maintenance and Construction Vehicle Equipment
MC06	Winter Maintenance	Existing	Maintenance Decision Support System
MC06	Winter Maintenance	Existing	RTMC
MC06	Winter Maintenance	Existing	TOCCs
MC07	Roadway Maintenance and Construction	Existing	Dynamic Late Merge Central Control System
MC07	Roadway Maintenance and Construction	Existing	Dynamic Late Merge Roadside Equipment
MC07	Roadway Maintenance and Construction	Existing	Infrastructure GIS Database Systems
MC07	Roadway Maintenance and Construction	Existing	Intelligent Work Zone System Roadside Equipment
MC07	Roadway Maintenance and Construction	Existing	Maintenance and Construction Management Center
MC07	Roadway Maintenance and Construction	Existing	Maintenance and Construction Vehicle Equipment
MC07	Roadway Maintenance and Construction	Existing	RTMC
MC07	Roadway Maintenance and Construction	Existing	TOCCs
MC08	Work Zone Management	Existing	CCTV Roadside Equipment
MC08	Work Zone Management	Existing	Condition Acquisition and Reporting System (CARS)
MC08	Work Zone Management	Existing	Driver
MC08	Work Zone Management	Existing	Dynamic Late Merge Central Control System
MC08	Work Zone Management	Existing	Dynamic Late Merge Roadside Equipment
MC08	Work Zone Management	Existing	Dynamic Message Sign Roadside Equipment
MC08	Work Zone Management	Existing	Intelligent Work Zone System Roadside Equipment
MC08	Work Zone Management	Existing	Lane/Ramp Access Control Roadside Equipment
MC08	Work Zone Management	Existing	Maintenance and Construction Management Center
MC08	Work Zone Management	Existing	Maintenance and Construction Vehicle Equipment
MC08	Work Zone Management	Existing	RTMC
MC08	Work Zone Management	Existing	TOCCs
MC08	Work Zone Management	Existing	Variable Speed Limit Roadside Equipment
MC09	Work Zone Safety Monitoring	Existing	Driver
MC09	Work Zone Safety Monitoring	Existing	Intelligent Work Zone System Roadside Equipment
MC09	Work Zone Safety Monitoring	Existing	Maintenance and Construction Field Personnel
MC09	Work Zone Safety Monitoring	Existing	Maintenance and Construction Management Center
MC09	Work Zone Safety Monitoring	Existing	Maintenance and Construction Vehicle Equipment
MC09	Work Zone Safety Monitoring	Existing	RTMC

Service Package	Service Package Name	Service Package Status	Included Elements
MC09	Work Zone Safety Monitoring	Existing	Traffic
MC10	Maintenance and Construction Activity Coordination	Existing	Maintenance and Construction Management Center
MC10	Maintenance and Construction Activity Coordination	Existing	Media Outlets
MC10	Maintenance and Construction Activity Coordination	Existing	RTMC
MC10	Maintenance and Construction Activity Coordination	Existing	TOCCs
MC12	Infrastructure Monitoring	Planned	Bridge Inspection / Structural Monitoring Roadside Equipment
MC12	Infrastructure Monitoring	Planned	Maintenance and Construction Management Center
MC12	Infrastructure Monitoring	Planned	RTMC
MC12	Infrastructure Monitoring	Planned	TOCCs

7 Operational Concept

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

Table 4: Operational Concept

RR Area Name	Stakeholder	RR Description	RR Status
Archived Data Systems for Minnesota Regional ITS Architecture	Account Management Providers		
Archived Data Systems for Minnesota Regional ITS Architecture	Airports		
Archived Data Systems for Minnesota Regional ITS Architecture	City of Minneapolis		
Archived Data Systems for Minnesota Regional ITS Architecture	FHWA		
Archived Data Systems for Minnesota Regional ITS Architecture	Intercity Transit Providers		
Archived Data Systems for Minnesota Regional ITS Architecture	Local Agencies		
Archived Data Systems for Minnesota Regional ITS Architecture	Local EM Agencies		
Archived Data Systems for Minnesota Regional ITS Architecture	Local Transit Providers		
Archived Data Systems for Minnesota Regional ITS Architecture	Map Update Providers		
Archived Data Systems for Minnesota Regional ITS Architecture	Metro Area Transit Providers		
Archived Data Systems for Minnesota Regional ITS Architecture	Metro Transit		
Archived Data Systems for Minnesota Regional ITS Architecture	Minnesota Homeland Security and Emergency Management		
Archived Data Systems for Minnesota Regional ITS Architecture	Minnesota State Patrol		
Archived Data Systems for Minnesota Regional ITS Architecture	MnDOT		

RR Area Name	Stakeholder	RR Description	RR Status
Archived Data Systems for Minnesota Regional ITS Architecture	MnDOT OFCVO		
Archived Data Systems for Minnesota Regional ITS Architecture	MnDOT Office of Aeronautics		
Archived Data Systems for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance		
Archived Data Systems for Minnesota Regional ITS Architecture	Neighboring States		
Archived Data Systems for Minnesota Regional ITS Architecture	NOAA		
Archived Data Systems for Minnesota Regional ITS Architecture	North/West Passage Corridor Members		
Archived Data Systems for Minnesota Regional ITS Architecture	Private Information Service Providers		
Archived Data Systems for Minnesota Regional ITS Architecture	Private Mayday Service Providers		
Archived Data Systems for Minnesota Regional ITS Architecture	Railroad Companies		
Archived Data Systems for Minnesota Regional ITS Architecture	Travelers		
Archived Data Systems for Minnesota Regional ITS Architecture	University of Minnesota CTS ITS Institute		
Archived Data Systems for Minnesota Regional ITS Architecture	University of Minnesota Duluth		
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	FMCSA		
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	IFTA, Inc.		
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	IRP, Inc.		
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	Local Agencies		
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	Minnesota DVS		
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	Minnesota Homeland Security and Emergency Management		
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	Minnesota State Patrol		

RR Area Name	Stakeholder	RR Description	RR Status
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	MnDOT		
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	MnDOT OFCVO		
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	North/West Passage Corridor Members		
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	Private Information Service Providers		
Commercial Vehicle Operations for Minnesota Regional ITS Architecture	Private Trucking Companies		
Electronic Toll Collection for Minnesota Regional ITS Architecture	Local Agencies	Operate MnPASS HOT lanes (TM27)	Planned
Electronic Toll Collection for Minnesota Regional ITS Architecture	Minnesota State Patrol	Operate MnPASS HOT lanes (TM27)	Existing
Electronic Toll Collection for Minnesota Regional ITS Architecture	MnDOT	Operate MnPASS HOT lanes (TM27)	Existing
Electronic Toll Collection for Minnesota Regional ITS Architecture	MnDOT	Operate dynamic shoulders (TM20)	Planned
Electronic Toll Collection for Minnesota Regional ITS Architecture	MnDOT	Provide simple and integrated parking fee payment systems (TM32)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Local Agencies	Provide mobile data computers in emergency vehicles to provide real-time information (E09)	Existing
Emergency Management for Minnesota Regional ITS Architecture	Local Agencies	Provide emergency/ evacuation and reentry information (E10)	Existing
Emergency Management for Minnesota Regional ITS Architecture	Local Agencies	Operate and enhance CAD systems (E06)	Existing
Emergency Management for Minnesota Regional ITS Architecture	Local Agencies	Provide AVL to emergency vehicles (E07)	Existing
Emergency Management for Minnesota Regional ITS Architecture	Local Agencies	Provide wireless digital feed from patrol cars to dispatch centers (E12)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Local Agencies	Provide dynamic routing of emergency vehicles (E02)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Local Agencies	Provide enhanced Mayday services (E03)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Local Agencies	Provide OnStar or third party information directly to MSP or other PSAP's CAD systems (E13)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Local Agencies	Provide surveillance to monitor transportation infrastructure (E05)	Planned

RR Area Name	Stakeholder	RR Description	RR Status
Emergency Management for Minnesota Regional ITS Architecture	Local Agencies	Provide CAD to CAD integration for multi-agency coordination at major incidents (E01)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Minnesota Homeland Security and Emergency Management	Provide surveillance to monitor transportation infrastructure (E05)	Existing
Emergency Management for Minnesota Regional ITS Architecture	Minnesota Homeland Security and Emergency Management	Provide emergency/ evacuation and reentry information (E10)	Existing
Emergency Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide AVL to emergency vehicles (E07)	Existing
Emergency Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Enhance GIS capabilities (E08)	Existing
Emergency Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide mobile data computers in emergency vehicles to provide real-time information (E09)	Existing
Emergency Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Operate and enhance CAD systems (E06)	Existing
Emergency Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide wireless digital feed from patrol cars to dispatch centers (E12)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide dynamic routing of emergency vehicles (E02)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide real-time digital video recordings (DVR) (E15)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide enhanced Mayday services (E03)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide OnStar or third party information directly to MSP or other PSAP's CAD systems (E13)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide ability to remotely post AMBER alert information on DMS (E11)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide CAD to CAD integration for multi-agency coordination at major incidents (E01)	Planned
Emergency Management for Minnesota Regional ITS Architecture	MnDOT	Provide dynamic routing of emergency vehicles (E02)	Existing
Emergency Management for Minnesota Regional ITS Architecture	MnDOT	Enhance GIS capabilities (E08)	Existing
Emergency Management for Minnesota Regional ITS Architecture	MnDOT	Provide surveillance to monitor transportation infrastructure (E05)	Existing
Emergency Management for Minnesota Regional ITS Architecture	MnDOT	Provide emergency/ evacuation and reentry information (E10)	Existing
Emergency Management for Minnesota Regional ITS Architecture	MnDOT	Provide AVL to emergency vehicles (E07)	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Emergency Management for Minnesota Regional ITS Architecture	MnDOT	Provide wireless digital feed from patrol cars to dispatch centers (E12)	Planned
Emergency Management for Minnesota Regional ITS Architecture	MnDOT	Provide real-time digital video recordings (DVR) (E15)	Planned
Emergency Management for Minnesota Regional ITS Architecture	MnDOT	Provide ability to remotely post AMBER alert information on DMS (E11)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Private Mayday Service Providers	Provide enhanced Mayday services (E03)	Planned
Emergency Management for Minnesota Regional ITS Architecture	Private Mayday Service Providers	Provide OnStar or third party information directly to MSP or other PSAP's CAD systems (E13)	Planned
Freeway Management for Minnesota Regional ITS Architecture	City of Minneapolis	Implement Integrated Corridor Management (ICM) strategies (TM38)	Planned
Freeway Management for Minnesota Regional ITS Architecture	Local Agencies	Implement Integrated Corridor Management (ICM) strategies (TM38)	Planned
Freeway Management for Minnesota Regional ITS Architecture	Metro Transit	Implement Integrated Corridor Management (ICM) strategies (TM38)	Planned
Freeway Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide speed enforcement at high risk locations (TM06)	Existing
Freeway Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide speed enforcement to improve safety (TM08)	Existing
Freeway Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Use roadside data collectors to determine locations with high incident of speeding (TM44)	Planned
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide operating or actual speed information to travelers (TM15)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Operate CCTV cameras (TM26)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Monitor queue length at ramps, incident scenes and work zones (TM41)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide lane control (TM07)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Operate ramp meters (TM24)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Operate MnPASS HOT lanes (TM27)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide HOV bypass (TM28)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide congestion information to travelers (TM05)	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Operate freeway/ expressway DMS (TM25)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide vehicle overheight detection/ warning systems (TM37)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide incident information to travelers (TM13)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide information on special events (TM17)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Use archived data for traffic strategy development and long range planning (TM03)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Monitor and collect air quality data (TM33)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Operate reversible lanes (TM11)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide speed enforcement at high risk locations (TM06)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide speed enforcement to improve safety (TM08)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide dynamic speed feedback to drivers (TM18)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide curve speed warnings (TM34)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide automated/ remote control gate system(s) (TM31)	Existing
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Use roadside data collectors to determine locations with high incident of speeding (TM44)	Planned
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Utilize variable speed limits (TM10)	Planned
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Operate dynamic lane markings (TM19)	Planned
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Operate dynamic shoulders (TM20)	Planned
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Implement Integrated Corridor Management (ICM) strategies (TM38)	Planned
Freeway Management for Minnesota Regional ITS Architecture	MnDOT	Provide roadway flood warnings (TM36)	Planned
Incident Management for Minnesota Regional ITS Architecture	Local Agencies	Provide cameras at locations with high incidents for incident identification and verification (TM04)	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Incident Management for Minnesota Regional ITS Architecture	Local Agencies	Share surveillance video data with PSAPs (TM09)	Existing
Incident Management for Minnesota Regional ITS Architecture	Local Agencies	Divert traffic from areas with restricted traffic flow due to emergency incidents/evacuation (TM22)	Existing
Incident Management for Minnesota Regional ITS Architecture	Local Agencies	Reduce clearance time for primary crashes (TM12)	Existing
Incident Management for Minnesota Regional ITS Architecture	Local Agencies	Identify alternate routes (TM16)	Existing
Incident Management for Minnesota Regional ITS Architecture	Local Agencies	Provide a system-coordinated response for incidents and emergencies (TM23)	Existing
Incident Management for Minnesota Regional ITS Architecture	Local Agencies	Monitor queue length at ramps, incident scenes and work zones (TM41)	Planned
Incident Management for Minnesota Regional ITS Architecture	Local EM Agencies	Divert traffic from areas with restricted traffic flow due to emergency incidents/evacuation (TM22)	Existing
Incident Management for Minnesota Regional ITS Architecture	Local EM Agencies	Reduce clearance time for primary crashes (TM12)	Existing
Incident Management for Minnesota Regional ITS Architecture	Local EM Agencies	Provide a system-coordinated response for incidents and emergencies (TM23)	Existing
Incident Management for Minnesota Regional ITS Architecture	Local EM Agencies	Improve incident investigation capabilities (TM43)	Existing
Incident Management for Minnesota Regional ITS Architecture	Local Media	Divert traffic from areas with restricted traffic flow due to emergency incidents/evacuation (TM22)	Existing
Incident Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Divert traffic from areas with restricted traffic flow due to emergency incidents/evacuation (TM22)	Existing
Incident Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Reduce clearance time for primary crashes (TM12)	Existing
Incident Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide a system-coordinated response for incidents and emergencies (TM23)	Existing
Incident Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Improve incident investigation capabilities (TM43)	Existing
Incident Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide incident information to travelers (TM13)	Planned
Incident Management for Minnesota Regional ITS Architecture	MnDOT	Provide cameras at locations with high incidents for incident identification and verification (TM04)	Existing
Incident Management for Minnesota Regional ITS Architecture	MnDOT	Share surveillance video data with PSAPs (TM09)	Existing
Incident Management for Minnesota Regional ITS Architecture	MnDOT	Monitor queue length at ramps, incident scenes and work zones (TM41)	Existing
Incident Management for Minnesota Regional ITS Architecture	MnDOT	Divert traffic from areas with restricted traffic flow due to emergency incidents/evacuation (TM22)	Existing
Incident Management for Minnesota Regional ITS Architecture	MnDOT	Reduce clearance time for primary crashes (TM12)	Existing
Incident Management for Minnesota Regional ITS Architecture	MnDOT	Identify alternate routes (TM16)	Existing
Incident Management for Minnesota Regional ITS Architecture	MnDOT	Provide a system-coordinated response for incidents and emergencies (TM23)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	City of Minneapolis	Coordinate construction and maintenance project schedules (WZ02)	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Track locations of maintenance fleet and personnel and usage of materials (WZ01)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Use GPS/GIS data to target replacement and repair of infrastructure (WZ10)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Provide work zone information to travelers (WZ11)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Coordinate construction and maintenance project schedules (WZ02)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Provide roadway automated treatment (WZ07)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Provide queue detection and advisory to warn traffic of a stopped queue at work zone (WZ06)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Provide real-time information via HAR in work zones (WZ12)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Provide automated flagging in work zones (WZ14)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Provide dynamic advisory speeds (WZ15)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Provide dynamic speed display (WZ16)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Warn work crews of errant vehicles (WZ03)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Warn travelers about trucks entering/exiting work zones (WZ05)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	Local Agencies	Provide cameras/ sensors on bridges for inspection (WZ13)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide work zone information to travelers (WZ11)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT	Provide work zone information to travelers (WZ11)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT	Coordinate construction and maintenance project schedules (WZ02)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT	Provide cameras/ sensors on bridges for inspection (WZ13)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Aeronautics	Provide automated monitoring of road weather conditions (WZ04)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Track locations of maintenance fleet and personnel and usage of materials (WZ01)	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Provide automated monitoring of road weather conditions (WZ04)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Provide roadway automated treatment (WZ07)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Use GPS/GIS data to target replacement and repair of infrastructure (WZ10)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Provide queue detection and advisory to warn traffic of a stopped queue at work zone (WZ06)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Provide dynamic lane merge systems for construction/ maintenance activities (WZ09)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Provide work zone information to travelers (WZ11)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Provide automated flagging in work zones (WZ14)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Provide dynamic advisory speeds (WZ15)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Provide dynamic speed display (WZ16)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Warn travelers about trucks entering/exiting work zones (WZ05)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Coordinate construction and maintenance project schedules (WZ02)	Existing
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Provide maintenance decision support (WZ08)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Provide real-time information via HAR in work zones (WZ12)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Warn work crews of errant vehicles (WZ03)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance	Provide cameras/ sensors on bridges for inspection (WZ13)	Planned
Maintenance and Construction for Minnesota Regional ITS Architecture	University of Minnesota Duluth	Provide automated monitoring of road weather conditions (WZ04)	Existing
Parking Management for Minnesota Regional ITS Architecture	City of Minneapolis	Provide information on parking availability (TM21)	Existing
Parking Management for Minnesota Regional ITS Architecture	City of Minneapolis	Provide simple and integrated parking fee payment systems (TM32)	Planned
Parking Management for Minnesota Regional ITS Architecture	Local Agencies	Provide information on parking availability (TM21)	Existing
Parking Management for Minnesota Regional ITS Architecture	Private Parking Operators	Provide information on parking availability (TM21)	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Regional Transportation Operations for Minnesota Regional ITS Architecture	MnDOT		
Regional Transportation Operations for Minnesota Regional ITS Architecture	Neighboring States		
Surface Street Management for Minnesota Regional ITS Architecture	City of Minneapolis	Monitor operation and performance of traffic signals (TM14)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	City of Minneapolis	Operate CCTV cameras (TM26)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	City of Minneapolis	Provide efficient signal timing (TM01)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	City of Minneapolis	Provide information on special events (TM17)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	City of Minneapolis	Provide safe signal phase transition (TM39)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	City of Minneapolis	Utilize/ improve signal coordination operation (TM29)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	City of Minneapolis	Implement Integrated Corridor Management (ICM) strategies (TM38)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	City of Minneapolis	Implement red-light running technology (TM02)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Operate CCTV cameras (TM26)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Provide efficient signal timing (TM01)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Monitor operation and performance of traffic signals (TM14)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Utilize/ improve signal coordination operation (TM29)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Provide safe signal phase transition (TM39)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Provide roadway flood warnings (TM36)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Provide information on special events (TM17)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Provide incident information to travelers (TM13)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Use archived data for traffic strategy development and long range planning (TM03)	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Provide speed enforcement at high risk locations (TM06)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Provide speed enforcement to improve safety (TM08)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Provide dynamic speed feedback to drivers (TM18)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Implement red-light running technology (TM02)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Provide operating or actual speed information to travelers (TM15)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Use roadside data collectors to determine locations with high incident of speeding (TM44)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Provide vehicle overheight detection/warning systems (TM37)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Implement Integrated Corridor Management (ICM) strategies (TM38)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	Local Agencies	Provide curve speed warnings (TM34)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	Local EM Agencies	Provide speed enforcement at high risk locations (TM06)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local EM Agencies	Provide speed enforcement to improve safety (TM08)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Local EM Agencies	Use roadside data collectors to determine locations with high incident of speeding (TM44)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	Metro Transit	Implement Integrated Corridor Management (ICM) strategies (TM38)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide speed enforcement at high risk locations (TM06)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Provide speed enforcement to improve safety (TM08)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	Minnesota State Patrol	Use roadside data collectors to determine locations with high incident of speeding (TM44)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide operating or actual speed information to travelers (TM15)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Operate CCTV cameras (TM26)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide efficient signal timing (TM01)	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Monitor operation and performance of traffic signals (TM14)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Utilize/ improve signal coordination operation (TM29)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide safe signal phase transition (TM39)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide congestion information to travelers (TM05)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide vehicle overheight detection/ warning systems (TM37)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide information on special events (TM17)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide incident information to travelers (TM13)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Use archived data for traffic strategy development and long range planning (TM03)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide railroad flashing light signals and gates (TM30)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide health monitoring of rail crossings (TM40)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide speed enforcement at high risk locations (TM06)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide speed enforcement to improve safety (TM08)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide dynamic speed feedback to drivers (TM18)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide curve speed warnings (TM34)	Existing
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Implement red-light running technology (TM02)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Implement Integrated Corridor Management (ICM) strategies (TM38)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Use roadside data collectors to determine locations with high incident of speeding (TM44)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide roadway flood warnings (TM36)	Planned
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Monitor and collect air quality data (TM33)	Planned

RR Area Name	Stakeholder	RR Description	RR Status
Surface Street Management for Minnesota Regional ITS Architecture	MnDOT	Provide intersection collision warnings (TM35)	Planned
Transit Services for Minnesota Regional ITS Architecture	City of Minneapolis	Coordinate transit vehicle movements with traffic control devices (TR20)	Planned
Transit Services for Minnesota Regional ITS Architecture	Local Agencies	Coordinate transit vehicle movements with traffic control devices (TR20)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Agencies	Provide queue jumping (TR24)	Planned
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Track fleet and personnel operations (TR05)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Measure historical transit route performance (TR10)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Optimize schedule efficiency (TR16)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide simple fare payment systems (TR03)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide surveillance and enforcement on transit vehicles and transit facilities (TR06)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide park and ride vehicle security (TR06)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Support vehicle diagnostics and maintenance (TR09)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Coordinate timed transfers between route segments, providers & modes (TR04)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide transit route and schedule information (TR01)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide information to the ADA community (TR12)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide information on ridesharing opportunities (TR17)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Coordinate transit vehicle movements with traffic control devices (TR20)	Existing
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide real-time transit vehicle arrival information (TR02)	Planned
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide on-line reservation system for demand-responsive transit (TR23)	Planned
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide electronic fare payment card (TR08)	Planned
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Upgrade analog cameras to digital cameras (TR20)	Planned
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Optimize garage operations (TR13)	Planned
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide on-board automated enunciators (TR11)	Planned
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide real-time transfer information to travelers (TR22)	Planned
Transit Services for Minnesota Regional ITS Architecture	Local Transit Providers	Provide queue jumping (TR24)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Track fleet and personnel operations (TR05)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Measure historical transit route performance (TR10)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Optimize schedule efficiency (TR16)	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide on-line reservation system for demand-responsive transit (TR23)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide simple fare payment systems (TR03)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide electronic fare payment card (TR08)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide surveillance and enforcement on transit vehicles and transit facilities (TR06)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide park and ride vehicle security (TR06)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Coordinate timed transfers between route segments, providers & modes (TR04)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide transit route and schedule information (TR01)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide information to the ADA community (TR12)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide information on ridesharing opportunities (TR17)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide real-time transit vehicle arrival information (TR02)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Upgrade analog cameras to digital cameras (TR20)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Support vehicle diagnostics and maintenance (TR09)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Optimize garage operations (TR13)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide on-board automated enunciators (TR11)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide real-time transfer information to travelers (TR22)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Coordinate transit vehicle movements with traffic control devices (TR20)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Area Transit Providers	Provide queue jumping (TR24)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide real-time transit vehicle arrival information (TR02)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Track fleet and personnel operations (TR05)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Measure historical transit route performance (TR10)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Optimize schedule efficiency (TR16)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide on-line reservation system for demand-responsive transit (TR23)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide simple fare payment systems (TR03)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide electronic fare payment card (TR08)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide surveillance and enforcement on transit vehicles and transit facilities (TR06)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide park and ride vehicle security (TR06)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Support vehicle diagnostics and maintenance (TR09)	Existing

RR Area Name	Stakeholder	RR Description	RR Status
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Coordinate timed transfers between route segments, providers & modes (TR04)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide transit route and schedule information (TR01)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide on-board automated enunciators (TR11)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide information to the ADA community (TR12)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide information on ridesharing opportunities (TR17)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide real-time transfer information to travelers (TR22)	Existing
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Upgrade analog cameras to digital cameras (TR20)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Optimize garage operations (TR13)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Coordinate transit vehicle movements with traffic control devices (TR20)	Planned
Transit Services for Minnesota Regional ITS Architecture	Metro Transit	Provide queue jumping (TR24)	Planned
Transit Services for Minnesota Regional ITS Architecture	MnDOT	Coordinate transit vehicle movements with traffic control devices (TR20)	Planned
Transit Services for Minnesota Regional ITS Architecture	MnDOT	Provide queue jumping (TR24)	Planned
Traveler Information for Minnesota Regional ITS Architecture	Airports		
Traveler Information for Minnesota Regional ITS Architecture	City of Minneapolis	Provide incident information on freeways and major arterials (TI01)	Existing
Traveler Information for Minnesota Regional ITS Architecture	City of Minneapolis	Provide information on roadway maintenance and construction activities	Existing
Traveler Information for Minnesota Regional ITS Architecture	Intercity Transit Providers		
Traveler Information for Minnesota Regional ITS Architecture	Local Agencies		
Traveler Information for Minnesota Regional ITS Architecture	Local EM Agencies		
Traveler Information for Minnesota Regional ITS Architecture	Local Media		
Traveler Information for Minnesota Regional ITS Architecture	Local Transit Providers		
Traveler Information for Minnesota Regional ITS Architecture	Map Update Providers		
Traveler Information for Minnesota Regional ITS Architecture	Metro Area Transit Providers		
Traveler Information for Minnesota Regional ITS Architecture	Metro Transit		
Traveler Information for Minnesota Regional ITS Architecture	Minnesota Homeland Security and Emergency Management		
Traveler Information for Minnesota Regional ITS Architecture	Minnesota State Patrol		
Traveler Information for Minnesota Regional ITS Architecture	MnDOT		
Traveler Information for Minnesota Regional ITS Architecture	MnDOT OFCVO		

RR Area Name	Stakeholder	RR Description	RR Status
Traveler Information for Minnesota Regional ITS Architecture	MnDOT Office of Aeronautics		
Traveler Information for Minnesota Regional ITS Architecture	MnDOT Office of Maintenance		
Traveler Information for Minnesota Regional ITS Architecture	Neighboring States		
Traveler Information for Minnesota Regional ITS Architecture	NOAA		
Traveler Information for Minnesota Regional ITS Architecture	North/West Passage Corridor Members		
Traveler Information for Minnesota Regional ITS Architecture	Private Information Service Providers		
Traveler Information for Minnesota Regional ITS Architecture	Private Mayday Service Providers		
Traveler Information for Minnesota Regional ITS Architecture	Private Trucking Companies		
Traveler Information for Minnesota Regional ITS Architecture	Railroad Companies		
Traveler Information for Minnesota Regional ITS Architecture	Traveler Information Kiosks Operators		
Traveler Information for Minnesota Regional ITS Architecture	University of Minnesota CTS ITS Institute		
Traveler Information for Minnesota Regional ITS Architecture	University of Minnesota Duluth		

8 Functional Requirements

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

Table 5: Functional Requirements

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
511 Telephone Information Service	Information Service Provider	Basic Information Broadcast	Broadcast dissemination of traffic, transit, maintenance and construction, event, and weather information to traveler interface systems and vehicles.	No
511 Telephone Information Service	Information Service Provider	Interactive Infrastructure Information	Personalized dissemination of traffic, transit, maintenance and construction, multimodal, event, and weather information to traveler interface systems and vehicles, upon request.	No
511 Telephone Information Service	Information Service Provider	ISP Emergency Traveler Information	Distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.	No
511 Telephone Information Service	Information Service Provider	ISP Traveler Data Collection	Collects traveler information from other centers, consolidates and refines the collected data, and makes this data available to traveler information applications.	No
511 Telephone Information Service	Information Service Provider	ISP Traveler Information Alerts	Provides personalized traveler information alerts, notifying travelers of relevant congestion, incidents, transit schedule delays, and other actionable information that may impact a trip. Relevant alerts are selected based on user-configurable parameters and thresholds.	No
511 Telephone Information Service	Information Service Provider	Traveler Telephone Information	Distribution of traveler information and wide-area alerts to traveler telephone information systems such as 511, based on voice-based traveler requests.	No
511 Telephone Information Service	Telecommunications System for Traveler Information			No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
511 Traveler Information Website	Information Service Provider	Basic Information Broadcast	Broadcast dissemination of traffic, transit, maintenance and construction, event, and weather information to traveler interface systems and vehicles.	No
511 Traveler Information Website	Information Service Provider	Infrastructure Provided Trip Planning	Generation of pre-trip and enroute trip plans for travelers (and vehicles) based on current traffic conditions, work zones, weather, and travelers constraints and preferences. Includes end-to-end trips using multiple modes, such as bicycle, transit, etc.	No
511 Traveler Information Website	Information Service Provider	Interactive Infrastructure Information	Personalized dissemination of traffic, transit, maintenance and construction, multimodal, event, and weather information to traveler interface systems and vehicles, upon request.	No
511 Traveler Information Website	Information Service Provider	ISP Emergency Traveler Information	Distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.	No
511 Traveler Information Website	Information Service Provider	ISP Traveler Data Collection	Collects traveler information from other centers, consolidates and refines the collected data, and makes this data available to traveler information applications.	No
511 Traveler Information Website	Information Service Provider	ISP Traveler Information Alerts	Provides personalized traveler information alerts, notifying travelers of relevant congestion, incidents, transit schedule delays, and other actionable information that may impact a trip. Relevant alerts are selected based on user-configurable parameters and thresholds.	No
511 Traveler Information Website	Information Service Provider	Traveler Telephone Information	Distribution of traveler information and wide-area alerts to traveler telephone information systems such as 511, based on voice-based traveler requests.	No
911 Dispatch Center	Emergency Management	Center Secure Area Alarm Support	Collection and response to silent and audible alarms received from travelers in secure areas (such as transit stops, rest areas, park-and-ride lots) and from on-board transit vehicles.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
911 Dispatch Center	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
911 Dispatch Center	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
911 Dispatch Center	Emergency Management	Emergency Call-Taking	Provides interface to the emergency call-taking systems such as the Emergency Telecommunications System (e.g., 911) that correlate call information with emergencies reported by transit agencies, commercial vehicle operators, or other public safety agencies. Allows the operator to verify the incident and forward the information to the responding agencies.	No
911 Dispatch Center	Emergency Management	Emergency Data Collection	Collection and storage of information related to Emergency Management. For use by operations personnel or data archives in the region.	No
911 Dispatch Center	Emergency Management	Emergency Dispatch	Dispatch emergency vehicles to incidents, tracking their location and status. Pertinent incident information is gathered and relayed to the responding units.	No
911 Dispatch Center	Emergency Management	Emergency Early Warning System	Monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies in order to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other ITS centers to notify the traveling public.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
911 Dispatch Center	Emergency Management	Emergency Environmental Monitoring	Collects current and forecast road and weather information that is used by the operator to more effectively manage incidents.	No
911 Dispatch Center	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.	No
911 Dispatch Center	Emergency Management	Emergency Routing	Routing of emergency vehicles to facilitate the quickest/safest arrival. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by Traffic Management on request.	No
911 Dispatch Center	Emergency Management	Emergency Transportation Operations Data Collection	Collects real-time information on the state of the regional transportation system for operational use by the center. It establishes communications with a regional repository, requests or subscribes to information relevant to the center, and distributes the received information for use.	No
911 Dispatch Center	Emergency Management	Incident Command	Tactical decision support, resource coordination, and communications integration among emergency management agencies for Incident Commands that are established by first responders to support local management of an incident.	No
911 Dispatch Center	Emergency Management	Mayday Support	Collection and response to Mayday messages received from vehicles and drivers.	No
Account Management Providers	Financial Institution			No
Advance Warning Flasher Roadside Equipment	Other Roadway			No
Advanced Pavement Condition and Visibility Warning System Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Advanced Pavement Condition and Visibility Warning System Roadside Equipment	Roadway	Roadway Environmental Monitoring	Environmental sensors, surface and sub-surface, that collect weather and road surface information. Weather conditions measured include temperature, wind, humidity, precipitation, and visibility. Sensors measure road surface temperature, moisture, icing, salinity, etc.	No
Advanced Pavement Condition and Visibility Warning System Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Advanced Pavement Condition and Visibility Warning System Roadside Equipment	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).	No
Advanced Pavement Condition and Visibility Warning System Roadside Equipment	Roadway	Roadway Warning	Field elements used to warn drivers approaching hazards including adverse road weather conditions, traffic conditions including queues, and obstacles or animals in the road.	No
Airport	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Airport	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Airport	Emergency Management	Emergency Early Warning System	Monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies in order to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other ITS centers to notify the traveling public.	No
Airport	Emergency Management	Emergency Environmental Monitoring	Collects current and forecast road and weather information that is used by the operator to more effectively manage incidents.	No
Animal Crossing Warning Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No
Animal Crossing Warning Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Animal Crossing Warning Roadside Equipment	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).	No
Animal Crossing Warning Roadside Equipment	Roadway	Roadway Warning	Field elements used to warn drivers approaching hazards including adverse road weather conditions, traffic conditions including queues, and obstacles or animals in the road.	No
Automated Crash Notification System	Emergency Management	Center Secure Area Alarm Support	Collection and response to silent and audible alarms received from travelers in secure areas (such as transit stops, rest areas, park-and-ride lots) and from on-board transit vehicles.	No
Automated Crash Notification System	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Automated Crash Notification System	Emergency Management	Mayday Support	Collection and response to Mayday messages received from vehicles and drivers.	No
Automated Permit Routing System	Information Service Provider			No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
AWOS Central Control System	Information Service Provider	Basic Information Broadcast	Broadcast dissemination of traffic, transit, maintenance and construction, event, and weather information to traveler interface systems and vehicles.	No
AWOS Central Control System	Information Service Provider	ISP Traveler Data Collection	Collects traveler information from other centers, consolidates and refines the collected data, and makes this data available to traveler information applications.	No
AWOS Central Control System	Maintenance and Construction Management	MCM Environmental Information Collection	Remotely controls environmental sensors and assimilates collected data with environmental probe data and other current and forecast road conditions and surface weather information from weather service providers and transportation operations.	No
AWOS Central Control System	Maintenance and Construction Management	MCM Environmental Information Processing	Processes current and forecast weather data, road condition information, local environmental data, and uses internal models to develop specialized detailed forecasts of local weather and surface conditions. Disseminates road weather information to other agencies and centers.	No
AWOS Roadside Equipment	Roadway	Roadway Environmental Monitoring	Environmental sensors, surface and sub-surface, that collect weather and road surface information. Weather conditions measured include temperature, wind, humidity, precipitation, and visibility. Sensors measure road surface temperature, moisture, icing, salinity, etc.	No
Basic Vehicle	Basic Vehicle			No
Bridge Inspection / Structural Monitoring Roadside Equipment	Roadway	Roadway Infrastructure Monitoring	Sensors that monitor the condition of pavement, bridges, tunnels, associated hardware, and other transportation-related infrastructure (e.g., culverts), under maintenance center and maintenance vehicle control.	No
Bridge Inspection / Structural Monitoring Roadside Equipment	Roadway	Roadway Probe Data Communications	Field elements that collect probe data from vehicles using short range communications.	No
CCTV Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
CCTV Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
CCTV Roadside Equipment	Roadway	Roadway Incident Detection	Field elements that monitor traffic conditions to identify incidents. It includes traffic detectors that collect traffic flow information and identify unusual traffic conditions and advanced CCTV cameras with built-in incident detection algorithms.	No
CCTV Roadside Equipment	Roadway	Roadway Warning	Field elements used to warn drivers approaching hazards including adverse road weather conditions, traffic conditions including queues, and obstacles or animals in the road.	No
CCTV Roadside Equipment	Roadway	Roadway Work Zone Traffic Control	Field elements in maintenance and construction areas including CCTV cameras, driver information systems (such as DMS), and gates/barriers that monitor and control traffic and provide information directly to drivers in affected areas.	No
Clarus Weather System	Weather Service			No
Commercial Vehicle Administration Center	Commercial Vehicle Administration	CV Information Exchange	Exchange information concerning safety, credentialing, and operations of commercial vehicles between the center and the roadside check stations, across jurisdictions, with fleet operators and other information requestors.	No
Commercial Vehicle Administration Center	Commercial Vehicle Administration	CV Safety and Security Administration	Provides commercial vehicle safety and security criteria to roadside check facilities, collects and reviews safety and security data from the field, conducts wireless roadside inspections, and distributes safety and security information to other centers, carriers, and enforcement agencies.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Commercial Vehicle Administration Center	Commercial Vehicle Administration	International CV Administration	Generate and process entry documentation for commercial vehicles and their shipments across international borders. Interface with customs and border protection, immigration, carriers, and brokers.	No
Commercial Vehicles	Commercial Vehicle	On-board Cargo Monitoring	On-board systems monitoring the location and status of the commercial vehicle and its cargo. Sends the data on to appropriate centers and roadside facilities, including emergency management in the case of HAZMAT incidents.	No
Commercial Vehicles	Commercial Vehicle	On-board CV Electronic Data	On-board systems exchanging information between the vehicle and the roadside facility with the information such as status of driver, vehicle, carrier IDs and cargo information identified via an electronic tag.	No
Commercial Vehicles	Commercial Vehicle	On-board CV Safety and Security	On-board systems collect and process on-board vehicle and driver safety and security information; exchanging information with roadside and remote facilities at mainline speeds and while stopped for inspections.	No
Commercial Vehicles	Commercial Vehicle	On-board Trip Monitoring	On-board systems to provide automatic vehicle location and automated mileage and fuel reporting and auditing. In addition, monitors the planned route and notifies the fleet and freight management center of any deviations.	No
Commercial Vehicles	Vehicle Characteristics			No
Commuter Rail Operations Center	Other Transit Management			No
Commuter Rail Operations Center	Transit Management	Transit Center Fare Management	Management of fare collection at the center - includes setting and distributing fare information, central processing of fares for transit as well as other ITS services, links to financial institutions and enforcement agencies.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Commuter Rail Operations Center	Transit Management	Transit Center Fixed-Route Operations	Management of fixed route transit operations. Planning, scheduling, and dispatch associated with fixed and flexible route transit services. Updates customer service operator systems, and provides current vehicle schedule adherence and optimum scenarios for schedule adjustment.	No
Commuter Rail Operations Center	Transit Management	Transit Center Multi-Modal Coordination	Coordinate schedules with other agencies and modes, including transit transfer cluster and transfer point information.	No
Commuter Rail Operations Center	Transit Management	Transit Garage Maintenance	Collect operational and maintenance data from transit vehicles, manage vehicle service histories, automatically generate preventative maintenance schedules, and provide information to service personnel.	No
Commuter Rail Operations Center	Transit Management	Transit Vehicle Assignment	Assigns individual transit vehicles to vehicle blocks and downloads this information to the transit vehicle, updating assignments as necessitated by changes. It also provides an inventory management function that stores attributes about each of the transit vehicles.	No
Commuter Rail Operations Center	Transit Management	Transit Vehicle Operator Assignment	Assignment of transit operators to runs in a fair manner while minimizing labor and overtime services, considering operator preferences, qualifications, accumulated work hours, and other information about each operator.	No
Condition Acquisition and Reporting System (CARS)	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.	No
Condition Acquisition and Reporting System (CARS)	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.	No
Condition Acquisition and Reporting System (CARS)	Archived Data Management	On-Line Analysis and Mining	Advanced data analysis and mining features to support discovery of information, patterns, and correlations in large ITS archives.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Condition Acquisition and Reporting System (CARS)	Archived Data Management	Traffic and Roadside Data Archival	Collects and archives traffic and environmental information directly from the roadside for use in off-line planning, research, and analysis.	No
Condition Acquisition and Reporting System (CARS)	Information Service Provider	Basic Information Broadcast	Broadcast dissemination of traffic, transit, maintenance and construction, event, and weather information to traveler interface systems and vehicles.	No
Condition Acquisition and Reporting System (CARS)	Information Service Provider	Interactive Infrastructure Information	Personalized dissemination of traffic, transit, maintenance and construction, multimodal, event, and weather information to traveler interface systems and vehicles, upon request.	No
Condition Acquisition and Reporting System (CARS)	Information Service Provider	ISP Data Collection	Collection and storage of information supporting the operations of traveler information service providers. For use by operations personnel or data archives in the region.	No
Condition Acquisition and Reporting System (CARS)	Information Service Provider	ISP Emergency Traveler Information	Distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.	No
Condition Acquisition and Reporting System (CARS)	Information Service Provider	ISP Operational Data Repository	Processes, stores, and distributes real-time information on the state of the regional transportation system to transportation system operators.	No
Condition Acquisition and Reporting System (CARS)	Information Service Provider	ISP Traveler Data Collection	Collects traveler information from other centers, consolidates and refines the collected data, and makes this data available to traveler information applications.	No
Condition Acquisition and Reporting System (CARS)	Information Service Provider	ISP Traveler Information Alerts	Provides personalized traveler information alerts, notifying travelers of relevant congestion, incidents, transit schedule delays, and other actionable information that may impact a trip. Relevant alerts are selected based on user-configurable parameters and thresholds.	No
Condition Acquisition and Reporting System (CARS)	Information Service Provider	Traveler Telephone Information	Distribution of traveler information and wide-area alerts to traveler telephone information systems such as 511, based on voice-based traveler requests.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
County Emergency Operations Centers	Emergency Management	Center Secure Area Alarm Support	Collection and response to silent and audible alarms received from travelers in secure areas (such as transit stops, rest areas, park-and-ride lots) and from on-board transit vehicles.	No
County Emergency Operations Centers	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
County Emergency Operations Centers	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
County Emergency Operations Centers	Emergency Management	Emergency Call-Taking	Provides interface to the emergency call-taking systems such as the Emergency Telecommunications System (e.g., 911) that correlate call information with emergencies reported by transit agencies, commercial vehicle operators, or other public safety agencies. Allows the operator to verify the incident and forward the information to the responding agencies.	No
County Emergency Operations Centers	Emergency Management	Emergency Commercial Vehicle Response	Responds to commercial vehicle and freight equipment related emergencies. Includes incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat.	No
County Emergency Operations Centers	Emergency Management	Emergency Dispatch	Dispatch emergency vehicles to incidents, tracking their location and status. Pertinent incident information is gathered and relayed to the responding units.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
County Emergency Operations Centers	Emergency Management	Emergency Early Warning System	Monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies in order to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other ITS centers to notify the traveling public.	No
County Emergency Operations Centers	Emergency Management	Emergency Environmental Monitoring	Collects current and forecast road and weather information that is used by the operator to more effectively manage incidents.	No
County Emergency Operations Centers	Emergency Management	Emergency Evacuation Support	Evacuation planning and coordination to manage evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety.	No
County Emergency Operations Centers	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.	No
County Emergency Operations Centers	Emergency Management	Incident Command	Tactical decision support, resource coordination, and communications integration among emergency management agencies for Incident Commands that are established by first responders to support local management of an incident.	No
County Emergency Operations Centers	Emergency Management	Mayday Support	Collection and response to Mayday messages received from vehicles and drivers.	No
County Emergency Operations Centers	Other Emergency Management			No
County Sheriff and City Police Offices	Emergency Management	Center Secure Area Alarm Support	Collection and response to silent and audible alarms received from travelers in secure areas (such as transit stops, rest areas, park-and-ride lots) and from on-board transit vehicles.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
County Sheriff and City Police Offices	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
County Sheriff and City Police Offices	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
County Sheriff and City Police Offices	Emergency Management	Emergency Early Warning System	Monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies in order to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other ITS centers to notify the traveling public.	No
County Sheriff and City Police Offices	Emergency Management	Emergency Environmental Monitoring	Collects current and forecast road and weather information that is used by the operator to more effectively manage incidents.	No
County Sheriff and City Police Offices	Emergency Management	Emergency Evacuation Support	Evacuation planning and coordination to manage evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety.	No
County Sheriff and City Police Offices	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
County Sheriff and City Police Offices	Emergency Management	Incident Command	Tactical decision support, resource coordination, and communications integration among emergency management agencies for Incident Commands that are established by first responders to support local management of an incident.	No
County Sheriff and City Police Offices	Enforcement Agency			No
CVO Information Requestor	CVO Information Requestor			No
Data Distribution Server	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.	No
Data Distribution Server	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.	No
Data Distribution Server	Archived Data Management	Traffic and Roadside Data Archival	Collects and archives traffic and environmental information directly from the roadside for use in off-line planning, research, and analysis.	No
Driver	Driver			No
Dynamic Late Merge Central Control System	Maintenance and Construction Management	MCM Maintenance Decision Support	Maintenance Decision Support Systems recommend courses of action based on current and forecast environmental and road conditions (filtered and fused for specific time horizons) and additional application specific information. Recommendations and dispatch instructions are generated based on this integrated information.	No
Dynamic Late Merge Central Control System	Maintenance and Construction Management	MCM Roadway Maintenance and Construction	Overall management and support for routine maintenance on the roadway or right-of-way. Includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Dynamic Late Merge Central Control System	Maintenance and Construction Management	MCM Work Zone Management	Remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), highway advisory radio, gates and barriers, and informing other groups of activity (e.g., traveler information systems, traffic management centers, other maintenance and construction centers).	No
Dynamic Late Merge Roadside Equipment	Roadway	Roadway Field Device Monitoring	Monitors field equipment operational status and detects and reports fault conditions. Device status, configuration, and fault information are provided to a remote center and a user interface provides information locally to field personnel.	No
Dynamic Late Merge Roadside Equipment	Roadway	Roadway Work Zone Traffic Control	Field elements in maintenance and construction areas including CCTV cameras, driver information systems (such as DMS), and gates/barriers that monitor and control traffic and provide information directly to drivers in affected areas.	No
Dynamic Message Sign Roadside Equipment	Other Roadway			No
Dynamic Message Sign Roadside Equipment	Remote Traveler Support	Remote Basic Information Reception	Public traveler interface, such as a kiosk, that provides formatted traffic advisories, transit, event, and other traveler information, as well as broadcast alerts.	No
Dynamic Message Sign Roadside Equipment	Remote Traveler Support	Remote Transit Information Services	Public traveler interface that provides real-time travel-related information at transit stops and multi-modal transfer points, including general annunciation, display of imminent arrival information, the latest available information on transit routes, schedules, transfer options, available services, fares, and real-time schedule adherence.	No
Dynamic Message Sign Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Dynamic Message Sign Roadside Equipment	Roadway	Roadway Speed Monitoring and Warning	Vehicle speed sensors that detect excessive vehicle speeds, optionally based on conditions and vehicle type, informing drivers, centers and/or enforcement agencies of speed violations.	No
Dynamic Message Sign Roadside Equipment	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).	No
Dynamic Message Sign Roadside Equipment	Roadway	Roadway Work Zone Traffic Control	Field elements in maintenance and construction areas including CCTV cameras, driver information systems (such as DMS), and gates/barriers that monitor and control traffic and provide information directly to drivers in affected areas.	No
Emergency Vehicle Equipment	Emergency Vehicle	On-board EV En Route Support	On-board systems for gathering of dispatch and routing information for emergency vehicle personnel, vehicle tracking, communications with care facilities, and signal preemption via short range communication directly with traffic control equipment at the roadside.	No
Emergency Vehicle Equipment	Emergency Vehicle	On-board EV Incident Management Communication	On-board systems provide communications support to first responders. Incident information is provided to dispatch emergency personnel. Emergency personnel transmit information about the incident and response status.	No
Event Promoters	Event Promoters			No
FAST Compliance Management System	Commercial Vehicle Check	International Border Crossing	Roadside check facility equipment to check compliance with import/export and immigration regulations to allow release of cargo, vehicle, and driver across an international border.	No
FAST Compliance Management System	Commercial Vehicle Check	Roadside Electronic Screening	Roadside check facility equipment to communicate with commercial vehicles at mainline speeds - reading tag data, identification, weight and vehicle characteristics, and credential checking. Determines whether a pull-in message should be generated, allowing for inspectors to override.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
FIRST Emergency Vehicles	Emergency Vehicle	On-board EV En Route Support	On-board systems for gathering of dispatch and routing information for emergency vehicle personnel, vehicle tracking, communications with care facilities, and signal preemption via short range communication directly with traffic control equipment at the roadside.	No
FIRST Emergency Vehicles	Emergency Vehicle	On-board EV Incident Management Communication	On-board systems provide communications support to first responders. Incident information is provided to dispatch emergency personnel. Emergency personnel transmit information about the incident and response status.	No
Highway Advisory Radio Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Highway Advisory Radio Roadside Equipment	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).	No
IFTA Clearinghouse	Other CVAS			No
In Vehicle Signing Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
In Vehicle Signing Roadside Equipment	Roadway	Roadway Short Range Traveler Information Communications	Field elements that distribute information to in-vehicle equipment. The information provided may be determined locally or under the control of a center.	No
In Vehicle Signing Vehicle Equipment	Vehicle	Vehicle Short Range Traveler Information Reception	Provides drivers with road condition, environmental, advisory, and other traveler information received via short range communications.	No
Infrastructure GIS Database Systems	Asset Management			No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Intelligent Work Zone System Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Intelligent Work Zone System Roadside Equipment	Roadway	Roadway Field Device Monitoring	Monitors field equipment operational status and detects and reports fault conditions. Device status, configuration, and fault information are provided to a remote center and a user interface provides information locally to field personnel.	No
Intelligent Work Zone System Roadside Equipment	Roadway	Roadway Work Zone Safety	Work zone intrusion detection devices (to detect vehicle intrusion upon a work zone or crew worker movement across a work zone boundary) and intrusion alerting devices that provide alerts to crew and drivers.	No
Intelligent Work Zone System Roadside Equipment	Roadway	Roadway Work Zone Traffic Control	Field elements in maintenance and construction areas including CCTV cameras, driver information systems (such as DMS), and gates/barriers that monitor and control traffic and provide information directly to drivers in affected areas.	No
Intercity Transit Management Centers	Emergency Management	Center Secure Area Alarm Support	Collection and response to silent and audible alarms received from travelers in secure areas (such as transit stops, rest areas, park-and-ride lots) and from on-board transit vehicles.	No
Intercity Transit Management Centers	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Intercity Transit Management Centers	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Intercity Transit Management Centers	Emergency Management	Emergency Data Collection	Collection and storage of information related to Emergency Management. For use by operations personnel or data archives in the region.	No
Intercity Transit Management Centers	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.	No
Intercity Transit Management Centers	Transit Management	Transit Center Connection Protection	Manages the coordination of transit transfers between routes, including routes on different modes. Also supports the capability for travelers to obtain connection protection throughout a trip.	No
Intercity Transit Management Centers	Transit Management	Transit Center Fare Management	Management of fare collection at the center - includes setting and distributing fare information, central processing of fares for transit as well as other ITS services, links to financial institutions and enforcement agencies.	No
Intercity Transit Management Centers	Transit Management	Transit Center Fixed-Route Operations	Management of fixed route transit operations. Planning, scheduling, and dispatch associated with fixed and flexible route transit services. Updates customer service operator systems, and provides current vehicle schedule adherence and optimum scenarios for schedule adjustment.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Intercity Transit Management Centers	Transit Management	Transit Center Information Services	Provide interactive traveler information to travelers (on-board transit vehicles, at stops/stations, using personal devices), traveler information service providers, media, and other transit organizations. Includes routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events.	No
Intercity Transit Management Centers	Transit Management	Transit Center Multi-Modal Coordination	Coordinate schedules with other agencies and modes, including transit transfer cluster and transfer point information.	No
Intercity Transit Management Centers	Transit Management	Transit Center Security	Monitor transit vehicle operator or traveler activated alarms; authenticate transit vehicle operators; remotely disable a transit vehicle; alert operators, travelers, and police to potential incidents identified by these security features.	No
Intercity Transit Management Centers	Transit Management	Transit Data Collection	Collection and storage of transit management data. For use by operations personnel or data archives in the region.	No
Intercity Transit Management Centers	Transit Management	Transit Vehicle Operator Assignment	Assignment of transit operators to runs in a fair manner while minimizing labor and overtime services, considering operator preferences, qualifications, accumulated work hours, and other information about each operator.	No
Intermodal Freight Depots	Intermodal Freight Depot			No
Intersection Collision Warning Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Intersection Collision Warning Roadside Equipment	Roadway	Roadway Intersection Safety Warning	Field elements that determine the probability of a collision in an intersection or at a railroad crossing and inform approaching vehicles using short-range wireless communications to the vehicles and traffic signal controls.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
IRP Clearinghouse	Other CVAS			No
Lane Control Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No
Lane Control Roadside Equipment	Roadway	Roadway Dynamic Lane Management and Shoulder Use	Field elements including physical overhead lane signs and associated control electronics that are used to manage and control specific lanes, including temporary use of shoulders as travel lanes.	No
Lane Control Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Lane/Ramp Access Control Roadside Equipment	Roadway	Field Barrier System Control	Field elements that control barrier systems such as gates and other systems that manage entry to roadways, transportation facilities and infrastructure.	No
Lane/Ramp Access Control Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No
Lane/Ramp Access Control Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Lane/Ramp Access Control Roadside Equipment	Roadway	Roadway Reversible Lanes	Traffic sensors, surveillance, and automated reversible lane equipment and lane control signals to control traffic in reversible lanes.	No
Lane/Ramp Access Control Roadside Equipment	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).	No
Lane/Ramp Access Control Roadside Equipment	Roadway	Roadway Work Zone Traffic Control	Field elements in maintenance and construction areas including CCTV cameras, driver information systems (such as DMS), and gates/barriers that monitor and control traffic and provide information directly to drivers in affected areas.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Lift Bridge Traffic Control Central System	Traffic Management	TMC Multimodal Crossing Management	Remotely monitors and manages multimodal crossings, such as draw bridges and other crossings between highway traffic and other modes; does not include highway-rail intersection.	No
Lift Bridge Traffic Control Roadside Equipment	Roadway	Multimodal Crossing Control	Field elements to monitor and control traffic at multimodal crossings, such as draw bridges and other crossings between highway traffic and other modes; does not include highway-rail intersection.	No
Light Rail Operations Center	Emergency Management	Center Secure Area Alarm Support	Collection and response to silent and audible alarms received from travelers in secure areas (such as transit stops, rest areas, park-and-ride lots) and from on-board transit vehicles.	No
Light Rail Operations Center	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Light Rail Operations Center	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Light Rail Operations Center	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.	No
Light Rail Operations Center	Transit Management	Transit Center Connection Protection	Manages the coordination of transit transfers between routes, including routes on different modes. Also supports the capability for travelers to obtain connection protection throughout a trip.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Light Rail Operations Center	Transit Management	Transit Center Fixed-Route Operations	Management of fixed route transit operations. Planning, scheduling, and dispatch associated with fixed and flexible route transit services. Updates customer service operator systems, and provides current vehicle schedule adherence and optimum scenarios for schedule adjustment.	No
Light Rail Operations Center	Transit Management	Transit Center Security	Monitor transit vehicle operator or traveler activated alarms; authenticate transit vehicle operators; remotely disable a transit vehicle; alert operators, travelers, and police to potential incidents identified by these security features.	No
Light Rail Operations Center	Transit Management	Transit Garage Maintenance	Collect operational and maintenance data from transit vehicles, manage vehicle service histories, automatically generate preventative maintenance schedules, and provide information to service personnel.	No
Light Rail Operations Center	Transit Management	Transit Vehicle Assignment	Assigns individual transit vehicles to vehicle blocks and downloads this information to the transit vehicle, updating assignments as necessitated by changes. It also provides an inventory management function that stores attributes about each of the transit vehicles.	No
Light Rail Operations Center	Transit Management	Transit Vehicle Operator Assignment	Assignment of transit operators to runs in a fair manner while minimizing labor and overtime services, considering operator preferences, qualifications, accumulated work hours, and other information about each operator.	No
Local Agency Traveler Information Website	Information Service Provider	Basic Information Broadcast	Broadcast dissemination of traffic, transit, maintenance and construction, event, and weather information to traveler interface systems and vehicles.	No
Local Agency Traveler Information Website	Information Service Provider	ISP Traveler Data Collection	Collects traveler information from other centers, consolidates and refines the collected data, and makes this data available to traveler information applications.	No
Local TMCs	Other Traffic Management			No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Local TMCs	Traffic Management	Collect Traffic Surveillance	Management of traffic sensors and surveillance (CCTV) equipment, collection of current traffic conditions, and distribution of the collected information to other centers and operators.	No
Local TMCs	Traffic Management	TMC Incident Detection	Remotely monitors traffic sensor and surveillance systems to detect and verify incidents. Also monitors external advisory and incident reporting systems, intermodal freight depots, and border crossings for additional incident information. Identified incidents are reported to operations personnel and other centers.	No
Local TMCs	Traffic Management	TMC Incident Dispatch Coordination/Communication	Formulates an incident response that takes into account the incident potential, incident impacts, and/or resources required for incident management. Facilitates the dispatch of emergency response and service vehicles and coordinates the response with cooperating agencies.	No
Local TMCs	Traffic Management	TMC Multimodal Coordination	Provides traffic signal priority for transit vehicles based on center-to-center communications with the transit management center; also exchange traffic and transit information.	No
Local TMCs	Traffic Management	TMC Regional Traffic Management	Coordination between traffic management centers in order to share traffic information between centers as well as control of traffic management field equipment. This may be used during incidents and special events and during day-to-day operations.	No
Local TMCs	Traffic Management	TMC Signal Control	Remotely controls traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, emergency vehicle preemptions, pedestrian crossings, etc.	No
Local TMCs	Traffic Management	TMC Traffic Information Dissemination	Controls dissemination of traffic-related data to other centers, the media, and travelers via the driver information systems (DMS, HAR) that it operates.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Local TMCs	Traffic Management	TMC Traffic Metering	Remotely controls ramp meters, interchange connector meters, and mainline meters, covering all types of metering as well as management of bypass lanes.	No
Local TMCs	Traffic Management	Traffic Data Collection	Collection and storage of traffic management data. For use by operations personnel or data archives in the region.	No
Local TMCs	Traffic Management	Traffic Equipment Maintenance	Monitoring and remote diagnostics of field equipment - detect failures, issue problem reports, and track the repair or replacement of the failed equipment.	No
Local Transit Management Centers	Emergency Management	Center Secure Area Alarm Support	Collection and response to silent and audible alarms received from travelers in secure areas (such as transit stops, rest areas, park-and-ride lots) and from on-board transit vehicles.	No
Local Transit Management Centers	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Local Transit Management Centers	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Local Transit Management Centers	Emergency Management	Emergency Data Collection	Collection and storage of information related to Emergency Management. For use by operations personnel or data archives in the region.	No
Local Transit Management Centers	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Local Transit Management Centers	Other Transit Management			No
Local Transit Management Centers	Transit Management	Transit Center Connection Protection	Manages the coordination of transit transfers between routes, including routes on different modes. Also supports the capability for travelers to obtain connection protection throughout a trip.	No
Local Transit Management Centers	Transit Management	Transit Center Fare Management	Management of fare collection at the center - includes setting and distributing fare information, central processing of fares for transit as well as other ITS services, links to financial institutions and enforcement agencies.	No
Local Transit Management Centers	Transit Management	Transit Center Fixed-Route Operations	Management of fixed route transit operations. Planning, scheduling, and dispatch associated with fixed and flexible route transit services. Updates customer service operator systems, and provides current vehicle schedule adherence and optimum scenarios for schedule adjustment.	No
Local Transit Management Centers	Transit Management	Transit Center Information Services	Provide interactive traveler information to travelers (on-board transit vehicles, at stops/stations, using personal devices), traveler information service providers, media, and other transit organizations. Includes routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events.	No
Local Transit Management Centers	Transit Management	Transit Center Multi-Modal Coordination	Coordinate schedules with other agencies and modes, including transit transfer cluster and transfer point information.	No
Local Transit Management Centers	Transit Management	Transit Center Paratransit Operations	Management of demand response transit services, including paratransit. Planning and scheduling of these services. Supports automated vehicle dispatch and automatically updates customer service operator systems.	No
Local Transit Management Centers	Transit Management	Transit Center Passenger Counting	Receives and processes transit vehicle loading data using two-way communications from equipped transit vehicles.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Local Transit Management Centers	Transit Management	Transit Center Security	Monitor transit vehicle operator or traveler activated alarms; authenticate transit vehicle operators; remotely disable a transit vehicle; alert operators, travelers, and police to potential incidents identified by these security features.	No
Local Transit Management Centers	Transit Management	Transit Center Signal Priority	Manage transit signal priority, monitoring schedule performance and generating requests for transit priority on routes and at certain intersections.	No
Local Transit Management Centers	Transit Management	Transit Center Vehicle Tracking	Monitoring transit vehicle locations via interactions with on-board systems. Furnish users with real-time transit schedule information and maintain interface with digital map providers.	No
Local Transit Management Centers	Transit Management	Transit Data Collection	Collection and storage of transit management data. For use by operations personnel or data archives in the region.	No
Local Transit Management Centers	Transit Management	Transit Garage Maintenance	Collect operational and maintenance data from transit vehicles, manage vehicle service histories, automatically generate preventative maintenance schedules, and provide information to service personnel.	No
Local Transit Management Centers	Transit Management	Transit Vehicle Assignment	Assigns individual transit vehicles to vehicle blocks and downloads this information to the transit vehicle, updating assignments as necessitated by changes. It also provides an inventory management function that stores attributes about each of the transit vehicles.	No
Local Transit Management Centers	Transit Management	Transit Vehicle Operator Assignment	Assignment of transit operators to runs in a fair manner while minimizing labor and overtime services, considering operator preferences, qualifications, accumulated work hours, and other information about each operator.	No
Maintenance and Construction Field Personnel	Maintenance and Construction Field Personnel			No
Maintenance and Construction Management Center	Archived Data User Systems			No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Automated Treatment System Control	Remotely controls automated roadway treatment systems (to disperse anti-icing chemicals, etc.) directly, or via control of the environmental sensors that activate the treatment systems automatically in the field.	No
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Data Collection	Collection and storage of maintenance and construction information. For use by operations personnel or data archives in the region.	No
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Environmental Information Processing	Processes current and forecast weather data, road condition information, local environmental data, and uses internal models to develop specialized detailed forecasts of local weather and surface conditions. Disseminates road weather information to other agencies and centers.	No
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Incident Management	Supports coordinated response to incidents - share incident notifications, manage incident response resources, and coordinate overall incident situation and response among allied response organizations.	No
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Infrastructure Monitoring	Remotely monitors the condition of pavement, bridges, tunnels, associated hardware, and other transportation-related infrastructure (e.g., culverts) using vehicle-based and roadway-based infrastructure monitoring sensors.	No
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Maintenance Decision Support	Maintenance Decision Support Systems recommend courses of action based on current and forecast environmental and road conditions (filtered and fused for specific time horizons) and additional application specific information. Recommendations and dispatch instructions are generated based on this integrated information.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Roadway Maintenance and Construction	Overall management and support for routine maintenance on the roadway or right-of-way. Includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment.	No
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Speed Monitoring and Warning	Remotely monitors vehicle speeds, and informs an enforcement agency if excessive speeds are detected; primarily used in work zones.	No
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Vehicle Tracking	Remotely tracks the location of maintenance and construction vehicles and other equipment; presented to the center personnel.	No
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Winter Maintenance Management	Manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying and other material applications) based on weather information.	No
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Work Activity Coordination	Disseminates work activity schedules and current asset restrictions to other agencies. Work schedules are coordinated, factoring in the needs and activities of other agencies and adjacent jurisdictions.	No
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Work Zone Management	Remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), highway advisory radio, gates and barriers, and informing other groups of activity (e.g., traveler information systems, traffic management centers, other maintenance and construction centers).	No
Maintenance and Construction Management Center	Maintenance and Construction Management	MCM Work Zone Safety Management	Remotely monitors work zone safety systems that detect vehicle intrusions in work zones and warns crew workers and drivers of imminent encroachment. Crew movements are also monitored so that the crew can be warned of movement beyond the designated safe zone.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Maintenance and Construction Management Center	Traffic Management	TMC Environmental Monitoring	Management of environmental sensors and assimilation of collected data with other current and forecast road conditions and surface weather information from weather service providers and roadway maintenance operations.	No
Maintenance and Construction Management Center	Traffic Management	TMC Evacuation Support	Development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. Interfaces with emergency management and other traffic management centers.	No
Maintenance and Construction Management Center	Traffic Management	TMC Incident Detection	Remotely monitors traffic sensor and surveillance systems to detect and verify incidents. Also monitors external advisory and incident reporting systems, intermodal freight depots, and border crossings for additional incident information. Identified incidents are reported to operations personnel and other centers.	No
Maintenance and Construction Management Center	Traffic Management	TMC Incident Dispatch Coordination/Communication	Formulates an incident response that takes into account the incident potential, incident impacts, and/or resources required for incident management. Facilitates the dispatch of emergency response and service vehicles and coordinates the response with cooperating agencies.	No
Maintenance and Construction Management Center	Traffic Management	TMC Speed Monitoring and Warning	Remotely monitors vehicle speeds, and informs an enforcement agency if excessive speeds are detected. Also configures and controls speed warning systems that provide safe speed advisories to the motorist.	No
Maintenance and Construction Management Center	Traffic Management	TMC Traffic Information Dissemination	Controls dissemination of traffic-related data to other centers, the media, and travelers via the driver information systems (DMS, HAR) that it operates.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Maintenance and Construction Management Center	Traffic Management	TMC Work Zone Traffic Management	Coordination with maintenance systems using work zone images and traveler information systems (such as DMS), and distribution of work plans so that work zones are established that have minimum traffic impact.	No
Maintenance and Construction Management Center	Traffic Management	Traffic Data Collection	Collection and storage of traffic management data. For use by operations personnel or data archives in the region.	No
Maintenance and Construction Management Center	Traffic Management	Traffic Equipment Maintenance	Monitoring and remote diagnostics of field equipment - detect failures, issue problem reports, and track the repair or replacement of the failed equipment.	No
Maintenance and Construction Vehicle Equipment	Maintenance and Construction Vehicle	MCV Barrier System Control	Control automatic or remotely controlled gates and other barrier systems from a maintenance and construction vehicle.	No
Maintenance and Construction Vehicle Equipment	Maintenance and Construction Vehicle	MCV Environmental Monitoring	On-board systems that collect environmental and road condition data (including road surface or air temperature, wind speed, and road traction information - spatially located and time stamped) from sensors on-board the maintenance vehicle or located at the roadway.	No
Maintenance and Construction Vehicle Equipment	Maintenance and Construction Vehicle	MCV Roadway Maintenance and Construction	On-board systems that support routine non-winter maintenance on the roadway or right-of-way. Includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of equipment on the roadway.	No
Maintenance and Construction Vehicle Equipment	Maintenance and Construction Vehicle	MCV Vehicle Location Tracking	On-board systems to track vehicle location and reports the position and timestamp information to the dispatch center.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Maintenance and Construction Vehicle Equipment	Maintenance and Construction Vehicle	MCV Vehicle Safety Monitoring	On-board systems to detect vehicle intrusions and warn crew workers and drivers of imminent encroachment. Crew movements are monitored so that the crew can be warned of movement beyond the designated safe zone. Used for stationary work zones or in mobile applications where a safe zone is maintained around the moving vehicle.	No
Maintenance and Construction Vehicle Equipment	Maintenance and Construction Vehicle	MCV Winter Maintenance	On-board systems that support snow plow operations and other roadway treatments (e.g., salt spraying and other material applications). Supports information sharing between snow plows.	No
Maintenance and Construction Vehicle Equipment	Maintenance and Construction Vehicle	MCV Work Zone Support	On-board systems that provide communications and support for local management of a work zone.	No
Maintenance Decision Support System	Maintenance and Construction Management	MCM Maintenance Decision Support	Maintenance Decision Support Systems recommend courses of action based on current and forecast environmental and road conditions (filtered and fused for specific time horizons) and additional application specific information. Recommendations and dispatch instructions are generated based on this integrated information.	No
Maintenance Decision Support System	Maintenance and Construction Management	MCM Winter Maintenance Management	Manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying and other material applications) based on weather information.	No
Mayday System	Emergency Management	Center Secure Area Alarm Support	Collection and response to silent and audible alarms received from travelers in secure areas (such as transit stops, rest areas, park-and-ride lots) and from on-board transit vehicles.	No
Mayday System	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Mayday System	Emergency Management	Mayday Support	Collection and response to Mayday messages received from vehicles and drivers.	No
Mayday System Vehicle Equipment	Vehicle	Vehicle Location Determination	Receives current location of the vehicle from GPS or other positioning technology and provides this information to other in-vehicle functions.	No
Mayday System Vehicle Equipment	Vehicle	Vehicle Mayday I/F	In-vehicle capability for drivers or collision detection sensors onboard a vehicle to report an emergency and summon assistance.	No
MCMIS	Other CVAS			No
Media Information Release System	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.	No
Media Information Release System	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.	No
Media Information Release System	Archived Data Management	Traffic and Roadside Data Archival	Collects and archives traffic and environmental information directly from the roadside for use in off-line planning, research, and analysis.	No
Media Outlets	Media			No
Metro Area Transit Management Centers	Emergency Management	Center Secure Area Alarm Support	Collection and response to silent and audible alarms received from travelers in secure areas (such as transit stops, rest areas, park-and-ride lots) and from on-board transit vehicles.	No
Metro Area Transit Management Centers	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Metro Area Transit Management Centers	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Metro Area Transit Management Centers	Emergency Management	Emergency Data Collection	Collection and storage of information related to Emergency Management. For use by operations personnel or data archives in the region.	No
Metro Area Transit Management Centers	Emergency Management	Emergency Early Warning System	Monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies in order to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other ITS centers to notify the traveling public.	No
Metro Area Transit Management Centers	Emergency Management	Emergency Environmental Monitoring	Collects current and forecast road and weather information that is used by the operator to more effectively manage incidents.	No
Metro Area Transit Management Centers	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.	No
Metro Area Transit Management Centers	Emergency Management	Incident Command	Tactical decision support, resource coordination, and communications integration among emergency management agencies for Incident Commands that are established by first responders to support local management of an incident.	No
Metro Area Transit Management Centers	Transit Management	Transit Center Connection Protection	Manages the coordination of transit transfers between routes, including routes on different modes. Also supports the capability for travelers to obtain connection protection throughout a trip.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Metro Area Transit Management Centers	Transit Management	Transit Center Fare Management	Management of fare collection at the center - includes setting and distributing fare information, central processing of fares for transit as well as other ITS services, links to financial institutions and enforcement agencies.	No
Metro Area Transit Management Centers	Transit Management	Transit Center Fixed-Route Operations	Management of fixed route transit operations. Planning, scheduling, and dispatch associated with fixed and flexible route transit services. Updates customer service operator systems, and provides current vehicle schedule adherence and optimum scenarios for schedule adjustment.	No
Metro Area Transit Management Centers	Transit Management	Transit Center Information Services	Provide interactive traveler information to travelers (on-board transit vehicles, at stops/stations, using personal devices), traveler information service providers, media, and other transit organizations. Includes routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events.	No
Metro Area Transit Management Centers	Transit Management	Transit Center Multi-Modal Coordination	Coordinate schedules with other agencies and modes, including transit transfer cluster and transfer point information.	No
Metro Area Transit Management Centers	Transit Management	Transit Center Paratransit Operations	Management of demand response transit services, including paratransit. Planning and scheduling of these services. Supports automated vehicle dispatch and automatically updates customer service operator systems.	No
Metro Area Transit Management Centers	Transit Management	Transit Center Passenger Counting	Receives and processes transit vehicle loading data using two-way communications from equipped transit vehicles.	No
Metro Area Transit Management Centers	Transit Management	Transit Center Security	Monitor transit vehicle operator or traveler activated alarms; authenticate transit vehicle operators; remotely disable a transit vehicle; alert operators, travelers, and police to potential incidents identified by these security features.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Metro Area Transit Management Centers	Transit Management	Transit Center Signal Priority	Manage transit signal priority, monitoring schedule performance and generating requests for transit priority on routes and at certain intersections.	No
Metro Area Transit Management Centers	Transit Management	Transit Center Vehicle Tracking	Monitoring transit vehicle locations via interactions with on-board systems. Furnish users with real-time transit schedule information and maintain interface with digital map providers.	No
Metro Area Transit Management Centers	Transit Management	Transit Data Collection	Collection and storage of transit management data. For use by operations personnel or data archives in the region.	No
Metro Area Transit Management Centers	Transit Management	Transit Garage Maintenance	Collect operational and maintenance data from transit vehicles, manage vehicle service histories, automatically generate preventative maintenance schedules, and provide information to service personnel.	No
Metro Area Transit Management Centers	Transit Management	Transit Vehicle Assignment	Assigns individual transit vehicles to vehicle blocks and downloads this information to the transit vehicle, updating assignments as necessitated by changes. It also provides an inventory management function that stores attributes about each of the transit vehicles.	No
Metro Area Transit Management Centers	Transit Management	Transit Vehicle Operator Assignment	Assignment of transit operators to runs in a fair manner while minimizing labor and overtime services, considering operator preferences, qualifications, accumulated work hours, and other information about each operator.	No
Minneapolis TMC	Archived Data User Systems			No
Minneapolis TMC	Other Traffic Management			No
Minneapolis TMC	Traffic Management	Collect Traffic Surveillance	Management of traffic sensors and surveillance (CCTV) equipment, collection of current traffic conditions, and distribution of the collected information to other centers and operators.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Minneapolis TMC	Traffic Management	TMC Incident Detection	Remotely monitors traffic sensor and surveillance systems to detect and verify incidents. Also monitors external advisory and incident reporting systems, intermodal freight depots, and border crossings for additional incident information. Identified incidents are reported to operations personnel and other centers.	No
Minneapolis TMC	Traffic Management	TMC Incident Dispatch Coordination/Communication	Formulates an incident response that takes into account the incident potential, incident impacts, and/or resources required for incident management. Facilitates the dispatch of emergency response and service vehicles and coordinates the response with cooperating agencies.	No
Minneapolis TMC	Traffic Management	TMC Multimodal Coordination	Provides traffic signal priority for transit vehicles based on center-to-center communications with the transit management center; also exchange traffic and transit information.	No
Minneapolis TMC	Traffic Management	TMC Regional Traffic Management	Coordination between traffic management centers in order to share traffic information between centers as well as control of traffic management field equipment. This may be used during incidents and special events and during day-to-day operations.	No
Minneapolis TMC	Traffic Management	TMC Signal Control	Remotely controls traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, emergency vehicle preemptions, pedestrian crossings, etc.	No
Minneapolis TMC	Traffic Management	TMC Speed Monitoring and Warning	Remotely monitors vehicle speeds, and informs an enforcement agency if excessive speeds are detected. Also configures and controls speed warning systems that provide safe speed advisories to the motorist.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Minneapolis TMC	Traffic Management	TMC Traffic Information Dissemination	Controls dissemination of traffic-related data to other centers, the media, and travelers via the driver information systems (DMS, HAR) that it operates.	No
Minneapolis TMC	Traffic Management	TMC Traffic Metering	Remotely controls ramp meters, interchange connector meters, and mainline meters, covering all types of metering as well as management of bypass lanes.	No
Minneapolis TMC	Traffic Management	Traffic Equipment Maintenance	Monitoring and remote diagnostics of field equipment - detect failures, issue problem reports, and track the repair or replacement of the failed equipment.	No
Minnesota CVIEW	Commercial Vehicle Administration	Credentials and Taxes Administration	Manage electronic filing of credentials, tax filing, and driver licensing for commercial vehicle operators. Provides commercial vehicle (including HAZMAT) route restrictions.	No
Minnesota CVIEW	Commercial Vehicle Administration	CV Information Exchange	Exchange information concerning safety, credentialing, and operations of commercial vehicles between the center and the roadside check stations, across jurisdictions, with fleet operators and other information requestors.	No
Minnesota CVIEW	Commercial Vehicle Administration	CV Safety and Security Administration	Provides commercial vehicle safety and security criteria to roadside check facilities, collects and reviews safety and security data from the field, conducts wireless roadside inspections, and distributes safety and security information to other centers, carriers, and enforcement agencies.	No
Minnesota CVO Online	Commercial Vehicle Administration	Credentials and Taxes Administration	Manage electronic filing of credentials, tax filing, and driver licensing for commercial vehicle operators. Provides commercial vehicle (including HAZMAT) route restrictions.	No
Minnesota CVO Online	Commercial Vehicle Administration	CV Information Exchange	Exchange information concerning safety, credentialing, and operations of commercial vehicles between the center and the roadside check stations, across jurisdictions, with fleet operators and other information requestors.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Minnesota Emergency Alert System	Alerting and Advisory Systems			No
Minnesota Emergency Responder Database	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.	No
Minnesota Emergency Responder Database	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.	No
Minnesota Emergency Responder Database	Archived Data Management	On-Line Analysis and Mining	Advanced data analysis and mining features to support discovery of information, patterns, and correlations in large ITS archives.	No
Minnesota Emergency Responder Database	Archived Data Management	Traffic and Roadside Data Archival	Collects and archives traffic and environmental information directly from the roadside for use in off-line planning, research, and analysis.	No
Minnesota State Emergency Operations Center (SEOC)	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Minnesota State Emergency Operations Center (SEOC)	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Minnesota State Emergency Operations Center (SEOC)	Emergency Management	Emergency Commercial Vehicle Response	Responds to commercial vehicle and freight equipment related emergencies. Includes incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Minnesota State Emergency Operations Center (SEOC)	Emergency Management	Emergency Data Collection	Collection and storage of information related to Emergency Management. For use by operations personnel or data archives in the region.	No
Minnesota State Emergency Operations Center (SEOC)	Emergency Management	Emergency Early Warning System	Monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies in order to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other ITS centers to notify the traveling public.	No
Minnesota State Emergency Operations Center (SEOC)	Emergency Management	Emergency Environmental Monitoring	Collects current and forecast road and weather information that is used by the operator to more effectively manage incidents.	No
Minnesota State Emergency Operations Center (SEOC)	Emergency Management	Emergency Evacuation Support	Evacuation planning and coordination to manage evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety.	No
Minnesota State Emergency Operations Center (SEOC)	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.	No
Minnesota State Emergency Operations Center (SEOC)	Emergency Management	Incident Command	Tactical decision support, resource coordination, and communications integration among emergency management agencies for Incident Commands that are established by first responders to support local management of an incident.	No
Minnesota State Emergency Operations Center (SEOC)	Emergency Management	Mayday Support	Collection and response to Mayday messages received from vehicles and drivers.	No
Minnesota State Emergency Operations Center (SEOC)	Other Emergency Management			No
Minnesota State Patrol Databases	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Minnesota State Patrol Databases	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.	No
Minnesota State Patrol Databases	Archived Data Management	On-Line Analysis and Mining	Advanced data analysis and mining features to support discovery of information, patterns, and correlations in large ITS archives.	No
Minnesota State Patrol Databases	Archived Data Management	Traffic and Roadside Data Archival	Collects and archives traffic and environmental information directly from the roadside for use in off-line planning, research, and analysis.	No
Minnesota State Patrol District Office	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Minnesota State Patrol District Office	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
Minnesota State Patrol District Office	Emergency Management	Emergency Call-Taking	Provides interface to the emergency call-taking systems such as the Emergency Telecommunications System (e.g., 911) that correlate call information with emergencies reported by transit agencies, commercial vehicle operators, or other public safety agencies. Allows the operator to verify the incident and forward the information to the responding agencies.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Minnesota State Patrol District Office	Emergency Management	Emergency Commercial Vehicle Response	Responds to commercial vehicle and freight equipment related emergencies. Includes incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat.	No
Minnesota State Patrol District Office	Emergency Management	Emergency Data Collection	Collection and storage of information related to Emergency Management. For use by operations personnel or data archives in the region.	No
Minnesota State Patrol District Office	Emergency Management	Emergency Dispatch	Dispatch emergency vehicles to incidents, tracking their location and status. Pertinent incident information is gathered and relayed to the responding units.	No
Minnesota State Patrol District Office	Emergency Management	Emergency Early Warning System	Monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies in order to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other ITS centers to notify the traveling public.	No
Minnesota State Patrol District Office	Emergency Management	Emergency Environmental Monitoring	Collects current and forecast road and weather information that is used by the operator to more effectively manage incidents.	No
Minnesota State Patrol District Office	Emergency Management	Emergency Evacuation Support	Evacuation planning and coordination to manage evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety.	No
Minnesota State Patrol District Office	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.	No
Minnesota State Patrol District Office	Emergency Management	Emergency Transportation Operations Data Collection	Collects real-time information on the state of the regional transportation system for operational use by the center. It establishes communications with a regional repository, requests or subscribes to information relevant to the center, and distributes the received information for use.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Minnesota State Patrol District Office	Emergency Management	Incident Command	Tactical decision support, resource coordination, and communications integration among emergency management agencies for Incident Commands that are established by first responders to support local management of an incident.	No
Minnesota State Patrol District Office	Emergency Management	Mayday Support	Collection and response to Mayday messages received from vehicles and drivers.	No
Minnesota State Patrol District Office	Enforcement Agency			No
Minnesota State Patrol District Office	Traffic Management	Collect Traffic Surveillance	Management of traffic sensors and surveillance (CCTV) equipment, collection of current traffic conditions, and distribution of the collected information to other centers and operators.	No
Minnesota State Patrol District Office	Traffic Management	TMC Evacuation Support	Development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. Interfaces with emergency management and other traffic management centers.	No
Minnesota State Patrol District Office	Traffic Management	TMC HOV Lane Management	Remotely controls HOV lane sensors, HOV lane usage signals, and ramp meters to manage use of HOV or HOT lanes; also detect HOV violators and notifies enforcement agencies.	No
Minnesota State Patrol District Office	Traffic Management	TMC Incident Detection	Remotely monitors traffic sensor and surveillance systems to detect and verify incidents. Also monitors external advisory and incident reporting systems, intermodal freight depots, and border crossings for additional incident information. Identified incidents are reported to operations personnel and other centers.	No
Minnesota State Patrol District Office	Traffic Management	TMC Incident Dispatch Coordination/Communication	Formulates an incident response that takes into account the incident potential, incident impacts, and/or resources required for incident management. Facilitates the dispatch of emergency response and service vehicles and coordinates the response with cooperating agencies.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Minnesota State Patrol District Office	Traffic Management	TMC Speed Monitoring and Warning	Remotely monitors vehicle speeds, and informs an enforcement agency if excessive speeds are detected. Also configures and controls speed warning systems that provide safe speed advisories to the motorist.	No
Minnesota State Patrol District Office	Traffic Management	TMC Traffic Information Dissemination	Controls dissemination of traffic-related data to other centers, the media, and travelers via the driver information systems (DMS, HAR) that it operates.	No
Minnesota State Patrol District Office	Traffic Management	TMC Transportation Operations Data Collection	Collects real-time information on the state of the regional transportation system for operational use by the center. It establishes communications with a regional repository, requests or subscribes to information relevant to the center, and distributes the received information for use.	No
Minnesota State Patrol District Office	Traffic Management	Traffic Data Collection	Collection and storage of traffic management data. For use by operations personnel or data archives in the region.	No
MnPASS Roadside Equipment	Other Roadway			No
MnPASS Roadside Equipment	Roadway Payment	Toll Plaza Toll Collection	Roadside collection of tolls from vehicle toll tags and violation identification.	No
MnPASS Service Center	Payment Administration	Toll Administration	Management of toll collection for private and commercial vehicles, dynamic pricing, payment reconciliation with financial institutions, and violation notification to enforcement agencies.	No
MnPASS Vehicle Equipment	Vehicle	Vehicle Toll/Parking Interface	On-board systems to support paying toll without stopping and pay for parking without the use of cash through the use of an active tag interface and debit/credit card interface.	No
Motor Carrier Registration System	DMV			No
Motor Carrier Registration System	Other CVAS			No
National Weather Service	Weather Service			No
Neighboring State CARS / Roadway Information Systems	Other ISP			No
Neighboring State Emergency Management Agencies	Other Emergency Management			No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Neighboring State Traffic Management Centers	Other Traffic Management			No
Neighboring State Traffic Management Centers	Traffic Management	TMC Incident Detection	Remotely monitors traffic sensor and surveillance systems to detect and verify incidents. Also monitors external advisory and incident reporting systems, intermodal freight depots, and border crossings for additional incident information. Identified incidents are reported to operations personnel and other centers.	No
Neighboring State Traffic Management Centers	Traffic Management	TMC Incident Dispatch Coordination/Communication	Formulates an incident response that takes into account the incident potential, incident impacts, and/or resources required for incident management. Facilitates the dispatch of emergency response and service vehicles and coordinates the response with cooperating agencies.	No
Neighboring State Traffic Management Centers	Traffic Management	TMC Regional Traffic Management	Coordination between traffic management centers in order to share traffic information between centers as well as control of traffic management field equipment. This may be used during incidents and special events and during day-to-day operations.	No
Neighboring State Traffic Management Centers	Traffic Management	TMC Signal Control	Remotely controls traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, emergency vehicle preemptions, pedestrian crossings, etc.	No
Neighboring State Traffic Management Centers	Traffic Management	TMC Traffic Metering	Remotely controls ramp meters, interchange connector meters, and mainline meters, covering all types of metering as well as management of bypass lanes.	No
Neighboring State Traffic Management Centers Roadside Equipment	Other Roadway			No
Neighboring State Traffic Management Centers Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Neighboring State Traffic Management Centers Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Neighboring State Traffic Management Centers Roadside Equipment	Roadway	Roadway Incident Detection	Field elements that monitor traffic conditions to identify incidents. It includes traffic detectors that collect traffic flow information and identify unusual traffic conditions and advanced CCTV cameras with built-in incident detection algorithms.	No
Neighboring State Traffic Management Centers Roadside Equipment	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).	No
North/West Passage Corridor Traveler Information Website	Information Service Provider	Basic Information Broadcast	Broadcast dissemination of traffic, transit, maintenance and construction, event, and weather information to traveler interface systems and vehicles.	No
North/West Passage Corridor Traveler Information Website	Information Service Provider	ISP Traveler Data Collection	Collects traveler information from other centers, consolidates and refines the collected data, and makes this data available to traveler information applications.	No
Oversize Warning Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Oversize Warning Roadside Equipment	Roadway	Roadway Speed Monitoring and Warning	Vehicle speed sensors that detect excessive vehicle speeds, optionally based on conditions and vehicle type, informing drivers, centers and/or enforcement agencies of speed violations.	No
Park-and-Ride Parking Information System Roadside Equipment	Parking Management	Parking Electronic Payment	Parking payment collection using in-vehicle equipment (tags) or contact or proximity traveler cards used for electronic payment. Includes field elements and back-office functionality.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Park-and-Ride Parking Information System Roadside Equipment	Parking Management	Parking Management	Monitor vehicles and current parking availability within parking facilities. Use driver information systems (e.g., DMS) to provide parking availability and other parking facility information to drivers. Support local traffic control coordination around the parking facility.	No
Parking Management Roadside Equipment	Parking Management	Parking Electronic Payment	Parking payment collection using in-vehicle equipment (tags) or contact or proximity traveler cards used for electronic payment. Includes field elements and back-office functionality.	No
Parking Management Roadside Equipment	Parking Management	Parking Management	Monitor vehicles and current parking availability within parking facilities. Use driver information systems (e.g., DMS) to provide parking availability and other parking facility information to drivers. Support local traffic control coordination around the parking facility.	No
Parking Management System	Parking Management	Parking Electronic Payment	Parking payment collection using in-vehicle equipment (tags) or contact or proximity traveler cards used for electronic payment. Includes field elements and back-office functionality.	No
Parking Management System	Parking Management	Parking Management	Monitor vehicles and current parking availability within parking facilities. Use driver information systems (e.g., DMS) to provide parking availability and other parking facility information to drivers. Support local traffic control coordination around the parking facility.	No
Parking Operator	Parking Operator			No
PRISM	Other CVAS			No
Private Fleet and Freight Management Center	Fleet and Freight Management	Commercial Vehicle and Freight Security	Coordinated response for commercial vehicle and freight security incidents. Remote monitoring of commercial vehicle driver and freight equipment to vehicle assignments as well as detection of breaches or tampering.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Private Fleet and Freight Management Center	Fleet and Freight Management	Fleet Administration	Commercial vehicle fleet tracking, dispatch, and reporting - includes interfaces to state/federal commercial vehicle administration, toll administration, emergency management, and traveler information service providers. Supports pre-hiring checks and performance monitoring for drivers.	No
Private Fleet and Freight Management Center	Fleet and Freight Management	Fleet Credentials and Taxes Management and Reporting	Commercial vehicle fleet support systems for the purchase and filing of electronic credentials, status reporting, tax audit data, and compliance reviews. Electronic interfaces with the appropriate state or federal commercial vehicle administration centers.	No
Private Fleet and Freight Management Center	Fleet and Freight Management	Fleet HAZMAT Management	Notification of hazardous materials (HAZMAT) shipments to emergency management centers for commercial vehicles managed by the center - includes information on the nature of the cargo, the vehicle, and its expected route.	No
Private Fleet and Freight Management Center	Fleet and Freight Management	Fleet Maintenance Management	Commercial vehicle fleet tracking and monitoring of on-board data sent to the center to support scheduling of maintenance and repair activities.	No
Private Fleet and Freight Management Center	Fleet and Freight Management	Freight Administration and Management	Management of the movement of cargo from source to destination via links to intermodal freight shippers, government agencies, and depots as well as links out to the freight equipment.	No
Private Information Service Providers	Information Service Provider	Infrastructure Provided Trip Planning	Generation of pre-trip and enroute trip plans for travelers (and vehicles) based on current traffic conditions, work zones, weather, and travelers constraints and preferences. Includes end-to-end trips using multiple modes, such as bicycle, transit, etc.	No
Private Information Service Providers	Information Service Provider	ISP Traveler Data Collection	Collects traveler information from other centers, consolidates and refines the collected data, and makes this data available to traveler information applications.	No
Queue Detection Roadside Equipment	Other Roadway			No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Queue Detection Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No
Queue Detection Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Queue Detection Roadside Equipment	Roadway	Roadway Warning	Field elements used to warn drivers approaching hazards including adverse road weather conditions, traffic conditions including queues, and obstacles or animals in the road.	No
Railroad Active Warning Roadside Equipment	Roadway	Standard Rail Crossing	Field elements at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Includes traditional HRI warning systems augmented with other standard traffic management devices.	No
Railroad Wayside Equipment	Wayside Equipment			No
Ramp Meter Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No
Ramp Meter Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Ramp Meter Roadside Equipment	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).	No
Ramp Meter Roadside Equipment	Roadway	Roadway Traffic Metering	Control equipment including ramp, interchange, and mainline meters and the dynamic message signs that provide information about the meters and any special bypass lanes.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Real-Time Bus Arrival Time Display Roadside Equipment	Remote Traveler Support	Remote Transit Information Services	Public traveler interface that provides real-time travel-related information at transit stops and multi-modal transfer points, including general annunciation, display of imminent arrival information, the latest available information on transit routes, schedules, transfer options, available services, fares, and real-time schedule adherence.	No
Real-Time Transit Travel Time Notification	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Real-Time Transit Travel Time Notification	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).	No
Red Light Monitoring/Enforcement Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Red Light Monitoring/Enforcement Roadside Equipment	Roadway	Roadway Speed Monitoring and Warning	Vehicle speed sensors that detect excessive vehicle speeds, optionally based on conditions and vehicle type, informing drivers, centers and/or enforcement agencies of speed violations.	No
Research Lab Network Surveillance Archive	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.	No
Research Lab Network Surveillance Archive	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.	No
Research Lab Network Surveillance Archive	Archived Data Management	Traffic and Roadside Data Archival	Collects and archives traffic and environmental information directly from the roadside for use in off-line planning, research, and analysis.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Research Lab Network Surveillance Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No
Research Lab Network Surveillance Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Research Lab New Surveillance Control System	Traffic Management	Collect Traffic Surveillance	Management of traffic sensors and surveillance (CCTV) equipment, collection of current traffic conditions, and distribution of the collected information to other centers and operators.	No
Research Lab New Surveillance Control System	Traffic Management	Traffic Data Collection	Collection and storage of traffic management data. For use by operations personnel or data archives in the region.	No
Research Lab New Surveillance Control System	Traffic Management	Traffic Equipment Maintenance	Monitoring and remote diagnostics of field equipment - detect failures, issue problem reports, and track the repair or replacement of the failed equipment.	No
Rest Area Wi-Fi	Information Service Provider	Basic Information Broadcast	Broadcast dissemination of traffic, transit, maintenance and construction, event, and weather information to traveler interface systems and vehicles.	No
Rest Area Wi-Fi	Information Service Provider	ISP Emergency Traveler Information	Distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.	No
Rest Area Wi-Fi	Information Service Provider	ISP Traveler Data Collection	Collects traveler information from other centers, consolidates and refines the collected data, and makes this data available to traveler information applications.	No
Rest Area Wi-Fi	Information Service Provider	Traveler Telephone Information	Distribution of traveler information and wide-area alerts to traveler telephone information systems such as 511, based on voice-based traveler requests.	No
Roadway Automated Treatment System	Roadway	Roadway Automated Treatment	Field elements that activate automated roadway treatment systems (to disperse anti-icing chemicals, etc.) based on environmental or atmospheric conditions, or under center control.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Roadway Automated Treatment System	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Roadway Automated Treatment System	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).	No
Roadway Environment	Roadway Environment			No
Roadway Flooding Warning Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No
Roadway Flooding Warning Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Roadway Flooding Warning Roadside Equipment	Roadway	Roadway Incident Detection	Field elements that monitor traffic conditions to identify incidents. It includes traffic detectors that collect traffic flow information and identify unusual traffic conditions and advanced CCTV cameras with built-in incident detection algorithms.	No
Roadway Flooding Warning Roadside Equipment	Roadway	Roadway Warning	Field elements used to warn drivers approaching hazards including adverse road weather conditions, traffic conditions including queues, and obstacles or animals in the road.	No
Roadway Lighting Management Central Monitoring Equipment	Traffic Management	TMC Lighting System Control	Provides remote monitoring and control of electrical lighting systems. It implements control plans for lighting systems that may be activated by time-of-day plans or by activating changes to the lighting based on traffic or incidents.	No
Roadway Lighting Management Roadside Equipment	Roadway	Roadside Lighting System Control	Field equipment that controls lighting systems for transportation facilities including lighting device monitoring and control based on local conditions, timing plans, or remote center control.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
RTMC	Archived Data User Systems			No
RTMC	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
RTMC	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
RTMC	Emergency Management	Emergency Call-Taking	Provides interface to the emergency call-taking systems such as the Emergency Telecommunications System (e.g., 911) that correlate call information with emergencies reported by transit agencies, commercial vehicle operators, or other public safety agencies. Allows the operator to verify the incident and forward the information to the responding agencies.	No
RTMC	Emergency Management	Emergency Data Collection	Collection and storage of information related to Emergency Management. For use by operations personnel or data archives in the region.	No
RTMC	Emergency Management	Emergency Dispatch	Dispatch emergency vehicles to incidents, tracking their location and status. Pertinent incident information is gathered and relayed to the responding units.	No
RTMC	Emergency Management	Emergency Early Warning System	Monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies in order to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other ITS centers to notify the traveling public.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
RTMC	Emergency Management	Emergency Environmental Monitoring	Collects current and forecast road and weather information that is used by the operator to more effectively manage incidents.	No
RTMC	Emergency Management	Emergency Evacuation Support	Evacuation planning and coordination to manage evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety.	No
RTMC	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.	No
RTMC	Emergency Management	Emergency Routing	Routing of emergency vehicles to facilitate the quickest/safest arrival. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by Traffic Management on request.	No
RTMC	Emergency Management	Emergency Transportation Operations Data Collection	Collects real-time information on the state of the regional transportation system for operational use by the center. It establishes communications with a regional repository, requests or subscribes to information relevant to the center, and distributes the received information for use.	No
RTMC	Emergency Management	Incident Command	Tactical decision support, resource coordination, and communications integration among emergency management agencies for Incident Commands that are established by first responders to support local management of an incident.	No
RTMC	Emergency Management	Service Patrol Management	Dispatch and communication with roadway service patrol vehicles that monitor roads to aid motorists, offering rapid response to minor incidents.	No
RTMC	Maintenance and Construction Management	MCM Automated Treatment System Control	Remotely controls automated roadway treatment systems (to disperse anti-icing chemicals, etc.) directly, or via control of the environmental sensors that activate the treatment systems automatically in the field.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
RTMC	Maintenance and Construction Management	MCM Data Collection	Collection and storage of maintenance and construction information. For use by operations personnel or data archives in the region.	No
RTMC	Maintenance and Construction Management	MCM Environmental Information Processing	Processes current and forecast weather data, road condition information, local environmental data, and uses internal models to develop specialized detailed forecasts of local weather and surface conditions. Disseminates road weather information to other agencies and centers.	No
RTMC	Maintenance and Construction Management	MCM Incident Management	Supports coordinated response to incidents - share incident notifications, manage incident response resources, and coordinate overall incident situation and response among allied response organizations.	No
RTMC	Maintenance and Construction Management	MCM Infrastructure Monitoring	Remotely monitors the condition of pavement, bridges, tunnels, associated hardware, and other transportation-related infrastructure (e.g., culverts) using vehicle-based and roadway-based infrastructure monitoring sensors.	No
RTMC	Maintenance and Construction Management	MCM Maintenance Decision Support	Maintenance Decision Support Systems recommend courses of action based on current and forecast environmental and road conditions (filtered and fused for specific time horizons) and additional application specific information. Recommendations and dispatch instructions are generated based on this integrated information.	No
RTMC	Maintenance and Construction Management	MCM Roadway Maintenance and Construction	Overall management and support for routine maintenance on the roadway or right-of-way. Includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
RTMC	Maintenance and Construction Management	MCM Speed Monitoring and Warning	Remotely monitors vehicle speeds, and informs an enforcement agency if excessive speeds are detected; primarily used in work zones.	No
RTMC	Maintenance and Construction Management	MCM Transportation Operations Data Collection	Collects real-time information on the state of the regional transportation system for operational use by the center. It establishes communications with a regional repository, requests or subscribes to information relevant to the center, and distributes the received information for use.	No
RTMC	Maintenance and Construction Management	MCM Vehicle Tracking	Remotely tracks the location of maintenance and construction vehicles and other equipment; presented to the center personnel.	No
RTMC	Maintenance and Construction Management	MCM Winter Maintenance Management	Manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying and other material applications) based on weather information.	No
RTMC	Maintenance and Construction Management	MCM Work Activity Coordination	Disseminates work activity schedules and current asset restrictions to other agencies. Work schedules are coordinated, factoring in the needs and activities of other agencies and adjacent jurisdictions.	No
RTMC	Maintenance and Construction Management	MCM Work Zone Management	Remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), highway advisory radio, gates and barriers, and informing other groups of activity (e.g., traveler information systems, traffic management centers, other maintenance and construction centers).	No
RTMC	Maintenance and Construction Management	MCM Work Zone Safety Management	Remotely monitors work zone safety systems that detect vehicle intrusions in work zones and warns crew workers and drivers of imminent encroachment. Crew movements are also monitored so that the crew can be warned of movement beyond the designated safe zone.	No
RTMC	Other Archives			No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
RTMC	Other Emergency Management			No
RTMC	Traffic Management	Barrier System Management	Remotely controls barrier systems such as gates and other systems that manage entry to roadways, transportation facilities and infrastructure.	No
RTMC	Traffic Management	Collect Traffic Surveillance	Management of traffic sensors and surveillance (CCTV) equipment, collection of current traffic conditions, and distribution of the collected information to other centers and operators.	No
RTMC	Traffic Management	Safeguard System Management	Remotely controls safeguard systems such as blast shields and tunnel exhaust systems that are used to mitigate the impact of incidents on transportation infrastructure.	No
RTMC	Traffic Management	TMC Dynamic Lane Management and Shoulder Use	Remotely monitors and controls dynamically managed travel lanes, including temporary use of shoulders. It monitors conditions and determines and manages lane configuration changes. Includes intersection reconfiguration, special designated lanes, temporary shoulder use, and lane use restrictions.	No
RTMC	Traffic Management	TMC Environmental Monitoring	Management of environmental sensors and assimilation of collected data with other current and forecast road conditions and surface weather information from weather service providers and roadway maintenance operations.	No
RTMC	Traffic Management	TMC Evacuation Support	Development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. Interfaces with emergency management and other traffic management centers.	No
RTMC	Traffic Management	TMC HOV Lane Management	Remotely controls HOV lane sensors, HOV lane usage signals, and ramp meters to manage use of HOV or HOT lanes; also detect HOV violators and notifies enforcement agencies.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
RTMC	Traffic Management	TMC Incident Detection	Remotely monitors traffic sensor and surveillance systems to detect and verify incidents. Also monitors external advisory and incident reporting systems, intermodal freight depots, and border crossings for additional incident information. Identified incidents are reported to operations personnel and other centers.	No
RTMC	Traffic Management	TMC Incident Dispatch Coordination/Communication	Formulates an incident response that takes into account the incident potential, incident impacts, and/or resources required for incident management. Facilitates the dispatch of emergency response and service vehicles and coordinates the response with cooperating agencies.	No
RTMC	Traffic Management	TMC Multimodal Coordination	Provides traffic signal priority for transit vehicles based on center-to-center communications with the transit management center; also exchange traffic and transit information.	No
RTMC	Traffic Management	TMC Regional Traffic Management	Coordination between traffic management centers in order to share traffic information between centers as well as control of traffic management field equipment. This may be used during incidents and special events and during day-to-day operations.	No
RTMC	Traffic Management	TMC Reversible Lane Management	Remotely controls traffic sensors, surveillance, and automated reversible lane equipment and lane control signals to control traffic in reversible lanes.	No
RTMC	Traffic Management	TMC Roadway Warning	Remotely monitors and controls field elements used to warn drivers approaching hazards. Detects and warns approaching vehicles of adverse road weather conditions, traffic conditions including queues, and obstacles or animals in the road.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
RTMC	Traffic Management	TMC Signal Control	Remotely controls traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, emergency vehicle preemptions, pedestrian crossings, etc.	No
RTMC	Traffic Management	TMC Speed Monitoring and Warning	Remotely monitors vehicle speeds, and informs an enforcement agency if excessive speeds are detected. Also configures and controls speed warning systems that provide safe speed advisories to the motorist.	No
RTMC	Traffic Management	TMC Traffic Information Dissemination	Controls dissemination of traffic-related data to other centers, the media, and travelers via the driver information systems (DMS, HAR) that it operates.	No
RTMC	Traffic Management	TMC Traffic Metering	Remotely controls ramp meters, interchange connector meters, and mainline meters, covering all types of metering as well as management of bypass lanes.	No
RTMC	Traffic Management	TMC Transportation Operations Data Collection	Collects real-time information on the state of the regional transportation system for operational use by the center. It establishes communications with a regional repository, requests or subscribes to information relevant to the center, and distributes the received information for use.	No
RTMC	Traffic Management	TMC Variable Speed Limits	Remotely monitors and controls variable speed limits systems, including equipment that monitors current traffic and environmental conditions, determines the current speed limits by lane, and displays the speed limits and additional information to drivers.	No
RTMC	Traffic Management	TMC Work Zone Traffic Management	Coordination with maintenance systems using work zone images and traveler information systems (such as DMS), and distribution of work plans so that work zones are established that have minimum traffic impact.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
RTMC	Traffic Management	Traffic Data Collection	Collection and storage of traffic management data. For use by operations personnel or data archives in the region.	No
RTMC	Traffic Management	Traffic Equipment Maintenance	Monitoring and remote diagnostics of field equipment - detect failures, issue problem reports, and track the repair or replacement of the failed equipment.	No
RWIS Central Control System	Information Service Provider	ISP Data Collection	Collection and storage of information supporting the operations of traveler information service providers. For use by operations personnel or data archives in the region.	No
RWIS Central Control System	Information Service Provider	ISP Traveler Data Collection	Collects traveler information from other centers, consolidates and refines the collected data, and makes this data available to traveler information applications.	No
RWIS Central Control System	Maintenance and Construction Management	MCM Data Collection	Collection and storage of maintenance and construction information. For use by operations personnel or data archives in the region.	No
RWIS Central Control System	Maintenance and Construction Management	MCM Environmental Information Collection	Remotely controls environmental sensors and assimilates collected data with environmental probe data and other current and forecast road conditions and surface weather information from weather service providers and transportation operations.	No
RWIS Central Control System	Maintenance and Construction Management	MCM Environmental Information Processing	Processes current and forecast weather data, road condition information, local environmental data, and uses internal models to develop specialized detailed forecasts of local weather and surface conditions. Disseminates road weather information to other agencies and centers.	No
RWIS Central Control System	Other Archives			No
RWIS Central Control System	Weather Service			No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
RWIS Stations	Roadway	Roadway Environmental Monitoring	Environmental sensors, surface and sub-surface, that collect weather and road surface information. Weather conditions measured include temperature, wind, humidity, precipitation, and visibility. Sensors measure road surface temperature, moisture, icing, salinity, etc.	No
SAFER	Other CVAS			No
Security Monitoring Roadside Equipment	Security Monitoring	Field Secure Area Sensor Monitoring	Security sensors monitoring facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, and transit railways or guideways) for environmental threats, intrusion and motion, object detection, and infrastructure integrity.	No
Security Monitoring Roadside Equipment	Security Monitoring	Field Secure Area Surveillance	Security surveillance devices (audio/video) that monitor facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, and transit railways or guideways).	No
Speed Monitoring Roadside Equipment	Other Roadway			No
Speed Monitoring Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Speed Monitoring Roadside Equipment	Roadway	Roadway Speed Monitoring and Warning	Vehicle speed sensors that detect excessive vehicle speeds, optionally based on conditions and vehicle type, informing drivers, centers and/or enforcement agencies of speed violations.	No
Surface Transportation Weather Service Providers	Surface Transportation Weather Service			No
TOCCs	Archived Data User Systems			No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
TOCCs	Emergency Management	Center Secure Area Sensor Management	Management of security sensors, analysis of sensor data, correlation with surveillance data and alerts from other agencies to detect potential threats, and dissemination of threat information to other agencies. Sensors may be placed in areas such as transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
TOCCs	Emergency Management	Center Secure Area Surveillance	Management of security surveillance devices and analysis of that data to detect potential threats. Areas under surveillance may include transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.	No
TOCCs	Emergency Management	Emergency Call-Taking	Provides interface to the emergency call-taking systems such as the Emergency Telecommunications System (e.g., 911) that correlate call information with emergencies reported by transit agencies, commercial vehicle operators, or other public safety agencies. Allows the operator to verify the incident and forward the information to the responding agencies.	No
TOCCs	Emergency Management	Emergency Data Collection	Collection and storage of information related to Emergency Management. For use by operations personnel or data archives in the region.	No
TOCCs	Emergency Management	Emergency Dispatch	Dispatch emergency vehicles to incidents, tracking their location and status. Pertinent incident information is gathered and relayed to the responding units.	No
TOCCs	Emergency Management	Emergency Early Warning System	Monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies in order to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to other ITS centers to notify the traveling public.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
TOCCs	Emergency Management	Emergency Environmental Monitoring	Collects current and forecast road and weather information that is used by the operator to more effectively manage incidents.	No
TOCCs	Emergency Management	Emergency Evacuation Support	Evacuation planning and coordination to manage evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety.	No
TOCCs	Emergency Management	Emergency Response Management	Strategic emergency planning and response capabilities and broad inter-agency interfaces to support large-scale incidents and disasters, commonly associated with Emergency Operations Centers.	No
TOCCs	Emergency Management	Emergency Routing	Routing of emergency vehicles to facilitate the quickest/safest arrival. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by Traffic Management on request.	No
TOCCs	Emergency Management	Incident Command	Tactical decision support, resource coordination, and communications integration among emergency management agencies for Incident Commands that are established by first responders to support local management of an incident.	No
TOCCs	Emissions Management	Emissions Data Collection	Collection and storage of air quality and emissions management information. For use by operations personnel or data archives in the region.	No
TOCCs	Emissions Management	Emissions Data Management	Assimilation and storage of air quality measures and roadside collected emissions data; distribution for general traveler information or for use in demand management programs.	No
TOCCs	Maintenance and Construction Management	MCM Automated Treatment System Control	Remotely controls automated roadway treatment systems (to disperse anti-icing chemicals, etc.) directly, or via control of the environmental sensors that activate the treatment systems automatically in the field.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
TOCCs	Maintenance and Construction Management	MCM Data Collection	Collection and storage of maintenance and construction information. For use by operations personnel or data archives in the region.	No
TOCCs	Maintenance and Construction Management	MCM Environmental Information Collection	Remotely controls environmental sensors and assimilates collected data with environmental probe data and other current and forecast road conditions and surface weather information from weather service providers and transportation operations.	No
TOCCs	Maintenance and Construction Management	MCM Environmental Information Processing	Processes current and forecast weather data, road condition information, local environmental data, and uses internal models to develop specialized detailed forecasts of local weather and surface conditions. Disseminates road weather information to other agencies and centers.	No
TOCCs	Maintenance and Construction Management	MCM Incident Management	Supports coordinated response to incidents - share incident notifications, manage incident response resources, and coordinate overall incident situation and response among allied response organizations.	No
TOCCs	Maintenance and Construction Management	MCM Infrastructure Monitoring	Remotely monitors the condition of pavement, bridges, tunnels, associated hardware, and other transportation-related infrastructure (e.g., culverts) using vehicle-based and roadway-based infrastructure monitoring sensors.	No
TOCCs	Maintenance and Construction Management	MCM Maintenance Decision Support	Maintenance Decision Support Systems recommend courses of action based on current and forecast environmental and road conditions (filtered and fused for specific time horizons) and additional application specific information. Recommendations and dispatch instructions are generated based on this integrated information.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
TOCCs	Maintenance and Construction Management	MCM Roadway Maintenance and Construction	Overall management and support for routine maintenance on the roadway or right-of-way. Includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment.	No
TOCCs	Maintenance and Construction Management	MCM Speed Monitoring and Warning	Remotely monitors vehicle speeds, and informs an enforcement agency if excessive speeds are detected; primarily used in work zones.	No
TOCCs	Maintenance and Construction Management	MCM Vehicle Tracking	Remotely tracks the location of maintenance and construction vehicles and other equipment; presented to the center personnel.	No
TOCCs	Maintenance and Construction Management	MCM Winter Maintenance Management	Manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying and other material applications) based on weather information.	No
TOCCs	Maintenance and Construction Management	MCM Work Activity Coordination	Disseminates work activity schedules and current asset restrictions to other agencies. Work schedules are coordinated, factoring in the needs and activities of other agencies and adjacent jurisdictions.	No
TOCCs	Maintenance and Construction Management	MCM Work Zone Management	Remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), highway advisory radio, gates and barriers, and informing other groups of activity (e.g., traveler information systems, traffic management centers, other maintenance and construction centers).	No
TOCCs	Other Archives			No
TOCCs	Other Traffic Management			No
TOCCs	Traffic Management	Barrier System Management	Remotely controls barrier systems such as gates and other systems that manage entry to roadways, transportation facilities and infrastructure.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
TOCCs	Traffic Management	Collect Traffic Surveillance	Management of traffic sensors and surveillance (CCTV) equipment, collection of current traffic conditions, and distribution of the collected information to other centers and operators.	No
TOCCs	Traffic Management	Safeguard System Management	Remotely controls safeguard systems such as blast shields and tunnel exhaust systems that are used to mitigate the impact of incidents on transportation infrastructure.	No
TOCCs	Traffic Management	TMC Environmental Monitoring	Management of environmental sensors and assimilation of collected data with other current and forecast road conditions and surface weather information from weather service providers and roadway maintenance operations.	No
TOCCs	Traffic Management	TMC Evacuation Support	Development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. Interfaces with emergency management and other traffic management centers.	No
TOCCs	Traffic Management	TMC Incident Detection	Remotely monitors traffic sensor and surveillance systems to detect and verify incidents. Also monitors external advisory and incident reporting systems, intermodal freight depots, and border crossings for additional incident information. Identified incidents are reported to operations personnel and other centers.	No
TOCCs	Traffic Management	TMC Incident Dispatch Coordination/Communication	Formulates an incident response that takes into account the incident potential, incident impacts, and/or resources required for incident management. Facilitates the dispatch of emergency response and service vehicles and coordinates the response with cooperating agencies.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
TOCCs	Traffic Management	TMC Regional Traffic Management	Coordination between traffic management centers in order to share traffic information between centers as well as control of traffic management field equipment. This may be used during incidents and special events and during day-to-day operations.	No
TOCCs	Traffic Management	TMC Roadway Warning	Remotely monitors and controls field elements used to warn drivers approaching hazards. Detects and warns approaching vehicles of adverse road weather conditions, traffic conditions including queues, and obstacles or animals in the road.	No
TOCCs	Traffic Management	TMC Signal Control	Remotely controls traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, emergency vehicle preemptions, pedestrian crossings, etc.	No
TOCCs	Traffic Management	TMC Speed Monitoring and Warning	Remotely monitors vehicle speeds, and informs an enforcement agency if excessive speeds are detected. Also configures and controls speed warning systems that provide safe speed advisories to the motorist.	No
TOCCs	Traffic Management	TMC Traffic Information Dissemination	Controls dissemination of traffic-related data to other centers, the media, and travelers via the driver information systems (DMS, HAR) that it operates.	No
TOCCs	Traffic Management	TMC Traffic Metering	Remotely controls ramp meters, interchange connector meters, and mainline meters, covering all types of metering as well as management of bypass lanes.	No
TOCCs	Traffic Management	TMC Variable Speed Limits	Remotely monitors and controls variable speed limits systems, including equipment that monitors current traffic and environmental conditions, determines the current speed limits by lane, and displays the speed limits and additional information to drivers.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
TOCCs	Traffic Management	TMC Work Zone Traffic Management	Coordination with maintenance systems using work zone images and traveler information systems (such as DMS), and distribution of work plans so that work zones are established that have minimum traffic impact.	No
TOCCs	Traffic Management	Traffic Data Collection	Collection and storage of traffic management data. For use by operations personnel or data archives in the region.	No
TOCCs	Traffic Management	Traffic Equipment Maintenance	Monitoring and remote diagnostics of field equipment - detect failures, issue problem reports, and track the repair or replacement of the failed equipment.	No
Traffic	Traffic			No
Traffic Data and Video Archive	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.	No
Traffic Data and Video Archive	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.	No
Traffic Data and Video Archive	Archived Data Management	On-Line Analysis and Mining	Advanced data analysis and mining features to support discovery of information, patterns, and correlations in large ITS archives.	No
Traffic Data and Video Archive	Archived Data Management	Traffic and Roadside Data Archival	Collects and archives traffic and environmental information directly from the roadside for use in off-line planning, research, and analysis.	No
Traffic Detector Roadside Equipment	Other Roadway			No
Traffic Detector Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No
Traffic Detector Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Traffic Detector Roadside Equipment	Roadway	Roadway Warning	Field elements used to warn drivers approaching hazards including adverse road weather conditions, traffic conditions including queues, and obstacles or animals in the road.	No
Traffic Signal Roadside Equipment	Roadway	Field Management Stations Operation	Supports direct communications between field management stations and the local field equipment under their control.	No
Traffic Signal Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No
Traffic Signal Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Traffic Signal Roadside Equipment	Roadway	Roadway Signal Controls	Field elements including traffic signal controllers for use at signalized intersections; also supports pedestrian crossings.	No
Traffic Signal Roadside Equipment	Roadway	Roadway Signal Preemption	Field elements that receive signal preemption requests from approaching emergency vehicles and overrides the current operation of the traffic signals	No
Traffic Signal Roadside Equipment	Roadway	Roadway Signal Priority	Field elements that provide the capability to receive transit vehicle signal priority requests and control traffic signals accordingly.	No
Transit Center and Station Surveillance System Roadside Equipment	Remote Traveler Support	Remote Traveler Security	Public traveler interface that provides the capability for travelers to report an emergency or activate a panic button to summon assistance in areas such as transit stops, park-and-ride areas, etc.	No
Transit Center and Station Surveillance System Roadside Equipment	Remote Traveler Support	Traveler Secure Area Sensor Monitoring	Security sensors monitoring traveler-frequented areas such as transit stops, park-and-ride lots, and rest areas for environmental threats, intrusion and motion, and object detection.	No
Transit Center and Station Surveillance System Roadside Equipment	Remote Traveler Support	Traveler Secure Area Surveillance	Security surveillance devices that monitor traveler-frequented areas such as transit stops and rest stops.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Transit Data Archives	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.	No
Transit Data Archives	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.	No
Transit Data Archives	Archived Data Management	On-Line Analysis and Mining	Advanced data analysis and mining features to support discovery of information, patterns, and correlations in large ITS archives.	No
Transit Data Archives	Archived Data Management	Traffic and Roadside Data Archival	Collects and archives traffic and environmental information directly from the roadside for use in off-line planning, research, and analysis.	No
Transit Information Telephone Systems	Personal Information Access	Personal Interactive Information Reception	Personal traveler interface that provides traffic, transit, yellow pages, event, and trip planning information, and other personalized traveler information services upon request. Devices include personal computers and personal portable devices such as PDAs.	No
Transit Information Telephone Systems	Transit Management	Transit Center Information Services	Provide interactive traveler information to travelers (on-board transit vehicles, at stops/stations, using personal devices), traveler information service providers, media, and other transit organizations. Includes routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events.	No
Transit Information Websites	Information Service Provider	Basic Information Broadcast	Broadcast dissemination of traffic, transit, maintenance and construction, event, and weather information to traveler interface systems and vehicles.	No
Transit Information Websites	Information Service Provider	Infrastructure Provided Dynamic Ridesharing	Dynamic rideshare matching, including traveler eligibility, preference information, connections to transit or other multimodal services, confirmation, and payment of rideshare matching services.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Transit Information Websites	Information Service Provider	Infrastructure Provided Trip Planning	Generation of pre-trip and enroute trip plans for travelers (and vehicles) based on current traffic conditions, work zones, weather, and travelers constraints and preferences. Includes end-to-end trips using multiple modes, such as bicycle, transit, etc.	No
Transit Information Websites	Information Service Provider	Interactive Infrastructure Information	Personalized dissemination of traffic, transit, maintenance and construction, multimodal, event, and weather information to traveler interface systems and vehicles, upon request.	No
Transit Information Websites	Information Service Provider	ISP Traveler Data Collection	Collects traveler information from other centers, consolidates and refines the collected data, and makes this data available to traveler information applications.	No
Transit Information Websites	Information Service Provider	ISP Traveler Information Alerts	Provides personalized traveler information alerts, notifying travelers of relevant congestion, incidents, transit schedule delays, and other actionable information that may impact a trip. Relevant alerts are selected based on user-configurable parameters and thresholds.	No
Transit Information Websites	Information Service Provider	Traveler Telephone Information	Distribution of traveler information and wide-area alerts to traveler telephone information systems such as 511, based on voice-based traveler requests.	No
Transit Kiosks	Remote Traveler Support	Remote Transit Fare Management	Public traveler interface, such as a kiosk, that provides the capability for the traveler to use a common fare medium for transit fares, tolls, and/or parking lot charges, to calculate the amount due and identify payment problems.	No
Transit Kiosks	Remote Traveler Support	Remote Transit Information Services	Public traveler interface that provides real-time travel-related information at transit stops and multi-modal transfer points, including general annunciation, display of imminent arrival information, the latest available information on transit routes, schedules, transfer options, available services, fares, and real-time schedule adherence.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Transit Vehicle Equipment	Transit Vehicle	On-board Maintenance	On-board systems to collect and process transit vehicle maintenance data including mileage and vehicle operating conditions for use in scheduling future vehicle maintenance.	No
Transit Vehicle Equipment	Transit Vehicle	On-board Paratransit Operations	On-board systems to manage paratransit and flexible-route dispatch requests, including multi-stop runs. Passenger data is collected and provided to the center.	No
Transit Vehicle Equipment	Transit Vehicle	On-board Passenger Counting	On-board systems collect transit vehicle loading data and make it available to the center.	No
Transit Vehicle Equipment	Transit Vehicle	On-board Schedule Management	Collecting of data for schedule generation and adjustment on-board a transit vehicle. Supports communication between the vehicle, operator, and center.	No
Transit Vehicle Equipment	Transit Vehicle	On-board Transit Fare Management	On-board systems provide fare collection using a travelers non-monetary fare medium. Collected fare data are made available to the center.	No
Transit Vehicle Equipment	Transit Vehicle	On-board Transit Information Services	On-board systems to furnish next-stop annunciation as well as interactive travel-related information, including routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, non-motorized transportation services, and special events.	No
Transit Vehicle Equipment	Transit Vehicle	On-board Transit Security	On-board video/audio surveillance systems, threat sensors, and object detection sensors to enhance security and safety on-board a transit vehicles. Also includes silent alarms activated by transit user or vehicle operator, operator authentication, and remote vehicle disabling.	No
Transit Vehicle Equipment	Transit Vehicle	On-board Transit Signal Priority	On-board systems request signal priority through short range communication directly with traffic control equipment at the roadside (intersections, ramps, interchanges, etc.).	No
Transit Vehicle Equipment	Transit Vehicle	On-board Transit Trip Monitoring	Support fleet management with automatic vehicle location (AVL) and automated mileage and fuel reporting and auditing.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Transit Vehicle Equipment	Vehicle	Vehicle Lateral Warning System	On-board sensors to monitor the areas to the sides of the vehicle and present warnings to the driver about potential hazards.	No
Transit Vehicle Equipment	Vehicle	Vehicle Location Determination	Receives current location of the vehicle from GPS or other positioning technology and provides this information to other in-vehicle functions.	No
Transit Vehicle Equipment	Vehicle	Vehicle Longitudinal Warning System	On-board sensors to monitor the areas in front of and behind the vehicle and present warnings to the driver about potential hazards.	No
Transit Vehicle Operator	Transit Vehicle Operator			No
Transportation Information System (TIS)	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.	No
Transportation Information System (TIS)	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.	No
Transportation Information System (TIS)	Archived Data Management	On-Line Analysis and Mining	Advanced data analysis and mining features to support discovery of information, patterns, and correlations in large ITS archives.	No
Transportation Information System (TIS)	Archived Data Management	Traffic and Roadside Data Archival	Collects and archives traffic and environmental information directly from the roadside for use in off-line planning, research, and analysis.	No
Transportation Information System (TIS)	Archived Data Management	Virtual Data Warehouse Services	Provides access to data from geographically dispersed archives and coordinates information exchange with a local data warehouse. Also provides the specialized publishing, directory services, and transaction management functions associated with coordinating remote archives.	No
Traveler	Traveler			No
Traveler Cards	Traveler Card			No
Traveler Information and Parking Kiosks	Remote Traveler Support	Remote Interactive Information Reception	Public traveler interface, such as a kiosk, that provides traffic, transit, yellow pages, special event, and other personalized traveler information services upon request.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Truck Center	Commercial Vehicle Administration	Credentials and Taxes Administration	Manage electronic filing of credentials, tax filing, and driver licensing for commercial vehicle operators. Provides commercial vehicle (including HAZMAT) route restrictions.	No
Truck Center	Commercial Vehicle Administration	CV Information Exchange	Exchange information concerning safety, credentialing, and operations of commercial vehicles between the center and the roadside check stations, across jurisdictions, with fleet operators and other information requestors.	No
Truck Center	Information Service Provider			No
UMD Transportation Data Research Laboratory (TDRL)	Archived Data Management	Government Reporting Systems Support	Selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements.	No
UMD Transportation Data Research Laboratory (TDRL)	Archived Data Management	ITS Data Repository	Collect and maintain data and data catalogs from one or more data sources. May include quality checks, error notification, and archive coordination.	No
UMD Transportation Data Research Laboratory (TDRL)	Archived Data Management	Traffic and Roadside Data Archival	Collects and archives traffic and environmental information directly from the roadside for use in off-line planning, research, and analysis.	No
UMD Transportation Data Research Laboratory (TDRL)	Information Service Provider	ISP Data Collection	Collection and storage of information supporting the operations of traveler information service providers. For use by operations personnel or data archives in the region.	No
User Personal Portable and Computing Devices	Archived Data User Systems			No
User Personal Portable and Computing Devices	Personal Information Access	Personal Basic Information Reception	Personal traveler interface that provides formatted traffic advisories, transit, event, and other traveler information, as well as broadcast alerts. Devices include personal computers and personal portable devices such as PDAs and pagers.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
User Personal Portable and Computing Devices	Personal Information Access	Personal Interactive Information Reception	Personal traveler interface that provides traffic, transit, yellow pages, event, and trip planning information, and other personalized traveler information services upon request. Devices include personal computers and personal portable devices such as PDAs.	No
User Personal Portable and Computing Devices	Personal Information Access	Personal Location Determination	Provides current location of a personal device from GPS or similar technology and uses this information for navigation, guidance, and emergency notification systems.	No
User Personal Portable and Computing Devices	Personal Information Access	Personal Trip Planning and Route Guidance	Personal traveler interface that coordinates with a traveler information center to provide a trip plan that is tailored to the traveler's preferences. During the trip, the route plan can be modified to account for new information. Devices include desktop computers at home, work, or at major trip generation sites, plus personal portable devices such as PDAs and pagers.	No
Variable Speed Limit Roadside Equipment	Roadway	Roadway Basic Surveillance	Field elements that monitor traffic conditions using loop detectors and CCTV cameras.	No
Variable Speed Limit Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Variable Speed Limit Roadside Equipment	Roadway	Roadway Traffic Information Dissemination	Driver information systems, such as dynamic message signs and Highway Advisory Radio (HAR).	No
Variable Speed Limit Roadside Equipment	Roadway	Roadway Variable Speed Limits	Field elements including physical overhead lane signs and associated monitoring, communications, and control electronics that are used to manage and control variable speed limits systems.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Variable Speed Limit Roadside Equipment	Roadway	Roadway Work Zone Traffic Control	Field elements in maintenance and construction areas including CCTV cameras, driver information systems (such as DMS), and gates/barriers that monitor and control traffic and provide information directly to drivers in affected areas.	No
Vehicle	Vehicle	Driver Safety Monitoring System	On-board systems to determine the driver's condition, warn the driver of potential dangers, and assess the suitability of the driver (e.g., fitness and alertness).	No
Vehicle	Vehicle	Vehicle Location Determination	Receives current location of the vehicle from GPS or other positioning technology and provides this information to other in-vehicle functions.	No
Vehicle	Vehicle	Vehicle Longitudinal Warning System	On-board sensors to monitor the areas in front of and behind the vehicle and present warnings to the driver about potential hazards.	No
Vehicle	Vehicle	Vehicle Mayday I/F	In-vehicle capability for drivers or collision detection sensors onboard a vehicle to report an emergency and summon assistance.	No
Vehicle	Vehicle	Vehicle Safety Monitoring System	On-board systems to diagnose critical components of the vehicle and warn the driver of potential dangers, including steering, braking, acceleration, emissions, fuel economy, engine performance, etc.	No
Vehicle	Vehicle	Vehicle Toll/Parking Interface	On-board systems to support paying toll without stopping and pay for parking without the use of cash through the use of an active tag interface and debit/credit card interface.	No
Vehicle	Vehicle	Vehicle Traffic Probe Support	On-board systems that identify location, measure traffic conditions such as link travel time and speed and transmit data to a center or roadside equipment.	No
Vehicle	Vehicle	Vehicle Trip Planning and Route Guidance	In-vehicle system that coordinates with a traveler information center to provide a suggested trip plan that is tailored to the driver's preferences. During the trip, the route plan can be modified to account for new information.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Vehicle	Vehicle Characteristics			No
Vehicle Occupancy Monitoring/Enforcement Roadside Equipment	Roadway	Roadway Equipment Coordination	Field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control.	No
Vehicle Occupancy Monitoring/Enforcement Roadside Equipment	Roadway	Roadway HOV Control	HOV lane usage traffic sensors and display equipment to notify users of HOV lane status for control of traffic in HOV lanes on freeways.	No
Virtual Weigh Stations	Commercial Vehicle Check	Citation and Accident Electronic Recording	Roadside check facility equipment records results of roadside inspections and forwards information to the commercial vehicle administration center. Includes accident reports, violations, citations, and the daily site activity data.	No
Virtual Weigh Stations	Commercial Vehicle Check	Roadside Electronic Screening	Roadside check facility equipment to communicate with commercial vehicles at mainline speeds - reading tag data, identification, weight and vehicle characteristics, and credential checking. Determines whether a pull-in message should be generated, allowing for inspectors to override.	No
Virtual Weigh Stations	Commercial Vehicle Check	Roadside Safety and Security Inspection	Roadside check facility equipment to provide the capabilities to automate the roadside safety inspection process including wireless roadside inspections and use of hand held devices to rapidly inspect the vehicle and driver.	No
Virtual Weigh Stations	Commercial Vehicle Check	Roadside WIM	Roadside check facility equipment to detect and measure the weight commercial vehicles at high speed. Can include an interface to the credential checking or it can be a standalone package with display.	No

Element Name	Entity Name	Functional Area	Functional Area Description	FA User Defined
Weigh In Motion (WIM) Stations	Commercial Vehicle Check	Citation and Accident Electronic Recording	Roadside check facility equipment records results of roadside inspections and forwards information to the commercial vehicle administration center. Includes accident reports, violations, citations, and the daily site activity data.	No
Weigh In Motion (WIM) Stations	Commercial Vehicle Check	Roadside Electronic Screening	Roadside check facility equipment to communicate with commercial vehicles at mainline speeds - reading tag data, identification, weight and vehicle characteristics, and credential checking. Determines whether a pull-in message should be generated, allowing for inspectors to override.	No
Weigh In Motion (WIM) Stations	Commercial Vehicle Check	Roadside Safety and Security Inspection	Roadside check facility equipment to provide the capabilities to automate the roadside safety inspection process including wireless roadside inspections and use of hand held devices to rapidly inspect the vehicle and driver.	No
Weigh In Motion (WIM) Stations	Commercial Vehicle Check	Roadside WIM	Roadside check facility equipment to detect and measure the weight commercial vehicles at high speed. Can include an interface to the credential checking or it can be a standalone package with display.	No
Weigh Station Roadside Equipment	Commercial Vehicle Check	Citation and Accident Electronic Recording	Roadside check facility equipment records results of roadside inspections and forwards information to the commercial vehicle administration center. Includes accident reports, violations, citations, and the daily site activity data.	No
Weigh Station Roadside Equipment	Commercial Vehicle Check	Roadside Electronic Screening	Roadside check facility equipment to communicate with commercial vehicles at mainline speeds - reading tag data, identification, weight and vehicle characteristics, and credential checking. Determines whether a pull-in message should be generated, allowing for inspectors to override.	No

9 Interfaces Between Systems

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

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

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

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

Table 6: Information Flows

Source Element	Destination Element	Flow Name	Flow Status
511 Telephone Information Service	Condition Acquisition and Reporting System (CARS)	emergency traveler information	Planned
511 Telephone Information Service	Condition Acquisition and Reporting System (CARS)	incident information	Planned
511 Telephone Information Service	Condition Acquisition and Reporting System (CARS)	multimodal information	Planned
511 Telephone Information Service	Condition Acquisition and Reporting System (CARS)	parking information	Planned
511 Telephone Information Service	Condition Acquisition and Reporting System (CARS)	road network conditions	Planned
511 Telephone Information Service	Condition Acquisition and Reporting System (CARS)	traffic images	Planned
511 Telephone Information Service	Condition Acquisition and Reporting System (CARS)	transit service information	Planned
511 Telephone Information Service	Condition Acquisition and Reporting System (CARS)	voice-based traveler request	Existing
511 Telephone Information Service	User Personal Portable and Computing Devices	interactive traveler information	Existing
511 Traveler Information Website	Condition Acquisition and Reporting System (CARS)	emergency traveler information	Existing

Source Element	Destination Element	Flow Name	Flow Status
511 Traveler Information Website	Condition Acquisition and Reporting System (CARS)	incident information	Existing
511 Traveler Information Website	Condition Acquisition and Reporting System (CARS)	multimodal information	Existing
511 Traveler Information Website	Condition Acquisition and Reporting System (CARS)	parking information	Existing
511 Traveler Information Website	Condition Acquisition and Reporting System (CARS)	road network conditions	Existing
511 Traveler Information Website	Condition Acquisition and Reporting System (CARS)	traffic images	Existing
511 Traveler Information Website	Condition Acquisition and Reporting System (CARS)	transit service information	Existing
511 Traveler Information Website	MnPASS Service Center	toll data request	Planned
511 Traveler Information Website	North/West Passage Corridor Traveler Information Website	emergency traveler information	Planned
511 Traveler Information Website	North/West Passage Corridor Traveler Information Website	incident information	Planned
511 Traveler Information Website	North/West Passage Corridor Traveler Information Website	multimodal information	Planned
511 Traveler Information Website	North/West Passage Corridor Traveler Information Website	parking information	Planned
511 Traveler Information Website	North/West Passage Corridor Traveler Information Website	road network conditions	Planned
511 Traveler Information Website	North/West Passage Corridor Traveler Information Website	traffic images	Planned
511 Traveler Information Website	North/West Passage Corridor Traveler Information Website	transit service information	Planned
511 Traveler Information Website	Rest Area Wi-Fi	broadcast traveler information	Planned
511 Traveler Information Website	Rest Area Wi-Fi	emergency traveler information	Planned
511 Traveler Information Website	User Personal Portable and Computing Devices	broadcast traveler information	Existing
511 Traveler Information Website	User Personal Portable and Computing Devices	emergency traveler information	Existing
511 Traveler Information Website	User Personal Portable and Computing Devices	interactive traveler information	Existing
511 Traveler Information Website	User Personal Portable and Computing Devices	trip plan	Planned
911 Dispatch Center	Condition Acquisition and Reporting System (CARS)	incident information	Planned
911 Dispatch Center	County Emergency Operations Centers	incident response coordination	Existing

Source Element	Destination Element	Flow Name	Flow Status
911 Dispatch Center	County Sheriff and City Police Offices	incident response coordination	Existing
911 Dispatch Center	Emergency Vehicle Equipment	emergency dispatch requests	Existing
911 Dispatch Center	Local TMCs	incident information	Existing
911 Dispatch Center	Minneapolis TMC	incident information	Existing
911 Dispatch Center	Minnesota State Emergency Operations Center (SEOC)	incident response coordination	Existing
911 Dispatch Center	Minnesota State Patrol Databases	emergency archive data	Planned
911 Dispatch Center	RTMC	incident information	Existing
911 Dispatch Center	Security Monitoring Roadside Equipment	infrastructure monitoring sensor control	Planned
911 Dispatch Center	Security Monitoring Roadside Equipment	secure area sensor control	Planned
911 Dispatch Center	Security Monitoring Roadside Equipment	secure area surveillance control	Planned
911 Dispatch Center	TOCCs	incident information	Existing
Account Management Providers	Local Transit Management Centers	transaction status	Existing
Account Management Providers	Metro Area Transit Management Centers	transaction status	Existing
Account Management Providers	Minnesota CVIEW	transaction status	Existing
Account Management Providers	Minnesota CVO Online	transaction status	Existing
Account Management Providers	MnPASS Service Center	transaction status	Existing
Advance Warning Flasher Roadside Equipment	Traffic Signal Roadside Equipment	roadway equipment coordination	Existing
Advanced Pavement Condition and Visibility Warning System Roadside Equipment	TOCCs	environmental sensor data	Planned
Advanced Pavement Condition and Visibility Warning System Roadside Equipment	TOCCs	roadway information system status	Planned
Airport	Condition Acquisition and Reporting System (CARS)	alert notification	Existing
Airport	Condition Acquisition and Reporting System (CARS)	evacuation information	Existing
Airport	Condition Acquisition and Reporting System (CARS)	incident information	Existing
Airport	Metro Area Transit Management Centers	incident information	Existing
Animal Crossing Warning Roadside Equipment	Driver	driver information	Planned

Source Element	Destination Element	Flow Name	Flow Status
Automated Crash Notification System	911 Dispatch Center	incident report	Planned
Automated Crash Notification System	FIRST Emergency Vehicles	emergency dispatch requests	Planned
Automated Crash Notification System	FIRST Emergency Vehicles	suggested route	Planned
Automated Crash Notification System	RTMC	incident information	Planned
Automated Crash Notification System	RTMC	incident report	Planned
Automated Crash Notification System	TOCCs	incident information	Planned
Automated Crash Notification System	Vehicle	emergency acknowledge	Planned
Automated Crash Notification System	Vehicle	emergency data request	Planned
Automated Permit Routing System	Condition Acquisition and Reporting System (CARS)	emergency traveler information	Planned
Automated Permit Routing System	Condition Acquisition and Reporting System (CARS)	incident information	Planned
Automated Permit Routing System	Condition Acquisition and Reporting System (CARS)	multimodal information	Planned
Automated Permit Routing System	Condition Acquisition and Reporting System (CARS)	parking information	Planned
Automated Permit Routing System	Condition Acquisition and Reporting System (CARS)	road network conditions	Planned
Automated Permit Routing System	Condition Acquisition and Reporting System (CARS)	traffic images	Planned
Automated Permit Routing System	Condition Acquisition and Reporting System (CARS)	transit service information	Planned
Automated Permit Routing System	Private Fleet and Freight Management Center	route plan	Planned
AWOS Central Control System	AWOS Roadside Equipment	environmental sensors control	Existing
AWOS Central Control System	Clarus Weather System	environmental sensor data	Existing
AWOS Central Control System	Maintenance and Construction Management Center	road weather information	Existing
AWOS Central Control System	User Personal Portable and Computing Devices	broadcast traveler information	Existing
AWOS Roadside Equipment	AWOS Central Control System	environmental sensor data	Existing
Basic Vehicle	Vehicle	basic vehicle measures	Planned

Source Element	Destination Element	Flow Name	Flow Status
Bridge Inspection / Structural Monitoring Roadside Equipment	Maintenance and Construction Management Center	infrastructure monitoring sensor data	Planned
Bridge Inspection / Structural Monitoring Roadside Equipment	RTMC	infrastructure monitoring sensor data	Planned
Bridge Inspection / Structural Monitoring Roadside Equipment	TOCCs	infrastructure monitoring sensor data	Planned
CCTV Roadside Equipment	911 Dispatch Center	traffic image data	Planned
CCTV Roadside Equipment	County Emergency Operations Centers	traffic image data	Planned
CCTV Roadside Equipment	Local TMCs	traffic images	Existing
CCTV Roadside Equipment	Local Transit Management Centers	traffic image data	Planned
CCTV Roadside Equipment	Metro Area Transit Management Centers	traffic image data	Planned
CCTV Roadside Equipment	Minneapolis TMC	traffic images	Existing
CCTV Roadside Equipment	Minnesota State Emergency Operations Center (SEOC)	traffic image data	Planned
CCTV Roadside Equipment	RTMC	traffic images	Existing
CCTV Roadside Equipment	TOCCs	traffic images	Existing
CCTV Roadside Equipment	Traffic Data and Video Archive	roadside archive data	Existing
Clarus Weather System	AWOS Central Control System	qualified environmental conditions data	Existing
Clarus Weather System	RWIS Central Control System	qualified environmental conditions data	Existing
Clarus Weather System	Surface Transportation Weather Service Providers	weather information	Existing
Commercial Vehicle Administration Center	Private Fleet and Freight Management Center	route restrictions	Existing
Commercial Vehicles	County Emergency Operations Centers	hazmat spill notification	Existing
Commercial Vehicles	FAST Compliance Management System	tag data	Existing
Commercial Vehicles	Minnesota State Emergency Operations Center (SEOC)	hazmat spill notification	Existing
Commercial Vehicles	Minnesota State Patrol District Office	hazmat spill notification	Existing
Commercial Vehicles	Oversize Warning Roadside Equipment	vehicle characteristics	Existing

Source Element	Destination Element	Flow Name	Flow Status
Commercial Vehicles	Private Fleet and Freight Management Center	driver to fleet request	Existing
Commercial Vehicles	Virtual Weigh Stations	safety inspection record	Planned
Commercial Vehicles	Virtual Weigh Stations	screening event record	Planned
Commercial Vehicles	Virtual Weigh Stations	tag data	Planned
Commercial Vehicles	Weigh In Motion (WIM) Stations	safety inspection record	Existing
Commercial Vehicles	Weigh In Motion (WIM) Stations	screening event record	Existing
Commercial Vehicles	Weigh In Motion (WIM) Stations	tag data	Existing
Commercial Vehicles	Weigh Station Roadside Equipment	safety inspection record	Existing
Commercial Vehicles	Weigh Station Roadside Equipment	tag data	Existing
Commuter Rail Operations Center	Metro Area Transit Management Centers	transit service coordination	Planned
Commuter Rail Operations Center	Transit Vehicle Equipment	alarm acknowledge	Planned
Commuter Rail Operations Center	Transit Vehicle Equipment	request for vehicle measures	Planned
Commuter Rail Operations Center	Transit Vehicle Equipment	transit schedule information	Planned
Commuter Rail Operations Center	Transit Vehicle Equipment	transit vehicle operator information	Planned
Condition Acquisition and Reporting System (CARS)	511 Telephone Information Service	emergency traveler information	Planned
Condition Acquisition and Reporting System (CARS)	511 Telephone Information Service	incident information	Planned
Condition Acquisition and Reporting System (CARS)	511 Telephone Information Service	multimodal information	Planned
Condition Acquisition and Reporting System (CARS)	511 Telephone Information Service	parking information	Planned
Condition Acquisition and Reporting System (CARS)	511 Telephone Information Service	road network conditions	Planned
Condition Acquisition and Reporting System (CARS)	511 Telephone Information Service	traffic images	Planned
Condition Acquisition and Reporting System (CARS)	511 Telephone Information Service	transit service information	Planned
Condition Acquisition and Reporting System (CARS)	511 Telephone Information Service	voice-based alert notification	Existing
Condition Acquisition and Reporting System (CARS)	511 Telephone Information Service	voice-based traveler information	Existing

Source Element	Destination Element	Flow Name	Flow Status
Condition Acquisition and Reporting System (CARS)	511 Traveler Information Website	emergency traveler information	Existing
Condition Acquisition and Reporting System (CARS)	511 Traveler Information Website	incident information	Existing
Condition Acquisition and Reporting System (CARS)	511 Traveler Information Website	multimodal information	Existing
Condition Acquisition and Reporting System (CARS)	511 Traveler Information Website	parking information	Existing
Condition Acquisition and Reporting System (CARS)	511 Traveler Information Website	road network conditions	Existing
Condition Acquisition and Reporting System (CARS)	511 Traveler Information Website	traffic images	Existing
Condition Acquisition and Reporting System (CARS)	511 Traveler Information Website	transit service information	Existing
Condition Acquisition and Reporting System (CARS)	511 Traveler Information Website	work zone information	Existing
Condition Acquisition and Reporting System (CARS)	911 Dispatch Center	transportation information for operations	Planned
Condition Acquisition and Reporting System (CARS)	Airport	alert status	Existing
Condition Acquisition and Reporting System (CARS)	Automated Permit Routing System	emergency traveler information	Planned
Condition Acquisition and Reporting System (CARS)	Automated Permit Routing System	incident information	Planned
Condition Acquisition and Reporting System (CARS)	Automated Permit Routing System	multimodal information	Planned
Condition Acquisition and Reporting System (CARS)	Automated Permit Routing System	parking information	Planned
Condition Acquisition and Reporting System (CARS)	Automated Permit Routing System	road network conditions	Planned
Condition Acquisition and Reporting System (CARS)	Automated Permit Routing System	traffic images	Planned
Condition Acquisition and Reporting System (CARS)	Automated Permit Routing System	transit service information	Planned
Condition Acquisition and Reporting System (CARS)	Minnesota State Patrol District Office	transportation information for operations	Planned
Condition Acquisition and Reporting System (CARS)	Neighboring State CARS / Roadway Information Systems	emergency traveler information	Existing
Condition Acquisition and Reporting System (CARS)	Neighboring State CARS / Roadway Information Systems	incident information	Existing
Condition Acquisition and Reporting System (CARS)	Neighboring State CARS / Roadway Information Systems	multimodal information	Existing

Source Element	Destination Element	Flow Name	Flow Status
Condition Acquisition and Reporting System (CARS)	Neighboring State CARS / Roadway Information Systems	parking information	Existing
Condition Acquisition and Reporting System (CARS)	Neighboring State CARS / Roadway Information Systems	road network conditions	Existing
Condition Acquisition and Reporting System (CARS)	Neighboring State CARS / Roadway Information Systems	traffic images	Existing
Condition Acquisition and Reporting System (CARS)	Neighboring State CARS / Roadway Information Systems	transit service information	Existing
Condition Acquisition and Reporting System (CARS)	North/West Passage Corridor Traveler Information Website	emergency traveler information	Planned
Condition Acquisition and Reporting System (CARS)	North/West Passage Corridor Traveler Information Website	incident information	Planned
Condition Acquisition and Reporting System (CARS)	North/West Passage Corridor Traveler Information Website	multimodal information	Planned
Condition Acquisition and Reporting System (CARS)	North/West Passage Corridor Traveler Information Website	parking information	Planned
Condition Acquisition and Reporting System (CARS)	North/West Passage Corridor Traveler Information Website	road network conditions	Planned
Condition Acquisition and Reporting System (CARS)	North/West Passage Corridor Traveler Information Website	traffic images	Planned
Condition Acquisition and Reporting System (CARS)	North/West Passage Corridor Traveler Information Website	transit service information	Planned
Condition Acquisition and Reporting System (CARS)	RTMC	transportation information for operations	Planned
Condition Acquisition and Reporting System (CARS)	RWIS Central Control System	archive requests	Planned
Condition Acquisition and Reporting System (CARS)	RWIS Central Control System	archive status	Planned
Condition Acquisition and Reporting System (CARS)	Transportation Information System (TIS)	archive coordination	Existing
Condition Acquisition and Reporting System (CARS)	Transportation Information System (TIS)	maint and constr archive data	Existing
Condition Acquisition and Reporting System (CARS)	Traveler Information and Parking Kiosks	interactive traveler information	Planned
County Emergency Operations Centers	911 Dispatch Center	incident response coordination	Existing
County Emergency Operations Centers	Event Promoters	event confirmation	Existing
County Emergency Operations Centers	Maintenance and Construction Management Center	emergency route request	Existing
County Emergency Operations Centers	Maintenance and Construction Management Center	emergency traffic control request	Existing
County Emergency Operations Centers	Maintenance and Construction Management Center	incident information	Existing

Source Element	Destination Element	Flow Name	Flow Status
County Emergency Operations Centers	Maintenance and Construction Management Center	incident response status	Existing
County Emergency Operations Centers	Maintenance and Construction Management Center	maint and constr resource request	Existing
County Emergency Operations Centers	Maintenance and Construction Management Center	resource request	Existing
County Emergency Operations Centers	Media Outlets	incident information for media	Existing
County Emergency Operations Centers	Metro Area Transit Management Centers	emergency transit service request	Existing
County Emergency Operations Centers	Minnesota State Emergency Operations Center (SEOC)	alert notification coordination	Existing
County Emergency Operations Centers	Minnesota State Emergency Operations Center (SEOC)	emergency plan coordination	Existing
County Emergency Operations Centers	Minnesota State Emergency Operations Center (SEOC)	evacuation coordination	Existing
County Emergency Operations Centers	Minnesota State Emergency Operations Center (SEOC)	incident command information coordination	Existing
County Emergency Operations Centers	Minnesota State Emergency Operations Center (SEOC)	incident response coordination	Existing
County Emergency Operations Centers	Minnesota State Patrol Databases	emergency archive data	Planned
County Emergency Operations Centers	Private Fleet and Freight Management Center	hazmat information request	Existing
County Sheriff and City Police Offices	911 Dispatch Center	incident response coordination	Existing
County Sheriff and City Police Offices	Intercity Transit Management Centers	incident response status	Planned
County Sheriff and City Police Offices	Local Transit Management Centers	incident response status	Planned
County Sheriff and City Police Offices	Maintenance and Construction Management Center	alert notification	Existing
County Sheriff and City Police Offices	Maintenance and Construction Management Center	evacuation information	Existing
County Sheriff and City Police Offices	Maintenance and Construction Management Center	incident information	Existing
County Sheriff and City Police Offices	Metro Area Transit Management Centers	incident response status	Planned
County Sheriff and City Police Offices	Minnesota State Patrol District Office	incident command information coordination	Existing
County Sheriff and City Police Offices	Minnesota State Patrol District Office	incident response coordination	Existing

Source Element	Destination Element	Flow Name	Flow Status
County Sheriff and City Police Offices	Transit Center and Station Surveillance System Roadside Equipment	secure area surveillance control	Planned
Data Distribution Server	Local TMCs	archived data products	Existing
Data Distribution Server	Maintenance and Construction Management Center	archived data products	Existing
Data Distribution Server	Metro Area Transit Management Centers	archived data products	Existing
Data Distribution Server	Minneapolis TMC	archived data products	Existing
Data Distribution Server	TOCCs	archived data products	Existing
Driver	Vehicle	driver inputs	Planned
Dynamic Late Merge Central Control System	Dynamic Late Merge Roadside Equipment	roadway information system data	Existing
Dynamic Late Merge Central Control System	Maintenance and Construction Management Center	work zone information	Planned
Dynamic Late Merge Central Control System	RTMC	work zone information	Planned
Dynamic Late Merge Central Control System	TOCCs	work zone information	Planned
Dynamic Late Merge Roadside Equipment	Driver	driver information	Existing
Dynamic Late Merge Roadside Equipment	Dynamic Late Merge Central Control System	field device status	Existing
Dynamic Late Merge Roadside Equipment	Dynamic Late Merge Central Control System	roadway information system status	Existing
Dynamic Message Sign Roadside Equipment	Driver	driver information	Existing
Dynamic Message Sign Roadside Equipment	Intelligent Work Zone System Roadside Equipment	roadway equipment coordination	Existing
Dynamic Message Sign Roadside Equipment	Local TMCs	roadway information system status	Planned
Dynamic Message Sign Roadside Equipment	Maintenance and Construction Management Center	speed monitoring information	Planned
Dynamic Message Sign Roadside Equipment	Minneapolis TMC	roadway information system status	Existing
Dynamic Message Sign Roadside Equipment	Neighboring State Traffic Management Centers	roadway information system status	Planned
Dynamic Message Sign Roadside Equipment	RTMC	roadway information system status	Existing
Dynamic Message Sign Roadside Equipment	Speed Monitoring Roadside Equipment	roadway equipment coordination	Planned

Source Element	Destination Element	Flow Name	Flow Status
Dynamic Message Sign Roadside Equipment	TOCCs	roadway information system status	Existing
Emergency Vehicle Equipment	911 Dispatch Center	emergency dispatch response	Existing
Emergency Vehicle Equipment	911 Dispatch Center	emergency vehicle tracking data	Existing
Emergency Vehicle Equipment	911 Dispatch Center	incident status	Existing
Emergency Vehicle Equipment	Minnesota State Patrol District Office	emergency dispatch response	Existing
Emergency Vehicle Equipment	Minnesota State Patrol District Office	emergency vehicle tracking data	Existing
Emergency Vehicle Equipment	Minnesota State Patrol District Office	incident status	Existing
Emergency Vehicle Equipment	RTMC	emergency dispatch response	Existing
Emergency Vehicle Equipment	RTMC	emergency vehicle tracking data	Existing
Emergency Vehicle Equipment	TOCCs	emergency dispatch response	Existing
Emergency Vehicle Equipment	TOCCs	emergency vehicle tracking data	Existing
Emergency Vehicle Equipment	Traffic Signal Roadside Equipment	local signal preemption request	Existing
Event Promoters	County Emergency Operations Centers	event plans	Existing
Event Promoters	Minneapolis TMC	event plans	Existing
Event Promoters	Minnesota State Patrol District Office	event plans	Existing
Event Promoters	RTMC	event plans	Existing
Event Promoters	TOCCs	event plans	Existing
FAST Compliance Management System	Commercial Vehicle Administration Center	border clearance event	Existing
FAST Compliance Management System	Commercial Vehicles	pass/pull-in	Existing
FAST Compliance Management System	Commercial Vehicles	request tag data	Existing
FIRST Emergency Vehicles	Automated Crash Notification System	emergency dispatch response	Planned
FIRST Emergency Vehicles	Automated Crash Notification System	emergency vehicle tracking data	Planned
FIRST Emergency Vehicles	Automated Crash Notification System	incident status	Planned
FIRST Emergency Vehicles	RTMC	emergency dispatch response	Existing

Source Element	Destination Element	Flow Name	Flow Status
FIRST Emergency Vehicles	RTMC	emergency vehicle tracking data	Existing
FIRST Emergency Vehicles	RTMC	incident status	Existing
Highway Advisory Radio Roadside Equipment	Driver	driver information	Existing
Highway Advisory Radio Roadside Equipment	RTMC	roadway information system status	Existing
Highway Advisory Radio Roadside Equipment	TOCCs	roadway information system status	Existing
IFTA Clearinghouse	Minnesota CVIEW	credential fee coordination	Existing
IFTA Clearinghouse	Minnesota CVIEW	credentials information	Existing
IFTA Clearinghouse	Minnesota CVIEW	credentials status information	Existing
IFTA Clearinghouse	Minnesota CVIEW	safety inspection report	Existing
IFTA Clearinghouse	Minnesota CVO Online	credential fee coordination	Existing
IFTA Clearinghouse	Minnesota CVO Online	credentials information	Existing
IFTA Clearinghouse	Minnesota CVO Online	credentials status information	Existing
IFTA Clearinghouse	Truck Center	credential fee coordination	Existing
IFTA Clearinghouse	Truck Center	credentials information	Existing
IFTA Clearinghouse	Truck Center	credentials status information	Existing
IFTA Clearinghouse	Truck Center	safety inspection report	Existing
In Vehicle Signing Roadside Equipment	In Vehicle Signing Vehicle Equipment	driver information	Existing
In Vehicle Signing Roadside Equipment	In Vehicle Signing Vehicle Equipment	vehicle signage data	Planned
In Vehicle Signing Vehicle Equipment	Driver	driver updates	Planned
Infrastructure GIS Database Systems	Maintenance and Construction Management Center	asset inventory	Planned
Infrastructure GIS Database Systems	Maintenance and Construction Management Center	asset restrictions	Planned
Infrastructure GIS Database Systems	Maintenance and Construction Management Center	maintenance and repair needs	Planned
Infrastructure GIS Database Systems	RTMC	asset inventory	Planned

Source Element	Destination Element	Flow Name	Flow Status
Infrastructure GIS Database Systems	RTMC	asset restrictions	Planned
Infrastructure GIS Database Systems	RTMC	maintenance and repair needs	Planned
Infrastructure GIS Database Systems	TOCCs	asset inventory	Planned
Infrastructure GIS Database Systems	TOCCs	asset restrictions	Planned
Infrastructure GIS Database Systems	TOCCs	maintenance and repair needs	Planned
Intelligent Work Zone System Roadside Equipment	Dynamic Message Sign Roadside Equipment	roadway equipment coordination	Planned
Intelligent Work Zone System Roadside Equipment	Maintenance and Construction Field Personnel	work zone warning	Planned
Intelligent Work Zone System Roadside Equipment	Maintenance and Construction Management Center	roadway treatment system status	Planned
Intelligent Work Zone System Roadside Equipment	Maintenance and Construction Management Center	work zone warning status	Planned
Intelligent Work Zone System Roadside Equipment	Maintenance and Construction Vehicle Equipment	roadway information system status	Planned
Intelligent Work Zone System Roadside Equipment	Queue Detection Roadside Equipment	roadway equipment coordination	Existing
Intelligent Work Zone System Roadside Equipment	RTMC	field device status	Existing
Intelligent Work Zone System Roadside Equipment	RTMC	roadway information system status	Existing
Intelligent Work Zone System Roadside Equipment	RTMC	work zone warning status	Existing
Intelligent Work Zone System Roadside Equipment	TOCCs	roadway information system status	Planned
Intelligent Work Zone System Roadside Equipment	TOCCs	work zone warning status	Planned
Intercity Transit Management Centers	County Sheriff and City Police Offices	transit emergency data	Planned
Intercity Transit Management Centers	Local Transit Management Centers	transit service coordination	Planned
Intercity Transit Management Centers	Real-Time Bus Arrival Time Display Roadside Equipment	transit traveler information	Planned
Intercity Transit Management Centers	Transit Center and Station Surveillance System Roadside Equipment	secure area surveillance control	Planned
Intercity Transit Management Centers	Transit Information Telephone Systems	personal transit information	Planned
Intercity Transit Management Centers	Transit Information Websites	transit and fare schedules	Planned

Source Element	Destination Element	Flow Name	Flow Status
Intercity Transit Management Centers	Transit Kiosks	transit traveler information	Planned
Intercity Transit Management Centers	Transit Vehicle Equipment	alarm acknowledge	Planned
Intercity Transit Management Centers	Transit Vehicle Equipment	transit schedule information	Existing
Intercity Transit Management Centers	User Personal Portable and Computing Devices	personal transit information	Planned
Intermodal Freight Depots	Private Fleet and Freight Management Center	freight transportation status	Planned
Intersection Collision Warning Roadside Equipment	Driver	driver information	Planned
Intersection Collision Warning Roadside Equipment	Driver	intersection warning	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	automated roadway status	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	barrier system status	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	environmental probe data	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	environmental sensor data	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	field device status	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	hov data	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	hri status	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	infrastructure monitoring sensor data	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	intersection blockage notification	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	lighting system status	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	reversible lane status	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	right-of-way request notification	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	roadway information system status	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	roadway treatment system status	Planned

Source Element	Destination Element	Flow Name	Flow Status
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	safeguard system status	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	short range communications status	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	signal control status	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	signal fault data	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	speed monitoring information	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	traffic flow	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	traffic images	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	traffic metering status	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	traffic probe data	Planned
Intersection Collision Warning Roadside Equipment	Maintenance and Construction Management Center	work zone warning status	Planned
IRP Clearinghouse	Minnesota CVIEW	credential fee coordination	Existing
IRP Clearinghouse	Minnesota CVIEW	credentials information	Existing
IRP Clearinghouse	Minnesota CVIEW	credentials status information	Existing
IRP Clearinghouse	Minnesota CVIEW	safety inspection report	Planned
IRP Clearinghouse	Minnesota CVO Online	credential fee coordination	Existing
IRP Clearinghouse	Minnesota CVO Online	credentials information	Existing
IRP Clearinghouse	Minnesota CVO Online	credentials status information	Existing
IRP Clearinghouse	Truck Center	border clearance status	Existing
IRP Clearinghouse	Truck Center	credential fee coordination	Existing
IRP Clearinghouse	Truck Center	credentials information	Existing
IRP Clearinghouse	Truck Center	credentials status information	Existing
IRP Clearinghouse	Truck Center	safety inspection report	Existing

Source Element	Destination Element	Flow Name	Flow Status
Lane Control Roadside Equipment	Driver	driver information	Existing
Lane Control Roadside Equipment	RTMC	roadway information system status	Existing
Lane Control Roadside Equipment	TOCCs	roadway information system status	Planned
Lane Control Roadside Equipment	Variable Speed Limit Roadside Equipment	roadway equipment coordination	Planned
Lane/Ramp Access Control Roadside Equipment	RTMC	reversible lane status	Existing
Lane/Ramp Access Control Roadside Equipment	TOCCs	barrier system status	Existing
Lane/Ramp Access Control Roadside Equipment	TOCCs	roadway information system status	Existing
Lane/Ramp Access Control Roadside Equipment	TOCCs	traffic images	Existing
Lift Bridge Traffic Control Central System	Lift Bridge Traffic Control Roadside Equipment	roadway information system data	Existing
Lift Bridge Traffic Control Central System	Lift Bridge Traffic Control Roadside Equipment	signal control commands	Existing
Lift Bridge Traffic Control Central System	Lift Bridge Traffic Control Roadside Equipment	signal control device configuration	Existing
Lift Bridge Traffic Control Central System	Lift Bridge Traffic Control Roadside Equipment	signal control plans	Existing
Lift Bridge Traffic Control Central System	Lift Bridge Traffic Control Roadside Equipment	signal system configuration	Existing
Lift Bridge Traffic Control Roadside Equipment	Driver	driver information	Planned
Lift Bridge Traffic Control Roadside Equipment	Lift Bridge Traffic Control Central System	roadway information system status	Existing
Lift Bridge Traffic Control Roadside Equipment	Lift Bridge Traffic Control Central System	signal control status	Existing
Lift Bridge Traffic Control Roadside Equipment	Lift Bridge Traffic Control Central System	signal fault data	Existing
Light Rail Operations Center	Transit Vehicle Equipment	alarm acknowledge	Existing
Light Rail Operations Center	Transit Vehicle Equipment	bad tag list	Planned
Light Rail Operations Center	Transit Vehicle Equipment	fare management information	Planned
Light Rail Operations Center	Transit Vehicle Equipment	request for vehicle measures	Planned
Light Rail Operations Center	Transit Vehicle Equipment	secure area surveillance control	Existing
Light Rail Operations Center	Transit Vehicle Equipment	transit schedule information	Existing

Source Element	Destination Element	Flow Name	Flow Status
Light Rail Operations Center	Transit Vehicle Equipment	transit traveler information	Planned
Light Rail Operations Center	Transit Vehicle Equipment	transit vehicle operator information	Existing
Local Agency Traveler Information Website	Surface Transportation Weather Service Providers	transportation weather information request	Existing
Local Agency Traveler Information Website	User Personal Portable and Computing Devices	broadcast traveler information	Existing
Local TMCs	CCTV Roadside Equipment	video surveillance control	Existing
Local TMCs	County Emergency Operations Centers	traffic image data	Existing
Local TMCs	Data Distribution Server	archived data product requests	Existing
Local TMCs	Dynamic Message Sign Roadside Equipment	roadway information system data	Planned
Local TMCs	Local Agency Traveler Information Website	road network conditions	Existing
Local TMCs	Metro Area Transit Management Centers	road network conditions	Planned
Local TMCs	Minneapolis TMC	device control request	Planned
Local TMCs	Minneapolis TMC	device data	Planned
Local TMCs	Minneapolis TMC	device status	Planned
Local TMCs	Minneapolis TMC	emergency traffic coordination	Planned
Local TMCs	Minneapolis TMC	incident information	Planned
Local TMCs	Minneapolis TMC	road network conditions	Planned
Local TMCs	Minneapolis TMC	traffic images	Planned
Local TMCs	Minnesota State Emergency Operations Center (SEOC)	incident response status	Planned
Local TMCs	Minnesota State Emergency Operations Center (SEOC)	road network conditions	Planned
Local TMCs	Minnesota State Emergency Operations Center (SEOC)	traffic images	Planned
Local TMCs	Parking Management System	parking lot data request	Existing
Local TMCs	Ramp Meter Roadside Equipment	roadway information system data	Existing
Local TMCs	RTMC	device control request	Planned
Local TMCs	RTMC	device data	Planned

Source Element	Destination Element	Flow Name	Flow Status
Local TMCs	RTMC	device status	Planned
Local TMCs	RTMC	emergency traffic coordination	Planned
Local TMCs	TOCCs	device control request	Planned
Local TMCs	TOCCs	device data	Planned
Local TMCs	TOCCs	device status	Planned
Local TMCs	TOCCs	emergency traffic coordination	Planned
Local TMCs	Traffic Data and Video Archive	archived data product requests	Planned
Local TMCs	Traffic Data and Video Archive	traffic archive data	Planned
Local TMCs	Traffic Detector Roadside Equipment	traffic sensor control	Existing
Local TMCs	Traffic Signal Roadside Equipment	signal control commands	Existing
Local TMCs	Traffic Signal Roadside Equipment	signal control device configuration	Existing
Local TMCs	Traffic Signal Roadside Equipment	signal control plans	Existing
Local TMCs	Traffic Signal Roadside Equipment	signal system configuration	Existing
Local Transit Management Centers	911 Dispatch Center	transit emergency data	Planned
Local Transit Management Centers	Account Management Providers	payment request	Existing
Local Transit Management Centers	County Sheriff and City Police Offices	transit emergency data	Planned
Local Transit Management Centers	Intercity Transit Management Centers	transit service coordination	Planned
Local Transit Management Centers	Media Outlets	transit information for media	Existing
Local Transit Management Centers	Real-Time Bus Arrival Time Display Roadside Equipment	transit traveler information	Planned
Local Transit Management Centers	RTMC	transit emergency data	Planned
Local Transit Management Centers	TOCCs	transit emergency data	Planned
Local Transit Management Centers	Transit Center and Station Surveillance System Roadside Equipment	secure area surveillance control	Planned
Local Transit Management Centers	Transit Data Archives	archived data product requests	Planned

Source Element	Destination Element	Flow Name	Flow Status
Local Transit Management Centers	Transit Data Archives	transit archive data	Planned
Local Transit Management Centers	Transit Information Telephone Systems	personal transit information	Planned
Local Transit Management Centers	Transit Information Websites	demand responsive transit plan	Planned
Local Transit Management Centers	Transit Information Websites	transit and fare schedules	Existing
Local Transit Management Centers	Transit Kiosks	transit traveler information	Planned
Local Transit Management Centers	Transit Vehicle Equipment	request for vehicle measures	Existing
Local Transit Management Centers	Transit Vehicle Equipment	transit schedule information	Existing
Local Transit Management Centers	Transit Vehicle Equipment	transit vehicle operator information	Existing
Local Transit Management Centers	Transit Vehicle Operator	route assignment	Planned
Local Transit Management Centers	User Personal Portable and Computing Devices	personal transit information	Existing
Maintenance and Construction Field Personnel	Condition Acquisition and Reporting System (CARS)	CARS data inputs	Existing
Maintenance and Construction Field Personnel	Intelligent Work Zone System Roadside Equipment	crew movements	Planned
Maintenance and Construction Management Center	Bridge Inspection / Structural Monitoring Roadside Equipment	infrastructure monitoring sensor control	Planned
Maintenance and Construction Management Center	Condition Acquisition and Reporting System (CARS)	road network conditions	Planned
Maintenance and Construction Management Center	Condition Acquisition and Reporting System (CARS)	roadway maintenance status	Planned
Maintenance and Construction Management Center	County Emergency Operations Centers	current asset restrictions	Planned
Maintenance and Construction Management Center	County Emergency Operations Centers	emergency routes	Existing
Maintenance and Construction Management Center	County Emergency Operations Centers	emergency traffic control information	Existing
Maintenance and Construction Management Center	County Emergency Operations Centers	incident information	Existing
Maintenance and Construction Management Center	County Emergency Operations Centers	incident response status	Existing
Maintenance and Construction Management Center	County Emergency Operations Centers	maint and constr resource response	Existing
Maintenance and Construction Management Center	County Emergency Operations Centers	maint and constr work plans	Planned

Source Element	Destination Element	Flow Name	Flow Status
Maintenance and Construction Management Center	County Emergency Operations Centers	roadway maintenance status	Planned
Maintenance and Construction Management Center	County Emergency Operations Centers	work zone information	Planned
Maintenance and Construction Management Center	Data Distribution Server	archived data product requests	Existing
Maintenance and Construction Management Center	Dynamic Message Sign Roadside Equipment	speed monitoring control	Planned
Maintenance and Construction Management Center	Infrastructure GIS Database Systems	asset status update	Planned
Maintenance and Construction Management Center	Intelligent Work Zone System Roadside Equipment	roadway information system data	Planned
Maintenance and Construction Management Center	Intelligent Work Zone System Roadside Equipment	work zone warning device control	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	automated roadway control data	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	barrier system control	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	environmental sensors control	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	hri control data	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	hri request	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	infrastructure monitoring sensor control	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	lighting system control data	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	reversible lane control	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	roadway information system data	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	roadway treatment system control	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	safeguard system control	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	signal control commands	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	signal control device configuration	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	signal control plans	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	signal system configuration	Planned

Source Element	Destination Element	Flow Name	Flow Status
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	speed monitoring control	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	traffic metering control	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	traffic sensor control	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	vehicle signage data	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	video surveillance control	Planned
Maintenance and Construction Management Center	Intersection Collision Warning Roadside Equipment	work zone warning device control	Planned
Maintenance and Construction Management Center	Local Transit Management Centers	current asset restrictions	Existing
Maintenance and Construction Management Center	Local Transit Management Centers	roadway maintenance status	Existing
Maintenance and Construction Management Center	Local Transit Management Centers	work zone information	Existing
Maintenance and Construction Management Center	Maintenance and Construction Vehicle Equipment	maint and constr dispatch information	Existing
Maintenance and Construction Management Center	Metro Area Transit Management Centers	alert status	Existing
Maintenance and Construction Management Center	Metro Area Transit Management Centers	current asset restrictions	Existing
Maintenance and Construction Management Center	Metro Area Transit Management Centers	roadway maintenance status	Existing
Maintenance and Construction Management Center	Metro Area Transit Management Centers	work zone information	Existing
Maintenance and Construction Management Center	Minnesota State Emergency Operations Center (SEOC)	alert status	Existing
Maintenance and Construction Management Center	Roadway Automated Treatment System	roadway treatment system control	Planned
Maintenance and Construction Management Center	RTMC	work plan coordination	Existing
Maintenance and Construction Management Center	Surface Transportation Weather Service Providers	road weather information	Existing
Maintenance and Construction Management Center	TOCCs	maint and constr resource coordination	Planned
Maintenance and Construction Management Center	TOCCs	roadway maintenance status	Planned
Maintenance and Construction Management Center	TOCCs	work plan coordination	Planned
Maintenance and Construction Management Center	TOCCs	work zone information	Planned

Source Element	Destination Element	Flow Name	Flow Status
Maintenance and Construction Vehicle Equipment	Intelligent Work Zone System Roadside Equipment	roadway information system data	Planned
Maintenance and Construction Vehicle Equipment	Maintenance and Construction Management Center	maint and constr dispatch status	Existing
Maintenance and Construction Vehicle Equipment	Maintenance and Construction Management Center	maint and constr vehicle location data	Planned
Maintenance and Construction Vehicle Equipment	Maintenance Decision Support System	maint and constr vehicle conditions	Existing
Maintenance and Construction Vehicle Equipment	Maintenance Decision Support System	maint and constr vehicle location data	Existing
Maintenance and Construction Vehicle Equipment	Maintenance Decision Support System	maint and constr vehicle operational data	Existing
Maintenance and Construction Vehicle Equipment	RTMC	maint and constr vehicle location data	Existing
Maintenance and Construction Vehicle Equipment	RWIS Central Control System	environmental sensor data	Planned
Maintenance and Construction Vehicle Equipment	TOCCs	environmental sensor data	Existing
Maintenance and Construction Vehicle Equipment	TOCCs	maint and constr dispatch status	Existing
Maintenance and Construction Vehicle Equipment	TOCCs	maint and constr vehicle location data	Existing
Maintenance and Construction Vehicle Equipment	TOCCs	maint and constr vehicle operational data	Existing
Maintenance Decision Support System	Maintenance and Construction Vehicle Equipment	maint and constr vehicle system control	Existing
Mayday System	911 Dispatch Center	incident report	Existing
Mayday System	Mayday System Vehicle Equipment	emergency acknowledge	Existing
Mayday System	Mayday System Vehicle Equipment	emergency data request	Existing
Mayday System	Minneapolis TMC	incident information	Existing
Mayday System	Minnesota State Patrol District Office	incident information	Existing
Mayday System	RTMC	incident command information coordination	Existing
Mayday System Vehicle Equipment	Mayday System	emergency notification	Existing

Source Element	Destination Element	Flow Name	Flow Status
MCMIS	Minnesota CVIEW	credentials information	Planned
MCMIS	Minnesota CVIEW	credentials status information	Planned
MCMIS	Minnesota CVIEW	safety inspection report	Planned
MCMIS	Minnesota CVIEW	safety status information	Planned
Media Information Release System	Media Outlets	traveler information for media	Existing
Media Information Release System	Minnesota State Patrol District Office	archive requests	Existing
Media Information Release System	Minnesota State Patrol District Office	archive status	Existing
Media Outlets	Maintenance and Construction Management Center	external reports	Existing
Media Outlets	Minneapolis TMC	external reports	Existing
Media Outlets	RTMC	external reports	Existing
Media Outlets	TOCCs	external reports	Existing
Metro Area Transit Management Centers	911 Dispatch Center	transit emergency data	Planned
Metro Area Transit Management Centers	Account Management Providers	payment request	Existing
Metro Area Transit Management Centers	Commuter Rail Operations Center	transit service coordination	Planned
Metro Area Transit Management Centers	County Emergency Operations Centers	emergency transit service response	Existing
Metro Area Transit Management Centers	County Sheriff and City Police Offices	transit emergency data	Planned
Metro Area Transit Management Centers	Data Distribution Server	archived data product requests	Existing
Metro Area Transit Management Centers	Dynamic Message Sign Roadside Equipment	transit traveler information	Planned
Metro Area Transit Management Centers	Media Outlets	incident information for media	Existing
Metro Area Transit Management Centers	Media Outlets	transit information for media	Existing
Metro Area Transit Management Centers	Minneapolis TMC	incident information	Planned
Metro Area Transit Management Centers	Real-Time Bus Arrival Time Display Roadside Equipment	transit traveler information	Existing
Metro Area Transit Management Centers	Real-Time Transit Travel Time Notification	transit travel time estimates	Existing

Source Element	Destination Element	Flow Name	Flow Status
Metro Area Transit Management Centers	Transit Center and Station Surveillance System Roadside Equipment	secure area surveillance control	Existing
Metro Area Transit Management Centers	Transit Data Archives	archived data product requests	Planned
Metro Area Transit Management Centers	Transit Data Archives	transit archive data	Planned
Metro Area Transit Management Centers	Transit Information Websites	transit and fare schedules	Existing
Metro Area Transit Management Centers	Transit Kiosks	transit fare information	Existing
Metro Area Transit Management Centers	Transit Kiosks	transit traveler information	Existing
Metro Area Transit Management Centers	Transit Vehicle Equipment	alarm acknowledge	Existing
Metro Area Transit Management Centers	Transit Vehicle Equipment	bad tag list	Existing
Metro Area Transit Management Centers	Transit Vehicle Equipment	fare management information	Existing
Metro Area Transit Management Centers	Transit Vehicle Equipment	request for vehicle measures	Existing
Metro Area Transit Management Centers	Transit Vehicle Equipment	transit schedule information	Existing
Metro Area Transit Management Centers	Transit Vehicle Equipment	transit vehicle operator information	Existing
Metro Area Transit Management Centers	Transit Vehicle Operator	route assignment	Planned
Metro Area Transit Management Centers	User Personal Portable and Computing Devices	personal transit information	Existing
Minneapolis TMC	CCTV Roadside Equipment	video surveillance control	Existing
Minneapolis TMC	Data Distribution Server	archived data product requests	Existing
Minneapolis TMC	Dynamic Message Sign Roadside Equipment	roadway information system data	Existing
Minneapolis TMC	Event Promoters	event confirmation	Existing
Minneapolis TMC	Metro Area Transit Management Centers	incident information	Planned
Minneapolis TMC	Metro Area Transit Management Centers	road network conditions	Planned
Minneapolis TMC	Parking Management System	parking lot data request	Existing
Minneapolis TMC	RTMC	alert status	Existing
Minneapolis TMC	RTMC	device control request	Planned

Source Element	Destination Element	Flow Name	Flow Status
Minneapolis TMC	RTMC	device data	Planned
Minneapolis TMC	RTMC	device status	Planned
Minneapolis TMC	RTMC	emergency plan coordination	Planned
Minneapolis TMC	RTMC	emergency routes	Existing
Minneapolis TMC	RTMC	emergency traffic control information	Existing
Minneapolis TMC	RTMC	emergency traffic coordination	Planned
Minneapolis TMC	RTMC	incident information	Planned
Minneapolis TMC	RTMC	maint and constr resource request	Planned
Minneapolis TMC	RTMC	resource request	Planned
Minneapolis TMC	Traffic Detector Roadside Equipment	traffic sensor control	Existing
Minneapolis TMC	Traffic Signal Roadside Equipment	signal control commands	Planned
Minneapolis TMC	Traffic Signal Roadside Equipment	signal control device configuration	Planned
Minneapolis TMC	Traffic Signal Roadside Equipment	signal control plans	Planned
Minneapolis TMC	Traffic Signal Roadside Equipment	signal system configuration	Planned
Minneapolis TMC	Transportation Information System (TIS)	archive analysis requests	Planned
Minneapolis TMC	Transportation Information System (TIS)	archived data product requests	Planned
Minnesota CVIEW	Account Management Providers	payment request	Existing
Minnesota CVIEW	CVO Information Requestor	cv driver record	Existing
Minnesota CVIEW	IFTA Clearinghouse	credential fee coordination	Existing
Minnesota CVIEW	IFTA Clearinghouse	credentials information	Existing
Minnesota CVIEW	IFTA Clearinghouse	credentials status information	Existing
Minnesota CVIEW	IFTA Clearinghouse	safety inspection report	Planned
Minnesota CVIEW	IRP Clearinghouse	credential fee coordination	Existing
Minnesota CVIEW	IRP Clearinghouse	credentials information	Existing
Minnesota CVIEW	IRP Clearinghouse	credentials status information	Existing

Source Element	Destination Element	Flow Name	Flow Status
Minnesota CVIEW	IRP Clearinghouse	safety inspection report	Planned
Minnesota CVIEW	MCMIS	credentials information	Planned
Minnesota CVIEW	MCMIS	credentials status information	Planned
Minnesota CVIEW	MCMIS	safety inspection report	Planned
Minnesota CVIEW	MCMIS	safety status information	Planned
Minnesota CVIEW	PRISM	safety inspection report	Existing
Minnesota CVIEW	PRISM	safety status information	Existing
Minnesota CVIEW	SAFER	safety inspection report	Existing
Minnesota CVIEW	SAFER	safety status information	Existing
Minnesota CVO Online	Account Management Providers	payment request	Existing
Minnesota CVO Online	IFTA Clearinghouse	credential fee coordination	Existing
Minnesota CVO Online	IFTA Clearinghouse	credentials information	Existing
Minnesota CVO Online	IFTA Clearinghouse	credentials status information	Existing
Minnesota CVO Online	IRP Clearinghouse	credential fee coordination	Existing
Minnesota CVO Online	IRP Clearinghouse	credentials information	Existing
Minnesota CVO Online	IRP Clearinghouse	credentials status information	Existing
Minnesota Emergency Alert System	Minnesota State Patrol District Office	alerts and advisories	Existing
Minnesota Emergency Alert System	RTMC	alerts and advisories	Existing
Minnesota Emergency Alert System	TOCCs	alerts and advisories	Existing
Minnesota State Emergency Operations Center (SEOC)	511 Traveler Information Website	incident information	Existing
Minnesota State Emergency Operations Center (SEOC)	911 Dispatch Center	incident response coordination	Existing
Minnesota State Emergency Operations Center (SEOC)	County Emergency Operations Centers	alert notification coordination	Existing
Minnesota State Emergency Operations Center (SEOC)	County Emergency Operations Centers	emergency plan coordination	Existing

Source Element	Destination Element	Flow Name	Flow Status
Minnesota State Emergency Operations Center (SEOC)	County Emergency Operations Centers	evacuation coordination	Existing
Minnesota State Emergency Operations Center (SEOC)	County Emergency Operations Centers	incident command information coordination	Existing
Minnesota State Emergency Operations Center (SEOC)	County Emergency Operations Centers	incident response coordination	Existing
Minnesota State Emergency Operations Center (SEOC)	Local Agency Traveler Information Website	incident information	Existing
Minnesota State Emergency Operations Center (SEOC)	Local TMCs	incident information	Planned
Minnesota State Emergency Operations Center (SEOC)	Local TMCs	resource request	Planned
Minnesota State Emergency Operations Center (SEOC)	Local Transit Management Centers	alert notification	Planned
Minnesota State Emergency Operations Center (SEOC)	Maintenance and Construction Management Center	alert notification	Existing
Minnesota State Emergency Operations Center (SEOC)	Media Outlets	incident information for media	Existing
Minnesota State Emergency Operations Center (SEOC)	Metro Area Transit Management Centers	alert notification	Existing
Minnesota State Emergency Operations Center (SEOC)	Minnesota State Patrol Databases	emergency archive data	Planned
Minnesota State Emergency Operations Center (SEOC)	Minnesota State Patrol District Office	alert notification	Existing
Minnesota State Emergency Operations Center (SEOC)	Minnesota State Patrol District Office	alert notification coordination	Existing
Minnesota State Emergency Operations Center (SEOC)	Minnesota State Patrol District Office	emergency route request	Existing
Minnesota State Emergency Operations Center (SEOC)	Minnesota State Patrol District Office	incident command information coordination	Existing
Minnesota State Emergency Operations Center (SEOC)	Neighboring State Emergency Management Agencies	incident response coordination	Existing
Minnesota State Emergency Operations Center (SEOC)	Neighboring State Emergency Management Agencies	resource coordination	Existing
Minnesota State Emergency Operations Center (SEOC)	North/West Passage Corridor Traveler Information Website	incident information	Planned
Minnesota State Emergency Operations Center (SEOC)	Private Fleet and Freight Management Center	hazmat information request	Existing
Minnesota State Emergency Operations Center (SEOC)	RTMC	emergency traffic control request	Existing
Minnesota State Emergency Operations Center (SEOC)	RTMC	evacuation information	Existing

Source Element	Destination Element	Flow Name	Flow Status
Minnesota State Emergency Operations Center (SEOC)	RTMC	incident information	Existing
Minnesota State Emergency Operations Center (SEOC)	RTMC	incident response status	Existing
Minnesota State Emergency Operations Center (SEOC)	RTMC	resource request	Existing
Minnesota State Emergency Operations Center (SEOC)	RTMC	threat information	Existing
Minnesota State Emergency Operations Center (SEOC)	RTMC	transportation system status	Existing
Minnesota State Patrol Databases	911 Dispatch Center	archive requests	Planned
Minnesota State Patrol Databases	911 Dispatch Center	archive status	Planned
Minnesota State Patrol Databases	County Emergency Operations Centers	archive requests	Planned
Minnesota State Patrol Databases	County Emergency Operations Centers	archive status	Planned
Minnesota State Patrol Databases	Minnesota State Emergency Operations Center (SEOC)	archive requests	Planned
Minnesota State Patrol Databases	Minnesota State Emergency Operations Center (SEOC)	archive status	Planned
Minnesota State Patrol District Office	Automated Crash Notification System	incident report	Planned
Minnesota State Patrol District Office	Condition Acquisition and Reporting System (CARS)	incident information	Existing
Minnesota State Patrol District Office	Condition Acquisition and Reporting System (CARS)	road network conditions	Planned
Minnesota State Patrol District Office	County Sheriff and City Police Offices	incident command information coordination	Existing
Minnesota State Patrol District Office	County Sheriff and City Police Offices	incident response coordination	Existing
Minnesota State Patrol District Office	Emergency Vehicle Equipment	emergency dispatch requests	Existing
Minnesota State Patrol District Office	Event Promoters	event confirmation	Existing
Minnesota State Patrol District Office	Media Information Release System	emergency archive data	Existing
Minnesota State Patrol District Office	Media Information Release System	incident information	Existing
Minnesota State Patrol District Office	Minnesota State Emergency Operations Center (SEOC)	alert notification coordination	Existing
Minnesota State Patrol District Office	Minnesota State Emergency Operations Center (SEOC)	alert status	Existing

Source Element	Destination Element	Flow Name	Flow Status
Minnesota State Patrol District Office	Minnesota State Emergency Operations Center (SEOC)	emergency routes	Existing
Minnesota State Patrol District Office	Minnesota State Emergency Operations Center (SEOC)	incident command information coordination	Existing
Minnesota State Patrol District Office	Minnesota State Patrol Databases	emergency archive data	Existing
Minnesota State Patrol District Office	Neighboring State Emergency Management Agencies	alert notification coordination	Existing
Minnesota State Patrol District Office	Neighboring State Emergency Management Agencies	emergency plan coordination	Existing
Minnesota State Patrol District Office	Neighboring State Emergency Management Agencies	evacuation coordination	Existing
Minnesota State Patrol District Office	Neighboring State Emergency Management Agencies	resource coordination	Existing
Minnesota State Patrol District Office	Private Fleet and Freight Management Center	hazmat information request	Existing
Minnesota State Patrol District Office	RTMC	incident information	Existing
Minnesota State Patrol District Office	RTMC	incident report	Existing
Minnesota State Patrol District Office	RTMC	incident response status	Existing
Minnesota State Patrol District Office	RTMC	traffic images	Existing
Minnesota State Patrol District Office	TOCCs	incident report	Existing
Minnesota State Patrol District Office	Variable Speed Limit Roadside Equipment	roadway information system data	Planned
MnPASS Roadside Equipment	MnPASS Service Center	toll transactions	Existing
MnPASS Roadside Equipment	MnPASS Vehicle Equipment	vehicle payment request	Existing
MnPASS Roadside Equipment	MnPASS Vehicle Equipment	vehicle payment update	Existing
MnPASS Roadside Equipment	RTMC	reversible lane status	Existing
MnPASS Roadside Equipment	RTMC	roadway information system status	Existing
MnPASS Service Center	511 Traveler Information Website	toll data	Planned
MnPASS Service Center	Account Management Providers	payment request	Existing
MnPASS Service Center	MnPASS Roadside Equipment	toll instructions	Existing
MnPASS Vehicle Equipment	Emergency Vehicle Equipment	tag confirmation	Existing

Source Element	Destination Element	Flow Name	Flow Status
MnPASS Vehicle Equipment	MnPASS Roadside Equipment	vehicle payment information	Existing
MnPASS Vehicle Equipment	Vehicle	payment	Existing
Motor Carrier Registration System	Truck Center	credentials information	Existing
National Weather Service	511 Telephone Information Service	weather information	Existing
National Weather Service	511 Traveler Information Website	weather information	Existing
National Weather Service	Condition Acquisition and Reporting System (CARS)	weather information	Existing
National Weather Service	County Emergency Operations Centers	weather information	Existing
National Weather Service	Local Agency Traveler Information Website	weather information	Existing
National Weather Service	Minneapolis TMC	weather information	Existing
National Weather Service	Minnesota State Patrol District Office	weather information	Existing
National Weather Service	RTMC	weather information	Existing
National Weather Service	TOCCs	weather information	Existing
National Weather Service	Truck Center	weather information	Existing
Neighboring State CARS / Roadway Information Systems	Condition Acquisition and Reporting System (CARS)	emergency traveler information	Existing
Neighboring State CARS / Roadway Information Systems	Condition Acquisition and Reporting System (CARS)	incident information	Existing
Neighboring State CARS / Roadway Information Systems	Condition Acquisition and Reporting System (CARS)	multimodal information	Existing
Neighboring State CARS / Roadway Information Systems	Condition Acquisition and Reporting System (CARS)	parking information	Existing
Neighboring State CARS / Roadway Information Systems	Condition Acquisition and Reporting System (CARS)	road network conditions	Existing
Neighboring State CARS / Roadway Information Systems	Condition Acquisition and Reporting System (CARS)	traffic images	Existing
Neighboring State CARS / Roadway Information Systems	Condition Acquisition and Reporting System (CARS)	transit service information	Existing
Neighboring State CARS / Roadway Information Systems	North/West Passage Corridor Traveler Information Website	emergency traveler information	Planned
Neighboring State CARS / Roadway Information Systems	North/West Passage Corridor Traveler Information Website	incident information	Planned
Neighboring State CARS / Roadway Information Systems	North/West Passage Corridor Traveler Information Website	multimodal information	Planned
Neighboring State CARS / Roadway Information Systems	North/West Passage Corridor Traveler Information Website	parking information	Planned

Source Element	Destination Element	Flow Name	Flow Status
Neighboring State CARS / Roadway Information Systems	North/West Passage Corridor Traveler Information Website	road network conditions	Planned
Neighboring State CARS / Roadway Information Systems	North/West Passage Corridor Traveler Information Website	traffic images	Planned
Neighboring State CARS / Roadway Information Systems	North/West Passage Corridor Traveler Information Website	transit service information	Planned
Neighboring State Emergency Management Agencies	Minnesota State Emergency Operations Center (SEOC)	incident response coordination	Existing
Neighboring State Emergency Management Agencies	Minnesota State Emergency Operations Center (SEOC)	resource coordination	Existing
Neighboring State Emergency Management Agencies	Minnesota State Patrol District Office	alert notification coordination	Existing
Neighboring State Emergency Management Agencies	Minnesota State Patrol District Office	emergency plan coordination	Existing
Neighboring State Emergency Management Agencies	Minnesota State Patrol District Office	evacuation coordination	Existing
Neighboring State Emergency Management Agencies	Minnesota State Patrol District Office	resource coordination	Existing
Neighboring State Traffic Management Centers	Dynamic Message Sign Roadside Equipment	roadway information system data	Planned
Neighboring State Traffic Management Centers	TOCCs	device control request	Planned
Neighboring State Traffic Management Centers	TOCCs	device data	Planned
Neighboring State Traffic Management Centers	TOCCs	device status	Planned
Neighboring State Traffic Management Centers	TOCCs	emergency traffic coordination	Existing
Neighboring State Traffic Management Centers Roadside Equipment	TOCCs	roadway information system status	Planned
Neighboring State Traffic Management Centers Roadside Equipment	TOCCs	traffic images	Planned
North/West Passage Corridor Traveler Information Website	511 Traveler Information Website	emergency traveler information	Planned
North/West Passage Corridor Traveler Information Website	511 Traveler Information Website	incident information	Planned
North/West Passage Corridor Traveler Information Website	511 Traveler Information Website	multimodal information	Planned
North/West Passage Corridor Traveler Information Website	511 Traveler Information Website	parking information	Planned
North/West Passage Corridor Traveler Information Website	511 Traveler Information Website	road network conditions	Planned

Source Element	Destination Element	Flow Name	Flow Status
North/West Passage Corridor Traveler Information Website	511 Traveler Information Website	traffic images	Planned
North/West Passage Corridor Traveler Information Website	511 Traveler Information Website	transit service information	Planned
North/West Passage Corridor Traveler Information Website	Condition Acquisition and Reporting System (CARS)	emergency traveler information	Planned
North/West Passage Corridor Traveler Information Website	Condition Acquisition and Reporting System (CARS)	incident information	Planned
North/West Passage Corridor Traveler Information Website	Condition Acquisition and Reporting System (CARS)	multimodal information	Planned
North/West Passage Corridor Traveler Information Website	Condition Acquisition and Reporting System (CARS)	parking information	Planned
North/West Passage Corridor Traveler Information Website	Condition Acquisition and Reporting System (CARS)	road network conditions	Planned
North/West Passage Corridor Traveler Information Website	Condition Acquisition and Reporting System (CARS)	traffic images	Planned
North/West Passage Corridor Traveler Information Website	Condition Acquisition and Reporting System (CARS)	transit service information	Planned
North/West Passage Corridor Traveler Information Website	Neighboring State CARS / Roadway Information Systems	emergency traveler information	Planned
North/West Passage Corridor Traveler Information Website	Neighboring State CARS / Roadway Information Systems	incident information	Planned
North/West Passage Corridor Traveler Information Website	Neighboring State CARS / Roadway Information Systems	multimodal information	Planned
North/West Passage Corridor Traveler Information Website	Neighboring State CARS / Roadway Information Systems	parking information	Planned
North/West Passage Corridor Traveler Information Website	Neighboring State CARS / Roadway Information Systems	road network conditions	Planned
North/West Passage Corridor Traveler Information Website	Neighboring State CARS / Roadway Information Systems	traffic images	Planned
North/West Passage Corridor Traveler Information Website	Neighboring State CARS / Roadway Information Systems	transit service information	Planned
North/West Passage Corridor Traveler Information Website	User Personal Portable and Computing Devices	broadcast traveler information	Planned
North/West Passage Corridor Traveler Information Website	User Personal Portable and Computing Devices	emergency traveler information	Planned
North/West Passage Corridor Traveler Information Website	User Personal Portable and Computing Devices	interactive traveler information	Planned
North/West Passage Corridor Traveler Information Website	User Personal Portable and Computing Devices	travel services information	Planned
North/West Passage Corridor Traveler Information Website	User Personal Portable and Computing Devices	trip plan	Planned
Oversize Warning Roadside Equipment	Driver	driver information	Existing

Source Element	Destination Element	Flow Name	Flow Status
Oversize Warning Roadside Equipment	TOCCs	roadway information system status	Existing
Park-and-Ride Parking Information System Roadside Equipment	Driver	driver parking information	Planned
Parking Management Roadside Equipment	Driver	driver parking information	Existing
Parking Management Roadside Equipment	Driver	roadside transaction status	Existing
Parking Management Roadside Equipment	Parking Operator	parking status	Existing
Parking Management Roadside Equipment	Traveler Cards	request for payment	Existing
Parking Management System	511 Telephone Information Service	parking information	Planned
Parking Management System	511 Traveler Information Website	parking information	Planned
Parking Management System	Driver	driver parking information	Planned
Parking Management System	Local TMCs	parking information	Existing
Parking Management System	Minneapolis TMC	parking information	Existing
Parking Management System	Parking Management Roadside Equipment	parking management data	Existing
Parking Operator	Parking Management Roadside Equipment	parking operator inputs	Existing
PRISM	Minnesota CVIEW	safety inspection report	Existing
PRISM	Minnesota CVIEW	safety status information	Existing
Private Fleet and Freight Management Center	Automated Permit Routing System	route request	Planned
Private Fleet and Freight Management Center	Commercial Vehicles	fleet to driver update	Existing
Private Fleet and Freight Management Center	County Emergency Operations Centers	hazmat information	Existing
Private Fleet and Freight Management Center	Intermodal Freight Depots	freight transportation status	Planned
Private Fleet and Freight Management Center	Minnesota State Emergency Operations Center (SEOC)	hazmat information	Existing
Private Fleet and Freight Management Center	Minnesota State Patrol District Office	hazmat information	Existing
Private Information Service Providers	User Personal Portable and Computing Devices	trip plan	Existing

Source Element	Destination Element	Flow Name	Flow Status
Private Information Service Providers	Vehicle	trip plan	Existing
Queue Detection Roadside Equipment	Intelligent Work Zone System Roadside Equipment	roadway equipment coordination	Existing
Queue Detection Roadside Equipment	Ramp Meter Roadside Equipment	roadway equipment coordination	Existing
Queue Detection Roadside Equipment	RTMC	roadway information system status	Existing
Railroad Active Warning Roadside Equipment	Driver	driver information	Existing
Railroad Active Warning Roadside Equipment	Railroad Wayside Equipment	hri operational status	Existing
Railroad Wayside Equipment	Railroad Active Warning Roadside Equipment	track status	Existing
Ramp Meter Roadside Equipment	Local TMCs	roadway information system status	Existing
Ramp Meter Roadside Equipment	Queue Detection Roadside Equipment	roadway equipment coordination	Existing
Ramp Meter Roadside Equipment	RTMC	roadway information system status	Existing
Ramp Meter Roadside Equipment	RTMC	signal control status	Existing
Ramp Meter Roadside Equipment	RTMC	signal fault data	Existing
Ramp Meter Roadside Equipment	Traffic Detector Roadside Equipment	roadway equipment coordination	Existing
Real-Time Bus Arrival Time Display Roadside Equipment	Traveler	traveler interface updates	Existing
Real-Time Transit Travel Time Notification	RTMC	roadway information system status	Planned
Red Light Monitoring/Enforcement Roadside Equipment	Minnesota State Patrol District Office	traffic violation notification	Planned
Red Light Monitoring/Enforcement Roadside Equipment	TOCCs	speed monitoring information	Planned
Research Lab Network Surveillance Archive	Research Lab Network Surveillance Roadside Equipment	data collection and monitoring control	Existing
Research Lab Network Surveillance Archive	Research Lab New Surveillance Control System	archive requests	Existing
Research Lab Network Surveillance Archive	Research Lab New Surveillance Control System	archive status	Existing
Research Lab Network Surveillance Archive	Research Lab New Surveillance Control System	data collection and monitoring control	Planned

Source Element	Destination Element	Flow Name	Flow Status
Research Lab Network Surveillance Archive	RTMC	archived data products	Planned
Research Lab Network Surveillance Roadside Equipment	Research Lab Network Surveillance Archive	roadside archive data	Existing
Research Lab Network Surveillance Roadside Equipment	Research Lab New Surveillance Control System	traffic images	Existing
Research Lab New Surveillance Control System	Research Lab Network Surveillance Archive	probe archive data	Planned
Research Lab New Surveillance Control System	Research Lab Network Surveillance Archive	roadside archive data	Planned
Research Lab New Surveillance Control System	Research Lab Network Surveillance Archive	traffic archive data	Existing
Research Lab New Surveillance Control System	Research Lab Network Surveillance Roadside Equipment	video surveillance control	Existing
Rest Area Wi-Fi	511 Traveler Information Website	emergency traveler information request	Planned
Rest Area Wi-Fi	Traveler	traveler interface updates	Planned
Rest Area Wi-Fi	User Personal Portable and Computing Devices	broadcast traveler information	Planned
Roadway Automated Treatment System	Driver	driver information	Existing
Roadway Automated Treatment System	Maintenance and Construction Management Center	roadway treatment system status	Planned
Roadway Automated Treatment System	RTMC	roadway treatment system status	Existing
Roadway Automated Treatment System	TOCCs	roadway treatment system status	Existing
Roadway Environment	Transit Vehicle Equipment	roadway characteristics	Planned
Roadway Environment	Vehicle	roadway characteristics	Planned
Roadway Flooding Warning Roadside Equipment	Driver	driver information	Existing
Roadway Flooding Warning Roadside Equipment	Maintenance and Construction Management Center	flood warning alert	Planned
Roadway Lighting Management Central Monitoring Equipment	Roadway Lighting Management Roadside Equipment	lighting system control data	Planned
Roadway Lighting Management Roadside Equipment	Roadway Lighting Management Central Monitoring Equipment	lighting system status	Planned
RTMC	511 Traveler Information Website	incident information	Existing

Source Element	Destination Element	Flow Name	Flow Status
RTMC	511 Traveler Information Website	road network conditions	Existing
RTMC	Bridge Inspection / Structural Monitoring Roadside Equipment	infrastructure monitoring sensor control	Planned
RTMC	CCTV Roadside Equipment	video surveillance control	Existing
RTMC	Condition Acquisition and Reporting System (CARS)	alert notification	Existing
RTMC	Condition Acquisition and Reporting System (CARS)	maint and constr work plans	Existing
RTMC	Condition Acquisition and Reporting System (CARS)	road network conditions	Existing
RTMC	Condition Acquisition and Reporting System (CARS)	road weather information	Existing
RTMC	Condition Acquisition and Reporting System (CARS)	work zone information	Existing
RTMC	County Emergency Operations Centers	traffic image data	Planned
RTMC	Dynamic Late Merge Roadside Equipment	work zone warning device control	Existing
RTMC	Dynamic Message Sign Roadside Equipment	roadway information system data	Existing
RTMC	Emergency Vehicle Equipment	emergency dispatch requests	Existing
RTMC	Event Promoters	event confirmation	Existing
RTMC	FIRST Emergency Vehicles	emergency dispatch requests	Existing
RTMC	FIRST Emergency Vehicles	suggested route	Existing
RTMC	Highway Advisory Radio Roadside Equipment	roadway information system data	Existing
RTMC	Infrastructure GIS Database Systems	asset status update	Planned
RTMC	Intelligent Work Zone System Roadside Equipment	roadway information system data	Existing
RTMC	Intelligent Work Zone System Roadside Equipment	work zone warning device control	Existing
RTMC	Lane Control Roadside Equipment	roadway information system data	Existing
RTMC	Lane/Ramp Access Control Roadside Equipment	reversible lane control	Existing
RTMC	Maintenance and Construction Management Center	maint and constr resource coordination	Existing

Source Element	Destination Element	Flow Name	Flow Status
RTMC	Maintenance and Construction Management Center	road network conditions	Existing
RTMC	Maintenance and Construction Management Center	work plan coordination	Existing
RTMC	Mayday System	incident command information coordination	Existing
RTMC	Media Outlets	maint and constr work plans	Existing
RTMC	Media Outlets	road weather information	Existing
RTMC	Media Outlets	roadway maintenance status	Existing
RTMC	Media Outlets	traffic information for media	Existing
RTMC	Media Outlets	traveler information for media	Existing
RTMC	Media Outlets	work zone information	Existing
RTMC	Metro Area Transit Management Centers	current asset restrictions	Existing
RTMC	Metro Area Transit Management Centers	road network conditions	Existing
RTMC	Metro Area Transit Management Centers	roadway maintenance status	Existing
RTMC	Metro Area Transit Management Centers	work zone information	Existing
RTMC	Minneapolis TMC	device control request	Planned
RTMC	Minneapolis TMC	device data	Planned
RTMC	Minneapolis TMC	device status	Planned
RTMC	Minneapolis TMC	emergency plan coordination	Planned
RTMC	Minneapolis TMC	emergency traffic control request	Existing
RTMC	Minneapolis TMC	emergency traffic coordination	Planned
RTMC	Minneapolis TMC	evacuation information	Planned
RTMC	Minneapolis TMC	incident information	Planned
RTMC	Minneapolis TMC	maint and constr resource response	Planned
RTMC	Minneapolis TMC	remote surveillance control	Planned

Source Element	Destination Element	Flow Name	Flow Status
RTMC	Minneapolis TMC	resource request	Planned
RTMC	Minneapolis TMC	road network conditions	Planned
RTMC	Minneapolis TMC	road weather information	Planned
RTMC	Minneapolis TMC	traffic images	Planned
RTMC	Minnesota State Emergency Operations Center (SEOC)	emergency traffic control information	Existing
RTMC	Minnesota State Emergency Operations Center (SEOC)	resource deployment status	Existing
RTMC	Minnesota State Emergency Operations Center (SEOC)	road network conditions	Existing
RTMC	Minnesota State Emergency Operations Center (SEOC)	road network status assessment	Existing
RTMC	Minnesota State Emergency Operations Center (SEOC)	traffic images	Existing
RTMC	Minnesota State Patrol District Office	incident information	Existing
RTMC	Minnesota State Patrol District Office	incident report	Existing
RTMC	Minnesota State Patrol District Office	road network conditions	Existing
RTMC	Minnesota State Patrol District Office	traffic violation notification	Planned
RTMC	MnPASS Roadside Equipment	reversible lane control	Existing
RTMC	North/West Passage Corridor Traveler Information Website	current asset restrictions	Planned
RTMC	North/West Passage Corridor Traveler Information Website	maint and constr work plans	Planned
RTMC	North/West Passage Corridor Traveler Information Website	road network conditions	Planned
RTMC	North/West Passage Corridor Traveler Information Website	road weather information	Planned
RTMC	North/West Passage Corridor Traveler Information Website	roadway maintenance status	Planned
RTMC	North/West Passage Corridor Traveler Information Website	work zone information	Planned
RTMC	Private Information Service Providers	incident information	Planned
RTMC	Private Information Service Providers	road network conditions	Planned
RTMC	Queue Detection Roadside Equipment	roadway information system data	Existing

Source Element	Destination Element	Flow Name	Flow Status
RTMC	Ramp Meter Roadside Equipment	signal control commands	Existing
RTMC	Ramp Meter Roadside Equipment	signal control device configuration	Existing
RTMC	Ramp Meter Roadside Equipment	signal control plans	Existing
RTMC	Ramp Meter Roadside Equipment	signal system configuration	Existing
RTMC	Real-Time Transit Travel Time Notification	roadway information system data	Planned
RTMC	Research Lab Network Surveillance Archive	archived data product requests	Planned
RTMC	Roadway Automated Treatment System	roadway treatment system control	Existing
RTMC	Security Monitoring Roadside Equipment	infrastructure monitoring sensor control	Planned
RTMC	Security Monitoring Roadside Equipment	secure area sensor control	Planned
RTMC	Security Monitoring Roadside Equipment	secure area surveillance control	Planned
RTMC	Surface Transportation Weather Service Providers	road weather information	Existing
RTMC	Traffic Data and Video Archive	archive analysis requests	Planned
RTMC	Traffic Data and Video Archive	archive coordination	Planned
RTMC	Traffic Data and Video Archive	archived data product requests	Planned
RTMC	Traffic Data and Video Archive	traffic archive data	Existing
RTMC	Traffic Detector Roadside Equipment	traffic sensor control	Existing
RTMC	Traffic Signal Roadside Equipment	signal control commands	Existing
RTMC	Traffic Signal Roadside Equipment	signal control device configuration	Existing
RTMC	Traffic Signal Roadside Equipment	signal control plans	Existing
RTMC	Traffic Signal Roadside Equipment	signal system configuration	Existing
RTMC	Transportation Information System (TIS)	archive coordination	Existing
RTMC	Transportation Information System (TIS)	maint and constr archive data	Existing
RTMC	Transportation Information System (TIS)	traffic archive data	Existing

Source Element	Destination Element	Flow Name	Flow Status
RTMC	Variable Speed Limit Roadside Equipment	roadway information system data	Planned
RTMC	Vehicle Occupancy Monitoring/Enforcement Roadside Equipment	traffic sensor control	Planned
RTMC	Vehicle Occupancy Monitoring/Enforcement Roadside Equipment	video surveillance control	Planned
RWIS Central Control System	511 Telephone Information Service	weather information	Existing
RWIS Central Control System	511 Traveler Information Website	weather information	Existing
RWIS Central Control System	Clarus Weather System	environmental conditions data	Planned
RWIS Central Control System	Condition Acquisition and Reporting System (CARS)	road weather information	Planned
RWIS Central Control System	Condition Acquisition and Reporting System (CARS)	weather information	Planned
RWIS Central Control System	Maintenance and Construction Management Center	environmental conditions data status	Planned
RWIS Central Control System	Maintenance and Construction Management Center	road weather information	Planned
RWIS Central Control System	Minnesota State Patrol District Office	weather information	Existing
RWIS Central Control System	RTMC	weather information	Existing
RWIS Central Control System	RWIS Stations	environmental sensors control	Existing
RWIS Central Control System	Surface Transportation Weather Service Providers	weather information	Existing
RWIS Central Control System	Transportation Information System (TIS)	archive coordination	Existing
RWIS Central Control System	UMD Transportation Data Research Laboratory (TDRL)	weather archive data	Existing
RWIS Stations	Clarus Weather System	environmental sensor data	Existing
RWIS Stations	RWIS Central Control System	environmental sensor data	Existing
SAFER	Minnesota CVIEW	safety inspection report	Existing
SAFER	Minnesota CVIEW	safety status information	Existing
Security Monitoring Roadside Equipment	911 Dispatch Center	infrastructure monitoring sensor data	Planned

Source Element	Destination Element	Flow Name	Flow Status
Security Monitoring Roadside Equipment	911 Dispatch Center	secure area sensor data	Planned
Security Monitoring Roadside Equipment	911 Dispatch Center	secure area surveillance data	Planned
Security Monitoring Roadside Equipment	RTMC	infrastructure monitoring sensor data	Planned
Security Monitoring Roadside Equipment	RTMC	secure area sensor data	Planned
Security Monitoring Roadside Equipment	RTMC	secure area surveillance data	Planned
Security Monitoring Roadside Equipment	TOCCs	infrastructure monitoring sensor data	Planned
Security Monitoring Roadside Equipment	TOCCs	secure area sensor data	Planned
Security Monitoring Roadside Equipment	TOCCs	secure area surveillance data	Planned
Speed Monitoring Roadside Equipment	Dynamic Message Sign Roadside Equipment	roadway equipment coordination	Planned
Speed Monitoring Roadside Equipment	Minneapolis TMC	speed monitoring information	Planned
Speed Monitoring Roadside Equipment	Minneapolis TMC	traffic images	Planned
Speed Monitoring Roadside Equipment	Minnesota State Patrol District Office	speed monitoring information	Planned
Speed Monitoring Roadside Equipment	Minnesota State Patrol District Office	traffic violation notification	Planned
Speed Monitoring Roadside Equipment	RTMC	speed monitoring information	Planned
Surface Transportation Weather Service Providers	Local Agency Traveler Information Website	transportation weather information	Existing
Surface Transportation Weather Service Providers	Maintenance and Construction Management Center	transportation weather information	Existing
Surface Transportation Weather Service Providers	RTMC	transportation weather information	Existing
Surface Transportation Weather Service Providers	TOCCs	transportation weather information	Existing
TOCCs	511 Telephone Information Service	incident information	Planned
TOCCs	511 Telephone Information Service	road network conditions	Planned
TOCCs	511 Traveler Information Website	incident information	Planned

Source Element	Destination Element	Flow Name	Flow Status
TOCCs	511 Traveler Information Website	road network conditions	Planned
TOCCs	Advanced Pavement Condition and Visibility Warning System Roadside Equipment	environmental sensors control	Planned
TOCCs	Advanced Pavement Condition and Visibility Warning System Roadside Equipment	roadway information system data	Planned
TOCCs	Animal Crossing Warning Roadside Equipment	traffic sensor control	Planned
TOCCs	Bridge Inspection / Structural Monitoring Roadside Equipment	infrastructure monitoring sensor control	Planned
TOCCs	CCTV Roadside Equipment	video surveillance control	Existing
TOCCs	Condition Acquisition and Reporting System (CARS)	alert notification	Existing
TOCCs	Condition Acquisition and Reporting System (CARS)	maint and constr work plans	Planned
TOCCs	Condition Acquisition and Reporting System (CARS)	road network conditions	Existing
TOCCs	Condition Acquisition and Reporting System (CARS)	road weather information	Existing
TOCCs	Condition Acquisition and Reporting System (CARS)	work zone information	Existing
TOCCs	County Emergency Operations Centers	traffic image data	Planned
TOCCs	Data Distribution Server	archived data product requests	Existing
TOCCs	Dynamic Late Merge Roadside Equipment	work zone warning device control	Existing
TOCCs	Dynamic Message Sign Roadside Equipment	roadway information system data	Existing
TOCCs	Emergency Vehicle Equipment	emergency dispatch requests	Existing
TOCCs	Event Promoters	event confirmation	Existing
TOCCs	Highway Advisory Radio Roadside Equipment	roadway information system data	Existing
TOCCs	Infrastructure GIS Database Systems	asset status update	Planned
TOCCs	Intelligent Work Zone System Roadside Equipment	roadway information system data	Planned
TOCCs	Intelligent Work Zone System Roadside Equipment	work zone warning device control	Planned

Source Element	Destination Element	Flow Name	Flow Status
TOCCs	Lane Control Roadside Equipment	roadway information system data	Planned
TOCCs	Lane/Ramp Access Control Roadside Equipment	barrier system control	Existing
TOCCs	Lane/Ramp Access Control Roadside Equipment	roadway information system data	Existing
TOCCs	Lane/Ramp Access Control Roadside Equipment	video surveillance control	Existing
TOCCs	Local TMCs	device control request	Planned
TOCCs	Local TMCs	device data	Planned
TOCCs	Local TMCs	device status	Planned
TOCCs	Local TMCs	emergency traffic coordination	Planned
TOCCs	Local TMCs	road network conditions	Planned
TOCCs	Local TMCs	traffic images	Planned
TOCCs	Maintenance and Construction Management Center	maint and constr resource coordination	Planned
TOCCs	Maintenance and Construction Management Center	road network conditions	Existing
TOCCs	Maintenance and Construction Management Center	work plan coordination	Planned
TOCCs	Maintenance and Construction Vehicle Equipment	environmental sensors control	Existing
TOCCs	Maintenance and Construction Vehicle Equipment	maint and constr dispatch information	Existing
TOCCs	Maintenance and Construction Vehicle Equipment	maint and constr vehicle system control	Existing
TOCCs	Media Outlets	maint and constr work plans	Existing
TOCCs	Media Outlets	road weather information	Existing
TOCCs	Media Outlets	roadway maintenance status	Existing
TOCCs	Minnesota State Emergency Operations Center (SEOC)	traffic images	Existing
TOCCs	Minnesota State Patrol District Office	incident report	Existing
TOCCs	Neighboring State Traffic Management Centers	device control request	Planned
TOCCs	Neighboring State Traffic Management Centers	device data	Planned

Source Element	Destination Element	Flow Name	Flow Status
TOCCs	Neighboring State Traffic Management Centers	device status	Planned
TOCCs	Neighboring State Traffic Management Centers	emergency traffic coordination	Existing
TOCCs	Neighboring State Traffic Management Centers	road network conditions	Existing
TOCCs	Neighboring State Traffic Management Centers	traffic images	Existing
TOCCs	Neighboring State Traffic Management Centers Roadside Equipment	roadway information system data	Planned
TOCCs	Neighboring State Traffic Management Centers Roadside Equipment	video surveillance control	Planned
TOCCs	North/West Passage Corridor Traveler Information Website	current asset restrictions	Planned
TOCCs	North/West Passage Corridor Traveler Information Website	maint and constr work plans	Planned
TOCCs	North/West Passage Corridor Traveler Information Website	road network conditions	Planned
TOCCs	North/West Passage Corridor Traveler Information Website	road weather information	Planned
TOCCs	North/West Passage Corridor Traveler Information Website	roadway maintenance status	Planned
TOCCs	North/West Passage Corridor Traveler Information Website	work zone information	Planned
TOCCs	Oversize Warning Roadside Equipment	roadway information system data	Existing
TOCCs	Red Light Monitoring/Enforcement Roadside Equipment	speed monitoring control	Planned
TOCCs	Red Light Monitoring/Enforcement Roadside Equipment	video surveillance control	Planned
TOCCs	Roadway Automated Treatment System	roadway treatment system control	Existing
TOCCs	Roadway Flooding Warning Roadside Equipment	traffic sensor control	Existing
TOCCs	Security Monitoring Roadside Equipment	infrastructure monitoring sensor control	Planned
TOCCs	Security Monitoring Roadside Equipment	secure area sensor control	Planned
TOCCs	Security Monitoring Roadside Equipment	secure area surveillance control	Planned

Source Element	Destination Element	Flow Name	Flow Status
TOCCs	Surface Transportation Weather Service Providers	road weather information	Existing
TOCCs	Traffic Data and Video Archive	archive analysis requests	Planned
TOCCs	Traffic Data and Video Archive	archived data product requests	Planned
TOCCs	Traffic Data and Video Archive	traffic archive data	Planned
TOCCs	Traffic Detector Roadside Equipment	traffic sensor control	Existing
TOCCs	Traffic Signal Roadside Equipment	signal control commands	Existing
TOCCs	Traffic Signal Roadside Equipment	signal control device configuration	Existing
TOCCs	Traffic Signal Roadside Equipment	signal control plans	Existing
TOCCs	Traffic Signal Roadside Equipment	signal system configuration	Existing
TOCCs	Transportation Information System (TIS)	archive analysis requests	Existing
TOCCs	Transportation Information System (TIS)	archive coordination	Existing
TOCCs	Transportation Information System (TIS)	archived data product requests	Existing
TOCCs	Transportation Information System (TIS)	maint and constr archive data	Existing
TOCCs	Transportation Information System (TIS)	traffic archive data	Existing
TOCCs	Variable Speed Limit Roadside Equipment	roadway information system data	Planned
Traffic	Dynamic Late Merge Roadside Equipment	traffic characteristics	Existing
Traffic	Dynamic Message Sign Roadside Equipment	traffic characteristics	Existing
Traffic	Queue Detection Roadside Equipment	traffic characteristics	Existing
Traffic	Red Light Monitoring/Enforcement Roadside Equipment	traffic characteristics	Planned
Traffic	Speed Monitoring Roadside Equipment	traffic characteristics	Planned
Traffic	Traffic Detector Roadside Equipment	traffic characteristics	Existing
Traffic Data and Video Archive	CCTV Roadside Equipment	data collection and monitoring control	Existing
Traffic Data and Video Archive	Local TMCs	archive requests	Planned

Source Element	Destination Element	Flow Name	Flow Status
Traffic Data and Video Archive	Local TMCs	archive status	Planned
Traffic Data and Video Archive	Local TMCs	archived data products	Planned
Traffic Data and Video Archive	RTMC	archive analysis results	Planned
Traffic Data and Video Archive	RTMC	archive coordination	Planned
Traffic Data and Video Archive	RTMC	archive request confirmation	Planned
Traffic Data and Video Archive	RTMC	archive requests	Existing
Traffic Data and Video Archive	RTMC	archive status	Existing
Traffic Data and Video Archive	RTMC	archived data products	Existing
Traffic Data and Video Archive	TOCCs	archive analysis results	Planned
Traffic Data and Video Archive	TOCCs	archive request confirmation	Planned
Traffic Data and Video Archive	TOCCs	archive requests	Planned
Traffic Data and Video Archive	TOCCs	archive status	Planned
Traffic Data and Video Archive	TOCCs	archived data products	Planned
Traffic Data and Video Archive	Traffic Detector Roadside Equipment	data collection and monitoring control	Existing
Traffic Detector Roadside Equipment	Local TMCs	traffic flow	Existing
Traffic Detector Roadside Equipment	Minneapolis TMC	traffic flow	Existing
Traffic Detector Roadside Equipment	Ramp Meter Roadside Equipment	roadway equipment coordination	Existing
Traffic Detector Roadside Equipment	RTMC	traffic flow	Existing
Traffic Detector Roadside Equipment	TOCCs	traffic flow	Existing
Traffic Detector Roadside Equipment	Traffic Data and Video Archive	roadside archive data	Existing
Traffic Signal Roadside Equipment	Advance Warning Flasher Roadside Equipment	roadway equipment coordination	Existing
Traffic Signal Roadside Equipment	Local TMCs	signal control status	Existing
Traffic Signal Roadside Equipment	Local TMCs	signal fault data	Existing
Traffic Signal Roadside Equipment	Minneapolis TMC	right-of-way request notification	Planned
Traffic Signal Roadside Equipment	Minneapolis TMC	signal control status	Planned

Source Element	Destination Element	Flow Name	Flow Status
Traffic Signal Roadside Equipment	Minneapolis TMC	signal fault data	Planned
Traffic Signal Roadside Equipment	RTMC	right-of-way request notification	Existing
Traffic Signal Roadside Equipment	RTMC	signal control status	Existing
Traffic Signal Roadside Equipment	RTMC	signal fault data	Existing
Traffic Signal Roadside Equipment	RTMC	traffic flow	Existing
Traffic Signal Roadside Equipment	TOCCs	signal control status	Existing
Traffic Signal Roadside Equipment	TOCCs	signal fault data	Existing
Transit Center and Station Surveillance System Roadside Equipment	County Sheriff and City Police Offices	secure area surveillance data	Planned
Transit Center and Station Surveillance System Roadside Equipment	Intercity Transit Management Centers	secure area surveillance data	Planned
Transit Center and Station Surveillance System Roadside Equipment	Local Transit Management Centers	secure area surveillance data	Planned
Transit Center and Station Surveillance System Roadside Equipment	Metro Area Transit Management Centers	secure area surveillance data	Existing
Transit Data Archives	Local Transit Management Centers	archive requests	Planned
Transit Data Archives	Local Transit Management Centers	archive status	Planned
Transit Data Archives	Local Transit Management Centers	archived data products	Planned
Transit Data Archives	Metro Area Transit Management Centers	archive requests	Planned
Transit Data Archives	Metro Area Transit Management Centers	archive status	Planned
Transit Data Archives	Metro Area Transit Management Centers	archived data products	Planned
Transit Information Telephone Systems	Intercity Transit Management Centers	transit information user request	Planned
Transit Information Telephone Systems	Local Transit Management Centers	transit information user request	Planned
Transit Information Telephone Systems	User Personal Portable and Computing Devices	personal transit information	Existing

Source Element	Destination Element	Flow Name	Flow Status
Transit Information Websites	Intercity Transit Management Centers	transit information request	Planned
Transit Information Websites	Local Transit Management Centers	demand responsive transit request	Planned
Transit Information Websites	Local Transit Management Centers	transit information request	Existing
Transit Information Websites	Metro Area Transit Management Centers	transit information request	Existing
Transit Information Websites	User Personal Portable and Computing Devices	broadcast traveler information	Existing
Transit Information Websites	User Personal Portable and Computing Devices	interactive traveler information	Planned
Transit Information Websites	User Personal Portable and Computing Devices	trip plan	Existing
Transit Kiosks	Intercity Transit Management Centers	transit information user request	Planned
Transit Kiosks	Local Transit Management Centers	transit information user request	Planned
Transit Kiosks	Metro Area Transit Management Centers	transit fare and passenger status	Existing
Transit Kiosks	Metro Area Transit Management Centers	transit information user request	Existing
Transit Kiosks	Traveler	traveler interface updates	Existing
Transit Kiosks	Traveler Cards	request for payment	Existing
Transit Vehicle Equipment	Commuter Rail Operations Center	alarm notification	Planned
Transit Vehicle Equipment	Commuter Rail Operations Center	transit vehicle conditions	Planned
Transit Vehicle Equipment	Commuter Rail Operations Center	transit vehicle location data	Planned
Transit Vehicle Equipment	Commuter Rail Operations Center	transit vehicle schedule performance	Planned
Transit Vehicle Equipment	Driver	driver updates	Planned
Transit Vehicle Equipment	Intercity Transit Management Centers	alarm notification	Planned
Transit Vehicle Equipment	Intercity Transit Management Centers	transit vehicle schedule performance	Existing
Transit Vehicle Equipment	Lane/Ramp Access Control Roadside Equipment	gate system activation	Planned
Transit Vehicle Equipment	Light Rail Operations Center	alarm notification	Existing

Source Element	Destination Element	Flow Name	Flow Status
Transit Vehicle Equipment	Light Rail Operations Center	demand response passenger and use data	Planned
Transit Vehicle Equipment	Light Rail Operations Center	fare collection data	Planned
Transit Vehicle Equipment	Light Rail Operations Center	request for bad tag list	Planned
Transit Vehicle Equipment	Light Rail Operations Center	secure area surveillance data	Existing
Transit Vehicle Equipment	Light Rail Operations Center	transit traveler request	Planned
Transit Vehicle Equipment	Light Rail Operations Center	transit vehicle conditions	Existing
Transit Vehicle Equipment	Light Rail Operations Center	transit vehicle loading data	Planned
Transit Vehicle Equipment	Light Rail Operations Center	transit vehicle location data	Existing
Transit Vehicle Equipment	Light Rail Operations Center	transit vehicle schedule performance	Existing
Transit Vehicle Equipment	Local Transit Management Centers	transit vehicle conditions	Existing
Transit Vehicle Equipment	Local Transit Management Centers	transit vehicle schedule performance	Planned
Transit Vehicle Equipment	Metro Area Transit Management Centers	alarm notification	Existing
Transit Vehicle Equipment	Metro Area Transit Management Centers	demand response passenger and use data	Existing
Transit Vehicle Equipment	Metro Area Transit Management Centers	fare collection data	Existing
Transit Vehicle Equipment	Metro Area Transit Management Centers	request for bad tag list	Existing
Transit Vehicle Equipment	Metro Area Transit Management Centers	transit vehicle conditions	Existing
Transit Vehicle Equipment	Metro Area Transit Management Centers	transit vehicle location data	Existing
Transit Vehicle Equipment	Metro Area Transit Management Centers	transit vehicle schedule performance	Existing
Transit Vehicle Equipment	Traffic Signal Roadside Equipment	local signal priority request	Existing
Transit Vehicle Equipment	Traveler	traveler interface updates	Planned
Transit Vehicle Equipment	Traveler Cards	request for payment	Existing

Source Element	Destination Element	Flow Name	Flow Status
Transit Vehicle Operator	Local Transit Management Centers	transit vehicle operator availability	Planned
Transit Vehicle Operator	Metro Area Transit Management Centers	transit vehicle operator availability	Planned
Transportation Information System (TIS)	Condition Acquisition and Reporting System (CARS)	archive coordination	Existing
Transportation Information System (TIS)	Condition Acquisition and Reporting System (CARS)	archive requests	Existing
Transportation Information System (TIS)	Condition Acquisition and Reporting System (CARS)	archive status	Existing
Transportation Information System (TIS)	Minneapolis TMC	archive analysis results	Planned
Transportation Information System (TIS)	Minneapolis TMC	archived data products	Planned
Transportation Information System (TIS)	RTMC	archive analysis results	Existing
Transportation Information System (TIS)	RTMC	archive coordination	Existing
Transportation Information System (TIS)	RTMC	archive requests	Existing
Transportation Information System (TIS)	RTMC	archive status	Existing
Transportation Information System (TIS)	RTMC	archived data products	Existing
Transportation Information System (TIS)	RWIS Central Control System	archive coordination	Existing
Transportation Information System (TIS)	TOCCs	archive analysis results	Existing
Transportation Information System (TIS)	TOCCs	archive coordination	Existing
Transportation Information System (TIS)	TOCCs	archive requests	Existing
Transportation Information System (TIS)	TOCCs	archive status	Existing
Transportation Information System (TIS)	TOCCs	archived data products	Existing
Traveler	Rest Area Wi-Fi	traveler inputs	Planned
Traveler	Transit Kiosks	traveler inputs	Existing
Traveler	Transit Vehicle Equipment	boarding and alighting	Existing
Traveler	Traveler Information and Parking Kiosks	traveler inputs	Planned
Traveler	User Personal Portable and Computing Devices	traveler inputs	Existing

Source Element	Destination Element	Flow Name	Flow Status
Traveler Cards	Parking Management Roadside Equipment	payment	Existing
Traveler Cards	Transit Kiosks	payment	Existing
Traveler Cards	Transit Vehicle Equipment	payment	Existing
Traveler Information and Parking Kiosks	Condition Acquisition and Reporting System (CARS)	traveler request	Planned
Traveler Information and Parking Kiosks	Traveler	traveler interface updates	Planned
Truck Center	CVO Information Requestor	cv driver record	Existing
Truck Center	IFTA Clearinghouse	credential fee coordination	Existing
Truck Center	IFTA Clearinghouse	credentials information	Existing
Truck Center	IFTA Clearinghouse	credentials status information	Existing
Truck Center	IFTA Clearinghouse	safety inspection report	Planned
Truck Center	IRP Clearinghouse	border clearance status	Existing
Truck Center	IRP Clearinghouse	credential fee coordination	Existing
Truck Center	IRP Clearinghouse	credentials information	Existing
Truck Center	IRP Clearinghouse	credentials status information	Existing
Truck Center	IRP Clearinghouse	safety inspection report	Existing
Truck Center	Motor Carrier Registration System	credentials information	Existing
Truck Center	Private Fleet and Freight Management Center	route plan	Existing
Truck Center	Private Fleet and Freight Management Center	route restrictions	Existing
UMD Transportation Data Research Laboratory (TDRL)	RWIS Central Control System	archive requests	Existing
UMD Transportation Data Research Laboratory (TDRL)	RWIS Central Control System	archive status	Existing
UMD Transportation Data Research Laboratory (TDRL)	User Personal Portable and Computing Devices	archived data products	Existing
User Personal Portable and Computing Devices	511 Telephone Information Service	traveler profile	Planned
User Personal Portable and Computing Devices	511 Telephone Information Service	traveler request	Existing

Source Element	Destination Element	Flow Name	Flow Status
User Personal Portable and Computing Devices	511 Traveler Information Website	emergency traveler information request	Existing
User Personal Portable and Computing Devices	511 Traveler Information Website	traveler request	Existing
User Personal Portable and Computing Devices	511 Traveler Information Website	trip confirmation	Planned
User Personal Portable and Computing Devices	511 Traveler Information Website	trip request	Planned
User Personal Portable and Computing Devices	Intercity Transit Management Centers	transit information user request	Planned
User Personal Portable and Computing Devices	Local Transit Management Centers	transit information user request	Existing
User Personal Portable and Computing Devices	Metro Area Transit Management Centers	transit information user request	Existing
User Personal Portable and Computing Devices	MnPASS Vehicle Equipment	traveler card update	Existing
User Personal Portable and Computing Devices	North/West Passage Corridor Traveler Information Website	emergency traveler information request	Planned
User Personal Portable and Computing Devices	North/West Passage Corridor Traveler Information Website	travel services request	Planned
User Personal Portable and Computing Devices	North/West Passage Corridor Traveler Information Website	traveler profile	Planned
User Personal Portable and Computing Devices	North/West Passage Corridor Traveler Information Website	traveler request	Planned
User Personal Portable and Computing Devices	North/West Passage Corridor Traveler Information Website	trip confirmation	Planned
User Personal Portable and Computing Devices	North/West Passage Corridor Traveler Information Website	trip request	Planned
User Personal Portable and Computing Devices	Private Information Service Providers	trip request	Existing
User Personal Portable and Computing Devices	Transit Information Telephone Systems	transit information user request	Existing
User Personal Portable and Computing Devices	Transit Information Websites	traveler profile	Existing
User Personal Portable and Computing Devices	Transit Information Websites	traveler request	Existing
User Personal Portable and Computing Devices	Transit Information Websites	trip request	Existing
User Personal Portable and Computing Devices	Traveler	traveler interface updates	Existing
Variable Speed Limit Roadside Equipment	Driver	driver information	Planned
Variable Speed Limit Roadside Equipment	Lane Control Roadside Equipment	roadway equipment coordination	Planned

Source Element	Destination Element	Flow Name	Flow Status
Variable Speed Limit Roadside Equipment	Minnesota State Patrol District Office	roadway information system status	Planned
Variable Speed Limit Roadside Equipment	RTMC	roadway information system status	Planned
Variable Speed Limit Roadside Equipment	TOCCs	roadway information system status	Planned
Vehicle	Automated Crash Notification System	emergency notification	Planned
Vehicle	Driver	driver updates	Planned
Vehicle	MnPASS Vehicle Equipment	request for payment	Existing
Vehicle	Oversize Warning Roadside Equipment	vehicle characteristics	Existing
Vehicle	Park-and-Ride Parking Information System Roadside Equipment	vehicle characteristics	Planned
Vehicle	Parking Management Roadside Equipment	vehicle characteristics	Existing
Vehicle	Private Information Service Providers	trip request	Existing
Vehicle Occupancy Monitoring/Enforcement Roadside Equipment	Minnesota State Patrol District Office	traffic violation notification	Planned
Virtual Weigh Stations	Commercial Vehicles	electronic screening request	Planned
Virtual Weigh Stations	Commercial Vehicles	request tag data	Planned
Virtual Weigh Stations	Commercial Vehicles	screening event record	Planned
Virtual Weigh Stations	Minnesota CVIEW	safety inspection report	Planned
Weigh In Motion (WIM) Stations	Commercial Vehicles	electronic screening request	Existing
Weigh In Motion (WIM) Stations	Commercial Vehicles	request tag data	Existing
Weigh In Motion (WIM) Stations	Commercial Vehicles	screening event record	Existing
Weigh In Motion (WIM) Stations	Minnesota CVIEW	safety inspection report	Existing
Weigh Station Roadside Equipment	Commercial Vehicles	pass/pull-in	Existing
Weigh Station Roadside Equipment	Commercial Vehicles	safety inspection request	Existing

Architecture Flow Definitions

Flow Name	Description
alarm acknowledge	Confirmation that alarm was received, instructions and additional information for the alarm initiator, and requests for additional information.
alarm notification	Notification of activation of an audible or silent alarm by a traveler in a public area or by a transit vehicle operator using an on-board device.
alert notification	Notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The flow identifies the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This flow may also identify specific information that should not be released to the public.
alert notification coordination	Coordination of emergency alerts to be distributed to the public. This includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public and status of the public notification.
alert status	Information indicating the current status of the emergency alert including identification of the traveler and driver information systems that are being used to provide the alert.
alerts and advisories	Assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), and alerts (information on imminent or in-progress emergencies). This flow also provides supporting descriptive detail on incidents, threats, and vulnerabilities to increase preparedness and support effective response to threats against the surface transportation system.
archive analysis requests	A user request that initiates data mining, analytical processing, aggregation or summarization, report formulation, or other advanced processing and analysis of archived data. The request also includes information that is used to identify and authenticate the user and support electronic payment requirements, if any.
archive analysis results	Processed information products, supporting meta data, and any associated transaction information resulting from data mining, analytical processing, aggregation or summarization, report formulation, or other on-line processing and analysis of archived data.
archive coordination	Catalog data, meta data, published data, and other information exchanged between archives to support data synchronization and satisfy user data requests.
archive request confirmation	Confirmation that an archive request has been received and processed with information on the disposition of the request.
archive requests	A request to a data source for information on available data (i.e. "catalog") or a request that defines the data to be archived. The request can be a general subscription intended to initiate a continuous or regular data stream or a specific request intended to initiate a one-time response from the recipient.
archive status	Notification that data provided to an archive contains erroneous, missing, or suspicious data or verification that the data provided appears valid. If an error has been detected, the offending data and the nature of the potential problem are identified.
archived data product requests	A user-specified request for archived data products (i.e. data, meta data, or data catalogs). The request also includes information that is used to identify and authenticate the user and support electronic payment requirements, if any.
archived data products	Raw or processed data, meta data, data catalogs and other data products provided to a user system upon request. The response may also include any associated transaction information.
asset inventory	Information on pavement, bridges, signs and other assets. This includes asset location, installation information, materials information, vendor/contractor information, current maintenance status, and a variety of other information (e.g., video logs) that define the transportation infrastructure.
asset restrictions	Restrictions levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard height, width, and weight restrictions by facility as well as special restrictions such as spring weight restrictions and temporary bridge weight restrictions.
asset status update	Changes to status of pavement, bridges, signs and other assets resulting from maintenance or construction activities or infrastructure monitoring. The updates may include changes in installation information, materials information, vendor/contractor information, condition, and current maintenance status. In addition to infrastructure asset updates, the information provided may also include status of the maintenance and construction support assets, including vehicle and equipment utilization and repair records.
automated roadway control data	Control commands and operating parameters provided to field equipment that controls and monitors automated vehicle operations.

Flow Name	Description
automated roadway status	Current operational status of an automated vehicle operations facility, including the status of the field equipment and vehicles using the facility.
bad tag list	List of invalid transit user tags which may have previously failed a fare payment transaction.
barrier system control	Information used to configure and control barrier systems that are represented by gates, barriers and other automated or remotely controlled systems used to manage entry to roadways.
barrier system status	Current operating status of barrier systems. Barrier systems represent gates, barriers and other automated or remotely controlled systems used to manage entry to roadways. Status of the systems includes operating condition and current operational state.
basic vehicle measures	Information provided to on-board ITS equipment from the vehicle platform indicating current vehicle status.
boarding and alighting	Detection of transit passenger boarding and alighting. This flow represents the travelers' physical presence as they board a transit vehicle that can be detected or monitored by on-board sensors.
border clearance event	Reports clearance event data regarding action taken at border, including acceptance or override of system decision, and date/time stamp
border clearance status	Notification regarding the crossing status of commercial freight shipment scheduled to enter the U.S. Includes portions of border agency and transportation agency clearance results, as they become available.
broadcast traveler information	General traveler information that contains traffic and road conditions, link travel times, incidents, advisories, restrictions, transit service information, weather information, parking information, and other related traveler information.
CARS data inputs	Data input from Maintenance and Construction Field Personnel from the field into the Minnesota CARS database. Data can include incident information, road network conditions, and maintenance and construction information.
credential fee coordination	Jurisdiction's rates for various credentials (IRP, IFTA, etc.) that are exchanged between agencies.
credentials information	Response containing full vehicle fuel tax and registration credentials information. "Response" may be provided in reaction to a real-time query or a standing request for updated information. The query flow is not explicitly shown.
credentials status information	Credentials information such as registration, licensing, insurance, check flags, and electronic screening enrollment data. A unique identifier is included. Corresponds to the credentials portion of CVISN "snapshots." The status information may be provided as a response to a real-time query or as a result of a standing request for updated information (subscription). This may also include information about non-U.S. fleets for use by U.S. authorities, and information regarding U.S. fleets made available to Mexican and Canadian authorities. The query flow is not explicitly shown.
crew movements	Visual or sensed presence of field crew location within a work zone that is monitored to enhance work zone safety.
current asset restrictions	Restrictions levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions, and temporary facility restrictions that are imposed during maintenance and construction.
cv driver record	Information typically maintained by a state driver licensing agency about a driver of a commercial vehicle including driver identification data, license data, permit data, and driving history details. The query flow is not explicitly shown.
data collection and monitoring control	Information used to configure and control data collection and monitoring systems.
demand response passenger and use data	Data collected on board a demand response vehicle relating to the picking up and discharging of passengers.
demand responsive transit plan	Plan regarding overall demand responsive transit schedules and deployment.
demand responsive transit request	Request for paratransit support.
device control request	Request for device control action
device data	Data from detectors, environmental sensor stations, and traffic control devices including device inventory information.
device status	Status information from devices

Flow Name	Description
driver information	Regulatory, warning, and guidance information provided to the driver while en route to support safe and efficient vehicle operation.
driver inputs	Driver input to the vehicle including configuration data, settings and preferences, interactive requests, and control commands.
driver parking information	Presentation of general parking information to drivers including lot status, parking availability, and directions to available spaces, entrances, and exits.
driver to fleet request	Requests from the driver and vehicle for routing, payment, and enrollment information.
driver updates	Information displayed or otherwise conveyed by the vehicle to the driver.
electronic screening request	Request for identification data to support electronic screening.
emergency acknowledge	Acknowledge request for emergency assistance and provide additional details regarding actions and verification requirements.
emergency archive data	Logged emergency information including information that characterizes identified incidents (routine highway incidents through disasters), corresponding incident response information, evacuation information, surveillance data, threat data, and resource information. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.
emergency data request	A request for additional information or a control command issued by the emergency response agency in response to an emergency request for assistance from a traveler.
emergency dispatch requests	Emergency vehicle dispatch instructions including incident location and available information concerning the incident.
emergency dispatch response	Request for additional emergency dispatch information and provision of en route status.
emergency notification	An emergency request for assistance automatically initiated by a vehicle or originated by a traveler using an in-vehicle or personal device.
emergency plan coordination	Information that supports coordination of emergency management plans, continuity of operations plans, emergency response and recovery plans, evacuation plans, and other emergency plans between agencies. This includes general plans that are coordinated prior to an incident and shorter duration tactical plans that are prepared during an incident.
emergency route request	Request for access routes for emergency response vehicles and equipment. This may be a request for ingress or egress routes or other emergency routes.
emergency routes	Suggested ingress and egress routes for access to and between the scene and staging areas or other specialized emergency access routes.
emergency traffic control information	Status of a special traffic control strategy or system activation implemented in response to an emergency traffic control request, a request for emergency access routes, a request for evacuation, a request to activate closure systems, a request to employ driver information systems to support public safety objectives, or other special requests. Identifies the selected traffic control strategy and system control status.
emergency traffic control request	Special request to preempt the current traffic control strategy in effect at one or more signalized intersections or highway segments, activate traffic control and closure systems such as gates and barriers, activate safeguard systems, or use driver information systems. For example, this flow can request all signals to red-flash, request a progression of traffic control preemptions along an emergency vehicle route, request a specific evacuation traffic control plan, request activation of a road closure barrier system, or place a public safety or emergency-related message on a dynamic message sign.
emergency traffic coordination	Coordination supporting disaster response including evacuation and reentry. Includes coordination of special traffic control strategies that support efficient evacuation and reentry while protecting and optimizing movement of response vehicles and other resources responding to the emergency.
emergency transit service request	Request to modify transit service and fare schedules to address emergencies, including requests for transit services to evacuate people from and/or deploy response agency personnel to an emergency scene. The request may poll for resource availability or request pre-staging, staging, or immediate dispatch of transit resources.
emergency transit service response	Response indicating changes to transit service, fares, and/or restrictions that will be made and status of transit resources to be deployed to support emergency response and/or evacuation.
emergency traveler information	Public notification of an emergency such as a natural or man-made disaster, civil emergency, or child abduction. This flow also includes evacuation information including evacuation instructions, evacuation zones, recommended evacuation times, tailored evacuation routes and destinations, traffic and road conditions along the evacuation routes, traveler services and shelter information, and reentry times and instructions.

Flow Name	Description
emergency traveler information request	Request for alerts, evacuation information, and other emergency information provided to the traveling public.
emergency vehicle tracking data	The current location and operating status of the emergency vehicle.
environmental conditions data	Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) as measured and reported by fixed and/or mobile environmental sensors and aggregated by the data collector. Attributes relating to the data collection (and aggregation) are also included.
environmental conditions data status	Status of the data quality of environmental conditions data provided by a data contributor. Includes not only status by sensor, but statistical data regarding the quality checking of data provided.
environmental probe data	Data from vehicle safety and convenience systems that can be used to estimate environmental conditions, including measured air temperature, exterior light status, wiper status, sun sensor status, rain sensor status, traction control status, anti-lock brake status, and other collected vehicle system status and sensor information. The collected data is reported along with the location, heading, and time that the data was collected. Both current data and snapshots of recent events (e.g., traction control or anti-lock brake system activations) may be reported.
environmental sensor data	Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) as measured and reported by fixed and/or mobile environmental sensors. Operational status of the sensors is also included.
environmental sensors control	Data used to configure and control environmental sensors.
evacuation coordination	Coordination of information regarding a pending or in-process evacuation. Includes evacuation zones, evacuation times, evacuation routes, forecast network conditions, and reentry times.
evacuation information	Evacuation instructions and information including evacuation zones, evacuation times, and reentry times.
event confirmation	Confirmation that special event details have been received and processed.
event plans	Plans for major events possibly impacting traffic.
external reports	Traffic and incident information that is collected by the media through a variety of mechanisms (e.g., radio station call-in programs, air surveillance).
fare collection data	Fare collection information including the summary of on-board fare system data and financial payment transaction data.
fare management information	Transit fare information and transaction data used to manage transit fare processing on the transit vehicle.
field device status	Reports from field equipment (sensors, signals, signs, controllers, etc.) which indicate current operational status.
fleet to driver update	Updated instructions to the driver including dispatch, routing, and special instructions.
flood warning alert	Issues an alert to MnDOT regarding high water levels.
freight transportation status	A time-stamped status of a freight shipment as it passes through the supply chain from manufacturer through arrival at its final destination; including cargo movement logs, routing information, and cargo ID's.
gate system activation	This flow represents an automated request from transit vehicles to open and close gates for access into and out of Bus Rapid Transit stations along major roadways.
hazmat information	Information about a particular hazmat load including nature of the load and unloading instructions. May also include hazmat vehicle route and route update information.
hazmat information request	Request for information about a particular hazmat load.
hazmat spill notification	Information provided to emergency response organizations when cargo sensors detect a release of hazardous material. This information will include sensor information, vehicle location and identification, and carrier identification.
hov data	Current HOV lane information including both standard traffic flow measures and information regarding vehicle occupancy in HOV lanes, and operational status of the HOV monitoring equipment.
hri control data	Data required for HRI information transmitted at railroad grade crossings and within railroad operations.
hri operational status	Status of the highway-rail grade crossing equipment including both the current state or mode of operation and the current equipment condition.

Flow Name	Description
hri request	A request for highway-rail intersection status or a specific control request intended to modify HRI operation.
hri status	Status of the highway-rail intersection equipment including both the current state or mode of operation and the current equipment condition.
incident command information coordination	Information that supports local management of an incident. It includes resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response.
incident information	Notification of existence of incident and expected severity, location, time and nature of incident. As additional information is gathered and the incident evolves, updated incident information is provided. Incidents include any event that impacts transportation system operation ranging from routine incidents (e.g., disabled vehicle at the side of the road) through large-scale natural or human-caused disasters that involve loss of life, injuries, extensive property damage, and multi-jurisdictional response. This also includes special events, closures, and other planned events that may impact the transportation system.
incident information for media	Report of current desensitized incident information prepared for public dissemination through the media.
incident report	Report of an identified incident including incident location, type, severity and other information necessary to initiate an appropriate incident response.
incident response coordination	Incident response procedures and current incident response status that are shared between allied response agencies to support a coordinated response to incidents. This flow provides current situation information, including a summary of incident status and its impact on the transportation system and other infrastructure, and current and planned response activities. This flow also coordinates a positive hand off of responsibility for all or part of an incident response between agencies.
incident response status	Status of the current incident response including a summary of incident status and its impact on the transportation system, traffic management strategies implemented at the site (e.g., closures, diversions, traffic signal control overrides), and current and planned response activities.
incident status	Information gathered at the incident site that more completely characterizes the incident and provides current incident response status.
infrastructure monitoring sensor control	Data used to configure and control infrastructure monitoring sensors.
infrastructure monitoring sensor data	Data read from infrastructure-based sensors that monitor the condition or integrity of transportation infrastructure including bridges, tunnels, interchanges, pavement, culverts, signs, transit rail or guideway, and other roadway infrastructure. Includes sensor data and the operational status of the sensors.
interactive traveler information	Traveler information provided in response to a traveler request. The provided information includes traffic and road conditions, advisories, incidents, payment information, transit services, parking information, weather information, and other travel-related data updates and confirmations.
intersection blockage notification	Notification that a highway-rail intersection is obstructed and supporting information.
intersection warning	Warning sent from roadside equipment to drivers that entry into an upcoming intersection is unsafe.
lighting system control data	Information used to configure and control roadside lighting systems.
lighting system status	Status of roadside lighting controls including operating condition and current operational state.
local signal preemption request	Direct control signal or message to a signalized intersection that results in preemption of the current control plan and grants right-of-way to the requesting vehicle.
local signal priority request	Request from a vehicle to a signalized intersection for priority at that intersection.
maint and constr archive data	Information describing road construction and maintenance activities identifying the type of activity, the work performed, and work zone information including work zone configuration and safety (e.g., a record of intrusions and vehicle speeds) information. For construction activities, this information also includes a description of the completed infrastructure, including as-built plans as applicable. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.

Flow Name	Description
maint and constr dispatch information	Information used to dispatch maintenance and construction vehicles, equipment, and crews and information used to keep work zone crews informed. This information includes routing information, traffic information, road restrictions, incident information, environmental information, decision support information, maintenance schedule data, dispatch instructions, personnel assignments, alert notifications, and corrective actions.
maint and constr dispatch status	Current maintenance and construction status including work data, operator status, crew status, and equipment status.
maint and constr resource coordination	Request for road maintenance and construction resources that can be used in the diversion of traffic (cones, portable signs), clearance of a road hazard, repair of ancillary damage, or any other incident response.
maint and constr resource request	Request for road maintenance and construction resources that can be used in the diversion of traffic (cones, portable signs), clearance of a road hazard, repair of ancillary damage, or any other incident response. The request may poll for resource availability or request pre-staging, staging, or immediate dispatch of resources.
maint and constr resource response	Current status of maintenance and construction resources including availability and deployment status. General resource inventory information covering vehicles, equipment, materials, and people and specific resource deployment status may be included.
maint and constr vehicle conditions	Vehicle diagnostics information that is collected, filtered, and selectively reported by a maintenance and construction vehicle. The information includes engine temperature, mileage, tire wear, brake wear, belt wear, and any warnings or alarms concerning the operational condition of the vehicle and ancillary equipment.
maint and constr vehicle location data	The current location and related status (e.g., direction and speed) of the maintenance/construction vehicle.
maint and constr vehicle operational data	Data that describes the maintenance and construction activity performed by the vehicle. Operational data includes materials usage (amount stored and current application rate), operational state of the maintenance equipment (e.g., blade up/down, spreader pattern), vehicle safety status, and other measures associated with the operation of a maintenance, construction, or other special purpose vehicle. Operational data may include basic operational status of the vehicle equipment or a more precise record of the work performed (e.g., application of crack sealant with precise locations and application characteristics).
maint and constr vehicle system control	Configure and control data that supports remote control of on-board maintenance and construction vehicle systems and field equipment that is remotely controlled by the vehicle. For example, the data can be used to adjust material application rates and spread patterns.
maint and constr work plans	Future construction and maintenance work schedules and activities including anticipated closures with anticipated impact to the roadway, alternate routes, anticipated delays, closure times, and durations.
maintenance and repair needs	Recommended strategies and schedules for maintenance of the transportation infrastructure.
multimodal information	Schedule information for alternate mode transportation providers such as train, ferry, air and bus.
parking information	General parking information and status, including current parking availability.
parking lot data request	Request for parking lot occupancy, fares, and availability. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
parking management data	Communication of parking management data from parking ramps to roadside equipment that informs drivers of parking availability in ramps.
parking operator inputs	User input from the parking operator to query current status and control the operation of the parking management system.
parking status	Presentation of information to the parking operator including operational status and transaction reports.
pass/pull-in	Command to commercial vehicle to pull into or bypass inspection station.
payment	Payment of some kind (e.g., toll, parking, fare) by traveler which, in most cases, can be related to a credit account.
payment request	Request for payment from financial institution.
personal transit information	General and personalized transit information for a particular fixed route, flexible route, or paratransit system.
probe archive data	Probe data that allows calculation of travel times, volumes, and other measures that support transportation planning. Optionally, this flow also includes origin and destination information for vehicles that opt to provide this information.

Flow Name	Description
qualified environmental conditions data	Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) that has had quality checks performed on it and has been formatted and consolidated by the Clarus system. Attributes relating to the data collection (and aggregation) are also included.
remote surveillance control	The control commands used to remotely operate another center's sensors or surveillance equipment so that roadside surveillance assets can be shared by more than one agency.
request for bad tag list	Request for list of bad vehicle tag IDs.
request for payment	Request to deduct cost of service from user's payment account.
request for vehicle measures	Request for vehicle performance and maintenance data collected by onboard sensors.
request tag data	Request for tag information including credit identity, stored value card cash, etc.
resource coordination	Coordination of resource inventory information, specific resource status information, resource prioritization and reallocation between jurisdictions, and specific requests for resources and responses that service those requests.
resource deployment status	Status of resource deployment identifying the resources (vehicles, equipment, materials, and personnel) available and their current status. General resource inventory information and specific status of deployed resources may be included.
resource request	A request for resources to implement special traffic control measures, assist in clean up, verify an incident, etc. The request may poll for resource availability or request pre-staging, staging, or immediate deployment of resources. Resources may be explicitly requested or a service may be requested and the specific resource deployment may be determined by the responding agency.
reversible lane control	Control of automated reversible lane configuration and driver information systems.
reversible lane status	Current reversible lane status including traffic sensor and surveillance data and the operational status and mode of the reversible lane control equipment.
right-of-way request notification	Notice that a request has occurred for signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other source for right-of-way.
road network conditions	Current and forecasted traffic information, road and weather conditions, and other road network status. Either raw data, processed data, or some combination of both may be provided by this architecture flow. Information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements) in effect is included along with a definition of the links, nodes, and routes that make up the road network.
road network status assessment	Assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.
road weather information	Road conditions and weather information that are made available by road maintenance operations to other transportation system operators.
roadside archive data	A broad set of data derived from roadside sensors that includes current traffic conditions, environmental conditions, and any other data that can be directly collected by roadside sensors. This data also indicates the status of the sensors and reports of any identified sensor faults.
roadside transaction status	The status of an electronic payment transaction provided directly to the driver via sign or other roadside infrastructure.
roadway characteristics	Detectable or measurable road characteristics such as friction coefficient and general surface conditions, road geometry and markings, etc. These characteristics are monitored or measured by ITS sensors and used to support advanced vehicle safety and control and road maintenance capabilities.
roadway equipment coordination	The direct flow of information between field equipment. This includes transfer of information between sensors and driver information systems (e.g., DMS, HAR, variable speed limit signs, dynamic lane signs) or control devices (e.g., traffic signals, ramp meters), direct coordination between adjacent control devices, interfaces between detection and warning or alarm systems, and any other direct communications between field equipment.
roadway information system data	Information used to initialize, configure, and control roadside systems that provide driver information (e.g., dynamic message signs, highway advisory radio, beacon systems). This flow can provide message content and delivery attributes, local message store maintenance requests, control mode commands, status queries, and all other commands and associated parameters that support remote management of these systems.
roadway information system status	Current operating status of dynamic message signs, highway advisory radios, beacon systems, or other configurable field equipment that provides dynamic information to the driver.

Flow Name	Description
roadway maintenance status	Summary of maintenance fleet operations affecting the road network. This includes the status of winter maintenance (snow plow schedule and current status).
roadway treatment system control	Control data for remotely located, automated devices, that affect the roadway surface (e.g. de-icing applications).
roadway treatment system status	Current operational status of automated roadway treatment devices (e.g., anti-icing systems).
route assignment	Route assignment information for transit vehicle operator.
route plan	Tailored route provided by ISP in response to a specific request.
route request	Request for a tailored route based on given constraints.
route restrictions	Information about routes, road segments, and areas that do not allow the transport of security sensitive hazmat cargoes or include other restrictions (such as height or weight limits).
safeguard system control	Data that controls safeguard systems (remotely controlled equipment used to mitigate the impact of incidents on transportation infrastructure, such as blast shields, exhaust systems, etc.).
safeguard system status	Current operating status of safeguard systems (remotely controlled equipment used to mitigate the impact of incidents on transportation infrastructure, such as blast shields, exhaust systems, etc.). Status of the systems includes operating condition and current operational state.
safety inspection record	Record containing results of commercial vehicle safety inspection.
safety inspection report	Report containing results of commercial vehicle safety inspection. The information may be provided as a response to a real-time query or proactively by the source. The query flow is not explicitly shown.
safety inspection request	Request for safety inspection record.
safety status information	Safety information such as safety ratings, security ratings or flags, inspection summaries, and violation summaries. A unique identifier is included. Corresponds to the safety and security portion of CVISN "snapshots." The status information may be provided as a response to a real-time query or as a result of a standing request for updated information (subscription). This may also include information about non-U.S. fleets for use by U.S. authorities, and information regarding U.S. fleets made available to Mexican and Canadian authorities. The query flow is not explicitly shown.
screening event record	Results of CVO electronic screening activity.
secure area sensor control	Information used to configure and control threat sensors (e.g., thermal, acoustic, radiological, chemical), object, motion and intrusion detection sensors. The provided information controls sensor data collection, aggregation, filtering, and other local processing.
secure area sensor data	Data provided by threat sensors (e.g., thermal, acoustic, radiological, chemical), and intrusion, motion, and object detection sensors in secure areas indicating the sensor's operational status, raw and processed sensor data, and alarm indicators when a threat has been detected.
secure area surveillance control	Information used to configure and control audio and video surveillance systems used for transportation infrastructure security in secure areas. The provided information controls surveillance data collection, aggregation, filtering, and other local processing.
secure area surveillance data	Data collected from surveillance systems used to monitor secure areas. Includes video, audio, processed surveillance data, equipment operational status, and alarm indicators when a threat has been detected.
short range communications status	Status of the short range communications equipment including the current state or mode of operation and the current equipment status.
signal control commands	Control of traffic signal controllers or field masters including clock synchronization.
signal control device configuration	Data used to configure traffic signal control equipment including local controllers and system masters.
signal control plans	Traffic signal timing parameters including minimum green time and interval durations for basic operation and cycle length, splits, offset, phase sequence, etc. for coordinated systems.
signal control status	Operational and status data of traffic signal control equipment including operating condition and current indications.
signal fault data	Faults from traffic signal control equipment.
signal system configuration	Data used to configure traffic signal systems including configuring control sections and mode of operation (time based or traffic responsive).

Flow Name	Description
speed monitoring control	Information used to configure and control automated speed monitoring, speed warning, and speed enforcement systems.
speed monitoring information	System status including current operational state and logged information including measured speeds, warning messages displayed, and violation records.
suggested route	Suggested route for a dispatched emergency or maintenance vehicle that may reflect current network conditions and the additional routing options available to en route emergency or maintenance vehicles that are not available to the general public.
tag confirmation	Message received by Minnesota State Patrol Emergency Vehicle that sufficient toll amount has been paid.
tag data	Unique tag ID and related vehicle information.
threat information	Threats regarding transportation infrastructure, facilities, or systems detected by a variety of methods (sensors, surveillance, threat analysis of advisories from outside agencies, etc).
toll data	Current toll schedules for different types of vehicles as well as advanced toll payment information.
toll data request	Request made to obtain toll schedule information or pay a toll in advance. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
toll instructions	Information provided to configure and support toll plaza operations including toll pricing information.
toll transactions	Detailed list of transactions from a toll station.
track status	Current status of the wayside equipment and notification of an arriving train.
traffic archive data	Information describing the use and vehicle composition on transportation facilities and the traffic control strategies employed. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.
traffic characteristics	Physical traffic characteristics which are monitored and translated into macroscopic measures like occupancy, volume, density, and average speed. Point measures support presence detection and individual vehicle measures like speed.
traffic flow	Raw and/or processed traffic detector data which allows derivation of traffic flow variables (e.g., speed, volume, and density measures) and associated information (e.g., congestion, potential incidents). This flow includes the traffic data and the operational status of the traffic detectors.
traffic image data	This flow represents the flow of traffic image data from roadside equipment to agencies and among transportation agencies.
traffic images	High fidelity, real-time traffic images suitable for surveillance monitoring by the operator or for use in machine vision applications.
traffic information for media	Report of traffic conditions including traffic incident reports and traffic images for public dissemination through the media. The reports may also include information on diversions and alternate routes, closures, and special traffic restrictions in effect.
traffic metering control	Control commands and operating parameters for ramp meters, interchange meters, mainline meters, and other systems equipment associated with roadway metering operations.
traffic metering status	Current operational status and operating parameters for ramp meters, interchange meters, mainline meters and other control equipment associated with roadway metering operations.
traffic probe data	Vehicle data that is used to determine traffic conditions. In a basic implementation, the data could be limited to time stamped unique identifiers that can be used to measure a vehicle's progress through the network. In more advanced implementations, the vehicle may report current position, speed, and heading and snapshots of recent events including route information, starts and stops, speed changes, and other information that can be used to estimate traffic conditions.
traffic sensor control	Information used to configure and control traffic sensor systems.
traffic violation notification	Notification to enforcement agency of a detected traffic violation including speed violations, HOV violations, and dynamic lane violations.
transaction status	Response to transaction request. Normally dealing with a request for payment.
transit and fare schedules	Transit service information including routes, schedules, and fare information.
transit archive data	Data used to describe and monitor transit demand, fares, operations, and system performance. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.
transit emergency data	Initial notification of transit emergency at a transit stop or on transit vehicles and further coordination as additional details become available and the response is coordinated.
transit fare and passenger status	Information provided from the traveler location that supports fare payments, passenger data, and associated record-keeping.

Flow Name	Description
transit fare information	Information provided by transit management that supports fare payment transactions and passenger data collection.
transit information for media	Report of transit schedule deviations for public dissemination through the media.
transit information request	Request for transit operations information including schedule and fare information. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
transit information user request	Request for special transit routing, real-time schedule information, and availability information.
transit schedule information	Current and projected transit schedule information used to initialize the transit vehicle with a vehicle assignment, monitor schedule performance, and develop corrective actions on-board.
transit service coordination	Schedule coordination information shared between local/regional transit organizations.
transit service information	Transit service information including routes, schedules, and fare information as well as dynamic transit schedule adherence and transit vehicle location information.
transit travel time estimates	Transit travel time estimates sent from the Metro Transit Control Center to roadside equipment displaying transit travel times alongside vehicular travel times that are estimated by MnDOT RTMC.
transit traveler information	Transit information prepared to support transit users and other travelers. It contains transit schedules, real-time arrival information, fare schedules, alerts and advisories, and general transit service information.
transit traveler request	Request by a Transit traveler to summon assistance, request transit information, or request any other transit services.
transit vehicle conditions	Operating conditions of transit vehicle (e.g., engine running, oil pressure, fuel level and usage).
transit vehicle loading data	Data collected on board the transit vehicle relating to passenger boarding and alighting.
transit vehicle location data	Current transit vehicle location and related operational conditions data provided by a transit vehicle.
transit vehicle operator availability	Transit vehicle operator availability data that can be used to develop vehicle operator assignments and detailed operations schedules.
transit vehicle operator information	Transit service instructions, wide area alerts, traffic information, road conditions, and other information for both transit and paratransit operators.
transit vehicle schedule performance	Estimated times of arrival and anticipated schedule deviations reported by a transit vehicle.
transportation information for operations	Information on the state of transportation system operations including traffic and road conditions, advisories, incidents, transit service information, weather information, parking information, and other related data.
transportation system status	Current status and condition of transportation infrastructure (e.g., tunnels, bridges, interchanges, TMC offices, maintenance facilities). In case of disaster or major incident, this flow provides an assessment of damage sustained by the surface transportation system including location and extent of the damage, estimate of remaining capacity and necessary restrictions, and time frame for repair and recovery.
transportation weather information	Current and forecast road conditions and weather information (e.g., surface condition, flooding, wind advisories, visibility, etc.) associated with the transportation network. This information is of a resolution, timeliness, and accuracy to be useful in transportation decision making.
transportation weather information request	A request for transportation weather information that may specify the area of interest (a geographic region, particular routes within a region, specific road segments), the type of information that is required, the desired spatial resolution of the information, and time horizon.
travel services information	Travel service information and reservations for tourist attractions, lodging, dining, service stations, emergency services, and other services and businesses of interest to the traveler.
travel services request	Request for travel service information including tourist attractions, lodging, restaurants, service stations, and emergency services. The request identifies the type of service, the area of interest, optional reservation request information, parameters that are used to prioritize or filter the returned information, and sorting preferences.
traveler card update	Information updated concerning traveler's personal data including items such as address, trip records, and profile data.

Flow Name	Description
traveler information for media	General traveler information regarding incidents, unusual traffic conditions, transit issues, or other advisory information that has been desensitized and provided to the media.
traveler inputs	User input from a traveler to summon assistance, request travel information, make a reservation, or request any other traveler service.
traveler interface updates	Visual or audio information (e.g., routes, messages, guidance, emergency information) that is provided to the traveler.
traveler profile	Information about a traveler including equipment capabilities, personal preferences, and traveler alert subscriptions.
traveler request	A request for traveler information including traffic, transit, toll, parking, road weather conditions, event, and passenger rail information. The request identifies the type of information, the area of interest, parameters that are used to prioritize or filter the returned information, and sorting preferences.
trip confirmation	Acknowledgement by the driver/traveler of acceptance of a trip plan with associated personal and payment information required to confirm reservations.
trip plan	A travel itinerary identifying a route and associated traveler information and instructions identifying recommended modes and transfer information, ride sharing options, and transit and parking reservation information.
trip request	Request for trip planning services that identifies the trip origin, destination(s), timing, preferences, and constraints. The request may also include a request for transit and parking reservations and ridesharing options associated with the trip.
vehicle characteristics	The physical or visible characteristics of an individual vehicle that can be measured to classify a vehicle and imaged to uniquely identify a vehicle.
vehicle payment information	Information provided for payment of tolls and parking fees including identification that can be used to identify the payment account or source and related vehicle and service information that are used to determine the type and price of service requested.
vehicle payment request	Request for information supporting toll and parking payments.
vehicle payment update	Data written to vehicle equipment to support electronic toll collection or parking payment.
vehicle signage data	In-vehicle signing data that augments regulatory, warning, and informational road signs and signals. The information provided would include static sign information (e.g., stop, curve warning, guide signs, service signs, and directional signs) and dynamic information (e.g., current signal states, grade crossing information, local traffic and road conditions, advisories, and detours).
video surveillance control	Information used to configure and control video surveillance systems.
voice-based alert notification	Information to be distributed to the traveling public via voice regarding a major emergency such as a natural or man-made disaster, civil emergency, severe weather or child abduction. The flow may identify the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. The content of this architecture flow may be specially formatted for voice-based traveler information.
voice-based traveler information	Traveler information sent to the telecommunications systems for traveler information terminator. This flow may represent the bulk transfer of traveler information, including traffic conditions, incident information, transit information and weather and road condition information. It may be specially formatted for voice-based traveler information.
voice-based traveler request	The electronic traveler information request from the telecommunications systems for traveler information terminator. It may be specifically formatted for voice-based traveler requests. The request can be a general subscription intended to initiate a continuous or regular data stream or a specific request intended to initiate a one-time response from the recipient.
weather archive data	Accumulated forecasted and current weather data (e.g., temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc.) as well as qualified environmental sensor data. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.
weather information	Accumulated forecasted and current weather data (e.g., temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc.).
work plan coordination	Coordination of work plan schedules and activities between maintenance and construction organizations or systems. This information includes the work plan schedules and comments and suggested changes that are exchanged as work plans are coordinated and finalized.

Flow Name	Description
work zone information	Summary of maintenance and construction work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.
work zone warning	Warnings provided to maintenance and construction field personnel, indicating a work zone emergency or safety issue such as the intrusion of a vehicle into the work zone area or movement of field crew into the travel lanes.
work zone warning device control	Data used to configure and control work zone safety monitoring and warning devices.
work zone warning status	Status of a work zone safety monitoring and warning devices. This flow documents system activations and includes additional supporting information (e.g., an image) that allows verification of the alarm.

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10 ITS Standards

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

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

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

Table 7: ITS Standards

SDO	Document ID	Standard Title	Standard Type
AASHTO/ITE	ITE TMDD	Traffic Management Data Dictionary (TMDD) and Message Sets for External Traffic Management Center Communications (MS/ETMCC)	Message/Data
AASHTO/ITE/NEMA	NTCIP 1201	Global Object Definitions	Message/Data
AASHTO/ITE/NEMA	NTCIP 1202	Object Definitions for Actuated Traffic Signal Controller (ASC) Units	Message/Data
AASHTO/ITE/NEMA	NTCIP 1203	Object Definitions for Dynamic Message Signs (DMS)	Message/Data
AASHTO/ITE/NEMA	NTCIP 1204	Object Definitions for Environmental Sensor Stations (ESS)	Message/Data
AASHTO/ITE/NEMA	NTCIP 1205	Object Definitions for Closed Circuit Television (CCTV) Camera Control	Message/Data
AASHTO/ITE/NEMA	NTCIP 1206	Object Definitions for Data Collection and Monitoring (DCM) Devices	Message/Data
AASHTO/ITE/NEMA	NTCIP 1207	Object Definitions for Ramp Meter Control (RMC) Units	Message/Data
AASHTO/ITE/NEMA	NTCIP 1208	Object Definitions for Closed Circuit Television (CCTV) Switching	Message/Data
AASHTO/ITE/NEMA	NTCIP 1209	Data Element Definitions for Transportation Sensor Systems (TSS)	Message/Data
AASHTO/ITE/NEMA	NTCIP 1210	Field Management Stations (FMS) - Part 1: Object Definitions for Signal System Masters	Message/Data
AASHTO/ITE/NEMA	NTCIP 1211	Object Definitions for Signal Control and Prioritization (SCP)	Message/Data
AASHTO/ITE/NEMA	NTCIP 1213	Object Definitions for Electrical and Lighting Management Systems (ELMS)	Message/Data
AASHTO/ITE/NEMA	NTCIP 1214	Object Definitions for Conflict Monitor Units (CMU)	Message/Data
AASHTO/ITE/NEMA	NTCIP C2C	NTCIP Center-to-Center Standards Group	Group
AASHTO/ITE/NEMA	NTCIP C2F	NTCIP Center-to-Field Standards Group	Group

SDO	Document ID	Standard Title	Standard Type
APTA	APTA TCIP-S-001 3.0.4	Standard for Transit Communications Interface Profiles	Message/Data
ASTM	ASTM E2468-05	Object Definitions for Signal Control and Prioritization (SCP)	Other
ASTM	ASTM E2665-08	Standard Specifications for Archiving ITS-Generated Traffic Monitoring Data	Message/Data
ASTM	DSRC 915MHz	Dedicated Short Range Communication at 915 MHz Standards Group	Group
ASTM/IEEE/SAE	DSRC 5GHz	Dedicated Short Range Communication at 5.9 GHz Standards Group	Group
IEEE	IEEE 1455-1999	Standard for Message Sets for Vehicle/Roadside Communications	Message/Data
IEEE	IEEE 1570-2002	Standard for the Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection	Message/Data
IEEE	IEEE IM	Incident Management Standards Group	Group
IEEE	IEEE P1609.11	Standard for Wireless Access in Vehicular Environments (WAVE) - Over-the-Air Data Exchange Protocol for Intelligent Transportation Systems (ITS)	Communications Protocol
SAE	ATIS General Use	Advanced Traveler Information Systems (ATIS) General Use Standards Group	Group
SAE	ATIS Low Bandwidth	Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group	Group
SAE	Mayday	On-board Vehicle Mayday Standards Group	Group
SAE	SAE J2395	ITS In-Vehicle Message Priority	Other
SAE	SAE J2396	Definitions and Experimental Measures Related to the Specification of Driver Visual Behavior Using Video Based Techniques	Other
SAE	SAE J2399	Adaptive Cruise Control (ACC) Operating Characteristics and User Interface	Other
SAE	SAE J2400	Human Factors in Forward Collision Warning Systems: Operating Characteristics and User Interface Requirements	Other