APPENDIX A – STAKEHOLDER MEETING ATTENDANCE

Stakeholders Meeting Attendance

– Meeting #1 – August 2, 2005
– Meeting #2 – October 4, 2005
– Meeting #3 – December 6, 2005

First Name	*Last Name*	*Title*	*Organization*	*Meeting #1*	*Meeting #2*	*Meeting #3*
Jim	Allen	Information Systems Manager	Tennessee Department of Transportation	☑	☐	☐
Robert	Allen	Incident Management Coordinator	Tennessee Department of Transportation Region 3 HELP	☑	☐	☐
Steve	Allen	Project Planning Director	Tennessee Department of Transportation Planning	☑	☐	☑
John	Benditz	Project Manager - Knoxville SmartWay	Tennessee Department of Transportation - Knoxville TMC	☑	☑	☑
Mark	Best	ITS/Traffic Manager	Tennessee Department of Transportation Region 1 Traffic	☑	☑	☑
Steve	Binkley	Captain	Tennessee Department of Safety, CV Enforcement	☐	☐	☑
Mickey	Campbell	Incident Management Coordinator	Tennessee Department of Transportation HELP Service Patrols	☑	☐	☑
Mike	Carroll	Wireless Systems Manager	Tennessee Department of Transportation Wireless Systems Section	☑	☑	☐
Don	Dahlinger	Assistant Director Design Division	Tennessee Department of Transportation ITS Office	☑	☑	☑
Kathy	Dannenhold	Statewide Transit Coordinator	Tennessee Department of Transportation	☐	☑	☑
Diane	Davidson	Director	TDOT Public Transportation, Waterways, and Rail	☑	☐	☐
Jason	Ellerbee		GS&P	☑	☐	☐
Ali	Farhangi	Traffic Engineer	Tennessee Department of Transportation Region 3	☐	☐	☑
Don	Gedge	Information Technology Specialist	Federal Highway Administration Tennessee Division	☑	☑	☑
Mike	Griffin	Assistant Wireless Systems Analyst	Tennessee Department of Transportation Wireless Systems Section	☑	☑	☑
John	Hall	Motorist Information Coordinator	Tennessee Department of Transportation Community Relations Division	☑	☑	☑
Bill	Hazelrig	Regional Maintenance Engineer	Tennessee Department of Transportation Region 4	☐	☑	☐
Pete	Hiett	Civil Engineering Manager 1	Tennessee Department of Transportation Traffic Design Section	☑	☑	☑
Frank	Horne	Incident Management Director	Tennessee Department of Transportation Incident Management	☑	☑	☑
Janet	Kelso		Tennessee Department of Transportation Region 2	☐	☐	☑

First Name	Last Name	Title	Organization	Meeting #1	Meeting #2	Meeting #3
Rick	Knoll		Tennessee Department of Transportation	☑	☐	☐
Dennis	Lowder		Tennessee Department of Transportation	☑	☐	☐
Kim	McDonough	GIS Manager 2	Tennessee Department of Transportation Information Technology Division	☑	☑	☑
Jason	Moody		Tennessee Department of Transportation	☑	☐	☐
Eddie	Newcomb	Highway Response Supervisor	Tennessee Department of Transportation HELP	☑	☐	☑
Steve	Norris		Tennessee Department of Transportation Information Technology	☑	☐	☐
J.R.	Perry	Captain	THP/Safety - District 3 - Nashville	☑	☑	☐
Bob	Richie		Tennessee Department of Transportation Governor's Highway Safety Office	☐	☐	☑
Sammy	Salameh		Tennessee Department of Transportation	☑	☐	☐
John	Savage	Lieutenant	THP/Safety - District 3 - Nashville	☑	☑	☑
Kevin	Speakman	Wireless Systems Analyst	Tennessee Department of Transportation Wireless Systems Section	☑	☐	☑
Jeanne	Stevens	Director of Long-Range Planning	Tennessee Department of Transportation Planning	☑	☐	☑
John	Thomas	Incident Management Coordinator	Tennessee Department of Transportation Region 4	☑	☑	☐
Del	Truitt	Rural Transportation Coordinator	Tennessee Department of Transportation Planning (RPTO)	☑	☐	☐
Bob	Van Horn		Tennessee Department of Transportation Region 2	☐	☐	☑
Joe	Warren	Region 4 Traffic Engineer	Tennessee Department of Transportation	☑	☐	☑
Alan	Wolfe	Regional Traffic Manager	Tennessee Department of Transportation Region 2	☑	☑	☐

APPENDIX B – INVENTORY DEFINITIONS

Element Name	Element Description
Airport	Regional airport (general and commercial aviation)
Alabama DOT	Alabama Department of Transportation, responsible for the maintenance and operations of roadways in the State of Alabama. Included in the TN Statewide ITS Architecture for coordination purposes.
Archived Data User Systems	Individuals who utilize the archive data system(s)
Arkansas DOT	Arkansas Department of Transportation, responsible for the maintenance and operations of roadways in the State of Arkansas. Included in the TN Statewide ITS Architecture for coordination purposes.
Commercial Vehicle	Commercial Vehicles are typically operated by private companies.
Commercial Vehicle Driver	Driver of commercial vehicle
Contractor Equipment	Portable ITS equipment belonging to a private contractor. In the context of the architecture, this would refer to portable CCTV, DMS, vehicle-mounted systems, or other contractor equipment that could be used at or near a highway construction site.
County EMA	County emergency management agency (EMA). The EMA operates the emergency operations center (EOC).
County Field Equipment	Field equipment such as speed monitoring equipment or other ITS devices
County Maintenance	Department responsible for maintenance of county roadway facilities. County maintenance departments are represented as general entities within the statewide ITS architecture. Regional ITS architectures provide for more detail about specific county maintenance functions and interfaces.
County Public Safety Dispatch	County public safety dispatch, such as sheriff or regional Fire/EMS.
County Public Safety Vehicles	County law enforcement/sheriff patrol vehicles
County TOC	County Traffic Operations Center responsible for signal control for county signals
County Traffic Signals	County operated signal systems
Cumberland Gap TOC	Traffic operations center at the Cumberland Gap Tunnel, located in Middlesboro, KY. This TOC monitors CCTV on the US25E corridor, as well as posts messages on DMS.
CVIEW	Application for exchanging commercial vehicle safety information, Commercial Vehicle Information Exchange Window (CVIEW)
Demand Response Transit Dispatch	Center responsible for the operations of a demand response transit agency and dispatching vehicles. The dispatch center communicates with drivers via radio communications (in most cases).
Demand Response Transit Vehicles	Transit vehicles for demand response transit operations. These vehicles could included buses, vans and automobiles.
Driver	Individual operating a motor vehicle
Electronic Fare Payment Card	Medium for collection of transit fares electronically. Cards typically feature a magnetic strip; on-board fare collection systems then debit the card for the fare amount when swiped.
Financial Institution	Handles exchange of money for electronic payment collection. This element would support transit and potentially toll collection strategies.
Freight Equipment	Equipment on hazardous cargo that monitors freight status
Georgia DOT	Georgia Department of Transportation, responsible for the maintenance and operations of roadways in the State of Georgia. Included in the TN Statewide ITS Architecture for coordination purposes.

Element Name	Element Description
IFTA	International Fuel Tax Agreement
IRP	International Registration Plan
Kentucky DOT	Kentucky Department of Transportation, responsible for the maintenance and operations of roadways in the State of Kentucky. Included in the TN Statewide ITS Architecture for coordination purposes.
Local Print and Broadcast Media	Local media outlets including newspapers, television and radio
Mississippi DOT	Mississippi Department of Transportation, responsible for the maintenance and operations of roadways in the State of Mississippi. Included in the TN Statewide ITS Architecture for coordination purposes.
Municipal EMA	Municipal emergency management agency (EMA). The EMA operates the emergency operations center (EOC)
Municipal Field Equipment	Field equipment such as detection, speed monitoring equipment or other ITS devices
Municipal Maintenance	Department responsible for maintenance of city streets and city-owned infrastructure (such as traffic signals)
Municipal Public Safety Dispatch	Dispatch center for municipal law enforcement agency (police). In some areas may also dispatch for Fire/EMS.
Municipal Public Safety Vehicles	Local law enforcement patrol vehicles. In some areas these could also include fire/EMS vehicles
Municipal TOC	Municipal Traffic Operations center responsible for municipal signal system operations
Municipal Traffic Signals	City operated traffic signals and traffic signal systems.
National Weather Service	Provides official US weather, marine, fire and aviation forecasts, warnings. The National Weather Service is a division of NOAA. TDOT TMCs receive weather forecast information feeds from NWS.
North Carolina DOT	North Carolina Department of Transportation, responsible for the maintenance and operations of roadways in the State of North Carolina. Included in the TN Statewide ITS Architecture for coordination purposes.
Other Maintenance and Construction Management	Additional maintenance and construction management agencies with whom information is shared for coordination in an emergency situation
Other States Maintenance	Maintenance operations of adjacent states. Represented in the Statewide ITS Architecture as a general entity. Detailed interfaces between TDOT entities (particularly regional maintenance or SmartWay TMCs) and maintenance entities in other states are detailed in the Regional ITS Architectures.
Other TDOT Region Construction Offices	TDOT Region Construction Offices
Other TDOT Region Maintenance	TDOT Region Maintenance
Other Traffic Management	Additional traffic management agencies with whom information is shared for coordination in an emergency situation
Private Fleet Operations	Fleet and freight management for private carriers
Private Long Distance Bus Company Operations	Private bus carrier
Private Sector Traveler Information Services	Third party distributor of transportation information, usually as a subscription service. This could include in-vehicle systems or wireless. This entity could also include private-sector operated traveler information web sites.
Private Traveler Personal Computing Devices	Personal traveler devices for accessing transportation information

Element Name	Element Description
Private Vehicle	Personal owner operated vehicle
Rail Operations Centers	Centers responsible for the operations and tracking of trains
Regional Amber Alert Network	Regional Amber Alert program coordinating emergency management and traffic management for information dissemination
Regional Toll Authority	Administration for tolled roadways. At present, there are no toll facilities in Tennessee, but this was identified as a potential future application.
Regional Toll Authority Toll Plazas	Toll collection facilities (future)
Regional Websites	Websites utilized by members of the Regional Amber Alert Network to disseminate amber alert information.
Service Agency	Agency responsible for payment of transit fares for medical transportation as part of government subsidized medical care
SSRS	Single State Registration System - in which commercial vehicles are required to register their FHWA operating authority and proof of insurance with their base state. The base state is determined by the location of the carrier's principal place of business. If a carrier's principal place of business is maintained outside of a participating state, the carrier must select the state where the largest number of vehicles will be operated during the next registration year.
TDOT Anti-icing Equipment	Roadway equipment that applies a chemical agent to lower the freezing point in an attempt to prevent ice from forming on the roadway
TDOT CCTV	Closed circuit television cameras for traffic surveillance and incident management. CCTV are existing in the metropolitan areas; TDOT plans to install CCTV along key highways corridors throughout the state. They are shown as 'planned' in the statewide ITS architecture
TDOT Closure Equipment	Roadway equipment to physically close roadways (such as gate systems)
TDOT Data Warehouse	Repository for transportation data for the State of Tennessee
TDOT District Maintenance	TDOT maintenance operations. Each TDOT Region contains several TDOT District Maintenance Offices.
TDOT DMS	Dynamic message signs for traffic information dissemination. TDOT has DMS in the urban areas, and plans to implement on corridors in the rural areas.
TDOT Emergency Services Coordinator	Emergency service coordinator from TDOT who serves in the TEMA emergency operations group. During a disaster this coordinator acts as a liaison between TEMA and the various TDOT TMCs and maintenance groups.
TDOT Field Sensors	Detectors/sensors that collect speed and volume data on key corridors.
TDOT HAR	Highway Advisory Radio for traffic information dissemination
TDOT HELP Dispatch	Roadway service patrol dispatch centers are located in the SmartWay TMCs.
TDOT HELP Vehicles	Roadway service patrol vehicles. These are existing in the urban areas, and TDOT plans to expand its HELP service to include rural corridors in the state.
TDOT Maintenance Headquarters	TDOT statewide maintenance headquarters in Nashville.
TDOT Maintenance Vehicles	TDOT vehicles used in maintenance operations
TDOT Public Information Office	TDOT department responsible for the dissemination of traffic, road closure, and planned construction activity information to the media and the public

Element Name	Element Description
TDOT Region 1 TMC - Knoxville	Traffic Management Center for TDOT Region 1. The center is located in Knoxville and is responsible for operating and managing the SmartWay system in the Knoxville metropolitan area as well as operation of ITS elements in rural areas of the Region. Detailed information flows and connections between the Region 1 TMC and devices and other agencies in Region 1 are detailed in the Knoxville Regional ITS Architecture.
TDOT Region 2 TMC - Chattanooga	Traffic Management Center for TDOT Region 2. The center will be located in Chattanooga and will be responsible for operating and managing the SmartWay system in the Chattanooga metropolitan area as well as operation of ITS elements in rural areas of the Region.
TDOT Region 3 TMC - Nashville	Traffic Management Center for TDOT Region 3. The center is located in Nashville and is responsible for operating and managing the SmartWay system in the Nashville metropolitan area as well as operation of ITS elements in rural areas of the Region.
TDOT Region 4 TMC - Memphis	Traffic Management Center for TDOT Region 4. The center is located in Memphis and is responsible for management of traffic in the Memphis metropolitan area as well as operation of ITS elements in rural areas of the Region.
TDOT Region Construction Office	Regional TDOT offices responsible for oversight of construction projects
TDOT Region Engineers Office	Region engineering office
TDOT Region Maintenance	Maintenance headquarters in each TDOT region. Each region contains several maintenance districts.
TDOT RWIS Sensors	Road weather information system sensors to provide data about real-time conditions, including temperature, precipitation, humidity and wind. TDOT currently has 37 RWIS stations throughout the state.
TDOT Security Monitoring Field Equipment	Field equipment for monitoring the security of the transportation infrastructure
TDOT Short Range Planning and Data Office	TDOT group responsible for traffic data collection and analysis as well as short range planning.
TDOT Smart Work Zone Equipment	Portable DMS and CCTV cameras as well as work zone safety monitoring equipment
TDOT SmartWay Information System (TSIS)	TSIS is a statewide roadways conditions database. Currently information can be entered by District and Regional maintenance personnel as well as staff at any of the Traffic Management Centers. TSIS feeds the Statewide 511 system as well as the SmartWay website.
TDOT SmartWay Website	Website providing road network conditions information, including closures, construction activity, weather and major incidents. TSIS provides data for the construction and incident information. A link to SmartWay CCTV camera views is also available
TDOT Speed Monitoring Equipment	Field equipment used for monitoring roadway speeds. These can be permanent or portable devices.
TDOT TSIS Archive	Data archive for historical transportation information from TSIS.
TEMA	TN Emergency Management Agency. Lead agency for emergency planning and responding to major incidents and disasters in Tennessee.
Tennessee 511 IVR	Tennessee 511 Interactive Voice Response. TDOT contracts the IVR operation to a vendor. The IVR accepts 511 callers' requests, and provides responses to specific traveler information needs. This is the customer interface component of the 511 phone system.
Tennessee 511 System	511 Traveler information system central server

Element Name	Element Description
Tennessee GoSmart Kiosks	Kiosks in rest areas that provide traveler information, including weather, road and travel conditions
Tennessee Pre-Pass	Determines whether or not a registered Pre-Pass commercial vehicle can bypass a weigh station
THP Dispatch	Highway Patrol dispatch center. THP dispatch includes a CAD system.
THP Enforcement	Enforcement officers for weigh and inspection station violations. THP is also responsible for law enforcement on state highways.
THP Truck Weigh and Inspection Station	Includes weigh in motion, static scales and inspection pits
THP Vehicles	Tennessee Highway Patrol vehicles
THP Weigh-in-Motion	Weigh-in-Motion scales
TN Bureau of Investigation	Responsible for Amber Alerts in TN
Transit Agency Archive	Archive for transit data
Transit Kiosks	Kiosks for dissemination of transit traveler information
Transit Vehicle Operator	Driver of bus or other transit vehicle
Transit Website	Website containing transit traveler information such as fares and schedules
USGS Field Equipment	Water level sensors and other weather equipment
USGS Flood Monitoring System	USGS system for monitoring water levels. Stream gauge data is collected and can be provided to TDOT and other agencies to alert them of high water conditions.
Violation Detection	Roadside equipment to detect trucks that fail to enter the weigh and inspection station as directed
Virginia DOT	Virginia Department of Transportation, responsible for the maintenance and operations of roadways in the State of Virginia. Included in the TN Statewide ITS Architecture for coordination purposes.
Wayside Detection Equipment	Train detection equipment

APPENDIX C – NATIONAL ITS ARCHITECTURE MARKET PACKAGES

National ITS Architecture Version 5.1
Market Packages
RECOMMENDED FOR TN STATEWIDE ARCHITECTURE

*Note: Market Packages in **Bold** were identified by stakeholders for inclusion in the Statewide ITS Architecture*

Market Package	Market Package Name	Description
Traffic Management Service Area		
ATMS01	**Network Surveillance**	Includes traffic detectors, CCTV cameras, other surveillance equipment, supporting field equipment and fixed point to point communications to transmit the collected data back to a traffic management center.
ATMS02	Probe Surveillance	Provides an alternative approach for surveillance of the roadway network. Probe vehicles are tracked and position and speed information utilized to determine road network conditions such as average speed and congestion conditions.
ATMS03	**Surface Street Control**	Provides the central control and monitoring equipment, communication links and signal control equipment that support local street and/or arterial traffic management. This market package is consistent with typical urban traffic signal control systems.
ATMS04	Freeway Control	Provides the communications and roadside equipment to support ramp control, lane controls and interchange control for freeways. This market package is consistent with typical urban traffic freeway control systems. Also includes the capability to utilize surveillance information for detection of incidents.
ATMS05	HOV Lane Management	Manages HOV lanes by coordinating freeway ramp meters and connector signals with HOV lane usage signals.
ATMS06	**Traffic Information Dissemination**	Provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. Information can include traffic and road conditions, closure and detour information, incident information, emergency alerts and driver advisories.
ATMS07	**Regional Traffic Control**	Sharing of traffic information and control among traffic management centers to support a regional control strategy. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions.
ATMS08	**Traffic Incident Management System**	Manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. This market package includes incident detection capabilities and coordination with other agencies. It supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel.
ATMS09	Traffic Forecast and Demand Management	Includes advanced algorithms, processing, and mass storage capabilities that support historical evaluation, real-time assessment, and forecasts of the roadway network performance.
ATMS10	**Electronic Toll Collection**	Provides toll operators with the ability to collect tolls electronically and detect and process violations.
ATMS11	Emissions Monitoring and Management	Monitors individual vehicle emissions and provides general air quality monitoring using distributed sensors to collect the data.
ATMS12	Virtual TMC and Smart Probe Data	Provides for special requirements of rural road systems. By distributing traffic management over a very wide area (whole state or collection of states). Each locality can access available information for assessment of road conditions. Vehicles are used as smart probes to provide information on road conditions.
ATMS13	**Standard Railroad Grade Crossing**	Manages highway traffic at highway-rail intersections (HRIs) where rail operational speeds are less than 80 mph.
ATMS14	Advanced Railroad Grade Crossing	Manages highway traffic at highway-rail intersections (HRIs) where operational speeds are greater than 80 mph. Augments Standard Railroad Grade Crossing market package with additional safety features to mitigate the risks associated with higher rail speeds.
ATMS15	**Railroad Operations Coordination**	Provides an additional level of strategic coordination between freight rail operations and traffic management centers. Could include train schedules, maintenance schedules or any other anticipated HRI closures.

National ITS Architecture Version 5.1
Market Packages
RECOMMENDED FOR TN STATEWIDE ARCHITECTURE

*Note: Market Packages in **Bold** were identified by stakeholders for inclusion in the Statewide ITS Architecture*

Market Package	Market Package Name	Description
Traffic Management Service Area (continued)		
ATMS16	Parking Facility Management	Provides enhanced monitoring and management of parking facilities. Market package assists in the management of parking operations, coordinates with transportation authorities, and supports electronic collection of parking fees.
ATMS17	Regional Parking Management	Supports coordination between parking facilities to enable regional parking management strategies.
ATMS18	Reversible Lane Management	Provides for the management of reversible lane facilities and includes the field equipment, physical lane access controls, and associated control electronics.
ATMS19	**Speed Monitoring**	Monitors the speeds of vehicles traveling through a roadway system.
ATMS20	Drawbridge Management	Supports systems that manage drawbridges at rivers and canals and other multimodal crossings. Includes control devices as well as traveler information systems.
ATMS21	**Roadway Closure Management**	Closes roadways to vehicular traffic when driving conditions are unsafe, maintenance must be performed, or other situations. Market package covers general road closures applications; specific closure systems that are used at railroad grade crossings, drawbridges, reversible lanes, etc. are covered by other market packages.
Emergency Management Service Area		
EM01	**Emergency Call - Taking and Dispatch**	Provides basic public safety call-taking and dispatch services. Includes emergency vehicle equipment, equipment used to receive and route emergency calls, wireless communications and coordination between emergency management agencies.
EM02	**Emergency Routing**	Supports automated vehicle location and dynamic routing of emergency vehicles. Traffic information, road conditions and suggested routing information are provided to enhance emergency vehicle routing. Includes signal preemption and priority applications.
EM03	Mayday Support	Allows the user to initiate a request for emergency assistance and enables the emergency management subsystem to locate the user, gather information about the incident and determine the appropriate response.
EM04	**Roadway Service Patrols**	Supports the roadway service patrol vehicles that aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. This market package monitors service patrol vehicle locations and supports vehicle dispatch.
EM05	**Transportation Infrastructure Protection**	Includes the monitoring of transportation infrastructure (e.g. bridges, tunnels and management centers) for potential threats using sensors, surveillance equipment, barriers and safeguard systems to preclude an incident, control access during and after an incident or mitigate the impact of an incident. Threats can be acts of nature, terrorist attacks or other incidents causing damage to the infrastructure.
EM06	**Wide-Area Alert**	Uses ITS driver and traveler information systems to alert the public in emergency situations such as child abductions, severe weather, civil emergencies or other situations that pose a threat to life and property.
EM07	Early Warning System	Monitors and detects potential, looming and actual disasters including natural, technological and man-made disasters.
EM08	**Disaster Response and Recovery**	Enhances the ability of the surface transportation system to respond to and recover from disasters. Supports coordination of emergency response plans, provides enhanced access to the scene and better information about the transportation system in the vicinity of the disaster, and maintains situation awareness.

National ITS Architecture Version 5.1
Market Packages
RECOMMENDED FOR TN STATEWIDE ARCHITECTURE

*Note: Market Packages in **Bold** were identified by stakeholders for inclusion in the Statewide ITS Architecture*

Market Package	Market Package Name	Description
Emergency Management Service Area (continued)		
EM09	**Evacuation and Reentry Management**	Supports evacuation of the general public from a disaster area and manages subsequent reentry to the disaster area. This market package supports both anticipated, well-planned and orderly evacuations such as for a hurricane, as well as sudden evacuations with little or no time for preparation or public warning such as a terrorist act. Employs a number of strategies to maximize capacity along an evacuation route including coordination with transit.
EM10	**Disaster Traveler Information**	Use of ITS to provide disaster-related traveler information to the general public, including evacuation and reentry information and other information concerning the operation of the transportation system during a disaster.
Maintenance and Construction Management Service Area		
MC01	**Maintenance and Construction Vehicle and Equipment Tracking**	Tracks the location of maintenance and construction vehicles and other equipment to ascertain the progress of their activities.
MC02	Maintenance and Construction Vehicle Maintenance	Performs vehicle maintenance scheduling and manages both routine and corrective maintenance activities. Includes on-board sensors capable of automatically performing diagnostics.
MC03	**Road Weather Data Collection**	Collects current road weather conditions using data collected from environmental sensors deployed on and about the roadway.
MC04	**Weather Information Processing and Distribution**	Processes and distributes the environmental information collected from the Road Weather Data Collection market package. This market package uses the environmental data to detect environmental hazards such as icy road conditions, high winds, dense fog, etc. so system operators can make decisions on corrective actions to take.
MC05	**Roadway Automated Treatment**	Automatically treats a roadway section based on environmental or atmospheric conditions. Includes the sensors that detect adverse conditions, automated treatment (such as anti-icing chemicals), and driver information systems.
MC06	Winter Maintenance	Supports winter road maintenance. Monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities.
MC07	Roadway Maintenance and Construction	Supports numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way. Environmental conditions information is also received from various weather sources to aid in scheduling maintenance and construction activities.
MC08	**Work Zone Management**	Directs activity in work zones, controlling traffic through portable dynamic message signs and informing other groups of activity for better coordination management. Also provides speed and delay information to motorists prior to the work zone.
MC09	**Work Zone Safety Monitoring**	Includes systems that improve work crew safety and reduce collisions between the motoring public and maintenance and construction vehicles. Detects vehicle intrusions in work zones and warns workers and drivers of safety hazards when encroachment occurs.
MC10	**Maintenance and Construction Activity Coordination**	Supports the dissemination of maintenance and construction activity to centers that can utilize it as part of their operations. (i.e., traffic management, transit, emergency management)
Public Transportation Service Area		
APTS1	**Transit Vehicle Tracking**	Monitors current transit vehicle location using an automated vehicle location system. Location data may be used to determine real time schedule adherence and update the transit system's schedule in real time.

National ITS Architecture Version 5.1
Market Packages
RECOMMENDED FOR TN STATEWIDE ARCHITECTURE

*Note: Market Packages in **Bold** were identified by stakeholders for inclusion in the Statewide ITS Architecture*

Market Package	Market Package Name	Description
Public Transportation Service Area (continued)		
APTS2	Transit Fixed-Route Operations	Performs vehicle routing and scheduling, as well as operator assignment and system monitoring for fixed-route and flexible-route transit services.
APTS3	**Demand Response Transit Operations**	Performs vehicle routing and scheduling, as well as operator assignment and system monitoring for demand responsive transit services.
APTS4	**Transit Passenger and Fare Management**	Manages passenger loading and fare payments on transit vehicles using electronic means.
APTS5	**Transit Security**	Provides for the physical security of transit passengers and transit vehicle operators. Includes on-board security cameras and panic buttons.
APTS6	Transit Maintenance	Supports automatic transit maintenance scheduling and monitoring for both routine and corrective maintenance.
APTS7	**Multi-modal Coordination**	Establishes two way communications between multiple transit and traffic agencies to improve service coordination.
APTS8	**Transit Traveler Information**	Provides transit users at transit stops and on board transit vehicles with ready access to transit information. Services include stop annunciation, imminent arrival signs and real-time transit schedule displays. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by this market package.
Commercial Vehicle Operations Service Area		
CVO01	Fleet Administration	Provides the capabilities to manage a fleet of commercial vehicles. Vehicle routing and tracking as well as notification of emergency management of any troublesome route deviations (such as a HAZMAT vehicle) are part of this market package.
CVO02	Freight Administration	Tracks the movement of cargo and monitors the cargo condition.
CVO03	**Electronic Clearance**	Provides for automatic clearance at roadside check facilities. Allows a good driver/vehicle/carrier to pass roadside facilities at highway speeds using transponders and dedicated short range communications to the roadside.
CVO04	**Administrative Processes**	Provides for electronic application, processing, fee collection, issuance and distribution of CVO credentials and tax filing.
CVO05	International Border Electronic Clearance	Provides for automated clearance at international border crossings.
CVO06	**Weigh-In-Motion**	Provides for high speed weigh-in-motion with or without automated vehicle identification capabilities.
CVO07	Roadside CVO Safety	Provides for automated roadside safety monitoring and reporting. Automates commercial vehicle safety inspections at the roadside check facilities.
CVO08	On-board CVO and Freight Safety & Security	Provides for on-board commercial vehicle safety monitoring and reporting as well as roadside support for reading on-board safety data via tags.
CVO09	CVO Fleet Maintenance	Supports maintenance of CVO fleet vehicles with on-board monitoring equipment and automated vehicle location capabilities.
CVO10	**HAZMAT Management**	Integrates incident management capabilities with commercial vehicle tracking to assure effective treatment of HAZMAT material and incidents.
CVO11	Roadside HAZMAT Security Detection and Mitigation (need to review)	Provides the capability to detect and classify security sensitive HAZMAT on commercial vehicles using roadside sensing and imaging technology. Credentials information can be accessed to verify if the commercial driver, vehicle and carrier are permitted to transport the identified HAZMAT.
CVO12	Commercial Vehicle Driver Security Authentication	Provides the ability for Fleet and Freight Management to detect when an unauthorized commercial vehicle driver attempts to drive a vehicle based on stored identity information. If an unauthorized driver has been detected the commercial vehicle can be disabled.

National ITS Architecture Version 5.1
Market Packages
RECOMMENDED FOR TN STATEWIDE ARCHITECTURE

*Note: Market Packages in **Bold** were identified by stakeholders for inclusion in the Statewide ITS Architecture*

Market Package	Market Package Name	Description
Commercial Vehicle Operations Service Area (continued)		
CVO13	Freight Assignment Tracking	Provides for the planning and tracking of the commercial vehicle, freight equipment and the commercial vehicle driver.
Traveler Information Service Area		
ATIS1	**Broadcast Traveler Information**	Collects traffic conditions, advisories, general public transportation, toll and parking information, incident information, roadway maintenance and construction information, air quality and weather information, and broadly disseminates this information through existing infrastructures (radio, cell phones, etc.).
ATIS2	**Interactive Traveler Information (discuss 511)**	Provides tailored information in response to a traveler request. The traveler can obtain current information regarding traffic conditions, roadway maintenance and construction, transit services, ride share/ride match, parking management, detours and pricing information.
ATIS3	Autonomous Route Guidance	Using vehicle location and other information, this market package enables route planning and detailed route guidance based on static, stored information.
ATIS4	Dynamic Route Guidance	Offers advanced route planning and guidance that is responsive to current conditions.
ATIS5	ISP Based Route Guidance	Offers the user pre-trip route planning and turn-by-turn route guidance services. Routes may be based on static or real time network conditions.
ATIS6	Integrated Transportation Management/Route Guidance	Provides advanced route planning and guidance that is responsive to current conditions.
ATIS7	Yellow Pages and Reservation	Provides yellow pages and reservations services to the user.
ATIS8	Dynamic Ridesharing	Provides dynamic ridesharing/ride matching services to travelers.
ATIS9	In Vehicle Signing	Supports the distribution of traffic and travel advisory information to drivers through in-vehicle devices.
Archived Data Management Service Area		
AD1	**ITS Data Mart**	Provides a focused archive that houses data collected and owned by a single agency or other organization. Focused archive typically covers a single transportation mode and one jurisdiction.
AD2	**ITS Data Warehouse**	Includes all the data collection and management capabilities of the ITS Data Mart. Adds the functionality to allow collection of data from multiple agencies and data sources across modal and jurisdictional boundaries.
AD3	ITS Virtual Data Warehouse	Provides the same broad access to multimodal, multidimensional data from varied sources as in the ITS Data Warehouse Market Package, but provides this access using enhanced interoperability between physically distributed ITS archives that are each locally managed.
Vehicle Safety Service Area		
AVSS01	Vehicle Safety Monitoring	This market package will diagnose critical components of the vehicle and warn the driver of potential dangers. On-board sensors will determine the vehicle's condition, performance, on-board safety data, and display information.
AVSS02	Driver Safety Monitoring	This market package will determine the driver's condition, and warn the driver of potential dangers. On-board sensors will determine the driver's condition, performance, on-board safety data, and display information.

National ITS Architecture Version 5.1
Market Packages
RECOMMENDED FOR TN STATEWIDE ARCHITECTURE

*Note: Market Packages in **Bold** were identified by stakeholders for inclusion in the Statewide ITS Architecture*

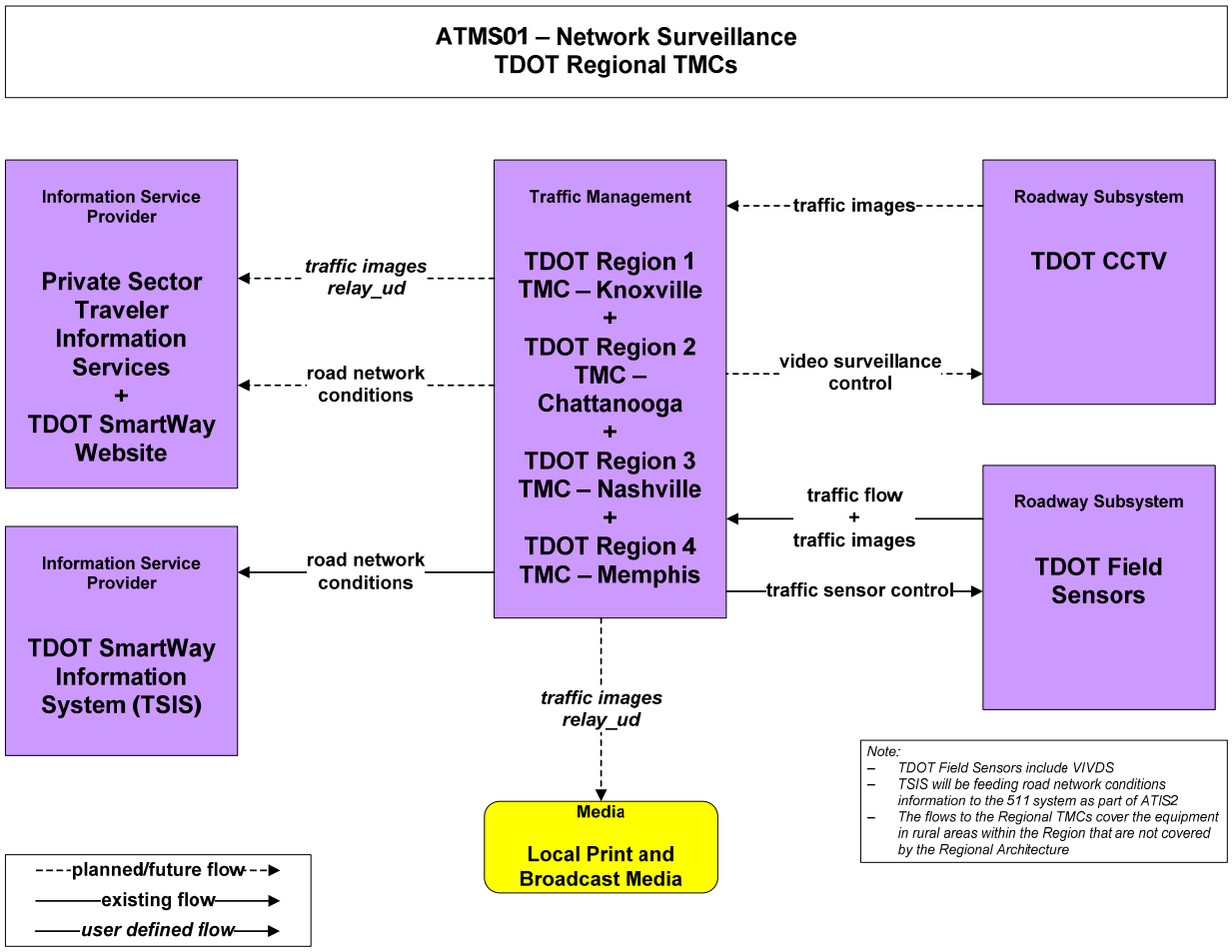
Market Package	Market Package Name	Description
Vehicle Safety Service Area (continued)		
AVSS03	Longitudinal Safety Warning	This market package allows for longitudinal warning. It utilizes safety sensors and collision sensors. It requires on-board sensors to monitor the areas in front of and behind the vehicle and present warnings to the driver about potential hazards.
AVSS04	Lateral Safety Warning	This market package allows for lateral warning. It utilizes safety sensors and collision sensors. It requires on-board sensors to monitor the areas to the sides of the vehicle and present warnings to the driver about potential hazards.
AVSS05	Intersection Safety Warning	This market package will determine the probability of a collision in an equipped intersection (either highway-highway or highway-rail) and provide timely warnings to drivers in response to hazardous conditions.
AVSS06	Pre-Crash Restraint Deployment	This market package provides in-vehicle sensors to monitor the vehicle's local environment, determine collision probability and deploy a pre-crash safety system.
AVSS07	Driver Visibility Improvement	This market package will enhance driver visibility using an enhanced vision system.
AVSS08	Advanced Vehicle Longitudinal Control	This market package automates the speed and headway control functions on board the vehicle.
AVSS09	Advanced Vehicle Lateral Control	This market package automates the steering control on board the vehicle.
AVSS10	Intersection Collision Avoidance	This market package will determine the probability of an intersection collision and provide timely warnings to approaching vehicles so that avoidance actions can be taken.
AVSS11	Automated Highway System	This market package enables “hands-off” operation of the vehicle on the automated portion of the highway system.

APPENDIX D – CUSTOMIZED MARKET PACKAGES

LIST OF MARKET PACKAGES

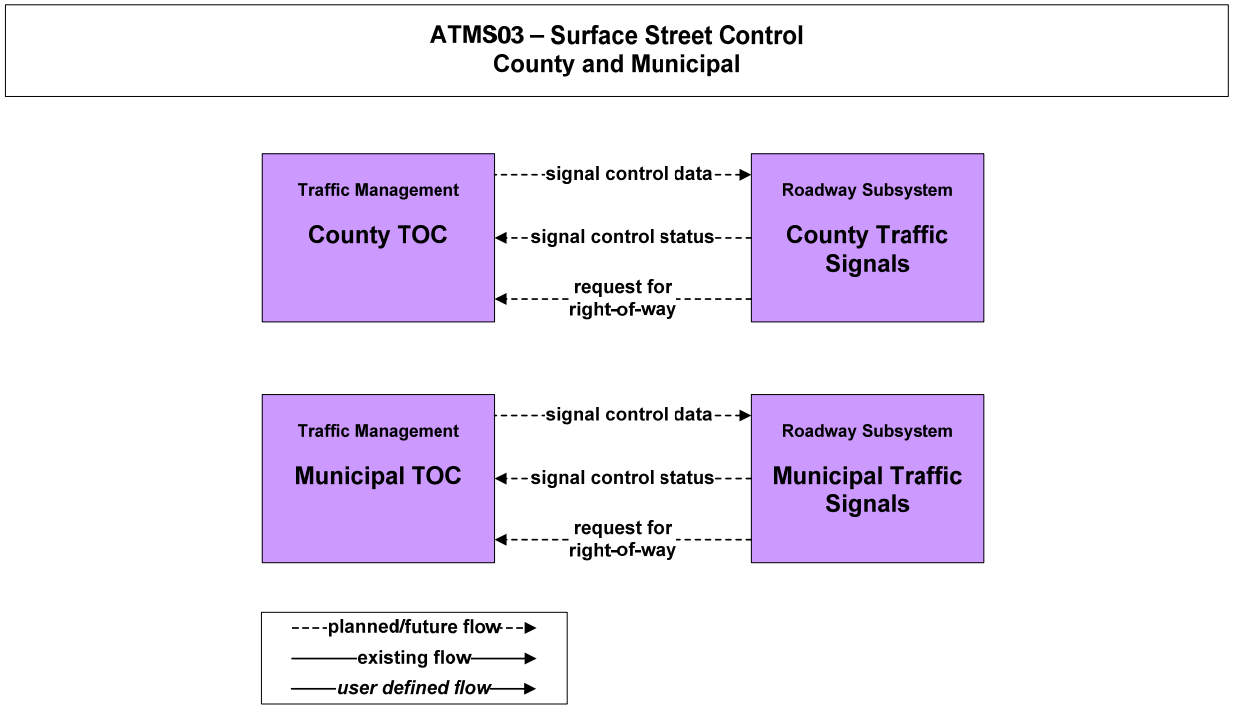
ATMS01 – Network Surveillance

Includes traffic detectors, CCTV cameras, other surveillance equipment, supporting field equipment and fixed point-to-point communications to transmit the collected data back to a traffic management center.



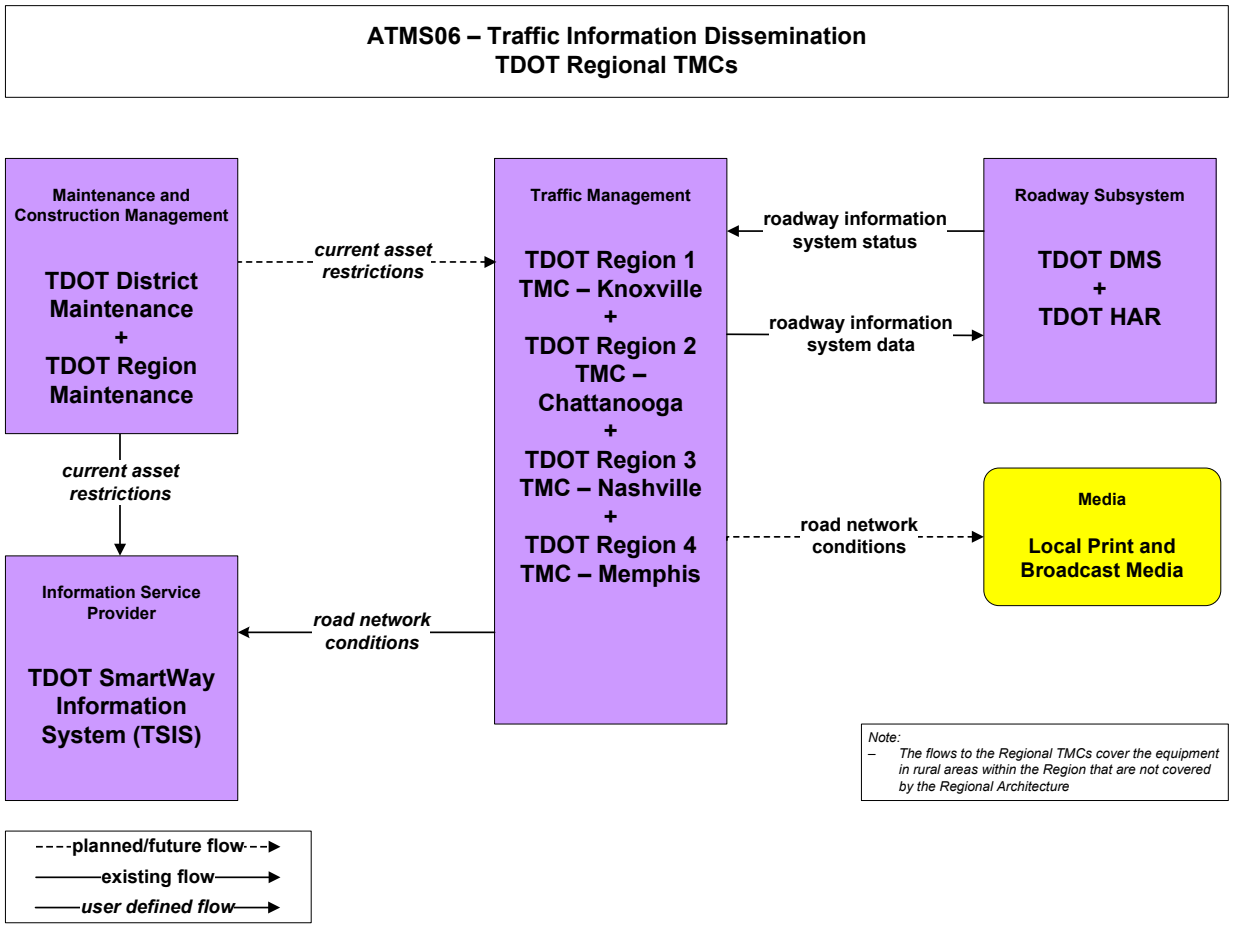
ATMS03 – Surface Street Control

Provides the central control and monitoring equipment, communication links and signal control equipment that support local street and/or arterial traffic management. This market package is consistent with typical urban traffic signal control systems.



ATMS06 – Traffic Information Dissemination

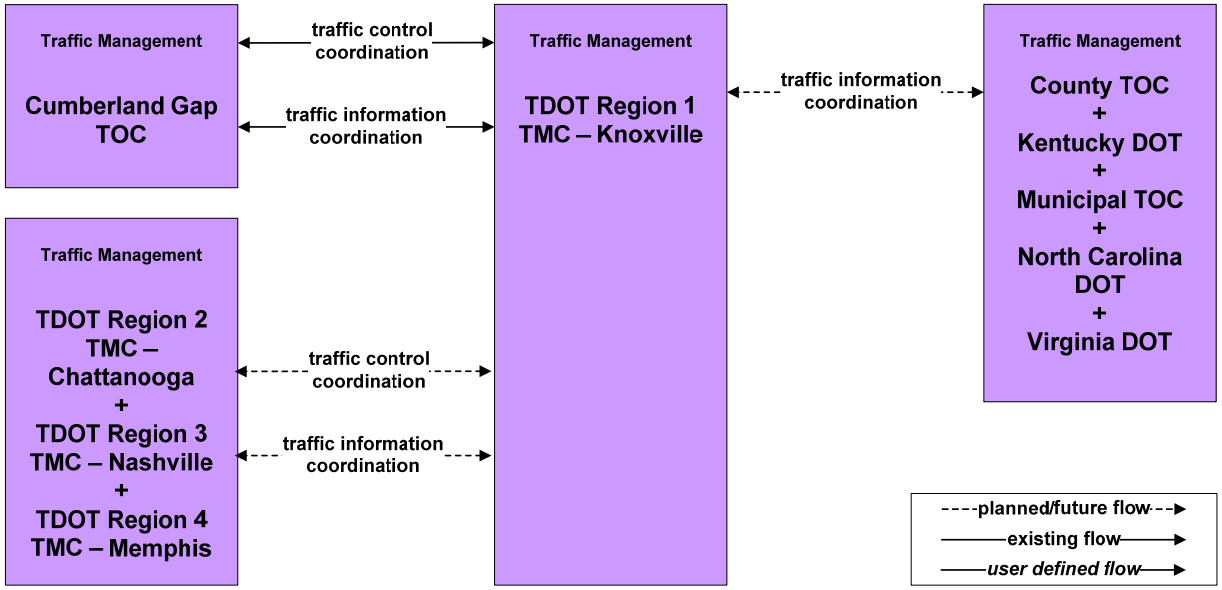
Provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. Information can include traffic and road conditions, closure and detour information, incident information, emergency alerts and driver advisories.



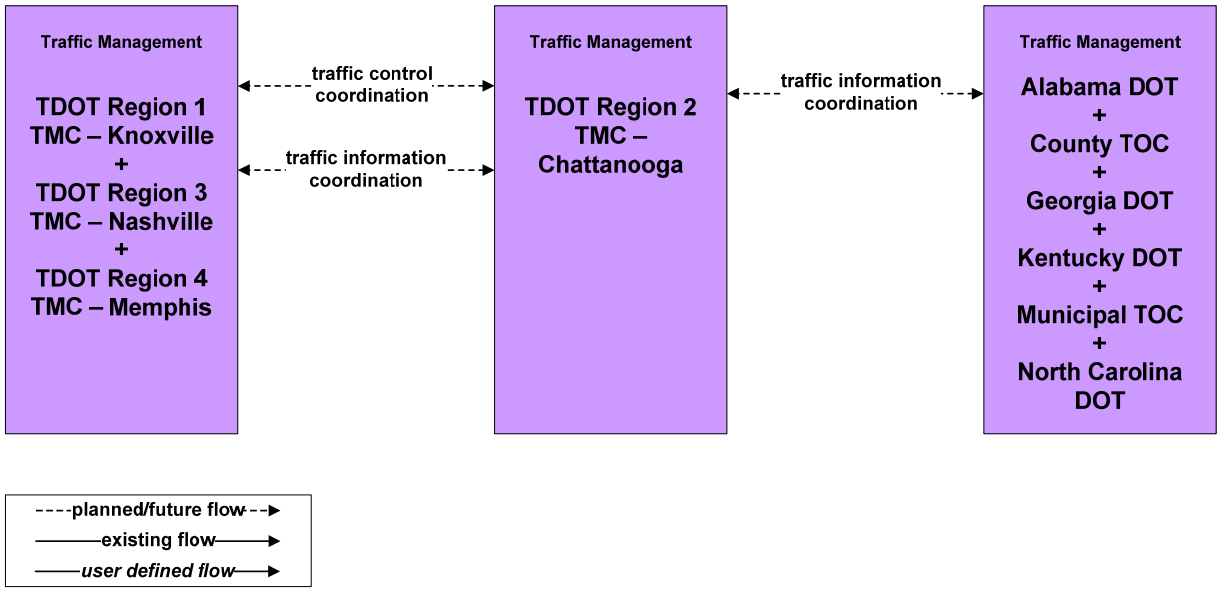
ATMS07 – Regional Traffic Control

Sharing of traffic information and control among traffic management centers to support a regional control strategy. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. Several levels of coordination are supported from sharing of information through sharing of control between traffic management centers.

ATMS07 – Regional Traffic Control
TDOT Region 1 TMC – Knoxville

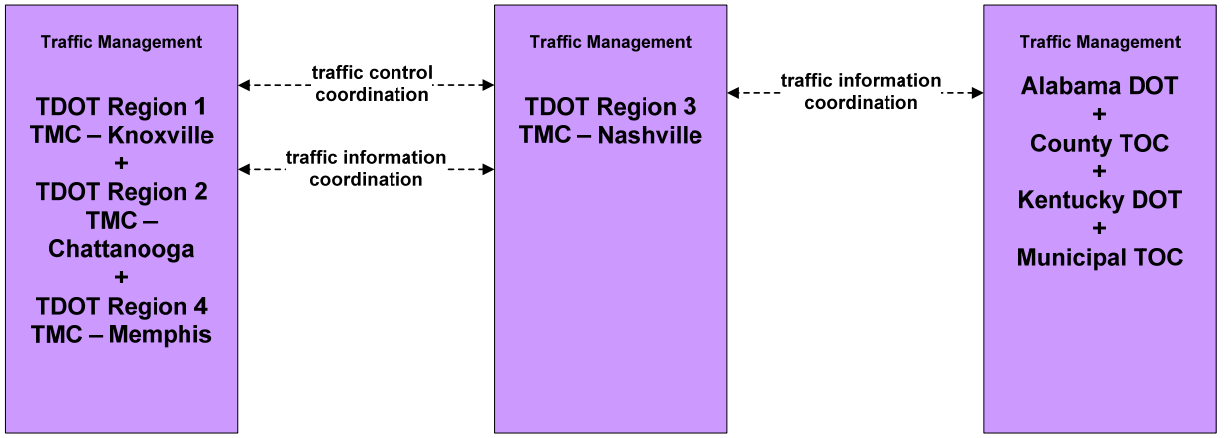


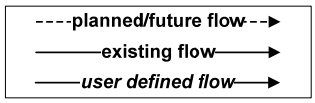
ATMS07 – Regional Traffic Control
TDOT Region 2 TMC – Chattanooga



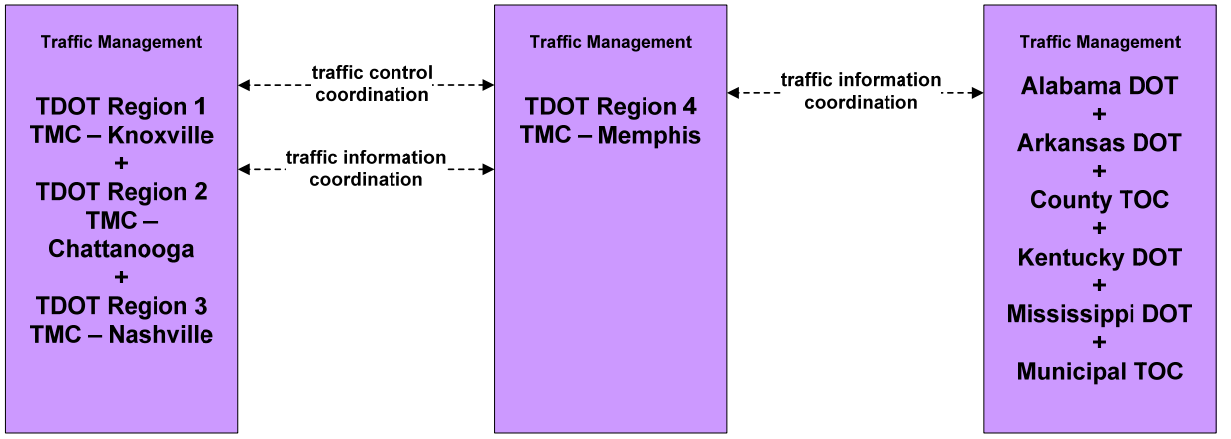
ATMS07 – Regional Traffic Control (continued)

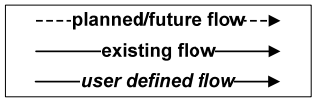
ATMS07 – Regional Traffic Control
TDOT Region 3 TMC – Nashville





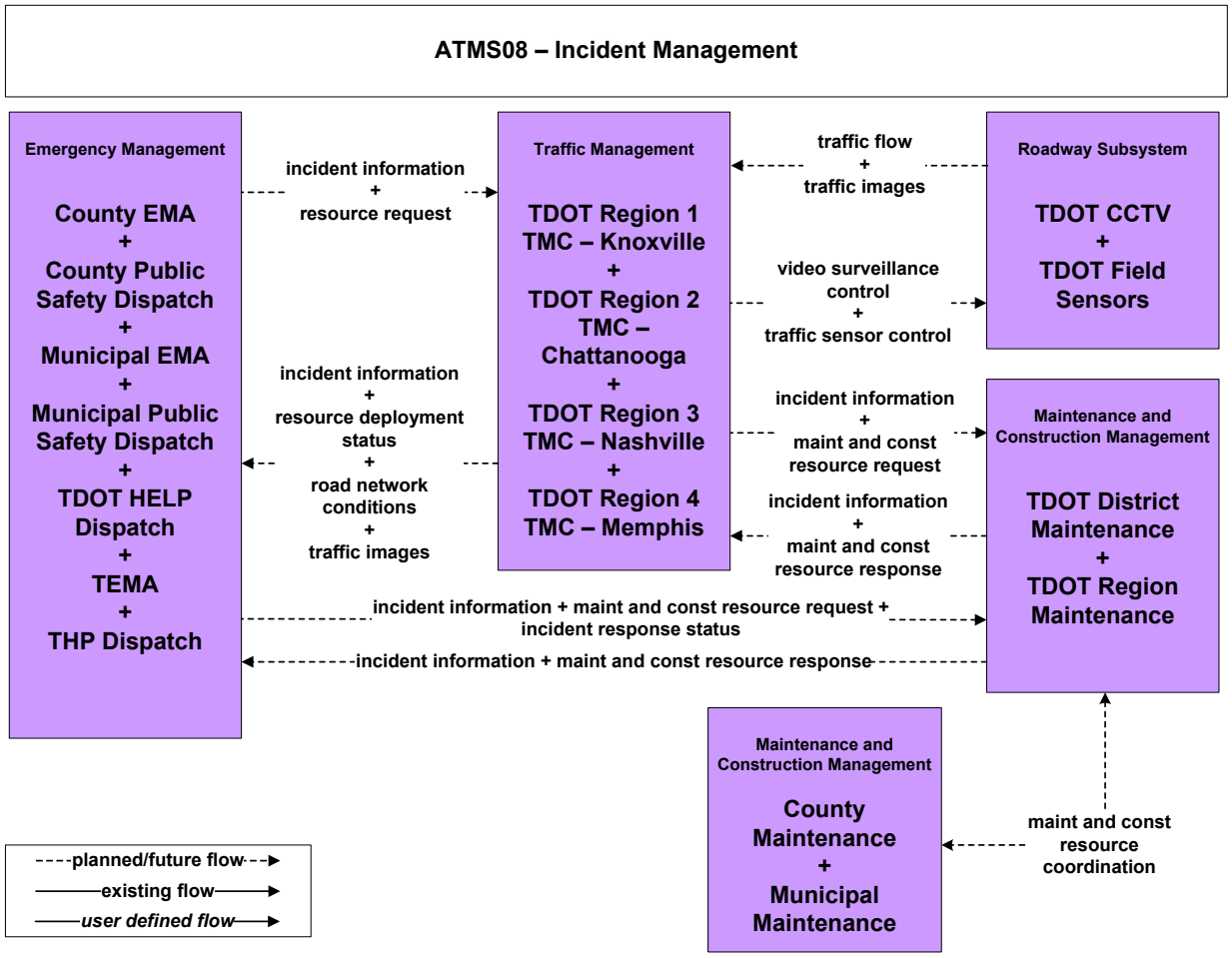
ATMS07 – Regional Traffic Control
TDOT Region 4 TMC – Memphis





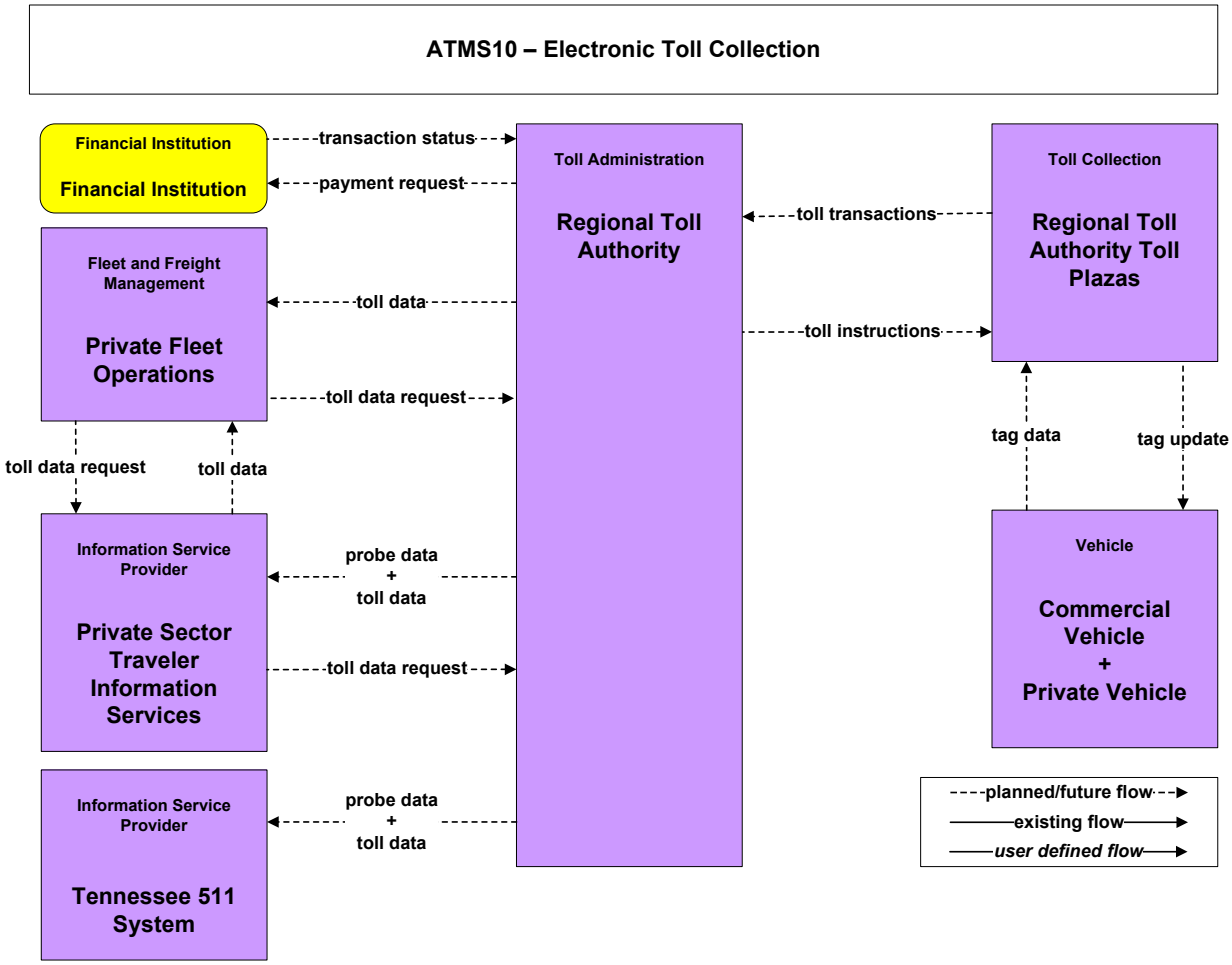
ATMS08 – Traffic Incident Management System

Manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. This market package includes incident detection capabilities and coordination with other agencies. It supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel. Coordination with emergency management might be through a CAD system or through other communication with emergency field personnel. Information is conveyed to travelers via other market packages (including Traffic Information Dissemination, Broadcast Traveler Information or Interactive Traveler Information).



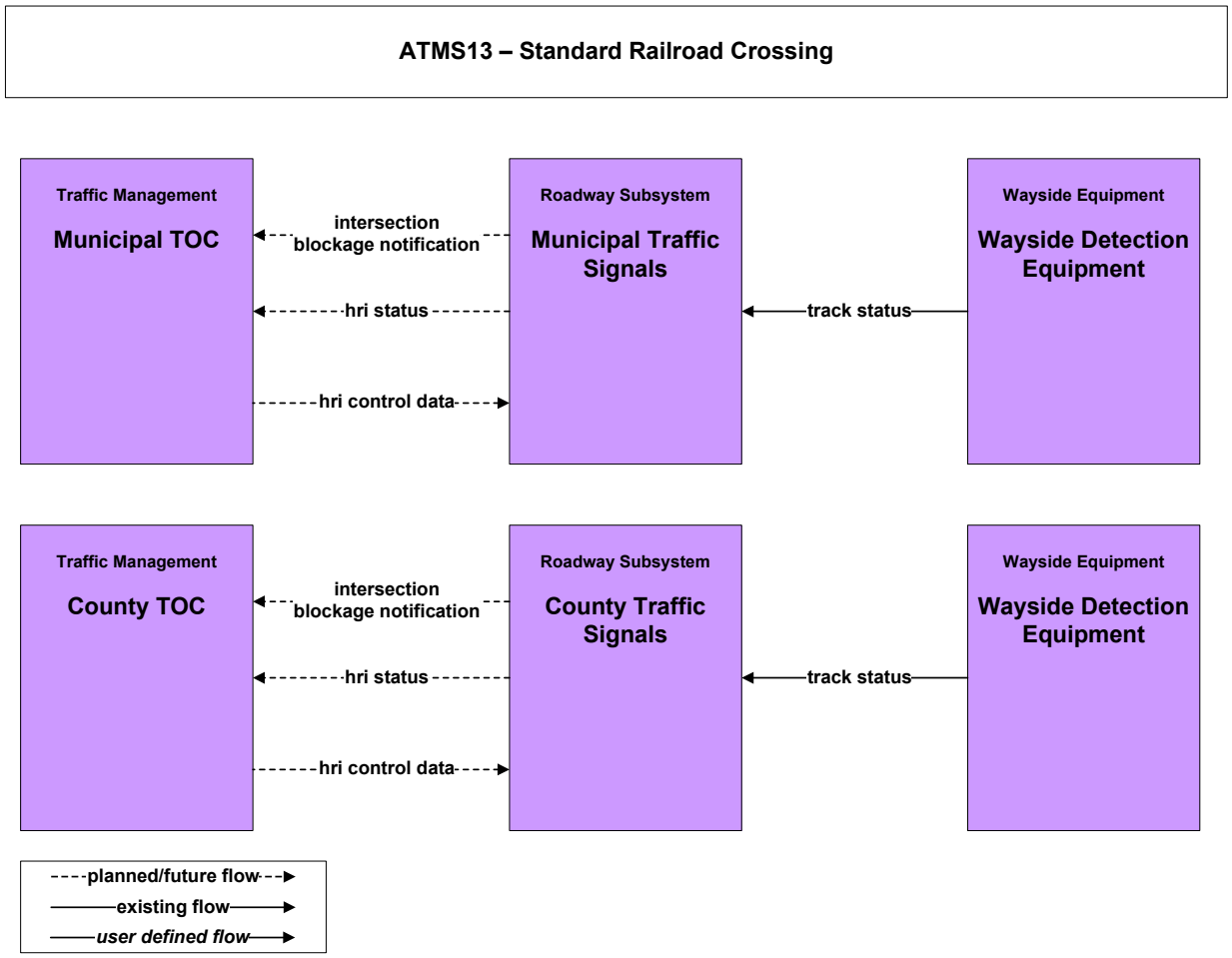
ATMS10 – Electronic Toll Collection

Provides toll operators with the ability to collect tolls electronically and detect and process violations. Dedicated short range communication between the roadway equipment and the vehicle is required as well as fixed-point to fixed-point interfaces between the toll collection equipment and transportation authorities and the financial infrastructure that supports fee collection. Toll tags and roadside readers can also be used to collect road use statistics for highway authorities.



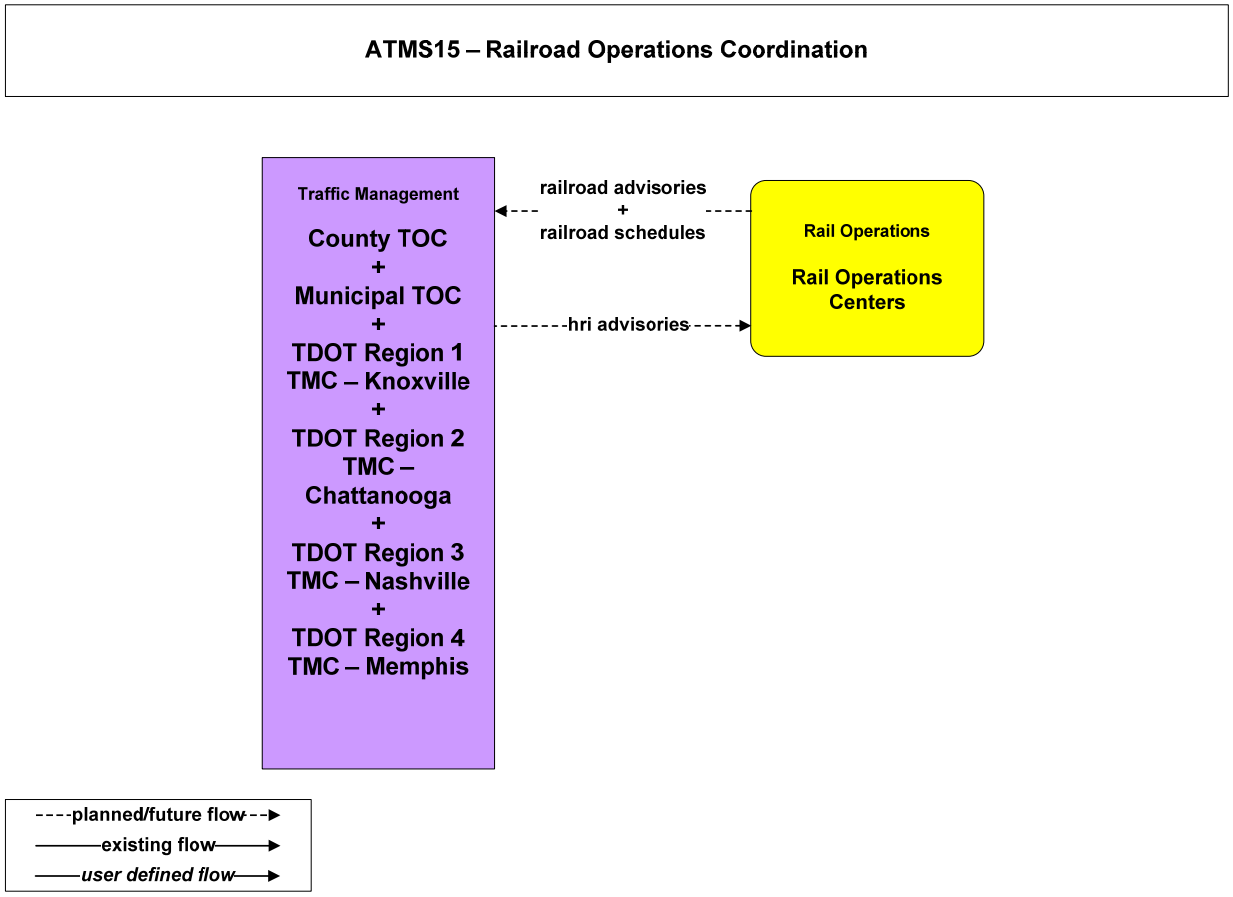
ATMS13 – Standard Railroad Crossing

Manages highway traffic at highway-rail intersections (HRIs) where rail operational speeds are less than 80 mph.



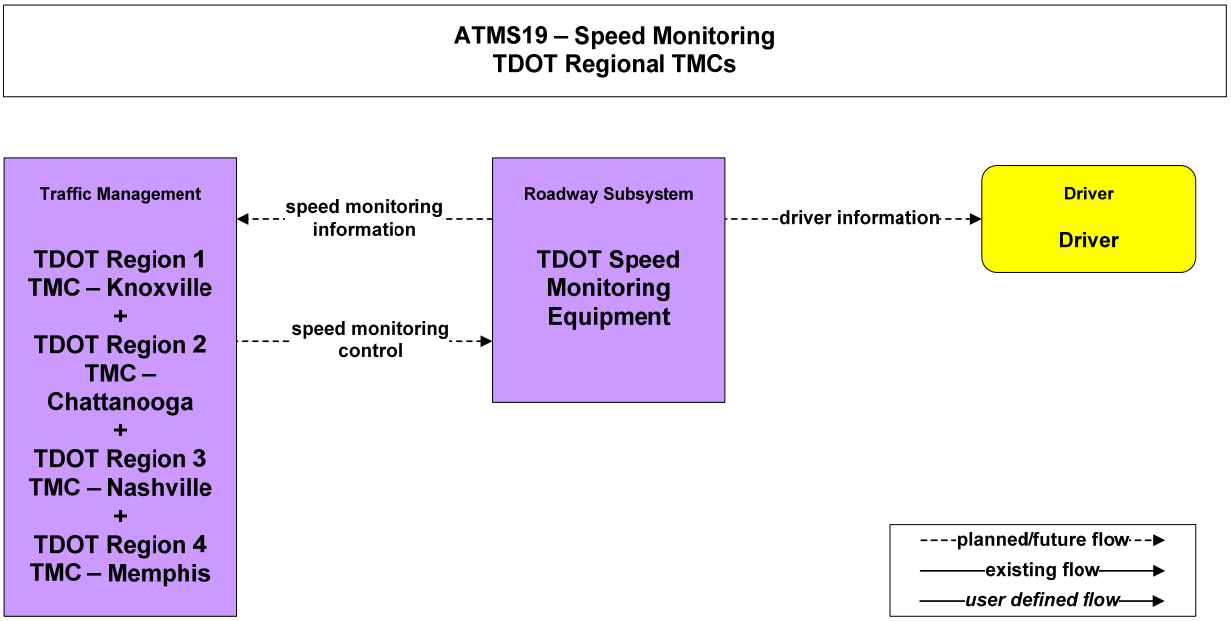
ATMS15 – Railroad Operations Coordination

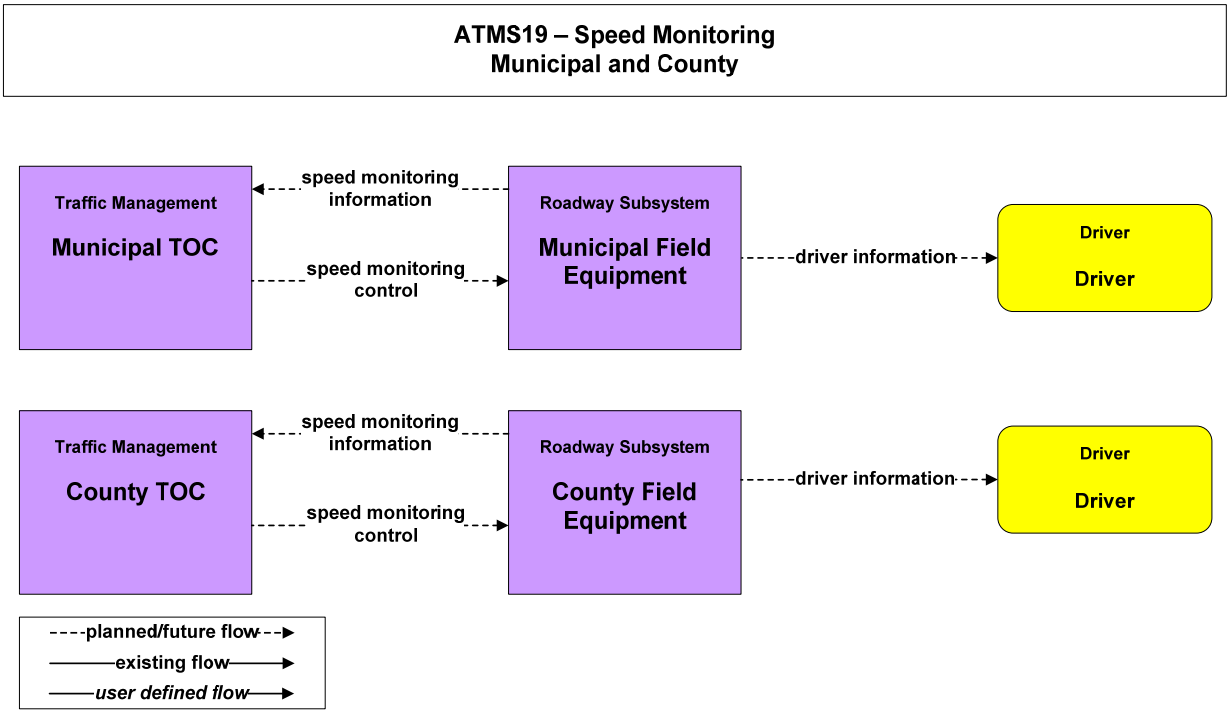
Provides an additional level of strategic coordination between freight rail operations and traffic management centers. Could include train schedules, maintenance schedules or any other anticipated HRI closures.



ATMS19 – Speed Monitoring

This market package monitors the speeds of vehicles traveling through a roadway system. If the speed is determine to be excessive, roadside equipment can suggest a safe driving speed. These applications are usually associated with school zones or work zones, or other areas deemed high priority for additional monitoring or enforcement. Environmental conditions may be monitored and factored into the safe speed advisories that are provided to the motorist. This service can also support notifications to an enforcement agency to enforce the speed limit on a roadway system.

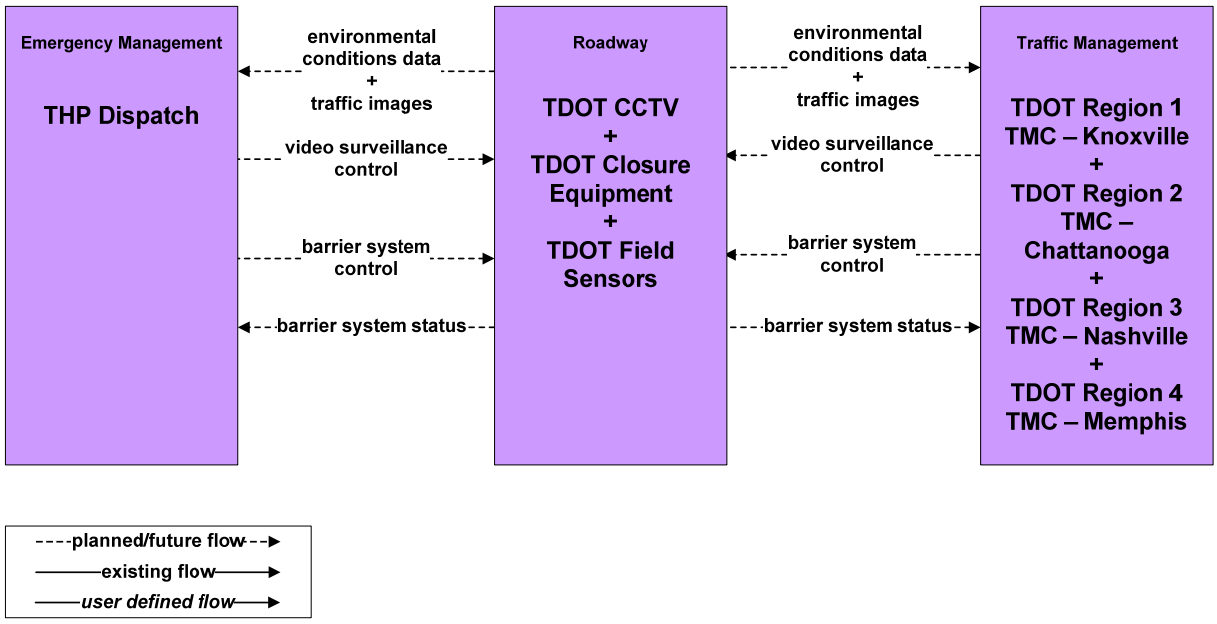




ATMS21 – Roadway Closure Management

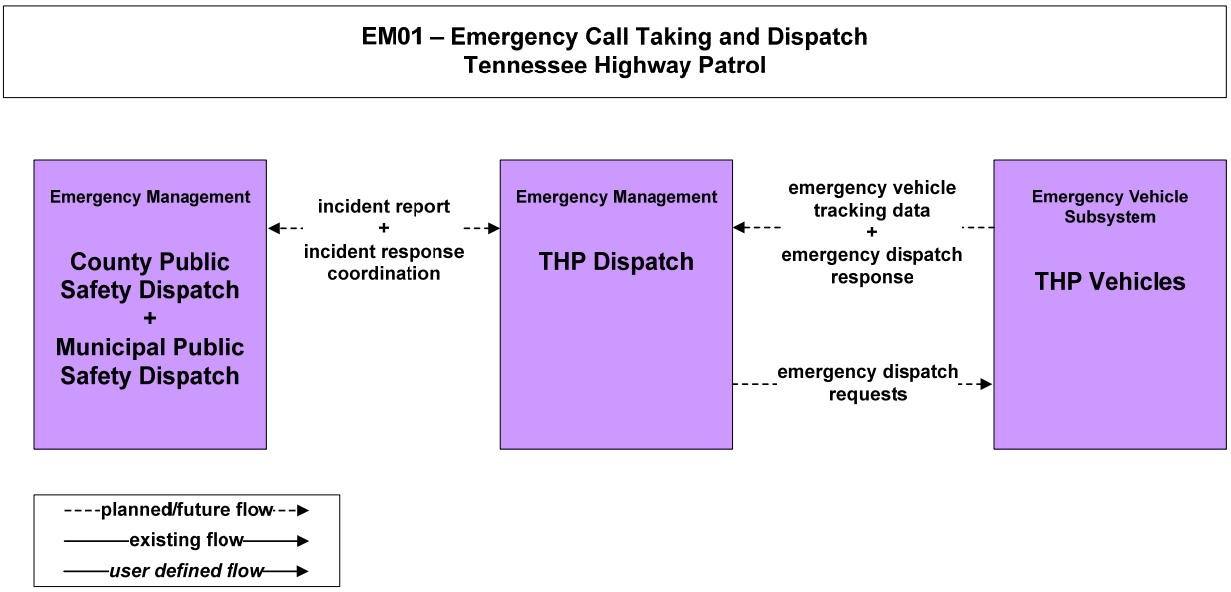
This market package closes roadways to vehicular traffic when driving conditions are unsafe, maintenance must be performed, and other scenarios where access to the roadway must be prohibited. The market package includes automatic or remotely controlled gates or barriers that control access to roadway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

ATMS21 – Roadway Closure Management
TDOT Fog Detection and Closure System

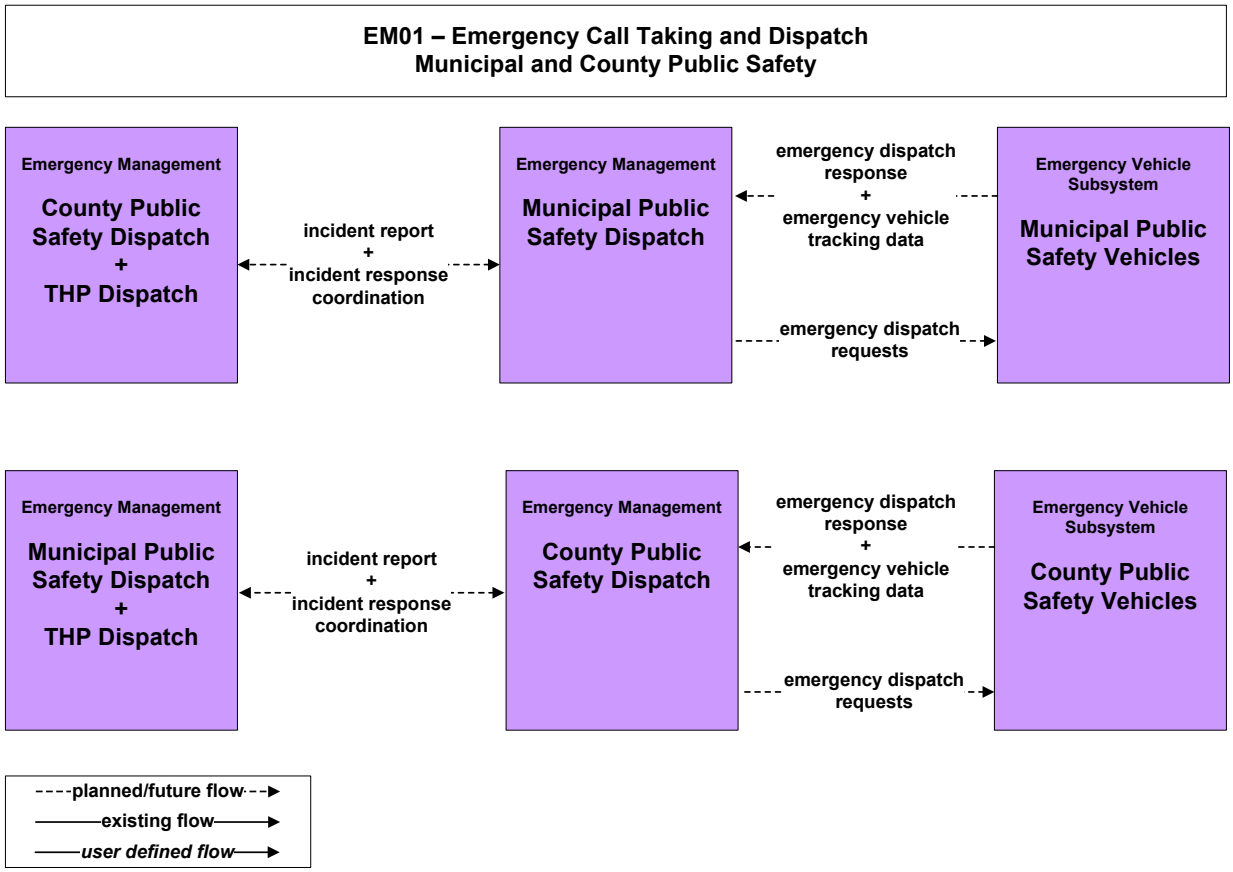


EM01 – Emergency Call Taking and Dispatch

This market package provides basic public safety call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Emergency Management Subsystems supports emergency notification between agencies. Wide area wireless communications between the Emergency Management Subsystem and an Emergency Vehicle supports dispatch and provision of information to responding personnel.

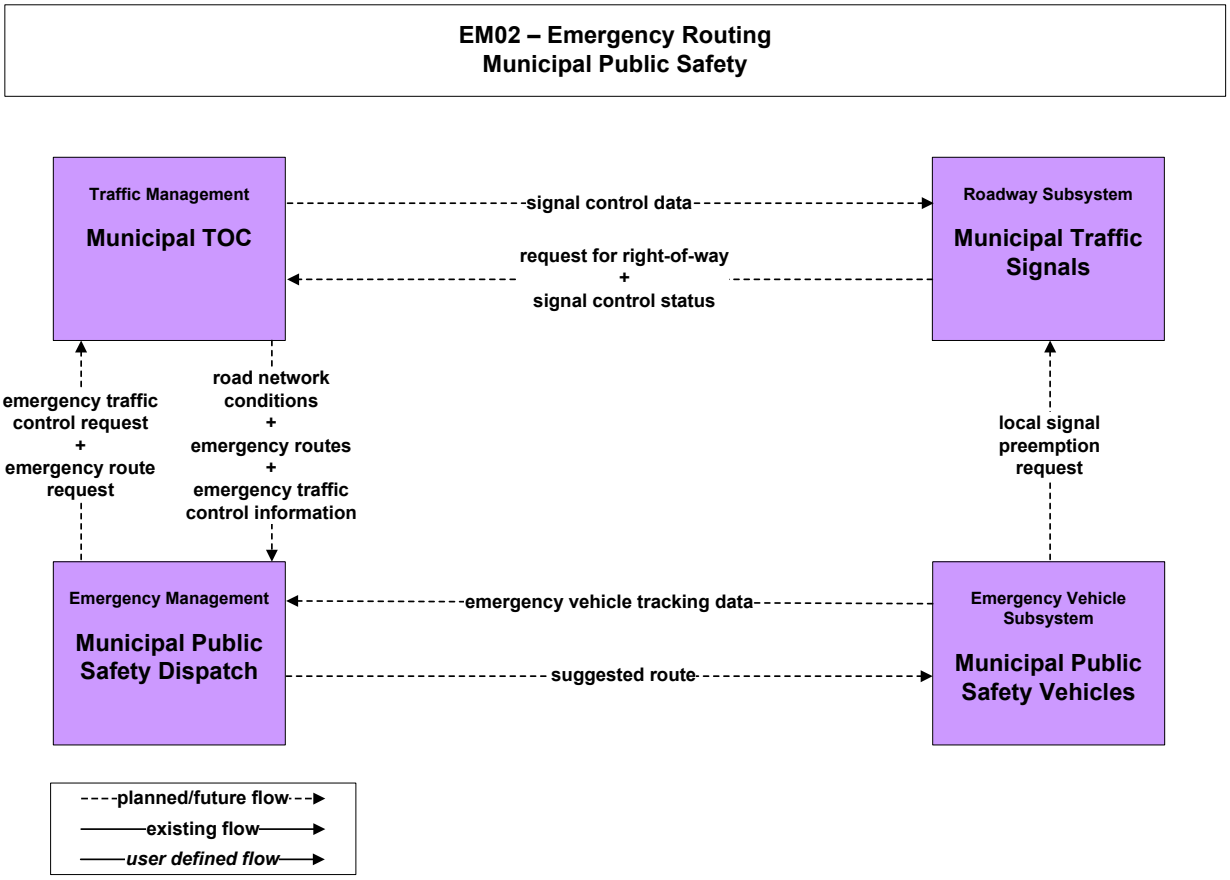


EM01 – Emergency Call Taking and Dispatch (continued)

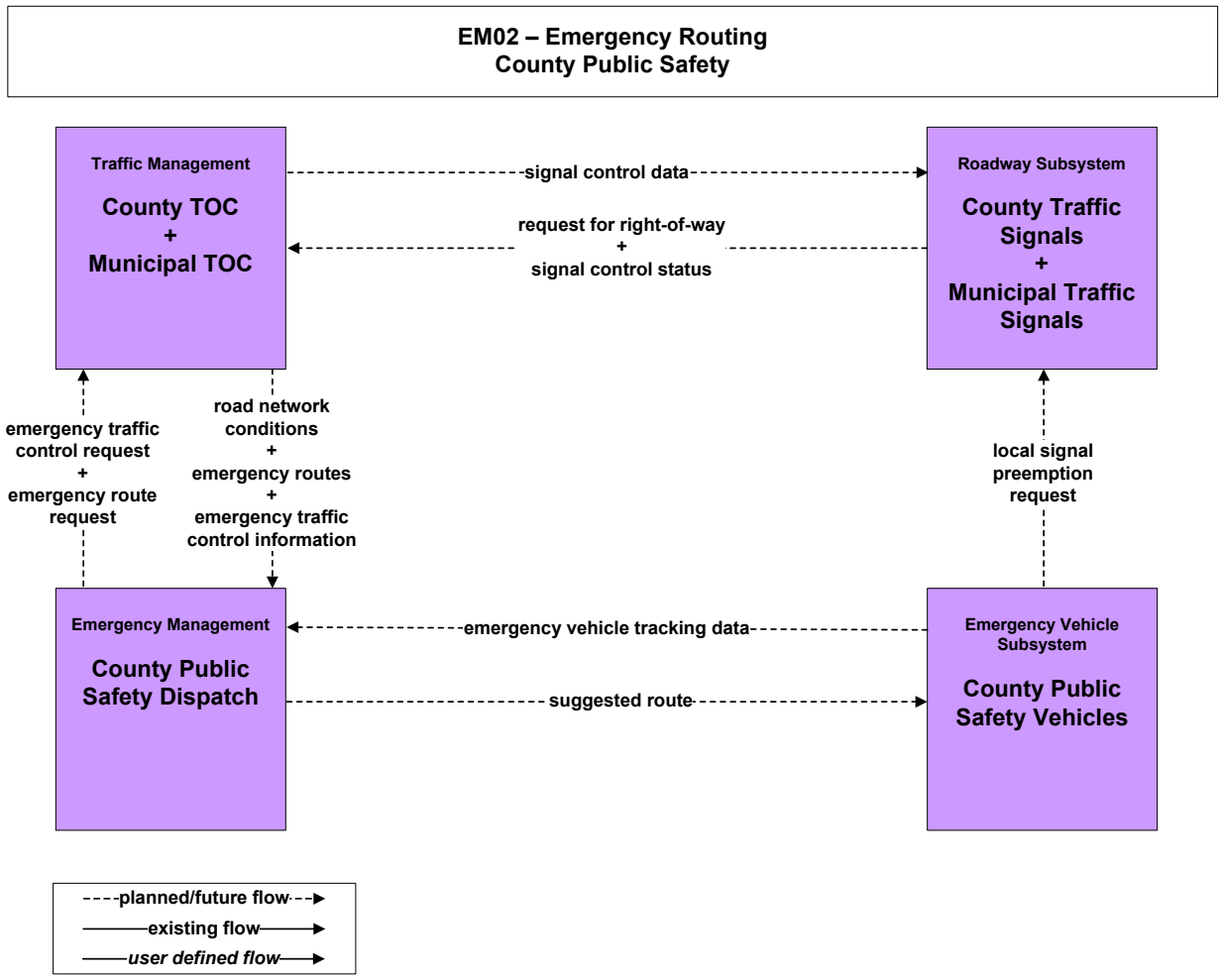


EM02 – Emergency Routing

Supports automated vehicle location and dynamic routing of emergency vehicles. Traffic information, road conditions and suggested routing information are provided to enhance emergency vehicle routing. Includes signal preemption and priority applications.



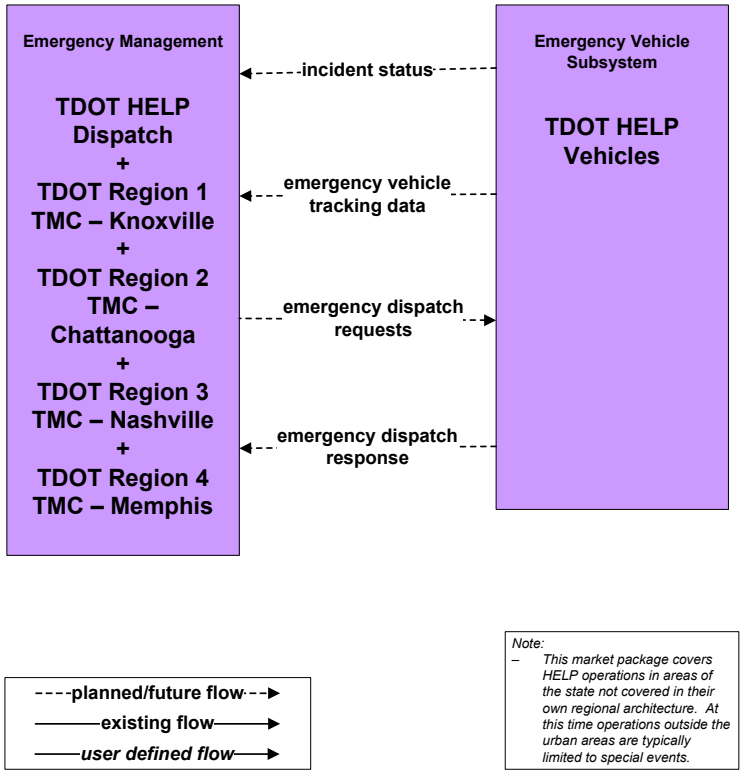
EM02 – Emergency Routing (continued)



EM04 – Roadway Service Patrols

Supports the roadway service patrol vehicles that aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. This market package monitors service patrol vehicle locations and supports vehicle dispatch. Roadway service patrols are already deployed in the major urban areas (HELP program), and this would extend the service patrols on to corridors outside of the urbanized areas.

EM04 – Roadway Service Patrols
HELP

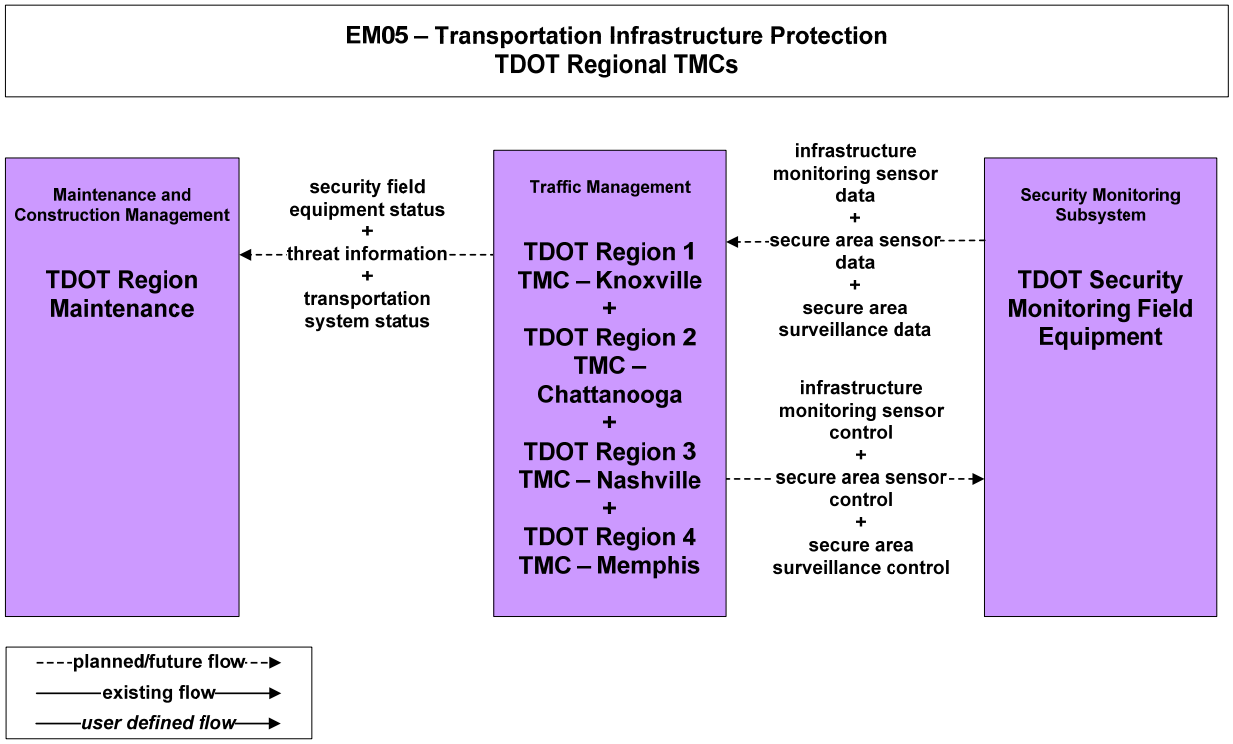


planned/future flow
existing flow
user defined flow

Note:
– *This market package covers HELP operations in areas of the state not covered in their own regional architecture. At this time operations outside the urban areas are typically limited to special events.*

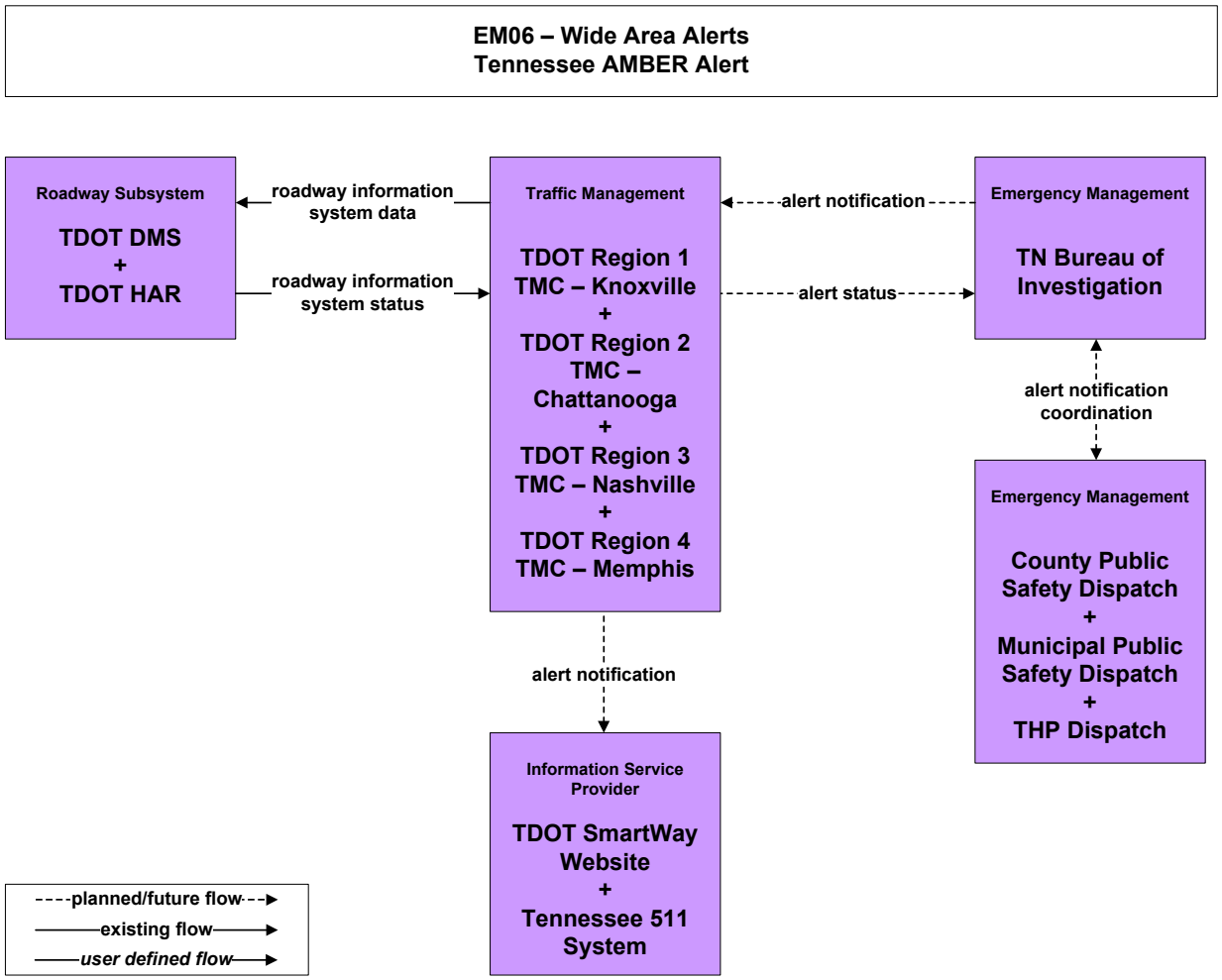
EM05 – Transportation Infrastructure Protection

Includes the monitoring of transportation infrastructure (e.g. bridges, tunnels and management centers) for potential threats using sensors, surveillance equipment, barriers and safeguard systems to preclude an incident, control access during and after an incident or mitigate the impact of an incident. Threats can be acts of nature, terrorist attacks or other incidents causing damage to the infrastructure. This market package would address the stakeholder-identified need for a bridge scour detection system.

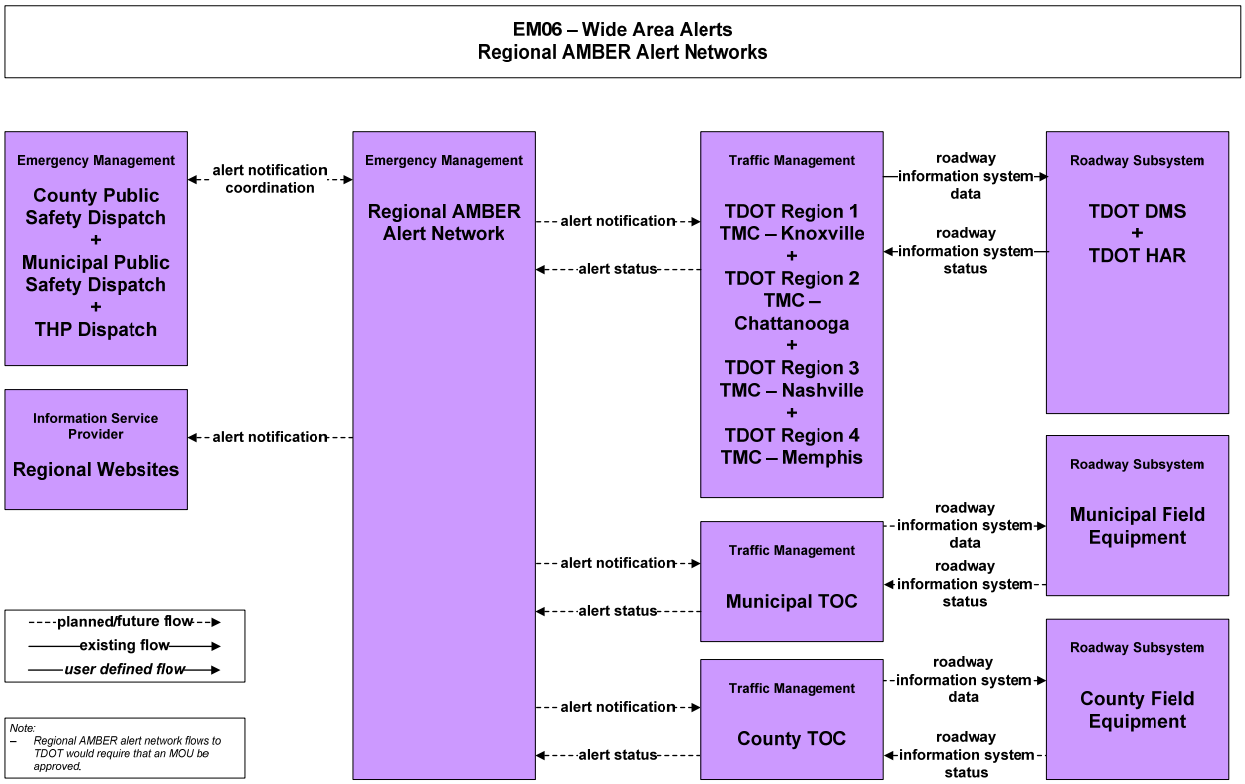


EM06 – Wide Area Alert

This market package uses ITS driver and traveler information systems to alert the public in emergency situations such as child abductions (AMBER Alerts), severe weather events, civil emergencies, and other situations that pose a threat to life and property. The alert includes information and instructions for transportation system operators and the traveling public, improving public safety and enlisting the public's help in some scenarios. The ITS technologies will supplement and support other emergency and homeland security alert systems such as the Emergency Alert System (EAS). When an emergency situation is reported and verified, a designated agency broadcasts emergency information to agencies that operate ITS systems. The ITS systems, in turn, provide the alert information to transportation system operators and the traveling public using dynamic message signs, highway advisory radios, 511 traveler information systems, and traveler information web sites.

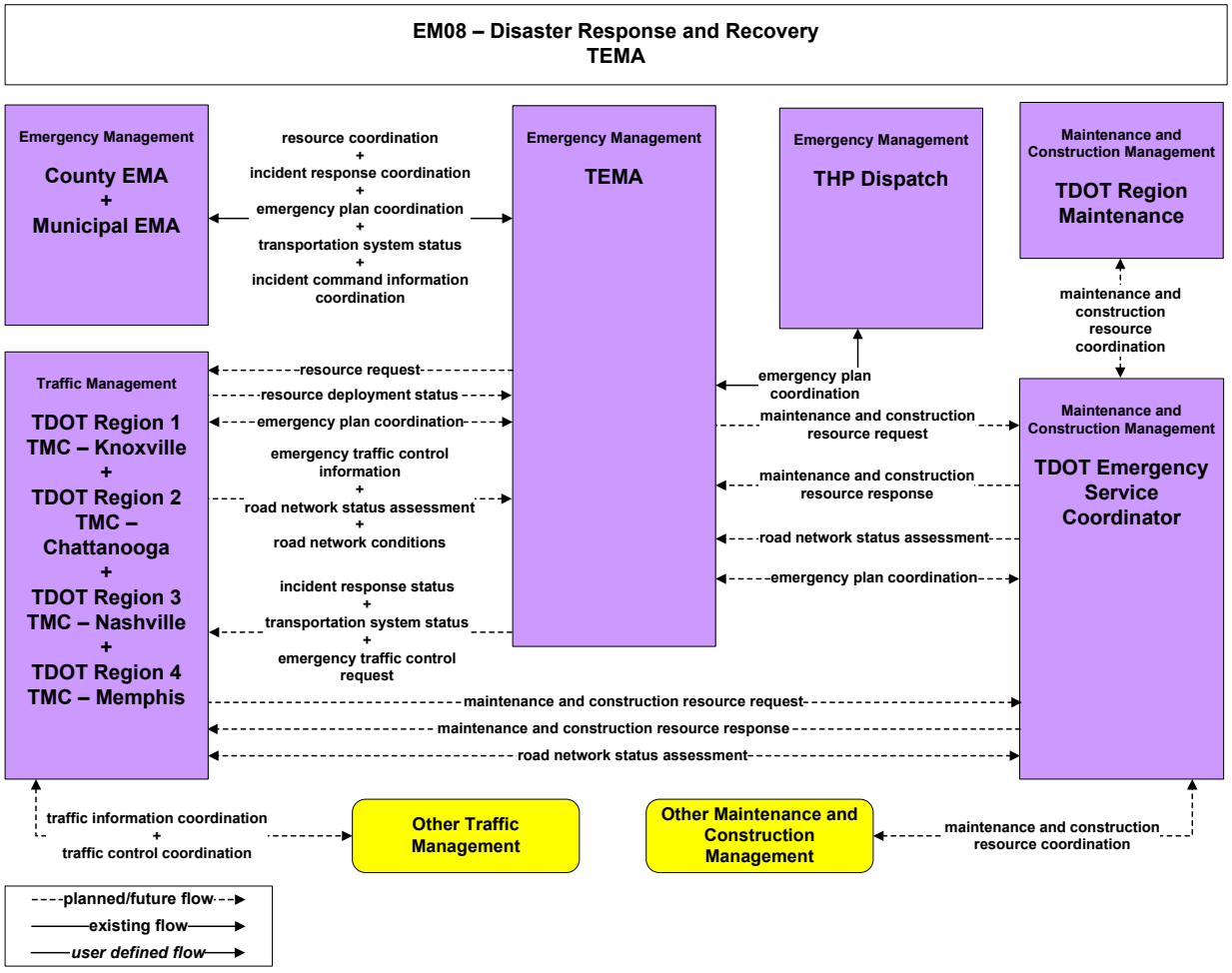


EM06 – Wide Area Alert (continued)

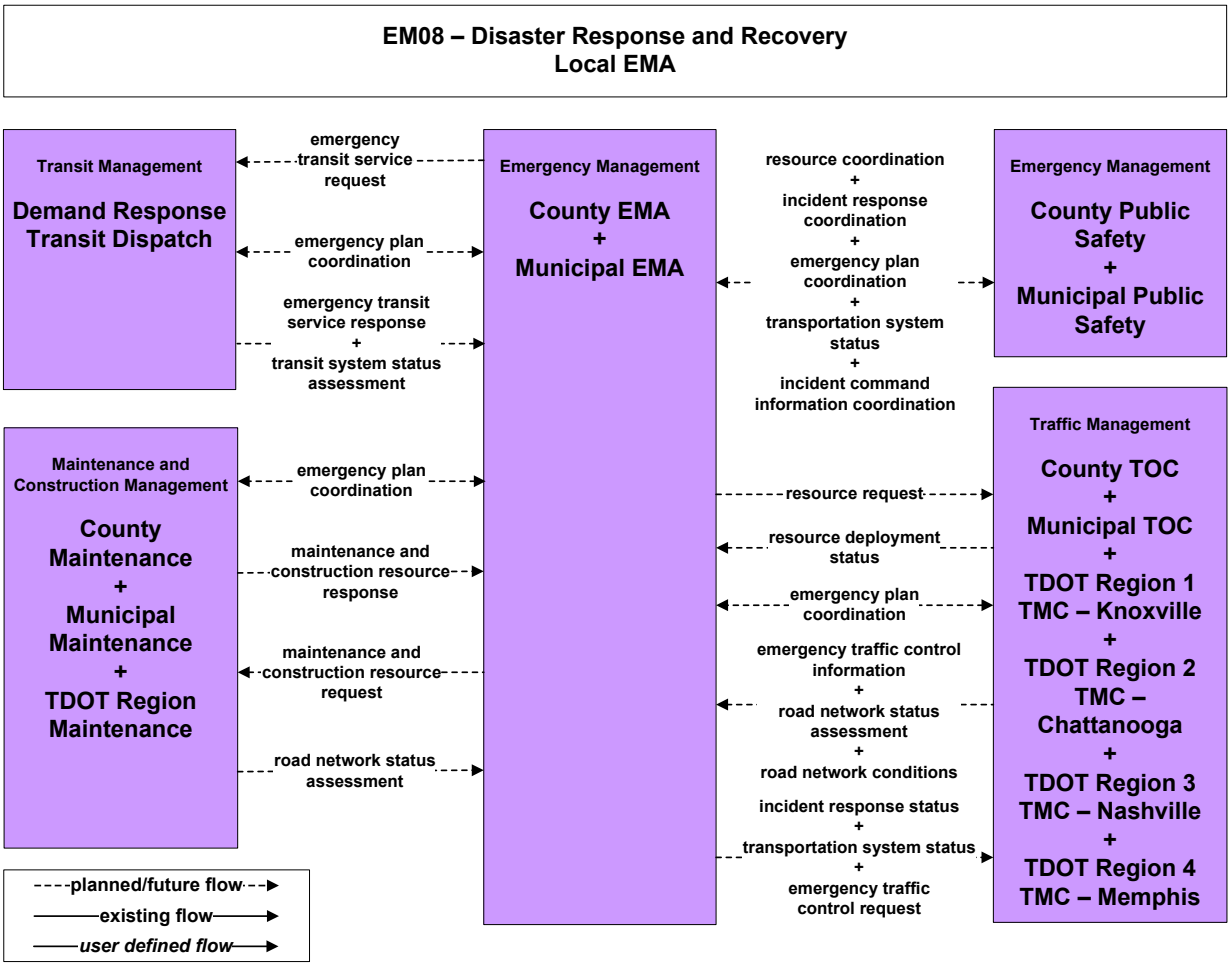


EM08 – Disaster Response and Recovery

This market package enhances the ability of the surface transportation system to respond to and recover from disasters. It addresses the most severe incidents that require an extraordinary response from outside the local community. All types of disasters are addressed including natural disasters (hurricanes, floods, winter storms, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and national security emergencies such as nuclear, chemical, biological, and radiological weapons attacks). This market package builds on the basic traffic incident response service that is provided by ATMS08, the Traffic Incident Management market package, and addresses the additional complexities and coordination requirements that are associated with the most severe incidents that warrant an extraordinary response.

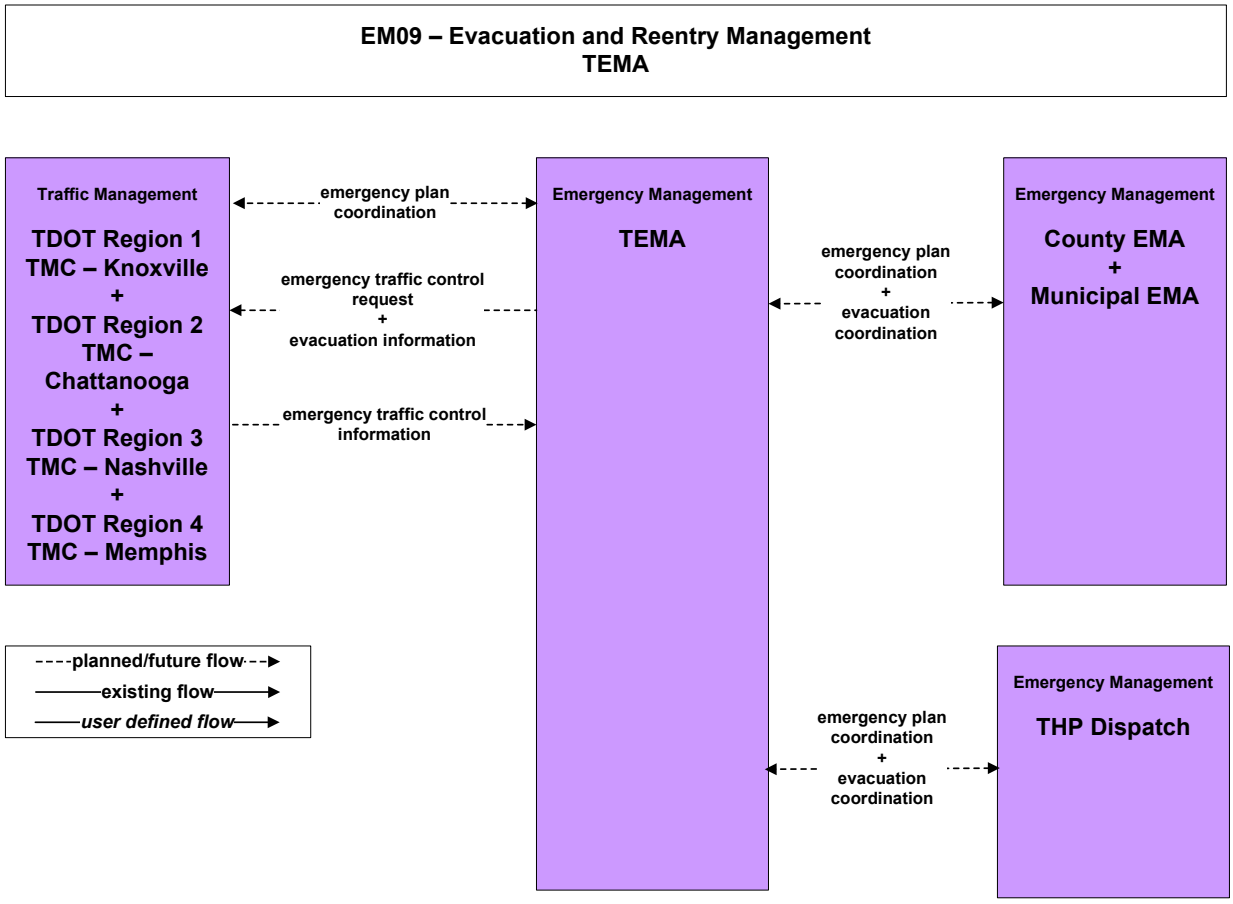


EM08 – Disaster Response and Recovery (continued)

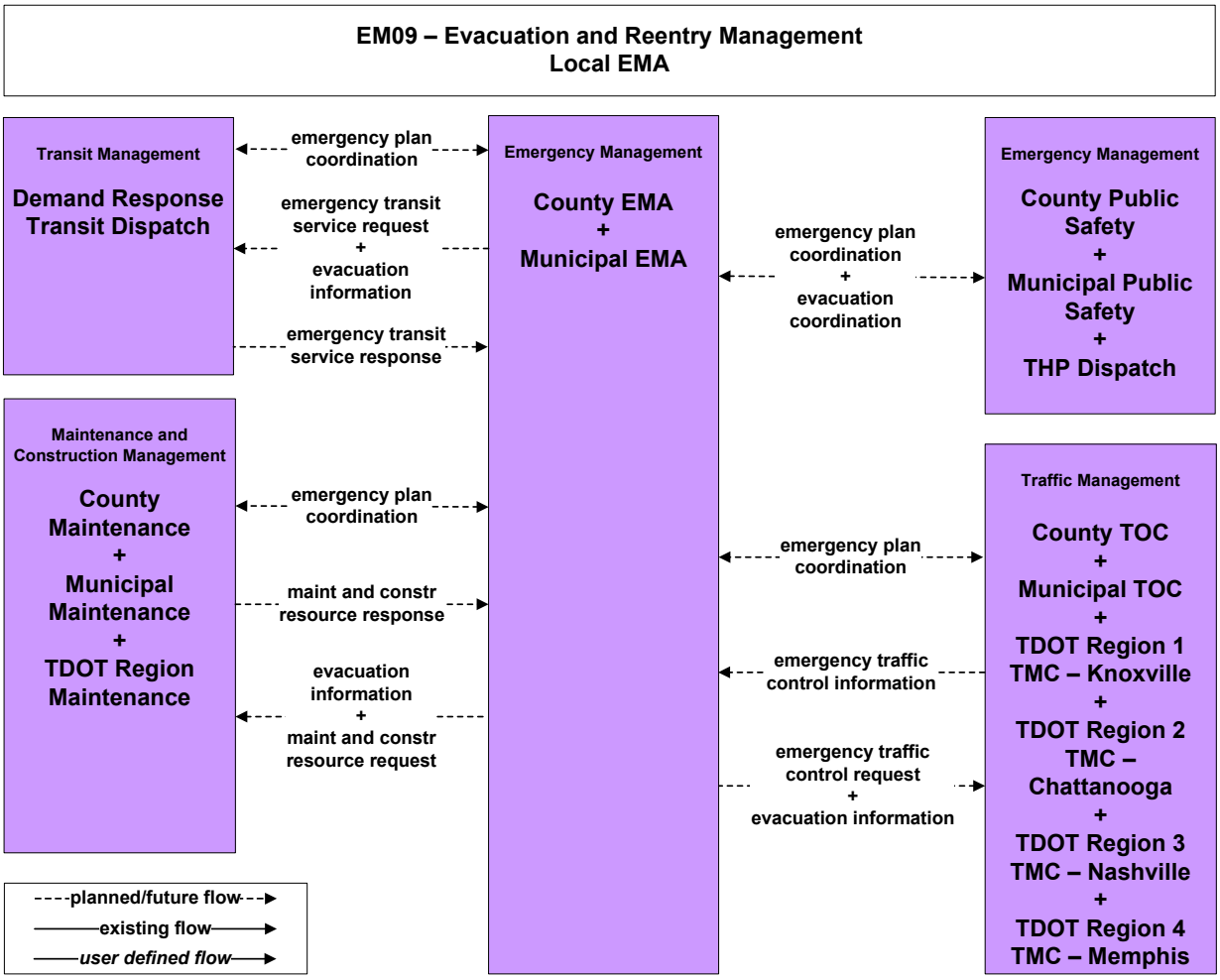


EM09 – Evacuation and Reentry Management

Supports evacuation of the general public from a disaster area and manages subsequent reentry to the disaster area. This market package supports both anticipated, well-planned and orderly evacuations such as for a hurricane, as well as sudden evacuations with little or no time for preparation or public warning such as a terrorist act. Employs a number of strategies to maximize capacity along an evacuation route including coordination with transit.

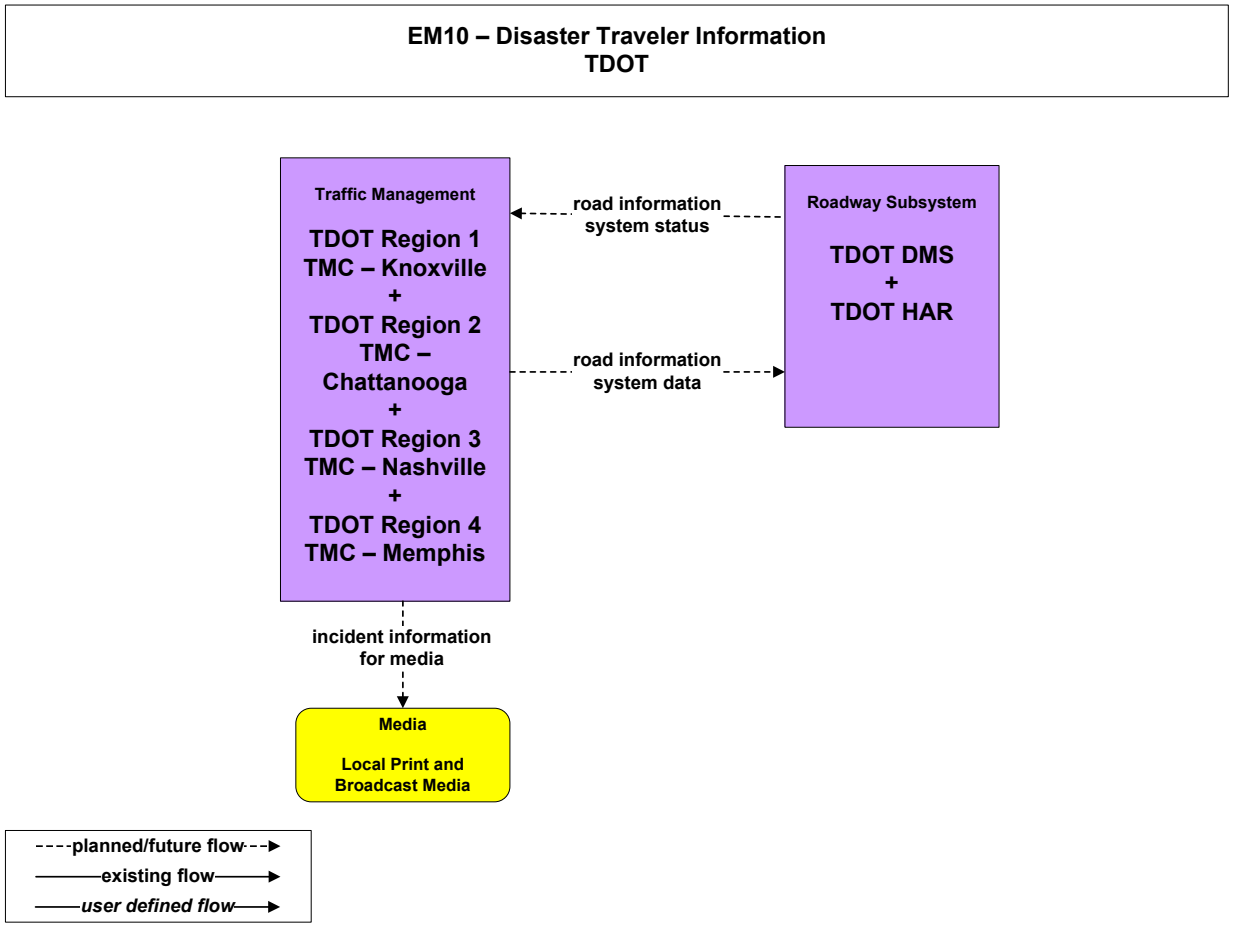


EM09 – Evacuation and Reentry Management (continued)

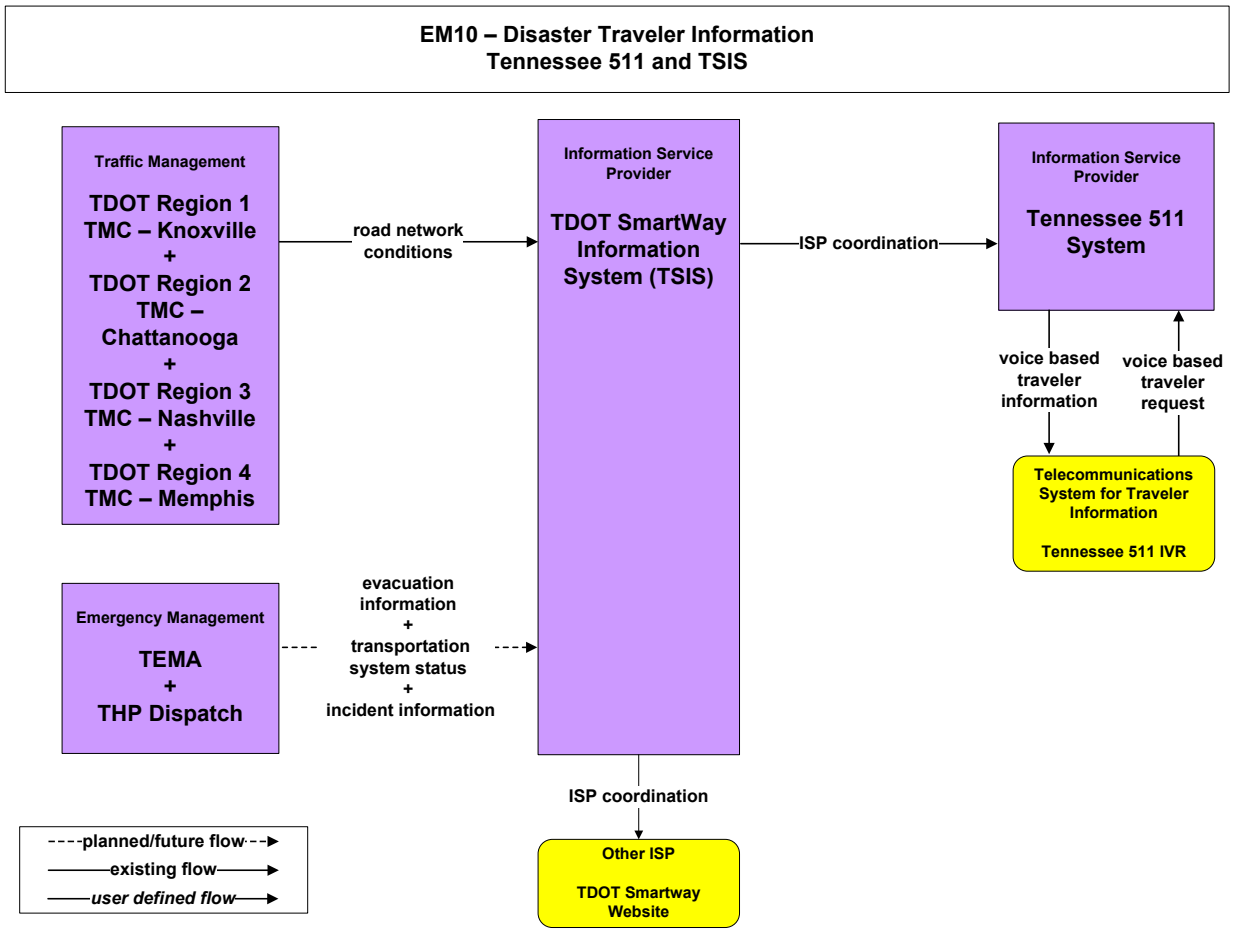


EM10 – Disaster Traveler Information

This market package uses ITS to provide disaster-related traveler information to the general public, including evacuation and reentry information and other information concerning the operation of the transportation system during a disaster. This market package collects information from multiple sources including traffic, transit, public safety, emergency management, shelter provider, and travel service provider organizations. The collected information is processed and the public is provided with real-time disaster and evacuation information using ITS traveler information systems. This market package augments the ATIS market packages that provide traveler information on a day-to-day basis for the surface transportation system. This market package provides focus on the special requirements for traveler information dissemination in disaster situations.

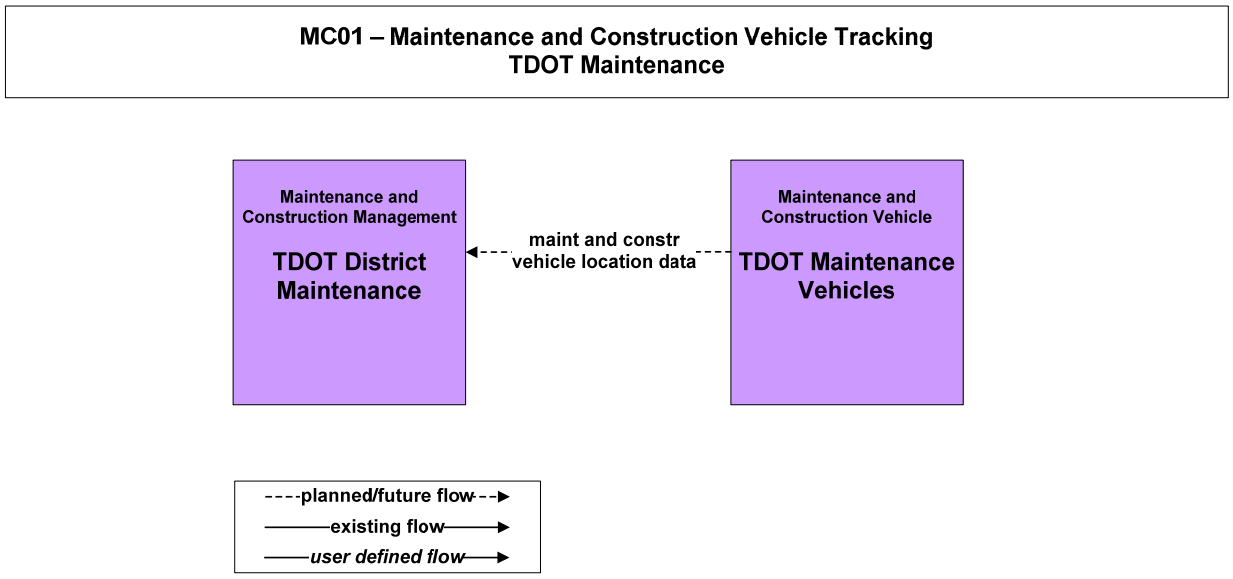


EM10 – Disaster Traveler Information (continued)



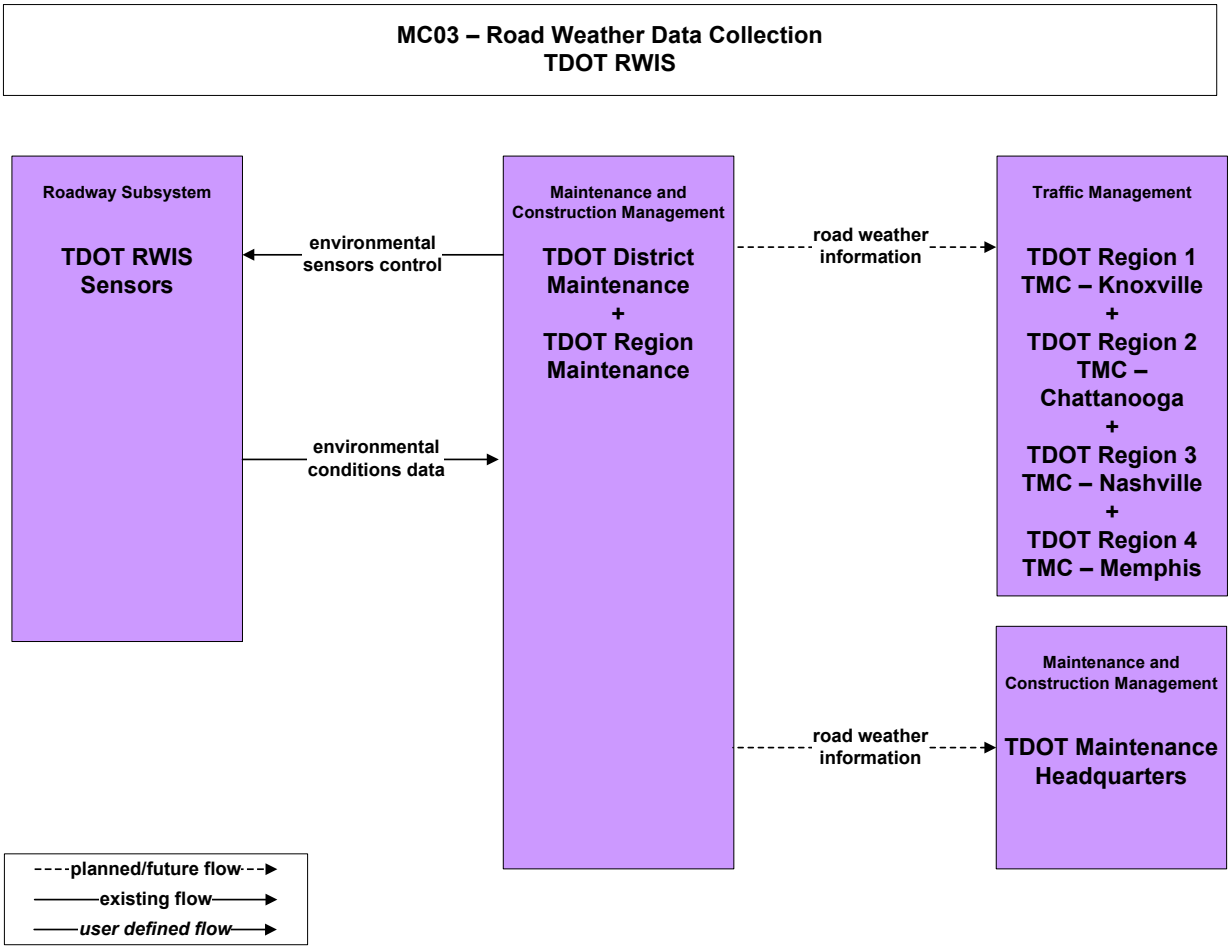
MC01 – Maintenance and Construction Vehicle and Equipment Tracking

Tracks the location of maintenance and construction vehicles and other equipment to ascertain the progress of their activities.

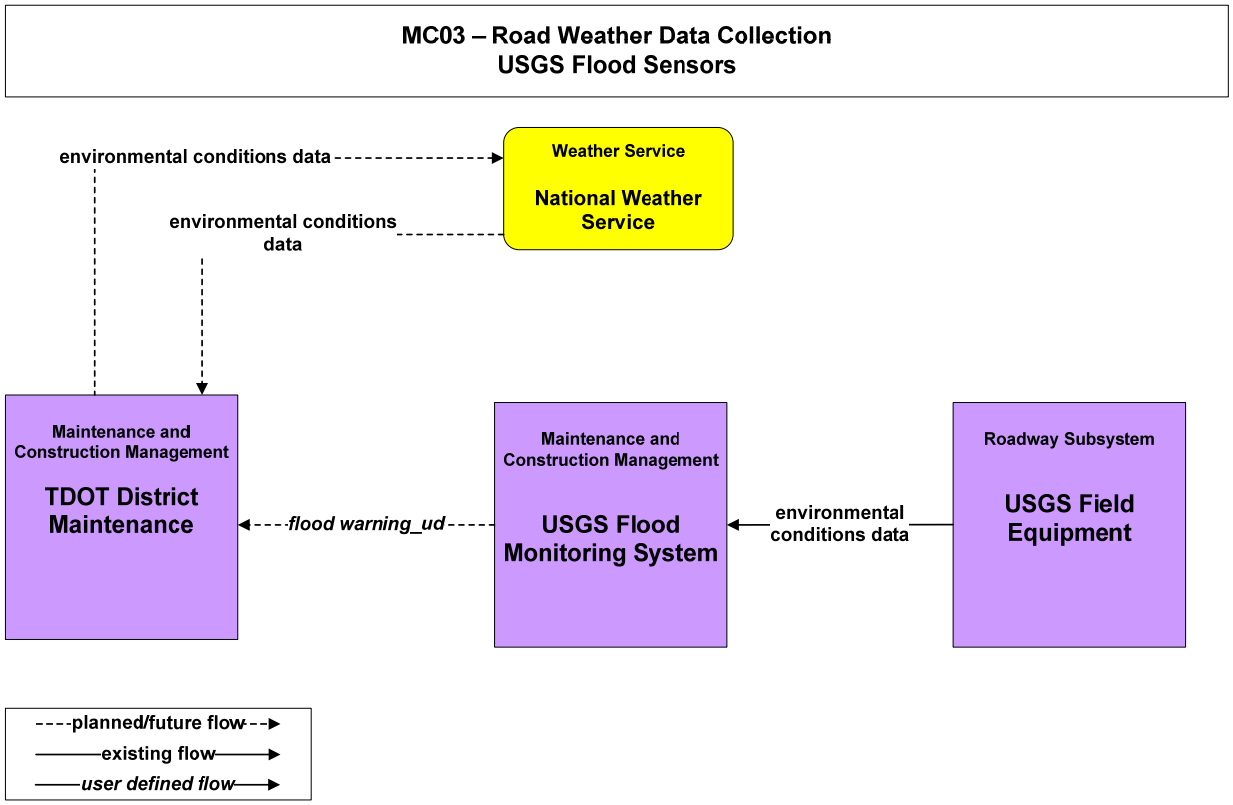


MC03 – Road Weather Data Collection

This market package collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. The collected environmental data is used by the Weather Information Processing and Distribution Market Package to process the information and make decisions on operations.

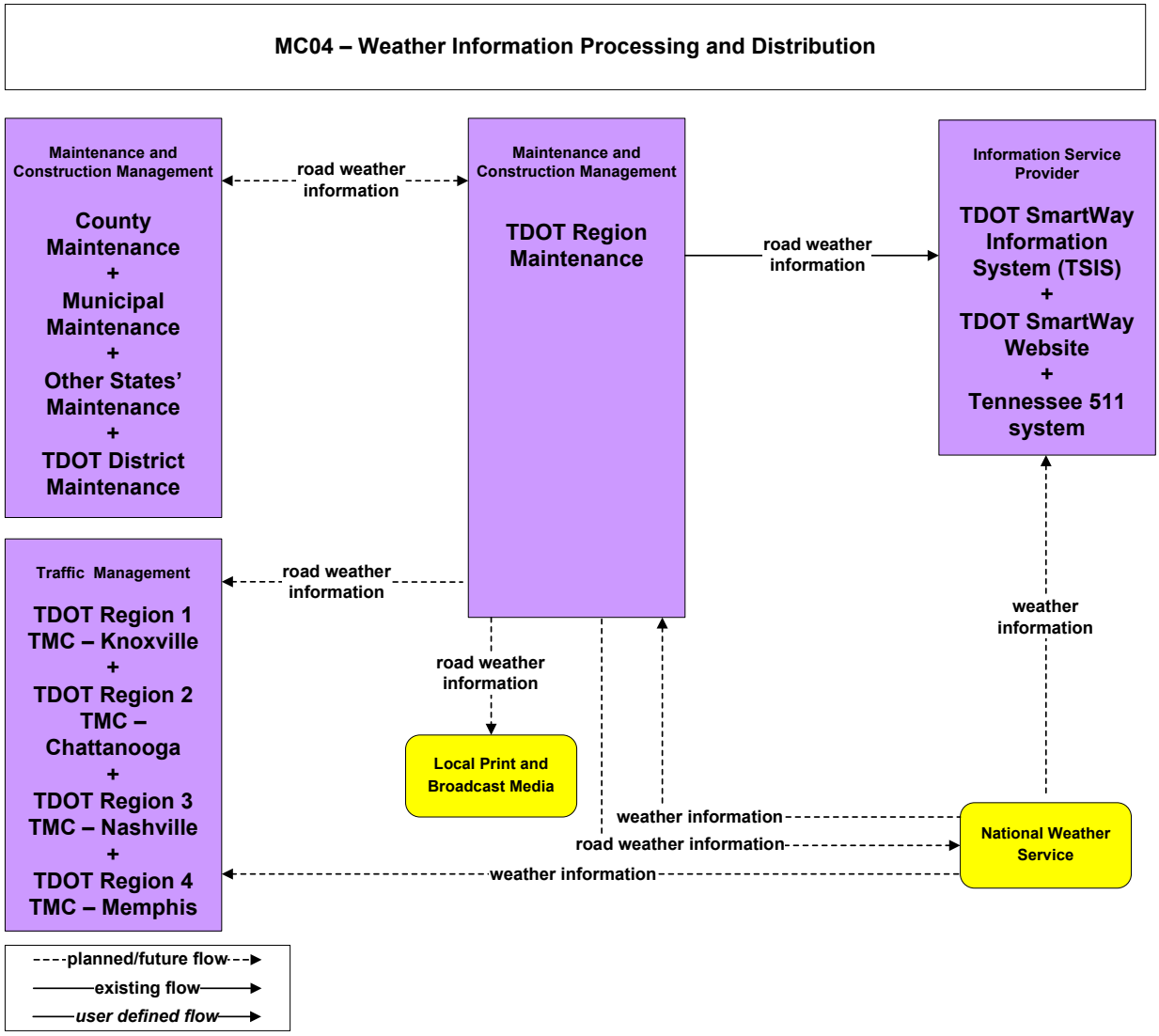


MC03 – Road Weather Data Collection (continued)



MC04 – Weather Information Processing and Distribution

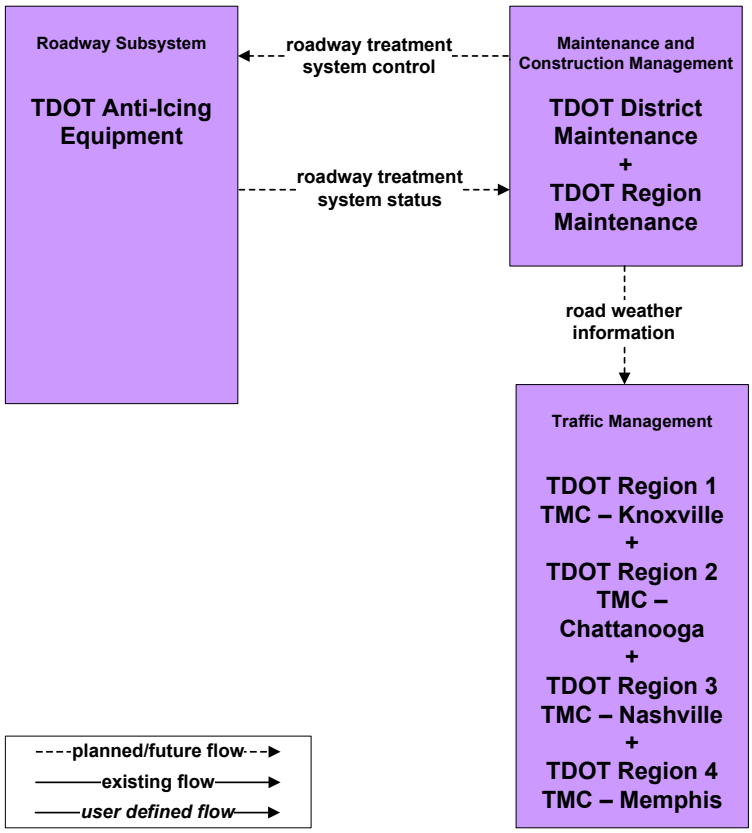
Processes and distributes the environmental information collected from the Road Weather Data Collection market package. This market package uses the environmental data to detect environmental hazards such as icy road conditions, high winds, dense fog, etc. so system operators can make decisions on corrective actions to take.



MC05 – Roadway Automated Treatment

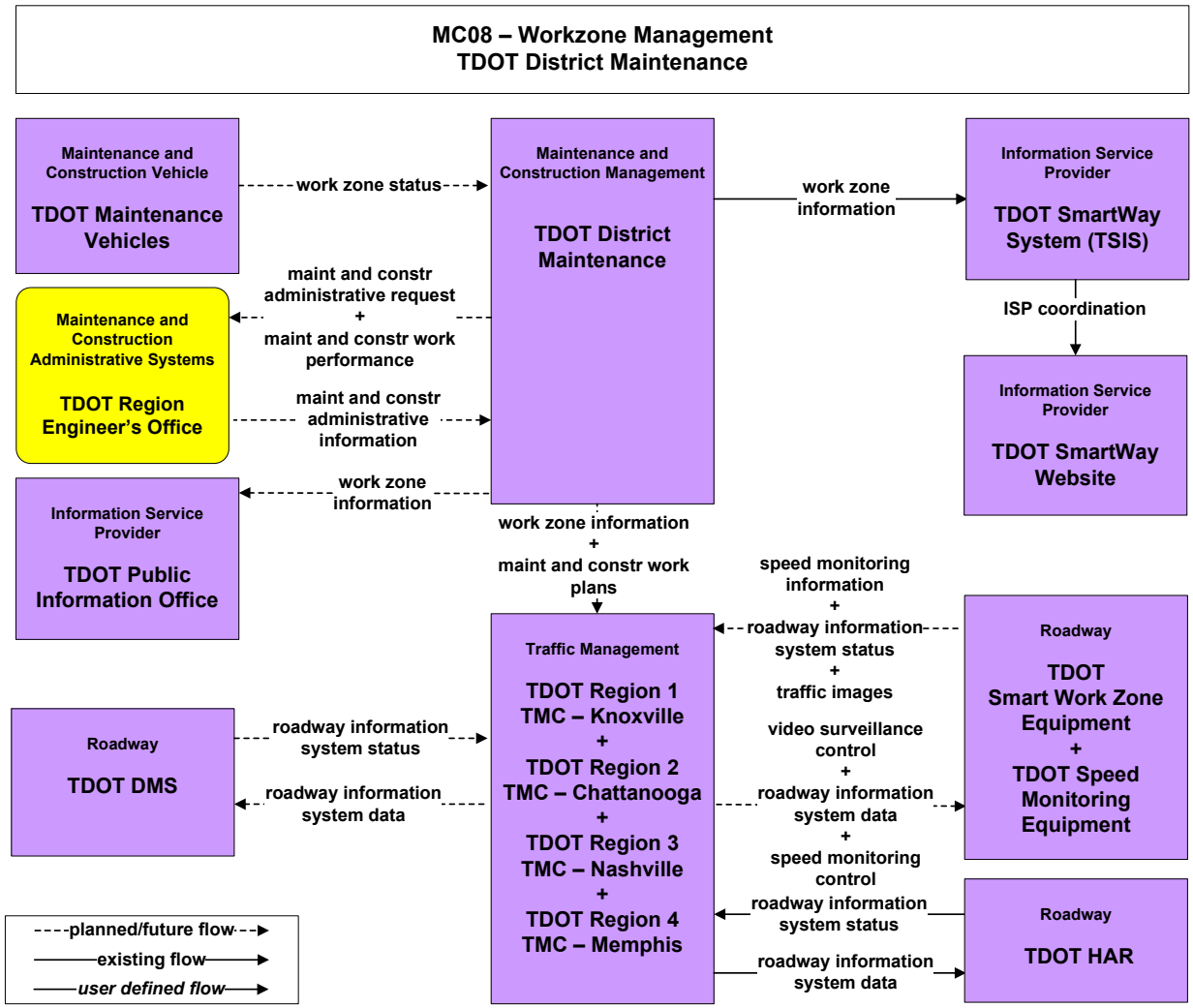
Automatically treats a roadway section based on environmental or atmospheric conditions. Treatments include fog dispersion, anti-icing chemicals, etc. This market package includes the environmental sensors that detect adverse conditions, the automated treatment system itself, and driver information systems (e.g., dynamic message signs) that warn drivers when the treatment system is activated.

MC05 – Roadway Automated Treatment
TDOT Anti-Icing

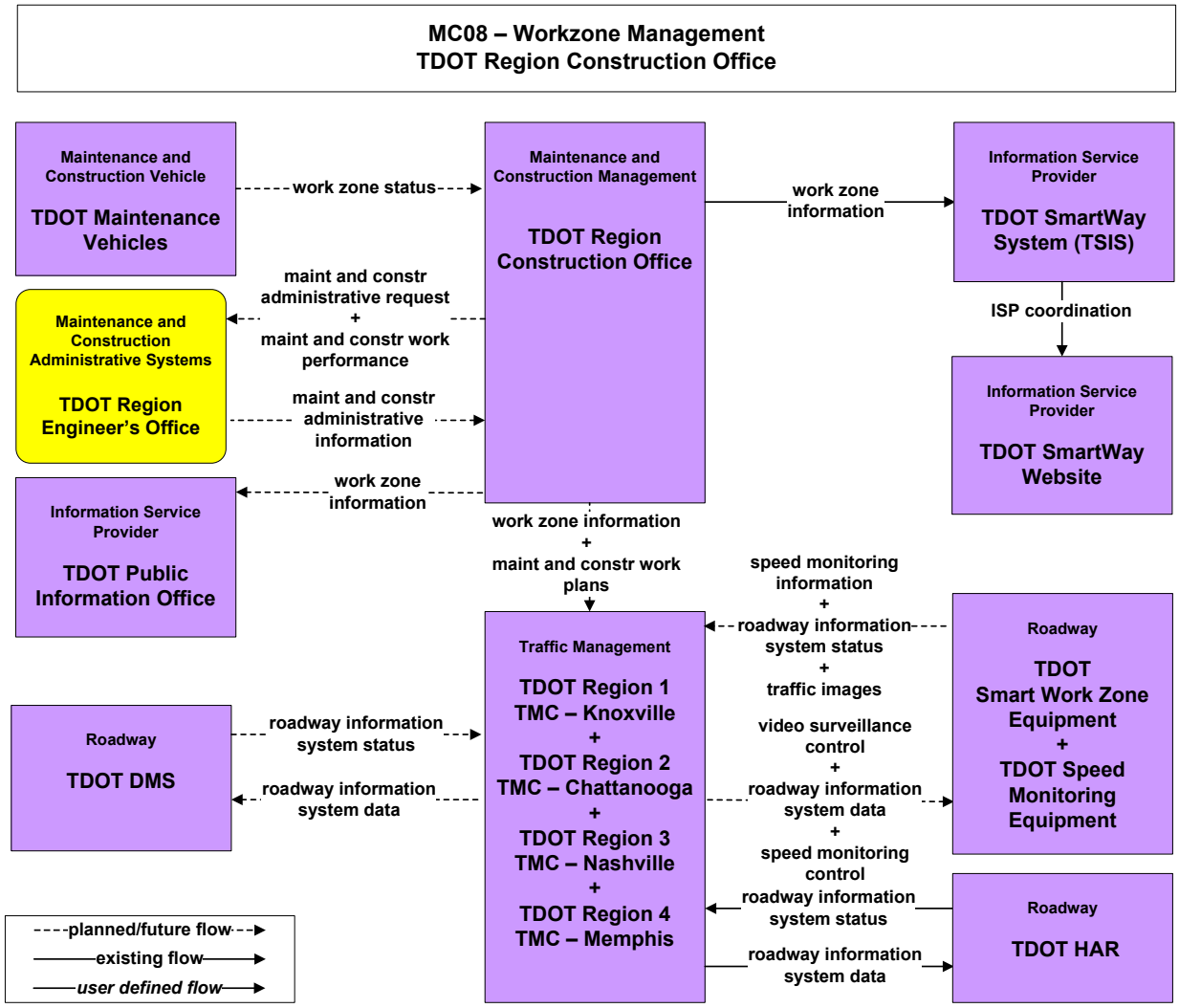


MC08 – Work Zone Management

Directs activity in work zones, controlling traffic through portable dynamic message signs and informing other groups of activity for better coordination management. Also provides speed and delay information to motorists prior to the work zone.

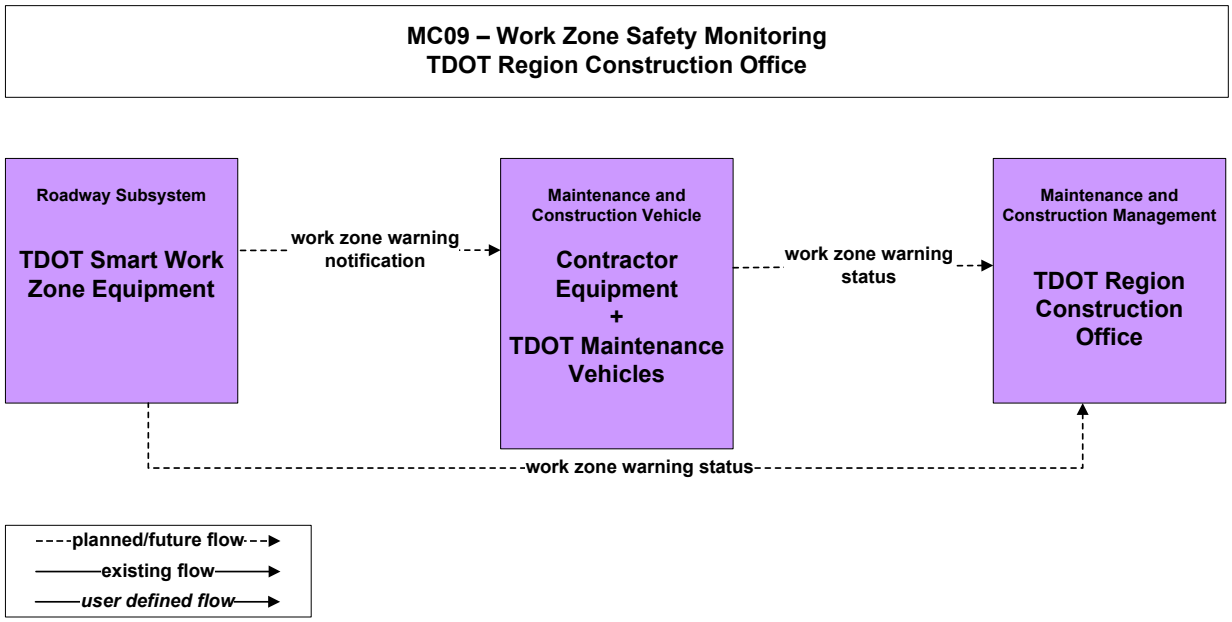


MC08 – Work Zone Management (continued)



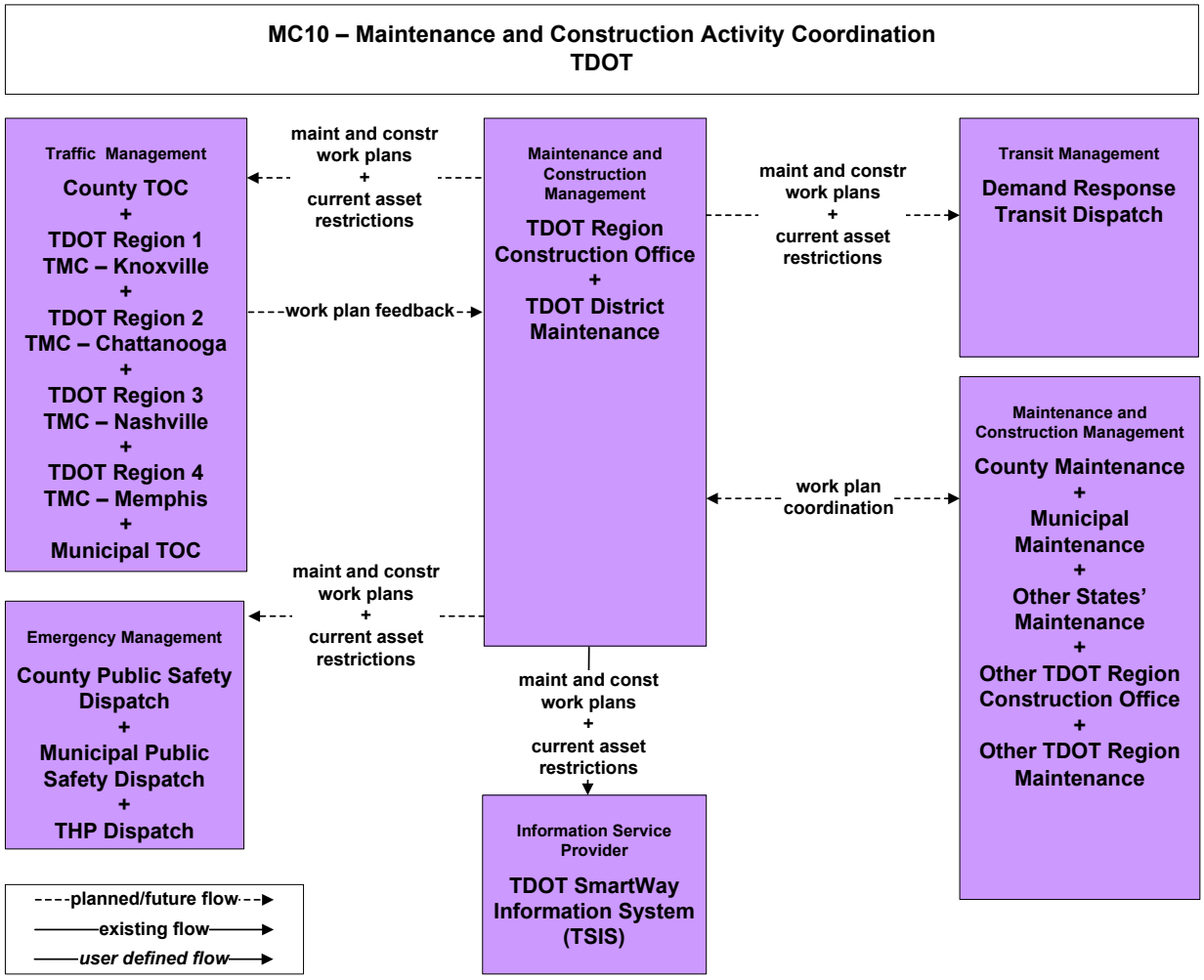
MC09 – Work Zone Safety Monitoring

Includes systems that improve work crew safety and reduce collisions between the motoring public and maintenance and construction vehicles. Detects vehicle intrusions in work zones and warns workers and drivers of safety hazards when encroachment occurs.



MC10 – Maintenance and Construction Activity Coordination

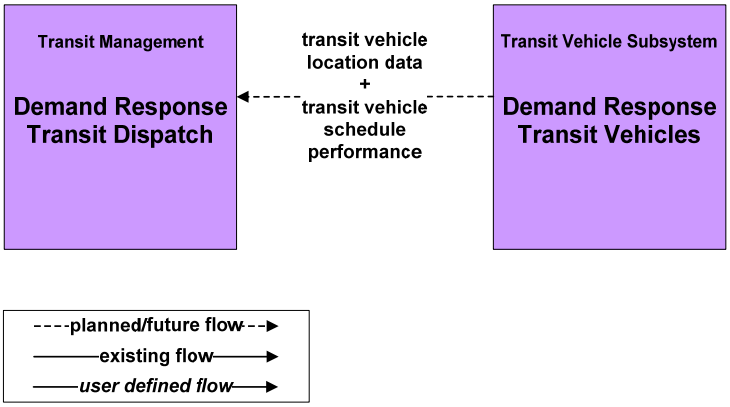
Supports the dissemination of maintenance and construction activity to centers that can utilize it as part of their operations (i.e., traffic management, transit, emergency management).



APTS1 – Transit Vehicle Tracking

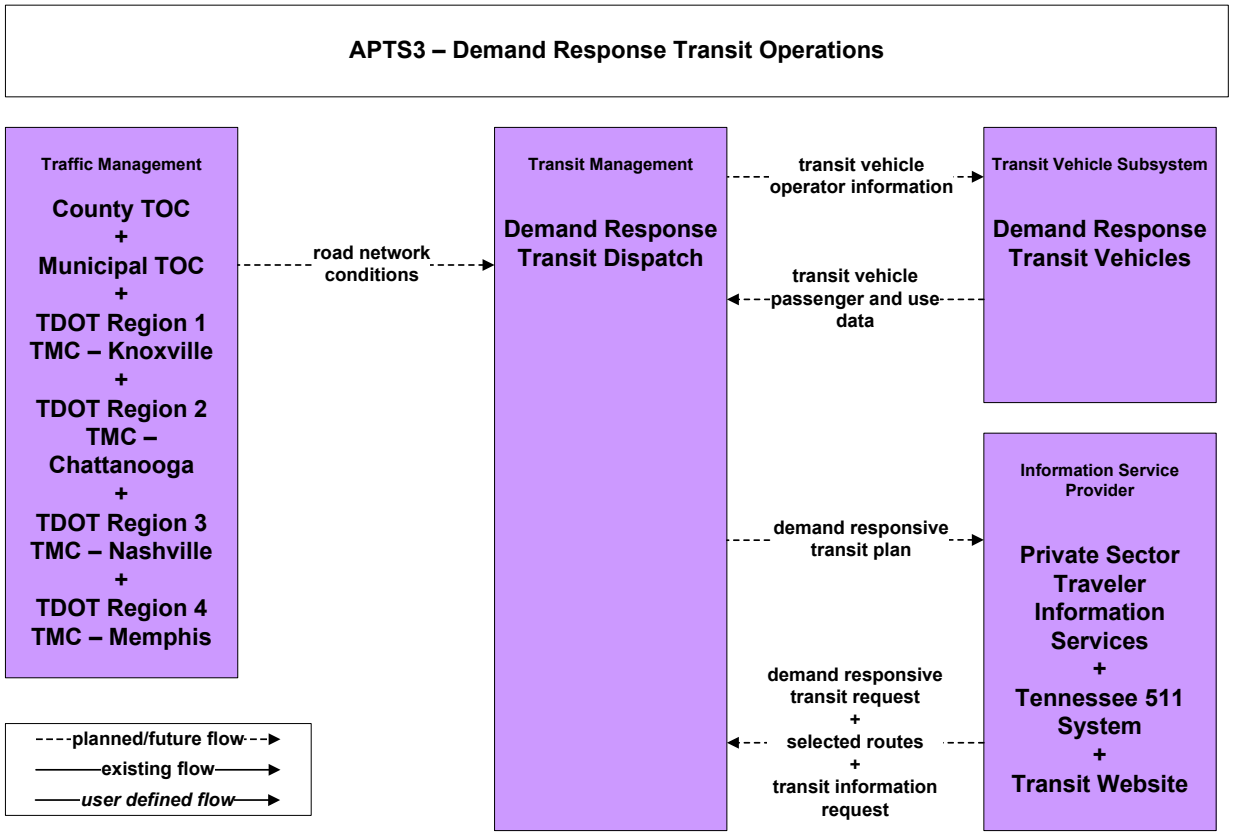
Monitors current transit vehicle location using an automated vehicle location system. Location data may be used to determine real time schedule adherence and update the transit system's schedule in real time.

APTS1 – Transit Vehicle Tracking (Demand Response)



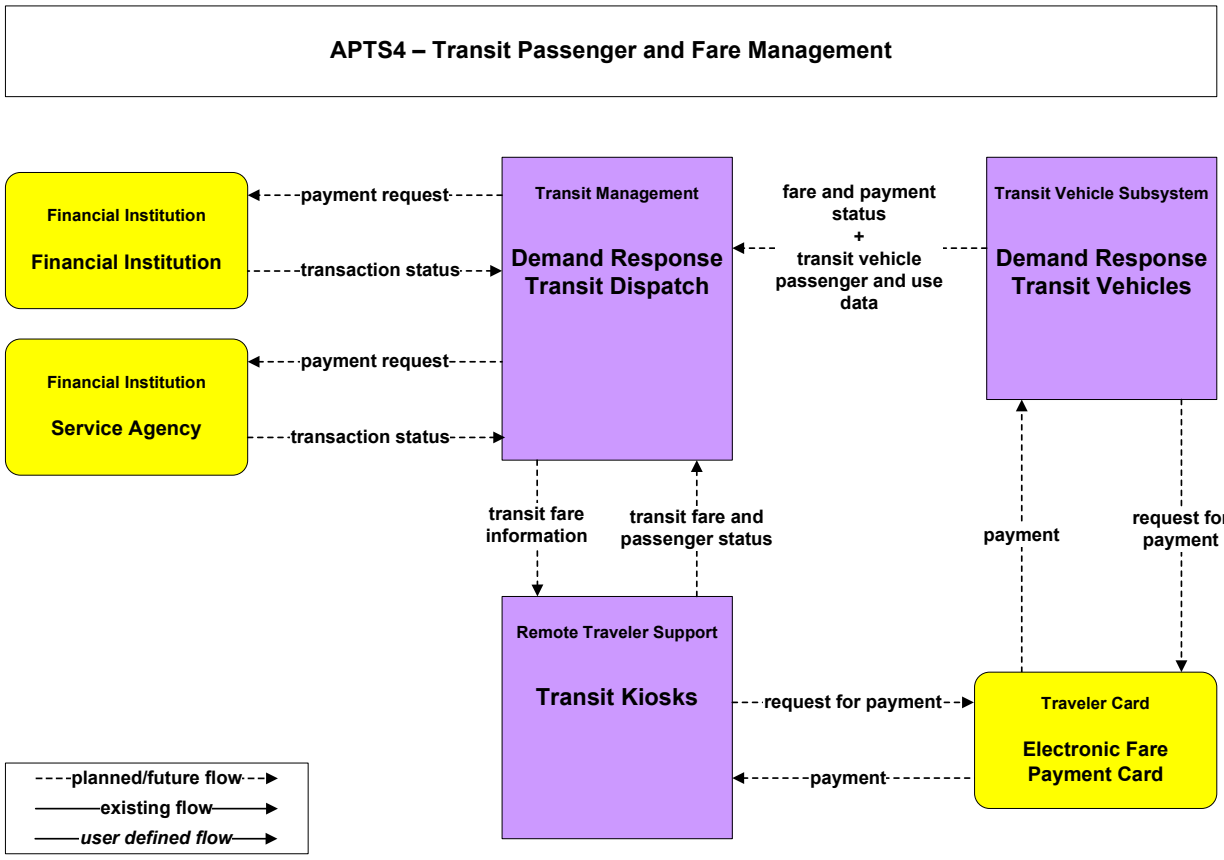
APTS3 – Demand-Response Transit Operations

This market package performs vehicle routing and scheduling as well as automatic operator assignment and monitoring for demand responsive transit services. In addition, this market package performs similar functions to support dynamic features of flexible-route transit services. This package monitors the current status of the transit fleet and supports allocation of these fleet resources to service incoming requests for transit service while also considering traffic conditions.



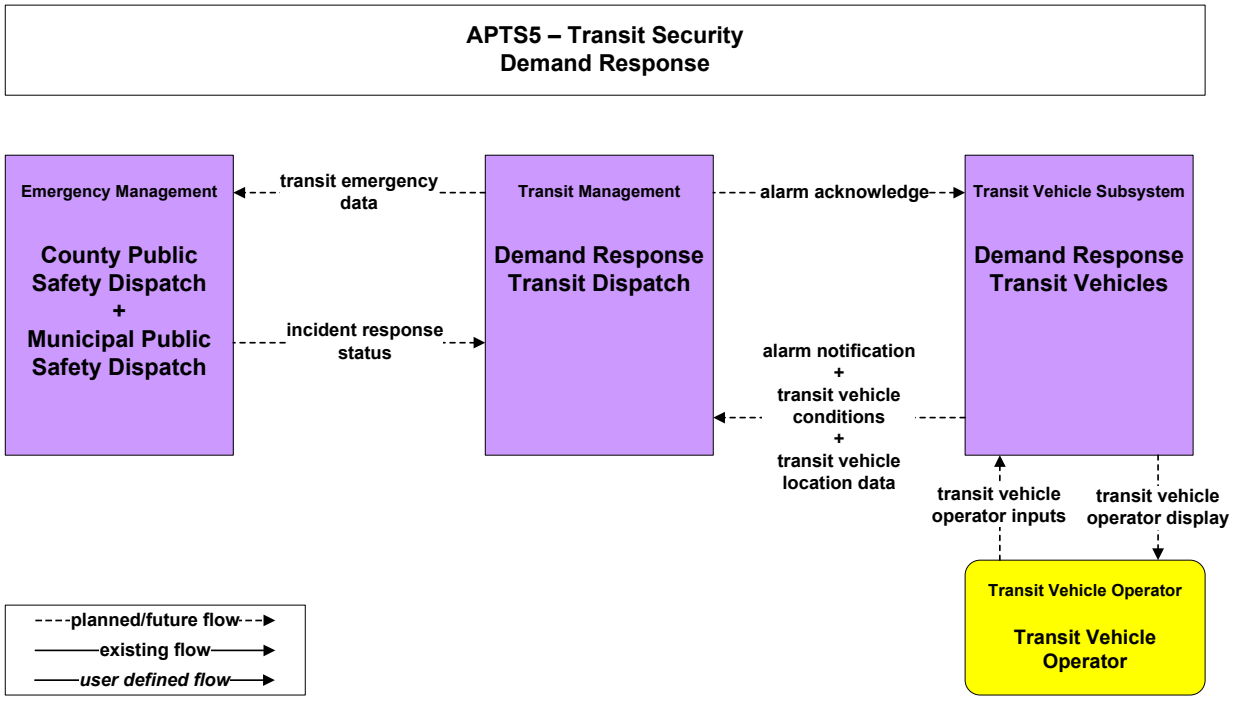
APTS4 – Transit Passenger and Fare Management

This market package manages passenger loading and fare payments on-board transit vehicles using electronic means. It allows transit users to use a traveler card or other electronic payment device. Sensors mounted on the vehicle permit the operator and central operations to determine vehicle loads, and readers located either in the infrastructure or on-board the transit vehicle allow electronic fare payment. Data is processed, stored, and displayed on the transit vehicle and communicated as needed to the Transit Management Subsystem.



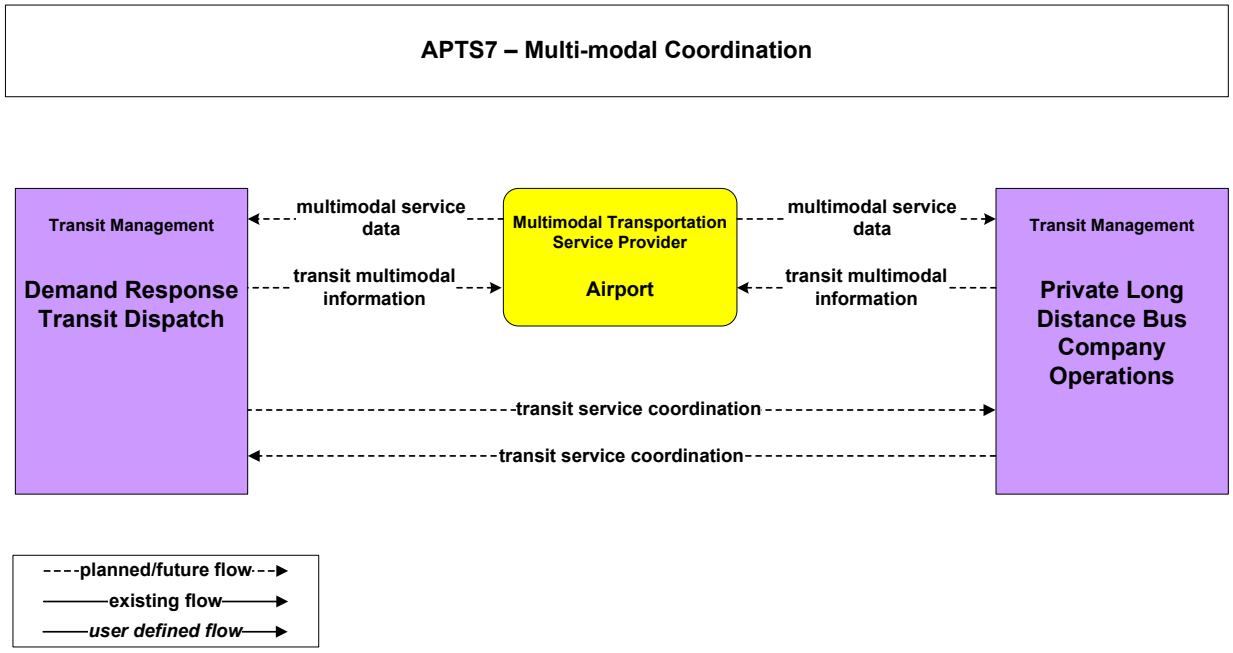
APTS5 – Transit Security

This market package provides for the physical security of transit passengers and transit vehicle operators. On-board equipment is deployed to perform surveillance and sensor monitoring in order to warn of potentially hazardous situations. The surveillance equipment includes video (e.g., CCTV cameras), audio systems and/or event recorder systems. Public areas (e.g., transit stops, park and ride lots, stations) are also monitored with similar surveillance and sensor equipment and provided with transit user activated alarms. On-board alarms, activated by transit users or transit vehicle operators are transmitted to both the Emergency Management Subsystem and the Transit Management Subsystem, indicating two possible approaches to implementing this market package.



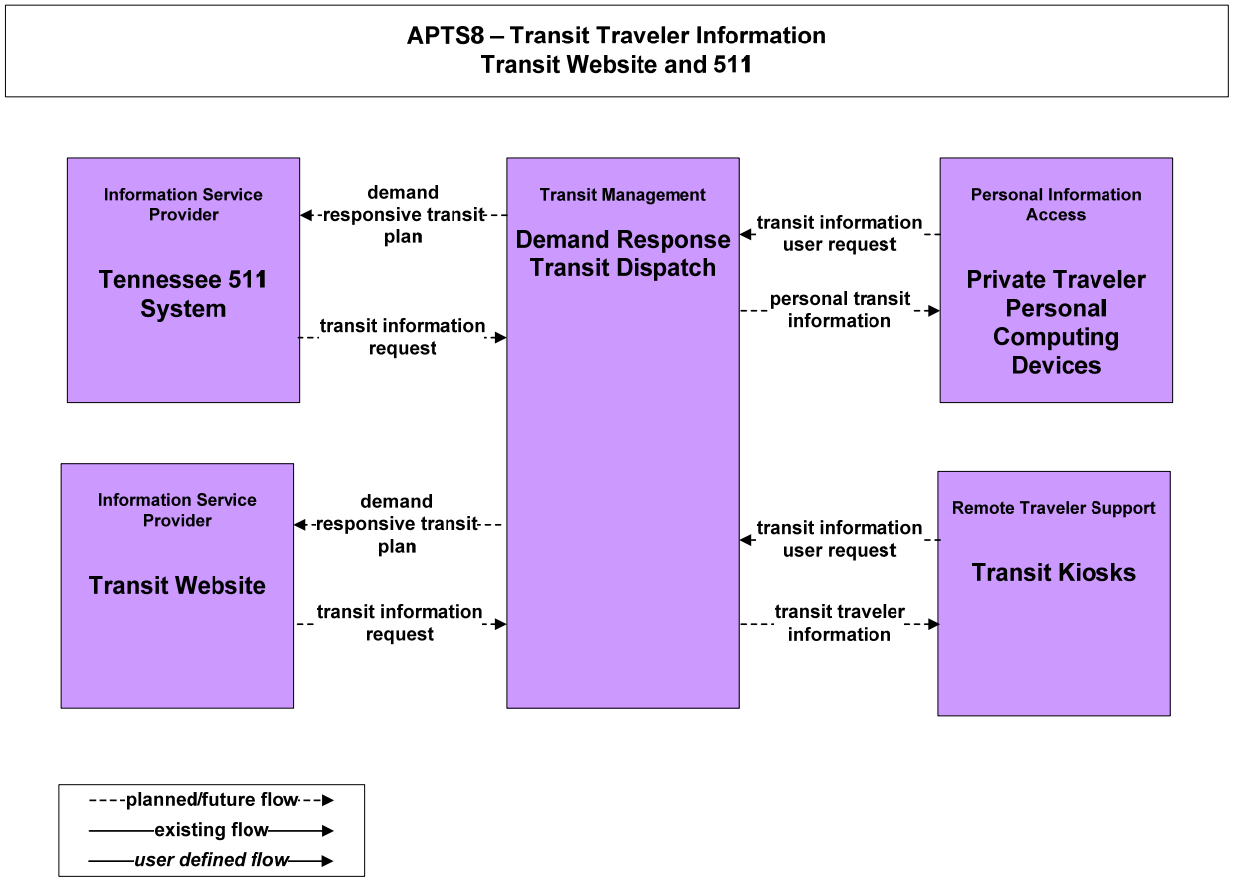
APTS7 – Multimodal Coordination

This market package establishes two way communications between multiple transit and traffic agencies to improve service coordination. Multimodal coordination between transit agencies can increase traveler convenience at transit transfer points and clusters (a collection of stops, stations, or terminals where transfers can be made conveniently) and also improve operating efficiency. Transit transfer information is shared between Multimodal Transportation Service Providers, Transit Agencies, and ISPs. Coordination between traffic and transit management is intended to improve on-time performance of the transit system to the extent that this can be accommodated without degrading overall performance of the traffic network. More limited local coordination between the transit vehicle and the individual intersection for signal priority is also supported by this package.



APTS8 – Transit Traveler Information

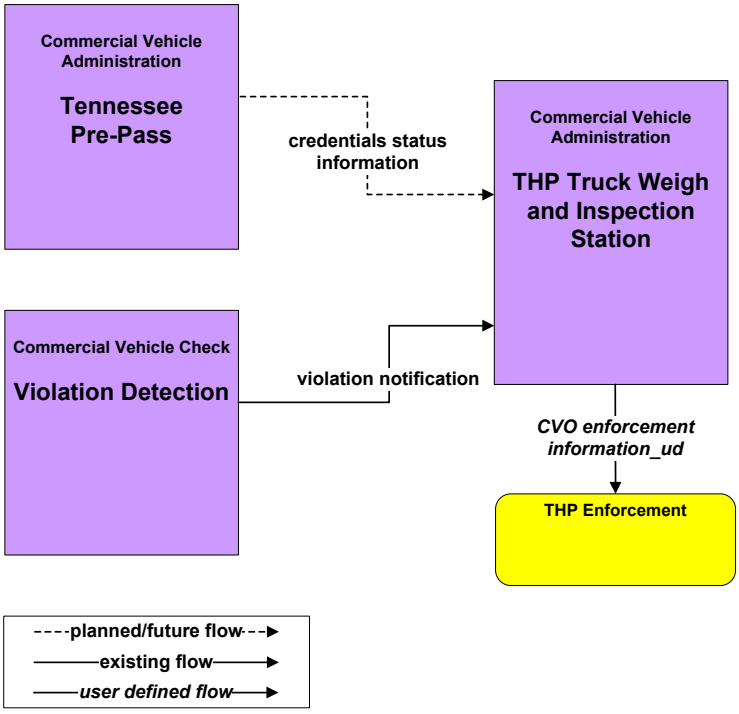
This market package provides transit users at transit stops and on-board transit vehicles with ready access to transit information. The information services include transit stop annunciation, imminent arrival signs, and real-time transit schedule displays that are of general interest to transit users. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by this market package.



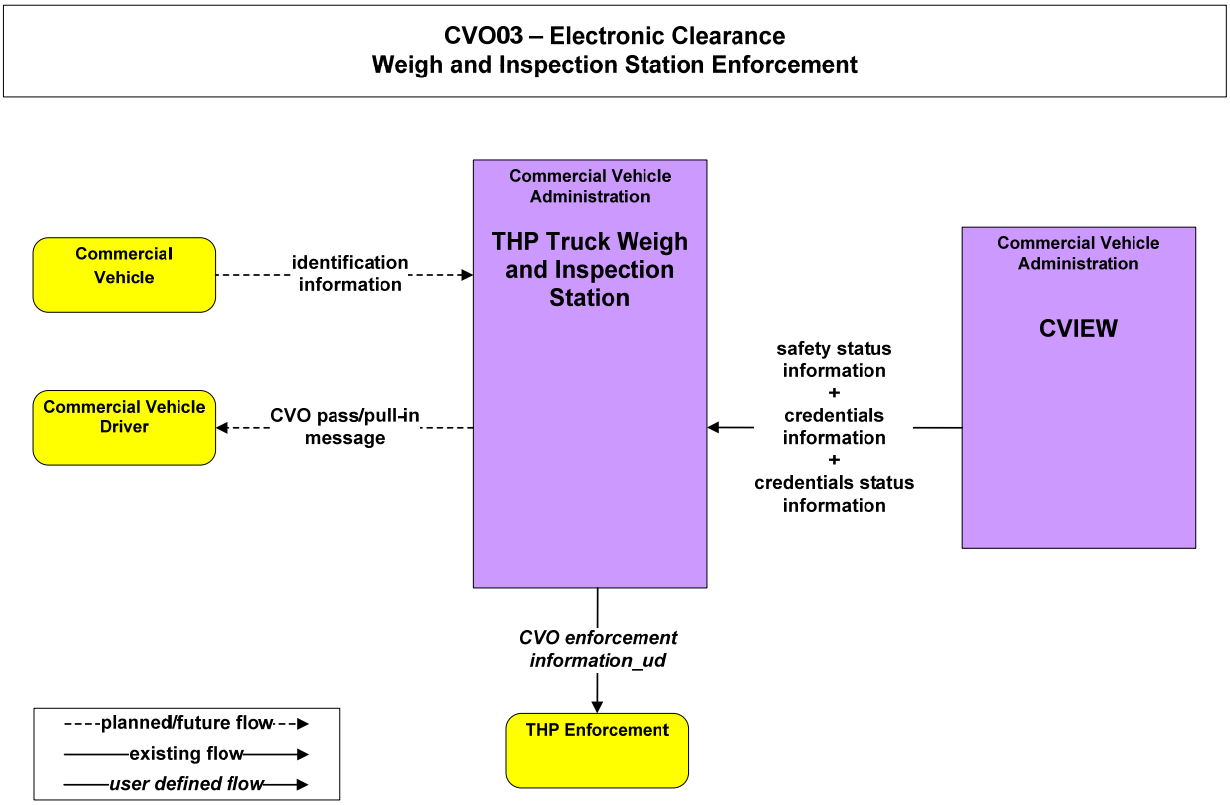
CVO03 – Electronic Clearance

Provides for automatic clearance of commercial vehicles at roadside check facilities. Allows a good driver/vehicle/carrier to pass roadside facilities at highway speeds using transponders and dedicated short range communications to the roadside.

CVO03 – Electronic Clearance
Mainline Enforcement



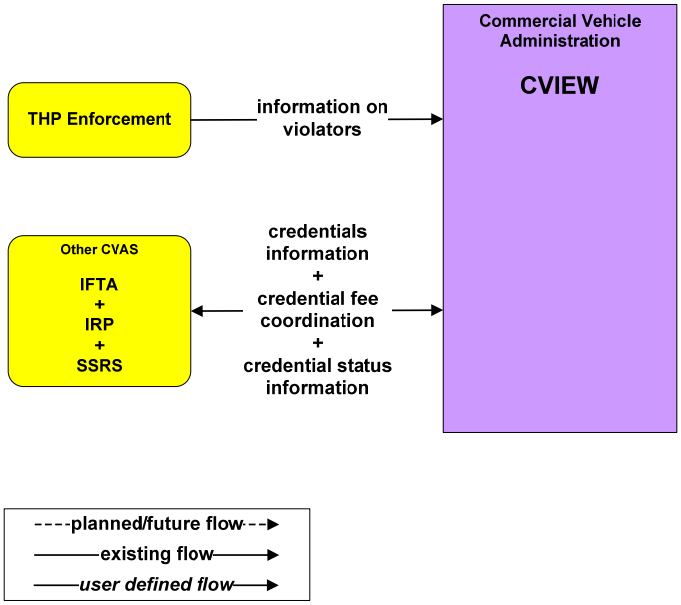
CVO03 – Electronic Clearance (continued)



CVO04 – Commercial Vehicle Administrative Processes

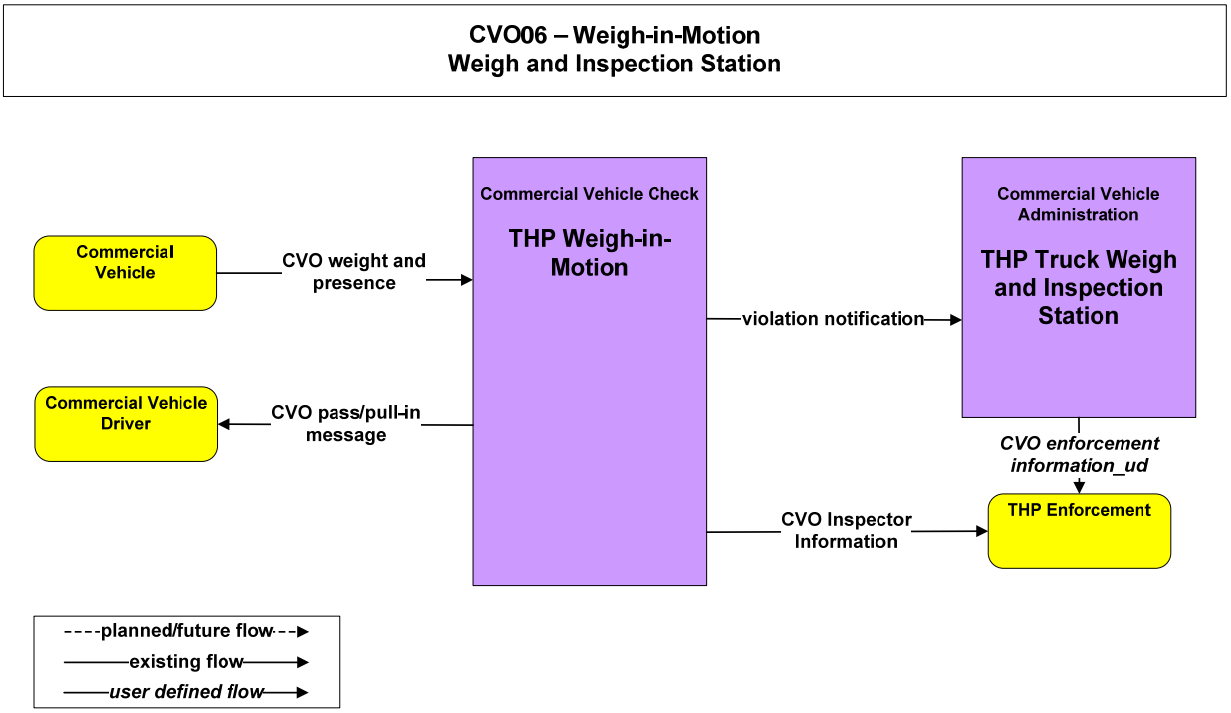
This market package provides for electronic application, processing, fee collection, issuance, and distribution of CVO credential and tax filing. Through this process, carriers, drivers, and vehicles may be enrolled in the electronic clearance program provided by a separate market package which allows commercial vehicles to be screened at mainline speeds at roadside check facilities. Through this enrollment process, current profile databases are maintained in the Commercial Vehicle Administration subsystem and snapshots of this database are made available to the roadside check facilities at the roadside to support the electronic clearance process.

CVO04 – CV Administrative Process



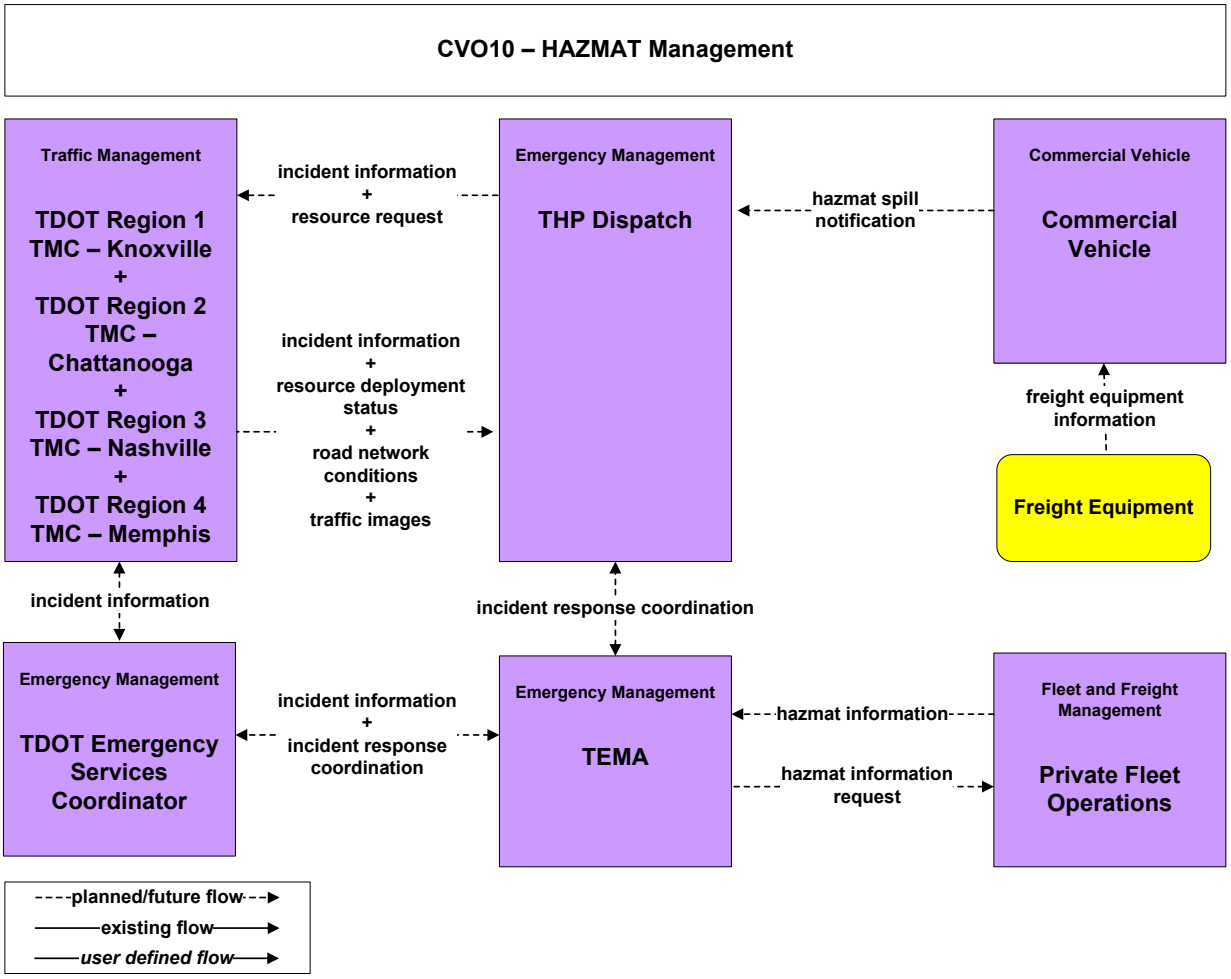
CVO06 – Weigh in Motion

This market package provides for high speed weigh-in-motion with or without Automated Vehicle Identification (AVI) capabilities. This market package provides the roadside equipment that could be used as a stand-alone system or to augment the Electronic Clearance (CVO03) market package.



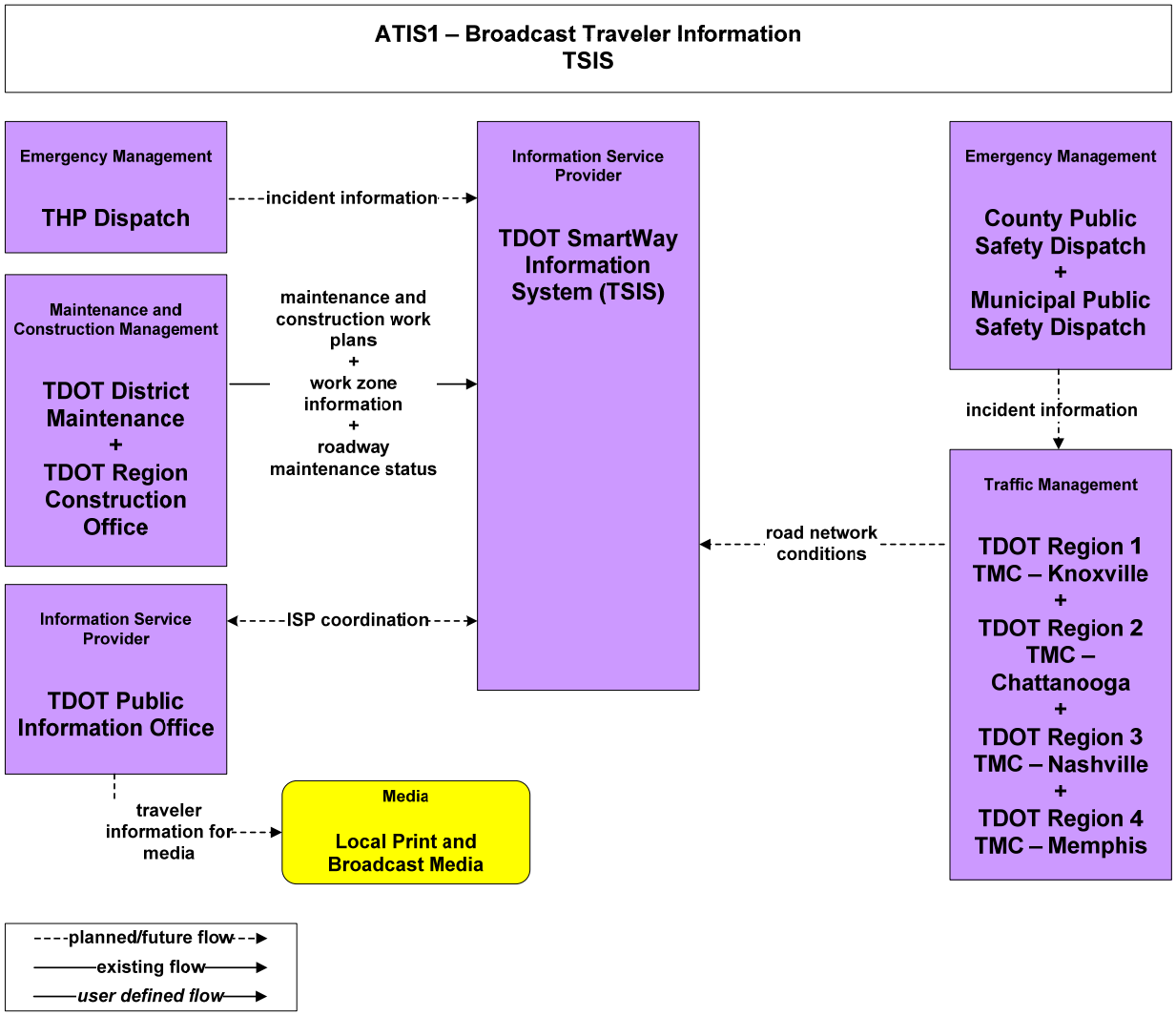
CVO10 – HAZMAT Management

This market package integrates incident management capabilities with commercial vehicle tracking to assure effective treatment of HAZMAT material and incidents. The Emergency Management subsystem is notified by the Commercial Vehicle if an incident occurs and coordinates the response, which is tailored based on the information provided.



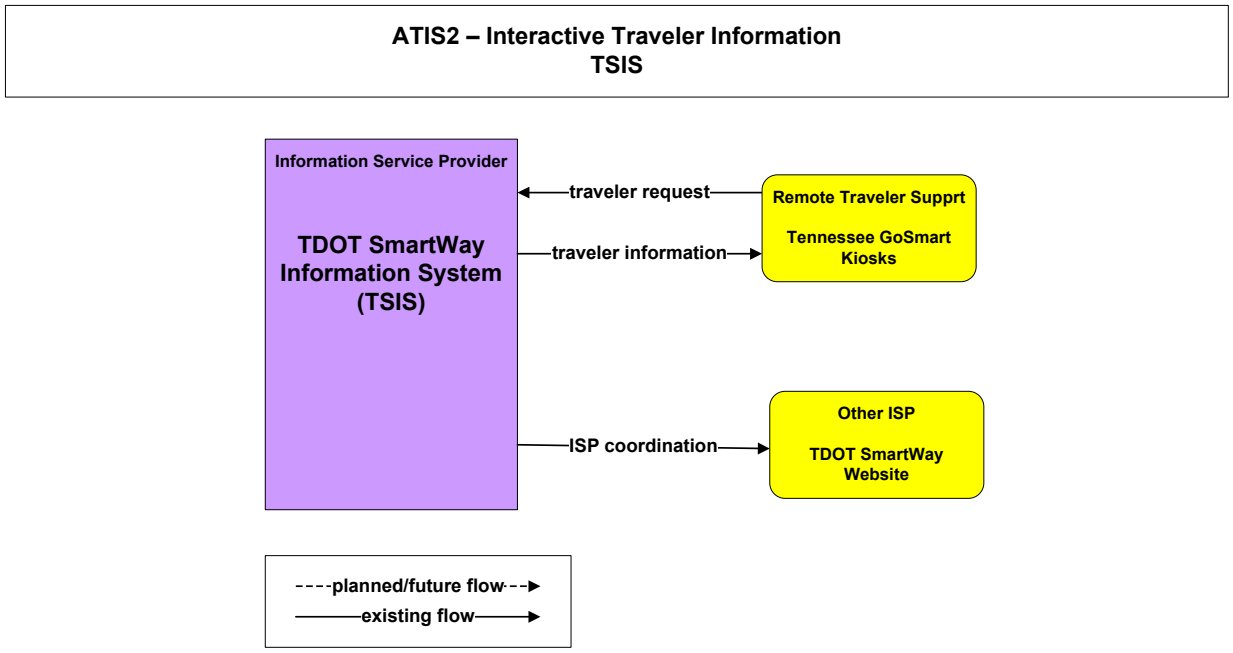
ATIS1 – Broadcast Traveler Information

Collects traffic conditions, advisories, general public transportation, toll and parking information, incident information, roadway maintenance and construction information, air quality and weather information, and broadly disseminates this information through existing infrastructures (radio). Different from the market package ATMS06 – Traffic Information Dissemination, which provides localized HAR and DMS information capabilities, ATIS1 provides a wide area digital broadcast service.

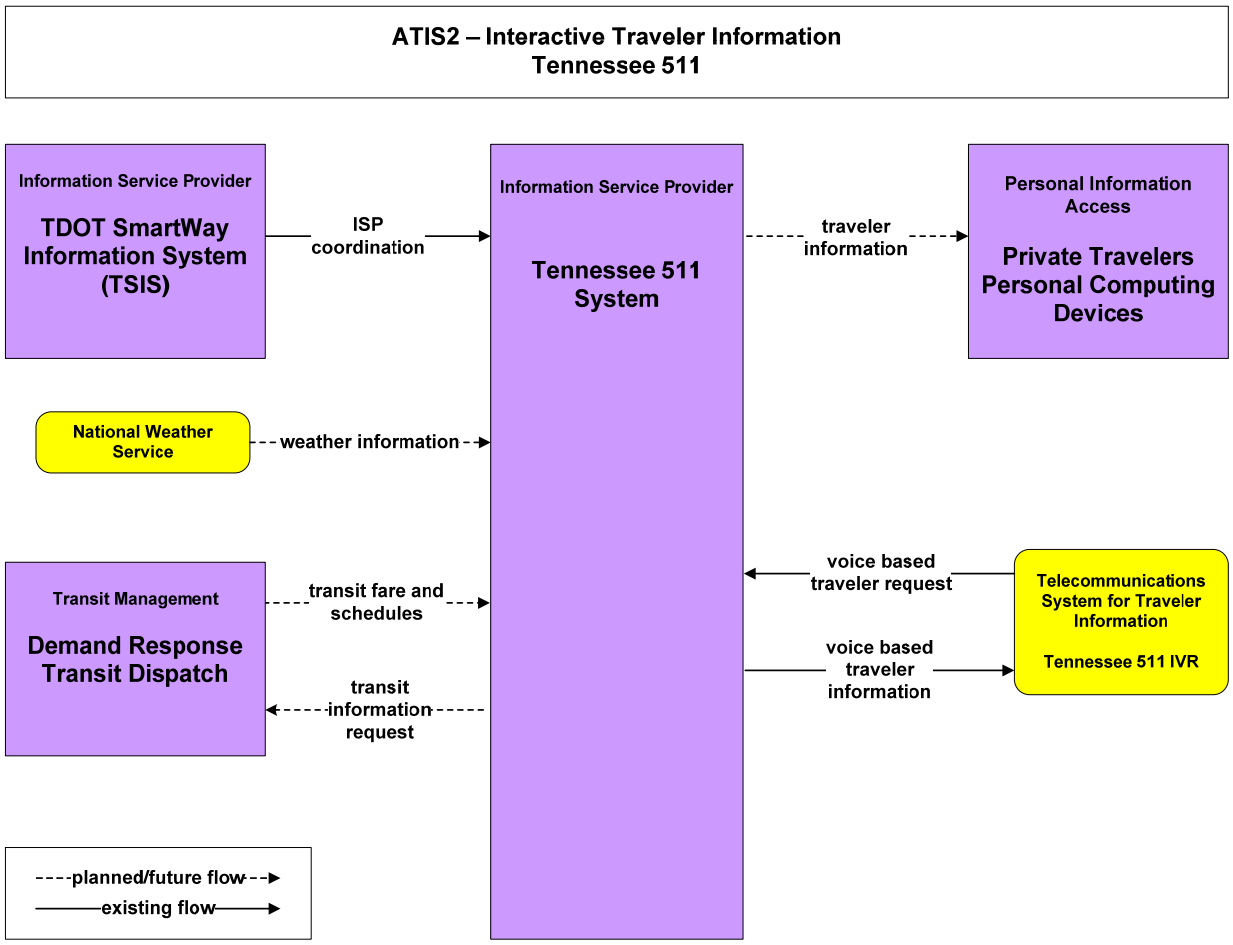


ATIS2 – Interactive Traveler Information

Provides tailored information in response to a traveler request, such as through 511, a web page or kiosk. Travelers can obtain current information regarding traffic conditions, roadway maintenance and construction, transit services, ride share/ride match, parking management, detours and pricing information.

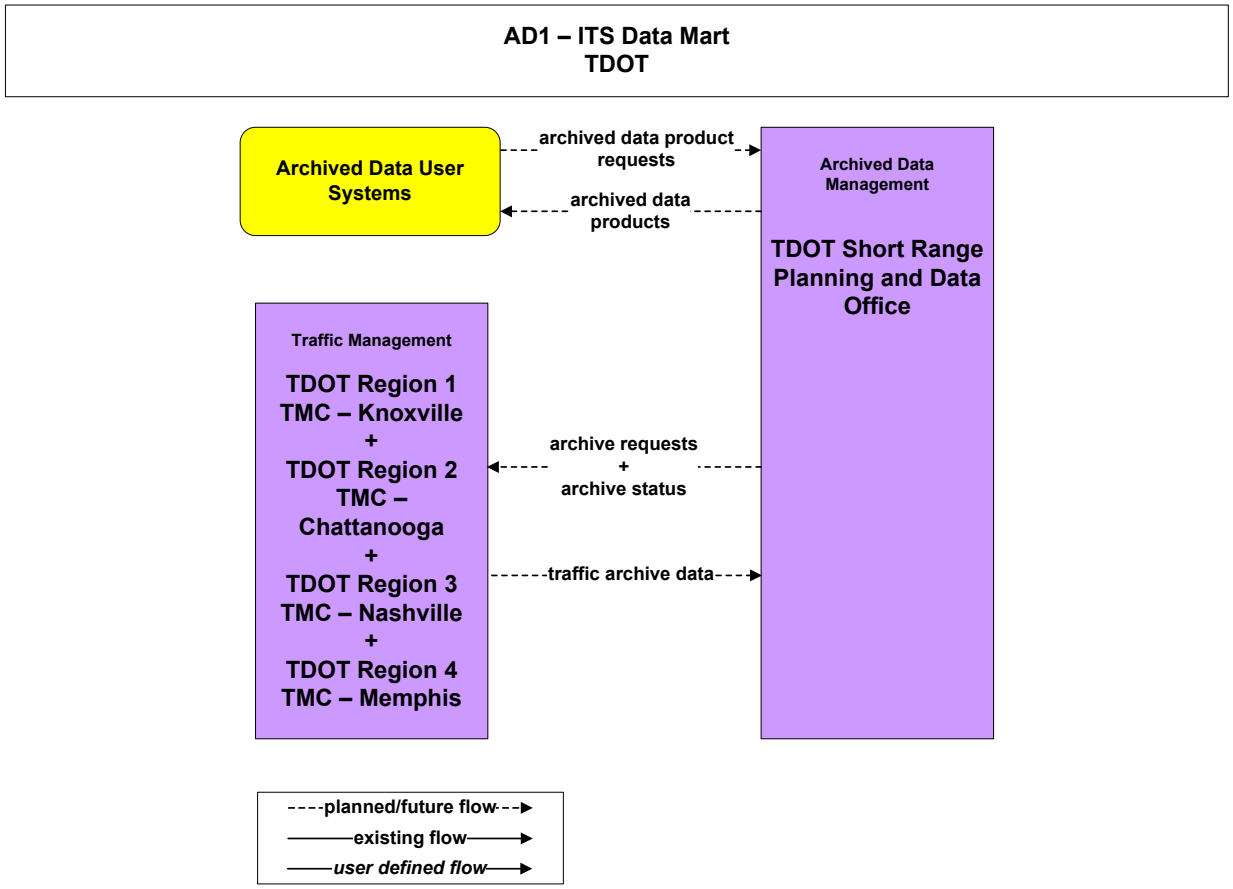


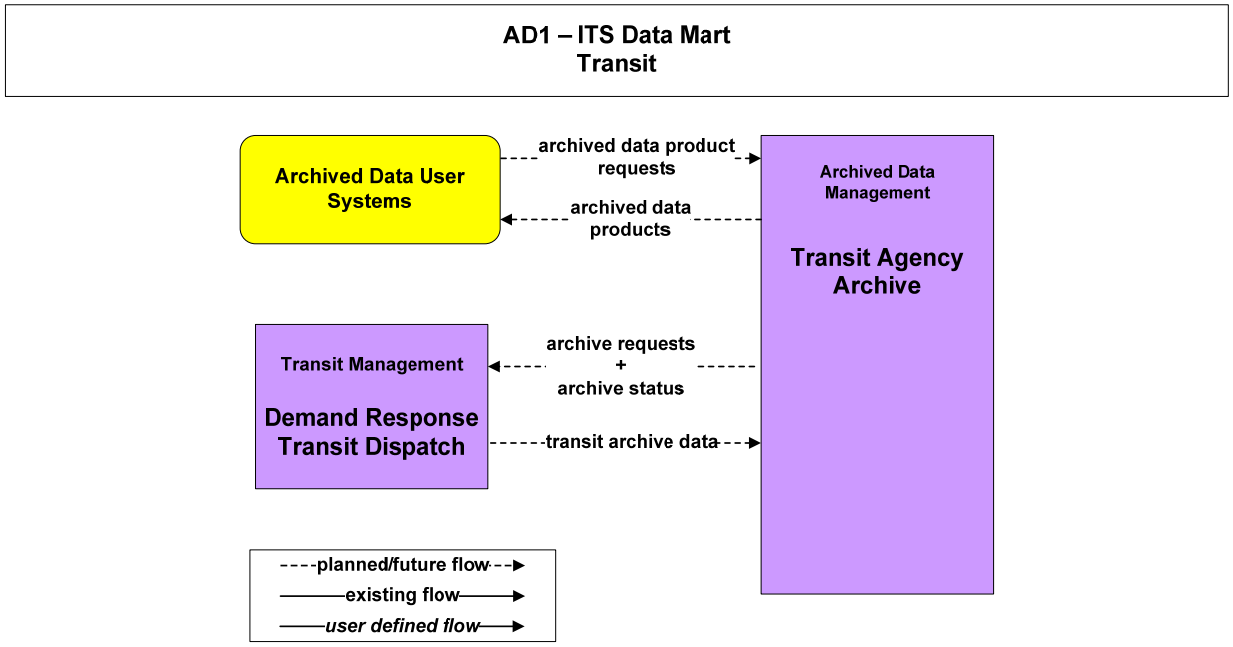
ATIS2 – Interactive Traveler Information (continued)



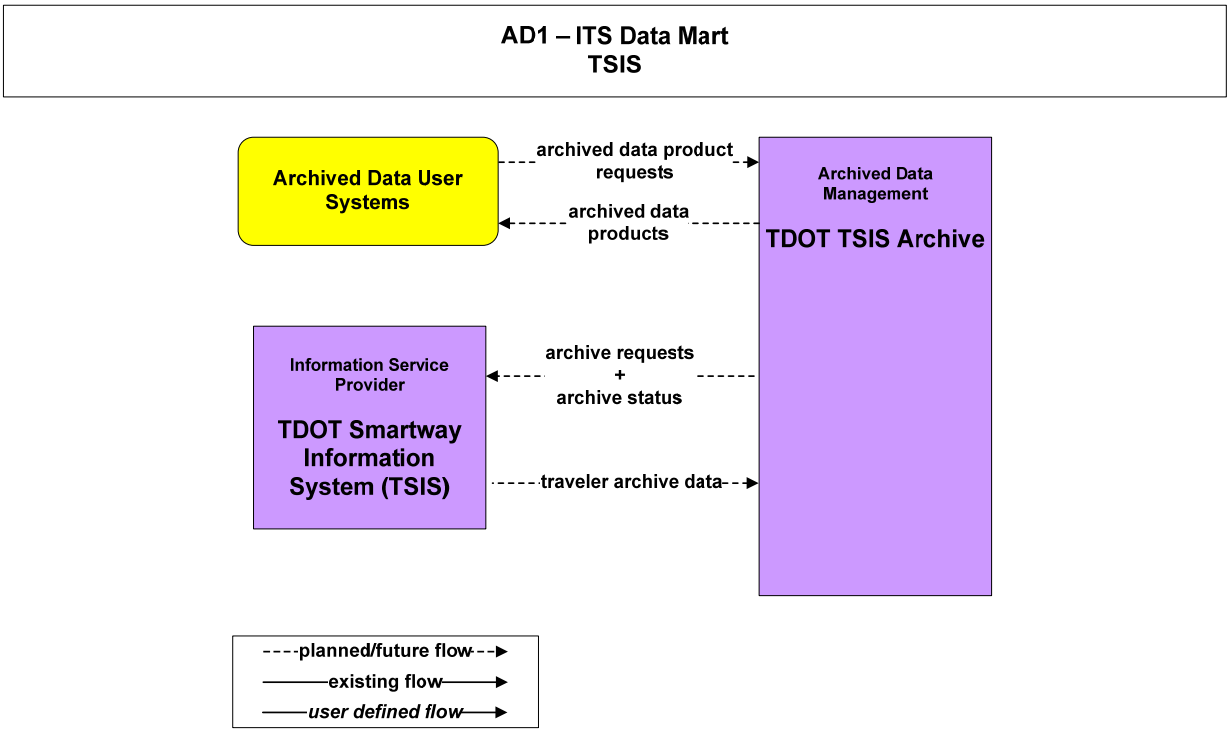
AD1 – ITS Data Mart

Provides a focused archive that houses data collected and owned by a single agency or other organization. Focused archive typically covers a single transportation mode and one jurisdiction.



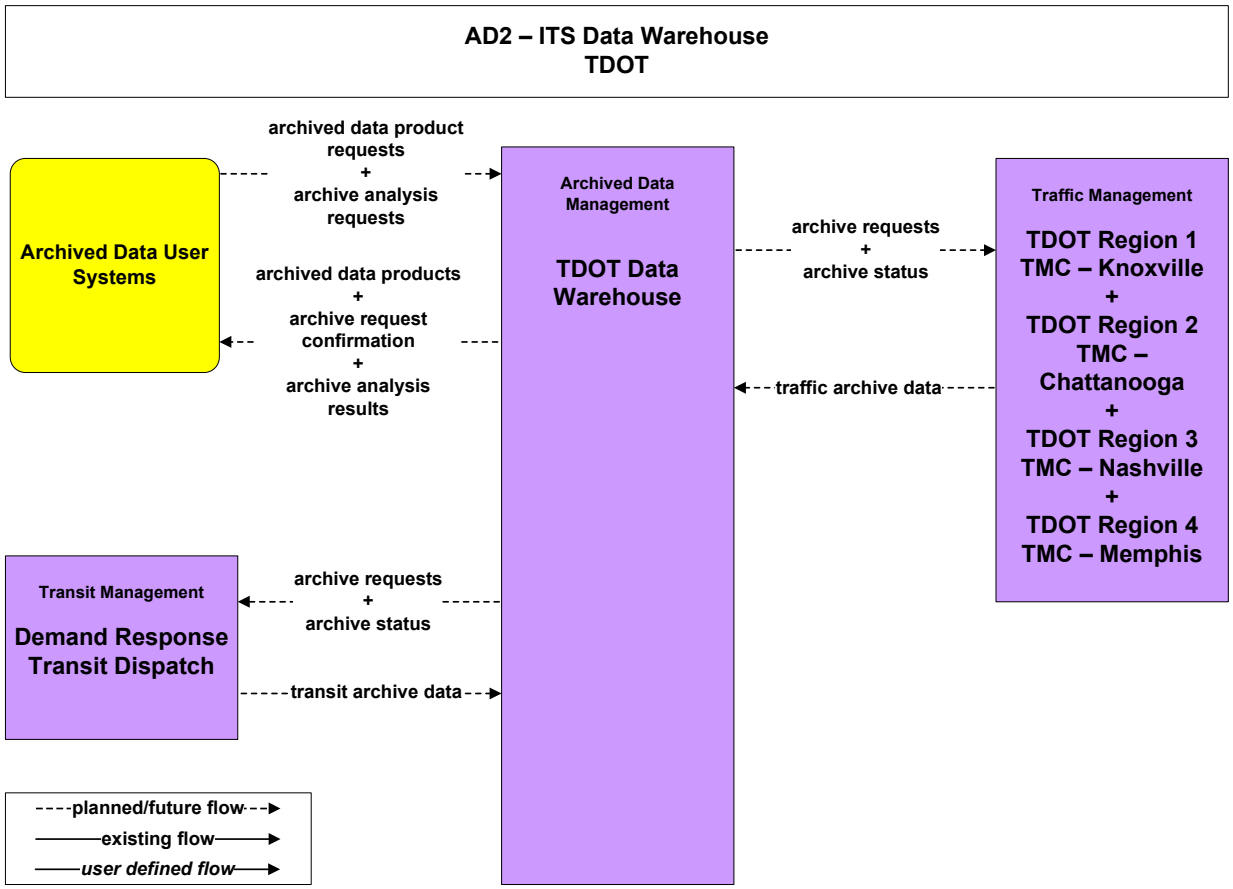


AD1 – ITS Data Mart (continued)



AD2 – ITS Data Warehouse

Includes all the data collection and management capabilities of the ITS Data Mart. Adds the functionality to allow collection of data from multiple agencies and data sources across modal and jurisdictional boundaries.

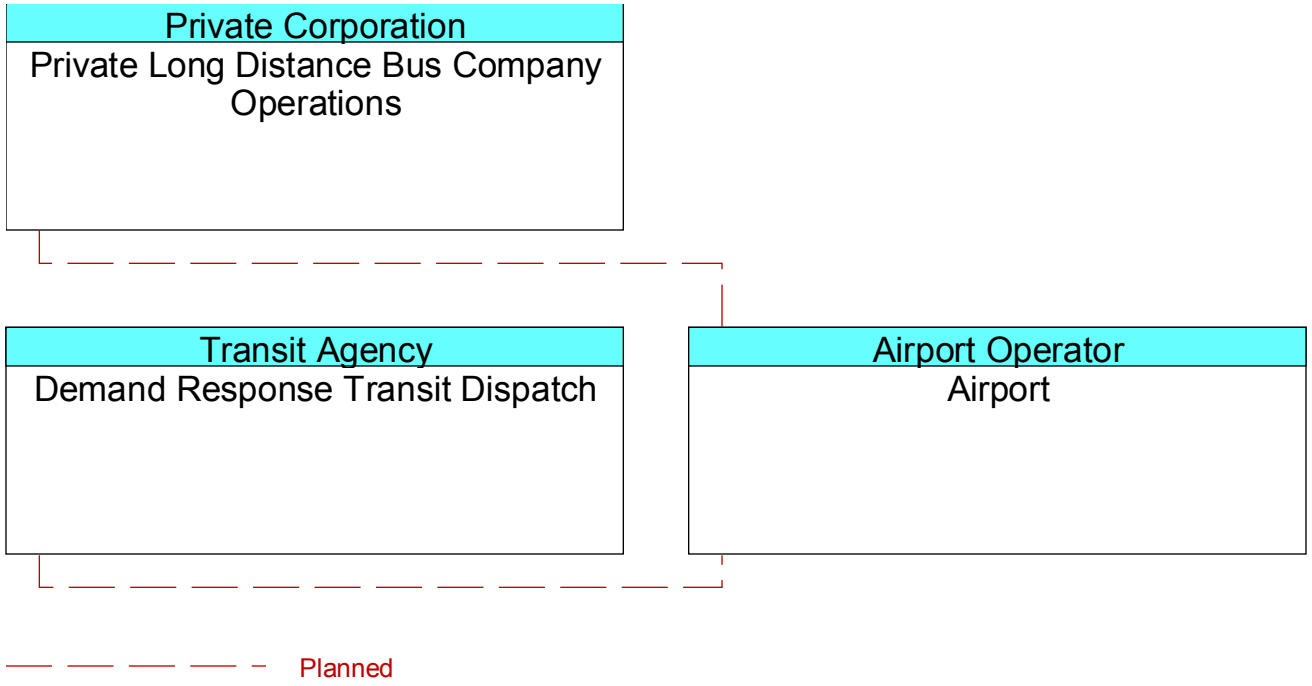


APPENDIX E – INTERFACE DIAGRAMS

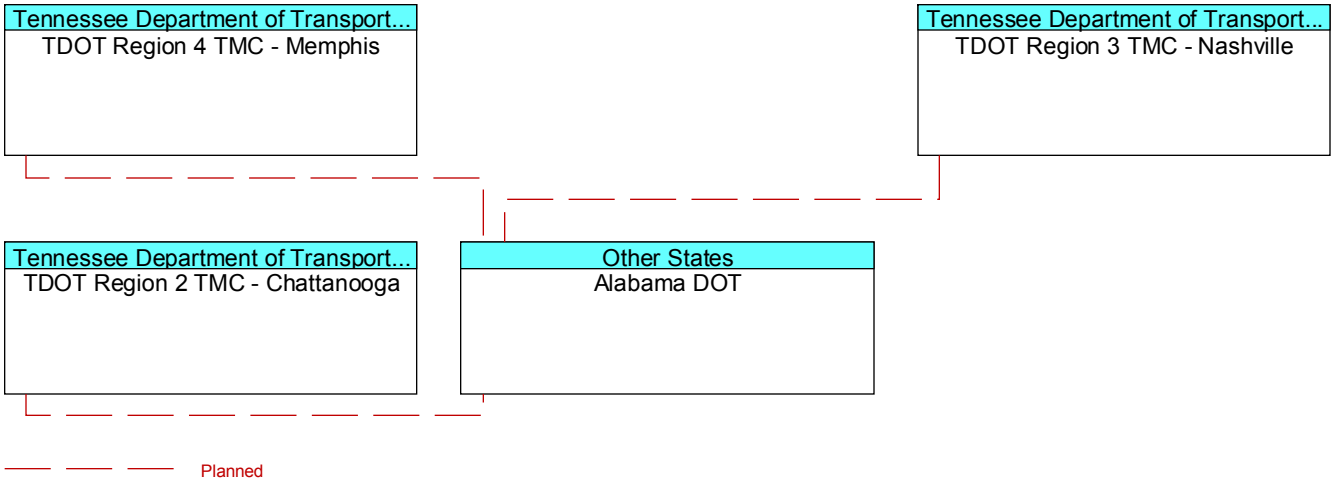
LIST OF INTERFACE DIAGRAMS

LIST OF INTERFACE DIAGRAMS

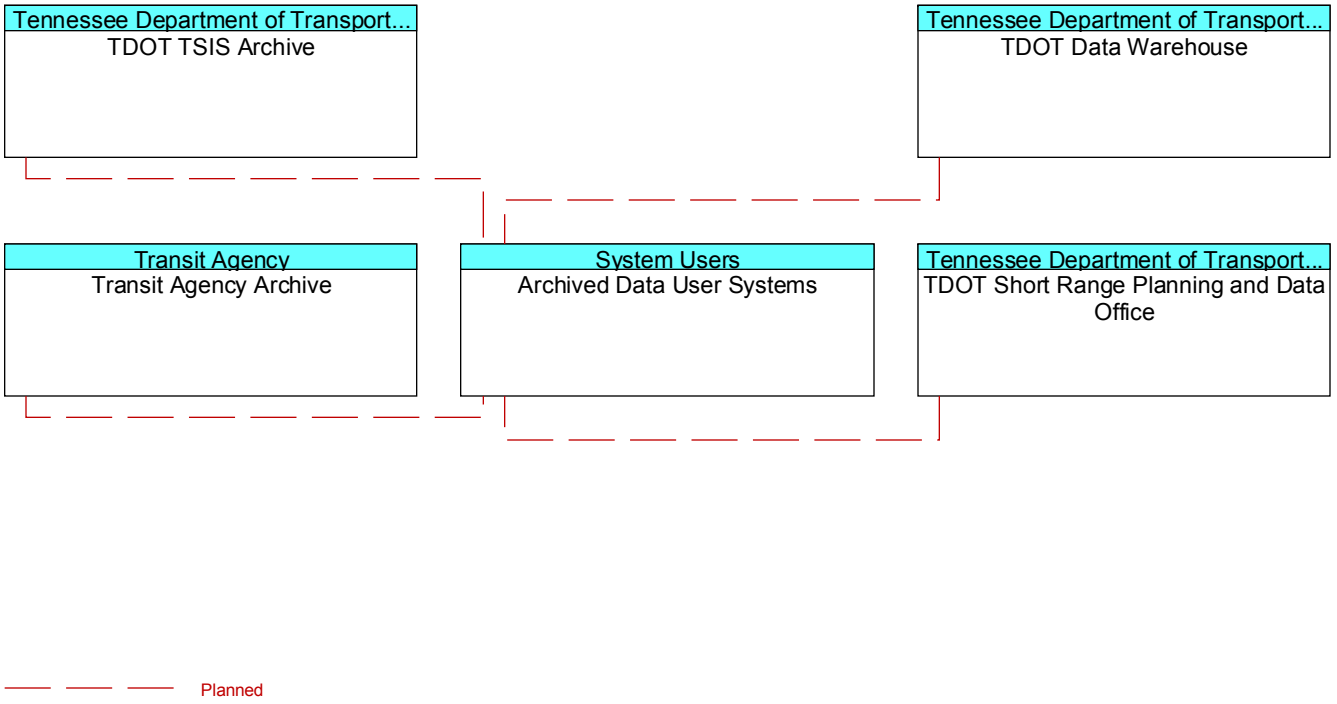
Airport Interfaces



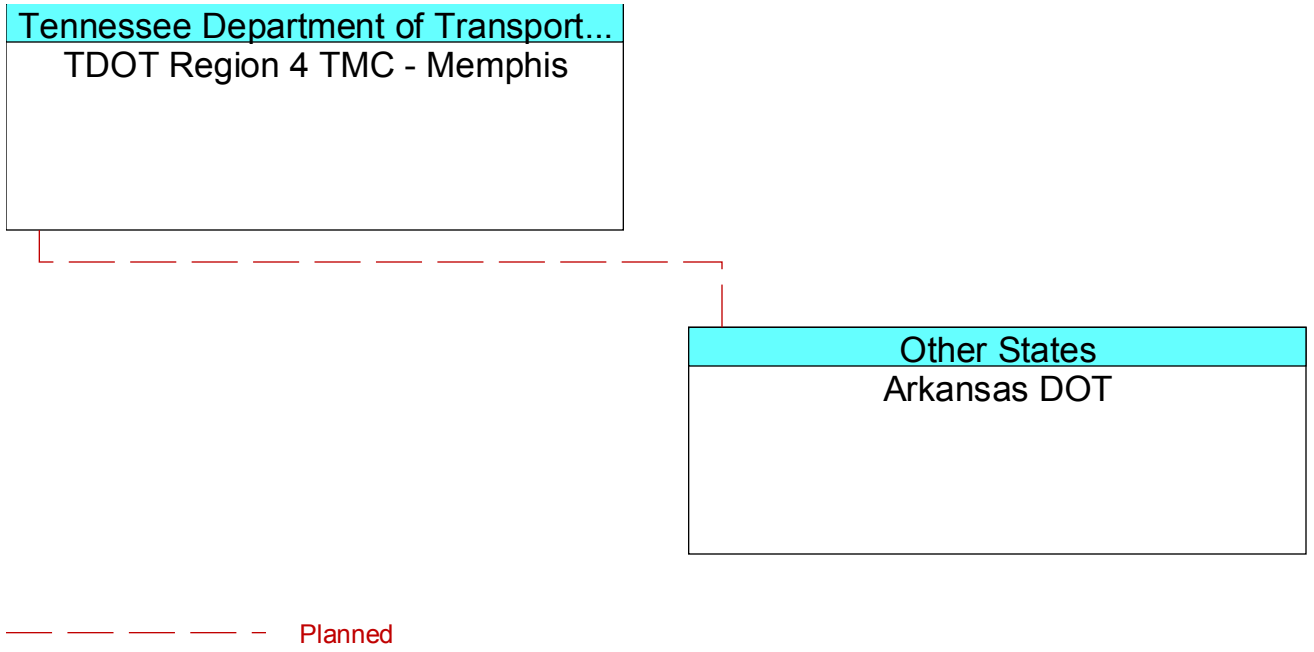
Alabama DOT Interfaces



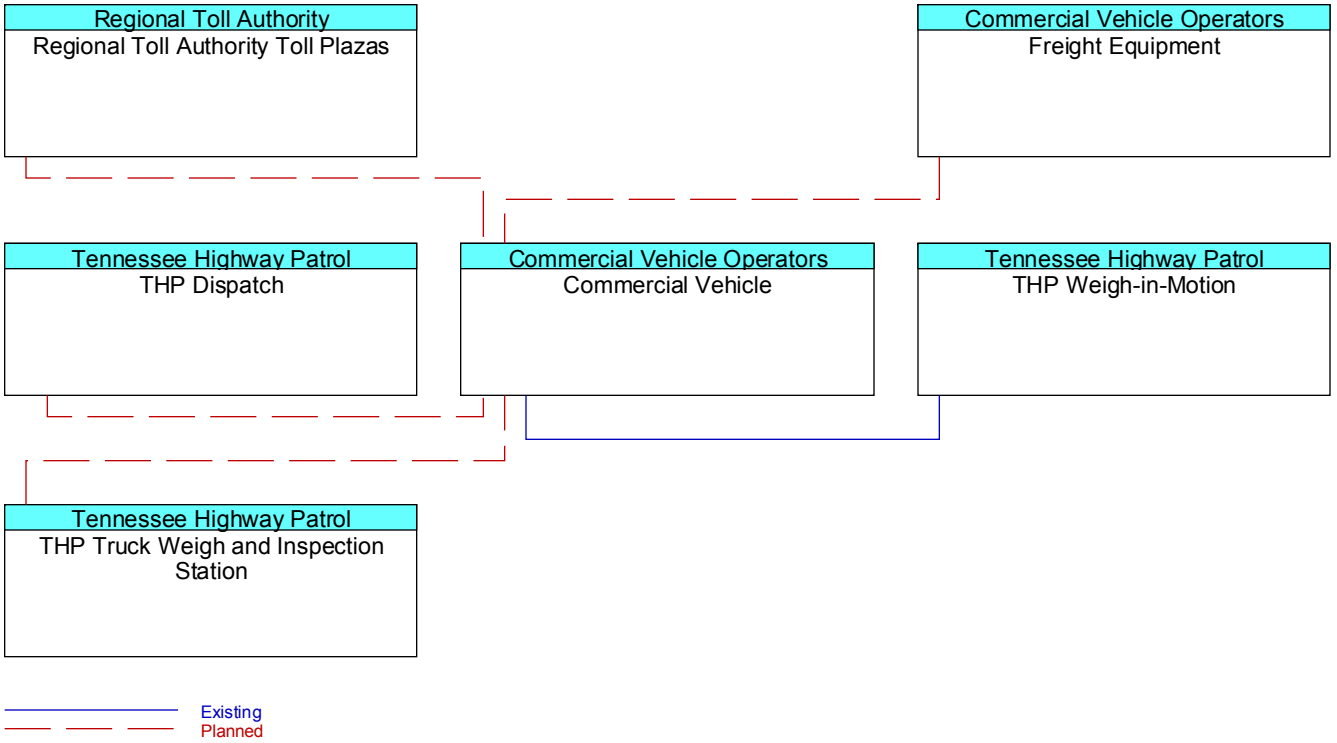
Archived Data User Systems Interfaces



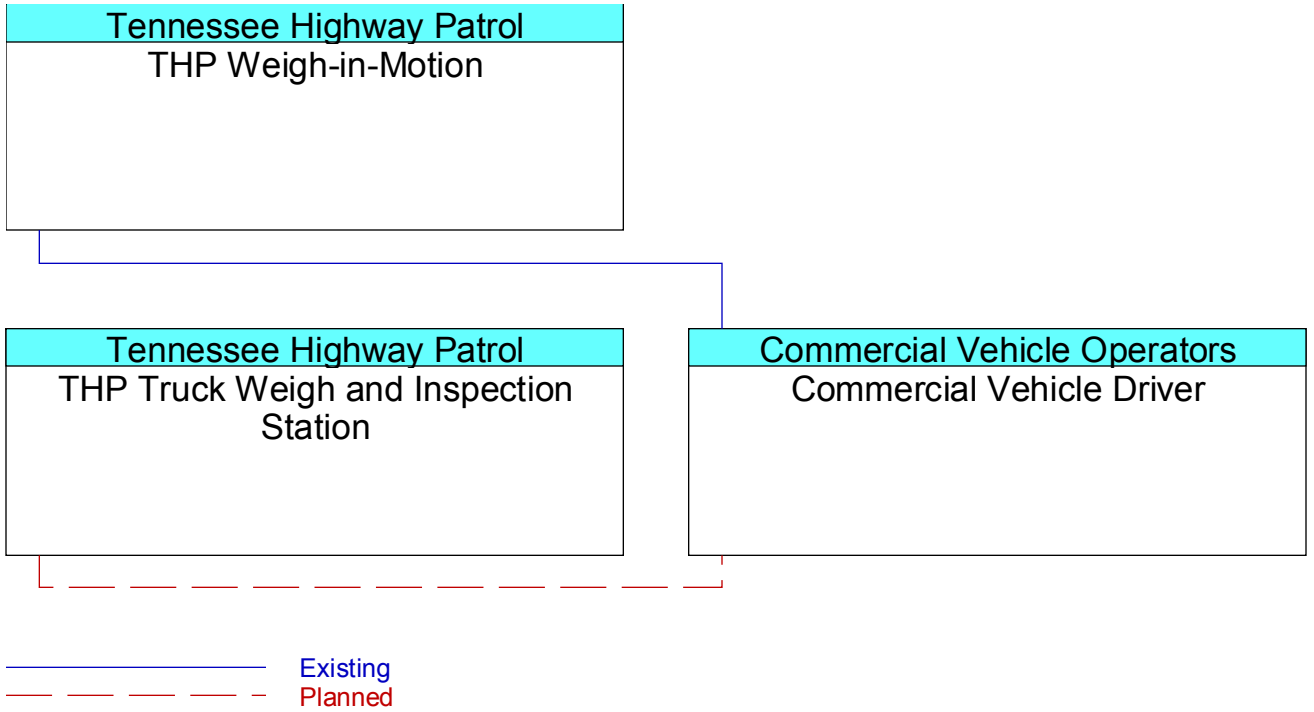
Arkansas DOT Interfaces



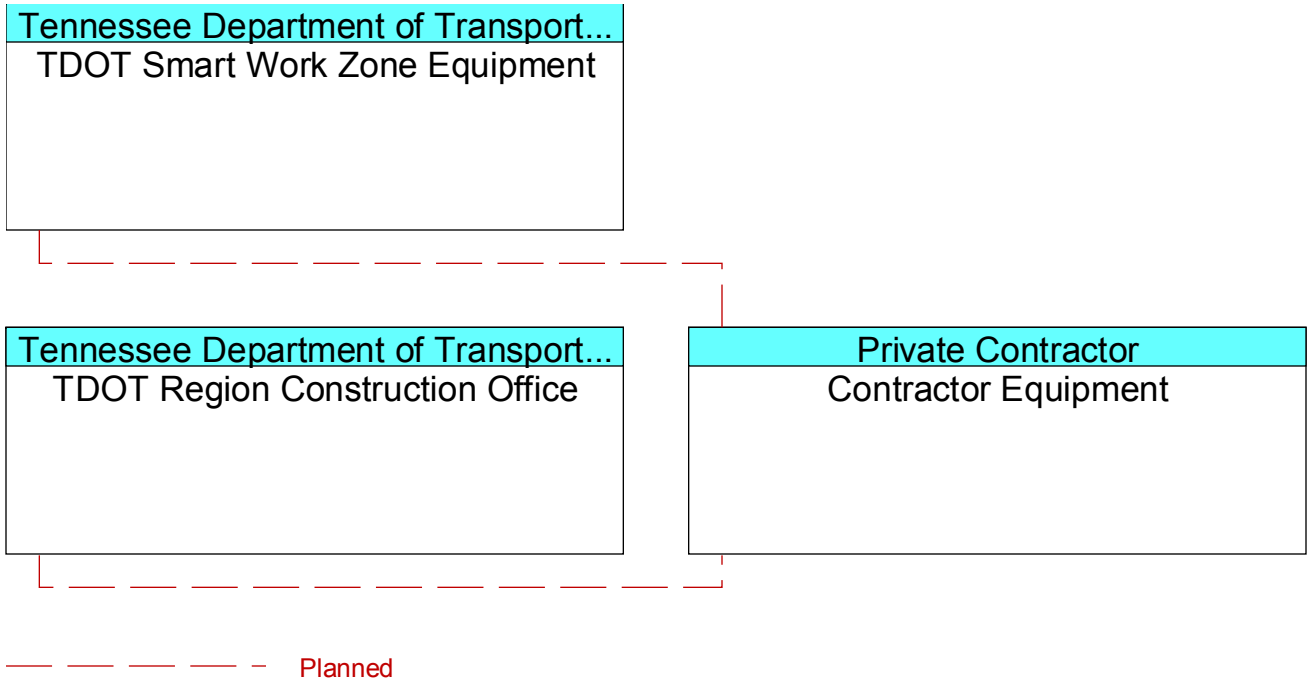
Commercial Vehicle Interfaces



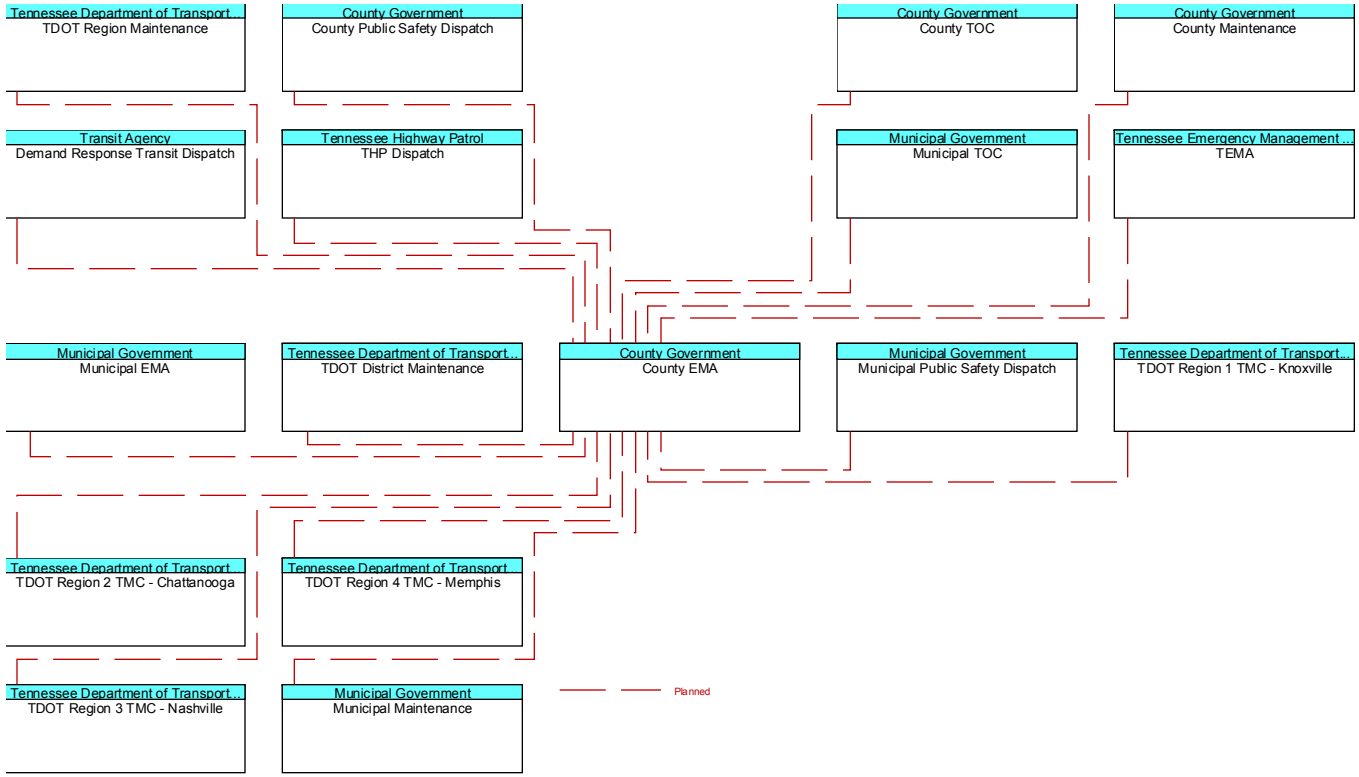
Commercial Vehicle Driver Interfaces



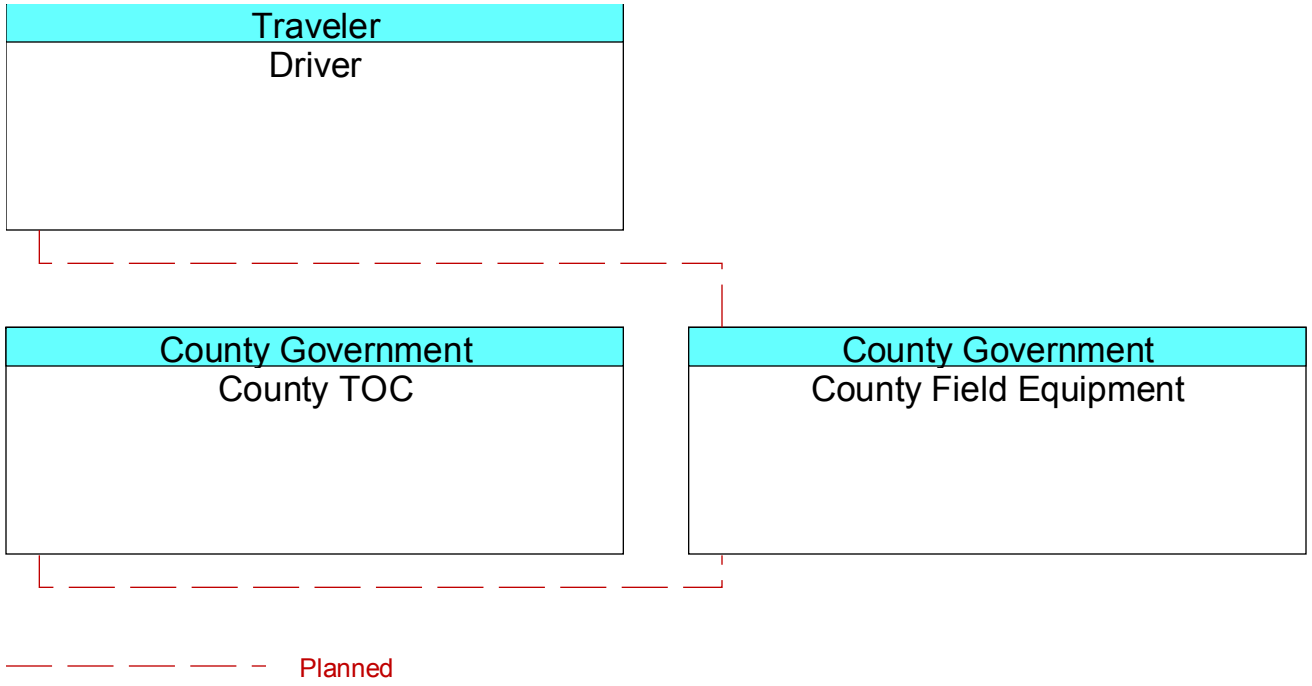
Contractor Equipment Interfaces



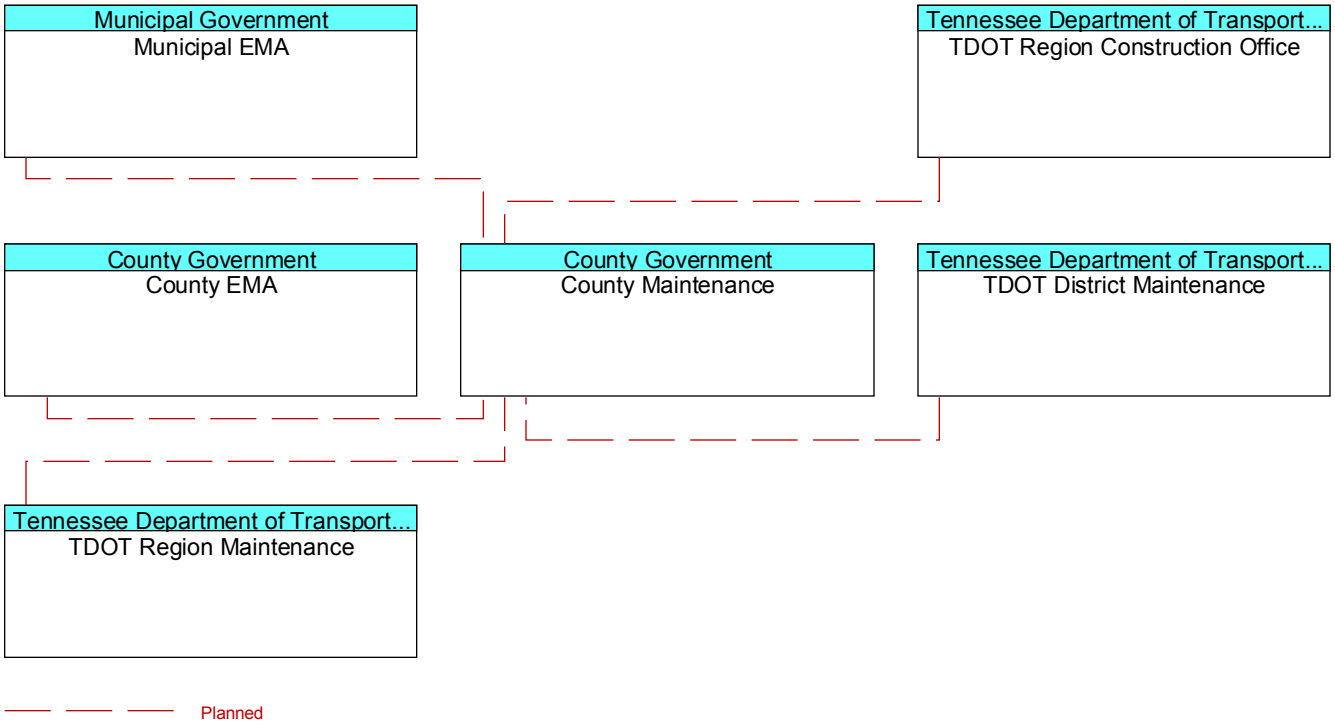
County EMA Interfaces



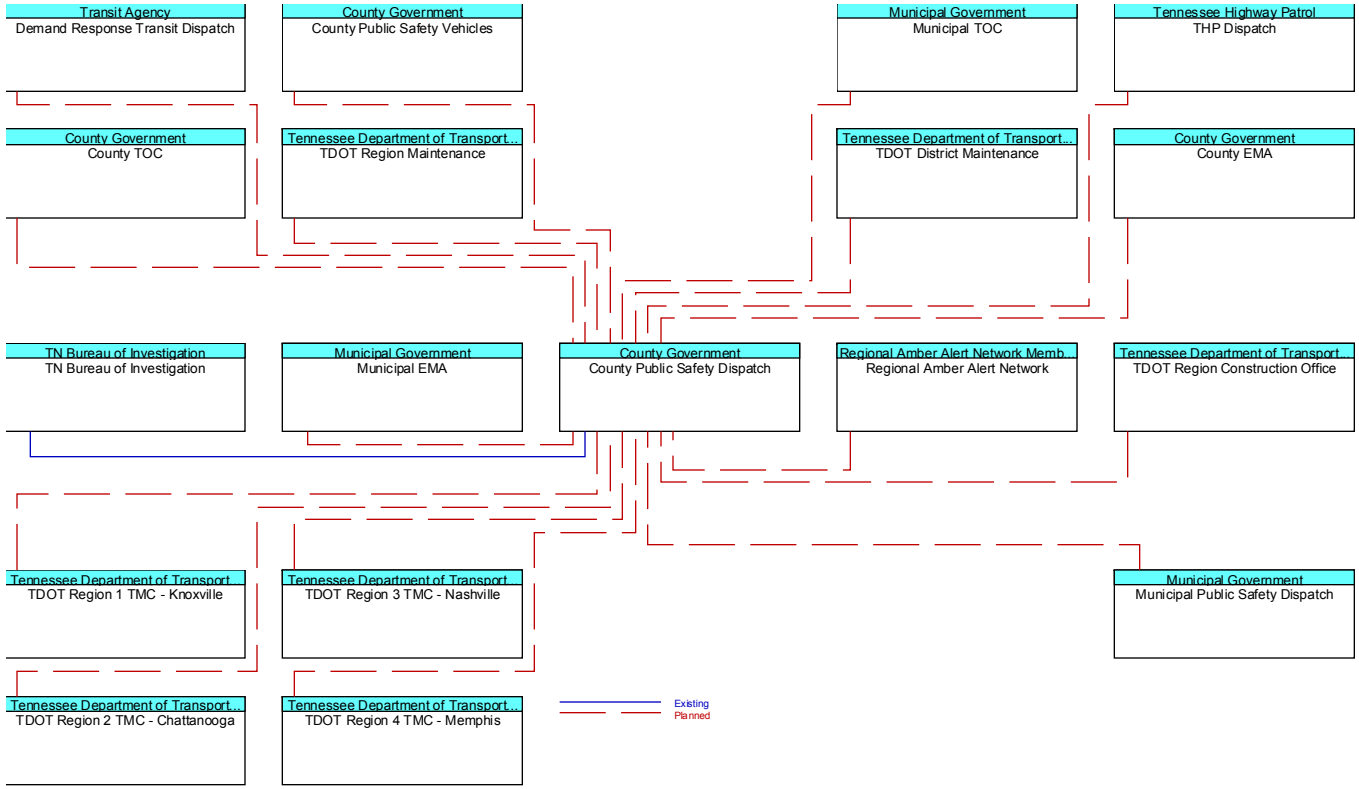
County Field Equipment Interfaces



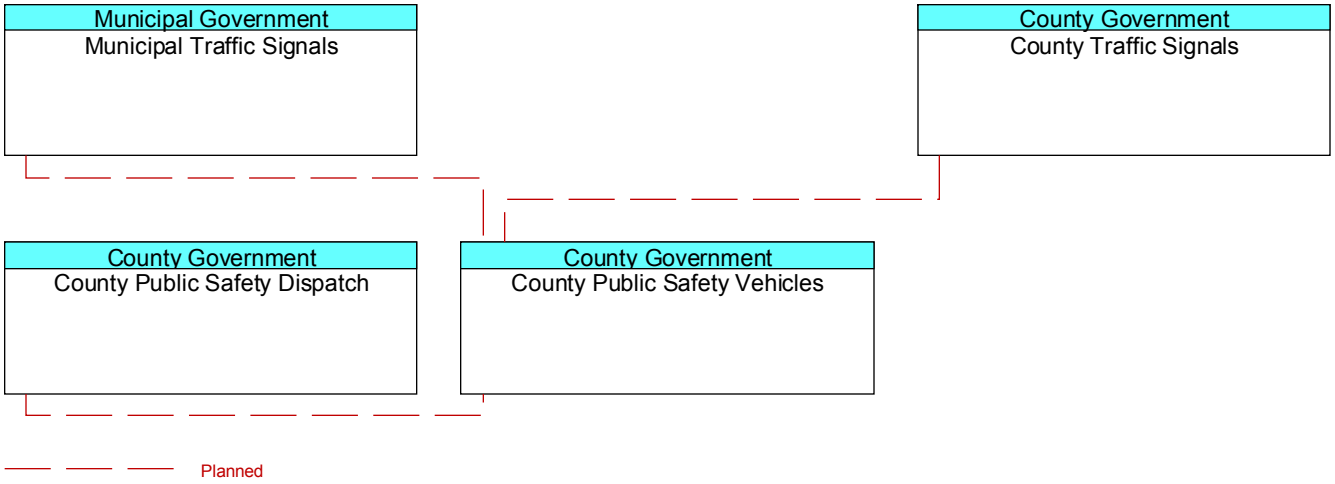
County Maintenance Interfaces



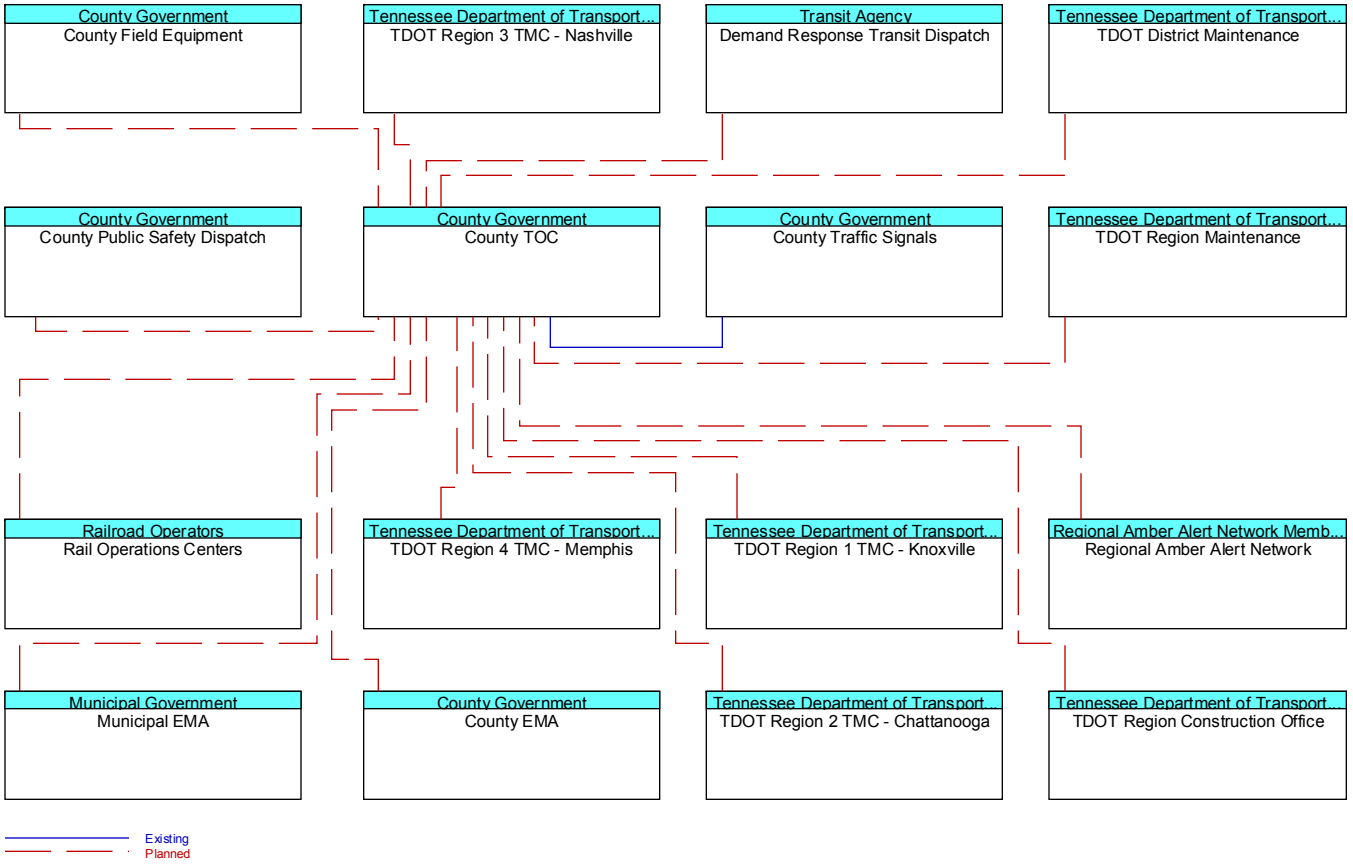
County Public Safety Dispatch Interfaces



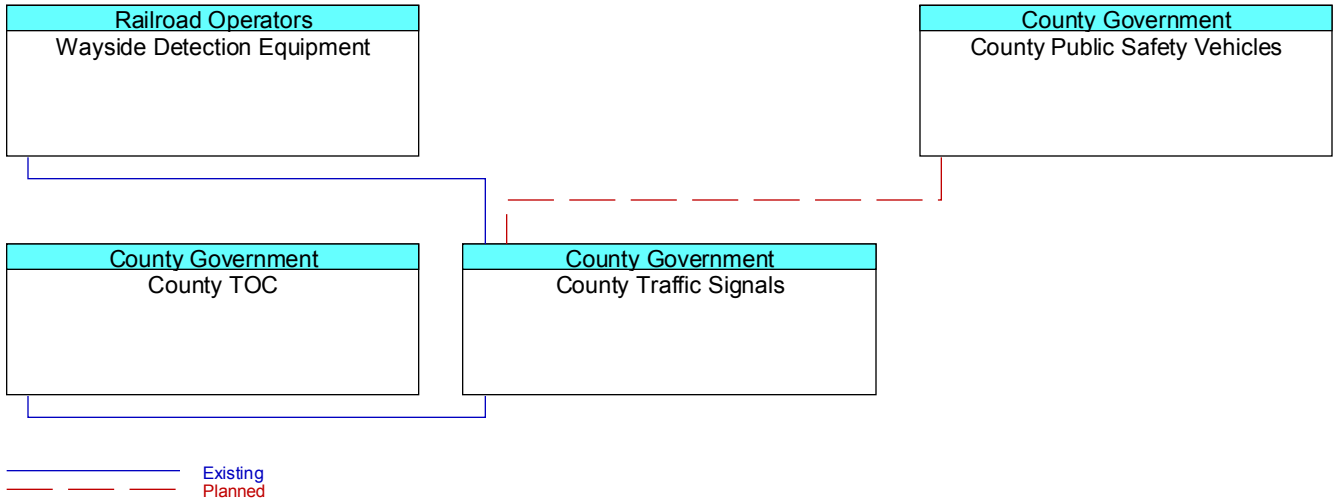
County Public Safety Vehicles Interfaces



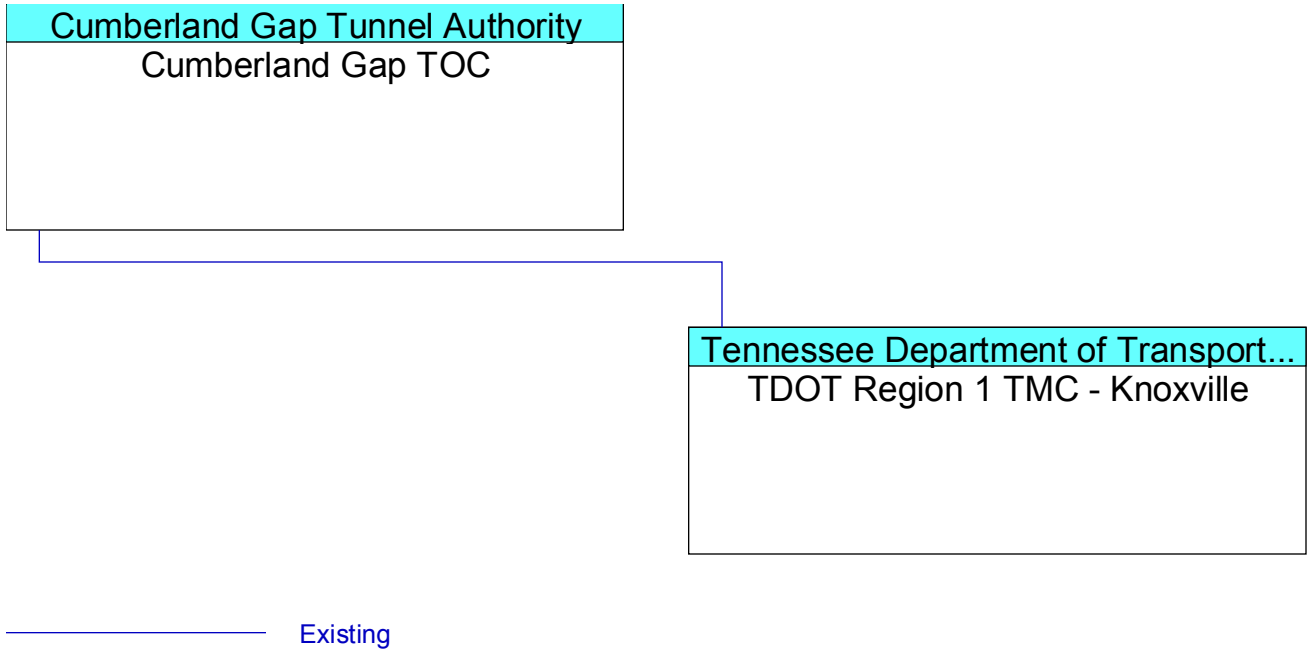
County TOC Interfaces



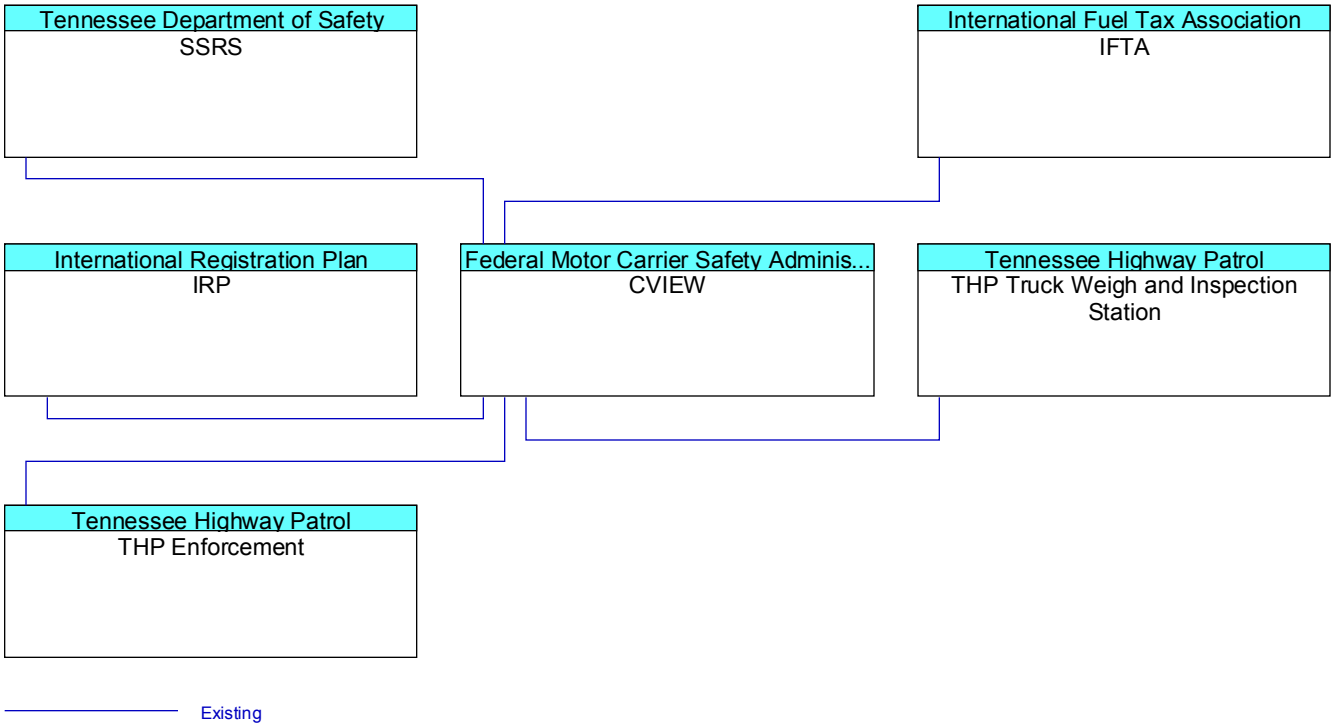
County Traffic Signals Interfaces



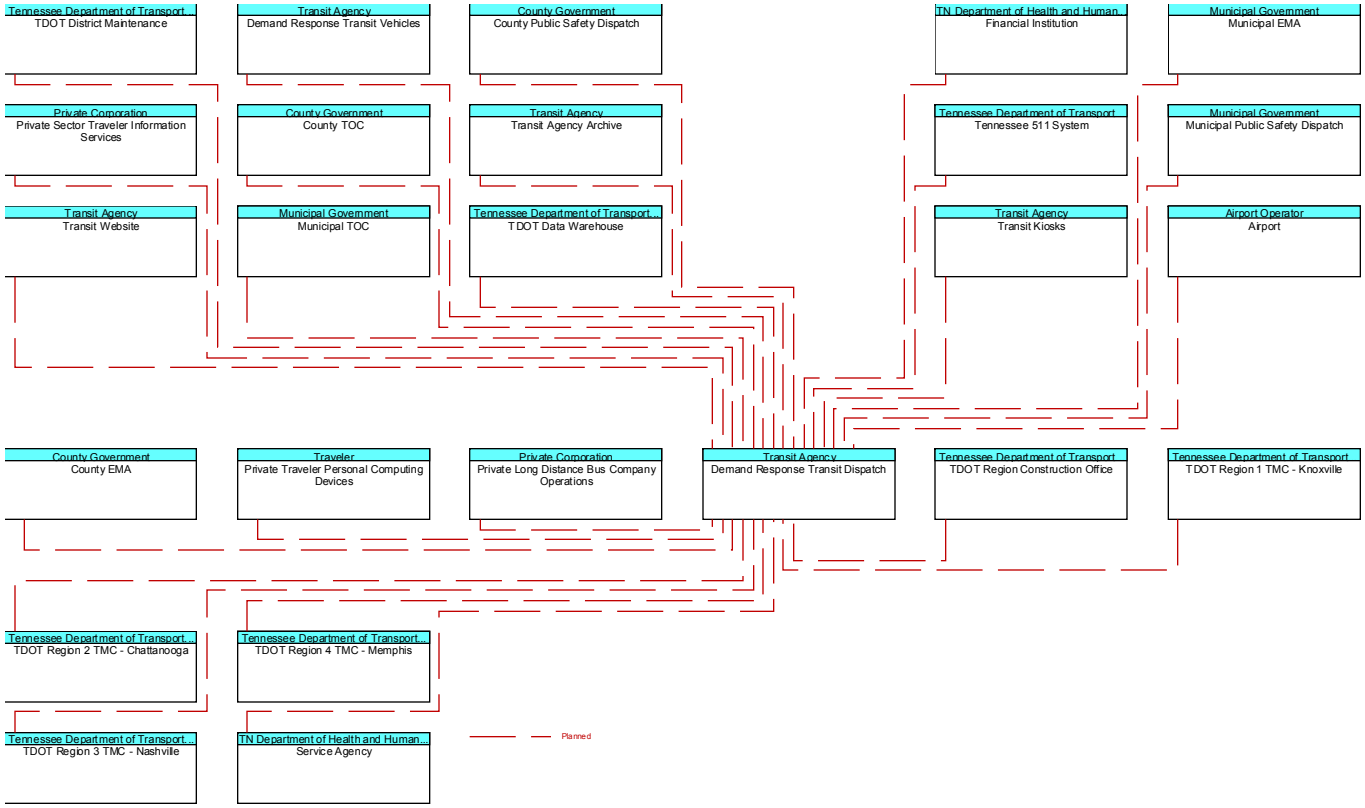
Cumberland Gap TOC Interfaces



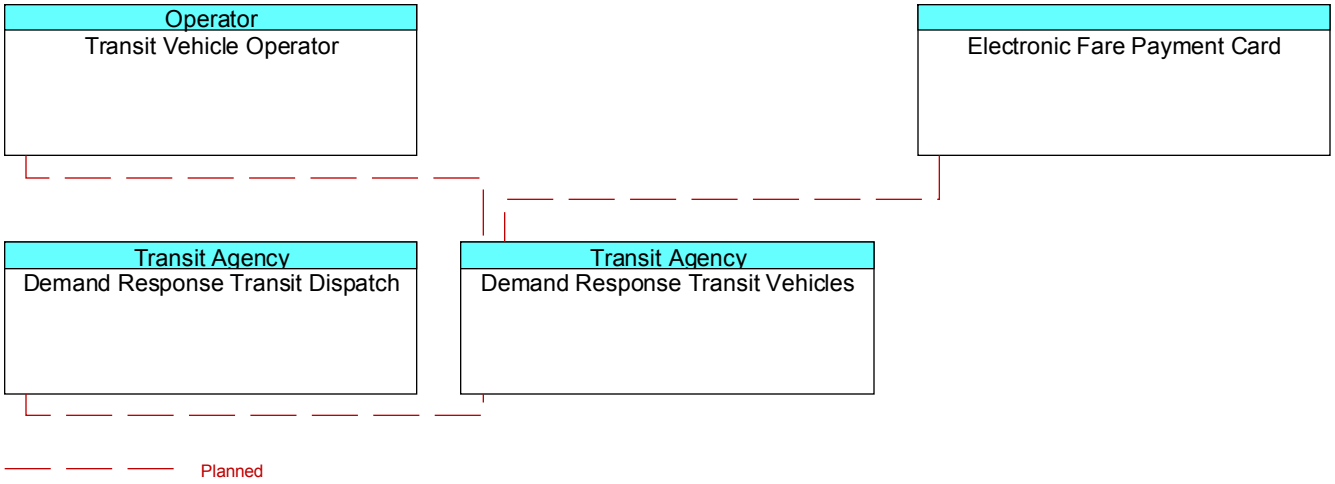
CVIEW Interfaces



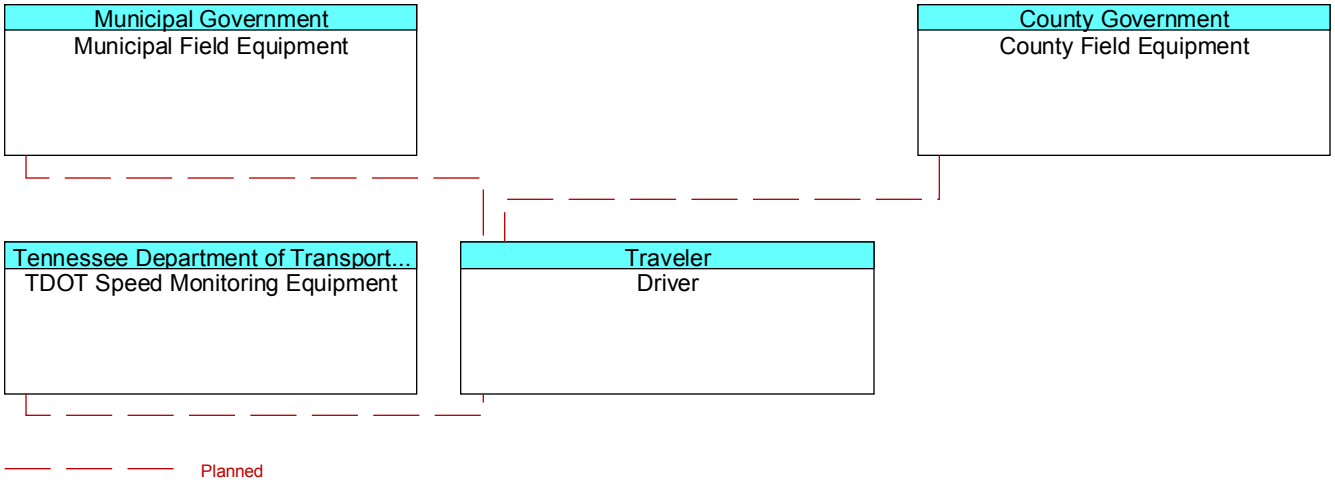
Demand Response Transit Dispatch Interfaces



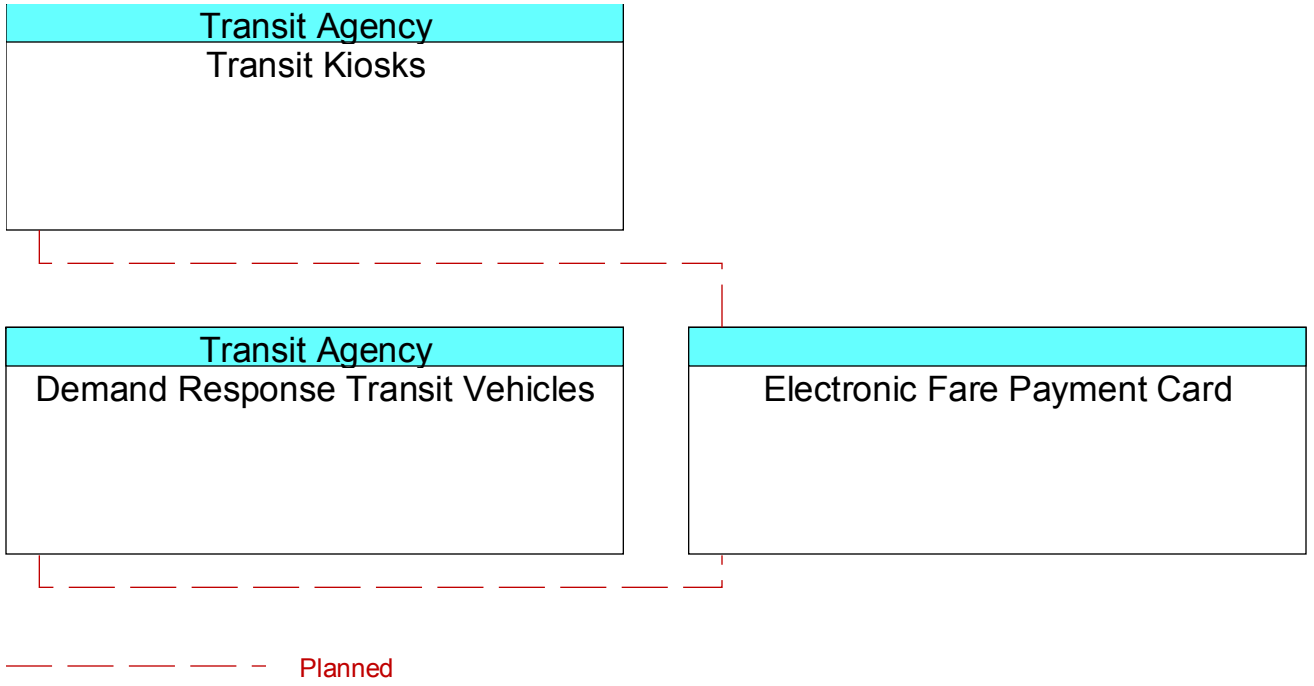
Demand Response Transit Vehicles Interfaces



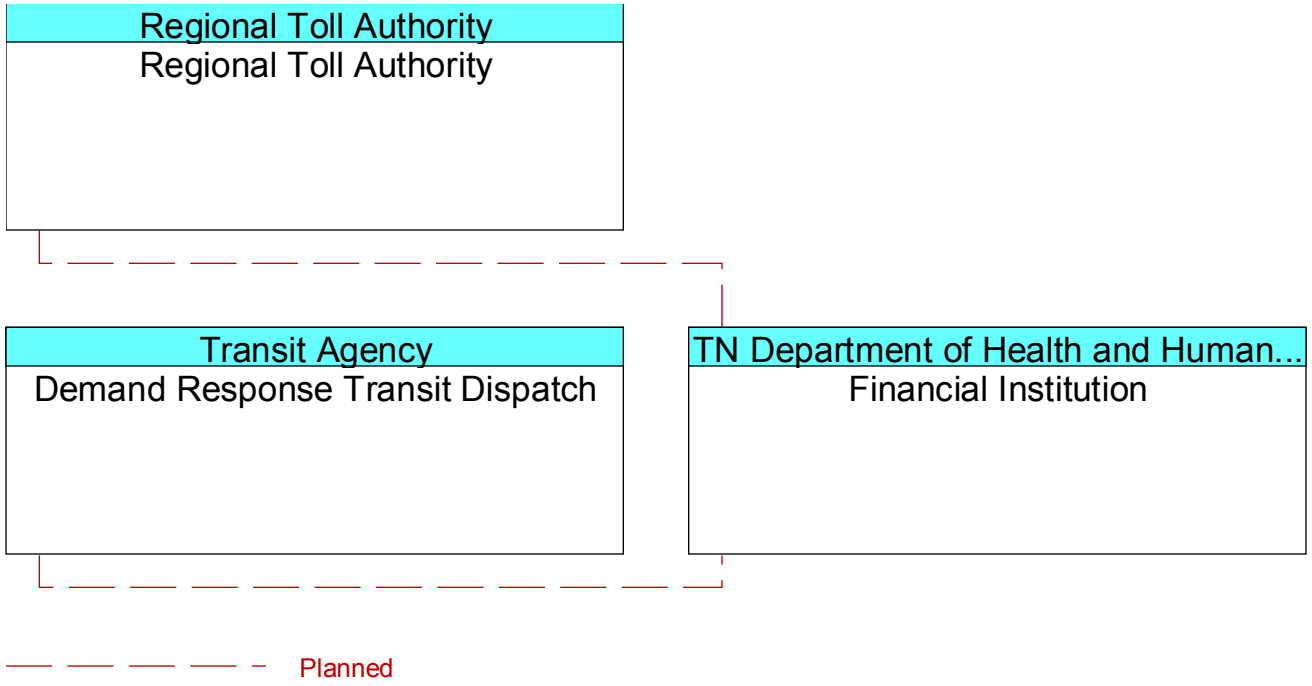
Driver Interfaces



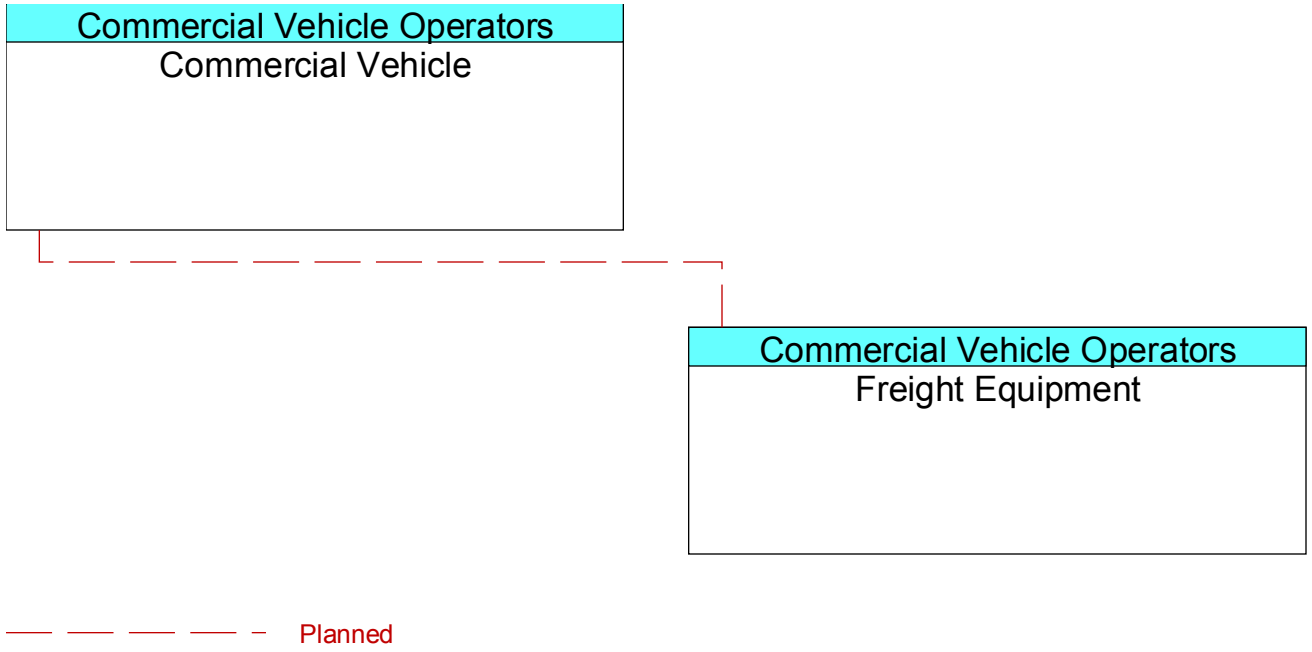
Electronic Fare Payment Card Interfaces



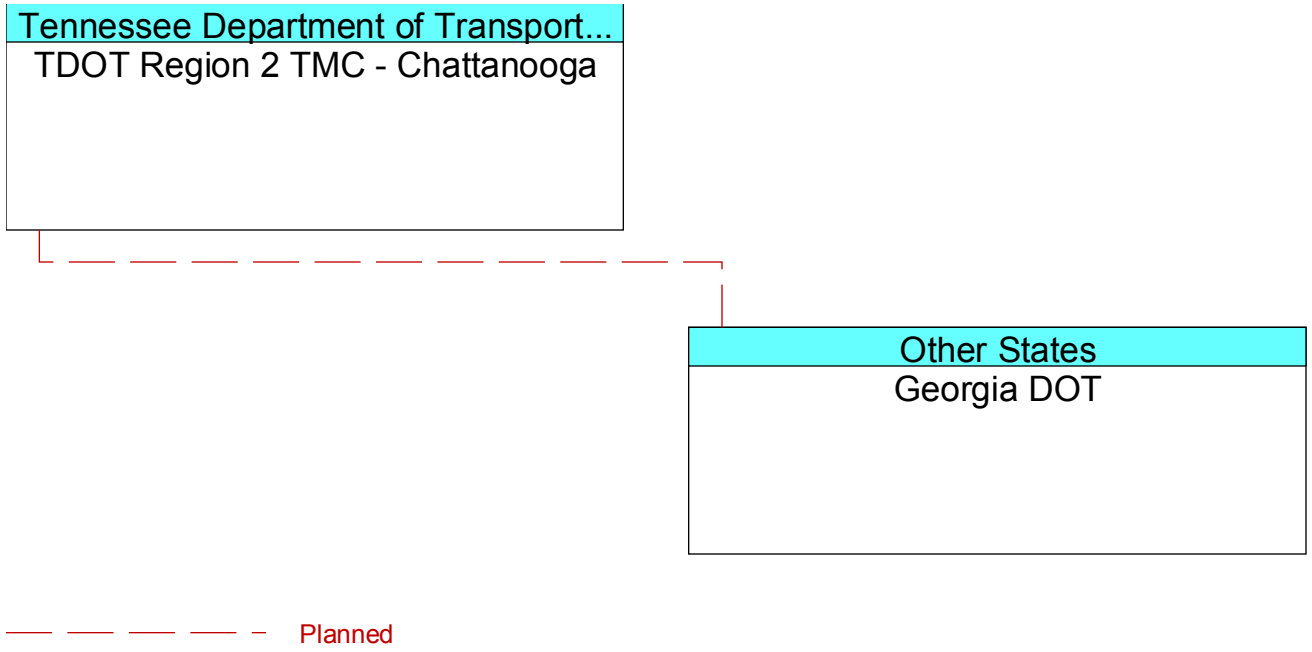
Financial Institution Interfaces



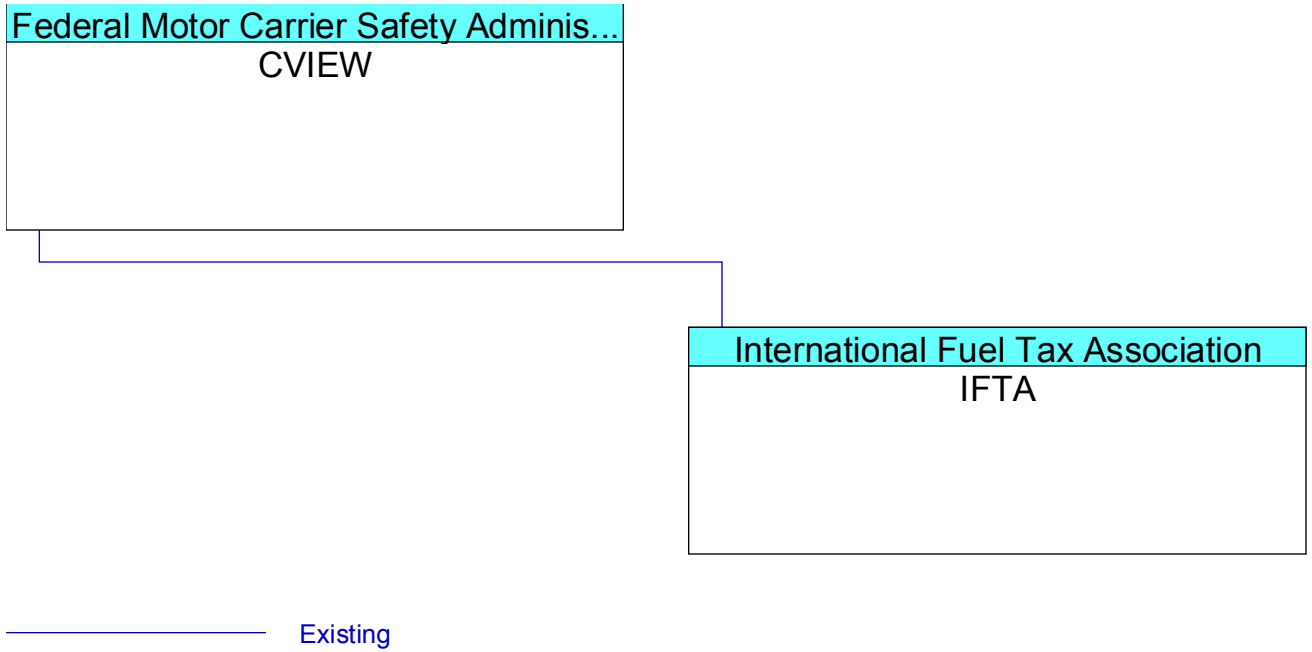
Freight Equipment Interfaces



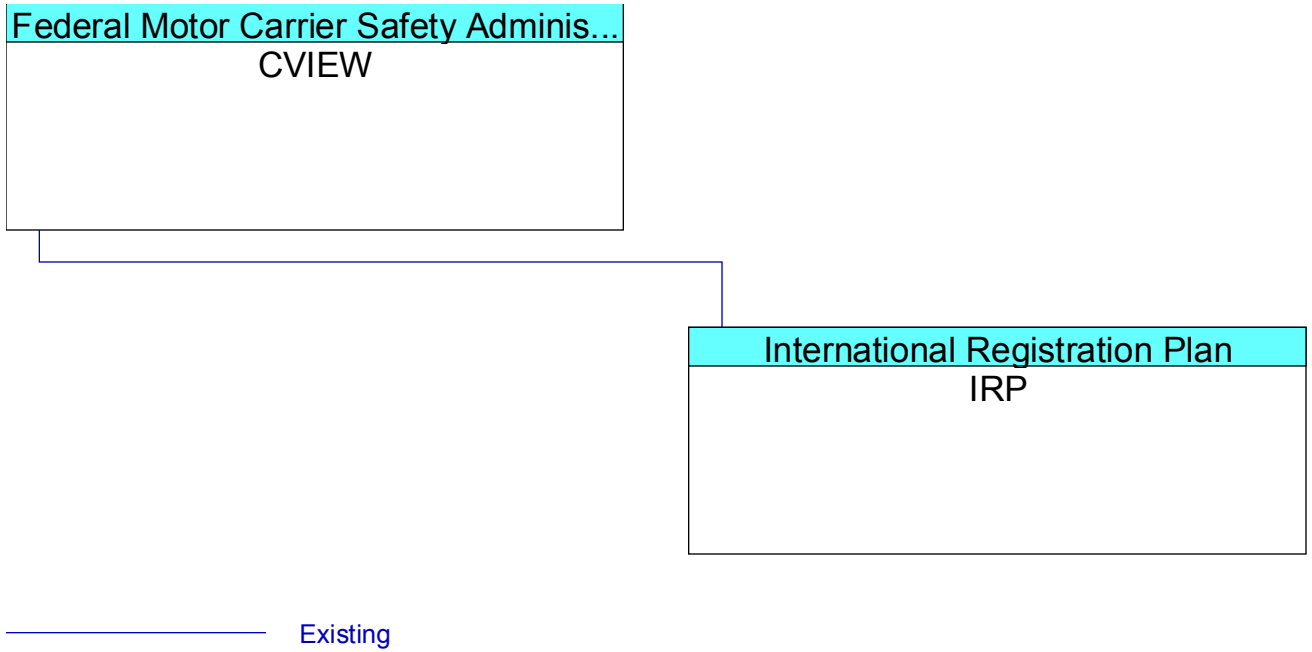
Georgia DOT Interfaces



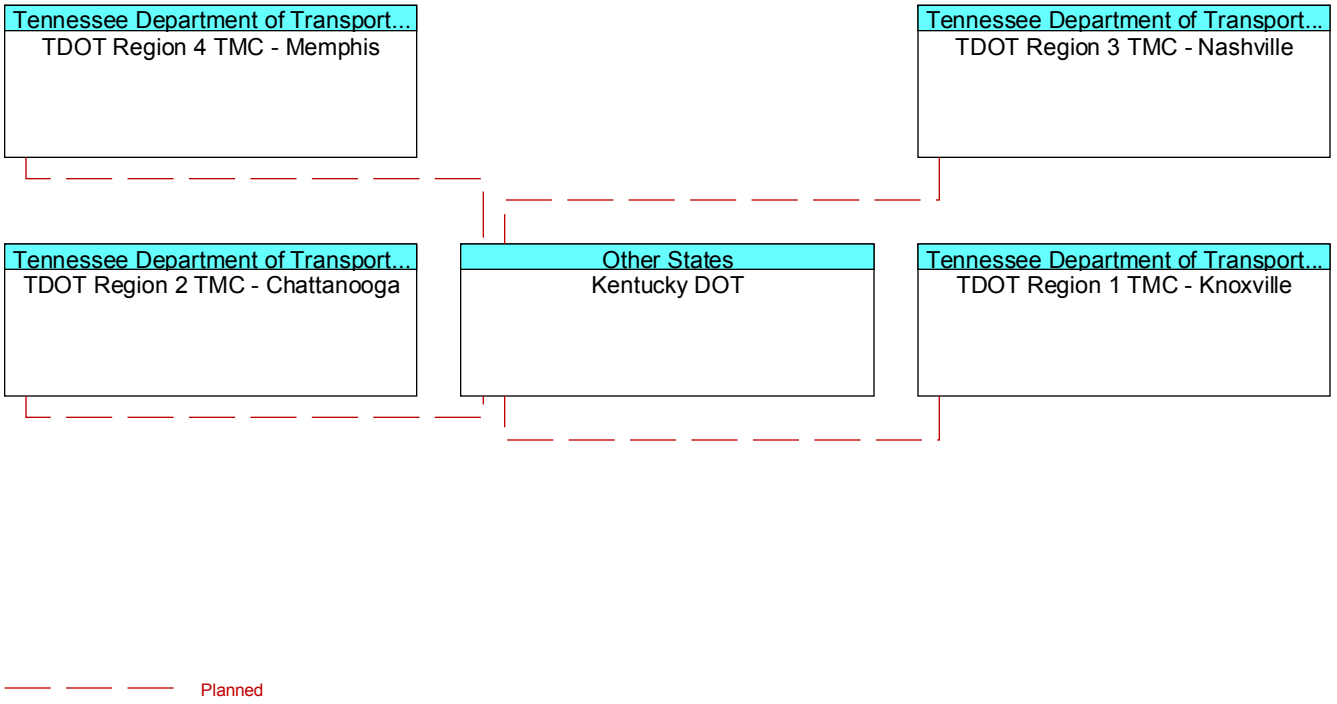
IFTA Interfaces



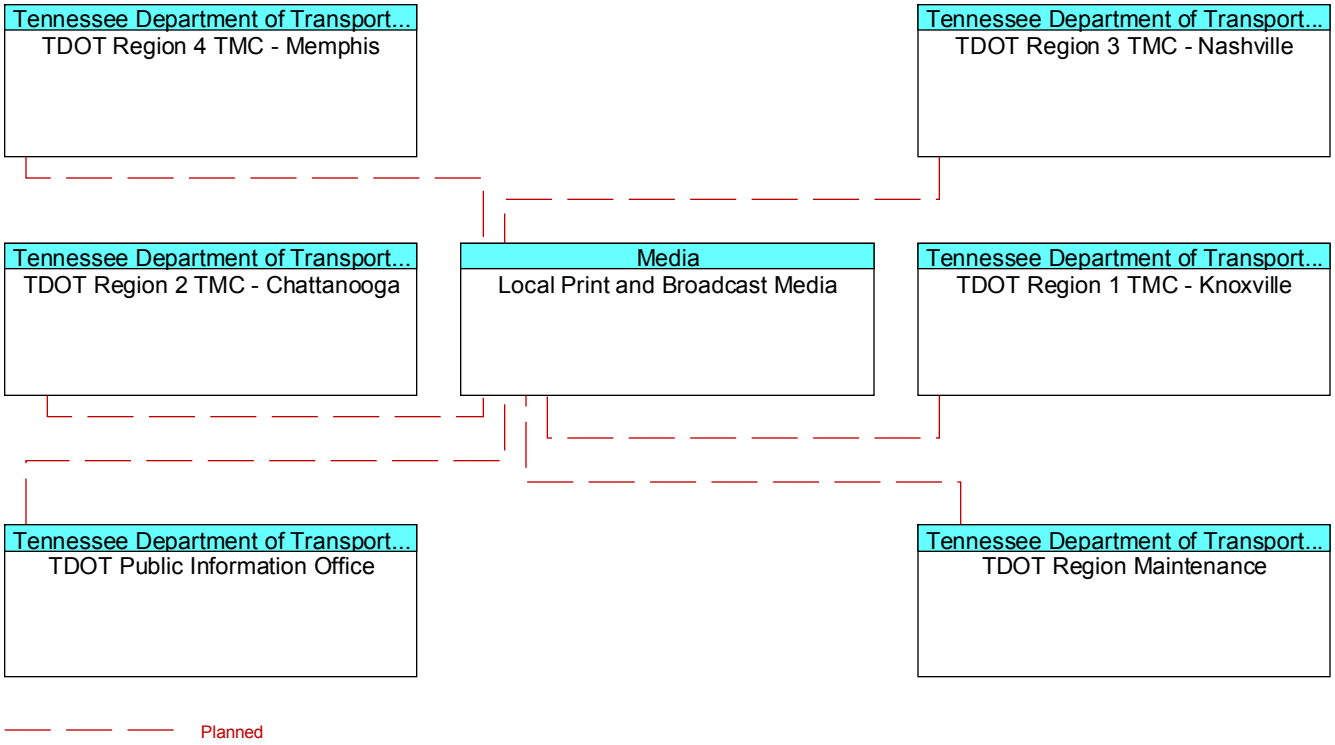
IRP Interfaces



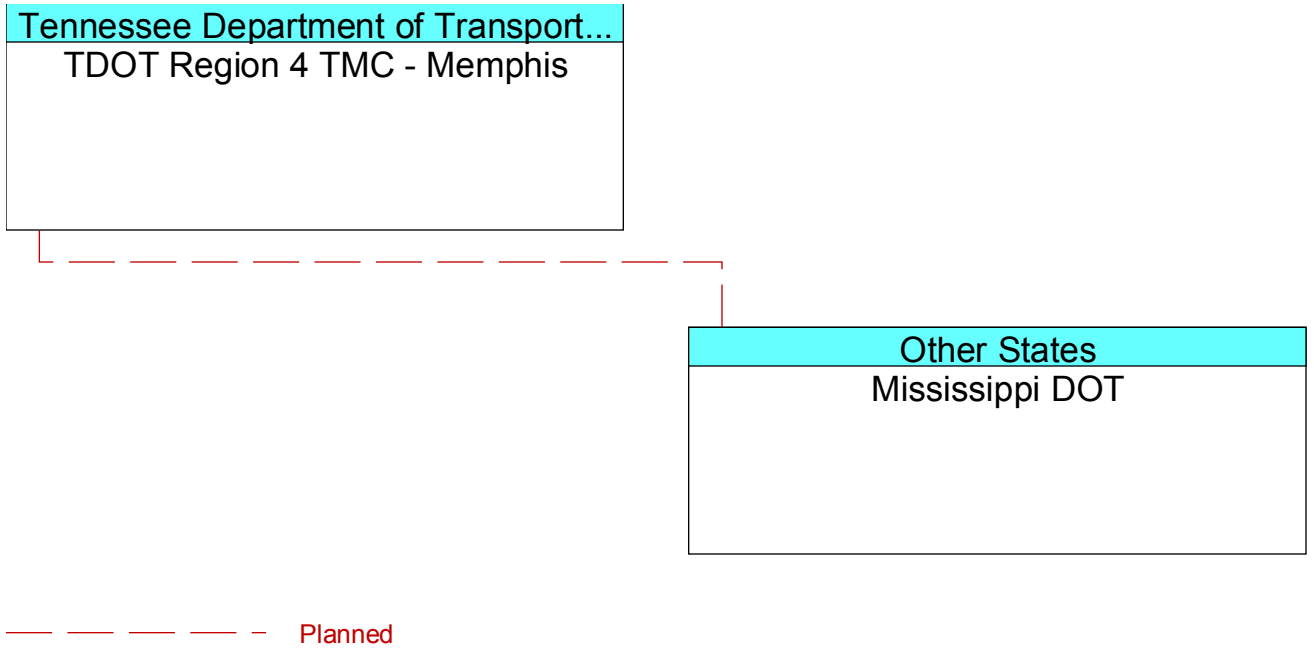
Kentucky DOT Interfaces



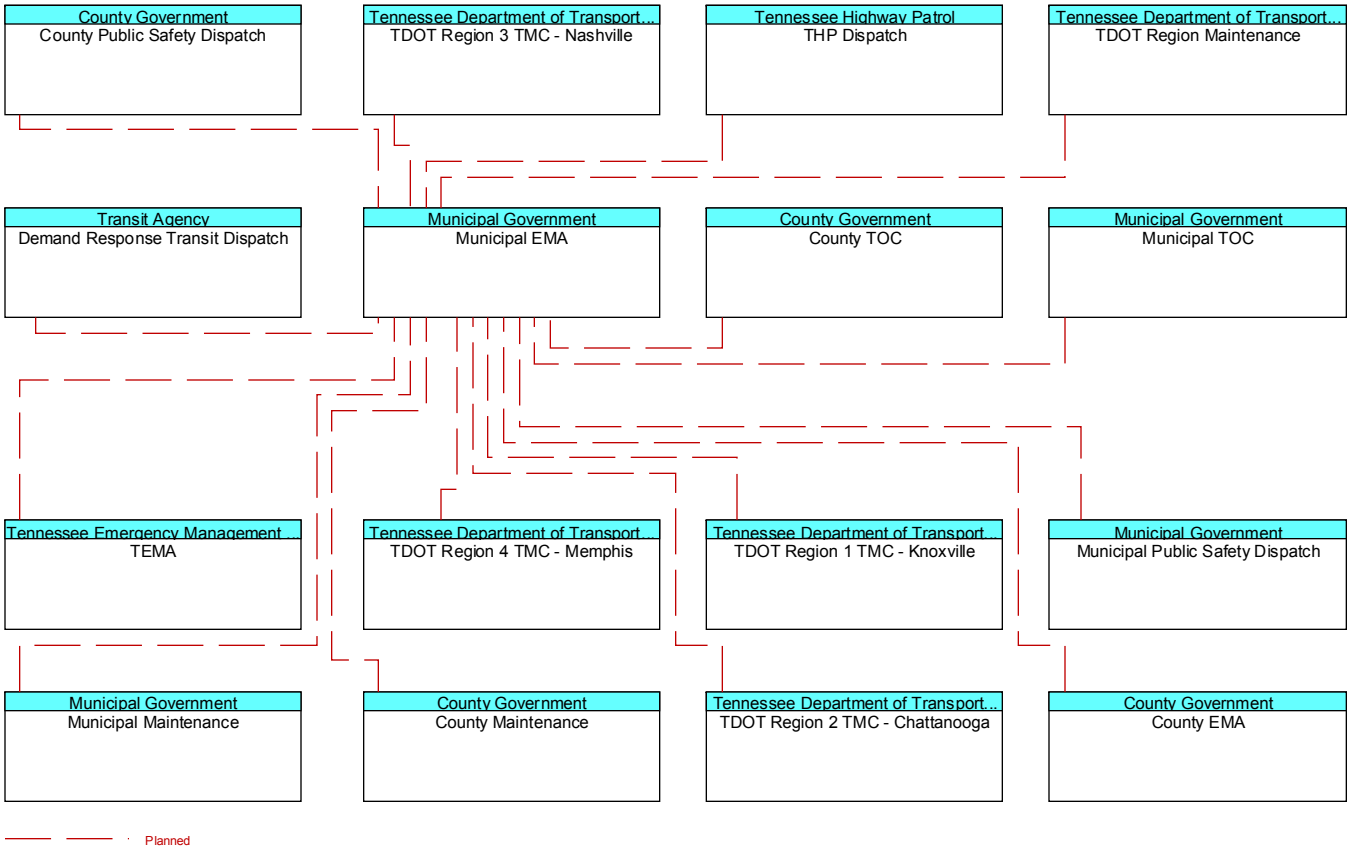
Local Print and Broadcast Media Interfaces



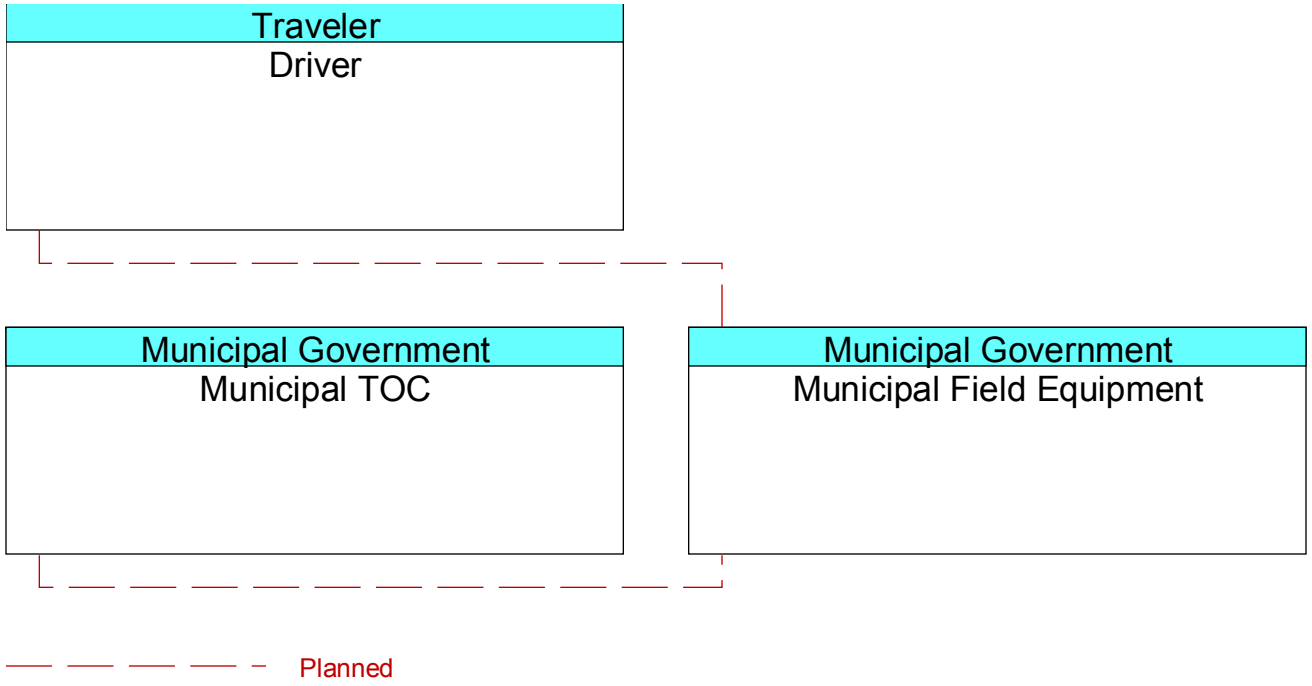
Mississippi DOT Interfaces



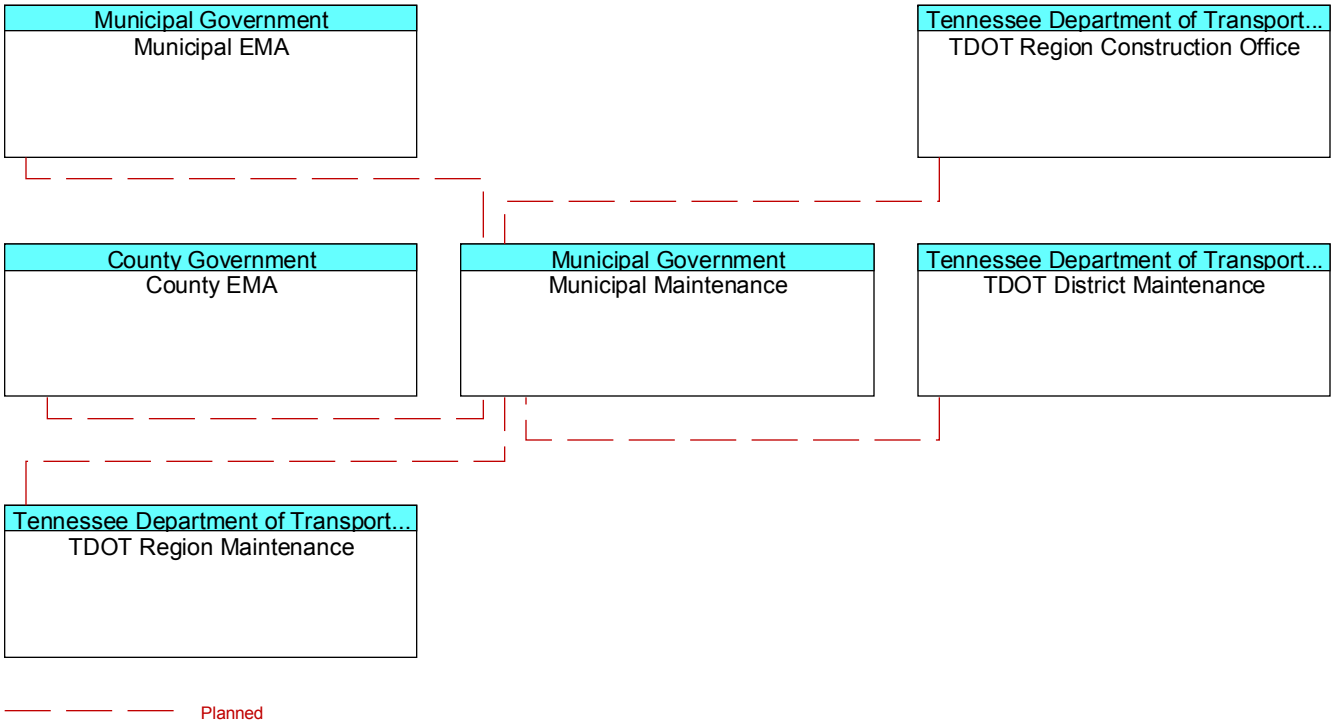
Municipal EMA Interfaces



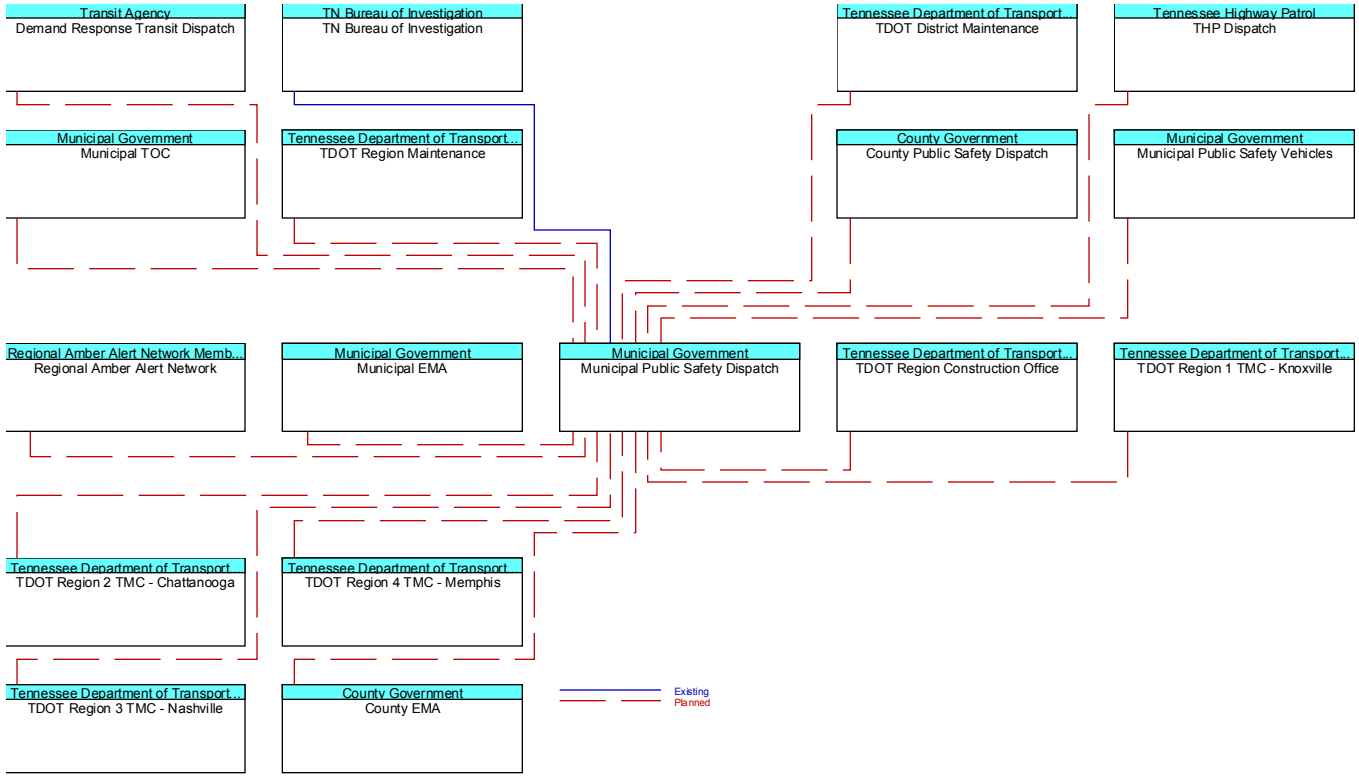
Municipal Field Equipment Interfaces



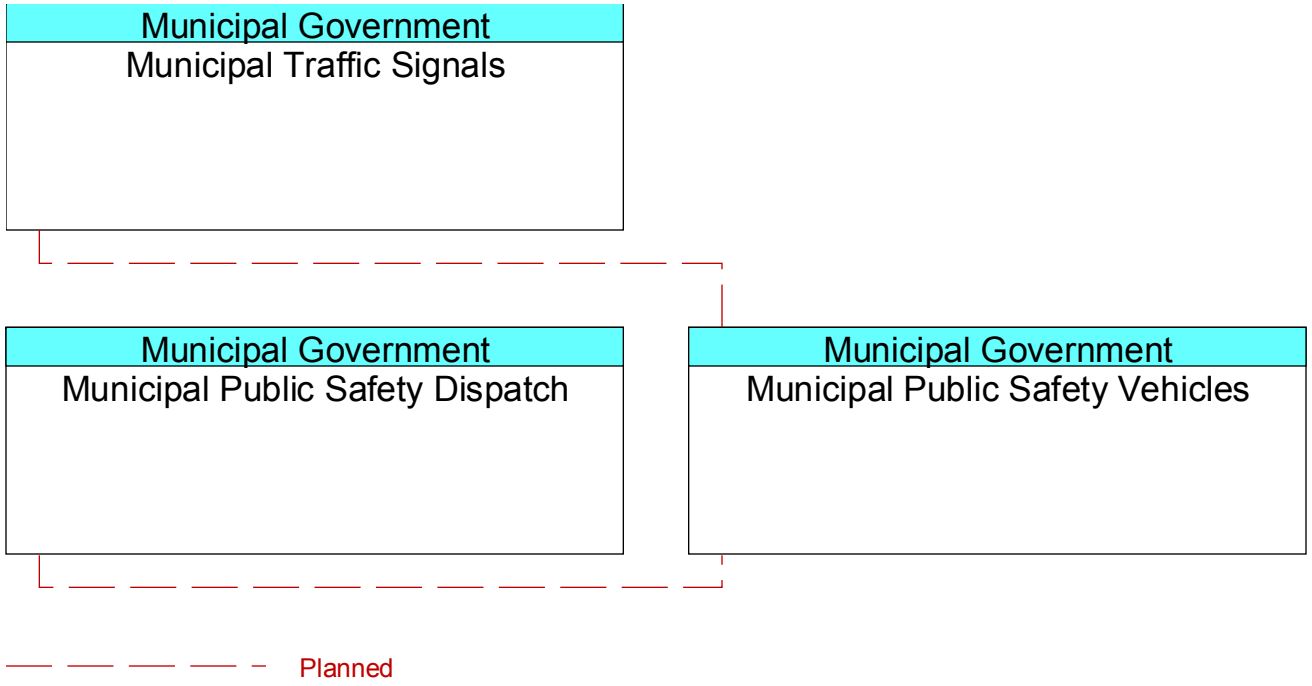
Municipal Maintenance Interfaces



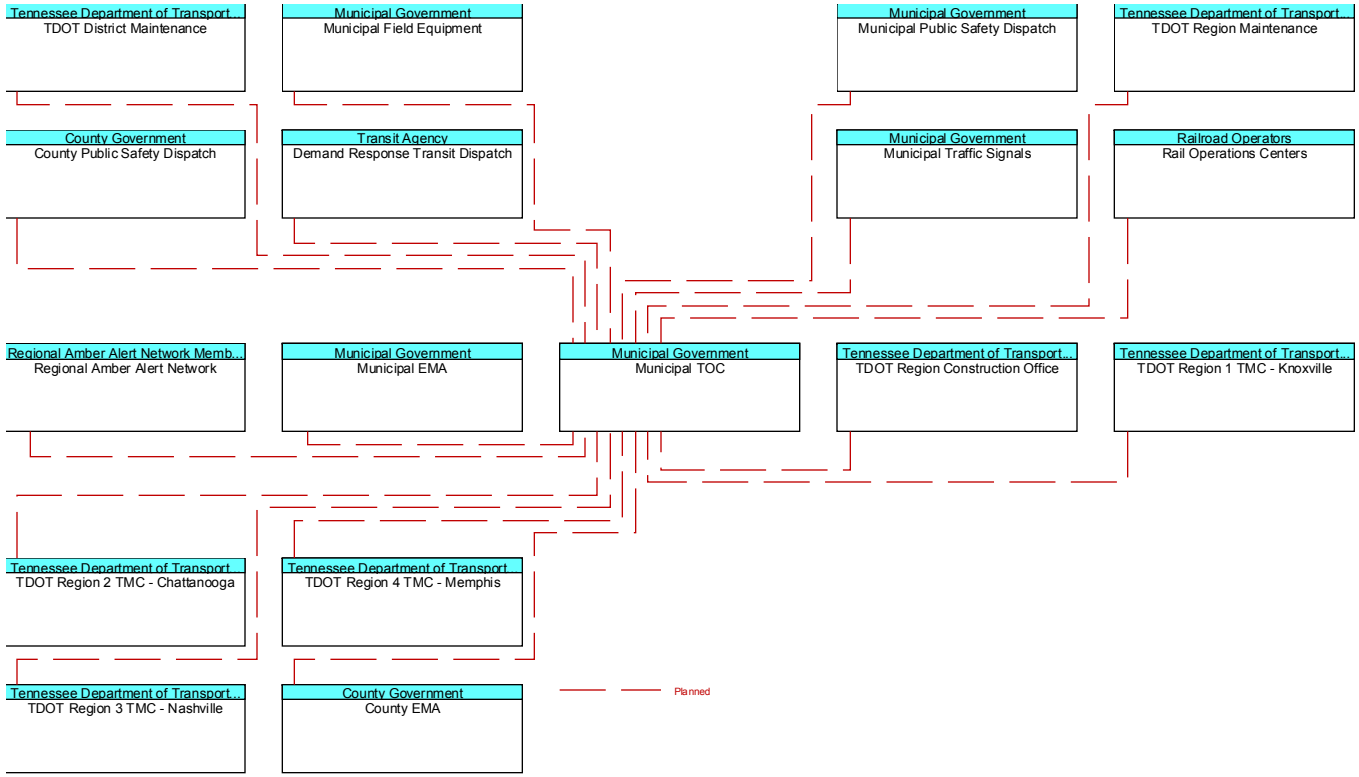
Municipal Public Safety Dispatch Interfaces



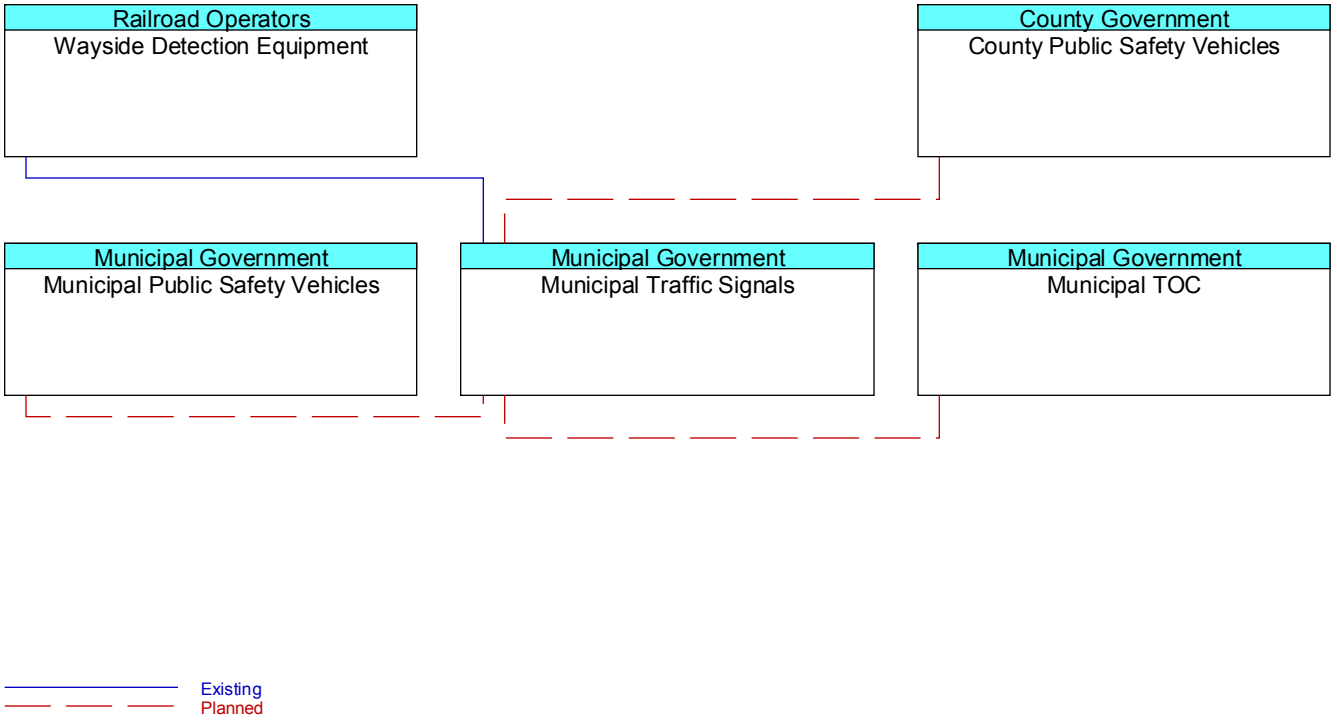
Municipal Public Safety Vehicles Interfaces



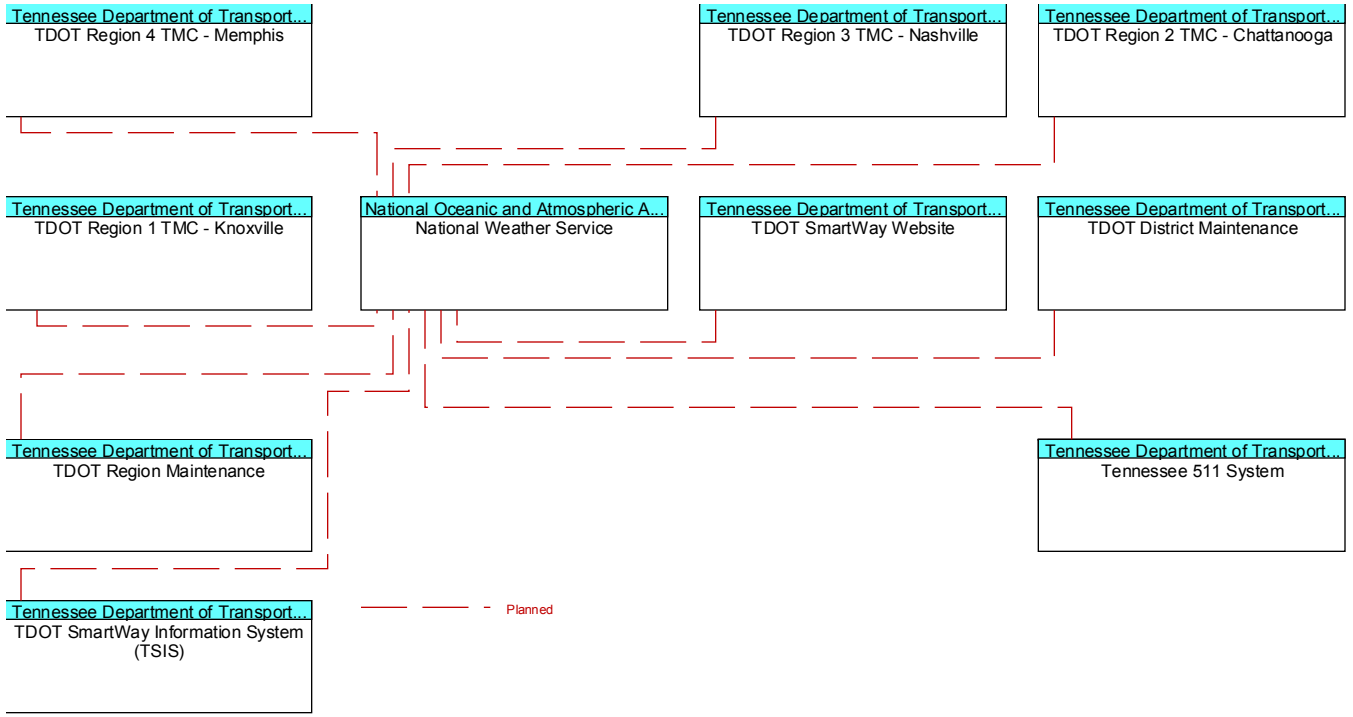
Municipal TOC Interfaces



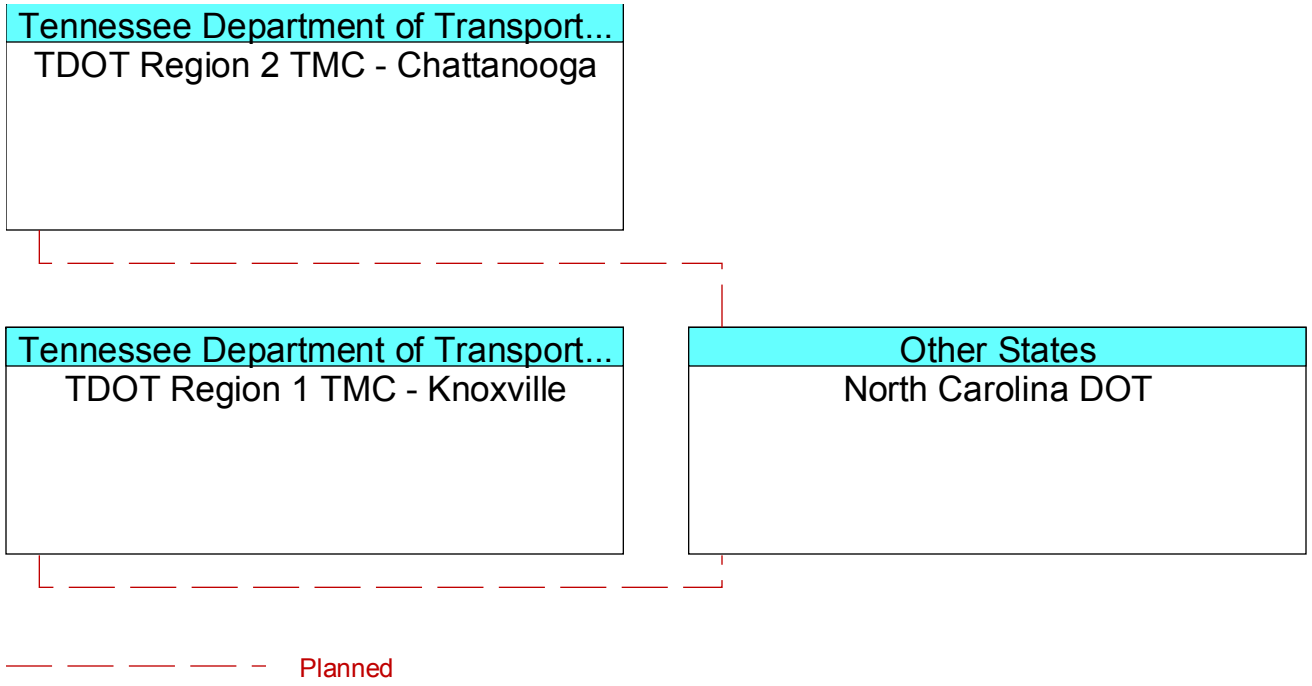
Municipal Traffic Signals Interfaces



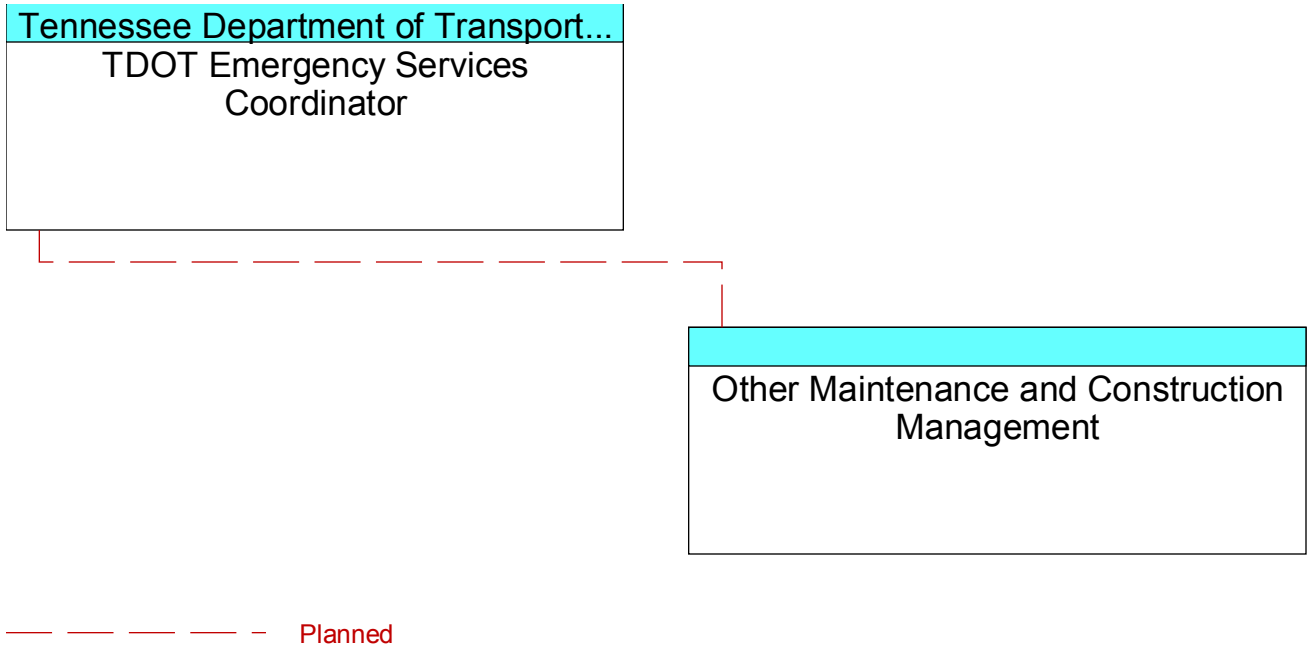
National Weather Service Interfaces



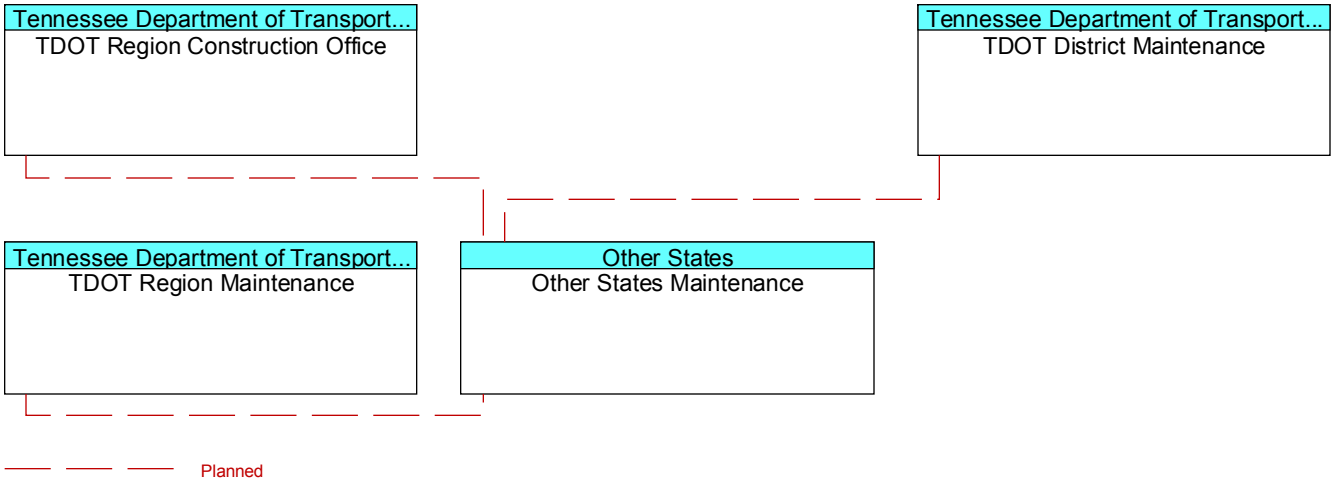
North Carolina DOT Interfaces



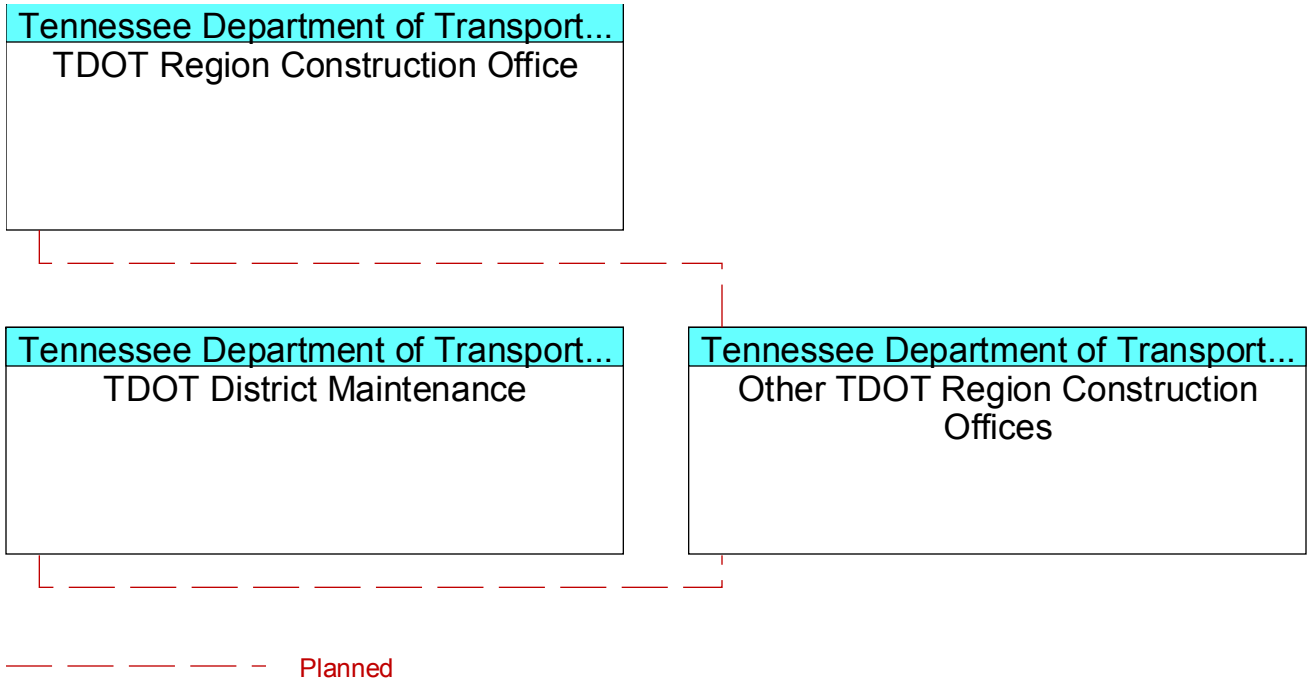
Other Maintenance and Construction Management Interfaces



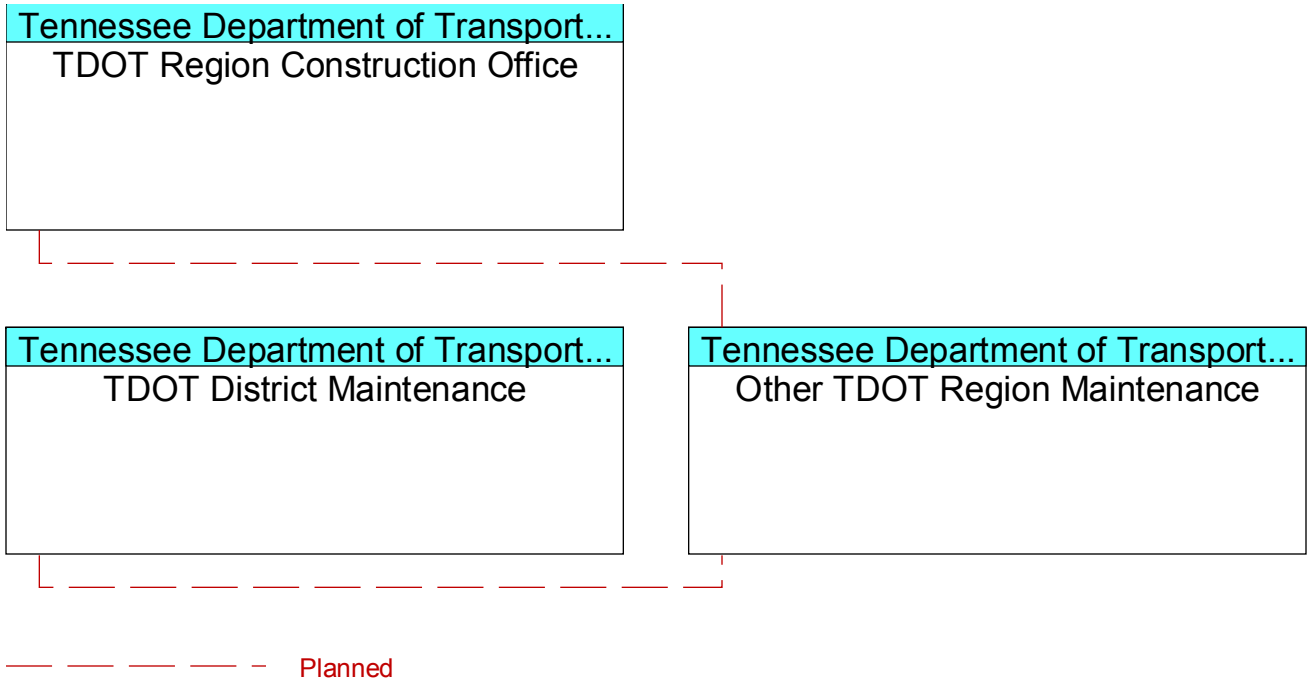
Other States Maintenance Interfaces



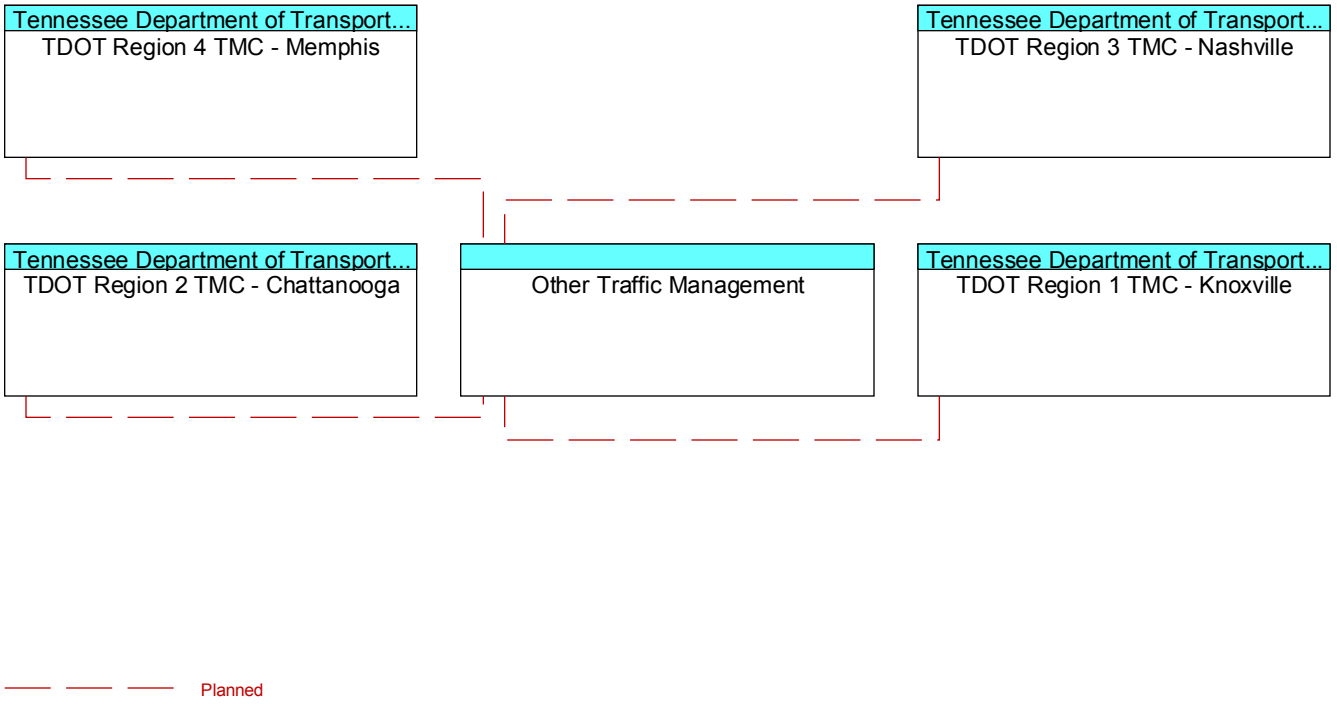
Other TDOT Region Construction Offices Interfaces



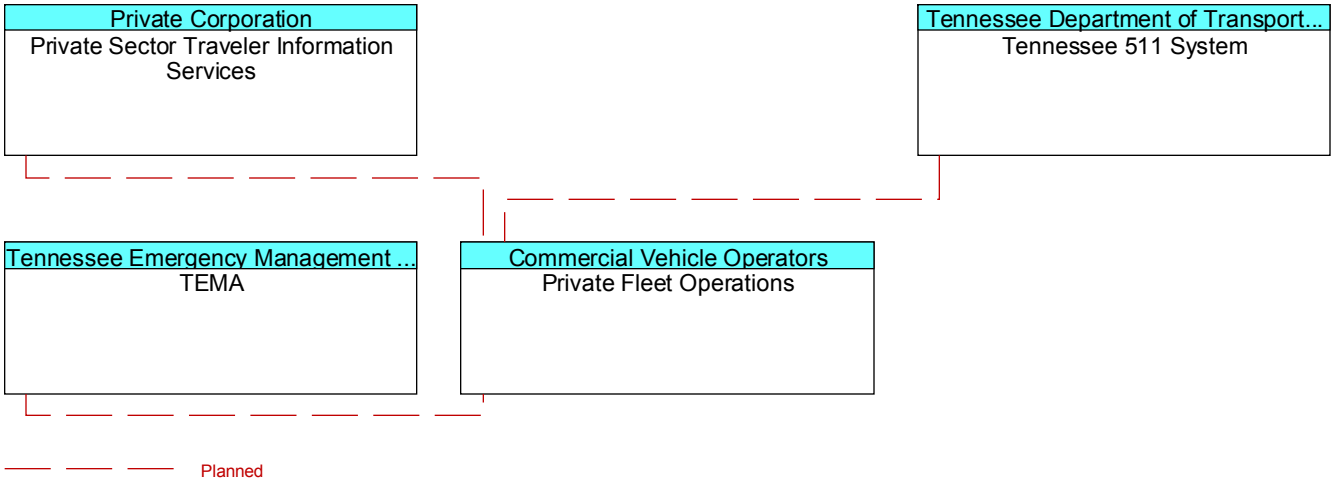
Other TDOT Region Maintenance Interfaces



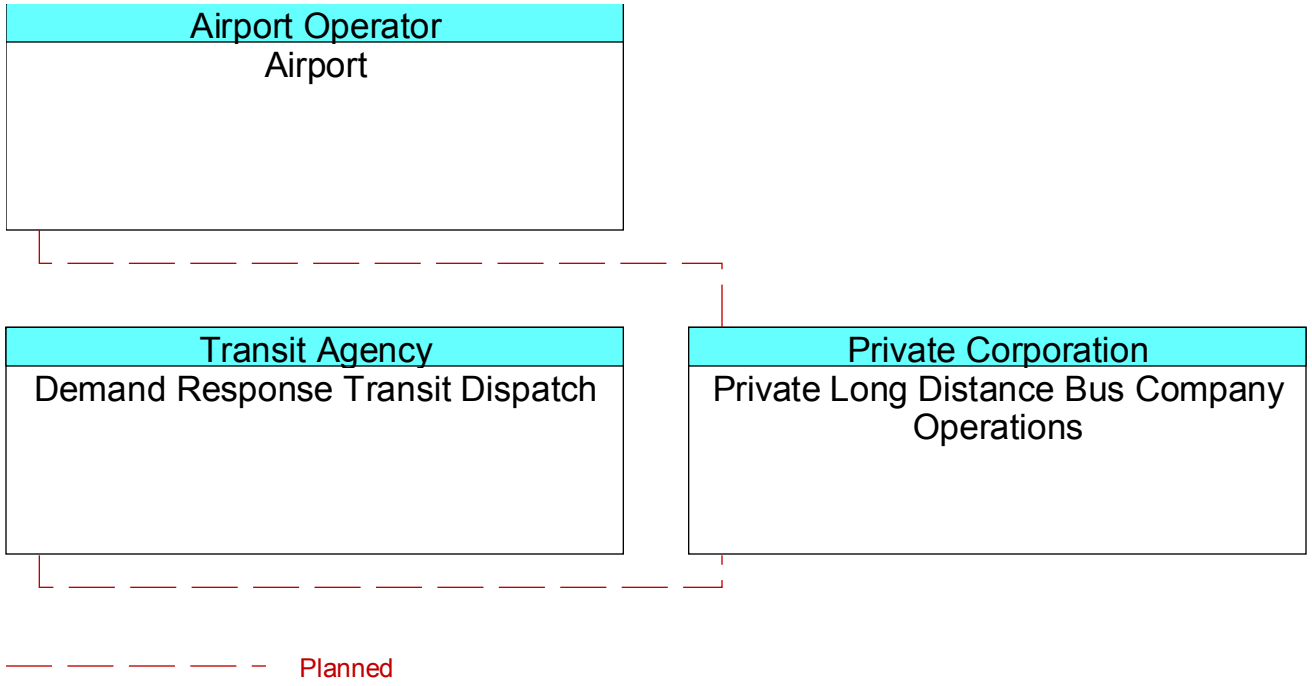
Other Traffic Management Interfaces



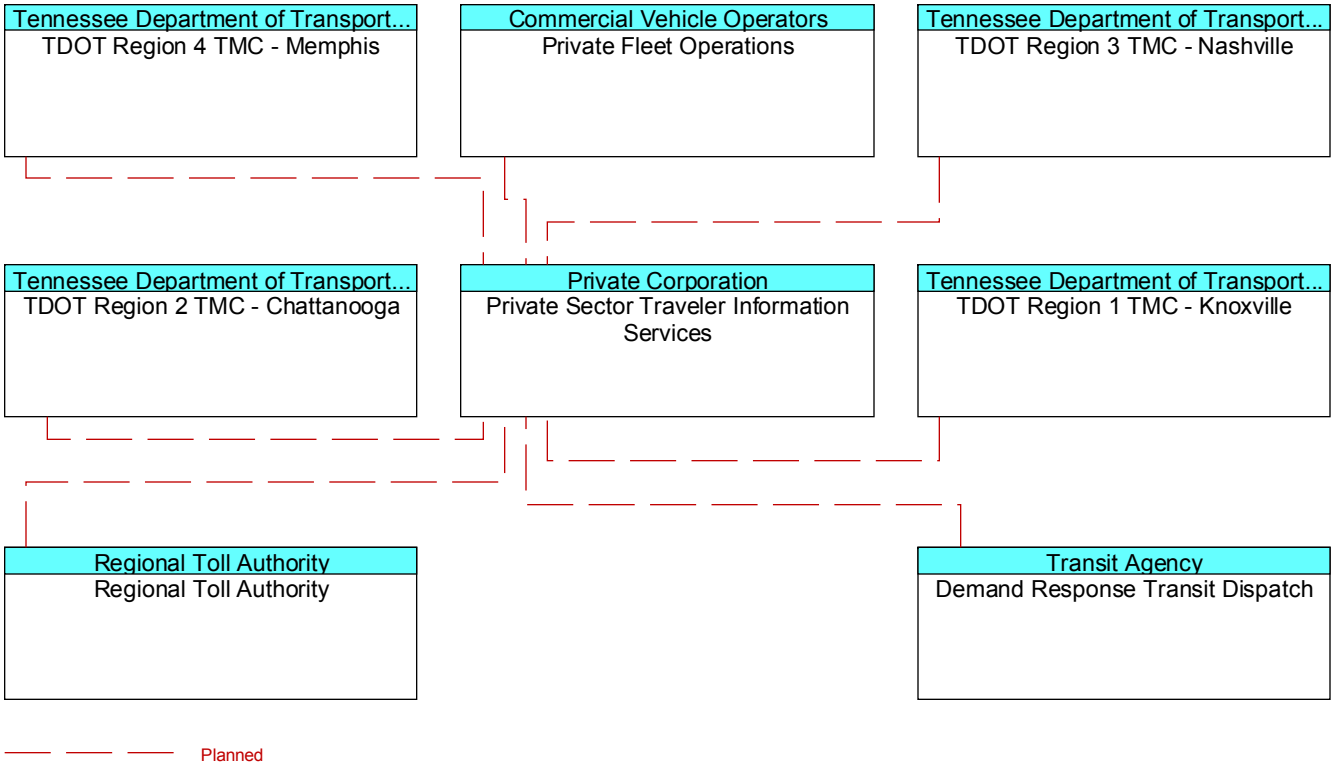
Private Fleet Operations Interfaces



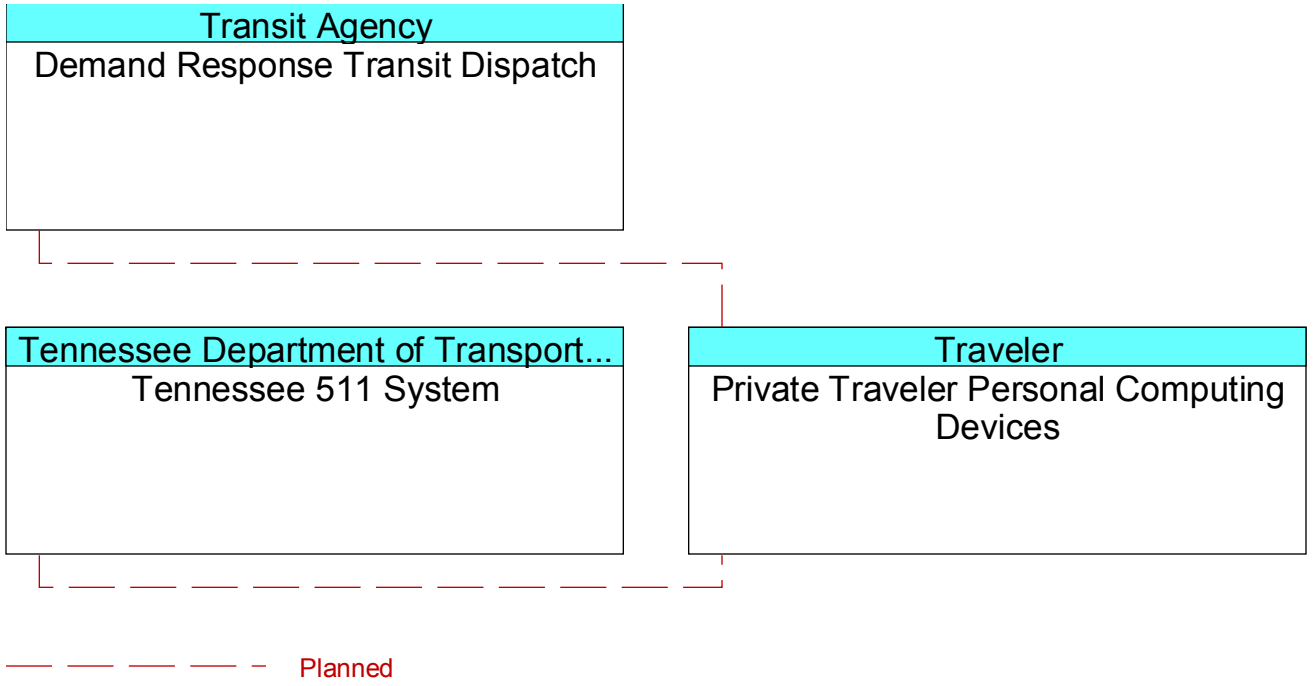
Private Long Distance Bus Company Operations Interfaces



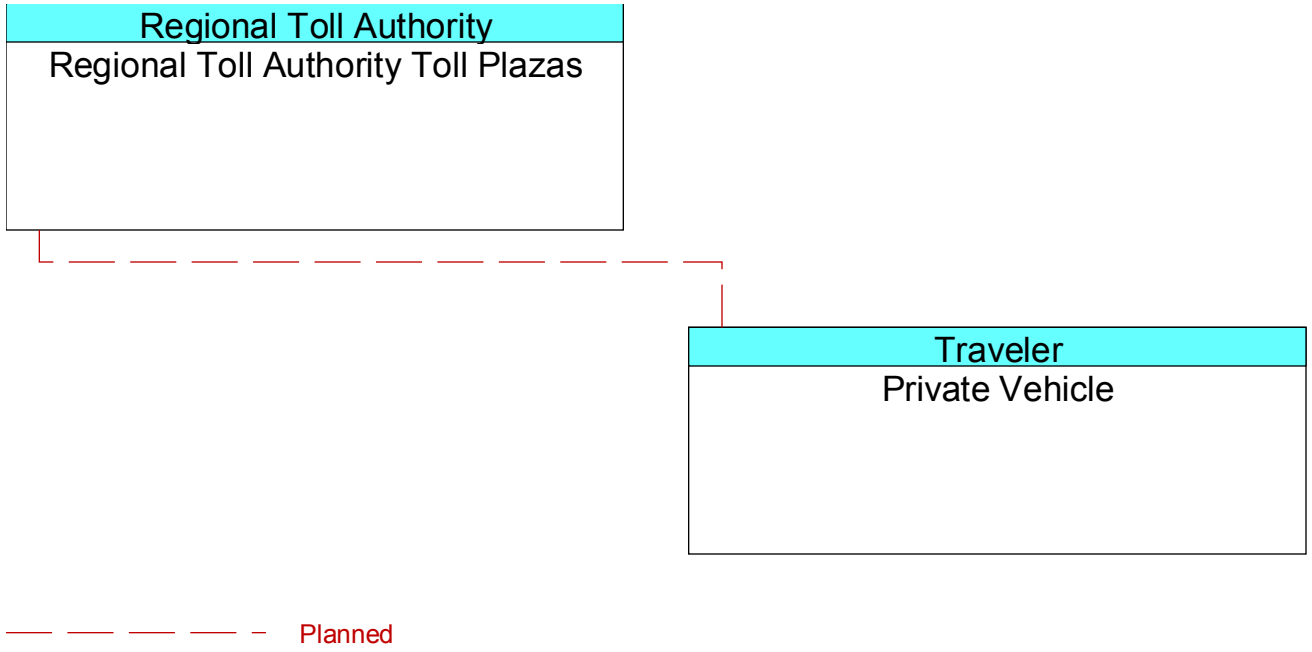
Private Sector Traveler Information Services Interfaces



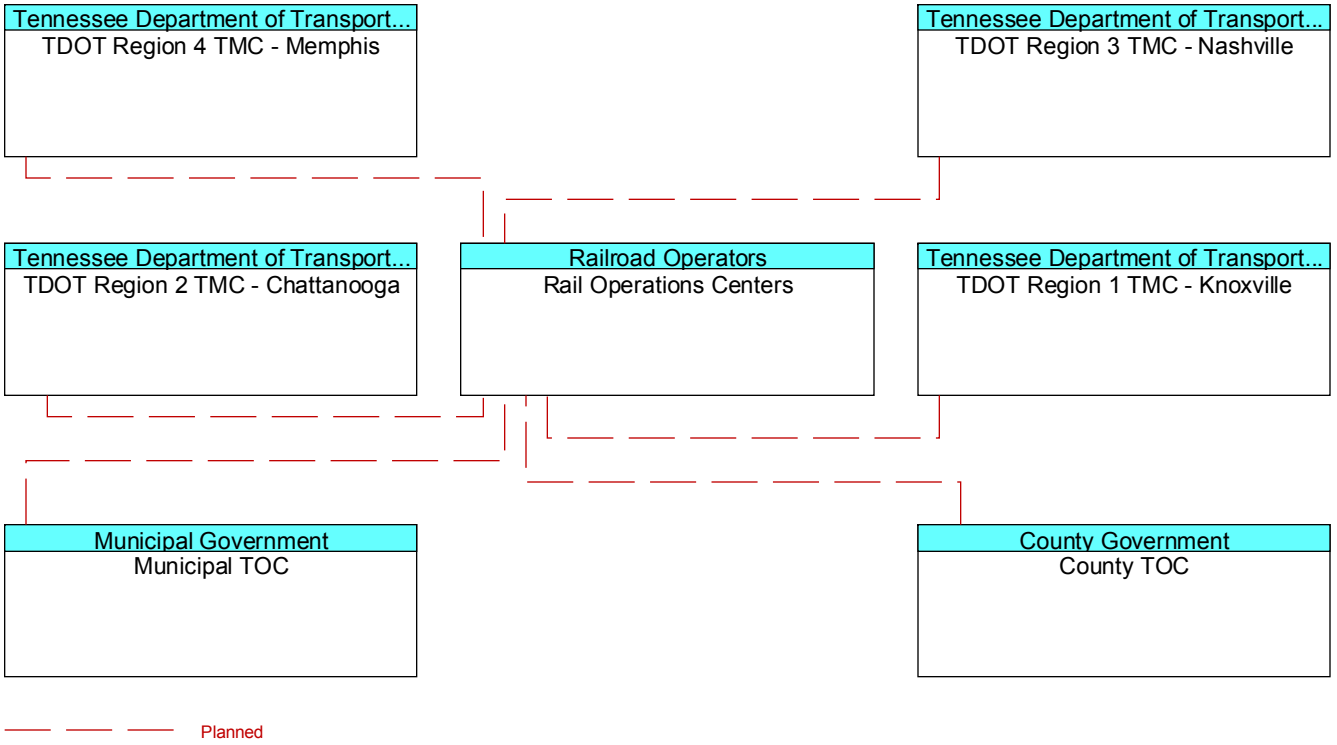
Private Traveler Personal Computing Devices Interfaces



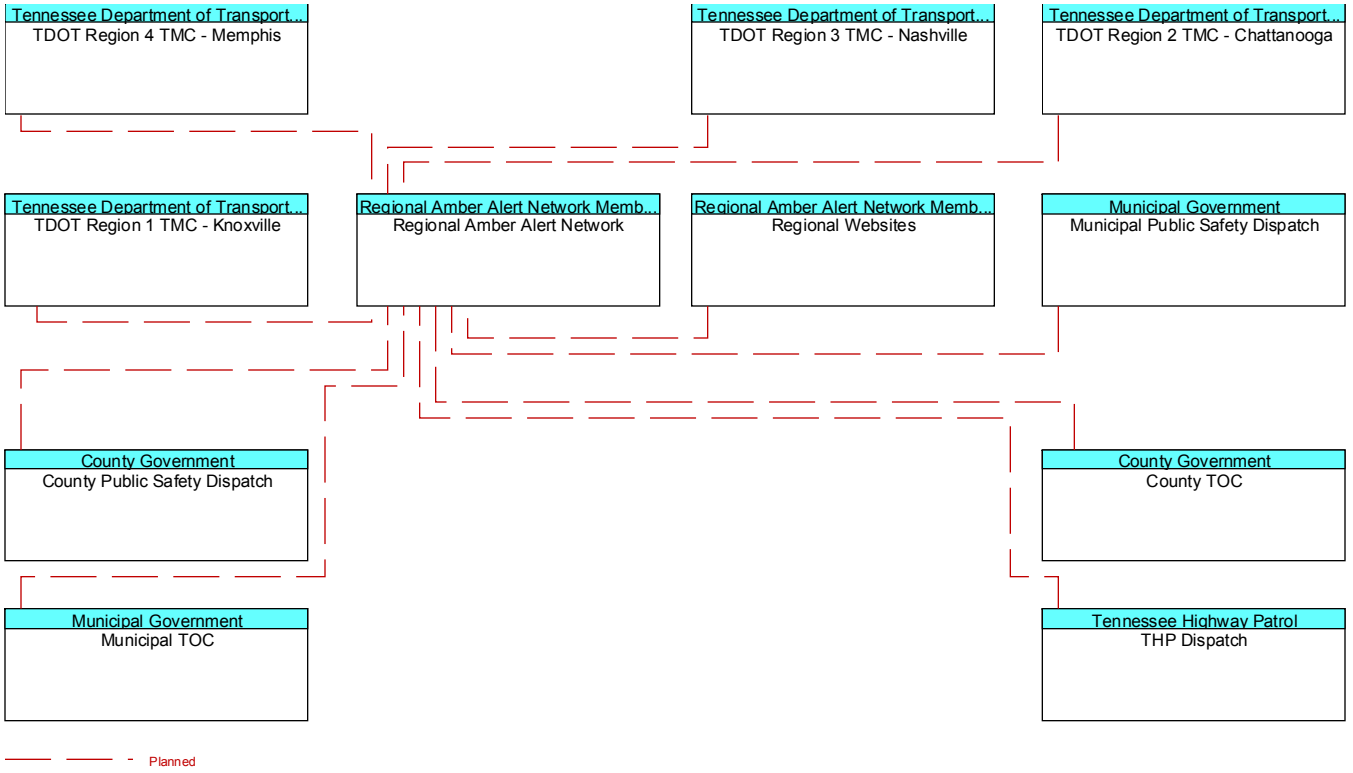
Private Vehicle Interfaces



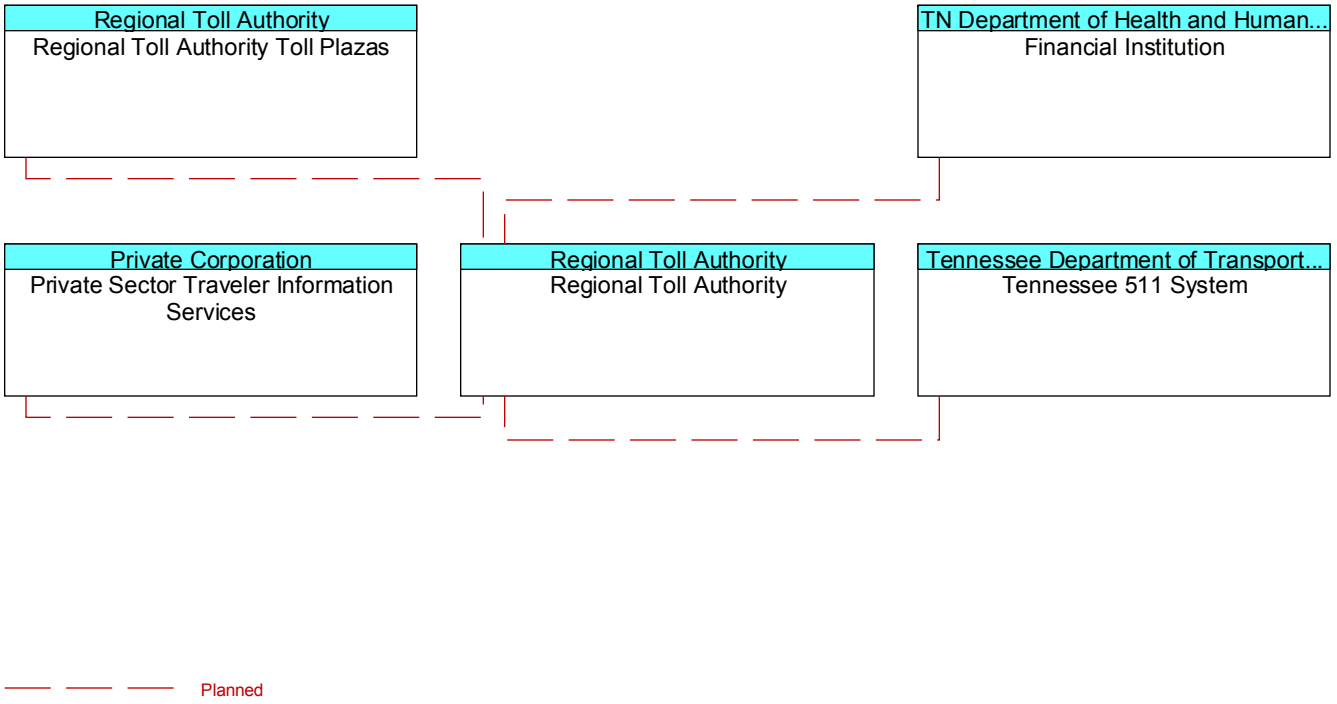
Rail Operations Centers Interfaces



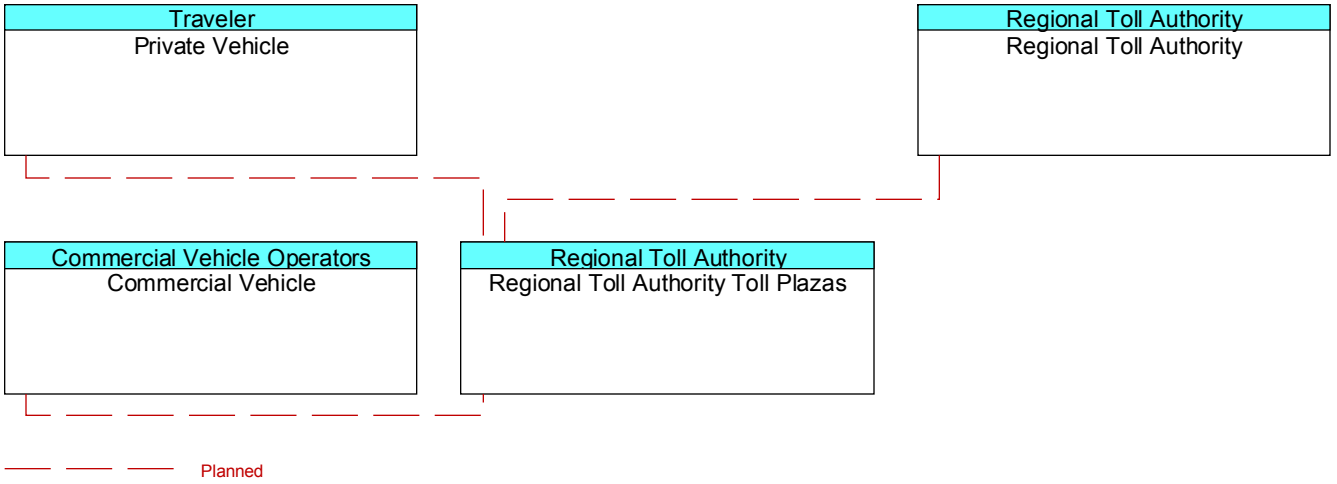
Regional AMBER Alert Network Interfaces



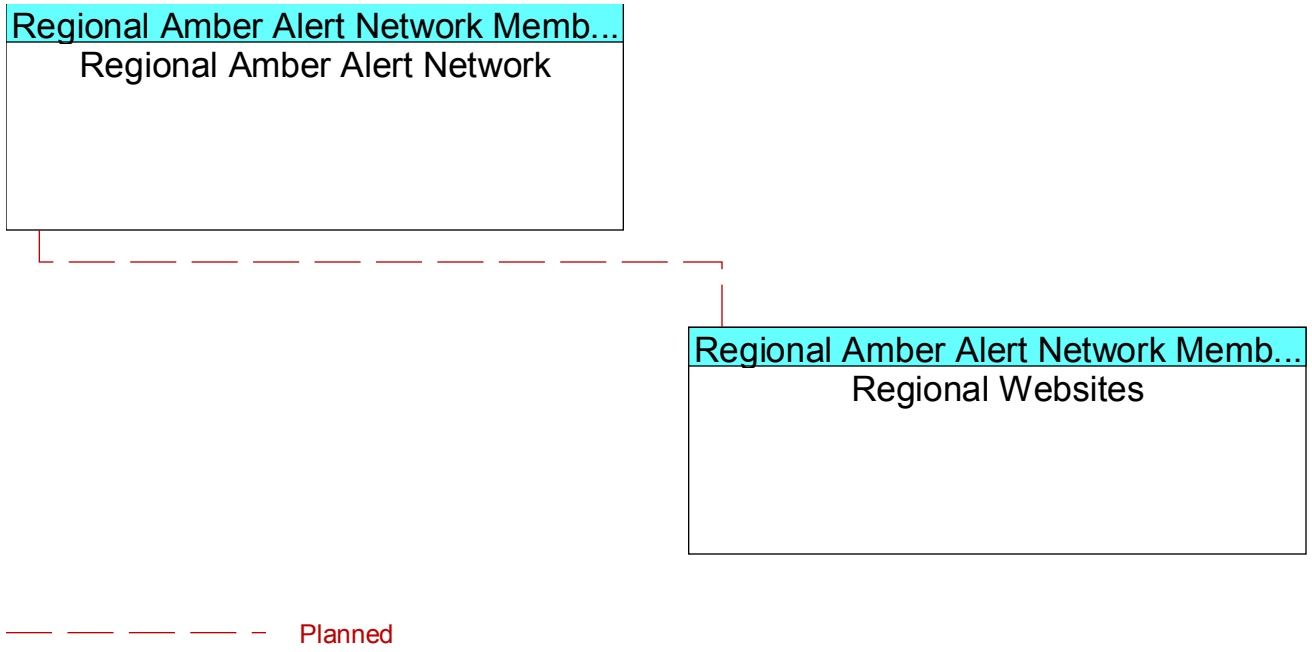
Regional Toll Authority Interfaces



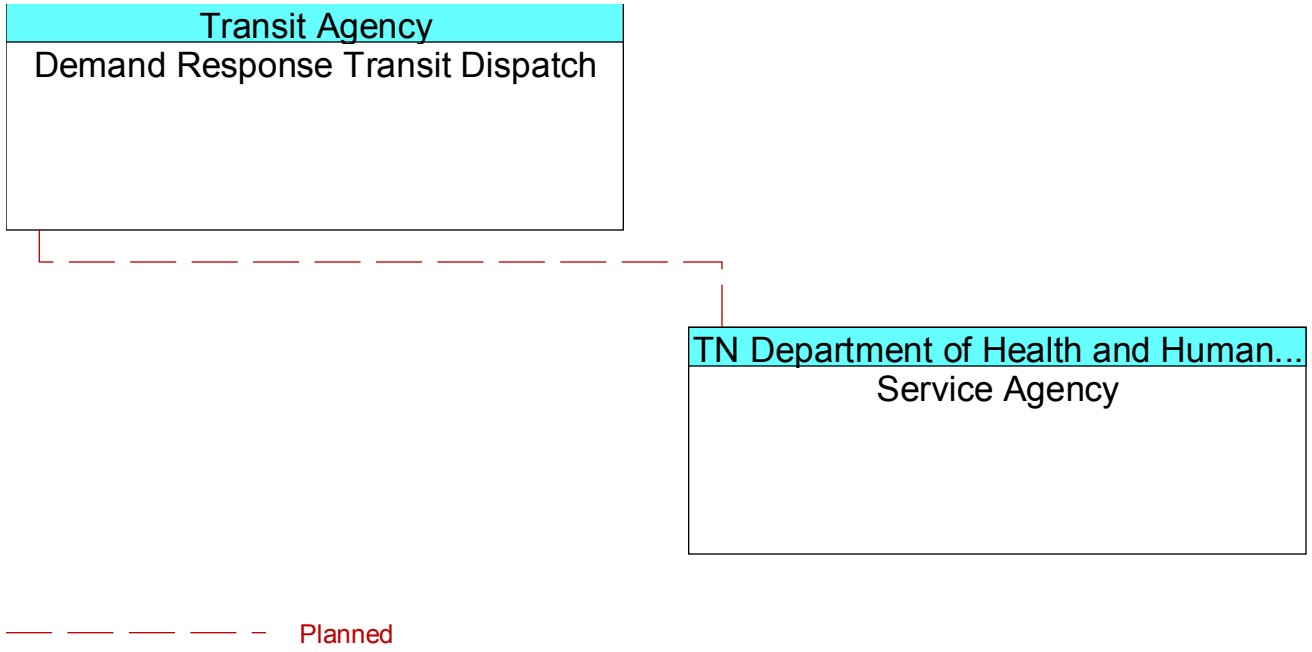
Regional Toll Authority Toll Plazas Interfaces



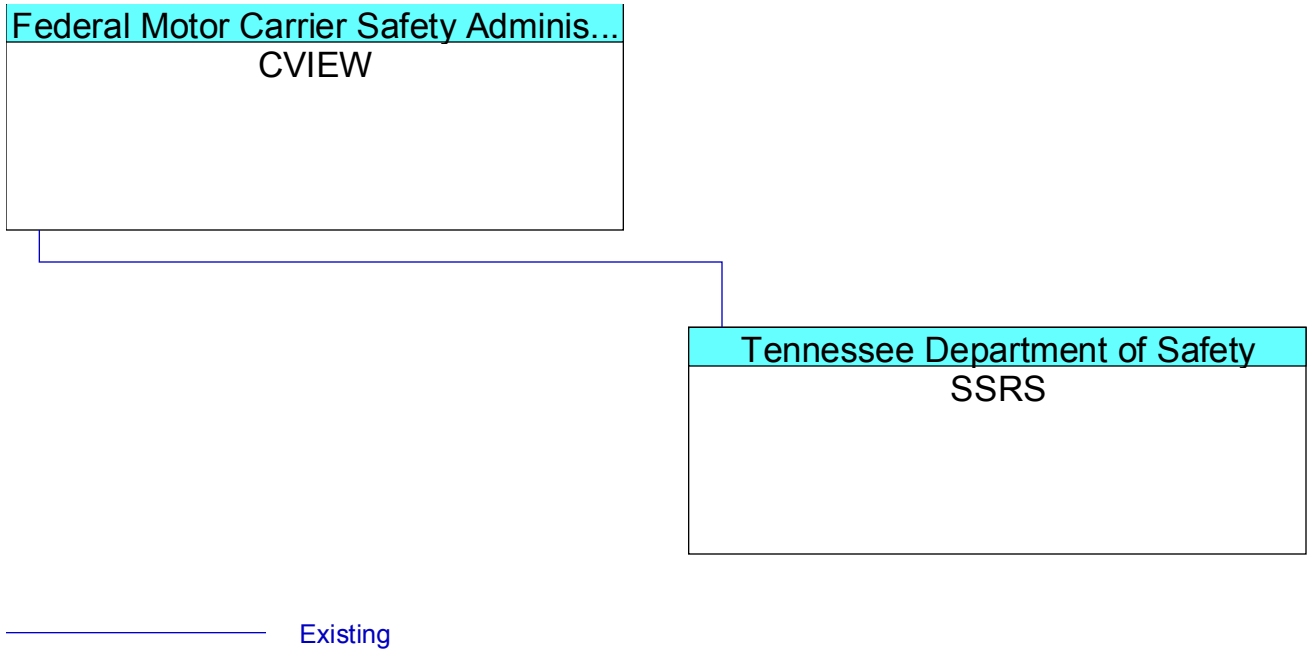
Regional Websites Interfaces



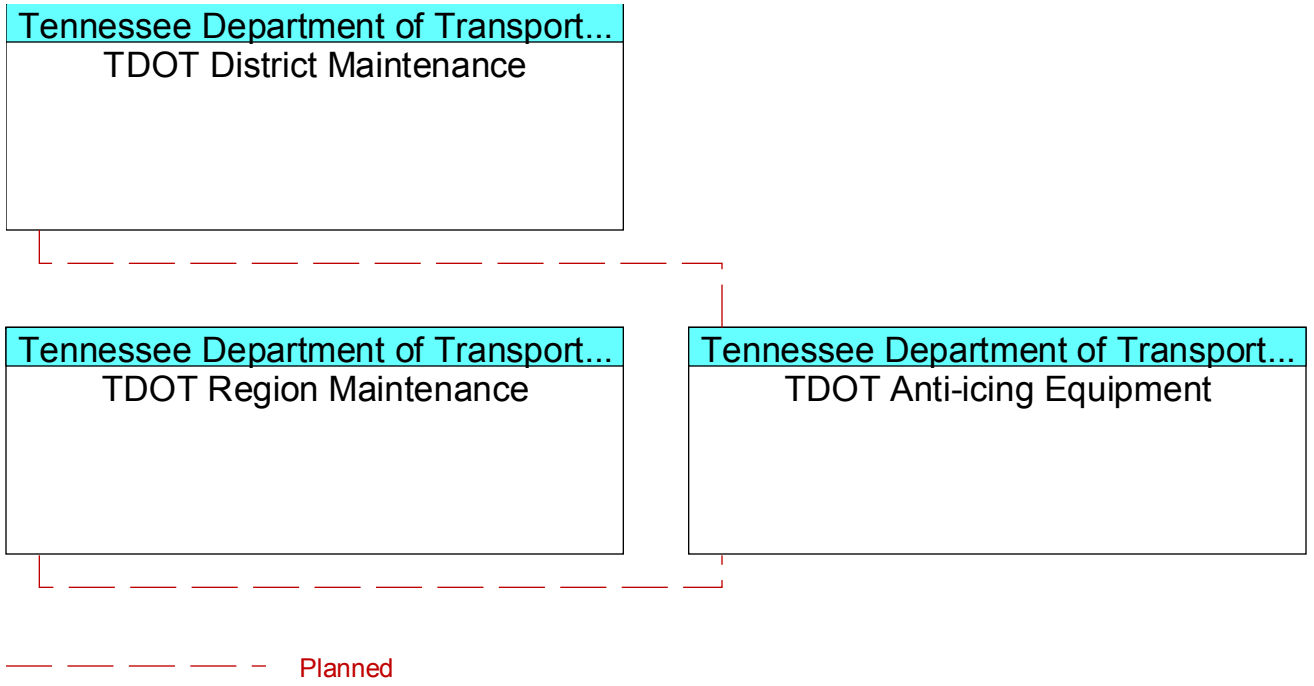
Service Agency Interfaces



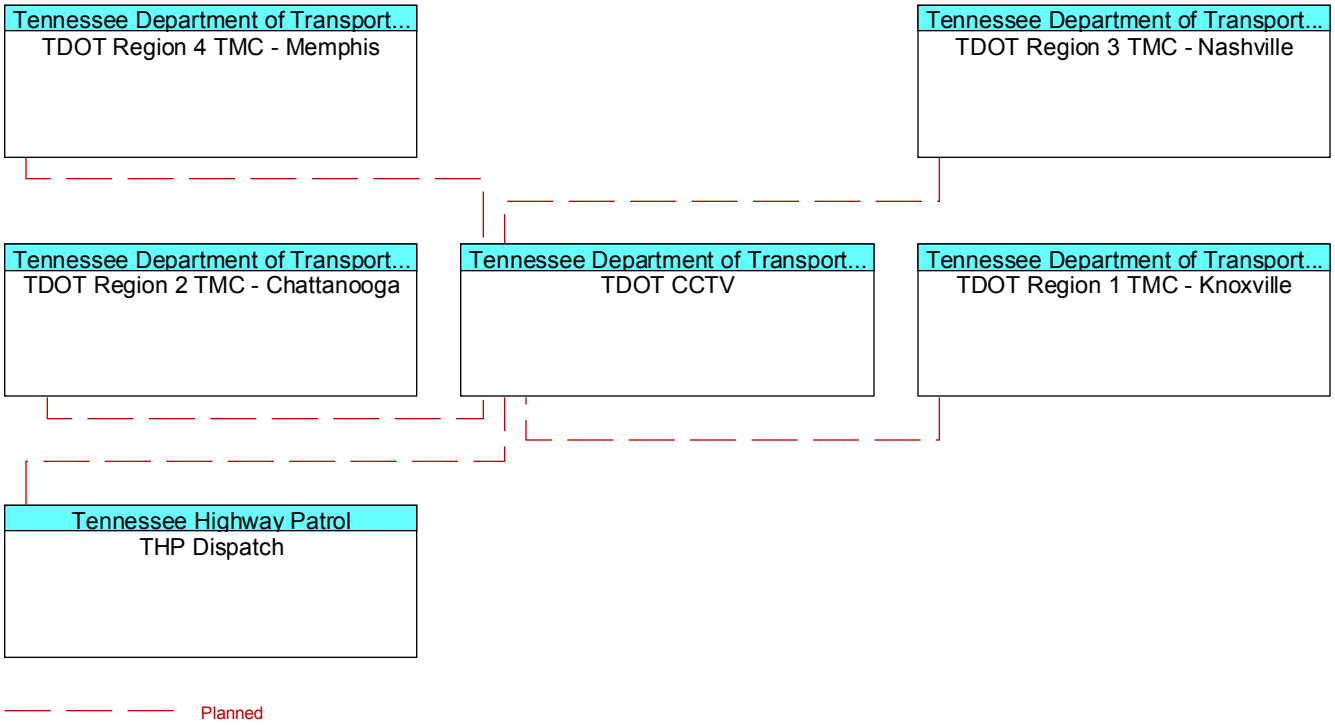
SSRS Interfaces



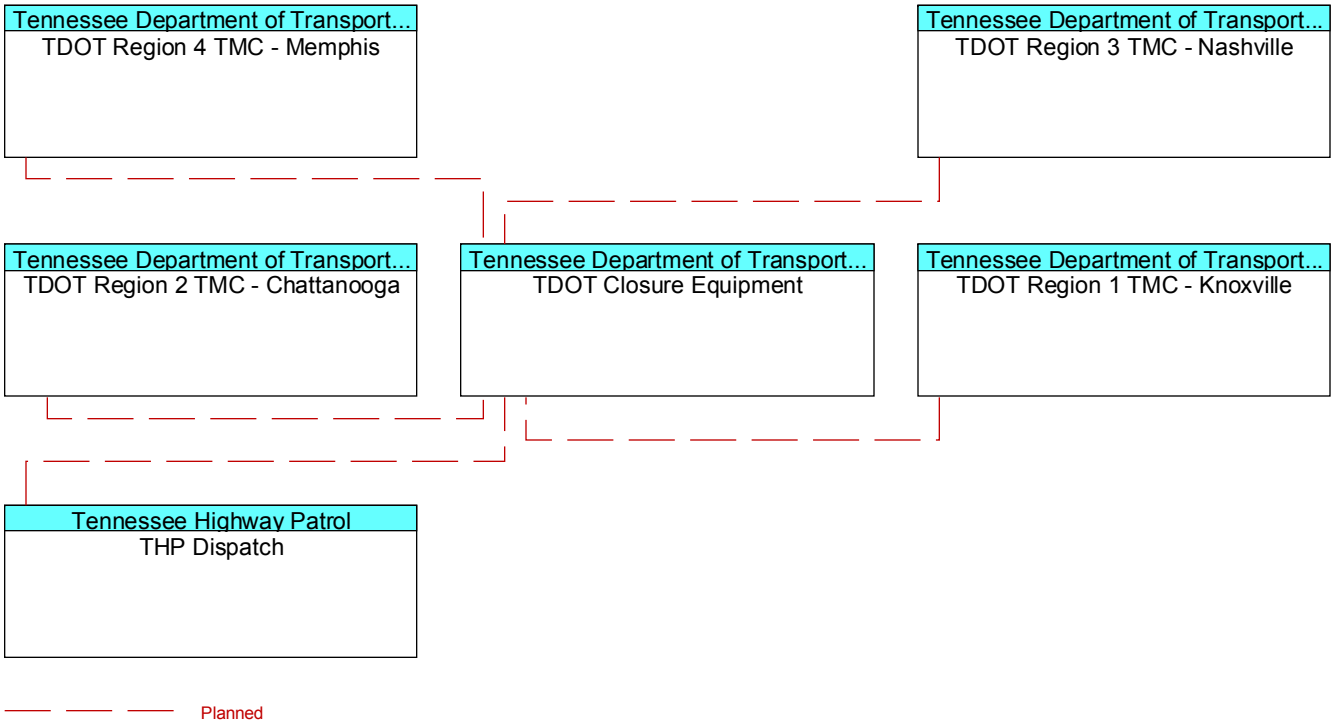
TDOT Anti-icing Equipment Interfaces



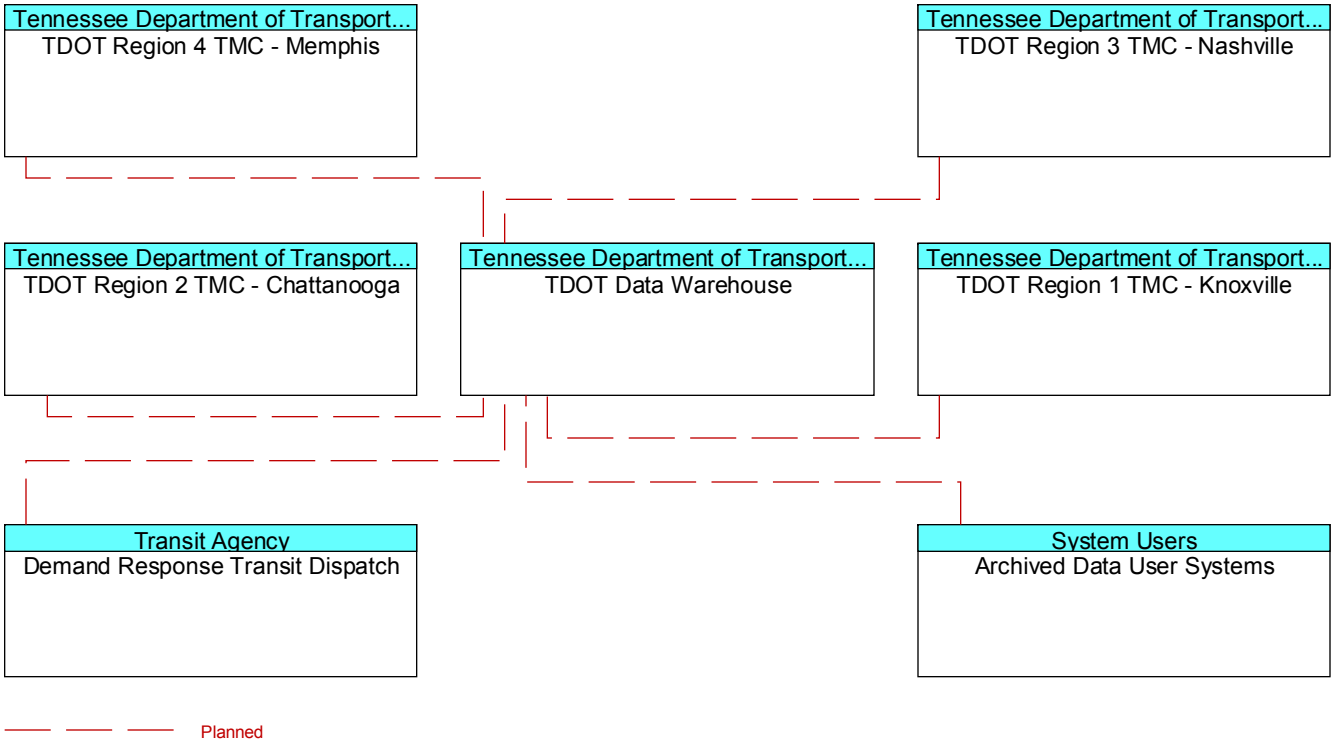
TDOT CCTV Interfaces



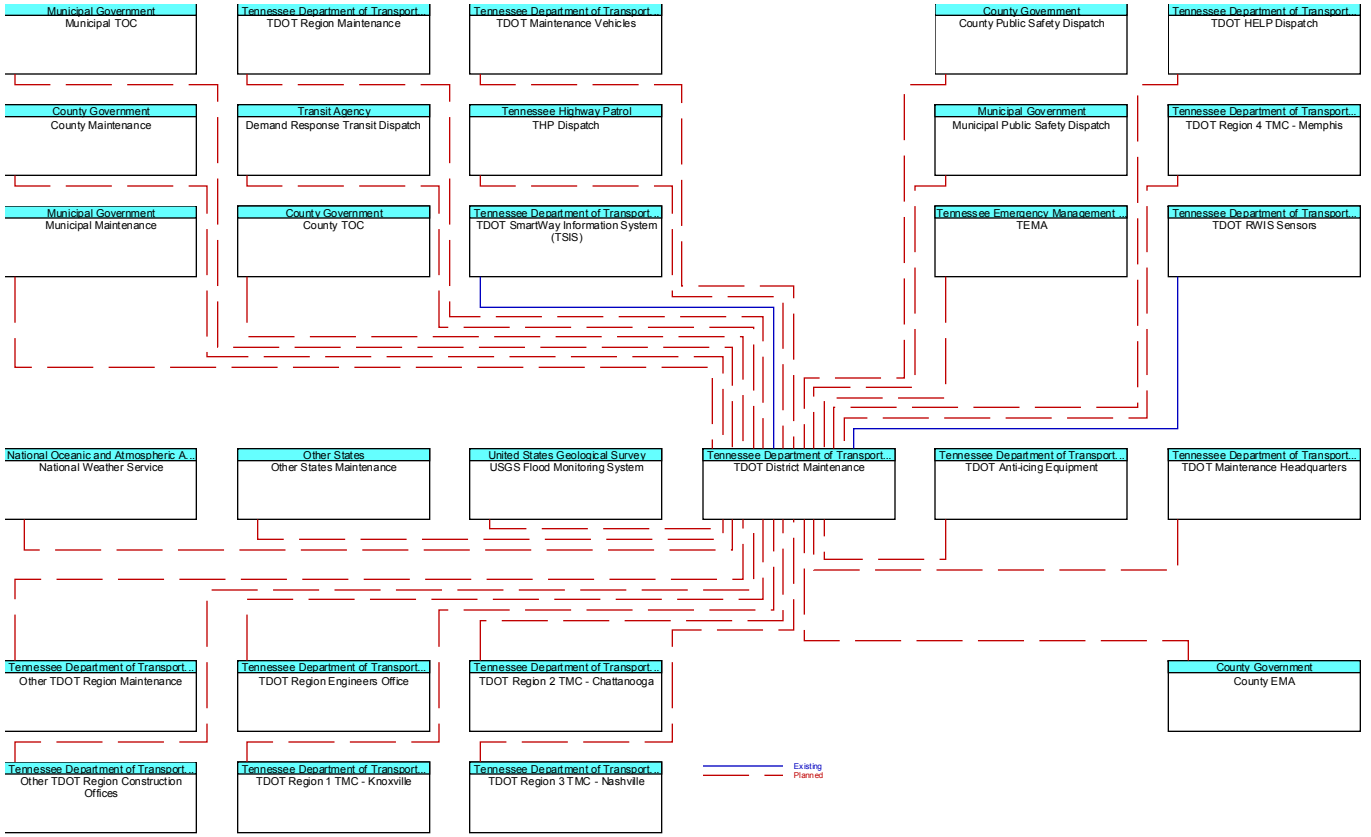
TDOT Closure Equipment Interfaces



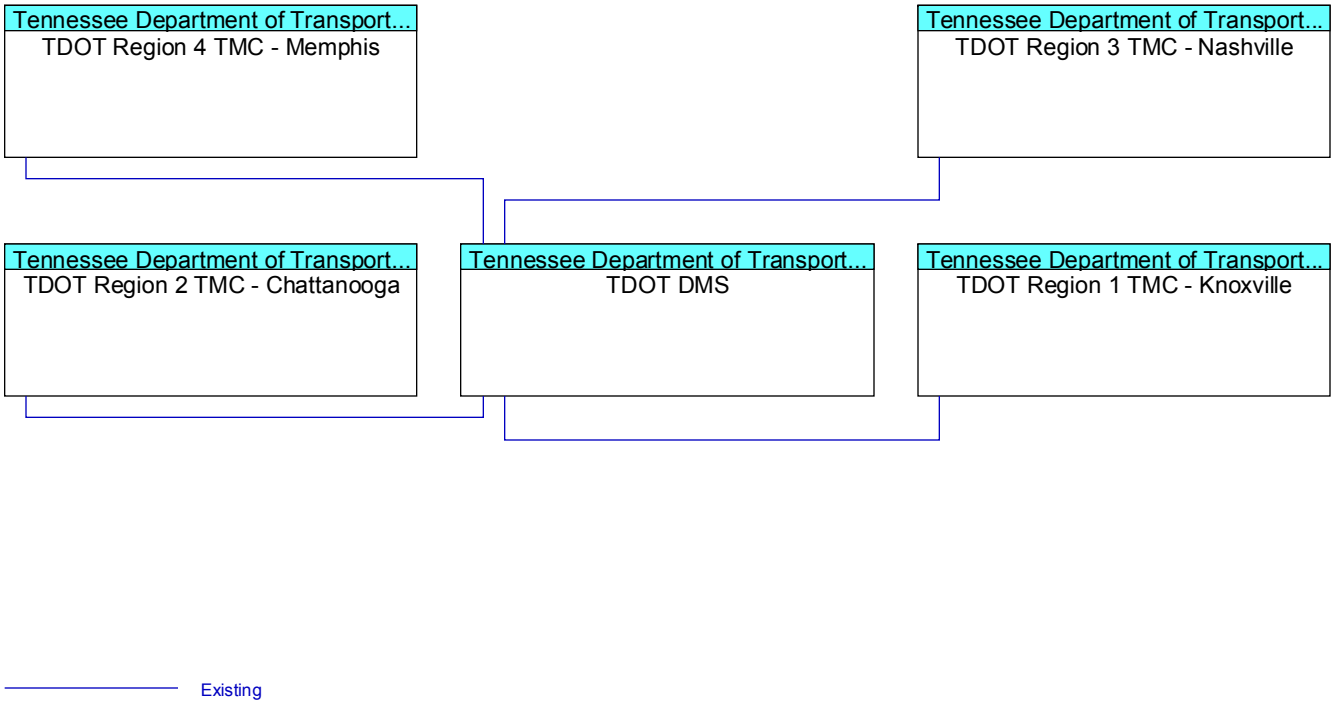
TDOT Data Warehouse Interfaces



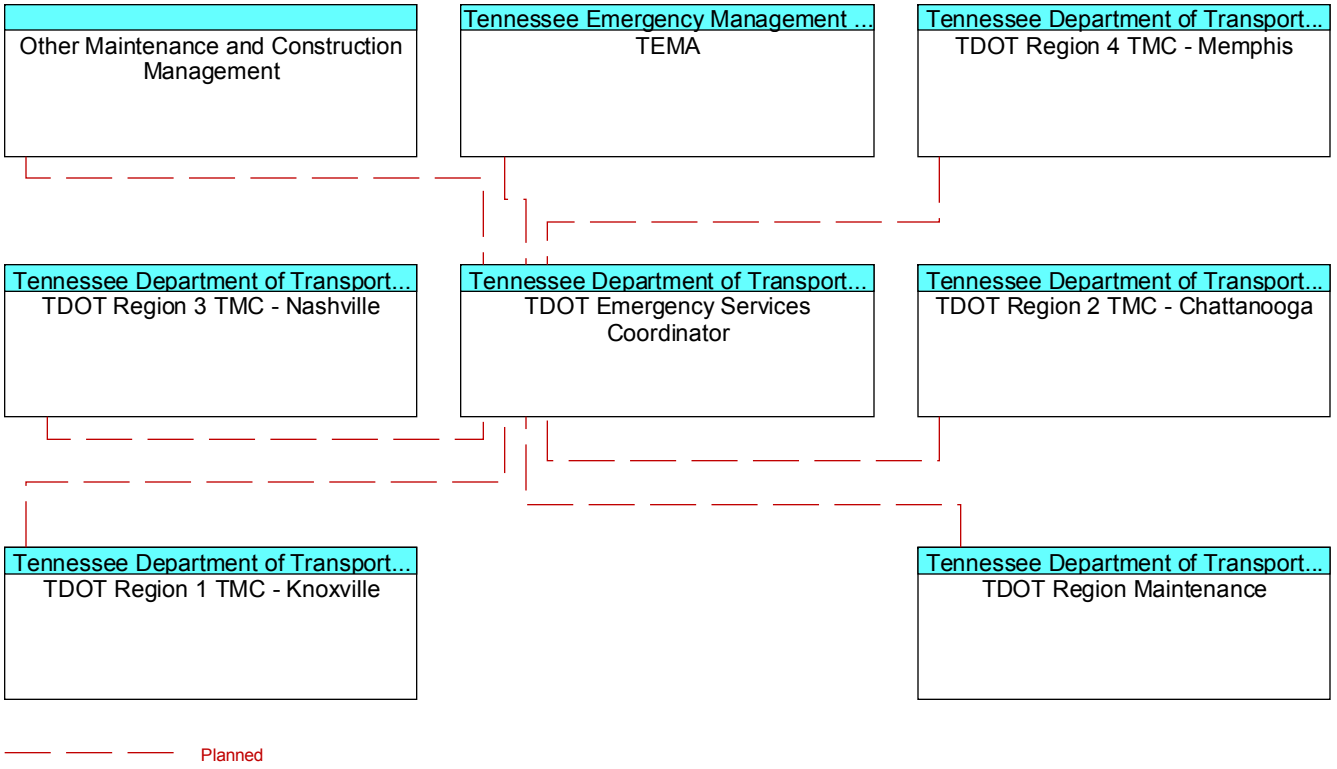
TDOT District Maintenance Interfaces



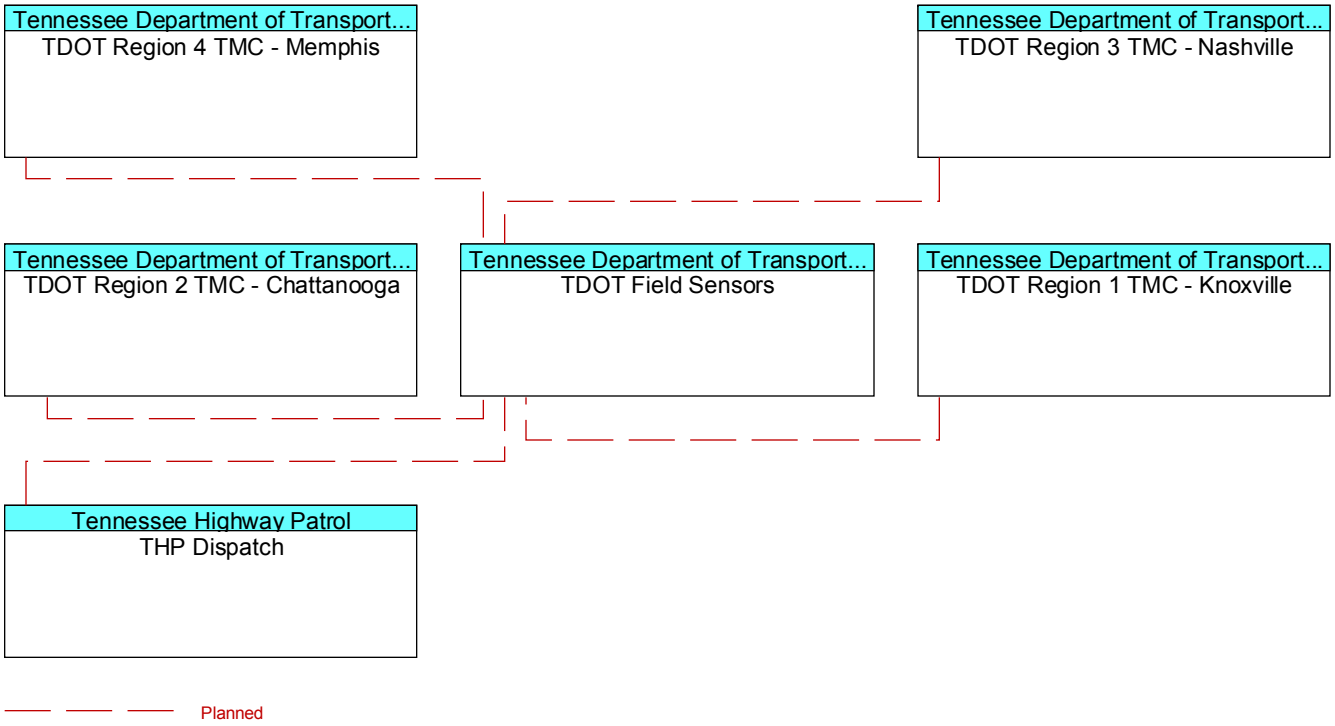
TDOT DMS Interfaces



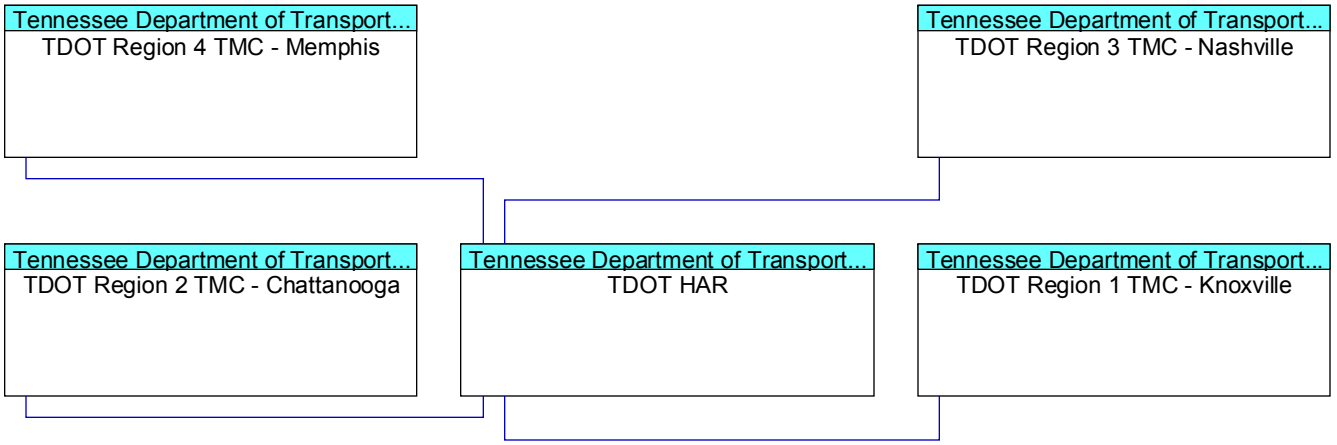
TDOT Emergency Services Coordinator Interfaces



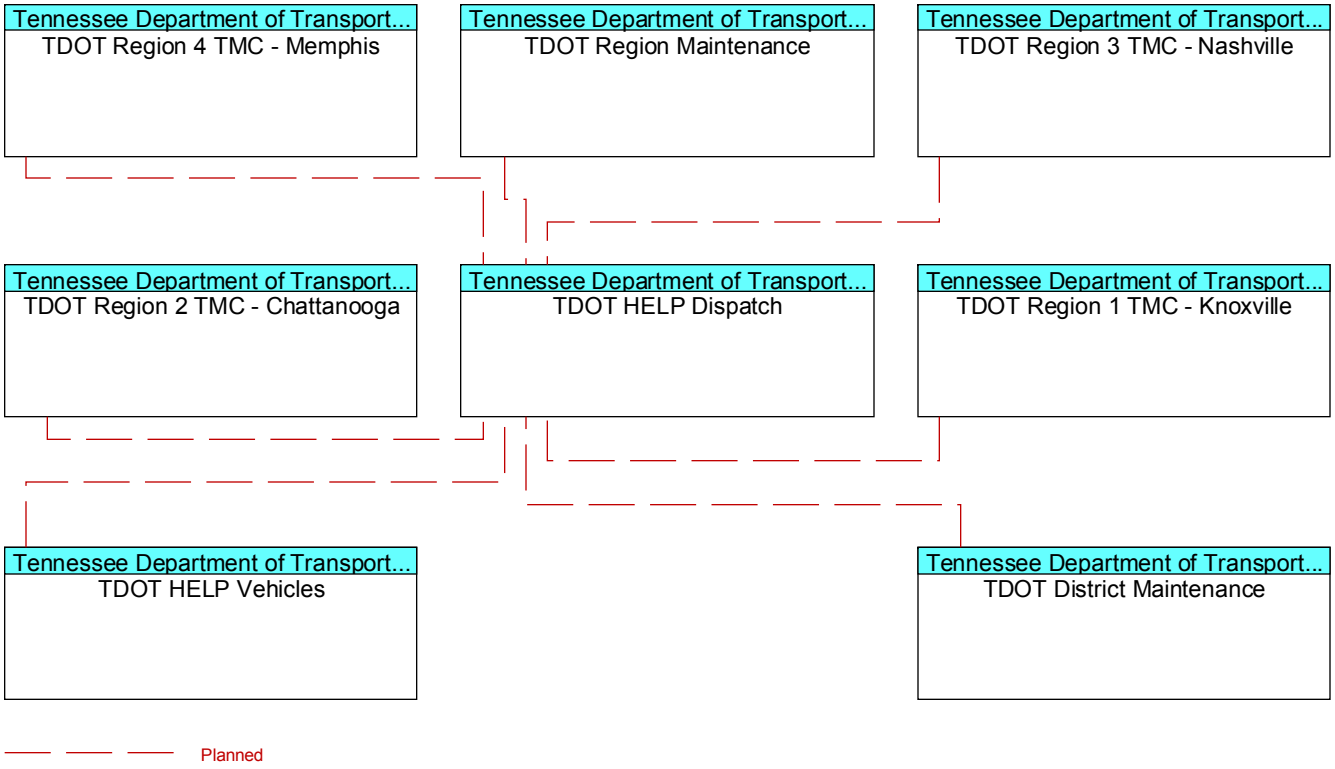
TDOT Field Sensors Interfaces



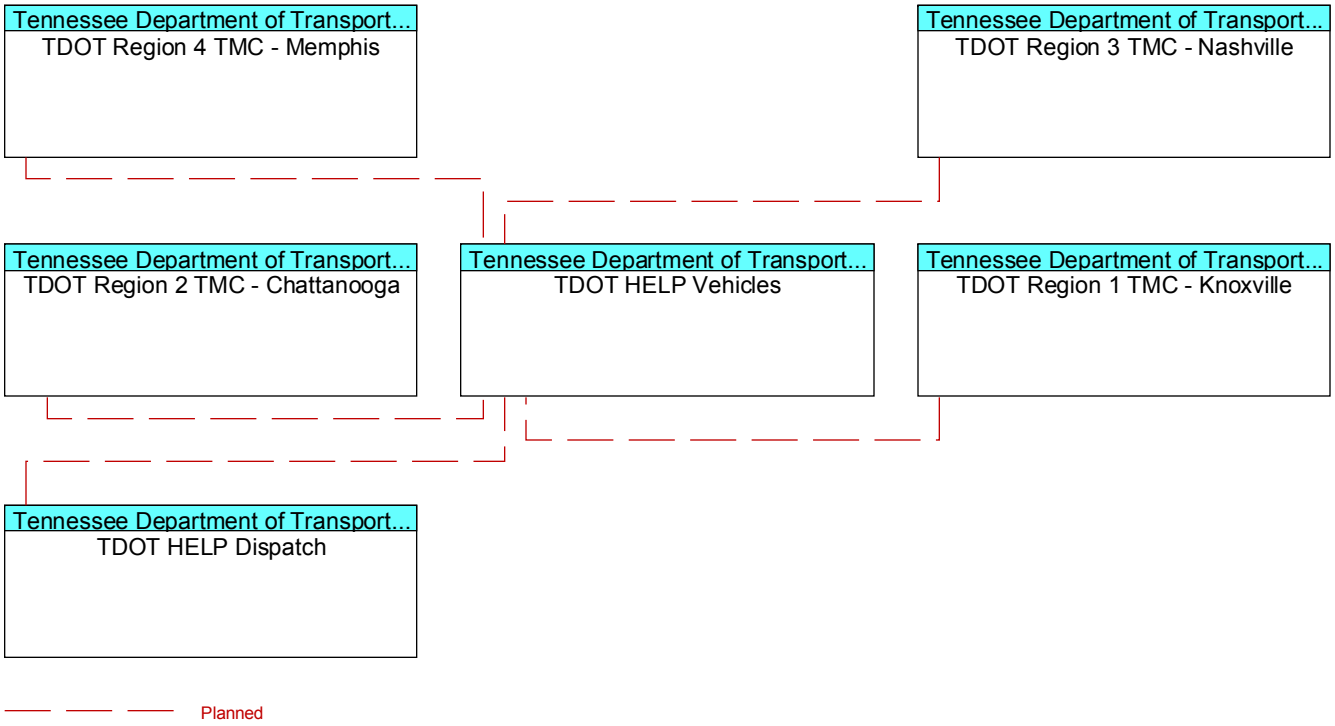
TDOT HAR Interfaces



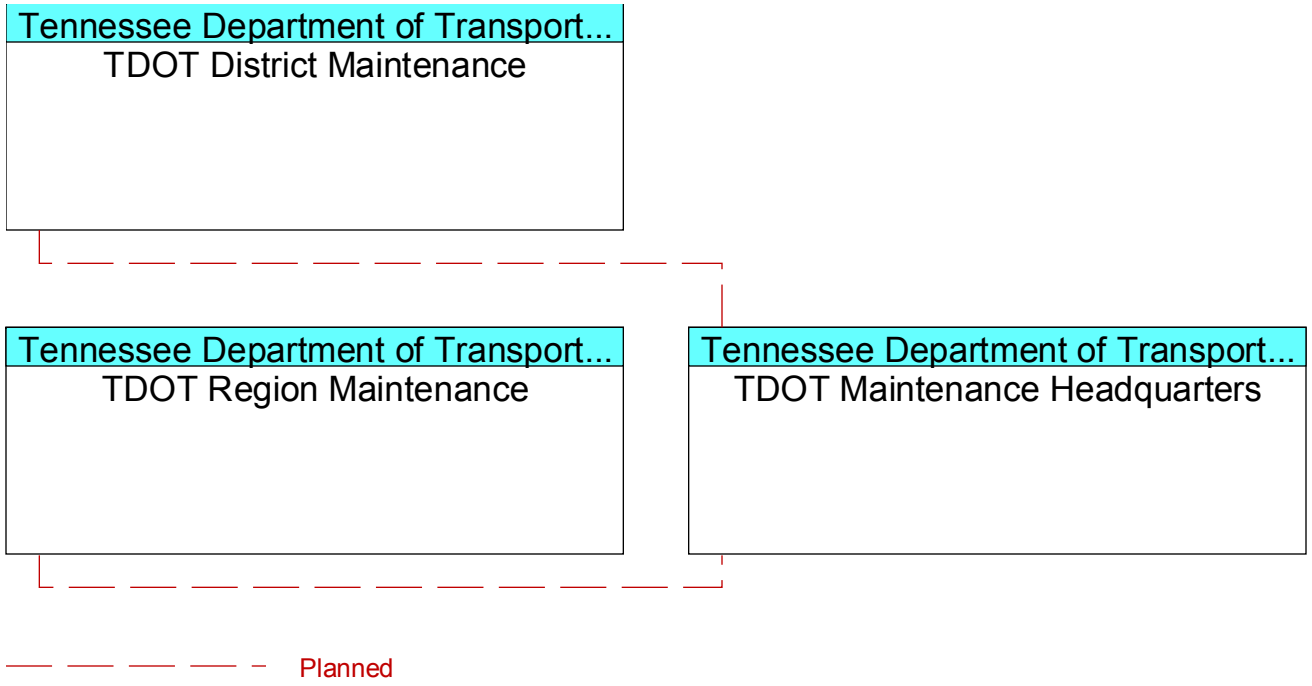
TDOT HELP Dispatch Interfaces



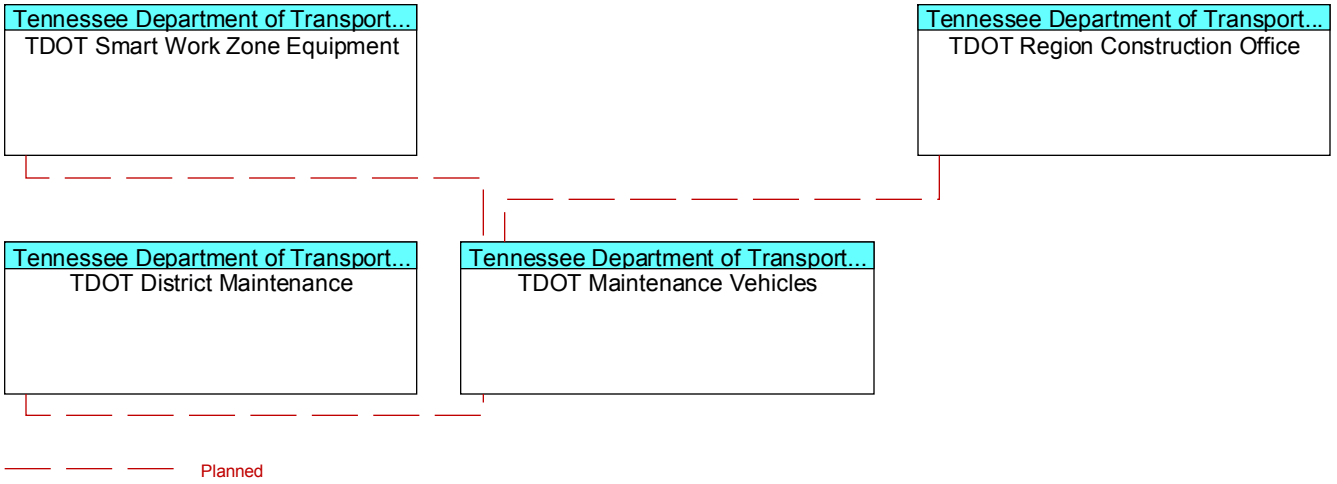
TDOT HELP Vehicles Interfaces



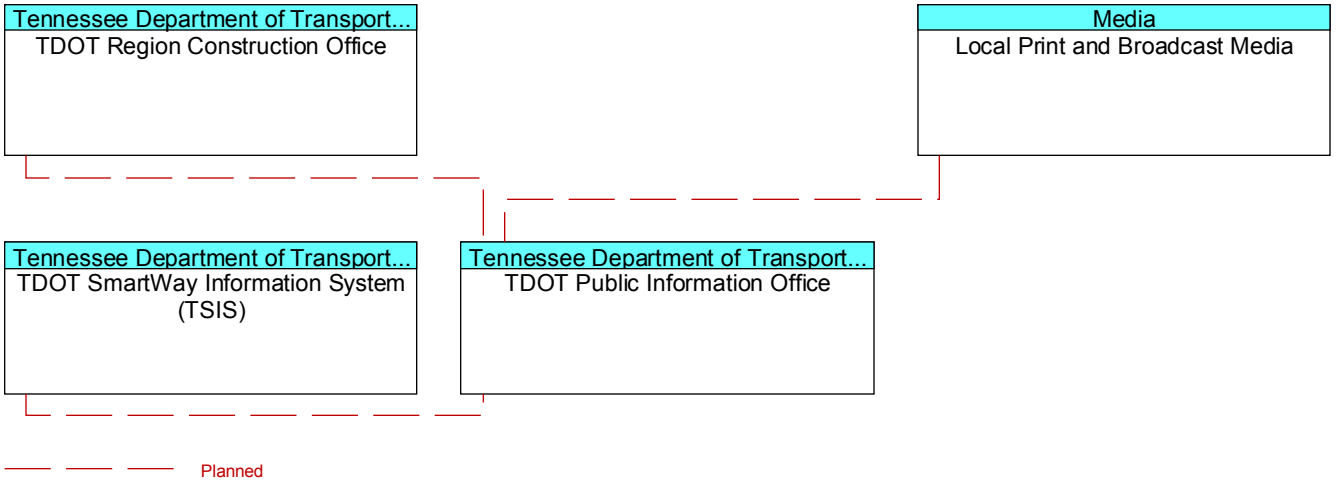
TDOT Maintenance Headquarters Interfaces



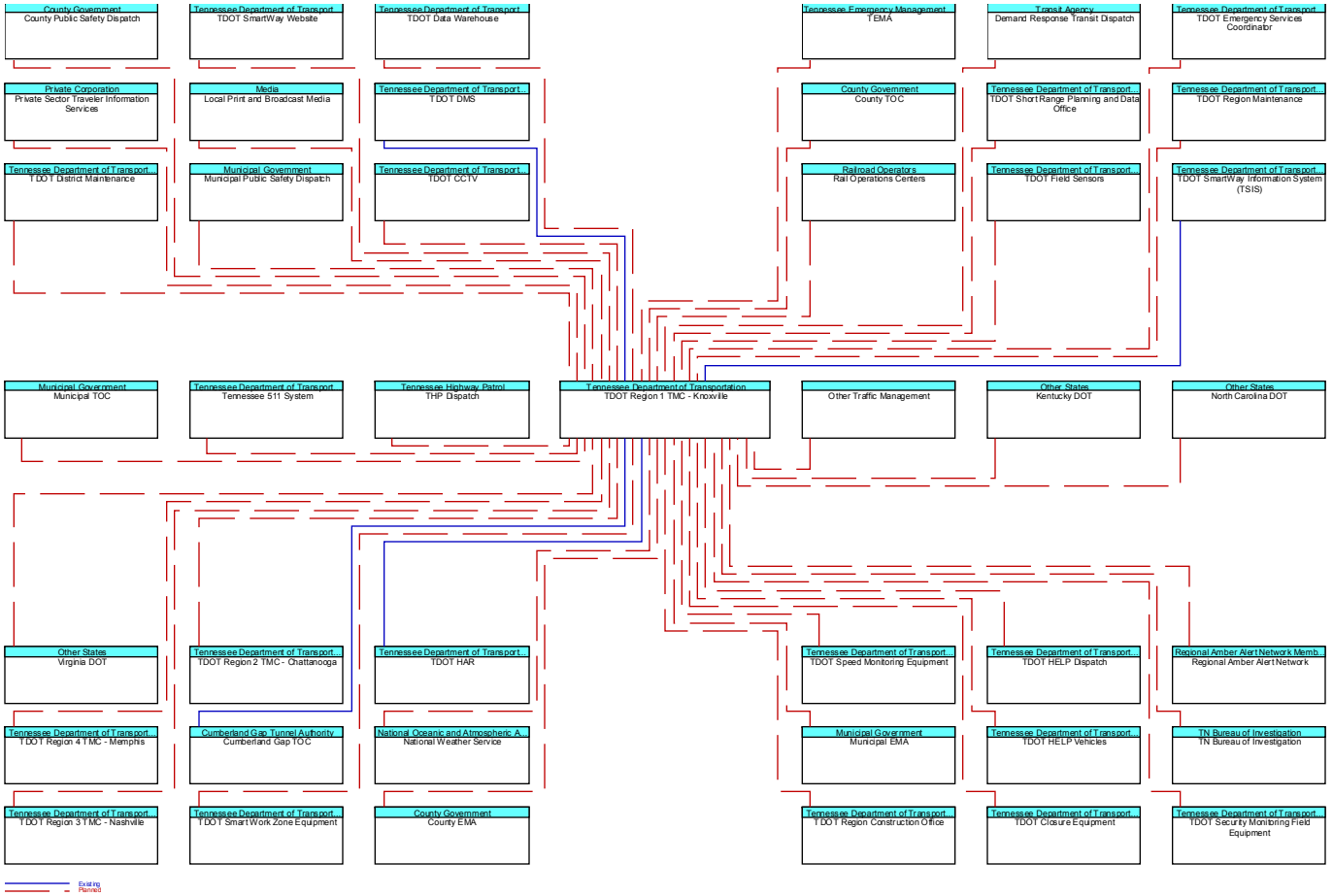
TDOT Maintenance Vehicles Interfaces



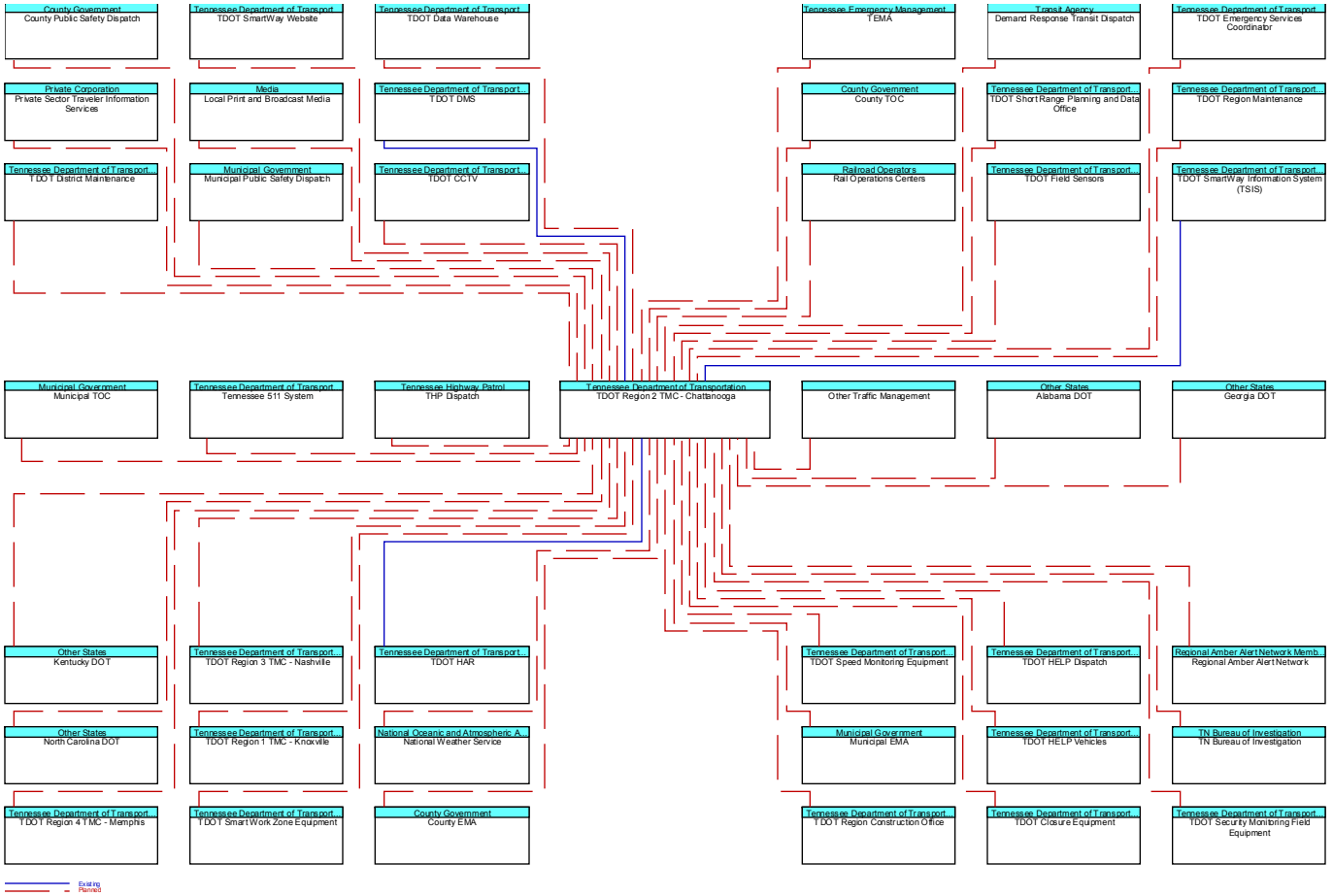
TDOT Public Information Office Interfaces



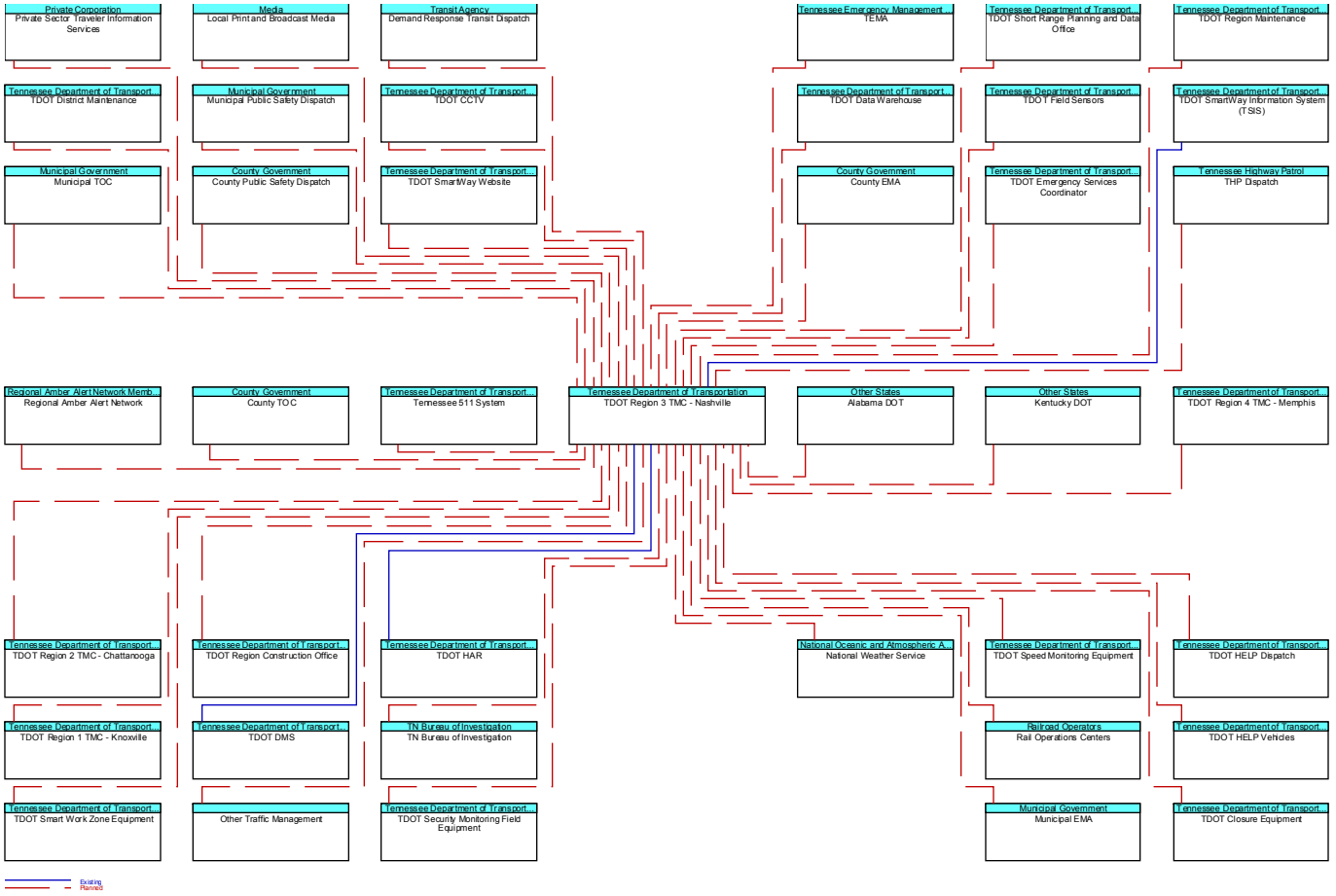
TDOT Region 1 TMC – Knoxville Interfaces



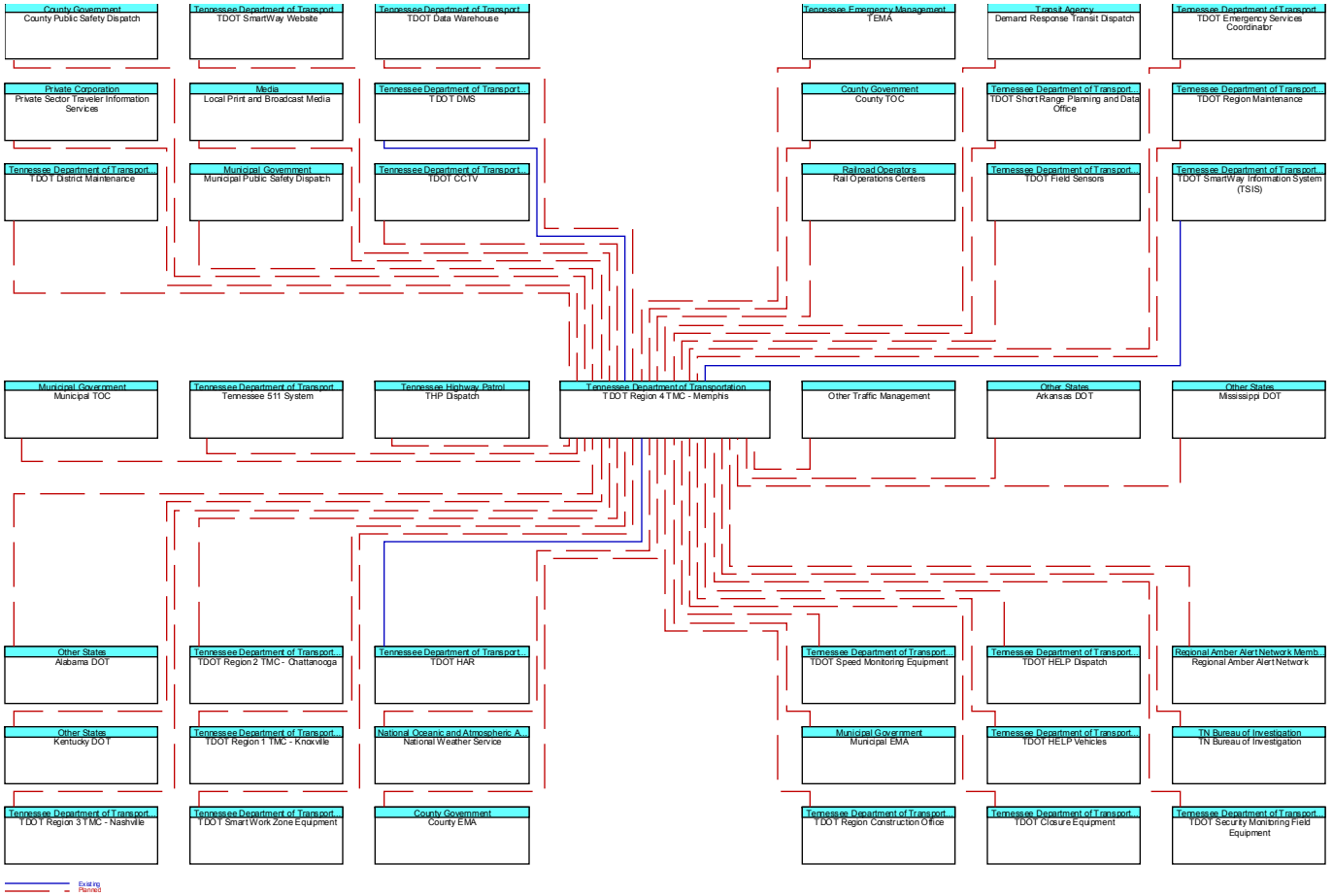
TDOT Region 2 TMC – Chattanooga Interfaces



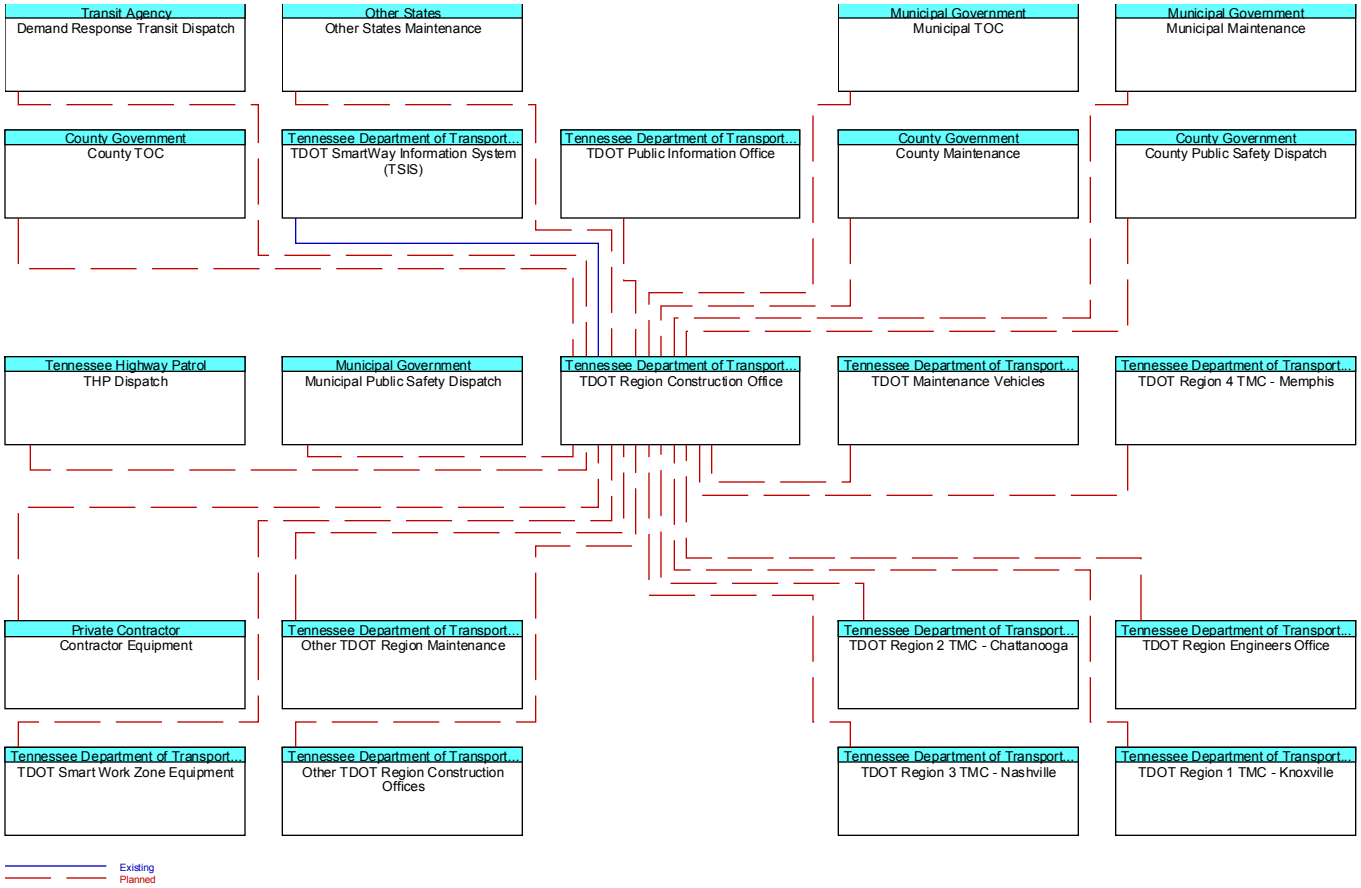
TDOT Region 3 TMC – Nashville Interfaces



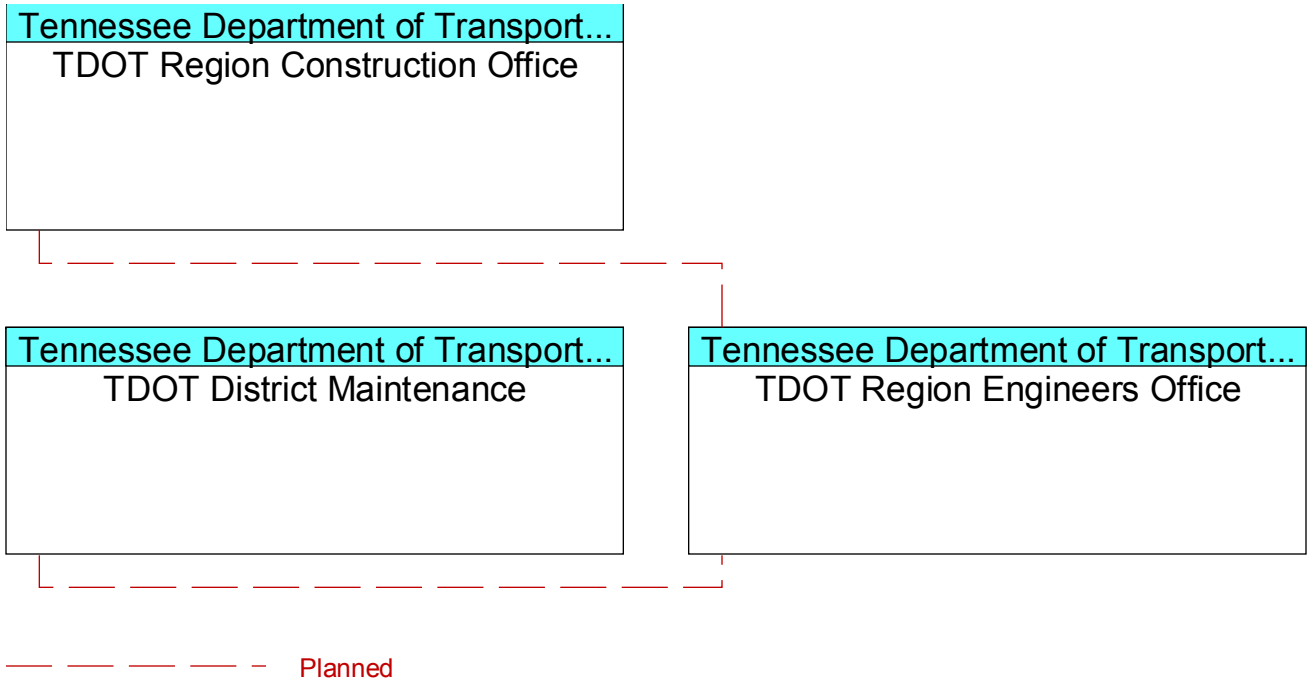
TDOT Region 4 TMC – Memphis Interfaces



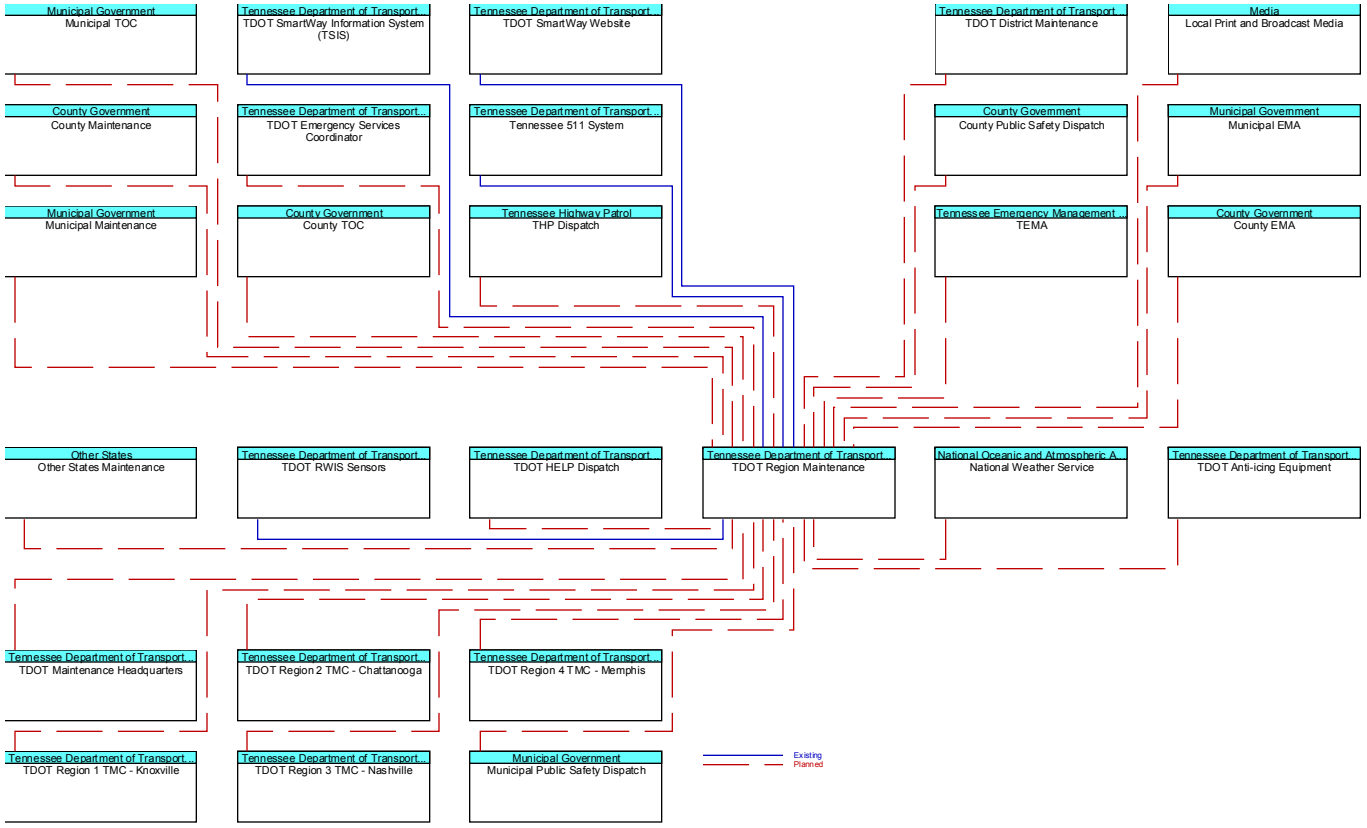
TDOT Region Construction Office Interfaces



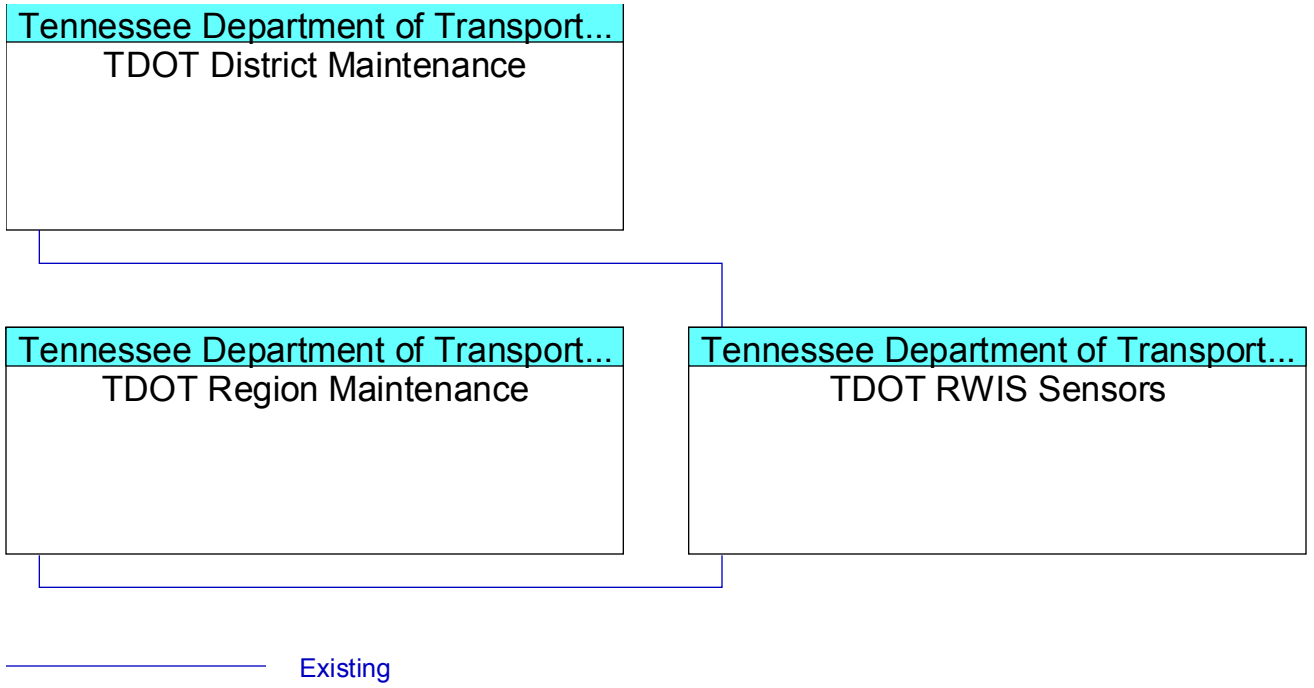
TDOT Region Engineers Office Interfaces



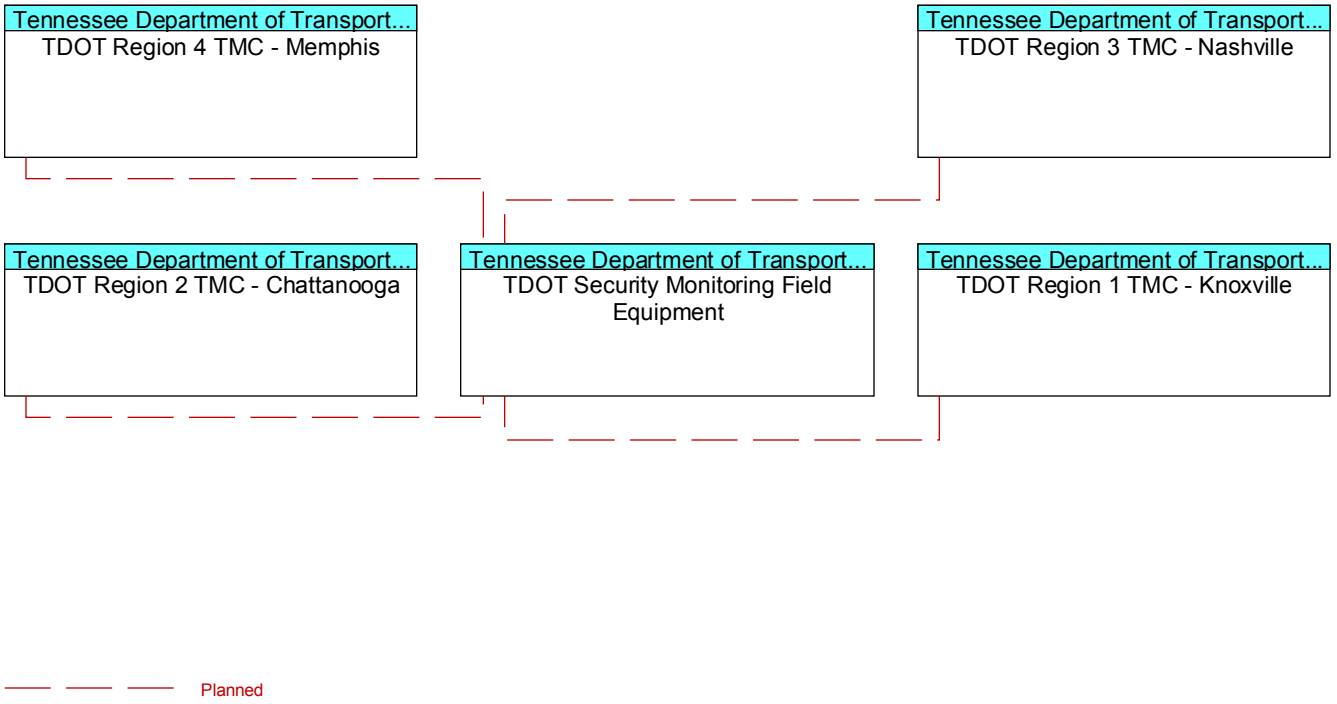
TDOT Region Maintenance Interfaces



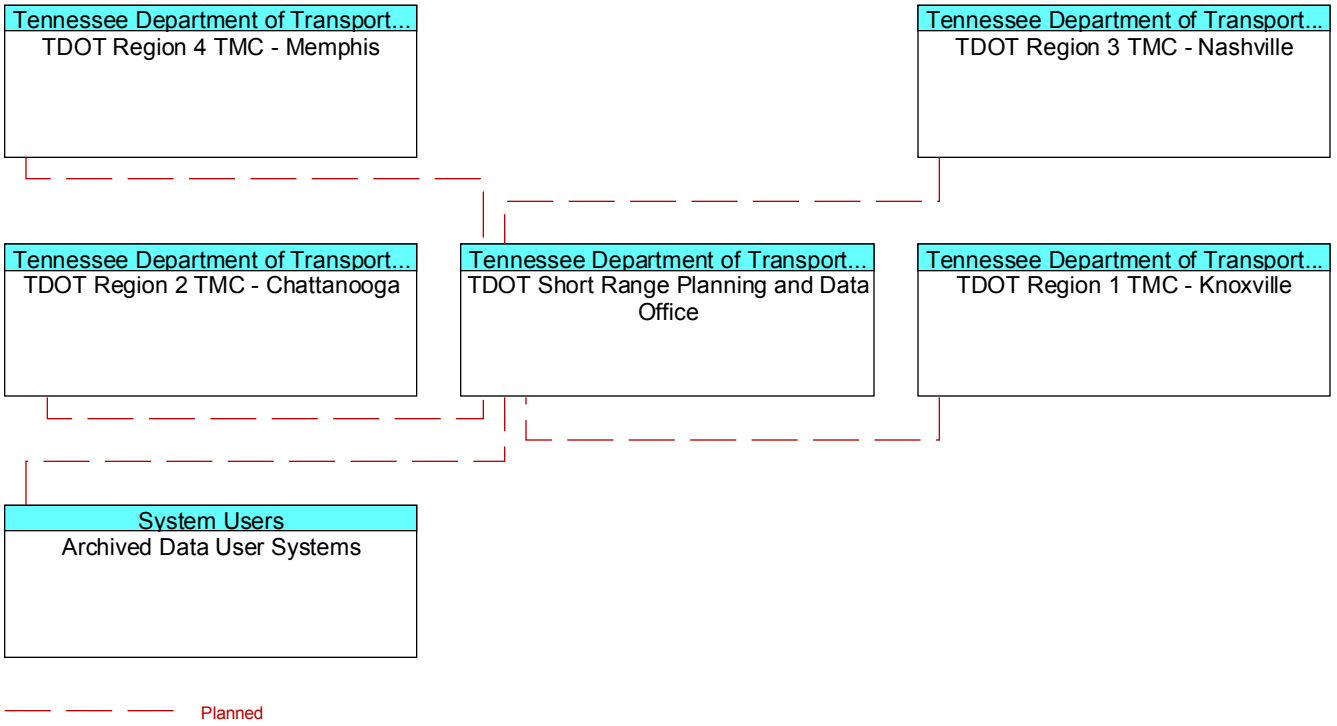
TDOT RWIS Sensors Interfaces



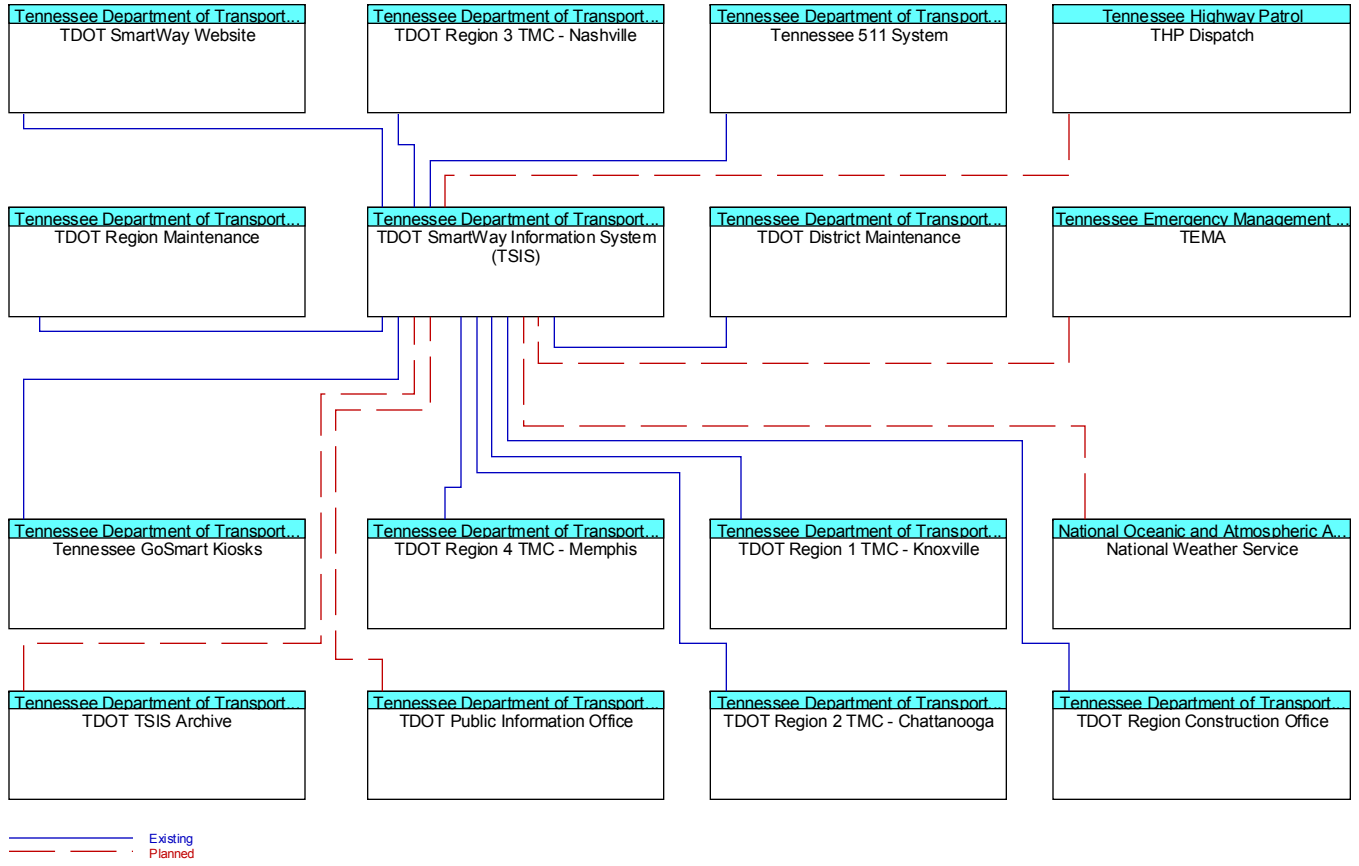
TDOT Security Monitoring Field Equipment Interfaces



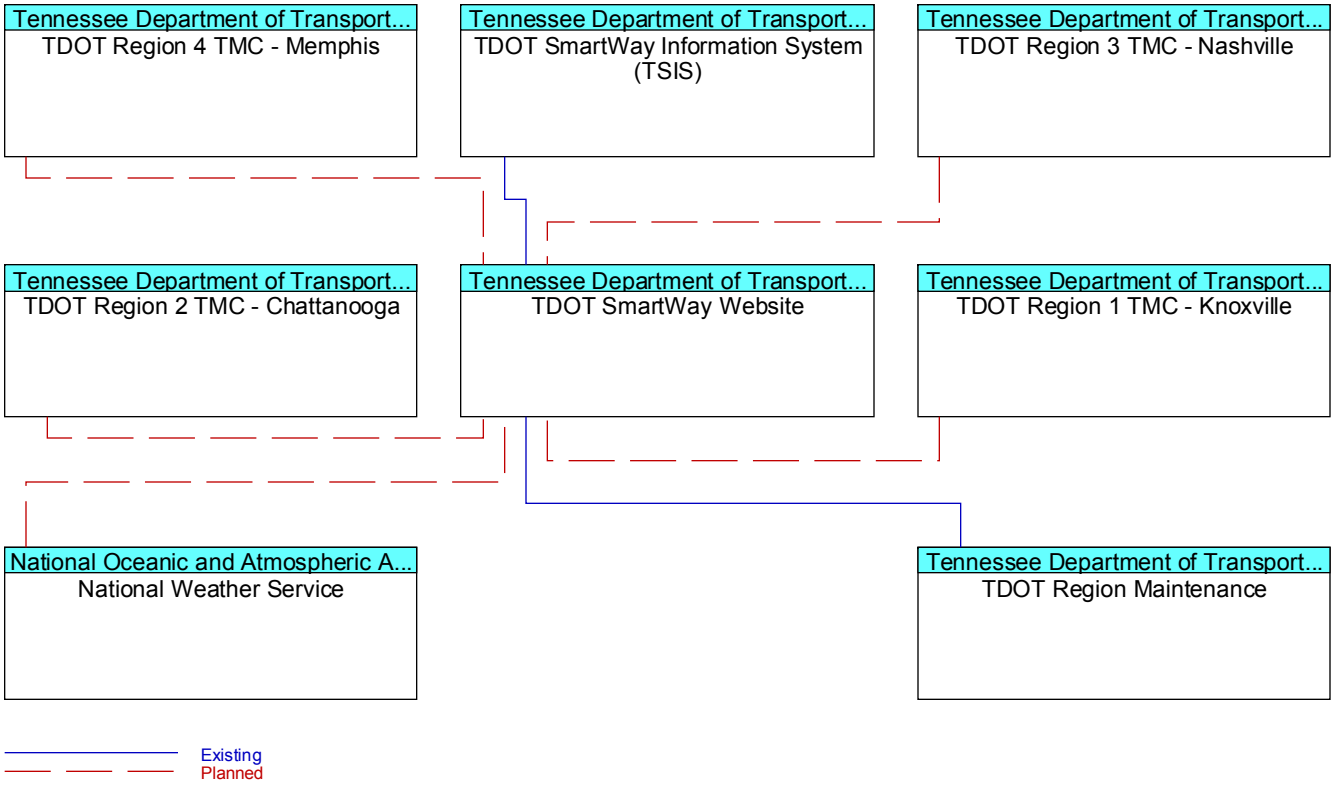
TDOT Short Range Planning and Data Office Interfaces



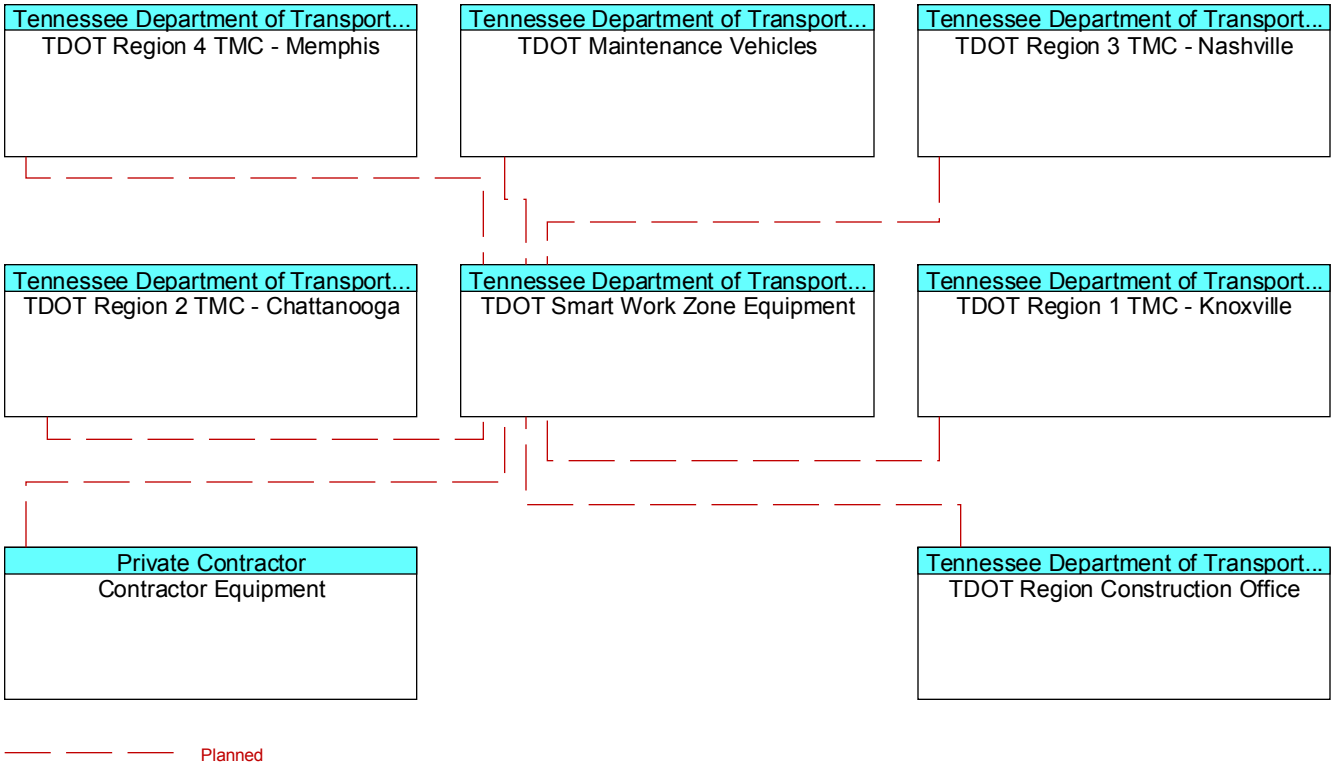
TDOT SmartWay Information System (TSIS) Interfaces



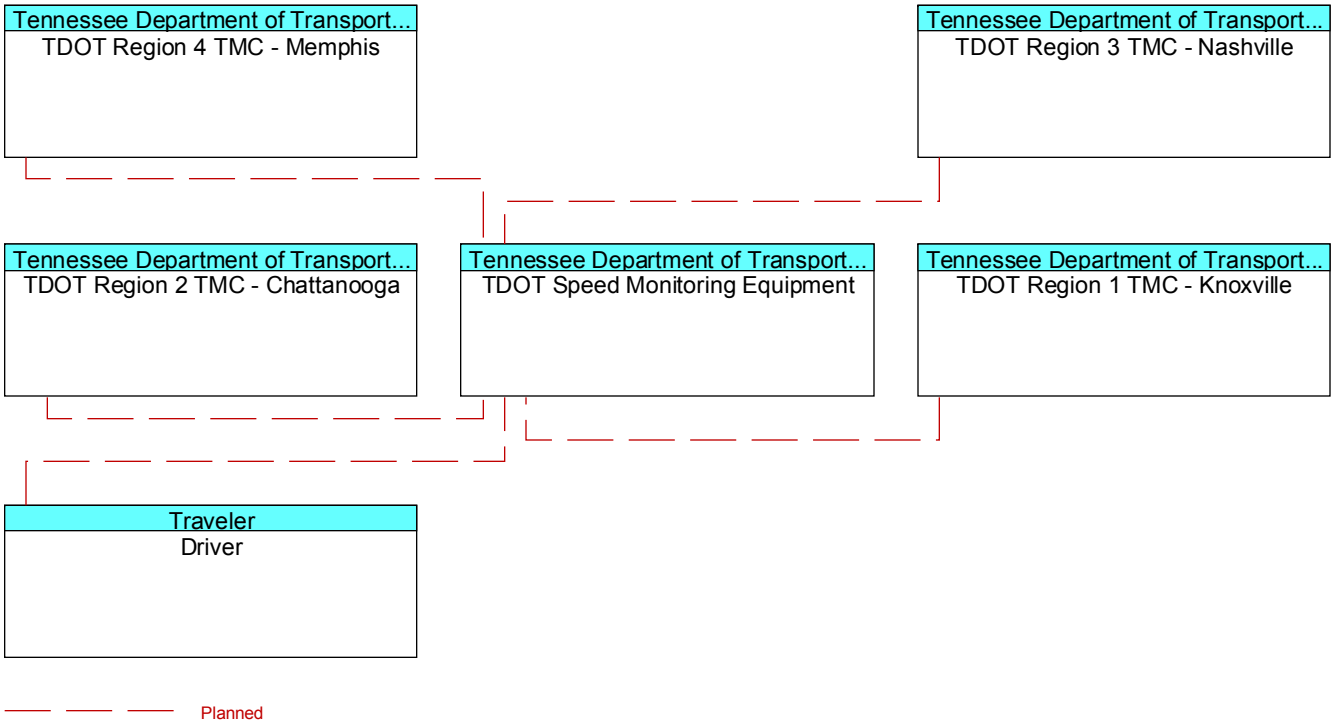
TDOT SmartWay Website Interfaces



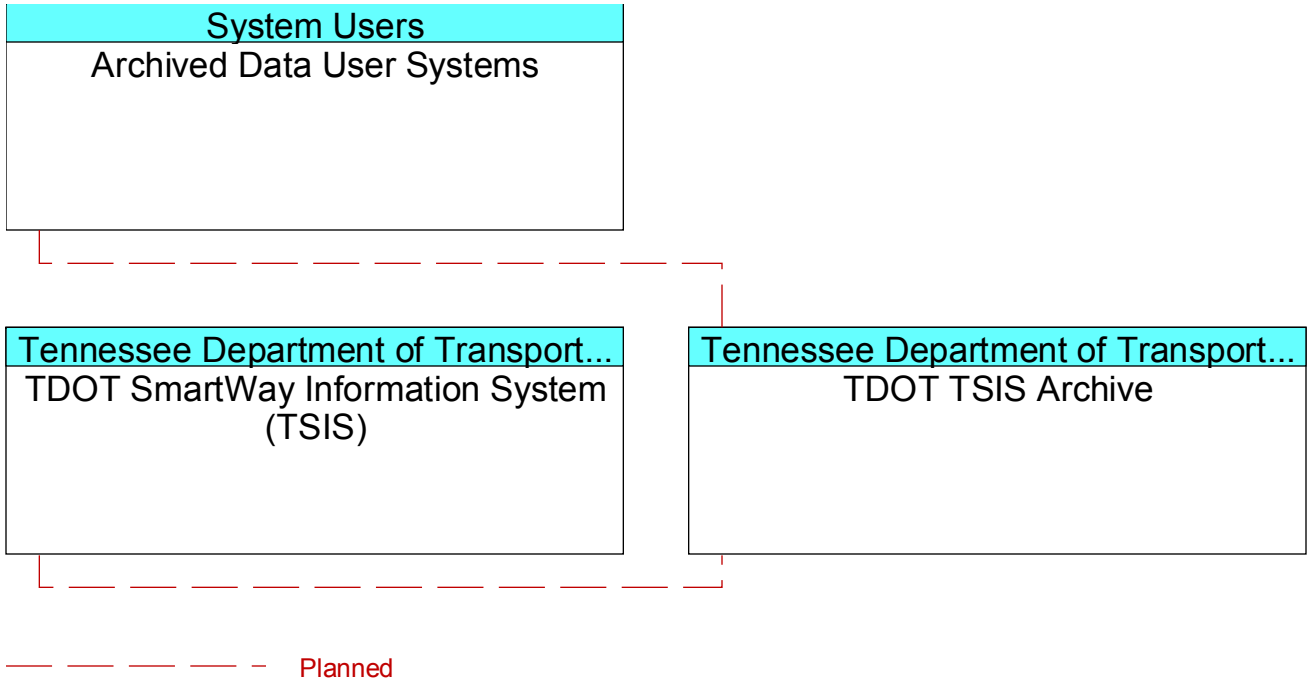
TDOT Smart Work Zone Equipment Interfaces



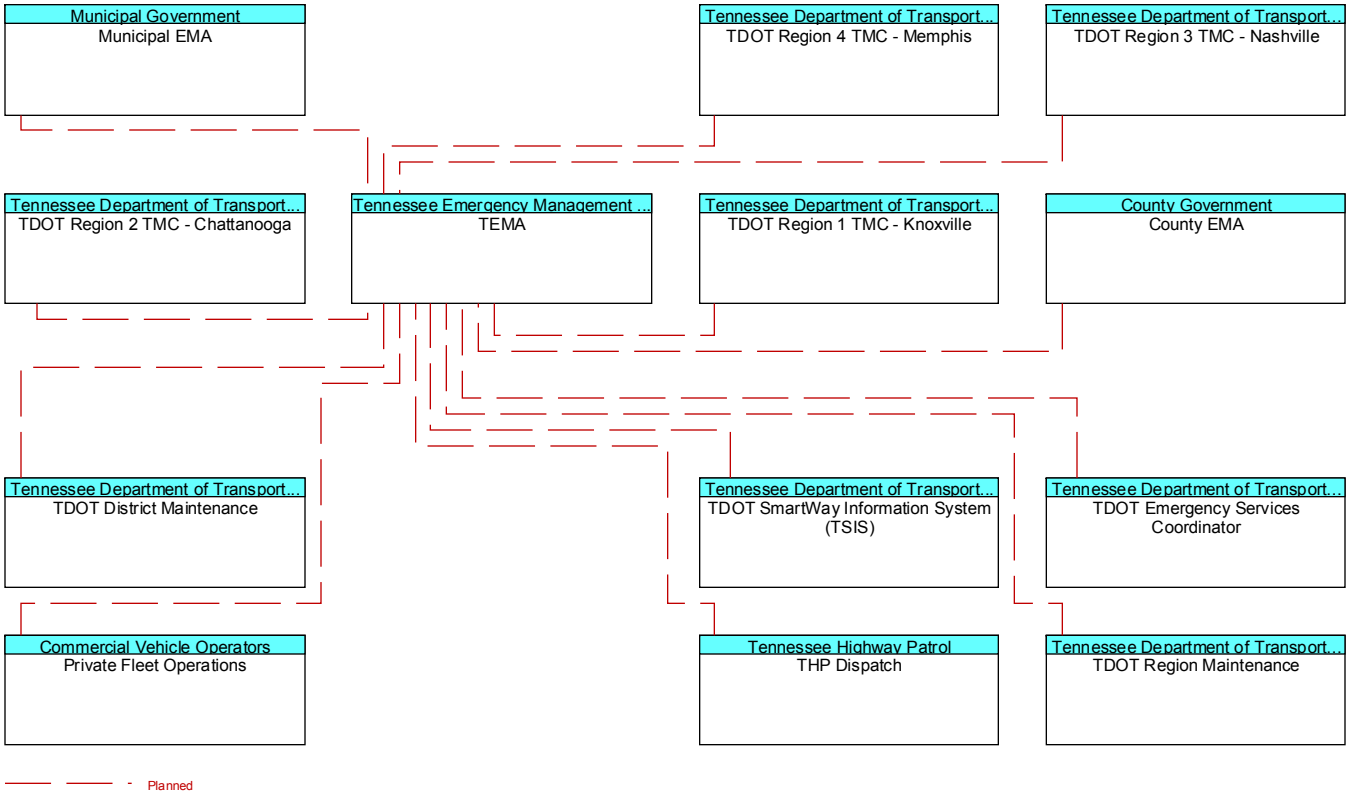
TDOT Speed Monitoring Equipment Interfaces



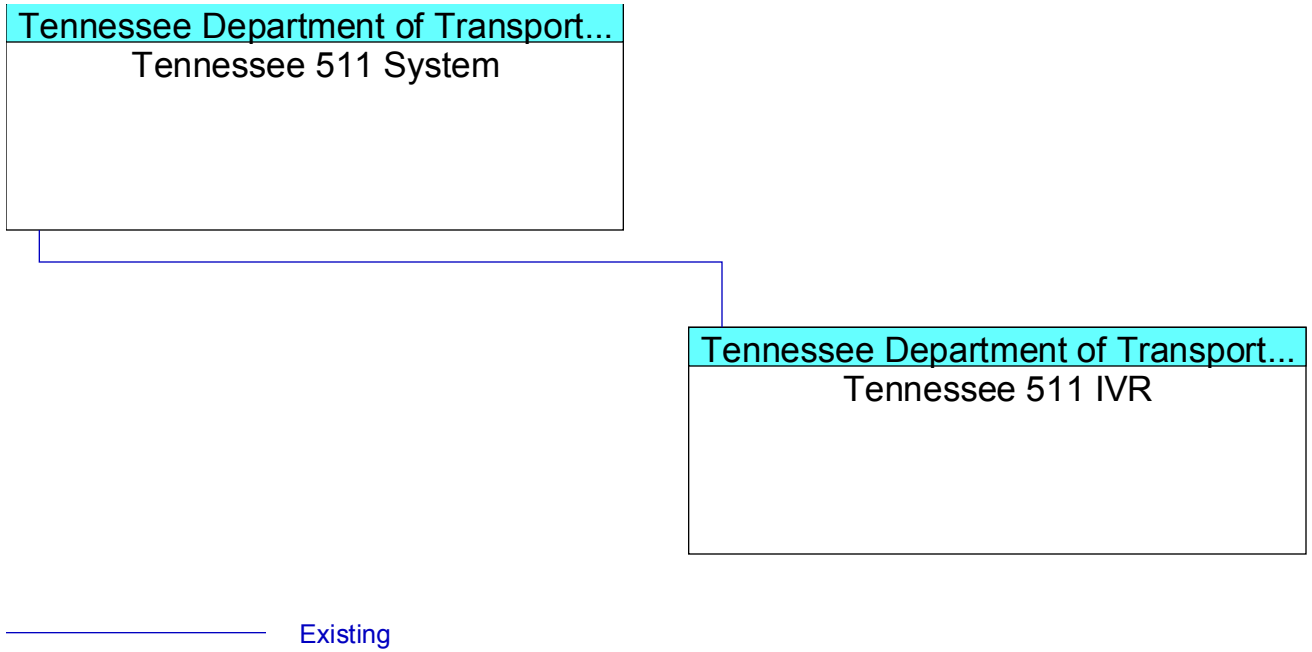
TDOT TSIS Archive Interfaces



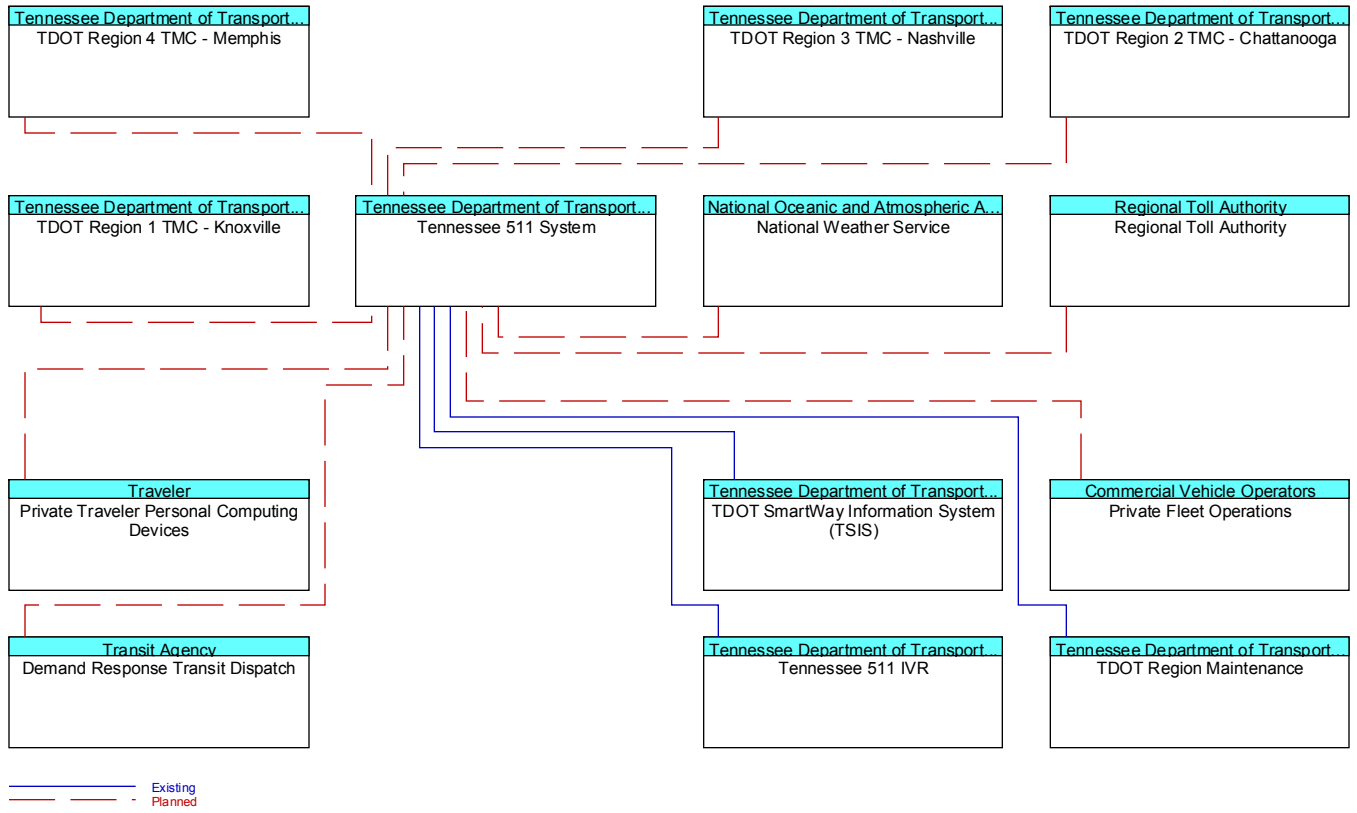
TEMA Interfaces



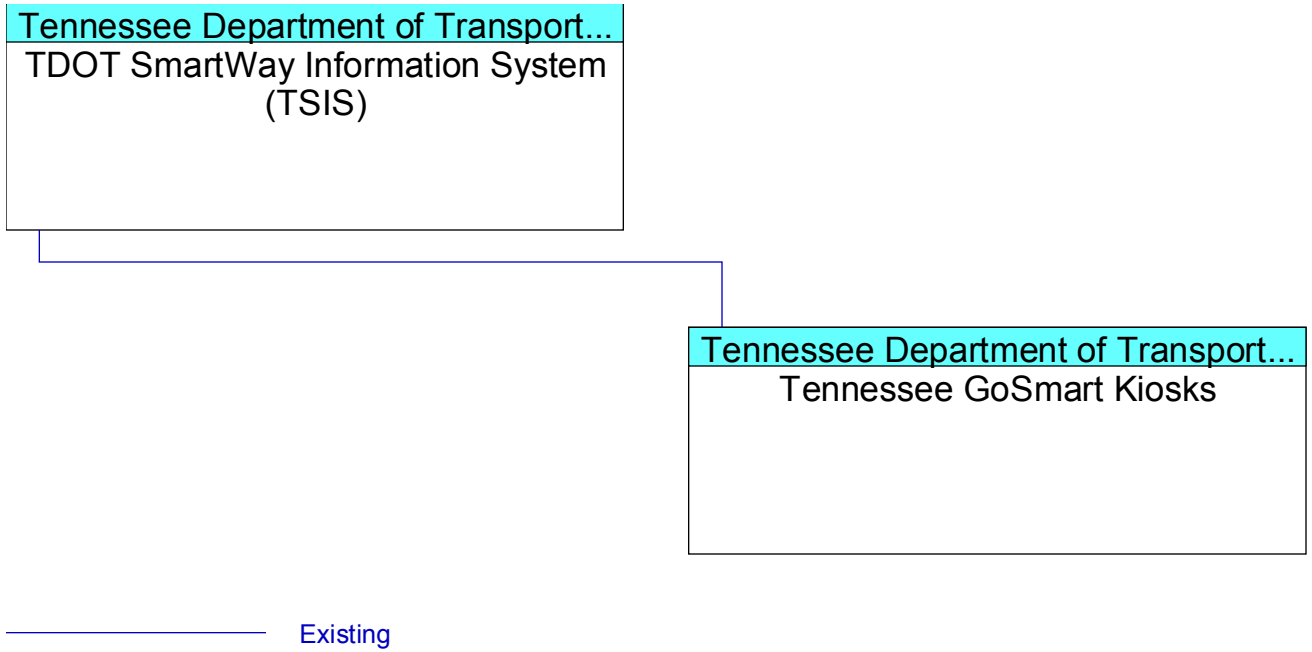
Tennessee 511 IVR Interfaces



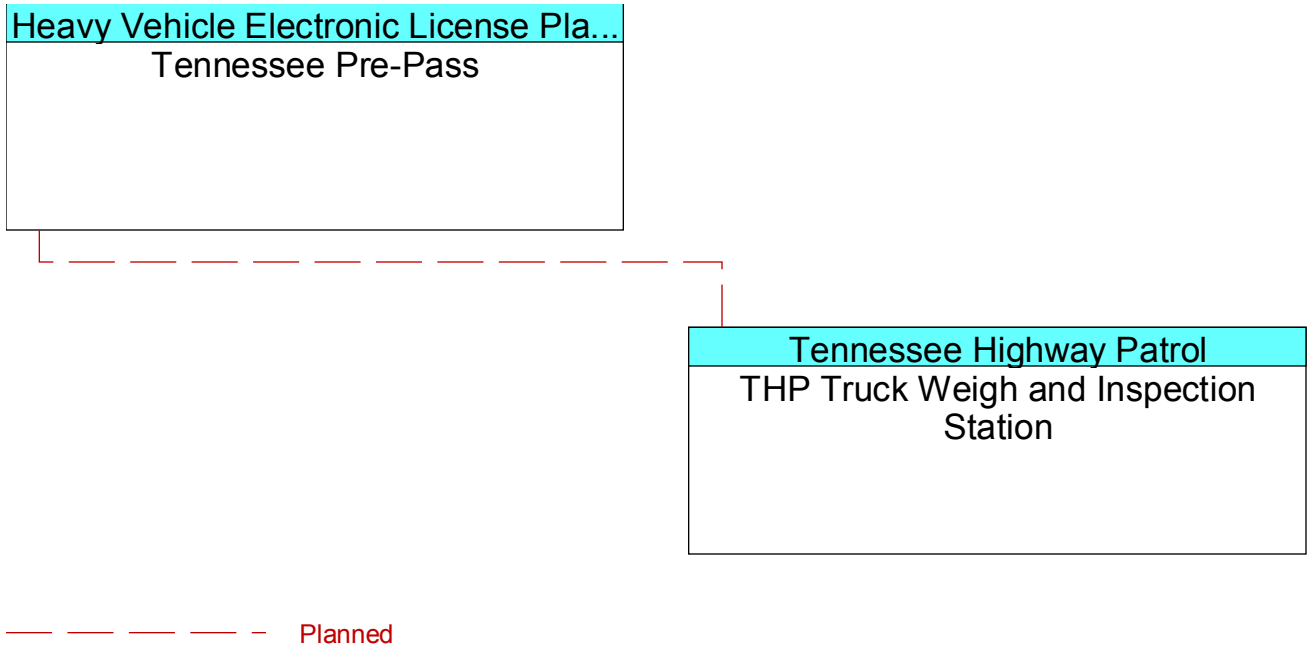
Tennessee 511 System Interfaces



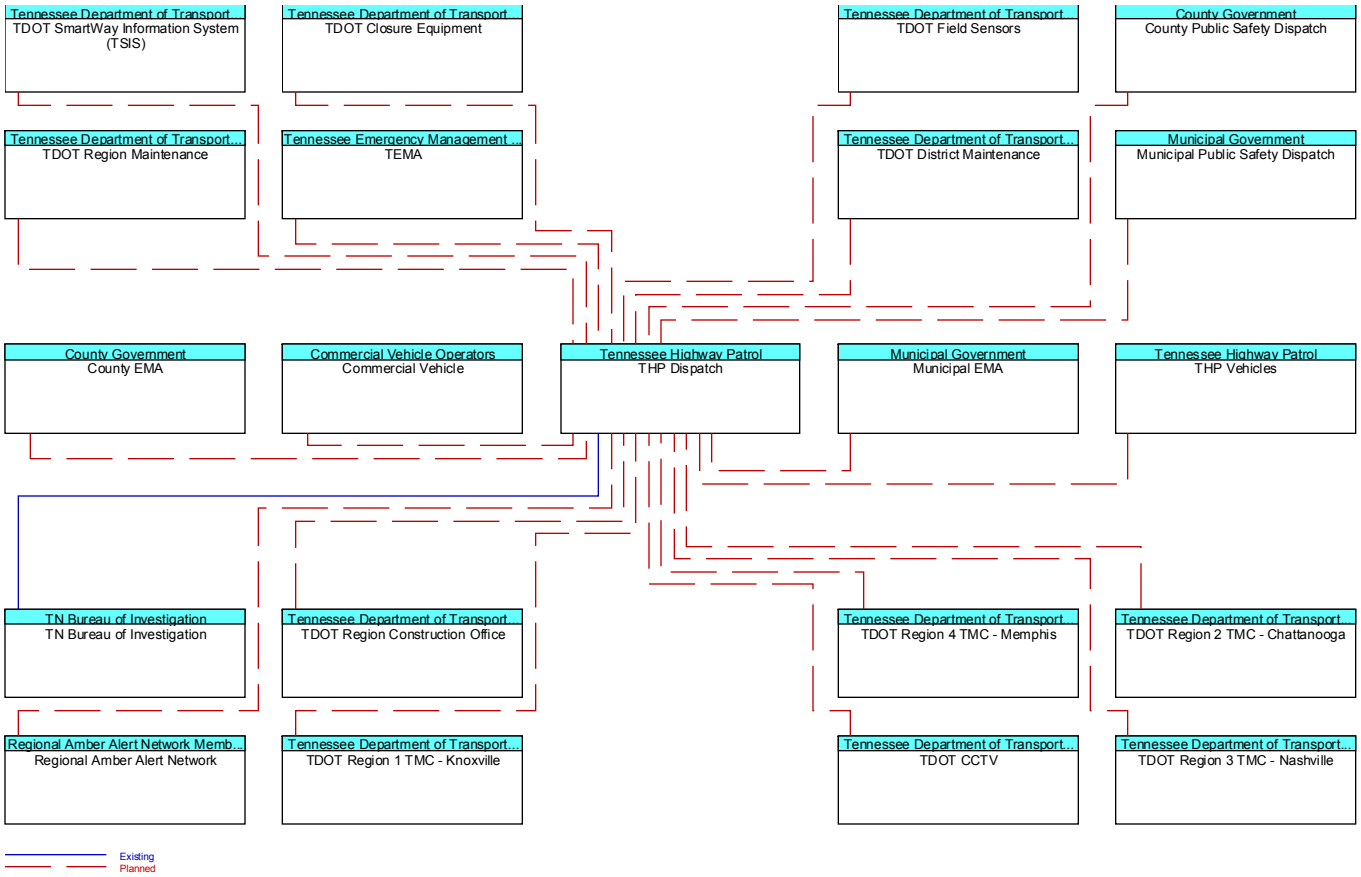
Tennessee GoSmart Kiosks Interfaces



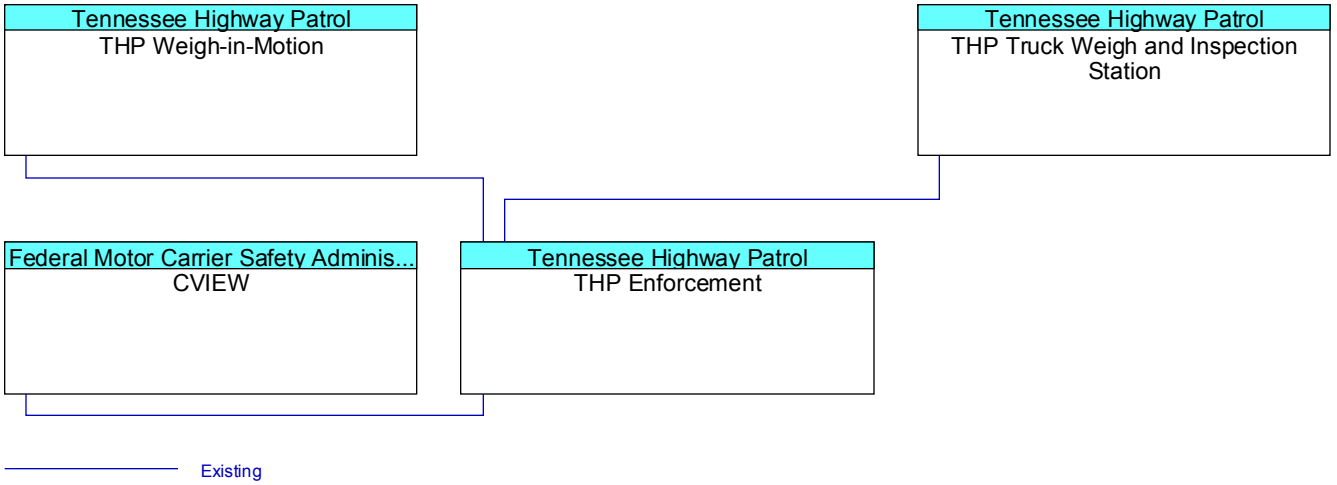
Tennessee Pre-Pass Interfaces



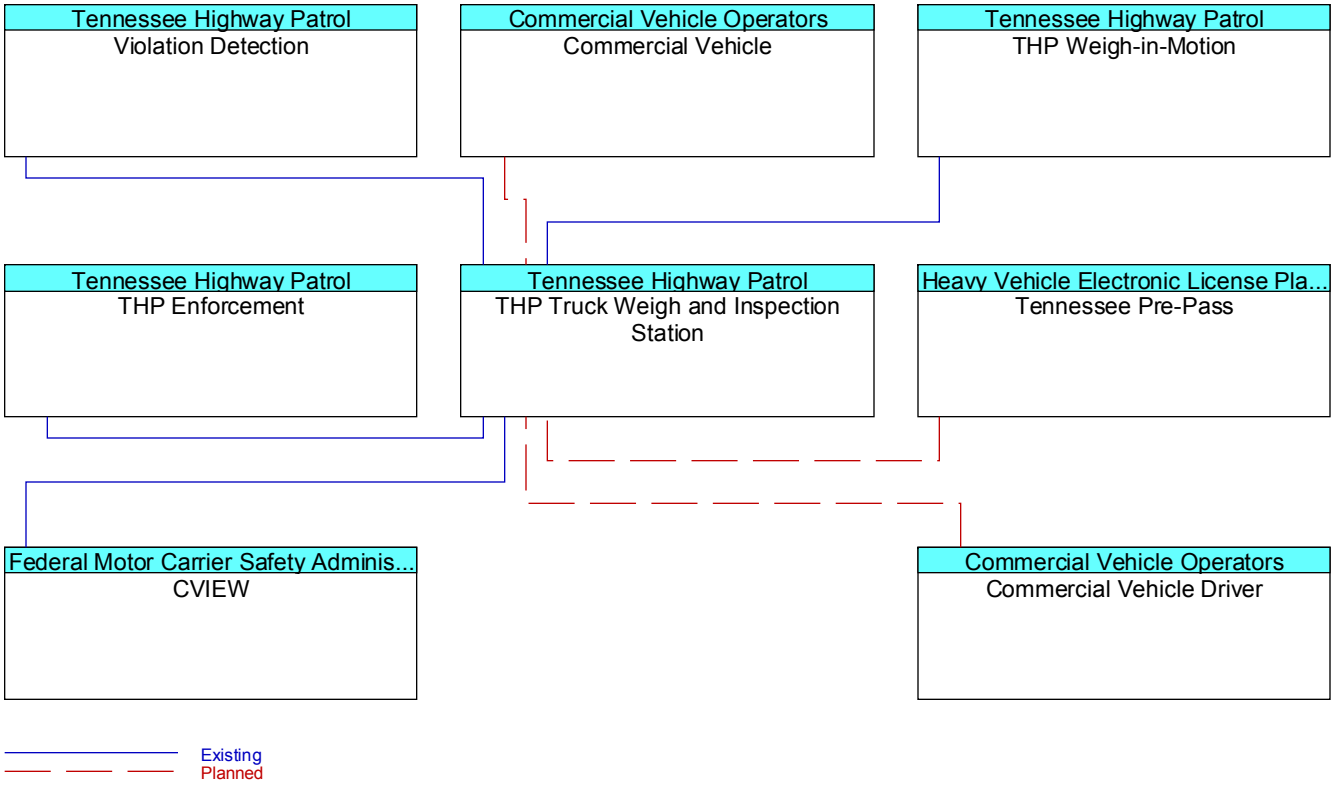
THP Dispatch Interfaces



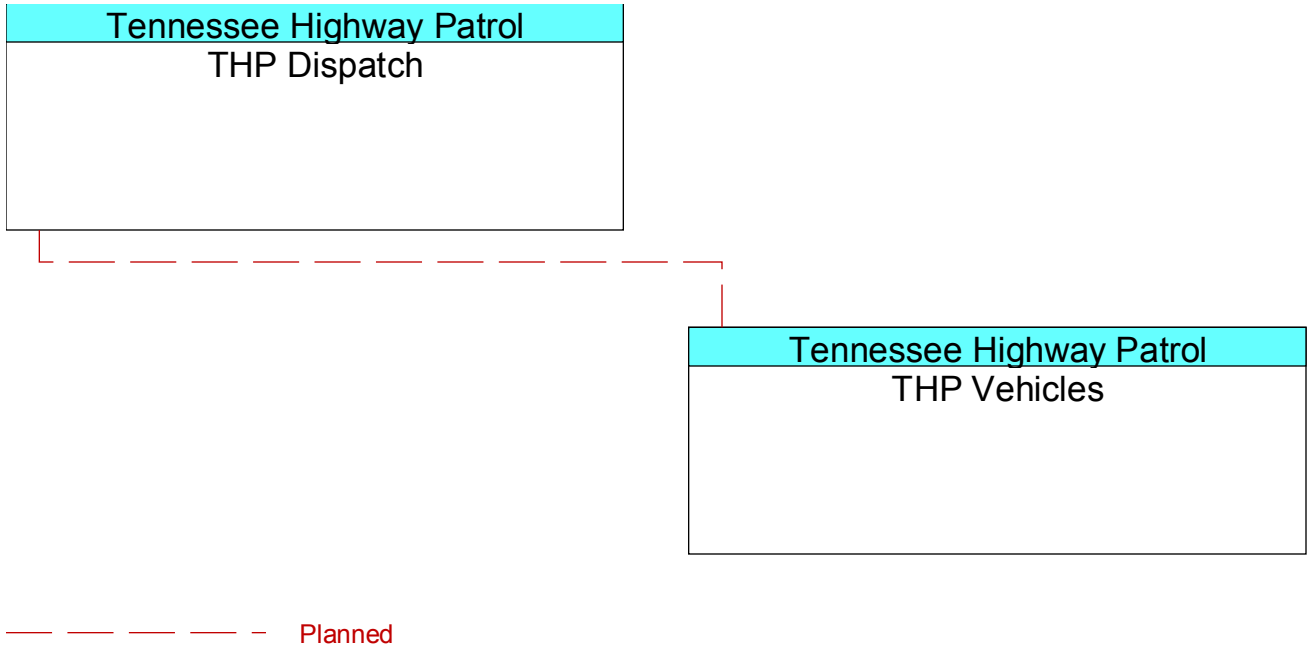
THP Enforcement Interfaces



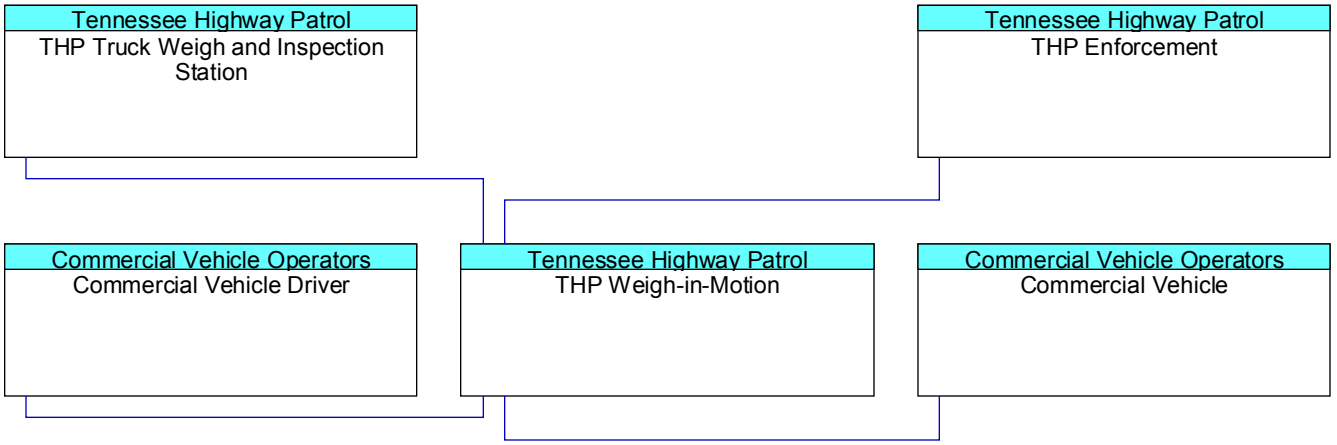
THP Truck Weigh and Inspection Station Interfaces



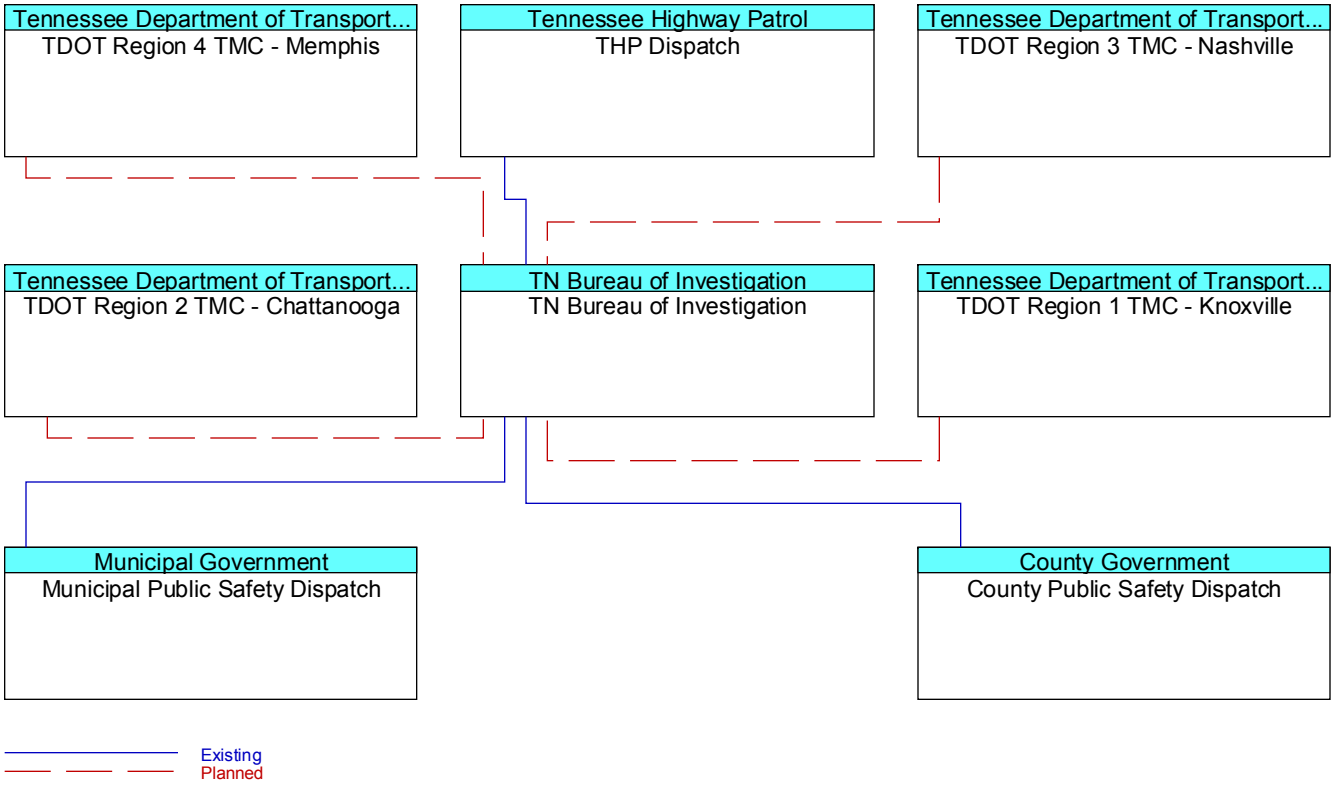
THP Vehicles Interfaces



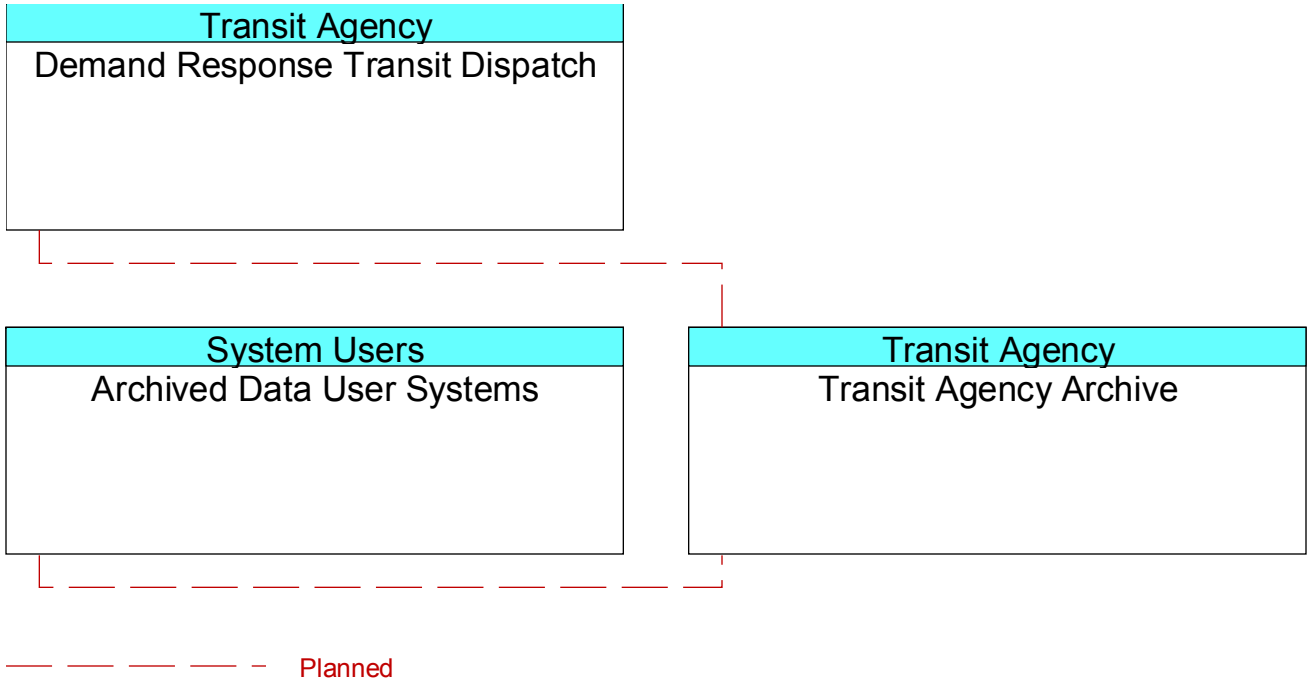
THP Weigh-in-Motion Interfaces



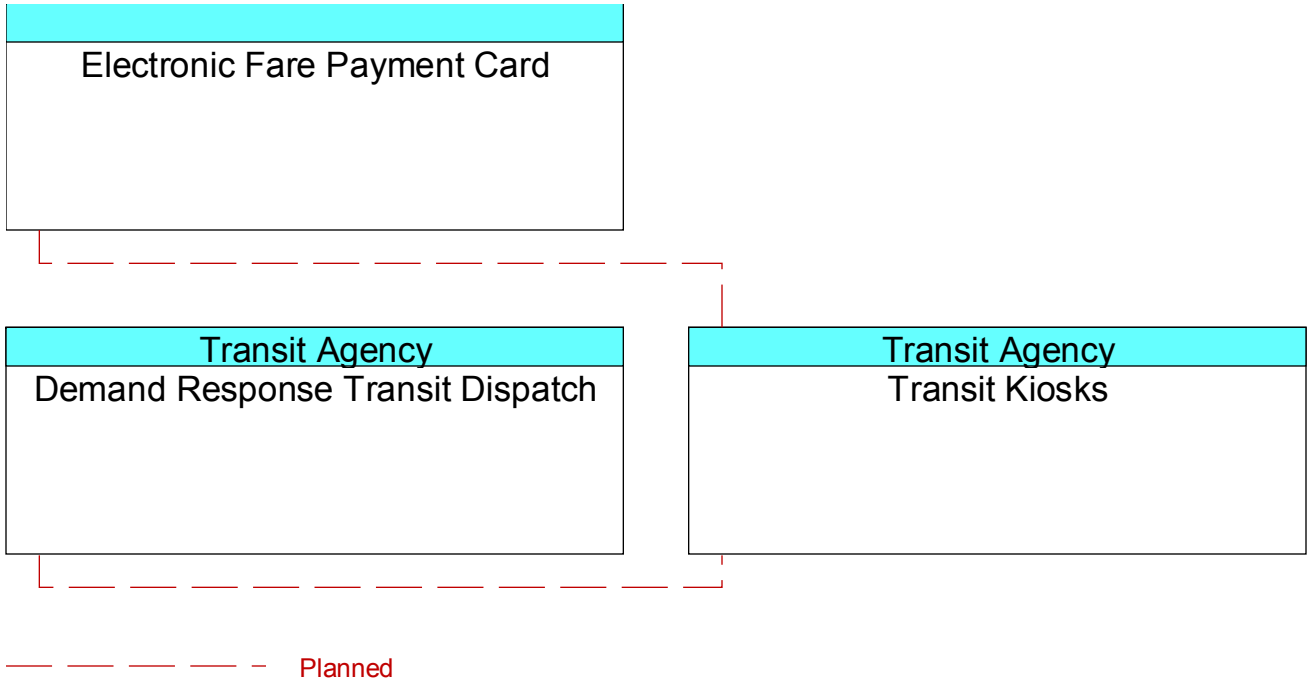
TN Bureau of Investigation Interfaces



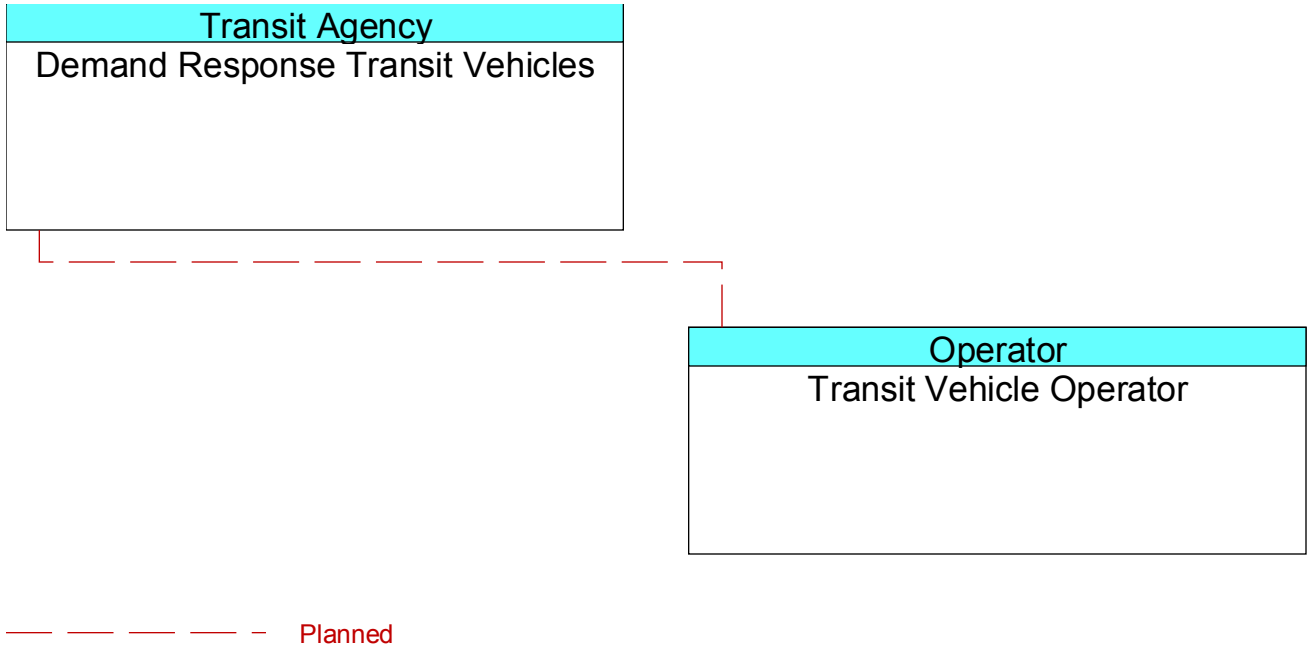
Transit Agency Archive Interfaces



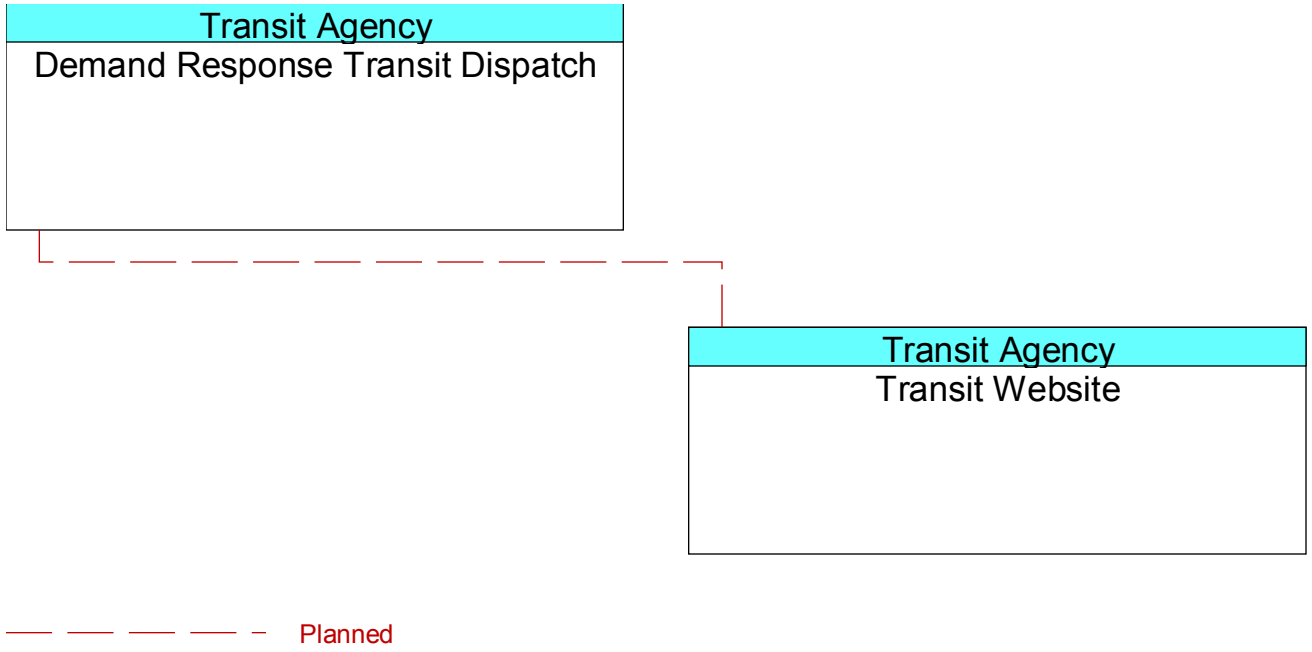
Transit Kiosks Interfaces



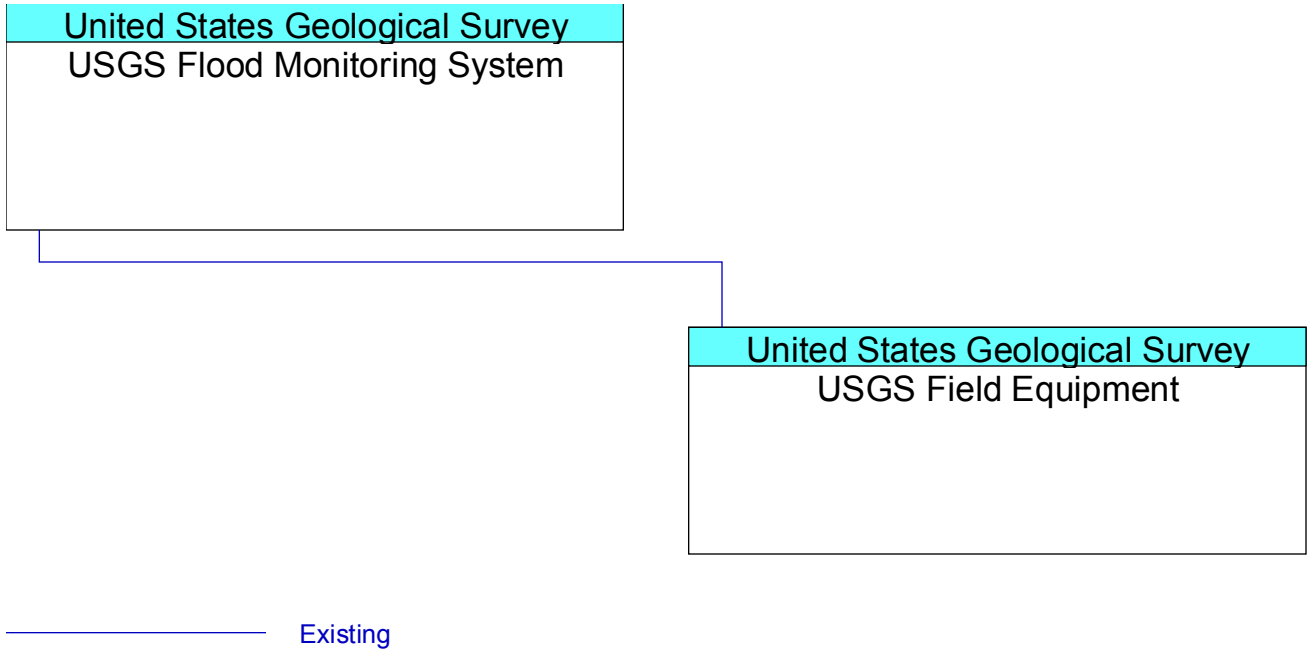
Transit Vehicle Operator Interfaces



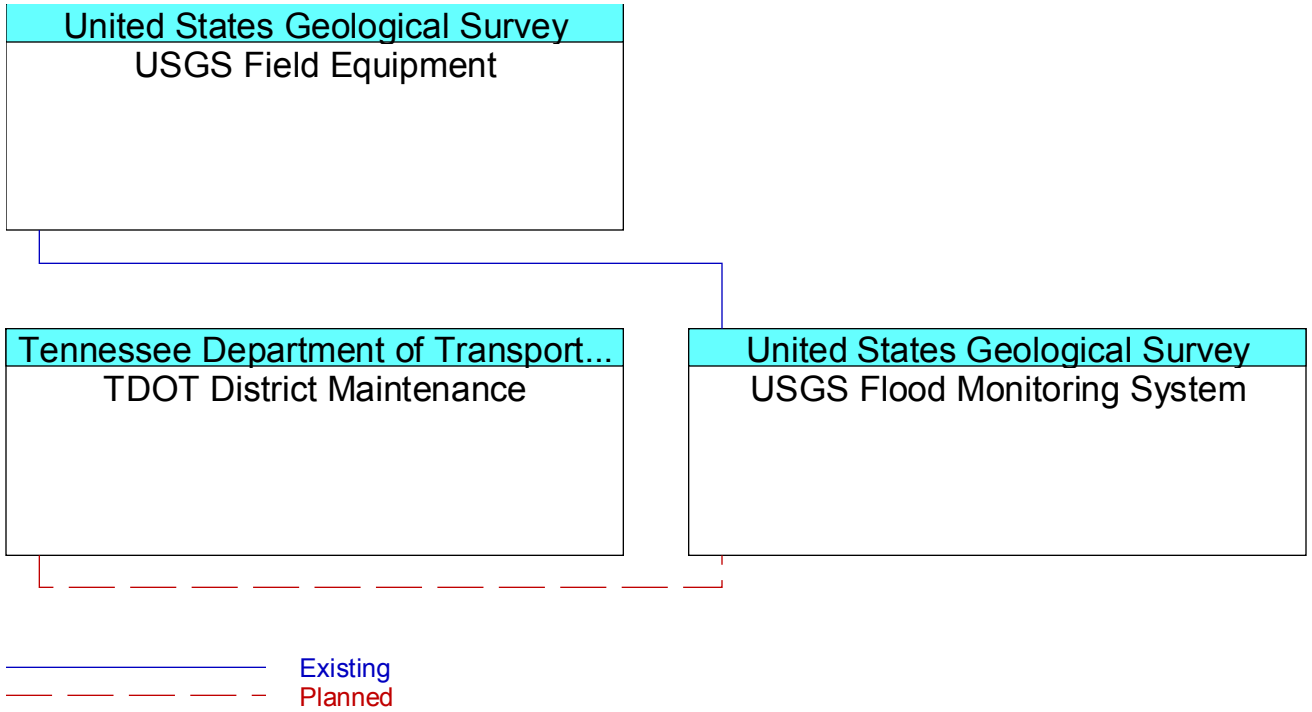
Transit Website Interfaces



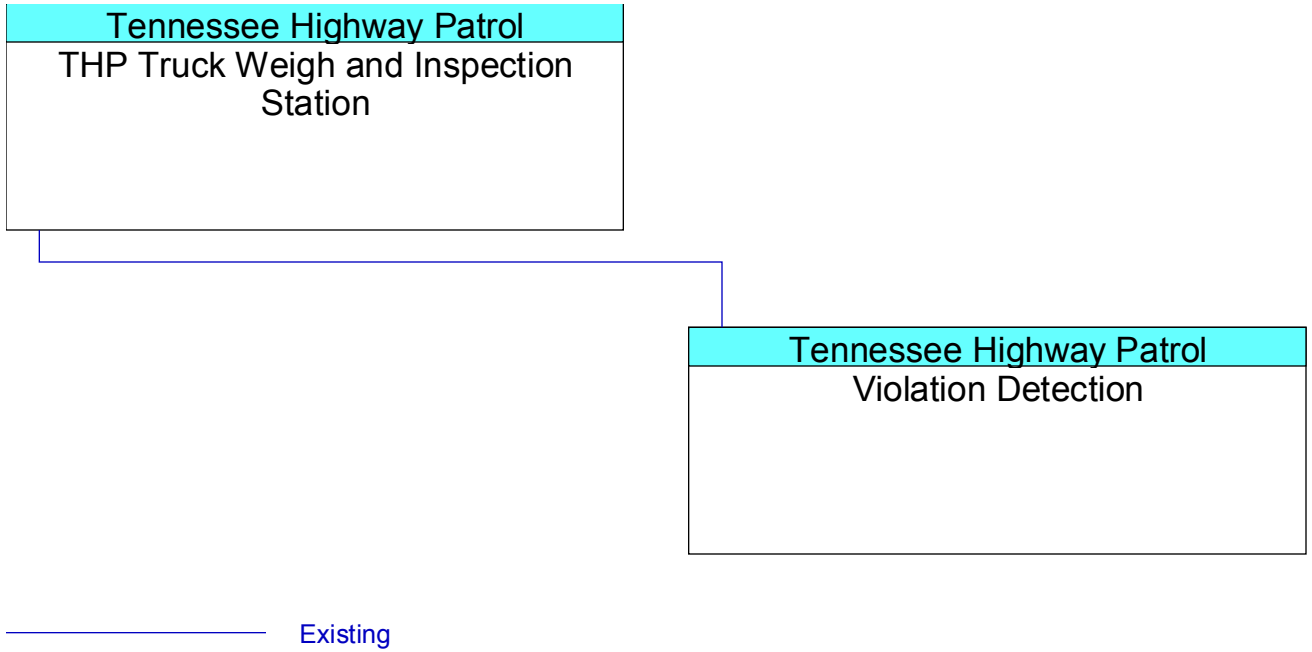
USGS Field Equipment Interfaces



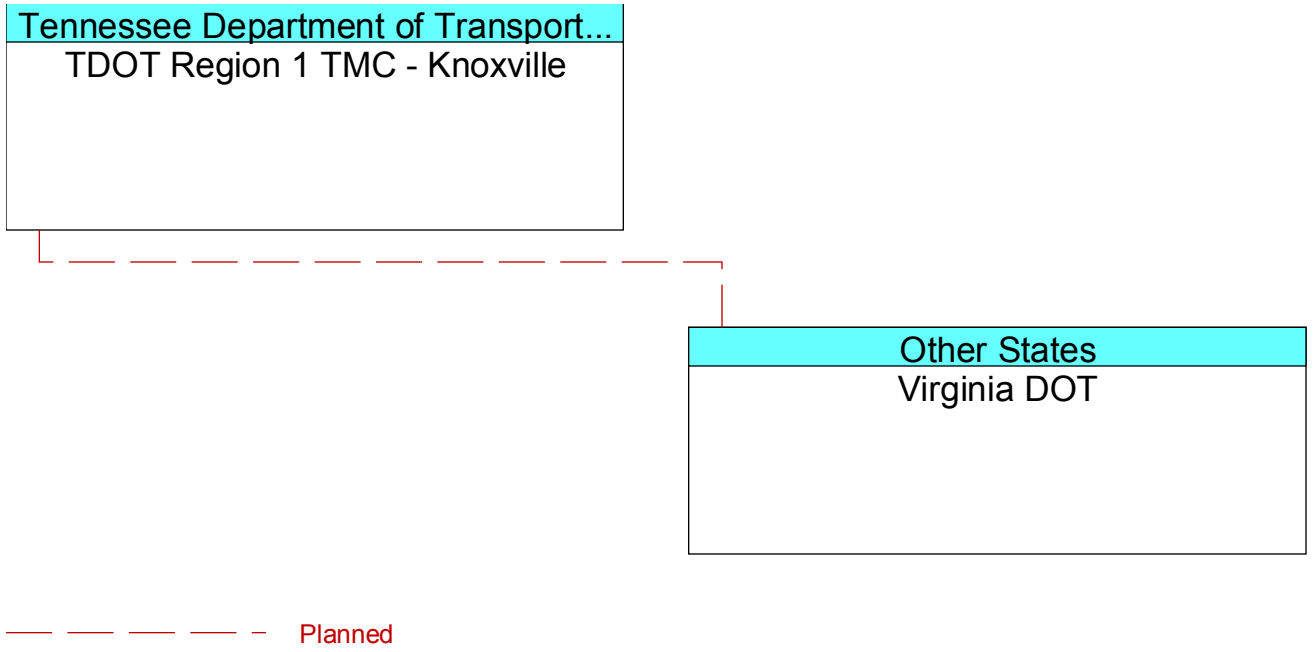
USGS Flood Monitoring System Interfaces



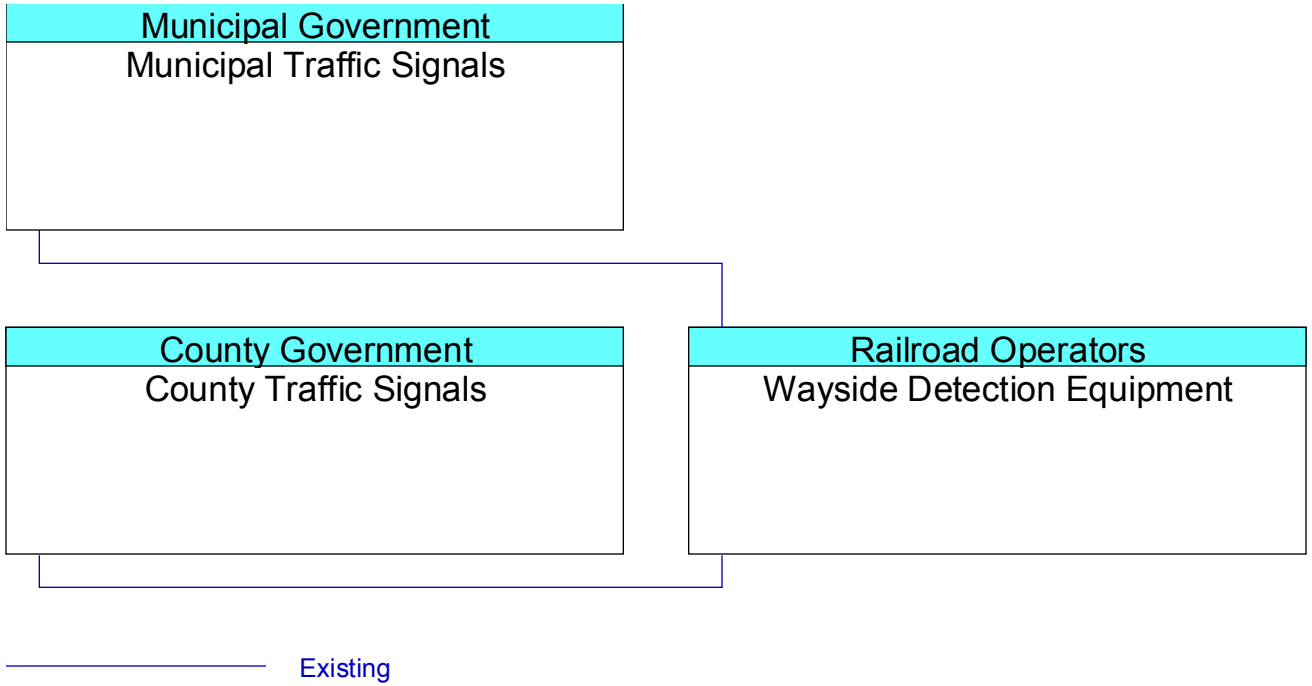
Violation Detection Interfaces



Virginia DOT Interfaces



Wayside Detection Equipment Interfaces



APPENDIX F – FUNCTIONAL REQUIREMENTS

TABLE OF CONTENTS

Element Name	Functional Area	Requirement	Status
Commercial Vehicle	On-board Cargo Monitoring	The commercial vehicle shall send notification of a hazmat spill to appropriate emergency management center in case of an incident including the information from cargo sensors, vehicle location, and the carrier identification.	Planned
	On-board CV Electronic Data	The commercial vehicle shall receive pass/pull-in messages from the roadside check facilities and present them to the driver in either audible or visual forms.	Planned
		The commercial vehicle shall respond to requests to provide data accumulated on-board the vehicle to roadside check facilities for inspection including driver logs, electronic identifiers, credentials, border clearance data, and other screening data such as cargo status, hazmat identifiers, out of service status, vehicle axle weight, vehicle weight, and time.	Planned
		The commercial vehicle shall respond to requests to provide the identity, status and other information from the electronic cargo lock tag, if so equipped, to roadside check facilities, including border crossings.	Planned
	Vehicle Location Determination	The vehicle shall calculate the location from one or more sources of position data. These location referencing systems include position systems such as GPS, DGPS, odometer, and differential odometers.	Planned
	Vehicle Mayday I/F	The vehicle shall forward a request for assistance to a center containing the driver's current location, its identity and basic vehicle data relevant to its current condition, as well as any other data, such as personal medical history, vehicle orientation, etc., that may be developed in-vehicle by other systems.	Planned
		The vehicle shall provide further details about the emergency to the center upon request from that function.	Planned
Contractor Equipment	MCV Vehicle Safety Monitoring	The maintenance and construction vehicle shall detect that a vehicle has intruded upon the boundary of a work zone. The boundary of the work zone represents an area around the maintenance and construction vehicle, which may be stationary or moving.	Planned
		The maintenance and construction vehicle shall monitor the crew movements to identify when a crew member is crossing the boundary between a work zone and vehicle traffic and issue an alert to the crew member.	Planned
		The maintenance and construction vehicle shall present work zone warnings to the field personnel using direct warning signals or in-vehicle signage functions.	Planned
		The maintenance and construction vehicle shall provide status of the work zone warning systems to the center.	Planned
		The maintenance and construction vehicle shall receive work zone warnings from the field equipment at the roadside, other maintenance and construction vehicles.	Planned

Element Name	Functional Area	Requirement	Status
Contractor Equipment (continued)	MCV Work Zone Support	The maintenance and construction vehicle shall monitor, operate, and control work zone devices located at or alongside the roadway. The devices operated on board the vehicle include driver information devices (e.g. dynamic message signs) and work zone intrusion detection and alert devices.	Planned
		The maintenance and construction vehicle shall provide an interface for field personnel to input status of their work zone activities.	Planned
County EMA	Emergency Evacuation Support	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Planned
		The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Planned
		The center shall monitor the progress of the reentry process.	Planned
		The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Planned
	Emergency Response Management	The center shall develop, coordinate with other agencies, and store emergency response plans.	Planned
		The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Planned
		The center shall provide information to the media concerning the status of an emergency response.	Planned
		The center shall provide strategic emergency response capabilities such as that of an Emergency Operations Center for large-scale incidents and disasters.	Planned
		The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and distributing response status to allied agencies.	Planned
		The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations.	Planned
		The center shall track the availability of resources (including vehicles, roadway cleanup, etc.), request additional resources from traffic, maintenance, or other emergency centers if needed.	Planned

Element Name	Functional Area	Requirement	Status
County EMA (continued)	Incident Command	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Planned
		The center shall track and maintain resource information and action plans pertaining to the incident command.	Planned
County Field Equipment	Roadway Basic Surveillance	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Planned
		The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
		The field element shall return sensor and CCTV system fault data to the controlling center for repair.	Planned
		The field element shall return sensor and CCTV system operational status to the controlling center.	Planned
	Roadway Speed Monitoring	If the speed detected by vehicle speed sensors is determined to be excessive, the field element shall provide a safe speed advisory to passing drivers via a driver information system (such as portable messages signs, etc.).	Planned
		The field element shall include sensors to detect vehicle speeds, under traffic or maintenance center control.	Planned
		The field element shall return fault data for the vehicle speed sensors to the controlling center for repair.	Planned
		The field element shall return operational status for the vehicle speed sensors to the controlling traffic or maintenance center; including measured speeds, warning messages displayed, and violation records.	Planned
County Maintenance	MCM Incident Management	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Planned
		The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Planned

Element Name	Functional Area	Requirement	Status
County Maintenance (continued)	MCM Incident Management (continued)	The center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Planned
	MCM Work Activity Coordination	The center shall collect and respond to feedback concerning scheduled maintenance and construction activities with other management centers such as traffic, emergency, transit, and rail operations.	Planned
		The center shall provide status information about scheduled maintenance and construction activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, multimodal transportation providers, rail operations, and the media.	Planned
	MCM Work Zone Management	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information providers, and the media.	Planned
	MCM Work Zone Management	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Planned
County Public Safety Dispatch	Emergency Call-Taking	The center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Planned
		The center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Planned
		The center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator.	Planned
		The center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Planned
	Emergency Dispatch	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Planned
		The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Planned

Element Name	Functional Area	Requirement	Status
County Public Safety Dispatch (continued)	Emergency Dispatch (continued)	The center shall relay location and incident details to the responding vehicles.	Planned
		The center shall store and maintain the emergency service responses in an action log.	Planned
		The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Planned
	Emergency Evacuation Support	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Planned
		The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster. TEMA is the primary oversight agency for evacuation and disaster planning.	Planned
		The center shall monitor the progress of the reentry process.	Planned
		The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Planned
		The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agenciesÆ plans.	Planned
		The center shall provide support to TEMA for inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry. All large-scale evacuations will be coordinated through TEMA and its ESC representatives, with other agencies providing support.	Planned
		The center shall provide traveler information systems with evacuation guidance on direction from TEMA.	Planned
	Emergency Response Management	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Planned
		The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and distributing response status to allied agencies.	Planned
		The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and distributing response status to allied agencies. TEMA is the centralized coordination point for large-scale incident response and emergency management activities. Municipal PSAPs will provide support to TEMA as requested.	Planned

Element Name	Functional Area	Requirement	Status
County Public Safety Dispatch (continued)	Emergency Response Management (continued)	The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations. TEMA will be the coordinating agencies for any large-scale disaster or evacuation support, and will coordinate with local public safety and transit as needed.	Planned
		The center shall track the availability of resources (including vehicles, roadway cleanup, etc.), request additional resources from traffic, maintenance, or other emergency centers if needed.	Planned
	Incident Command	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Planned
		The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Planned
County Public Safety Vehicles	On-board EV En Route Support	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Planned
		The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.	Planned
		The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Planned
		The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Planned
County TOC	Collect Traffic Surveillance	The center shall distribute road network conditions data (raw or processed) based on collected and analyzed traffic sensor and surveillance data to other centers.	Planned
		The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.	Planned
		The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Planned
	HRI Traffic Management	The center shall accept collect highway-rail intersection (HRI) advisory or alert data from rail operations centers.	Planned
		The center shall collect incident information related to a highway-rail intersection (HRI), such as intersection blockages or crashes or equipment malfunctions.	Planned

Element Name	Functional Area	Requirement	Status
County TOC (continued)	HRI Traffic Management (continued)	The center shall implement control plans to coordinate signalized intersections around highway-rail intersections (HRI), under control of center personnel, based on data from sensors and surveillance monitoring traffic conditions, incidents, equipment faults, pedestrian crossings, etc.	Planned
		The center shall provide the highway-rail intersection (HRI) equipment operational status to rail operations centers.	Planned
		The center shall remotely control highway-rail intersection (HRI) equipment located in the field.	Planned
	Rail Operations Coordination	The center shall exchange highway-rail intersection (HRI) information with rail operations centers. This information may include event schedules, requests for information from the Rail Operators, incident notification based on rail operations messages, and priority messages like notifications of a HAZMAT spill, equipment failure, or an intersection blockage.	Planned
		The center shall receive highway-rail intersection (HRI) maintenance schedules, train schedules, and incident notifications from rail operations centers.	Planned
	TMC Evacuation Support	The center shall coordinate execution of evacuation strategies with emergency management centers - including activities such as setting closures and detours, establishing routes, updating areas to be evacuated, timing the process, etc.	Planned
		The center shall coordinate execution of evacuation strategies with emergency management centers - including activities such as setting closures and detours, establishing routes, updating areas to be evacuated, timing the process, etc. County evacuation support will be at the direction of TEMA.	Planned
		The center shall coordinate information and controls with other traffic management centers.	Planned
		The center shall coordinate planning for evacuation with emergency management centers - including pre-planning activities such as establishing routes, areas to be evacuated, timing, etc.	Planned
		The center shall coordinate planning for evacuation with emergency management centers - including pre-planning activities such as establishing routes, areas to be evacuated, timing, etc. TEMA is the lead agency for coordinating emergency and evacuation planning.	Planned
		The center shall support requests from emergency management centers to preempt the current traffic control strategy, activate traffic control and closure systems such as gates and barriers, activate safeguard systems, or use driver information systems to support evacuation traffic control plans.	Planned

Element Name	Functional Area	Requirement	Status
County TOC (continued)	TMC Regional Traffic Control	The center shall exchange traffic information with other traffic management centers, includes incident information, congestion data, traffic data, signal timing plans, and real-time signal control information.	Planned
	TMC Signal Control	The center shall accept notifications of right-of-way requests from pedestrians.	Planned
		The center shall implement control plans to coordinate signalized intersections, under control of center personnel, based on data from sensors and surveillance monitoring traffic conditions, incidents, emergency vehicle preemptions, the passage of commercial vehicles with unusual loads, equipment faults, pedestrian crossings, etc.	Planned
		The center shall remotely control traffic signal controllers.	Planned
	TMC Speed Monitoring	The center shall collect operational status for the vehicle speed sensors; the status shall include logged information including measured speeds, warning messages displayed, and violation records.	Planned
	Traffic Maintenance	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.	Planned
County Traffic Signals	Roadway Basic Surveillance	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Planned
		The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
	Roadway Equipment Coordination	The field element shall include sensors (such as traffic, environmental, and work zone intrusion detection sensors) that provide data and status information to other field element devices (such as dynamic message signs, ramp meters, traffic signals, work zone intrusion alert systems), without center control.	Planned
	Roadway Signal Controls	The field element shall control traffic signals at intersections and on main highways for urban and rural areas, under center control.	Planned
		The field element shall monitor operation of traffic signal controllers and report to the center any instances in which the indicator response does not match that expected from known indicator preemptions.	Planned
		The field element shall monitor operation of traffic signal controllers and report to the center any instances in which the indicator response does not match that expected from the indicator control information.	Planned

Element Name	Functional Area	Requirement	Status
County Traffic Signals (continued)	Roadway Signal Controls (continued)	The field element shall return traffic signal controller fault data to the maintenance center for repair.	Planned
		The field element shall return traffic signal controller operational status to the controlling center.	Planned
	Standard Rail Crossing	The field element shall close the highway-rail intersection (HRI) when a train is approaching using gates, lights/signs, barriers, and traffic control signals.	Planned
		The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Planned
		The field element shall control the dynamic message signs (DMS) in the vicinity of a highway-rail intersection (HRI) to advise drivers, cyclists, and pedestrians of approaching trains.	Planned
		The field element shall forward rail traffic advisories received from the Wayside Equipment to the traffic management center.	Planned
		The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the rail wayside equipment.	Planned
		The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Planned
		The field element shall receive track status from the rail wayside equipment that can be passed on to the traffic management center. This may include the current status of the tracks and whether a train is approaching.	Planned
		The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.	Planned
CVIEW	Credentials and Taxes Administration	The center shall exchange credentials and tax information with other commercial vehicle administration centers - either in other states or the federal government.	Planned
		The center shall manage electronic credentials filing and processing for commercial vehicles.	Planned
		The center shall process requests for payments of electronic credentials and tax filing and maintain an interface to a Financial Institution.	Planned

Element Name	Functional Area	Requirement	Status
CVIEW (continued)	Credentials and Taxes Administration (continued)	The center shall provide route restrictions information, including hazmat restrictions, to other centers and agencies for distribution to commercial vehicle operators. These centers and agencies may include commercial fleet and freight management operators, traveler information centers, digital map update providers, and other commercial vehicle administration centers.	Planned
		The center shall use information on asset restrictions received from maintenance centers to develop the commercial vehicle route restrictions and process credentials applications.	Planned
		The center shall use information on asset restrictions received from maintenance centers to develop the commercial vehicle route restrictions and process credentials applications. TDOT Maintenance enters current and planned restrictions in to the TSIS database which supports a range of web, phone and other dissemination outlets. Will require coordination with THP Enforcement.	Planned
	CV Information Exchange	The center shall exchange information with roadside check facilities, including credentials and credentials status information, safety status information, daily site activity data, and citations.	Planned
		The center shall exchange safety and credentials data among other commercial vehicle administration centers; includes border clearance status, credentials information, credentials status information, and safety status information.	Planned
		The center shall provide commercial vehicle accident reports and citations to enforcement agencies.	Planned
	CV Safety Administration	The center shall notify enforcement agencies of commercial vehicle safety violations by individual commercial vehicles, drivers, or carriers.	Planned
		The center shall provide commercial vehicle safety data to roadside check facilities.	Planned
Demand Response Transit Dispatch	Transit Center Fare and Load Management	The center shall collect passenger loading and fare statistics data to implement variable and flexible fare structures.	Planned
		The center shall exchange fare and load information with other transit management centers, including potential Centralized Payments facilities.	Planned
		The center shall process requests for transit fares to be paid in advance.	Planned
		The center shall process the financial requests from the transit vehicles or roadside and manage an interface to a Financial Institution.	Planned
		The center shall provide the capability for a system operator to manage the transit fares and control the exchange of transit fare information.	Planned

Element Name	Functional Area	Requirement	Status
Demand Response Transit Dispatch (continued)	Transit Center Fare and Load Management (continued)	The center shall provide transit fare information to other centers, including traveler information providers upon request.	Planned
		The center shall support the payment of transit fare transactions using data provided by the traveler cards / payment instruments.	Planned
	Transit Center Information Services	The center shall broadcast transit advisory data, including alerts and advisories pertaining to major emergencies, or man made disasters.	Planned
		The center shall broadcast transit advisory data, including alerts and advisories pertaining to major emergencies, or man made disasters. Disaster information and advisories will originate from TEMA and be coordinated through transit operators and local public safety and emergency management as appropriate	Planned
		The center shall exchange transit schedules, real-time arrival information, fare schedules, and general transit service information with other transit organizations to support transit traveler information systems.	Planned
		The center shall provide transit service information to traveler information service providers including routes, schedules, schedule adherence, and fare information as well as transit service information during evacuation.	Planned
	Transit Center Multi-Modal Coordination	The center shall accept requests from traffic management to change routes and schedules as part of the implementation of demand management strategies.	Planned
		The center shall coordinate schedules and services between transit agencies, traffic management, maintenance and construction operations, parking management, and other surface or air transportation modes.	Planned
	Transit Center Paratransit Operations	The center shall dispatch demand response (paratransit) transit vehicles.	Planned
		The center shall disseminate up-to-date schedules and route information to other centers for demand responsive transit services (paratransit).	Planned
		The center shall generate demand response transit (including paratransit) routes and schedules based on such factors as parameters input by the system operator, what other demand responsive transit schedules have been planned, the availability and location of vehicles, the relevance of any fixed transit routes and schedules, and road network information.	Planned
		The center shall monitor the operational status of the demand response vehicles including status of passenger pick-up and drop-off.	Planned
		The center shall process trip requests for demand responsive transit services, i.e. paratransit. Sources of the requests may include traveler information service providers.	Planned

Element Name	Functional Area	Requirement	Status
Demand Response Transit Dispatch (continued)	Transit Center Security	The center shall coordinate the response to security incidents involving transit with other agencies including Emergency Management, other transit agencies, media, traffic management, and traveler information service providers.	Planned
		The center shall coordinate the response to security incidents involving transit with other agencies including Emergency Management, other transit agencies, media, traffic management, and traveler information service providers. TEMA will be the lead agency coordinating any large-scale incidents, and will communicate with transit agencies about support or response.	Planned
		The center shall exchange transit incident information along with other service data with other transit agencies.	Planned
		The center shall monitor transit vehicle operational data to determine if the transit vehicle is off-route and assess whether a security incident is occurring.	Planned
		The center shall receive information pertaining to a wide-area alert such as weather alerts, disaster situations, or child abductions. This information may come from Emergency Management or from other Alerting and Advisory Systems.	Planned
		The center shall receive reports of emergencies on-board transit vehicles entered directly be the transit vehicle operator or from a traveler through interfaces such as panic buttons or alarm switches.	Planned
		The center shall send wide-area alert information to travelers (on-board transit vehicles or at stations/stops) and transit vehicle operators.	Planned
		The center shall support the back-office portion of functionality to authenticate transit vehicle operators.	Planned
	Transit Center Vehicle Tracking	The center shall determine adherence of transit vehicles to their assigned schedule.	Planned
		The center shall monitor the locations of all transit vehicles within its network.	Planned
		The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for transit tracking and dispatch.	Planned
	Transit Data Collection	The center shall collect transit management data such as transit fares and passenger use, transit services, paratransit operations, transit vehicle maintenance data, etc.	Planned

Element Name	Functional Area	Requirement	Status
Demand Response Transit Dispatch (continued)	Transit Evacuation Support (continued)	The center shall adjust and update transit service and fare schedules and provide that information to other agencies as they coordinate evacuations.	Planned
		The center shall coordinate regional evacuation plans with Emergency Management - identifying the transit role in an evacuation and the transit resources that would be used.	Planned
		The center shall coordinate regional evacuation plans with Emergency Management - identifying the transit role in an evacuation and the transit resources that would be used. TEMA will direct any large-scale evacuation activities and coordinate with transit agencies to support.	Planned
		The center shall coordinate the use of transit and school bus fleets during an evacuation, supporting evacuation of those with special needs and the general population.	Planned
		The center shall coordinate the use of transit and school bus fleets during an evacuation, supporting evacuation of those with special needs and the general population. TEMA will direct any large-scale evacuation activities and coordinate with transit agencies to support.	Planned
		The center shall manage the use of transit resources to support evacuation and subsequent reentry of a population in the vicinity of a disaster or other emergency.	Planned
Demand Response Transit Vehicles	On-board Paratransit Operations	The transit vehicle shall manage data input to sensor(s) on-board a transit vehicle to determine the vehicle's availability for use in demand responsive and flexible-route transit services based on identity, type, and passenger capacity.	Planned
		The transit vehicle shall provide the transit vehicle operator instructions about the demand responsive or flexible-route transit schedule that has been confirmed from the center.	Planned
		The transit vehicle shall receive the status of demand responsive or flexible-route transit schedules and passenger loading from the transit vehicle operator.	Planned
	On-board Transit Fare and Load Management	The transit vehicle shall calculate the traveler's fare based on the origin and destination provided by the traveler as well as factors such as the transit routing, transit fare category, traveler history, and route-specific information.	Planned
		The transit vehicle shall detect embarking travelers on-board a transit vehicle and read data from the traveler card / payment instrument that they are carrying.	Planned
		The transit vehicle shall provide a transit fare payment interface that is suitable for travelers with physical disabilities.	Planned
		The transit vehicle shall provide passenger loading and fare statistics data to the center.	Planned

Element Name	Functional Area	Requirement	Status
Demand Response Transit Vehicles (continued)	On-board Transit Security	The transit vehicle shall accept emergency inputs from either the transit vehicle operator or a traveler through such interfaces as panic buttons, silent or audible alarms, etc.	Planned
		The transit vehicle shall be capable of disabling or enabling the transit vehicle based on commands from the center or authentic inputs from the transit vehicle operator.	Planned
		The transit vehicle shall be capable of receiving an emergency message for broadcast to the travelers or to the transit vehicle operator.	Planned
		The transit vehicle shall output an indication of potential incidents or threats and the processed video or audio information to the center along with the vehicle's current location.	Planned
		The transit vehicle shall output reported emergencies to the center.	Planned
		The transit vehicle shall perform authentication of the transit vehicle operator.	Planned
		The transit vehicle shall perform local monitoring of video or audio surveillance data collected inside of transit vehicles, and identify potential incidents or threats based on received processing parameters.	Planned
		The transit vehicle shall perform video and audio surveillance inside of transit vehicles and output raw video or audio data for either local monitoring (for processing or direct output to the transit vehicle operator), remote monitoring or for local storage (e.g., in an event recorder).	Planned
		The transit vehicle shall receive acknowledgments of the emergency request from the center and output this acknowledgment to the transit vehicle operator or to the travelers.	Planned
	On-board Transit Trip Monitoring	The transit vehicle shall compute the location of the transit vehicle based on inputs from a vehicle location determination function.	Planned
		The transit vehicle shall record transit trip monitoring data including operational status information such as doors open/closed, passenger loading, running times, etc.	Planned
		The transit vehicle shall record transit trip monitoring data including vehicle mileage and fuel usage.	Planned
Municipal Field Equipment	Roadway Basic Surveillance	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
	Roadway Equipment Coordination	The field element shall include sensors (such as traffic, environmental, and work zone intrusion detection sensors) that provide data and status information to other field element devices (such as dynamic message signs, ramp meters, traffic signals, work zone intrusion alert systems), without center control.	Planned

Element Name	Functional Area	Requirement	Status
Municipal Field Equipment (continued)	Roadway Speed Monitoring	If the speed detected by vehicle speed sensors is determined to be excessive, the field element shall provide a safe speed advisory to passing drivers via a driver information system (such as portable messages signs, etc.).	Planned
		The field element shall include sensors to detect vehicle speeds, under traffic or maintenance center control.	Planned
Municipal Maintenance	MCM Incident Management	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Planned
		The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations. TEMA oversees all large-scale incident and emergency planning and coordination.	Planned
		The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Planned
		The center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.	Planned
		The center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Planned
	MCM Work Activity Coordination	The center shall collect and respond to feedback concerning scheduled maintenance and construction activities with other management centers such as traffic, emergency, transit, and rail operations.	Planned
		The center shall provide status information about scheduled maintenance and construction activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, multimodal transportation providers, rail operations, and the media.	Planned

Element Name	Functional Area	Requirement	Status
Municipal Maintenance	MCM Work Activity Coordination (continued)	The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Planned
	MCM Work Zone Management	The center shall control the collection of work zone status information including video images from cameras located in or near the work zone.	Planned
		The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information providers, and the media.	Planned
		The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Planned
Municipal Public Safety Dispatch	Center Secure Area Alarm Support	After the alarm message becomes a verified incident, the center shall determine the appropriate response.	Planned
		After the alarm message has been received, the center shall generate an alarm acknowledgment to the sender.	Planned
		The center shall collect silent and audible alarms received from transit vehicles, originated by the traveler or the transit vehicle operator.	Planned
		The center shall determine whether the alarm message indicates an emergency that requires the attention of public safety agencies, and forward alarm message data to the appropriate agency as necessary.	Planned
		The center shall forward the alarm message to center personnel and respond to the traveler or transit vehicle operator as directed by the personnel.	Planned
	Emergency Call-Taking	The center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Planned
		The center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Planned
		The center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Planned
		The center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator.	Planned

Element Name	Functional Area	Requirement	Status
Municipal Public Safety Dispatch (continued)	Emergency Call-Taking (continued)	The center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Planned
		The center shall update the incident information log once the emergency system operator has verified the incident.	Planned
	Emergency Dispatch	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Planned
		The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Planned
		The center shall relay location and incident details to the responding vehicles.	Planned
		The center shall store and maintain the emergency service responses in an action log.	Planned
		The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Planned
	Emergency Early Warning System	The center shall broadcast wide-area alerts and advisories to traffic management centers for child abduction (AMBER alert system). The Tennessee Bureau of Investigation is the primary originator for AMBER Alert information.	Planned
		The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Planned
		The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Planned
	Emergency Evacuation Support	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Planned
		The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster. TEMA is the primary oversight agency for evacuation and disaster planning.	Planned
		The center shall monitor the progress of the reentry process.	Planned
		The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Planned
		The center shall provide support to TEMA for inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry. All large-scale evacuations will be coordinated through TEMA and its ESC representatives, with other agencies providing support.	Planned

Element Name	Functional Area	Requirement	Status
Municipal Public Safety Dispatch (continued)	Emergency Response Management	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Planned
		The center shall develop, coordinate with other agencies, and store emergency response plans.	Planned
		The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and distributing response status to allied agencies.	Planned
		The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and distributing response status to allied agencies. TEMA is the centralized coordination point for large-scale incident response and emergency management activities. Municipal PSAPs will provide support to TEMA as requested.	Planned
		The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations. TEMA will be the coordinating agencies for any large-scale disaster or evacuation support, and will coordinate with local public safety and transit as needed.	Planned
		The center shall track the availability of resources (including vehicles, roadway cleanup, etc.), request additional resources from traffic, maintenance, or other emergency centers if needed.	Planned
	Emergency Routing	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.	Planned
		The center shall receive inputs from traffic management and maintenance centers on the location and status of traffic control equipment and work zones along potential emergency routes.	Planned
		The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.	Planned
	Incident Command	The center shall assess the status of responding emergency vehicles as part of an incident command.	Planned
		The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Planned

Element Name	Functional Area	Requirement	Status
Municipal Public Safety Dispatch (continued)	Incident Command (continued)	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Planned
		The center shall track and maintain resource information and action plans pertaining to the incident command.	Planned
Municipal Public Safety Vehicles	On-board EV En Route Support	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Planned
		The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.	Planned
		The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Planned
		The emergency vehicle, including roadway service patrols, shall compute the location of the emergency vehicle based on inputs from a vehicle location determination function.	Planned
		The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Planned
		The emergency vehicle, including roadway service patrols, shall send the vehicle's location and operational data to the center for emergency management and dispatch.	Planned
Municipal TOC	Collect Traffic Surveillance	The center shall distribute road network conditions data (raw or processed) based on collected and analyzed traffic sensor and surveillance data to other centers.	Planned
		The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Planned
	HRI Traffic Management	The center shall accept collect highway-rail intersection (HRI) advisory or alert data from rail operations centers.	Planned
		The center shall collect highway-rail intersection (HRI) equipment operational status and compare against the control information sent by the center.	Planned
		The center shall collect incident information related to a highway-rail intersection (HRI), such as intersection blockages or crashes or equipment malfunctions.	Planned

Element Name	Functional Area	Requirement	Status
Municipal TOC (continued)	HRI Traffic Management (continued)	The center shall implement control plans to coordinate signalized intersections around highway-rail intersections (HRI), under control of center personnel, based on data from sensors and surveillance monitoring traffic conditions, incidents, equipment faults, pedestrian crossings, etc.	Planned
		The center shall provide the highway-rail intersection (HRI) equipment operational status to rail operations centers.	Planned
		The center shall remotely control highway-rail intersection (HRI) equipment located in the field.	Planned
	Rail Operations Coordination	The center shall exchange highway-rail intersection (HRI) information with rail operations centers. This information may include event schedules, requests for information from the Rail Operators, incident notification based on rail operations messages, and priority messages like notifications of a HAZMAT spill, equipment failure, or an intersection blockage.	Planned
		The center shall receive highway-rail intersection (HRI) maintenance schedules, train schedules, and incident notifications from rail operations centers.	Planned
	TMC Evacuation Support	The center shall coordinate planning for evacuation with emergency management centers - including pre-planning activities such as establishing routes, areas to be evacuated, timing, etc.	Planned
		The center shall coordinate planning for evacuation with emergency management centers - including pre-planning activities such as establishing routes, areas to be evacuated, timing, etc. TEMA is the lead agency for coordinating emergency and evacuation planning.	Planned
		The center shall support requests from emergency management centers to preempt the current traffic control strategy, activate traffic control and closure systems such as gates and barriers, activate safeguard systems, or use driver information systems to support evacuation traffic control plans.	Planned
	TMC Incident Dispatch Coordination/Communication	The center shall coordinate information and controls with other traffic management centers.	Planned
		The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Planned

Element Name	Functional Area	Requirement	Status
Municipal TOC (continued)	TMC Incident Dispatch Coordination/Communication (continued)	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. TEMA is the primary originating agency for information about large-scale disasters or emergencies. The information may include 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 may also identify specific information that should not be released to the public.	Planned
		The center shall exchange road network status assessment information with emergency management and maintenance centers including an 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.	Planned
		The center shall provide road network conditions and traffic images to emergency management centers, maintenance and construction centers, and traveler information service providers.	Planned
		The center shall receive inputs from emergency management and transit management centers to develop an overall status of the transportation system including emergency transit schedules in effect and current status and condition of the transportation infrastructure.	Planned
		The center shall respond to requests from emergency management to provide traffic management resources to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers.	Planned
		The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for traffic incident management.	Planned
		The center shall support requests from emergency management centers to provide special routing for emergency vehicles, and to provide responding emergency vehicles with signal preemption.	Planned
	TMC Regional Traffic Control	The center shall exchange traffic information with other traffic management centers, includes incident information, congestion data, traffic data, signal timing plans, and real-time signal control information.	Planned
	TMC Signal Control	The center shall accept notifications of right-of-way requests from pedestrians.	Planned
		The center shall collect traffic signal controller fault data from the field.	Planned

Element Name	Functional Area	Requirement	Status
Municipal TOC (continued)	TMC Signal Control (continued)	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.	Planned
		The center shall implement control plans to coordinate signalized intersections, under control of center personnel, based on data from sensors and surveillance monitoring traffic conditions, incidents, emergency vehicle preemptions, the passage of commercial vehicles with unusual loads, equipment faults, pedestrian crossings, etc.	Planned
		The center shall remotely control traffic signal controllers.	Planned
	Traffic Maintenance	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Planned
		The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.	Planned
Municipal Traffic Signals	Roadway Basic Surveillance	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
	Roadway Equipment Coordination	The field element shall include sensors (such as traffic, environmental, and work zone intrusion detection sensors) that provide data and status information to other field element devices (such as dynamic message signs, ramp meters, traffic signals, work zone intrusion alert systems), without center control.	Planned
	Roadway Signal Controls	The field element shall control traffic signals at intersections and on main highways for urban and rural areas, under center control.	Planned
		The field element shall monitor operation of traffic signal controllers and report to the center any instances in which the indicator response does not match that expected from known indicator preemptions.	Planned
		The field element shall monitor operation of traffic signal controllers and report to the center any instances in which the indicator response does not match that expected from the indicator control information.	Planned
		The field element shall return traffic signal controller fault data to the maintenance center for repair.	Planned
		The field element shall return traffic signal controller operational status to the controlling center.	Planned
	Roadway Signal Priority	The field element shall notify controlling traffic management center and maintenance center that the signal timing has changed based on a signal preemption/priority request to help those centers determine whether a fault detected at the signal is a true malfunction or due to a signal override.	Planned

Element Name	Functional Area	Requirement	Status
Municipal Traffic Signals (continued)	Roadway Signal Priority (continued)	The field element shall respond to requests for indicator (e.g., signal) preemption requests from emergency vehicles at intersections, pedestrian crossings, and multimodal crossings.	Planned
	Standard Rail Crossing	The field element shall close the highway-rail intersection (HRI) when a train is approaching using gates, lights/signs, barriers, and traffic control signals.	Planned
		The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Planned
		The field element shall forward rail traffic advisories received from the Wayside Equipment to the traffic management center.	Planned
		The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the rail wayside equipment.	Planned
		The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Planned
		The field element shall receive track status from the rail wayside equipment that can be passed on to the traffic management center. This may include the current status of the tracks and whether a train is approaching.	Planned
		The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.	Planned
Other TDOT Region Construction Offices	MCM Work Activity Coordination	The center shall collect and respond to feedback concerning scheduled maintenance and construction activities with other management centers such as traffic, emergency, transit, and rail operations.	Planned
		The center shall provide status information about scheduled maintenance and construction activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, multimodal transportation providers, rail operations, and the media.	Planned
		The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Planned

Element Name	Functional Area	Requirement	Status
Other TDOT Region Construction Offices (continued)	MCM Work Zone Management	The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Planned
		The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Planned
Other TDOT Region Maintenance	MCM Work Activity Coordination	The center shall provide status information about scheduled maintenance and construction activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, multimodal transportation providers, rail operations, and the media.	Planned
		The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Planned
	MCM Work Zone Management	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Planned
Private Traveler Personal Computing Devices	Personal Basic Information Reception	The personal traveler interface shall receive evacuation information from a center and present it to the traveler.	Planned
		The personal traveler interface shall receive traffic information from a center and present it to the traveler.	Planned
		The personal traveler interface shall receive wide-area alerts and present it to the traveler.	Planned
	Personal Interactive Information Reception	The personal traveler interface shall receive evacuation information from a center and present it to the traveler.	Planned
		The personal traveler interface shall receive traffic information from a center and present it to the traveler upon request.	Planned
		The personal traveler interface shall receive wide-area alerts and present it to the traveler.	Planned

Element Name	Functional Area	Requirement	Status
Regional Amber Alert Network	Emergency Early Warning System	The center shall broadcast wide-area alerts and advisories to other emergency management centers for child abduction (AMBER alert system). Tennessee Bureau of Investigation will coordinate activities of other public safety agencies for AMBER Alert responses.	Existing
		The center shall broadcast wide-area alerts and advisories to traffic management centers for child abduction (AMBER alert system).	Existing
		The center shall broadcast wide-area alerts and advisories to traffic management centers for child abduction (AMBER alert system). The Tennessee Bureau of Investigation is the primary originator for AMBER Alert information.	Existing
		The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
		The center shall broadcast wide-area alerts and advisories to traveler information service providers for child abduction (AMBER alert system). The Tennessee Bureau of Investigation is the primary originator for AMBER Alerts.	Existing
		The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
		The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Planned
		The center shall process status information from each of the centers that have been sent the wide-area alert.	Planned
		The center shall support the entry of alert and advisory information directly from the emergency system operator.	Planned
Regional Toll Authority	Toll Administration	For electronic toll payments requiring financial payment, the center shall process the financial information from toll plazas and manage an interface to a Financial Institution.	Planned
		The center shall manage toll transactions, including maintaining a log of all transactions and toll pricing structure information.	Planned
		The center shall support toll transactions by commercial fleet operators.	Planned

Element Name	Functional Area	Requirement	Status
Regional Toll Authority Toll Plazas	Toll Plaza Toll Collection	The field element shall calculate the toll due based on the vehicle characteristics (vehicle size, weight, axle count, etc.), tag data, and stored toll prices.	Planned
		The field element shall control roadside displays indicating success or failure of the toll transaction to the driver.	Planned
		The field element shall read data from vehicle toll tags to support toll payment transactions.	Planned
		The field element shall read the credit identity on the toll tag and send that identity and the amount to be debited to a center.	Planned
		The field element shall respond to changes in tolls from the Toll Operator.	Planned
		The field element shall support advanced toll payment by checking the vehicle's toll tag information against a stored list of advanced payments, and debiting the toll from the list in the case of a match.	Planned
		The field element shall update the toll tag value after debiting the toll amount and send a record of the transaction to a center.	Planned
Regional Websites	ISP Emergency Traveler Information	The center shall collect and provide to the traveler interface systems emergency evacuation information, including evacuation zones, shelter information, available transportation modes, road closures and detours, changes to transit services, and traffic and road conditions at the origin, destination, and along the evacuation routes.	Planned
		The center shall collect and provide wide-area alert information to the traveler interface system with region-specific data, including major emergencies such as a natural or man-made disaster, civil emergency, child abductions, severe weather watches and warnings, military activities, and law enforcement warnings.	Planned
	ISP Traveler Data Collection	The center shall collect, process, and store event information.	Planned
		The center shall collect, process, and store traffic and highway condition information, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.	Planned
		The center shall collect, process, and store weather information.	Planned
TDOT Anti-icing Equipment	Roadway Automated Treatment	The field element shall activate automated roadway treatment systems based on environmental or atmospheric conditions. Treatments can be in the form of fog dispersion, anti-icing chemicals, etc.	Planned
		The field element shall activate automated roadway treatment systems under center control. Treatments can be in the form of fog dispersion, anti-icing chemicals, etc.	Planned
		The field element shall return automated roadway treatment system and associated environmental sensor fault data to the maintenance center for repair.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Anti-icing EQUIPMENT (continued)	Roadway Automated Treatment (continued)	The field element shall return automated roadway treatment system and associated environmental sensor operational status to the TMC.	Planned
	Roadway Equipment Coordination	The field element shall include devices (such as arterial or freeway controllers, roadway automated treatment systems, barrier and safeguard systems, emissions or pollution systems, and work zone intrusion alert systems) that provide data and status information to other field element devices (such as dynamic message signs, traffic controllers on adjacent intersections), without center control.	Planned
		The field element shall include devices (such as arterial or freeway controllers, roadway automated treatment systems, barrier and safeguard systems, emissions or pollution systems, and work zone intrusion alert systems) that receive control information from other field element devices, without center control.	Planned
	Roadway Traffic Information Dissemination	The field element shall include driver information systems that communicate directly from a center to the vehicle radio (such as Highway Advisory Radios) for dissemination of traffic and other information to drivers, under center control.	Planned
		The field element shall include dynamic messages signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Planned
		The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair.	Planned
		The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center.	Planned
TDOT CCTV	Roadway Basic Surveillance	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Planned
		The field element shall return sensor and CCTV system fault data to the controlling center for repair.	Planned
		The field element shall return sensor and CCTV system operational status to the controlling center.	Planned
	Roadway Work Zone Traffic Control	The field element shall collect, process, and send work zone images to the center for further analysis and distribution, under center control.	Planned
		The field element shall provide fault data for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center for repair.	Planned
		The field element shall provide operational status for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Data Warehouse	Government Reporting Systems Support	The center shall provide data from an ITS archive to federal, state, or local government reporting systems.	Planned
		The center shall provide the applicable meta-data for any ITS archived data to satisfy government reporting system requests. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.	Planned
		The center shall provide the capability to format data from an ITS archive suitable for input into government reports.	Planned
		The center shall provide the capability to select data from an ITS archive for use in government reports.	Planned
		The center shall support requests for ITS archived data from Government Reporting Systems.	Planned
	ITS Data Repository	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).	Planned
		The center shall collect data to be archived from one or more data sources.	Planned
		The center shall include capabilities for archive to archive coordination.	Planned
		The center shall include capabilities for error notification on the incoming archived data.	Planned
		The center shall perform quality checks on received data.	Planned
		The center shall provide the capability to execute methods on the incoming data such as cleansing, summarizations, aggregations, or transformations applied to the data before it is stored in the archive.	Planned
		The center shall respond to requests from the administrator interface function to maintain the archive data.	Planned
		The center shall store the archived data in a focused repository that is suited to a particular set of ITS data users.	Planned
		The center shall support a broad range of archived data management implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Data Warehouse (continued)	On-Line Analysis and Mining	The center shall provide the capability to perform activities such as data mining, data fusion, summarizations, aggregations, and recreation from archive data. This may include multidimensional analysis, selective summarization and expansion of data details, and many other advanced analysis services.	Planned
		The center shall receive the user's systems requests and develop the request to retrieve the data from the archive.	Planned
		The center shall respond to users systems requests for a catalog of the archived data analysis products available.	Planned
		The center shall support the interface with Archive Data User Systems for requests for analysis of the archive data.	Planned
	Traffic and Roadside Data Archival	The center shall collect environmental sensor information that from roadside devices.	Planned
		The center shall collect traffic sensor information from roadside devices.	Planned
TDOT District Maintenance	MCM Automated Treatment System Control	The center shall accept requests for automated roadway treatment system activation from center personnel.	Planned
		The center shall collect automated roadway treatment system and associated environmental sensor fault data and request repair.	Planned
		The center shall collect automated roadway treatment system and associated environmental sensor operational status.	Planned
		The center shall remotely control automated roadway treatment systems. Treatments can be in the form of fog dispersion, anti-icing chemicals, etc.	Planned
		The center shall remotely control the environmental sensors that upon detecting changes in environmental or atmospheric conditions, automatically activate roadway treatment systems.	Planned
	MCM Environmental Information Collection	The center shall collect fault data for the roadside and vehicle-based environmental sensor equipment for repair.	Planned
		The center shall collect operational status for the roadside and vehicle-based environmental sensor equipment.	Planned
		The center shall provide weather and road condition information to weather service providers and center personnel.	Planned
		The center shall remotely control environmental sensors that measure road surface temperature, moisture, icing, salinity, and other measures.	Planned
		The center shall remotely control environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.	Planned

Element Name	Functional Area	Requirement	Status
TDOT District Maintenance (continued)	MCM Environmental Information Processing	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services) and local environmental sensor data.	Planned
		The center shall disseminate current and forecasted road weather and road condition information to weather service providers (such as the National Weather Service and value-added sector specific meteorological services) as well as other agencies including traffic, emergency, and transit management, traveler information providers, rail operations centers, media, and other maintenance management centers.	Planned
		The center shall respond to control data from center personnel regarding environmental sensor control and weather data collection and processing.	Planned
		The center shall use the various data inputs of environmental sensors and road weather data to develop a view of current and predicted road weather and road conditions.	Planned
	MCM Incident Management	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Planned
		The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Planned
		The center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.	Planned
		The center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Planned
	MCM Maintenance Decision Support	The center shall provide dispatch information to maintenance and construction vehicles based on the outputs of the decision support system, including recommended roadway treatment actions.	Planned
		The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.	Planned

Element Name	Functional Area	Requirement	Status
TDOT District Maintenance (continued)	MCM Roadway Maintenance and Construction	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Planned
		The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Planned
		The center shall dispatch and route maintenance and construction vehicle drivers and support them with route- specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Planned
		The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	Planned
		The center shall remotely control and collect data from infrastructure monitoring sensors located along the roadway infrastructure or on maintenance and construction vehicles.	Planned
		The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.	Planned
		The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for the scheduling of roadway maintenance and construction activities.	Planned
		The center shall track the status of roadway maintenance and construction activities by monitoring collected data from the dispatched vehicles and equipment.	Planned
	MCM Vehicle Tracking	The center shall monitor the locations of all maintenance and construction vehicles and other equipment under its jurisdiction.	Planned
		The center shall present location data to center personnel for the fleet of maintenance and construction vehicles and other equipment.	Planned
		The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for maintenance and construction vehicle tracking.	Planned

Element Name	Functional Area	Requirement	Status
TDOT District Maintenance (continued)	MCM Work Zone Management	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information providers, and the media.	Planned
		The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Planned
TDOT DMS	Roadway Traffic Information Dissemination	The field element shall include dynamic messages signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Planned
		The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair.	Planned
		The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center.	Planned
TDOT Emergency Services Coordinator	Emergency Evacuation Support	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Planned
		The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster. TEMA is the primary oversight agency for evacuation and disaster planning.	Planned
		The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Planned
		The center shall provide support to TEMA for inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry. All large-scale evacuations will be coordinated through TEMA and its ESC representatives, with other agencies providing support.	Planned
	Emergency Response Management	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Planned
		The center shall assimilate the status of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Planned
		The center shall develop, coordinate with other agencies, and store emergency response plans.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Emergency Services Coordinator (continued)	Emergency Response Management (continued)	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Planned
		The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations.	Planned
		The center shall track the availability of resources (including vehicles, roadway cleanup, etc.), request additional resources from traffic, maintenance, or other emergency centers if needed.	Planned
	Incident Command	The center shall provide tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders to support local management of an incident.	Planned
		The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Planned
TDOT Field Sensors	Field Barrier System Control	The field element shall activate barrier systems for transportation facilities and infrastructure under center control. Barrier systems include automated or remotely controlled gates, barriers and other systems that manage entry to roadways.	Planned
		The field element shall return barrier system operational status to the controlling center.	Planned
	Roadway Basic Surveillance	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Existing
		The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Existing
		The field element shall return sensor and CCTV system fault data to the controlling center for repair.	Planned
		The field element shall return sensor and CCTV system operational status to the controlling center.	Planned
	Roadway Equipment Coordination	The field element shall include devices (such as arterial or freeway controllers, roadway automated treatment systems, barrier and safeguard systems, emissions or pollution systems, and work zone intrusion alert systems) that provide data and status information to other field element devices (such as dynamic message signs, traffic controllers on adjacent intersections), without center control.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Field Sensors (continued)	Roadway Equipment Coordination (continued)	The field element shall include sensors (such as traffic, environmental, and work zone intrusion detection sensors) that provide data and status information to other field element devices (such as dynamic message signs, ramp meters, traffic signals, work zone intrusion alert systems), without center control.	Planned
		The field element shall include sensors (such as traffic, environmental, and work zone intrusion detection sensors) that receive control information from other field element devices, without center control.	Planned
	Roadway Work Zone Traffic Control	The field element shall collect, process, and send work zone images to the center for further analysis and distribution, under center control.	Planned
TDOT HAR	Roadway Traffic Information Dissemination	The field element shall include driver information systems that communicate directly from a center to the vehicle radio (such as Highway Advisory Radios) for dissemination of traffic and other information to drivers, under center control.	Existing
		The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair.	Existing
		The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center.	Existing
TDOT HELP Dispatch	Service Patrol Management	The center shall dispatch roadway service patrol vehicles to identified incident locations.	Existing
		The center shall share incident information collected by the service patrol with traffic, maintenance and construction, and traveler information centers for incident management, incident notification to travelers, and incident cleanup.	Existing
		The center shall store the current status of all service patrol vehicles available for dispatch and those that have been dispatched.	Planned
		The center shall track the location and status of service patrol vehicles.	Planned
TDOT HELP Vehicles	On-board EV En Route Support	HELP vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Planned
		HELP vehicles shall compute the vehicle location based on inputs from a vehicle location determination function.	Planned
		HELP vehicles shall receive incident details and a suggested route when dispatched to a scene.	Planned
		HELP vehicles shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Planned

Element Name	Functional Area	Requirement	Status
TDOT HELP Vehicles (continued)	On-board EV En Route Support (continued)	HELP vehicles shall send the vehicle's location and operational data to the center for emergency management and dispatch.	Planned
	On-board EV Incident Management Communication	HELP vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Planned
		HELP vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Planned
TDOT Maintenance Headquarters	MCM Environmental Information Collection	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services), data from traffic, emergency, and transit management, traveler information providers, and environmental data collected from sensors deployed on and about the roadway as well as the fleet of maintenance and construction vehicles.	Planned
		The center shall provide weather and road condition information to weather service providers and center personnel.	Planned
	MCM Maintenance Decision Support	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.	Planned
		The center shall tailor the decision support information to include filtering (selection from a large amount of external information), error reduction ('smoothing' the information), fusion (combination of disparate information to match the decision needs), and analysis (creating the decision).	Planned
TDOT Maintenance Vehicles	MCV Roadway Maintenance and Construction	The maintenance and construction vehicle shall monitor materials information including remaining quantity and current application rate of materials on the vehicle.	Planned
		The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Planned
		The maintenance and construction vehicle shall track the location and status of safety systems on-board the vehicle.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Maintenance Vehicles (continued)	MCV Vehicle Location Tracking	The maintenance and construction vehicle shall compute the location of the vehicle based on inputs from a vehicle location determination function.	Planned
		The maintenance and construction vehicle shall send the time stamped vehicle location to the controlling center.	Planned
	MCV Vehicle Safety Monitoring	The maintenance and construction vehicle shall present work zone warnings to the field personnel using direct warning signals or in-vehicle signage functions.	Planned
		The maintenance and construction vehicle shall provide status of the work zone warning systems to the center.	Planned
		The maintenance and construction vehicle shall receive work zone warnings from the field equipment at the roadside, other maintenance and construction vehicles.	Planned
	MCV Work Zone Support	The maintenance and construction vehicle shall collect inputs from field personnel and from work zone devices on-board the maintenance and construction vehicle and send them to the controlling center.	Planned
		The maintenance and construction vehicle shall monitor, operate, and control work zone devices located at or alongside the roadway. The devices operated on board the vehicle include driver information devices (e.g. dynamic message signs) and work zone intrusion detection and alert devices.	Planned
		The maintenance and construction vehicle shall provide an interface for field personnel to input status of their work zone activities.	Planned
TDOT Public Information Office	Basic Information Broadcast	The center shall collect, process, store, and disseminate maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities.	Planned
		The center shall collect, process, store, and disseminate traffic and highway condition information to travelers, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.	Planned
	ISP Traveler Data Collection	The center shall collect, process, and store event information.	Planned
TDOT Region Construction Office	MCM Work Activity Coordination	The center shall collect and disseminate asset restriction information 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.	Planned
		The center shall collect and respond to feedback concerning scheduled maintenance and construction activities with other management centers such as traffic, emergency, transit, and rail operations.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Region Construction Office (continued)	MCM Work Activity Coordination (continued)	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance and construction activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Planned
		The center shall provide status information about scheduled maintenance and construction activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, multimodal transportation providers, rail operations, and the media.	Planned
		The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Planned
	MCM Work Zone Management	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information providers, and the media.	Planned
		The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Planned
		The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Planned
TDOT Region Maintenance	MCM Environmental Information Collection	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services), data from traffic, emergency, and transit management, traveler information providers, and environmental data collected from sensors deployed on and about the roadway as well as the fleet of maintenance and construction vehicles.	Planned
		The center shall collect fault data for the roadside and vehicle-based environmental sensor equipment for repair.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Region Maintenance (continued)	MCM Environmental Information Collection	The center shall collect operational status for the roadside and vehicle-based environmental sensor equipment.	Planned
		The center shall provide weather and road condition information to weather service providers and center personnel.	Planned
		The center shall remotely control environmental sensors that measure road surface temperature, moisture, icing, salinity, and other measures.	Planned
		The center shall remotely control environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.	Planned
		The center shall respond to control data from center personnel regarding environmental sensor control and weather data collection and processing.	Planned
	MCM Environmental Information Processing	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services) and local environmental sensor data.	Planned
		The center shall disseminate current and forecasted road weather and road condition information to weather service providers (such as the National Weather Service and value-added sector specific meteorological services) as well as other agencies including traffic, emergency, and transit management, traveler information providers, rail operations centers, media, and other maintenance management centers.	Planned
		The center shall respond to control data from center personnel regarding environmental sensor control and weather data collection and processing.	Planned
		The center shall use the various data inputs of environmental sensors and road weather data to develop a view of current and predicted road weather and road conditions.	Planned
	MCM Incident Management	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations. TEMA oversees all large-scale incident and emergency planning and coordination.	Planned
		The center shall exchange road network status assessment information with emergency management and traffic management centers including an 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.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Region Maintenance (continued)	MCM Incident Management (continued)	The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Planned
		The center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.	Planned
		The center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System. TEMA is the responsible state agency for coordinating and distributing large-scale emergency or disaster information to other agencies.	Planned
		The center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Planned
	MCM Roadway Maintenance and Construction	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Planned
		The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Planned
		The center shall collect the status and fault data from traffic management centers, including data for traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Planned
		The center shall dispatch and route maintenance and construction vehicle drivers and support them with route- specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Region Maintenance (continued)	MCM Roadway Maintenance and Construction (continued)	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Planned
		The center shall maintain an interface with asset management systems to track the inventory, restrictions, repair needs and status updates of transportation assets (pavement, bridges, signs, etc.) including location, installation and materials information, vendor/contractor, current maintenance status, standard height, width, and weight restrictions.	Planned
		The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	Planned
		The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.	Planned
		The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as a background for the scheduling of roadway maintenance and construction activities.	Planned
		The center shall track the status of roadway maintenance and construction activities by monitoring collected data from the dispatched vehicles and equipment.	Planned
	MCM Work Activity Coordination	The center shall collect and respond to feedback concerning scheduled maintenance and construction activities with other management centers such as traffic, emergency, transit, and rail operations.	Planned
		The center shall exchange information with administrative systems to support the planning and scheduling of maintenance and construction activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Region Maintenance (continued)	MCM Work Activity Coordination (continued)	The center shall provide status information about scheduled maintenance and construction activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, multimodal transportation providers, rail operations, and the media.	Planned
		The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Planned
	MCM Work Zone Management	The center shall control the collection of work zone status information including video images from cameras located in or near the work zone.	Planned
		The center shall control traffic in work zones by providing remote control of dynamic message signs, highway advisory radio systems, gates, and barriers located in or near the work zone.	Planned
		The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information providers, and the media.	Planned
		The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Planned
		The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Planned
TDOT RWIS Sensors	Roadway Environmental Monitoring	The field element shall include environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.	Existing
		The field element shall include surface and sub-surface environmental sensors that measure road surface temperature, moisture, icing, salinity, and other measures.	Existing
		The field element shall provide environmental sensor equipment fault indication to the controlling center.	Existing
		The field element shall provide environmental sensor equipment operational status to the controlling center.	Existing

Element Name	Functional Area	Requirement	Status
TDOT RWIS Sensors (continued)	Roadway Environmental Monitoring (continued)	The field element shall provide weather and road surface condition data to centers.	Existing
		The field element's environmental sensors shall be remotely controlled by a maintenance center.	Existing
TDOT Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	The field element shall be remotely controlled by a center.	Planned
		The field element shall include infrastructure condition and integrity monitoring sensors.	Planned
		The field element shall include security sensors that monitor conditions of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Planned
		The field element shall provide equipment status and fault indication of security sensor equipment to a center.	Planned
		The field element shall remotely process security sensor data and provide an indication of potential incidents or threats to a center.	Planned
TDOT Short Range Planning and Data Office	Government Reporting Systems Support	The center shall provide data from an ITS archive to federal, state, or local government reporting systems.	Planned
		The center shall provide the applicable meta-data for any ITS archived data to satisfy government reporting system requests. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.	Planned
		The center shall provide the capability to format data from an ITS archive suitable for input into government reports.	Planned
		The center shall provide the capability to select data from an ITS archive for use in government reports.	Planned
		The center shall support requests for ITS archived data from Government Reporting Systems.	Planned
	ITS Data Repository	For archive data requiring financial payment, the center shall process the financial requests and manage an interface to a Financial Institution.	Planned
		The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).	Planned

Element Name	Functional Area	Requirement	Status
TDOT Short Range Planning and Data Office (continued)	ITS Data Repository (continued)	The center shall collect data to be archived from one or more data sources.	Planned
		The center shall include capabilities for archive to archive coordination.	Planned
		The center shall include capabilities for error notification on the incoming archived data.	Planned
		The center shall include capabilities for performing quality checks on the incoming archived data.	Planned
		The center shall perform quality checks on received data.	Planned
		The center shall provide the capability to execute methods on the incoming data such as cleansing, summarizations, aggregations, or transformations applied to the data before it is stored in the archive.	Planned
		The center shall respond to requests from the administrator interface function to maintain the archive data.	Planned
		The center shall store the archived data in a focused repository that is suited to a particular set of ITS data users.	Planned
		The center shall support a broad range of archived data management implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region.	Planned
		When data or a catalog of data is received from the archive, the center shall generate the requested data product for the users systems.	Planned
TDOT Smart Work Zone Equipment	Roadway Equipment Coordination	The field element shall include devices (such as arterial or freeway controllers, roadway automated treatment systems, barrier and safeguard systems, emissions or pollution systems, and work zone intrusion alert systems) that provide data and status information to other field element devices (such as dynamic message signs, traffic controllers on adjacent intersections), without center control.	Planned
		The field element shall include sensors (such as traffic, environmental, and work zone intrusion detection sensors) that provide data and status information to other field element devices (such as dynamic message signs, ramp meters, traffic signals, work zone intrusion alert systems), without center control.	Planned

Element Name	Functional Area	Requirement	Status
TDOT Smart Work Zone Equipment (continued)	Roadway Work Zone Safety	The field element shall include work zone intrusion alerting devices that alert crew workers of 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.	Planned
		The field element shall include work zone intrusion alerting devices that alert drivers that they have intruded upon the perimeter of the work zone, or are about to do so; may provide alerts to drivers directly or via in-vehicle signing.	Planned
		The field element shall include work zone intrusion alerting devices that notify crew via maintenance vehicles of 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.	Planned
		The field element shall include work zone intrusion detection devices that detect when a vehicle has intruded upon the boundary of a work zone, under center control.	Planned
		The field element shall provide fault data for the work zone intrusion alerting devices to the maintenance center for repair.	Planned
		The field element shall provide fault data for the work zone intrusion detection devices to the maintenance center for repair.	Planned
		The field element shall provide operational status for the work zone intrusion alerting devices to the maintenance center.	Planned
		The field element shall provide operational status for the work zone intrusion detection devices to the maintenance center.	Planned
	Roadway Work Zone Traffic Control	The field element shall collect, process, and send work zone images to the center for further analysis and distribution, under center control.	Planned
		The field element shall provide fault data for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center for repair.	Planned
		The field element shall provide operational status for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center.	Planned
		Under the control of field personnel within maintenance vehicles, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around a work zone through which they are currently passing.	Planned
		Under traffic and maintenance center control, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around the work zone through which they are currently passing.	Planned

Element Name	Functional Area	Requirement	Status
TDOT SmartWay Information System (TSIS)	ISP Traveler Data Collection	The center shall collect, process, and store event information.	Planned
		The center shall collect, process, and store maintenance and construction information, including scheduled maintenance and construction work activities and work zone activities.	Planned
		The center shall collect, process, and store traffic and highway condition information, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.	Planned
		The center shall collect, process, and store weather information.	Planned
TDOT SmartWay Website	Interactive Infrastructure Information	The center shall collect, process, store, and disseminate customized maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities upon request.	Existing
		The center shall collect, process, store, and disseminate customized traffic and highway condition information to travelers, including incident information, detours and road closures, recommended routes, and current speeds on specific routes upon request.	Existing
		The center shall collect, process, store, and disseminate customized weather information to travelers upon request.	Existing
		The center shall provide the capability to support requests from the media for traffic and incident data.	Planned
	ISP Emergency Traveler Information	The center shall collect and provide to the traveler interface systems emergency evacuation information, including evacuation zones, shelter information, available transportation modes, road closures and detours, changes to transit services, and traffic and road conditions at the origin, destination, and along the evacuation routes.	Existing
		The center shall collect and provide wide-area alert information to the traveler interface system with region-specific data, including major emergencies such as a natural or man-made disaster, civil emergency, child abductions, severe weather watches and warnings, military activities, and law enforcement warnings.	Existing
TDOT Speed Monitoring Equipment	Roadway Equipment Coordination	The field element shall include sensors (such as traffic, environmental, and work zone intrusion detection sensors) that provide data and status information to other field element devices (such as dynamic message signs, ramp meters, traffic signals, work zone intrusion alert systems), without center control.	Planned
	Roadway Speed Monitoring	If the speed detected by vehicle speed sensors is determined to be excessive, the field element shall provide a safe speed advisory to passing drivers via a driver information system (such as portable messages signs, etc.).	Planned

Element Name	Functional Area	Requirement	Status
TDOT Speed Monitoring Equipment (continued)	Roadway Speed Monitoring (continued)	The field element shall base speed advisories to passing drivers on environmental conditions.	Planned
		The field element shall include sensors to detect vehicle speeds, under traffic or maintenance center control.	Planned
		The field element shall return fault data for the vehicle speed sensors to the controlling center for repair.	Planned
		The field element shall return operational status for the vehicle speed sensors to the controlling traffic or maintenance center; including measured speeds, warning messages displayed, and violation records.	Planned
		The field element shall return operational status for the vehicle speed sensors to the enforcement agency.	Planned
TEMA	Emergency Evacuation Support	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Planned
		The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster. TEMA is the primary oversight agency for evacuation and disaster planning.	Planned
		The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Planned
		The center shall monitor the progress of the reentry process.	Planned
		The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Planned
		The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Planned
		The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Planned
		The center shall request resources from transit agencies as needed to support the evacuation.	Planned
		The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes. These requests will be based on direction from TEMA.	Planned

Element Name	Functional Area	Requirement	Status
TEMA (continued)	Emergency Response Management	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Planned
		The center shall develop, coordinate with other agencies, and store emergency response plans.	Planned
		The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Planned
		The center shall provide strategic emergency response capabilities such as that of an Emergency Operations Center for large-scale incidents and disasters.	Planned
		The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and distributing response status to allied agencies. TEMA is the centralized coordination point for large-scale incident response and emergency management activities. Municipal PSAPs will provide support to TEMA as requested.	Planned
		The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations. TEMA will be the coordinating agencies for any large-scale disaster or evacuation support, and will coordinate with local public safety and transit as needed.	Planned
		The center shall track the availability of resources (including vehicles, roadway cleanup, etc.), request additional resources from traffic, maintenance, or other emergency centers if needed.	Planned
	Incident Command	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Planned
		The center shall provide tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders to support local management of an incident.	Planned
		The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Planned
		The center shall track and maintain resource information and action plans pertaining to the incident command.	Planned

Element Name	Functional Area	Requirement	Status
Tennessee 511 System	Basic Information Broadcast	The center shall collect, process, store, and disseminate maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities.	Existing
		The center shall collect, process, store, and disseminate traffic and highway condition information to travelers, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.	Existing
		The center shall collect, process, store, and disseminate weather information to travelers.	Existing
		The center shall provide the capability for a system operator to control the type and update frequency of broadcast traveler information.	Existing
	Interactive Infrastructure Information	The center shall collect, process, store, and disseminate customized maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities upon request.	Existing
		The center shall collect, process, store, and disseminate customized traffic and highway condition information to travelers, including incident information, detours and road closures, recommended routes, and current speeds on specific routes upon request.	Existing
		The center shall provide the capability for a system operator to control the type and update frequency of traveler information.	Existing
	ISP Emergency Traveler Information	The center shall collect and provide to the traveler interface systems emergency evacuation information, including evacuation zones, shelter information, available transportation modes, road closures and detours, changes to transit services, and traffic and road conditions at the origin, destination, and along the evacuation routes.	Existing
		The center shall collect and provide wide-area alert information to the traveler interface system with region-specific data, including major emergencies such as a natural or man-made disaster, civil emergency, child abductions, severe weather watches and warnings, military activities, and law enforcement warnings.	Existing
		The center shall provide the capability for a system operator to control the type and update frequency of emergency and wide-area alert information distributed to travelers.	Existing
	ISP Traveler Data Collection	The TN 511 System shall collect, process, and store maintenance and construction information, including scheduled maintenance and construction work activities and work zone activities. This information will be stored in TSIS and provided to the 511 server for phone and web dissemination.	Existing

Element Name	Functional Area	Requirement	Status
Tennessee 511 System (continued)	ISP Traveler Data Collection (continued)	The TN System shall collect, process, and store traffic and highway condition information, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes. Information will come from TSIS, SmartWay, and other sources (both automated and manual).	Existing
	Traveler Telephone Information	The center shall collect and provide information on traffic conditions in the requested voice format and for the requested location.	Existing
		The center shall collect and provide weather and event information in the requested voice format and for the requested location.	Existing
		The center shall collect and provide work zone and roadway maintenance information in the requested voice format and for the requested location.	Existing
		The center shall provide the capability to process dual-tone multifrequency (DTMF)-based requests (touch-tone) for traveler information from a traveler telephone information system.	Existing
		The center shall provide the capability to process traveler information requests from a traveler telephone information system.	Existing
		The center shall provide the capability to process voice-formatted requests for traveler information from a traveler telephone information system, and return the information in the requested format.	Existing
		The center shall provide the capability to support both specific caller requests as well as bulk upload of regional traveler information.	Existing
Tennessee GoSmart Kiosks	Remote Interactive Information Reception	GoSmart kiosks shall provide digitized map data to act as the background to the information presented to the traveler.	Existing
		GoSmart kiosks shall receive event information from a center and present it to the traveler upon request.	Existing
		GoSmart Kiosks shall receive traffic information from a center and present it to the traveler upon request.	Existing
Tennessee Pre-Pass	CV Information Exchange	The center shall exchange information with roadside check facilities, including credentials and credentials status information, safety status information, daily site activity data, and citations.	Planned
		The center shall package data concerning commercial vehicle safety and credentials into profiles (detailed and historical data).	Planned
		The center shall package data concerning commercial vehicle safety and credentials into snapshots (top-level summary and critical status information).	Planned

Element Name	Functional Area	Requirement	Status
Tennessee Pre-Pass (continued)	CV Safety Administration	The center shall collect and review safety inspection reports and violations from the roadside check facilities and pass on appropriate portions to other commercial vehicle administrative centers and commercial vehicle fleet operators.	Planned
		The center shall notify enforcement agencies of commercial vehicle safety violations by individual commercial vehicles, drivers, or carriers.	Planned
		The center shall provide commercial vehicle safety data to roadside check facilities.	Planned
THP Dispatch	Emergency Call-Taking	The center shall provide the capability for digitized map data to act as the background to the emergency information presented to the emergency system operator.	Planned
		The center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing
		The center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
		The center shall update the incident information log once the emergency system operator has verified the incident.	Existing
	Emergency Dispatch	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
		The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
		The center shall provide the capability for digitized map data to act as the background to the information presented to the emergency system operator.	Planned
		The center shall receive traffic images to support dispatch of emergency vehicles.	Planned
		The center shall relay location and incident details to the responding vehicles.	Existing
		The center shall store and maintain the emergency service responses in an action log.	Existing
		The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Planned
		The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Planned

Element Name	Functional Area	Requirement	Status
THP Dispatch (continued)	Emergency Evacuation Support	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster. TEMA is the primary oversight agency for evacuation and disaster planning.	Planned
		The center shall provide support to TEMA for inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry. All large-scale evacuations will be coordinated through TEMA and its ESC representatives, with other agencies providing support.	Planned
		The center shall provide traveler information systems with evacuation guidance on direction from TEMA.	Planned
		The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes. These requests will be based on direction from TEMA.	Planned
	Emergency Response Management	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Planned
		The center shall develop, coordinate with other agencies, and store emergency response plans.	Planned
		The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and distributing response status to allied agencies.	Planned
		The center shall track the availability of resources (including vehicles, roadway cleanup, etc.), request additional resources from traffic, maintenance, or other emergency centers if needed.	Planned
	Incident Command	The center shall assess the status of responding emergency vehicles as part of an incident command.	Planned
		The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Planned
		The center shall provide tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders to support local management of an incident.	Existing
		The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Planned

Element Name	Functional Area	Requirement	Status
THP Dispatch (continued)	Incident Command (continued)	The center shall track and maintain resource information and action plans pertaining to the incident command.	Planned
THP Truck Weigh and Inspection Station	CV Data Collection	The center shall receive operational data from the roadside check systems as well as administration and credentials data.	Planned
	CV Information Exchange	The center shall exchange information with roadside check facilities, including credentials and credentials status information, safety status information, daily site activity data, and citations.	Planned
THP Vehicles	On-board EV En Route Support	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing
		The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
		The emergency vehicle, including roadway service patrols, shall compute the location of the emergency vehicle based on inputs from a vehicle location determination function.	Planned
		The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Planned
		The emergency vehicle, including roadway service patrols, shall send the vehicle's location and operational data to the center for emergency management and dispatch.	Planned
	On-board EV Incident Management Communication	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
		The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
		The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing

Element Name	Functional Area	Requirement	Status
THP Weigh-in-Motion	Roadside WIM	The roadside check facility equipment shall detect the presence of commercial vehicles and freight equipment approaching a facility. Sensors can differentiate between different types of vehicles and determine the number of axles, gross vehicle weight, weight per axle, and the identification of the vehicle and its cargo.	Existing
		The roadside check facility equipment shall request and input electronic screening data from the commercial vehicle's electronic tag data.	Planned
		The roadside check facility equipment shall send a pass/pull-in notification to the commercial vehicle and its driver based on the information received from the vehicle and the measurements taken. The message may be sent to the on-board equipment in the commercial vehicle or transmitted to the driver using equipment such as dynamic message signs, red-green lights, flashing signs, etc.	Existing
TN Bureau of Investigation	Emergency Early Warning System	The center shall broadcast wide-area alerts and advisories to other emergency management centers for child abduction (AMBER alert system). Tennessee Bureau of Investigation will coordinate activities of other public safety agencies for AMBER Alert responses.	Planned
		The center shall broadcast wide-area alerts and advisories to traffic management centers for child abduction (AMBER alert system). The Tennessee Bureau of Investigation is the primary originator for AMBER Alert information.	Planned
		The center shall broadcast wide-area alerts and advisories to traveler information service providers for child abduction (AMBER alert system). The Tennessee Bureau of Investigation is the pimary originator for AMBER Alerts.	Planned
		The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Planned
Transit Agency Archive	Government Reporting Systems Support	The center shall provide data from an ITS archive to federal, state, or local government reporting systems.	Planned
		The center shall provide the applicable meta-data for any ITS archived data to satisfy government reporting system requests. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.	Planned
		The center shall provide the capability to format data from an ITS archive suitable for input into government reports.	Planned
		The center shall provide the capability to select data from an ITS archive for use in government reports.	Planned
		The center shall support requests for ITS archived data from Government Reporting Systems.	Planned

Element Name	Functional Area	Requirement	Status
Transit Agency Archive (continued)	ITS Data Repository	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).	Planned
		The center shall collect data to be archived from one or more data sources.	Planned
		The center shall include capabilities for archive to archive coordination.	Planned
		The center shall include capabilities for error notification on the incoming archived data.	Planned
		The center shall include capabilities for performing quality checks on the incoming archived data.	Planned
		The center shall provide the capability to execute methods on the incoming data such as cleansing, summarizations, aggregations, or transformations applied to the data before it is stored in the archive.	Planned
		The center shall store the archived data in a focused repository that is suited to a particular set of ITS data users.	Planned
		When data or a catalog of data is received from the archive, the center shall generate the requested data product for the users systems.	Planned
	Transit Data Collection	The center shall assign quality control metrics and meta-data to be stored along with the data. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.	Planned
		The center shall be able to produce sample products of the data available.	Planned
		The center shall collect transit management data such as transit fares and passenger use, transit services, paratransit operations, transit vehicle maintenance data, etc.	Planned
		The center shall receive and respond to requests from ITS Archives for either a catalog of the transit data or for the data itself.	Planned
Transit Kiosks	Remote Interactive Information Reception	The public interface for travelers shall base requests from the traveler on the traveler's current location or a specific location identified by the traveler, and filter the provided information accordingly.	Planned
		The public interface for travelers shall present information to the traveler in audible or visual forms consistent with a kiosk, including those that are suitable for travelers with hearing or vision physical disabilities.	Planned

Element Name	Functional Area	Requirement	Status
Transit Kiosks (continued)	Remote Interactive Information Reception (continued)	The public interface for travelers shall receive evacuation information from a center and present it to the traveler.	Planned
		The public interface for travelers shall receive transit information from a center and present it to the traveler upon request.	Planned
	Remote Transit Fare Management	The public interface for travelers shall accept and process current transit passenger fare collection information.	Planned
		The public interface for travelers shall calculate a fare based on the origin and destination provided by the traveler, in conjunction with transit routing, transit fare category, and transit user history.	Planned
		The public interface for travelers shall determine the routing based on the traveler's destination and the location of the closest transit stop from which a route request is being made.	Planned
		The public interface for travelers shall present information to the traveler in a form suitable for travelers with physical disabilities.	Planned
	Remote Transit Information Services	The public interface for travelers shall collect and present to the transit traveler information on transit routes, schedules, and real-time schedule adherence.	Planned
		The public interface for travelers shall present information to the traveler in a form suitable for travelers with physical disabilities.	Planned
Transit Website	Infrastructure Provided Trip Planning	The center shall generate route plans based on transit services, including fares, schedules, and requirements for travelers with special needs.	Planned
		The center shall provide the capability for the traveler to confirm the proposed trip plan.	Planned
		The center shall provide the capability to provide specific pre-trip and enroute directions to travelers (and drivers), including costs, arrival times, and transfer points.	Planned
	Interactive Infrastructure Information	The center shall accept traveler profiles for determining the type of personalized data to send to the traveler.	Planned
		The center shall collect, process, store, and disseminate customized multimodal transportation service information (for example, from ferry and airline operators), including transfer points and other information, to travelers upon request.	Planned
		The center shall collect, process, store, and disseminate customized transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information to travelers upon request.	Planned

Element Name	Functional Area	Requirement	Status
Transit Website (continued)	Interactive Infrastructure Information (continued)	The center shall provide all traveler information based on the traveler's current location or a specific location identified by the traveler, and filter or customize the provided information accordingly.	Planned
	ISP Traveler Data Collection	The center shall collect, process, and store transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information.	Planned
USGS Field Equipment	Roadway Environmental Monitoring	The field element shall include USGS flood sensors that measure and monitor flood levels in streams, rivers and other estuaries.	Existing
		The field element shall provide environmental sensor equipment fault indication to the controlling center.	Existing
		The field element shall provide environmental sensor equipment operational status to the controlling center.	Existing
		The field element shall provide weather and road surface condition data to centers.	Existing
Violation Detection	Citation and Accident Electronic Recording	The roadside check facility equipment shall provide an interface for an inspector to add comments to the inspection results.	Planned
		The roadside check facility equipment shall record the results of roadside inspections carried using an inspector's hand held terminal interface.	Planned
	Roadside Electronic Screening	The roadside check facility equipment shall detect the presence of commercial vehicles and freight equipment approaching a facility. Sensors can differentiate between different types of vehicles and determine the number of axles, gross vehicle weight, and the identification of the vehicle and its cargo.	Existing
		The roadside check facility equipment shall provide an interface to inspectors in the field to allow them to monitor and if necessary override the pull-in decisions made by the system.	Existing
		The roadside check facility equipment shall request and input electronic screening data from the commercial vehicle's electronic tag data.	Planned
		The roadside check facility equipment shall send a pass/pull-in notification to the commercial vehicle and its driver based on the information received from the vehicle, the administration center, enforcement agencies, and the inspector. The message may be sent to the on-board equipment in the commercial vehicle or transmitted to the driver using equipment such as dynamic message signs, red-green lights, flashing signs, etc.	Planned