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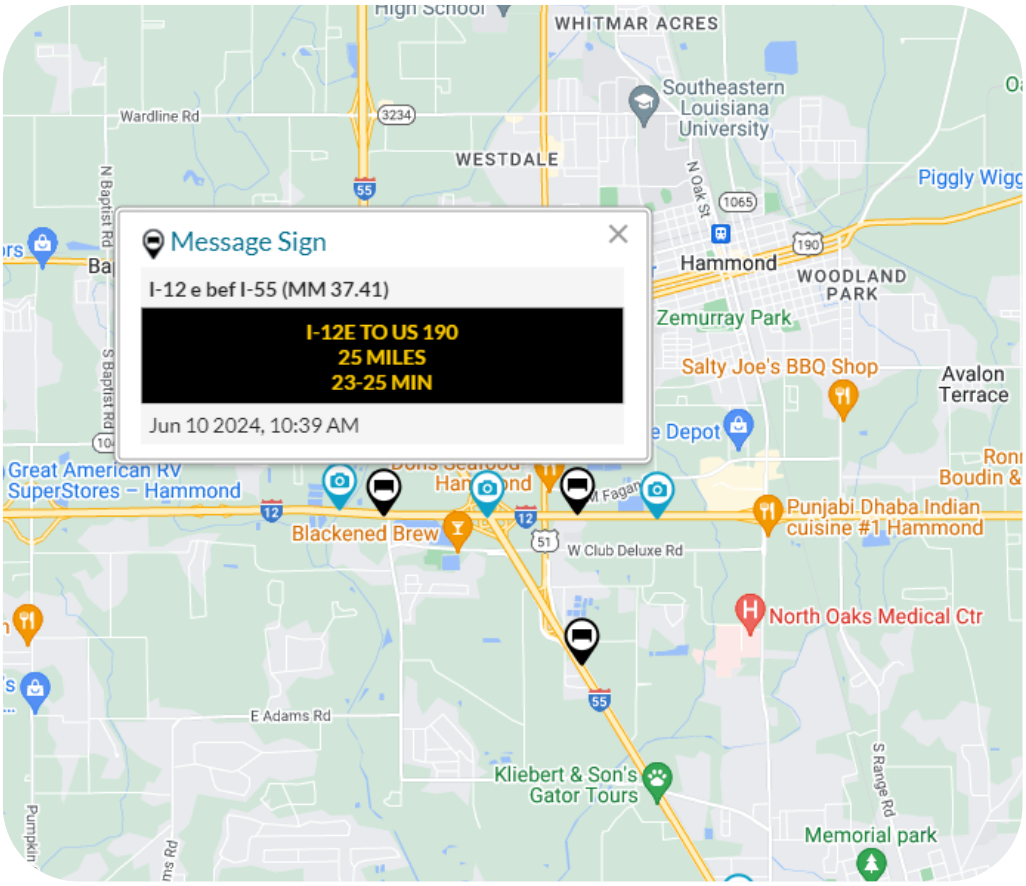
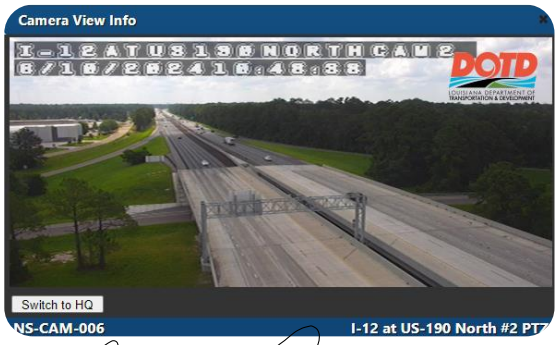
Northshore Regional Intelligent Transportation Systems Architecture Report





Prepared for:

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

July 3, 2024

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In Association with

INTELLIGENT TRANSPORTATION SYSTEMS

VECTURA CONSULTING SERVICES, LLC

Northshore Regional Intelligent Transportation Systems Architecture

Prepared For:

Louisiana Department of Transportation and Development

Prepared By:

NEEL-SCHAFFER

With Partners:
Intelligent Transportation Systems LLC &
Vectura Consulting Services, LLC

July 3, 2024

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Acronyms

ATC	advanced traffic controller
CAD	computer assisted drawing
CAV	connected and autonomous vehicles
CCTV	closed circuit television
CFR	Code of Federal Regulations
CTI	Connected Transportation Interoperability
DMS	dynamic message sign

DSRC	direct short-range communication
EOC	emergency operations center
FHWA	Federal Highway Administration
GNOEC	Greater New Orleans Expressway Commission
HOV	high occupancy vehicle
HQ	headquarters
ISO	International Organization for Standardization
ITE	Institute of Transportation Engineers
ITS	intelligent transportation systems
LADOTD	Louisiana Department of Transportation and Development
LSP	Louisiana State Police
MAP	Motorist Assistance Patrol
MPO	Metropolitan Planning Organization
NB, SB, WB, EB	northbound, southbound, westbound, eastbound
NEMA	National Electrical Manufacturers Association
NIST	National Institute for Standards and Technology
NORPC	New Orleans Regional Planning Commission
NTCIP	National Transportation Communications for ITS Protocol
O&M	operations and maintenance
PTZ	pan-tilt-zoom
RAD-IT	Regional Architecture Development for Intelligent Transportation
RPC	Regional Planning Commission
RR	roles and responsibilities
RWIS	road weather information system
SDO	standard development organization
TIM	traffic incident management
TMC	traffic management center

1 Background

This regional architecture report defines the existing and proposed regional Intelligent Transportation Systems (ITS) architecture for the Northshore region of Louisiana. This geographic region includes St. Helena Parish, Tangipahoa Parish, Washington Parish, and St. Tammany Parish. According to the Federal Highway Administration (FHWA), "the ITS technologies focus area aims to develop innovations to advance transportation safety, mobility, and environmental sustainability". In addition, FHWA defines a regional ITS architecture as "a specific tailored framework for ensuring institutional agreement and technical integration for the implementation of ITS projects or groups of projects in a particular region." ITS projects funded with highway trust funds shall meet certain requirements based on systems engineering analysis commensurate with the project scope. These requirements include having regional ITS architecture that is based on the national ITS architecture. This is not a mandate for all projects using federal funds but includes ITS projects using highway trust funds.

Title 23 of the Code of Federal Regulations Part 940 (CFR 940.9(a)) states the following:

> *"A regional ITS architecture shall be developed to guide the development of ITS projects and programs and be consistent with ITS strategies and projects contained in applicable transportation plans. The National ITS Architecture shall be used as a resource in the development of the regional ITS architecture. The regional ITS architecture shall be on a scale commensurate with the scope of ITS investment in the region. Provision should be made to include participation from the following agencies, as appropriate, in the development of the regional ITS architecture: Highway agencies; public safety agencies (e.g., police, fire, emergency/medical); transit operators; Federal lands agencies; State motor carrier agencies; and other operating agencies necessary to fully address regional ITS integration."*

Title 23, Part 940 (CFR 940.9(d)), also states the required elements of a regional ITS architecture which are needed to satisfy the requirements of paragraph (a) quoted above. These include:

1) A description of the region – Section 2.2

2) Identification of the participating agencies and other stakeholders – Section 4.0

3) An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems included in the regional ITS architecture – Section 8.0

4) Any agreements (existing or new) required for operations, including at a minimum those affecting ITS project interoperability, utilization of ITS related standards, and the operation of the projects identified in the regional ITS architecture – Section 11.0

5) System functional requirements – Section 9.0

6) Interface requirements and information exchanges with planned and existing systems and subsystems (for example, subsystems and architecture flows as defined in the National ITS Architecture) – **Appendix B**

7) Identification of ITS standards supporting regional and national interoperability – Section 10.0

8) The sequence of projects required for implementation– Section 8.1

The development of a regional ITS architecture provides benefits to transportation planners and engineers. Some of these benefits include:

1) Developing standard terminology for various ITS elements and applications which can be used by a variety of stakeholders to clearly communicate and develop future needs.

2) Identifying the functions and relationships between the various ITS elements and stakeholders.

3) Developing a working document which can integrate new elements and connections as the region's needs develop. Building this document in a modular way allows new ideas to be integrated, while minimizing impacts to the existing architecture, thus allowing for modifications as regional issues change.

4) Encouraging an integrated and collaborative approach to ITS that spans multiple jurisdictions. This involves adopting a systematic approach to ITS and the use of a Systems Engineering process for deploying ITS solutions.

5) Advocating for the adoption of emerging "standards" within the USDOT National ITS Architecture program. These standards play a crucial role in enhancing interoperability and consistency across ITS implementations.

2 Architecture Scope

The Northshore Regional ITS Architecture is a product of collaborative efforts among transportation agencies within the region. By pooling their expertise, these agencies have crafted a unified vision for transportation systems integration. This collaborative approach ensures that diverse systems—ranging from traffic management to public transit—are seamlessly interconnected. The goal is to enhance overall efficiency, reduce redundancy, and improve the traveler experience.

At its core, the architecture provides a comprehensive framework that transcends individual projects. Rather than viewing each transportation initiative in isolation, it encourages a holistic perspective. Every project becomes a piece of the larger puzzle, contributing to the overall transportation fabric. This interconnected view allows decision-makers to identify synergies, allocate resources effectively, and prioritize investments strategically.

The Northshore Regional ITS Architecture extends beyond immediate needs. It considers the long-term horizon, envisioning how transportation systems will evolve over time. By doing so, it facilitates informed planning and investment decisions. Whether it's adapting to emerging technologies, accommodating population growth, or addressing environmental concerns, the architecture serves as a compass for sustainable development.

2.1 Temporal Scope

The time frame for components of this Architecture include projections within the next five years.

2.2 Geographic Scope

The Northshore Regional ITS Architecture encompasses the following parishes:

1. St. Helena Parish
2. St. Tammany Parish
3. Tangipahoa Parish
4. Washington Parish

The New Orleans Regional Planning Commission (RPC) acts as the Metropolitan Planning Organization (MPO) for this Northshore area. This four-parish region falls under the jurisdiction of Louisiana Department of Transportation and Development (LADOTD) District 62. **Figure 1** depicts this geographic region of LADOTD District 62. The RPC is responsible for conducting a comprehensive assessment of transportation planning across the entire urbanized zone.

2.3 Service Scope

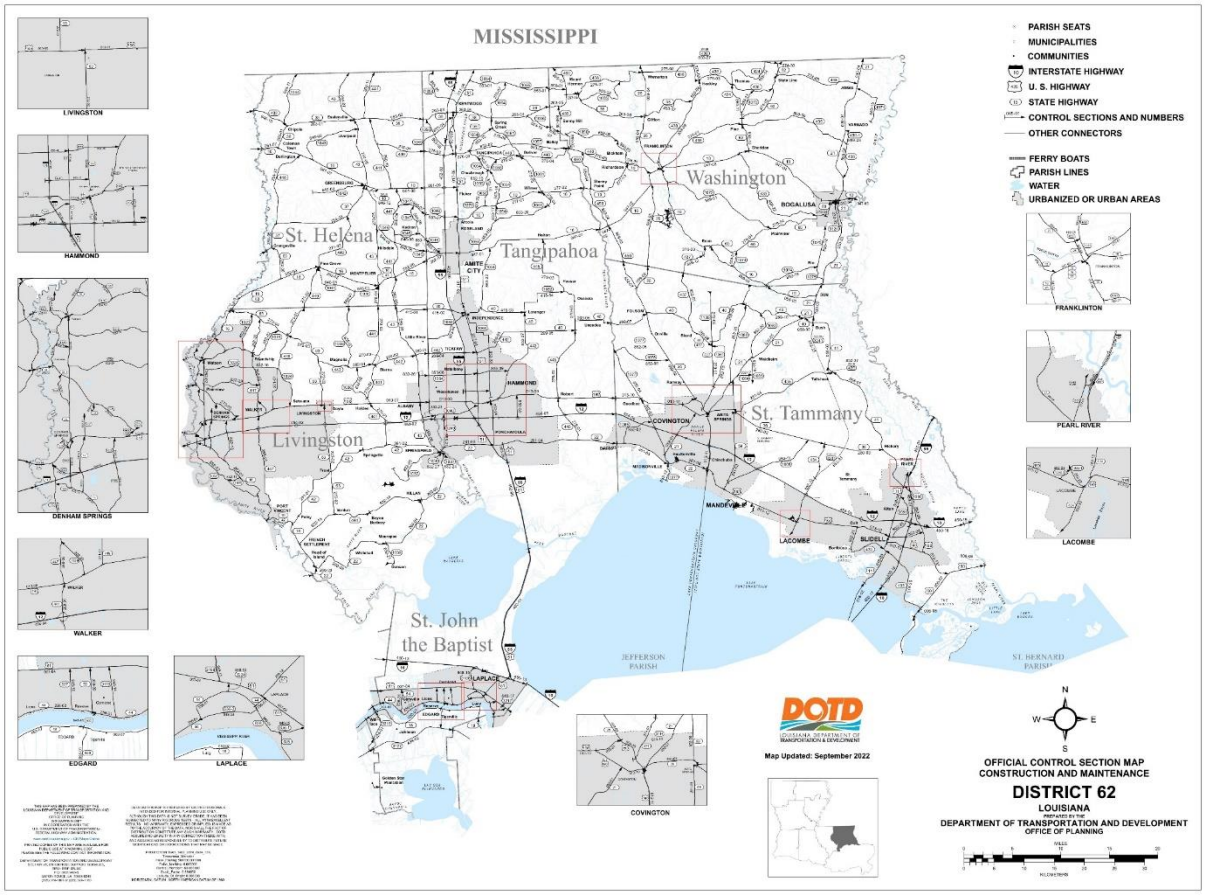
The Regional Intelligent Transportation Systems (ITS) Architecture serves as a roadmap for integrating transportation systems within a defined geographic area. Developed collaboratively by regional transportation agencies, the architecture encompasses all modes of transportation and all roads in the region. It outlines how each agency's systems will work together in the future, facilitating information sharing and coordination.

From a planning perspective, the regional ITS architecture supports the region's objectives and caters to the specific needs of transportation planning agencies. It provides insights into data collection, archiving, and processing methods that support transportation planning and performance monitoring. Section 7 of this report documents a range of existing and planned ITS services.

2.4 Records and Updates

LADOTD, through coordination with NORPC, will maintain the Northshore Regional ITS architecture, through required updates to the RAD-IT architecture files as well as the summary report.

Figure 1: Geographic Area Covered by LADOTD District 62[1]



3 Relationship to Regional Planning

The Northshore Regional ITS Architecture is the framework that links operational and maintenance goals to strategic initiatives. Integrated enhancements within the transportation system are carried out through a gradual sequence of ITS projects. The architecture specifically outlines the requirements related to performance monitoring, which in turn facilitates an informed planning process. Within this section, we identify the planning objectives, strategies, and performance metrics associated with the regional ITS architecture plan. These planning elements are intricately tied to the ITS services cataloged in the RAD-IT database. The transportation goals of the architecture are summarized in **Table 1**.

[1] A high resolution LADOTD District 62 map is located on LADOTD's website at: http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Multimodal/Data_Collection/Mapping/District%20Maps/District_62.pdf.

Table 1: Transportation Goals

Name[1]	Description	Performance Measure
Safety	To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.	Crashes/MVM Fatalities per year
Infrastructure Condition	To maintain the highway infrastructure asset system in a state of good repair	Condition Index
Congestion Reduction	To achieve a significant reduction in congestion on the National Highway System	Travel Time
System Reliability	To improve the efficiency of the surface transportation system	Road closures
Freight Movement and Economic Vitality	To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.	Benefit-Cost Ratio
Environmental Sustainability	To enhance the performance of the transportation system while protecting and enhancing the natural environment.	Decibel (dB) VOC, CO, NOx
Reduced Project Delivery Delays	To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices	Project performance measures

4 ITS Stakeholders

Developing an effective Intelligent Transportation Systems (ITS) architecture requires collaboration among multiple stakeholders and their respective transportation systems. This section specifically outlines the participants who contributed to the current version of the Northshore Regional ITS Architecture. Some stakeholders have been grouped together due to their shared involvement in transportation services and elements. Additionally, **Table 2** provides concise descriptions of each stakeholder associated with the Northshore Regional Architecture. Section 6.0 delves into the ITS system inventory and explains how these stakeholders are interconnected with specific elements within it.

Table 2: Northshore ITS Architecture Stakeholders

Stakeholder Name	Stakeholder Description
Cities	This stakeholder group collectively refers to the cities of Covington, Hammond, Mandeville and Slidell which form the major population centers within the Northshore area.
Cities of Covington-Mandeville	The cities of Covington-Mandeville provide municipal government services, including police and fire protection, to its residents and businesses. Land use plans and ordinances guide city administration, elected officials, and private citizens and developers.

Stakeholder Name	Stakeholder Description
City of Hammond	The City of Hammond is an incorporated city providing municipal government services, including police and fire protection, to its residents and businesses. Land use plans and ordinances guide city administration, elected officials, and private citizens and developers.
City of Slidell	The City of Slidell government operates police and fire departments and the emergency medical services.
Commercial Vehicle Operator	This stakeholder group refers to commercial vehicle operations responsible for movement of freight on the highway system.
GNOEC	The five-member Greater New Orleans Expressway Commission (GNOEC) is the controlling body of the Causeway which includes the bridge system and the Causeway approach road system on the North Shore of Lake Pontchartrain. Called The Causeway Commission, it is an entity responsible for the maintenance, construction, and enforcement of safety laws on the Lake Pontchartrain Causeway. It is headquartered in the New Orleans suburb of Metairie. Also, the GNOEC polices the US 90, Huey P. Long Bridge.
LADOTD	Louisiana Department of Transportation and Development (LADOTD) is an arm of the Louisiana government responsible for state-wide transportation. The LADOTD responsibilities include statewide transportation system operations. This stakeholder group includes all Department of Transportation and Development (DOTD) units (ITS, Office of Planning Programming, Highway Safety, Weights and Standards, Traffic Services, and Traffic Engineering) involved in transportation planning, operations, and maintenance. Some of the typical responsibilities include incident detection and response, evacuation planning and management, transportation data collection, management, and distribution for the local region as well as for the entire state.
Local Emergency Medical	This includes local hospitals and emergency medical service providers (i.e., ambulance, air-evacuation, etc) that are components of emergency management.
Local/Regional Public Safety Agencies	Responsible for operating local police, sheriff, fire, and EMS offices and vehicles throughout region. This stakeholder group includes all the regional agencies that are involved in emergency, fire, sheriff, police, and other public safety/emergency response activities.
Louisiana State Police (Troop L)	Louisiana State Police agency is responsible for operating Louisiana State Police Centers. This includes Computer Aided Dispatch database, which collects incident/emergency detection, dispatch, response, and status information related to the Louisiana State Police officers/equipment. They are also responsible for Louisiana State Police vehicles.
Media	This stakeholder group includes local TV/Radio Channels and print media that are responsible for receiving and distributing transportation information like traffic conditions, incidents and road weather conditions.
NORPC	The New Orleans Regional Planning Commission (NORPC) serves as the designated Economic Development District for Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes as well as the Metropolitan Planning Organization (MPO) for all of the named parishes in

Stakeholder Name	Stakeholder Description
	addition to St. Charles and St. John parishes. This regional body is comprised of a 26 voting member board with representation from each of the five core parishes and supported by a staff of planning professionals. This board, which consists of elected officials and citizen members, meets on a monthly basis to discuss issues that are regional in nature.
Parish Government	This refers to the collective group of Parishes for which this ITS architecture is being developed.
Public	Members of the general public own and operate various devices/systems to access ITS information including personal digital assistants (PDAs), cell phones, and personal computers.
St. Helena Parish	The parish seat is in Greensburg. The 2020 Census estimated its population to be 10,920. The Parish provides local governmental services including law enforcement, fire department and maintenance of public roads and bridges.
St. Tammany Parish	The parish seat is in Covington. In 2020, the population was 233,575. In 2004, the population was estimated to have grown to 212,000, and after the landfall of Hurricane Katrina the following year, the population was estimated by St. Tammany Planners to be about 264,000. St. Tammany Parish is colloquially referred to as part of the "Northshore" or "North Shore" throughout metropolitan New Orleans, owing to its location on Lake Pontchartrain.
Tangipahoa Parish	The parish seat is in Amite City, but the major city is Hammond. As of 2020, the population was 137,157. The Hammond Metropolitan Statistical Area includes all of Tangipahoa Parish.
Tourism and Traveler Information Service Providers	This includes various tourism agencies, chambers of commerce, hotel associations, motorist services, and map search.
Washington Parish	The parish seat is in Franklinton. The 2020 Census estimated its population to be 45,463. The Parish provides local governmental services including law enforcement, fire department and maintenance of public roads and bridges.

5 ITS System Inventory

The Northshore Regional ITS Architecture update is built upon an inventory of existing and proposed Intelligent Transportation Systems (ITS). Stakeholders from throughout the Northshore region contributed to the development of this ITS inventory. It includes a comprehensive list of ITS elements, along with the associated stakeholders responsible for operating these systems.

Table 3 outlines the surface transportation inventory elements specific to the region. These transportation elements can be categorized as centers, vehicles, travelers, or field equipment. To simplify the ITS architecture, similar transportation elements have been grouped together. Additionally, each ITS inventory element is linked to at least one entity within the National ITS Architecture.

5.1 Existing Regional ITS Systems and Operations

The Louisiana Department of Transportation and Development (LADOTD) has already began implementing an Intelligent Transportation System (ITS) architecture in the Northshore region. ITS communications are managed from the New Orleans Traffic Management Center. Additionally, the existing ITS architecture can be monitored and controlled from the Statewide Traffic Management Center located in Baton Rouge. Within the regional architecture coverage area, the existing ITS elements have been compiled and described in **Table 3**.

To enhance traveler notifications, the 511 Traveler Information System, social media, and dynamic message signs are utilized. These tools empower drivers to make informed decisions by selecting alternate routes and avoiding incident-prone areas. Travelers receive information about construction activity, lane closures, incidents, and Amber alerts.

CCTV cameras serve as essential ITS infrastructure for monitoring road networks, detecting congestion, and identifying incidents. Operators at Traffic Management Centers can verify incidents using CCTV footage, including details such as lane blockages, the number of vehicles involved, and traffic congestion. This critical information can then be communicated to first responders and shared with the public.

Table 3: Existing ITS Devices

ITS Device	Number	Comments
511 Traveler Information	www.511la.org	Provides traveler information to the public
CCTV Camera	31	Cameras have pan-tilt-zoom capability with the vast majority as newer IP cameras providing a HQ and SQ stream
DMS	11	Provides critical messages for emergencies and travel time information to the public
Fiber Optic Communication	I-12 Corridor	Most device sites are on fiber communications, with some additional on wireless radio or cellular communications

5.2 Transportation Needs

The transportation needs discussed in this section were gathered from meetings with stakeholders, including LADOTD District 62, the New Orleans Regional Planning Commission, and Louisiana State Police Troop L. These needs address challenges such as flooding, incident management, congestion mitigation, traveler information, and emergency evacuation. Stakeholders have requested primary devices like CCTV cameras with pan-tilt-zoom (PTZ) capability, Dynamic Message Signs (DMS), queue warning beacons, and associated communication infrastructure. While some devices are already deployed in the Northshore area and monitored from the Statewide and New Orleans Traffic Management Centers (TMC), additional CCTV coverage is needed for certain “blind spots” along I-12 and I-55 (see **Table 4**). Furthermore, stakeholders express interest in establishing a dedicated traffic

management center (TMC) in the region to effectively monitor and control these devices. Detailed discussions on these needs can be found in Appendix F from the meeting minutes with stakeholders.

5.2.1 Flooding

Flooding has been identified in several areas in the region which lead to road closures. Specifically, areas along the Pearl River Bridge and near the interchange of I-55 at US 51 are well-known issues. The Pearl River Bridge, along I-10, is located along the eastern edge of the region. I-55 at US 51 is located near the southernmost part of the region, physically located near the southwestern shore of Lake Pontchartrain. A recent road weather information system (RWIS) pilot deployment near the I-55 at US 51 interchange may prove useful to correlate flooding events to rainfall events.

5.2.2 Incident Management

LA State Police Troop L has identified incident hotspots along I-12 between LA 21 and US 190. Currently active construction projects to provide additional lanes and enhanced ITS support (CCTV cameras and DMS) are underway. Queues on I-12 EB are frequent in this area. Troop L wants to embrace technology that can help with this queue management and advance warning to the travelling public.

Additional locations where incidents are frequent include: I-12 EB west of LA 1077 and the intersection of LA 442/LA 443/LA 40 near Tickfaw.

5.2.3 Emergency Management

Hurricane activities are a major concern for Louisiana and especially the Northshore region. This region includes major evacuation routes of I-55, I-10, US 190, and I-12. Preceding hurricane activity, residents evacuate from coastal and nearby inland areas to safer locations, either along or further from the coast and even to neighboring states. Multiple stakeholders indicated a need for improved ITS infrastructure to support evacuation efforts, especially at the state lines. Existing infrastructure is on cellular communications and can only provides a snapshot of CCTV coverage, but improved communications could allow for improved CCTV as well as the introduction of additional ITS devices.

5.2.4 CCTV Camera

Gaps have been identified within the existing CCTV camera coverage area by stakeholders. The Statewide TMC provided locations where CCTV cameras would provide benefit. These locations were mostly focused on I-12. One signalized intersection, US 190 at LA 1077, was also identified as a good location for CCTV. NORPC supplemented this need with improved CCTV coverage at the state lines on I-10, I-55, and I-59. **Table 4** lists the proposed locations for supplemental or improved CCTV coverage.

Table 4: Proposed CCTV Camera Locations

Corridor	Location
I-12	Pumpkin Center Overpass
I-12	Veterans/South Railroad Ave Overpass
I-12	LA 3158 (Airport Rd.)
I-12	Sontheimer Rd Overpass
I-12	LA 445 Overpass

Corridor	Location
I-12	Fire Tower Road Overpass
I-12	Emergency Crossover (MM 52)
I-12	Mile Marker 54
I-12	LA 1085 Overpass
I-12	LA 59
I-12	LA 1088
I-12	Mile Marker 71
I-12	LA 434
I-12	Mile Marker 76
I-12	Mile Marker 78
I-12	Airport Road (Slidell)
I-12	US 11
I-12	LA 21
I-12	LA 1077
I-12	US 51
I-12	LA 445
US 190	LA 1077
US 190	LSP Troop L HQ
US 190	US 11
US 190	LA 21
US 190	LA 25
US 190	Judge Tanner/Fairway Overpass
I-10	I-10/I-12/I-59 Interchange (coverage insufficient)
I-10	Pearl Bridge (West, Middle, and East Pearl)
I-10	MS State Line
I-55	MS State Line
I-55	LA 442
I-55	US 51
I-55	LA 3234
I-55	LA 40
I-55	LA 16
I-55	LA 1042
I-55	LA 440
I-55	LA 1053
I-55	LA 38
I-55	Morrison
I-55	University/Wardline Rd
I-55	Natalbany Rd Overpass
I-55	New Gennesse Rd Overpass
I-55	Emergency Crossover (MM 38)
I-55	Black Cat Rd Overpass
I-55	Mile Marker 44
I-55	Mile Marker 48
I-55	LA 1048
I-55	Mile Marker 51

Corridor	Location
I-55	LA 10
I-55	Mile Marker 55
I-55	LA 440
I-55	Weigh Station (I-55 South)
I-55	Welcome Centers
I-59	MS State Line
I-59	US 11
I-59	LA 3081
I-59	Honey Island Swamp
I-59	Mile Marker 8
LA 22	LA 22 at LA 445

Additionally, camera locations outside of the region were identified that would provide benefit to this region. These locations include:

- I-12 at Middle Coyell Creek
- I-12 at Satsuma Overpass
- I-12 at LA 63
- I-12 at Hog Branch Creek
- I-12 at LA 441
- I-12 at LA 43
- US 11 at US 90
- US 11 from St Tammany/Orleans Parish Line to US 90
- US 90 from US 11 to Orleans/St Tammany Parish Line
- US 190 at LA 441
- US 190 at LA 43
- US 190 at LA 63

5.2.5 Dynamic Message Signs (DMS)

LADOTD Statewide TMC and State Police Troop L have identified locations where supplemental DMS would have an benefit on emergency activities. These locations are identified in **Table 5**. The focus of DMS locations would be to support emergency and evacuation operations as well as necessary detours. It should also be noted that guidance from FHWA and DOTD ITS indicates moving away from the deployment of DMS in the coming years. Although, the full list of proposed locations is included, current perception is that only a few DMS may be installed at critical locations.

Table 5: Proposed DMS Locations

Corridor	Location
I-12	I-12 East and West at Tangipahoa/St. Tammany Parish Line
I-12	I-12 East and West between LA 1088 and LA 434
I-12	I-12 East and West between LA 434 and US 11
I-12	I-12 East and West between US 11 and I-10/I-59
US 11	US 11 North and South before I-12
US 190	US 190 East before I-12 (Previously was NS DMS 9)

Corridor	Location
US 190	EB and WB before LA 22
I-55	SB near Welcome Center
I-55	NB before US 51B
I-55	SB past Morrison Rd
I-55	SB before US 190
I-55	NB and SB at MM 19.1
I-55	NB and SB at MM 12.1
I-55	NB and SB before LA 16
I-55	NB and SB before LA 10
I-55	NB and SB before LA 442
I-55	NB and SB before LA 40
I-10	EB before US 11
I-10	EB and WB before US 190 (Gause Blvd)
I-10	EB before LA 443
US 190 (Gause)	EB and WB before I-10
LA 443	NB and SB before I-10
I-59	SB before I-12/I-10 Interchange
I-59	NB and SB before US 11
US 11	NB and SB before I-59
LA 22	WB at West Causeway
LA 22	East of US 190

Additionally, DMS locations outside of the region were identified that would provide benefit to this region. These locations include:

- I-12 East between Juban and LA 447
- I-12 East and West before LA 441
- I-10 East before US 11
- US 11 North and South before I-10
- US 90 North and South before US 11

5.2.6 Queue Warning Beacons

LADOTD District 62 (Hammond) has identified one location which would benefit from a queue warning beacon system to supplement existing ITS infrastructure along I-12. This location is:

- I-12 West from LA 1088 to LA 1077

The implementation of queue warning in this location, which regularly develop queues, is expected to increase safety through early warning to drivers.

5.2.7 Motorist Assistance Patrol (MAP)

Currently, MAP is in operation in the Northshore region, running Monday through Friday. State Police Troop L recommends this be expanded to the weekends as well. This service currently runs out of the New Orleans TMC; however, the development of a Northshore Regional TMC would also benefit the

timeliness of MAP services. Due to the population sizes and separation of areas, three separate services would ideally support the region. These locations, in order of priority, are:

1. Slidell
2. Hammond
3. Mandeville-Covington

MAP operates in the Northshore area on weekdays from 6:30am to 6:30pm on I-10, I-12, and I-55 with the following limits:

- I-10 – From Michoud Blvd. to I-10/I-12/I-59
- I-12 – From LA 1249 to I-10/I-12/I-59
- I-55 – From Manchac (Exit 15) to LA 3234

5.2.8 Communications

There are significant fiber optic communications, primarily along I-12, to support ITS infrastructure in the Northshore region; however, there is not complete coverage. Some critical locations, such as the Louisiana/Mississippi state lines, do not benefit from fiber optic communications. These locations include:

- I-10 at Mississippi State Line
- I-55 at Mississippi State Line
- I-59 at Mississippi State Line

These locations are critical corridors for emergency hurricane evacuation, and providing fiber optic communications would allow for a significant increase in infrastructure such as improved CCTV coverage, vehicle detection, and license plate readers. Additionally, along I-10, I-12, and I-55, all signalized intersections at interchanges and along adjacent corridors would benefit from communications.

Outside of the I-12 corridor, however, there are major routes which can be used for interstate detours, which would benefit from more reliable communications. These corridors include: US 11, US 190, LA 22, LA 1077, LA 445, and US 51 Business. In many cases, these signal corridors do not have remote communication to manage and maintain timing plans or to supplement the existing system in the future with improved technology-based systems. DOTD

5.2.9 Detection

NORPC seeks comprehensive vehicle detection data (including volume, speed, and classification) for interstates, major arterials, and interchanges. Additionally, there is interest in environmental data collection, specifically using a RWIS, road weather information system. This data will serve as a baseline for performance measurement, trend analysis, and other planning studies, as well as support real-time decision making for emergency operations. NORPC aims to use this information to develop compelling and defensible programs, measure outcomes and benefits, and justify funding.

Recently, in response to a major vehicle incident which was propagated by the media-coined “superfog”, a RWIS pilot system was deployed at I-10 at US 51/I-55. This location is adjacent to two major bridge areas, I-55 and I-10 (Bonnet Carre), which both carry significant traffic volumes and are

critical corridors for every day and emergency operations. Similar types of RWIS equipment have been requested by LSP Troop L to be deployed on the high rise and Twin Span bridges (I-55 and I-10) to monitor fog and other weather conditions.

5.2.10 Video Distribution

NORPC suggested providing CCTV camera feeds to the Parish Emergency Operations Center (EOC). Each EOC would receive a workstation with access to video from CCTV cameras on roadways, facilitating system status management and assessment.

5.2.11 Northshore Transportation Management Center (TMC)

A Traffic Management Center (TMC) has been discussed, and is desired to be a partnership with all relevant stakeholders, but especially LA State Police Troop L and LADOTD for everyday operations. The site of the new Troop L headquarters is currently planned to be constructed next to their existing headquarters, along US 190 near LA 22. LADOTD is looking at the northeast quadrant of the I-12 at LA 21 interchange but also has interest in being co-located with LSP. Troop L would also recommend that the facility be planned such that future MAP operations can work out of this TMC location as well.

5.2.12 ITS Notifications

The 511 app disseminates ITS notifications and the device locations are displayed through the 511 webpage. This webpage is accessible through the LADOTD website, located at: https://www.511la.org. This comprehensive ITS architecture encompasses CCTV cameras, DMS, and provides information on weather incidences, closures, ferries, movable bridges, and rest areas.

5.2.13 Relocation of Existing ITS Devices

Infrastructure projects related to roadways can impact the placement of existing ITS architecture, leading to their relocation. Additionally, when roadways are widened, there are chances to introduce new ITS architecture or establish fiber conduits for future device connectivity.

5.2.14 Connected and Autonomous Vehicles (CAVs)

The Federal Highway Administration (FHWA) plays a pivotal role in national research related to roadway infrastructure. As part of this effort, they are actively developing policies and transportation planning tools specifically focused on Connected and Autonomous Vehicles (CAVs). These policies and tools include:

1. **Simulation Software for Cooperative Driving Automation (CDA)**: FHWA's research includes the development of simulation software designed to facilitate cooperative driving automation. This technology aims to enhance safety and efficiency by enabling vehicles to communicate and collaborate on the road.
2. **Human Factors Studies and Platooning**: FHWA is conducting human factors studies related to platooning—a technique where multiple vehicles travel closely together to improve traffic flow and reduce congestion. Understanding how humans interact with these platooning systems is crucial for successful implementation.

3. **Fuel Consumption and Emissions Reduction**: FHWA is actively exploring ways to reduce fuel consumption and emissions. By leveraging advancements in CAV technology, they aim to create more sustainable transportation solutions.
4. **Connected Vehicle Reference Implementation Architecture (CVRIA)**: The U.S. Department of Transportation (USDOT) has deployed the CVRIA software as a comprehensive reference for connected vehicle architecture. This software provides guidelines and standards for integrating CAVs into the transportation ecosystem.
5. **National ITS Architecture (ARC-IT)**: In addition to CVRIA, FHWA relies on the National ITS Architecture (ARC-IT) as a foundational framework. ARC-IT defines the essential components and interfaces needed for intelligent transportation systems (ITS) deployment.
6. **Systems Engineering Tool for Intelligent Transportation (SET-IT)**: SET-IT is another valuable software tool used by FHWA. It assists transportation agencies and consultants in designing and implementing effective ITS solutions.
7. **Regional Architecture Development for Intelligent Transportation (RAD-IT)**: FHWA also utilizes RAD-IT software for regional planning. It helps stakeholders create customized ITS architectures that align with local needs and priorities.

Overall, these tools serve as essential resources for transportation agencies, consultants, and stakeholders as they navigate the evolving landscape of connected and autonomous vehicles.

5.2.15 Ramp Metering

Ramp metering is a traffic management strategy that involves installing traffic signals on freeway on-ramps which control the frequency of vehicles entering the freeway. This ITS system is typically deployed in metropolitan areas with high traffic volumes. Benefits of ramp metering include increased mobility, reliability, and efficiency. Additionally, breaking up platoons of vehicles increases safety and improved traffic flow lowers environmental impacts through emissions reduction. Ramp meters should remain a viable tool in long term ITS planning.

6 ITS Services

ITS encompasses a range of activities aimed at enhancing the efficiency, safety, and convenience of the regional transportation system through improved information management, advanced systems, and new technologies. These services cater to various stakeholders, with some being specific to individual primary stakeholders, while others necessitate broad participation. In **Table 6**, you'll find a concise overview of the ITS services that address transportation needs in the region. For comprehensive details on service packages, refer to the RAD-IT Architecture file.

Table 6: ITS Services

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
CVO02	Freight Administration	This service package tracks the movement of cargo and monitors the cargo condition. Interconnections are provided to intermodal freight shippers and intermodal freight depots	Planned	CVO, DOTD Weights + Enforcement, LSP Troop L

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		for tracking of cargo from origin to destination. In addition to exceptions that are reported, on-going indications of the state of the various freight equipment are reported to the Fleet and Freight Management Center.		
CVO03	Electronic Clearance	This service package provides for automated clearance at roadside check facilities. The roadside check facility communicates with the Commercial Vehicle Administration Center to retrieve infrastructure snapshots of critical carrier, vehicle, and driver data to be used to sort passing vehicles. This allows a good driver/vehicle/carrier to pass roadside facilities at highway speeds using vehicle to infrastructure (V2I) Communications. Results of roadside clearance activities will be passed on to the Commercial Vehicle Administration Center. The roadside check facility may be equipped with Automated Vehicle Identification (AVI), weighing sensors, communications equipment, and computer workstations. Communications may be implemented using a range of technologies from transponder data readers through connected vehicle short range communications.	Planned	CVO, DOTD Weights + Enforcement, LSP Troop L
CVO07	Roadside CVO Safety	This service package provides for automated roadside safety monitoring and reporting. It automates commercial vehicle safety inspections at roadside check locations. The basic option, directly supported by this service package, facilitates safety inspection of vehicles that have been pulled off the highway, perhaps as a result of the automated screening process provided by the Electronic Clearance (CVO03) service package. In this scenario, only basic identification data and status information is read from the electronic tag on the commercial vehicle. The identification data from the tag enables access to additional safety data maintained in the infrastructure which is used to support the safety inspection, and may also inform the pull-in decision if system timing requirements can be met. More advanced implementations collect additional data from commercial vehicles. This service package focuses on manned inspection locations. See CVO08 for remote monitoring options using smart roadside infrastructure at unmanned, virtual inspection stations.	Planned	CVO, DOTD Weights + Enforcement, LSP Troop L

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
CVO08	Smart Roadside and Virtual WIM	This service package includes the delivery of capabilities related to wireless roadside inspections and electronic screening/virtual weigh stations. Wireless roadside inspection is defined by a safety screening capability that employs communications technologies to obtain information from a commercial vehicle that will allow safety screening of the vehicle and its driver. This capability provides for the interrogation at mainline speeds of a commercial vehicle when it has entered a control segment or geofenced area. Vehicle identification and driver information are provided to the roadside unit. The information communicated can be used to verify compliance with safety requirements, allowing a decision to be made regarding whether the vehicle should pull in to a roadside check station. A more advanced version of this service package would download safety information measured on the vehicle including driver related information such as the driver log allowing real time evaluation that the vehicle and driver are meeting safety requirements. The electronic screening/virtual weigh stations capability employs communications technologies to obtain information from a commercial vehicle that will allow verification of permits or credentials for the vehicle. The information communicated is used to verify compliance with safety requirements, allowing a decision to be made regarding whether the vehicle should pull in to a roadside check station. This service package can also be used to verify that the commercial vehicle meets vehicle weight (via weigh in motion capability) or dimension requirements.	Planned	<None>
CVO08	Smart Roadside and Virtual WIM (Instance 1)	--Instance of CVO08-- This service package includes the delivery of capabilities related to wireless roadside inspections and electronic screening/virtual weigh stations. Wireless roadside inspection is defined by a safety screening capability that employs communications technologies to obtain information from a commercial vehicle that will allow safety screening of the vehicle and its driver. This capability provides for the interrogation at mainline speeds of a commercial vehicle when it has entered a control segment or geofenced area. Vehicle identification and driver information are provided to the roadside unit. The information communicated can be used to verify compliance with safety requirements, allowing a decision to be made regarding whether the vehicle should pull in to a roadside check station. A more advanced version of this service package would download safety information measured on the vehicle including driver related information such as the driver log allowing real time evaluation that the vehicle and driver are meeting safety requirements.	Planned	<None>

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		The electronic screening/virtual weigh stations capability employs communications technologies to obtain information from a commercial vehicle that will allow verification of permits or credentials for the vehicle. The information communicated is used to verify compliance with safety requirements, allowing a decision to be made regarding whether the vehicle should pull in to a roadside check station. This service package can also be used to verify that the commercial vehicle meets vehicle weight (via weigh in motion capability) or dimension requirements.		
CVO12	HAZMAT Management	This service package integrates incident management capabilities with commercial vehicle tracking to assure effective treatment of HAZMAT material transport, including response to incidents. HAZMAT tracking is performed by the Fleet and Freight Management Center. The Emergency Management Center is notified by the Commercial Vehicle and the Fleet and Freight Management Center of the HAZMAT vehicle location and information about the HAZMAT load. If an incident occurs, the Emergency Management Center can use the information to coordinate the response. The response is tailored based on information that is provided as part of the original incident notification or derived from supplemental information provided by the Fleet and Freight Management Center. The latter information can be provided prior to the beginning of the trip, during the trip, or gathered following the incident depending on the selected policy and implementation.	Planned	CVO, DOTD Weights + Enforcement, Emergency 911, Emergency Management Department, HAZMAT Mobil Response, LSP Troop L
DM01	ITS Data Warehouse	This service package provides access to transportation data to support transportation planning, condition and performance monitoring, safety analysis, and research. Configurations range from focused repositories that house data collected and owned by a single agency, district, private sector provider, or research institution to broad repositories that contain multimodal, multidimensional data from varied data sources covering a broader region. Both central repositories and physical distributed ITS data repositories are supported. Requests for data that are satisfied by access to a single repository in the ITS Data Warehouse service package may be parsed by the local repository and dynamically translated to requests to other repositories that relay the data necessary to satisfy the request. The repositories could include a data registry capability that allows registration of data identifiers or data definitions for interoperable use throughout a region.	Existing	Causeway Traffic Operations, DOTD District 02 Traffic Operation, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations Archive, DOTD Statewide TMC, DOTD Weights + Enforcement, Emergency 911, Local Emergency Operations Centers, LSP Troop L, NORPC, Northshore TMC, Parish Traffic Operations, Transit Data Archive

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
MC05	Roadway Maintenance and Construction	This service package supports numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way. Maintenance services include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, CCTV, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling maintenance and construction activities.	Existing	DOTD District 02 Traffic Operation, DOTD ITS Section, DOTD Statewide TMC, DPW, Northshore TMC, Parish Traffic Operations
MC06	Work Zone Management	This service package manages work zones, controlling traffic in areas of the roadway where maintenance, construction, and utility work activities are underway. Traffic conditions are monitored using CCTV cameras and controlled using dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers. Work zone information is coordinated with other groups (e.g., TIC, traffic management, other maintenance and construction centers). Work zone speeds and delays are provided to the motorist prior to the work zones. This service package provides control of field equipment in all maintenance and construction areas, including fixed, portable, and truck-mounted devices supporting both stationary and mobile work zones.	Planned	DOTD CCTV, DOTD District 62 Traffic Operations, DOTD ITS Field Equipment, DOTD MAP, DOTD Social Media, DOTD Statewide TMC, DPW, Louisiana 511/ Website, LSP Troop L, Northshore TMC
MC09	Infrastructure Monitoring	This service package monitors the condition of pavement, bridges, tunnels, associated hardware, and other transportation-related infrastructure (e.g., culverts) using both fixed and vehicle-based infrastructure monitoring sensors. Fixed sensors monitor vibration, stress, temperature, continuity, and other parameters and mobile sensors and data logging devices collect information on current infrastructure condition. This service package also monitors vehicle probes for vertical acceleration data and other probe data that may be used to determine current pavement condition.	Planned	DOTD District 62 Traffic Operations, DPW

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
PS01	Emergency Call-Taking and Dispatch	This service package provides basic public safety call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Emergency Management Centers supports emergency notification between agencies. Wide area wireless communications between the Emergency Management Center and an Emergency Vehicle supports dispatch and provision of information to responding personnel. This service package also provides information to support dynamic routing of emergency vehicles. Traffic information, road conditions, and weather advisories are provided to enhance emergency vehicle routing. The Emergency Management Center provides routing information based on real-time conditions and has the option to request an ingress/egress route from the Traffic Management Center.	Existing	Causeway Police, DOTD MAP, DOTD Statewide TMC, Emergency 911, Emergency Management Department, HAZMAT Mobil Response, Local Emergency Medical Service, Local Emergency Operations Centers, LSP Troop L, Northshore TMC, Parish Fire Department, Parish Sheriffs Office, Police Departments
PS02	Emergency Response	This service package supports emergency/ incident response by personnel in the field. It includes emergency vehicle equipment used to provide response status as well as video or images from either the vehicle or from emergency personnel in the field. Wide area wireless communications between the Emergency Management Center, Emergency Personnel and Emergency Vehicles supports a sharing of emergency response information. The service package also includes tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident, including the functions and interfaces commonly supported by a mobile command center.	Existing	DOTD District 62 Traffic Operations, DOTD MAP, DOTD Statewide TMC, Emergency 911, Local Emergency Operations Centers, LSP Troop L, Northshore TMC, Parish Sheriffs Office, Police Departments
PS03	Emergency Vehicle Preemption	This service package provides signal preemption for public safety first responder vehicles. Both traditional signal preemption systems and new systems based on connected vehicle technology are covered. In more advanced systems, movement of public safety vehicles through the intersection can be facilitated by clearing queues and holding conflicting phases. In addition, this SP also covers the transition back to normal traffic signal operations after providing emergency vehicle preemption.	Planned	Causeway Police, DOTD MAP, Emergency 911, HAZMAT Mobil Response, Local Emergency Medical Service, LSP Troop L, Northshore TMC, Parish Fire Department, Parish Sheriffs Office, Police Departments

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
PS08	Roadway Service Patrols	This service package supports roadway service patrol vehicles that monitor roads and aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. If problems are detected, the roadway service patrol vehicles will provide assistance to the motorist (e.g., push a vehicle to the shoulder or median). The service package monitors service patrol vehicle locations and supports vehicle dispatch to identified incident locations. Incident information collected by the service patrol is shared with traffic, maintenance and construction, and traveler information systems.	Existing	DOTD MAP, DOTD Statewide TMC, LSP Troop L, Northshore TMC
PS09	Transportation Infrastructure Protection	This service package includes the monitoring of transportation infrastructure (e.g., bridges, tunnels and management centers) for potential threats using sensors and surveillance equipment and barrier and safeguard systems to control access, preclude an incident, and mitigate the impact of an incident if it occurs. Threats can result from acts of nature (e.g., hurricanes, earthquakes), terrorist attacks or other incidents causing damage to the infrastructure (e.g., stray barge hitting a bridge support). Infrastructure may be monitored with acoustic, environmental threat (such as nuclear, biological, chemical, and explosives), infrastructure condition and integrity, motion and object sensors and video and audio surveillance equipment. Data from such sensors and surveillance equipment may be processed in the field or sent to a center for processing. The data enables operators at the center to detect and verify threats. When a threat is detected, agencies are notified. Detected threats or advisories received from other agencies result in an increased level of system preparedness. In response to threats, barrier and safeguard systems may be activated to deter an incident, control access to an area or mitigate the impact of an incident. Barrier systems include gates, barriers and other automated and remotely controlled systems that manage entry to transportation infrastructure. Safeguard systems include blast shields, exhaust systems and other automated and remotely controlled systems that mitigate impact of an incident.	Existing	DOTD District 62 Traffic Operations, DOTD ITS Field Equipment, DOTD Statewide TMC, LSP Troop L, Northshore TMC
PS10	Wide-Area Alert	This service package uses ITS driver and traveler information systems to alert the public in emergency situations such as child abductions, severe weather events, civil emergencies, and other situations that pose a threat to life and property. The alert includes information and instructions for transportation system operators and the traveling public, improving public safety and enlisting the public's help in some scenarios. The ITS technologies will supplement and support other emergency and homeland security alert	Planned	DOTD Statewide TMC, Emergency 911, Emergency Management Department, Local Emergency Operations Centers, LSP Troop L, Northshore TMC

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		systems such as the Emergency Alert System (EAS). When an emergency situation is reported and verified and the terms and conditions for system activation are satisfied, a designated agency broadcasts emergency information to traffic agencies, transit agencies, information service providers, toll operators, and others that operate ITS systems. The ITS systems, in turn, provide the alert information to transportation system operators and the traveling public using ITS technologies such as dynamic message signs, highway advisory radios, in-vehicle displays, transit displays, 511 traveler information systems, and traveler information websites.		
PS11	Early Warning System	This service package monitors and detects potential, looming, and actual disasters including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and acts of terrorism including nuclear, chemical, biological, and radiological weapons attacks). The service package monitors alerting and advisory systems, ITS sensors and surveillance systems, field reports, and emergency call-taking systems to identify emergencies and notifies all responding agencies of detected emergencies.	Planned	DOTD Statewide TMC, Emergency Management Department, Local Emergency Operations Centers, LSP Troop L, Northshore TMC

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
PS12	Disaster Response and Recovery	This service package enhances the ability of the surface transportation system to respond to and recover from disasters. It addresses the most severe incidents that require an extraordinary response from outside the local community. All types of disasters are addressed including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and national security emergencies such as nuclear, chemical, biological, and radiological weapons attacks). The service package supports coordination of emergency response plans, including general plans developed before a disaster as well as specific tactical plans with short time horizon that are developed as part of a disaster response. The service package provides enhanced access to the scene for response personnel and resources, provides better information about the transportation system in the vicinity of the disaster, and maintains situation awareness regarding the disaster itself. In addition, this service package tracks and coordinates the transportation resources - the transportation professionals, equipment, and materials - that constitute a portion of the disaster response. The service package identifies the key points of integration between transportation systems and the public safety, emergency management, public health, and other allied organizations that form the overall disaster response. In this service package, the Emergency Management Center represents the federal, regional, state, and local Emergency Operations Centers and the Incident Commands that are established to respond to the disaster. The interface between the Emergency Management Center and the other centers provides situation awareness and resource coordination among transportation and other allied response agencies. In its role, traffic management implements special traffic control strategies and detours and restrictions to effectively manage traffic in and around the disaster. Maintenance and construction provides damage assessment of road network facilities and manages service restoration. Transit management provides a similar assessment of status for transit facilities and modifies transit operations to meet the special demands of the disaster. As immediate public safety concerns are addressed and disaster response transitions into recovery, this service package supports transition back to normal transportation system operation, recovering resources, managing on-going transportation facility repair, supporting data collection and revised plan coordination, and other recovery	Planned	Causeway Police, Causeway Traffic Operations, DOTD District 02 Traffic Operation, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD Statewide TMC, Emergency 911, Emergency Management Department, HAZMAT Mobil Response, Local Emergency Medical Service, Local Emergency Operations Centers, LSP Troop L, Northshore TMC, Parish Fire Department, Parish Sheriffs Office, Parish Traffic Operations, Police Departments

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		activities. This service package builds on the basic traffic incident response service that is provided by TM08, the Traffic Incident Management service package. This service package addresses the additional complexities and coordination requirements that are associated with the most severe incidents that warrant an extraordinary response from outside the local jurisdictions and require special measures such as the activation of one or more emergency operations centers. Many users of ARC-IT will want to consider both TM08 and this service package since every region is concerned with both day-to-day management of traffic-related incidents and occasional management of disasters that require extraordinary response. Disaster Response and Recovery is also supported by PS14, the "Disaster Traveler Information" service package that keeps the public informed during a disaster response. See that service package for more information.		

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
PS13	Evacuation and Reentry Management	This service package supports evacuation of the general public from a disaster area and manages subsequent reentry to the disaster area. The service package addresses evacuations for all types of disasters, including disasters like hurricanes that are anticipated and occur slowly, allowing a well-planned orderly evacuation, as well as disasters like terrorist acts that occur rapidly, without warning, and allow little or no time for preparation or public warning. This service package supports coordination of evacuation plans among the federal, state, and local transportation, emergency, and law enforcement agencies that may be involved in a large-scale evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. Information is shared with traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes. Reversible lanes, shoulder use, closures, special signal control strategies, and other special strategies may be implemented to maximize capacity along the evacuation routes. Transit resources play an important role in an evacuation, removing many people from an evacuated area while making efficient use of limited capacity. Additional shared transit resources may be added and managed in evacuation scenarios. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. Evacuations are also supported by PS14, the "Disaster Traveler Information" service package, which keeps the public informed during evacuations. See that service package for more information.	Planned	Causeway Police, Causeway Traffic Operations, DOTD District 02 Traffic Operation, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD MAP, DOTD Social Media, DOTD Statewide TMC, Emergency Management Department, Local Emergency Operations Centers, Louisiana 511/ Website, LSP Troop L, Northshore TMC, Parish Sheriffs Office, Parish Traffic Operations, Police Departments, Transit
PS14	Disaster Traveler Information	This service package uses ITS to provide disaster-related traveler information to the general public, including evacuation and reentry information and other information concerning the operation of the transportation system during a disaster. This service package collects information from multiple sources including traffic, transit, public safety, emergency management, shelter provider, and travel service provider organizations. The collected information is processed and the public is provided with real-time disaster and evacuation information using ITS traveler information systems. A disaster will stress the surface transportation system since it may damage transportation facilities at the same time that it places unique demands on these facilities to support public	Planned	Causeway Traffic Operations, DOTD District 62 Traffic Operations, DOTD MAP, DOTD Social Media, DOTD Statewide TMC, Emergency 911, Emergency Management Department, Local Emergency Operations Centers, Local Print

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		evacuation and provide access for emergency responders. Similarly, a disaster may interrupt or degrade the operation of many traveler information systems at the same time that safety-critical information must be provided to the traveling public. This service package keeps the public informed in these scenarios, using all available means to provide information about the disaster area including damage to the transportation system, detours and closures in effect, special traffic restrictions and allowances, special transit schedules, and real-time information on traffic conditions and transit system performance in and around the disaster. This service package also provides emergency information to assist the public with evacuations when necessary. Information on mandatory and voluntary evacuation zones, evacuation times, and instructions are provided. Available evacuation routes and destinations and current and anticipated travel conditions along those routes are provided so evacuees are prepared and know their destination and preferred evacuation route. Information on available transit services and traveler services (shelters, medical services, hotels, restaurants, gas stations, etc.) is also provided. In addition to general evacuation information, this service package provides specific evacuation trip planning information that is tailored for the evacuee based on origin, selected destination, and evacuee-specified evacuation requirements and route parameters. This service package augments the Traveler Information (TI) service packages that provide traveler information on a day-to-day basis for the surface transportation system. This service package provides focus on the special requirements for traveler information dissemination in disaster situations.		and Broadcast Channels, Louisiana 511/ Website, LSP Troop L, Northshore TMC, Private Traveler Information Service Providers, Transit, Transit Information Center
PT01	Transit Vehicle Tracking	This service package monitors current transit vehicle location using an Automated Vehicle Location System. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time.	Existing	Transit
PT02	Transit Fixed-Route Operations	This service package performs automated dispatch and system monitoring for fixed-route and flexible-route transit services. This service performs scheduling activities including the creation of schedules, blocks and runs, as well as operator assignment. This service monitors the transit vehicle trip performance against the schedule and provides information displays at the Transit Management Center.	Existing	Transit

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
PT03	Dynamic Transit Operations	The Dynamic Transit Operations service package allows travelers to request trips and obtain itineraries using a personal device such as a smart phone, tablet, or personal computer. The trips and itineraries cover multiple transportation services (public transportation modes, private transportation services, shared-ride, walking and biking). This service package builds on existing technology systems such as computer-aided dispatch/ automated vehicle location (CAD/AVL) systems and automated scheduling software, providing a coordination function within and between transit providers that would dynamically schedule and dispatch or modify the route of an in-service vehicle by matching compatible trips together. TI06 covers other shared use transportation options.	Existing	Transit, Transit Information Center
PT04	Transit Fare Collection Management	This service package manages transit fare collection on-board transit vehicles and at transit stops using electronic means. It allows transit users to use a traveler card or other electronic payment device such as a smart phone. Readers located either in the infrastructure or on-board the transit vehicles enable electronic fare payment. Data is processed, stored, and displayed on the transit vehicle and communicated as needed to the Transit Management Center. This service supports ad-hoc payments to the transport provider (typically through the 'payment' and 'fare' flows), payments using a transport provider's account system using account-based tokens or integrated multi-provider account systems (typically through the 'account', 'secureID' and 'authorization' flows).	Existing	Transit
PT05	Transit Security	This service package provides for the physical security of transit passengers and transit vehicle operators. On-board equipment performs surveillance and sensor monitoring in order to identify potentially hazardous situations. The surveillance equipment includes video (e.g., CCTV cameras), audio systems and/or event recorder systems. The sensor equipment includes threat sensors (e.g., chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors (e.g., metal detectors). Transit user or transit vehicle operator activated alarms are provided on-board. Public areas (e.g., transit stops, park and ride lots, stations) are also monitored with similar surveillance and sensor equipment and provided with transit user activated alarms. In addition this service package provides surveillance and sensor monitoring of non-public areas of transit facilities (e.g., transit yards) and transit infrastructure such as bridges, tunnels, and transit railways or bus rapid transit (BRT) guideways. The surveillance equipment includes video and/or audio	Existing	Transit

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		systems. The sensor equipment includes threat sensors and object detection sensors as described above as well as, intrusion or motion detection sensors and infrastructure integrity monitoring (e.g., rail track continuity checking or bridge structural integrity monitoring). Most of the surveillance and sensor data that is collected by this service package may be monitored by either the Emergency Management Center or the Transit Management Center, providing two possible approaches to implementing this service package. This service package also supports remote transit vehicle disabling and transit vehicle operator authentication by the Transit Management Center.		
PT06	Transit Fleet Management	This service package supports automatic transit maintenance scheduling and monitoring. On-board condition sensors monitor system status and transmit critical status information to the Transit Management Center. The Transit Management Center processes this data and schedules preventative and corrective maintenance. The service package also supports the day to day management of the transit fleet inventory, including the assignment of specific transit vehicles to blocks and the assignment of transit vehicle operators to runs.	Existing	Transit
PT07	Transit Passenger Counting	This service package counts the number of passengers entering and exiting a transit vehicle using sensors mounted on the vehicle and communicates the collected passenger data back to the management center. The collected data can be used to calculate reliable ridership figures and measure passenger load information at particular stops.	Existing	Transit
PT08	Transit Traveler Information	This service package provides transit users at transit stops and on-board transit vehicles with ready access to transit information. The information services include transit stop annunciation, imminent arrival signs, and real-time transit schedule displays that are of general interest to transit users. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by this service package.	Planned	Local Print and Broadcast Channels, Louisiana 511/ Website, Transit, Transit Information Center
PT14	Multi-modal Coordination	This service package establishes two way communications between multiple transit and traffic agencies to improve service coordination. Multimodal coordination between transit agencies can increase traveler convenience at transit transfer points and clusters (a collection of stops, stations, or terminals where transfers can be made conveniently) and also improve operating efficiency.	Planned	DOTD District 62 Traffic Operations, Northshore TMC, Parish Traffic Operations, Transit

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
ST01	Emissions Monitoring	This service package monitors individual vehicle emissions and provides general air quality monitoring using distributed sensors to collect the data. The collected information is transmitted to the Emissions Management Center for processing. Both area wide air quality monitoring and point emissions monitoring are supported by this service package. For area wide monitoring, this service package measures air quality, identifies sectors that are non-compliant with air quality standards, and collects, stores and reports supporting statistical data. For point emissions monitoring, this service package collects data from on-board diagnostic systems and measures tail pipe emissions to identify vehicles that exceed emissions standards and/or clean vehicles that could be released from standard emissions tests, depending on policy and regulations. Summary emissions information or warnings can also be displayed to drivers. The gathered information can be used to implement environmentally sensitive travel demand management (TDM) programs, policies, and regulations.	Planned	NORPC
TI01	Broadcast Traveler Information	This service package provides a digital broadcast service that disseminates traveler information to all equipped travelers within range. It collects traffic conditions, advisories, general public transportation, toll and parking information, incident information, roadway maintenance and construction information, air quality and weather information, and broadcasts the information to travelers using technologies such as FM subcarrier, satellite radio, cellular data broadcasts, and Internet streaming technologies. This service package also provides location-specific or situation-relevant information to travelers in vehicles using Dedicated Short Range Communications (DSRC) infrastructure supporting mobility service packages for connected vehicles. DSRC is used to deliver real-time traveler information including travel times, incident information, road conditions, and emergency traveler information to vehicles as they pass connected vehicle roadside equipment along their route. This service package provides public information that is available to all equipped vehicles in the vicinity of the roadside equipment.	Planned	Causeway Traffic Operations, DOTD District 62 Traffic Operations, DOTD Social Media, DOTD Statewide TMC, Local Print and Broadcast Channels, Northshore TMC, Personal Devices, Private Traveler Information Service Providers, Transit Information Center
TI02	Personalized Traveler Information	This service package provides tailored information in response to a traveler request. Both real-time interactive request/response systems and information systems that "push" a tailored stream of information to the traveler based on a submitted profile are supported. The traveler can obtain current information regarding traffic conditions, roadway maintenance and construction, transit services, ride share/ride match, parking	Existing	DOTD Social Media, Louisiana 511/ Website, Personal Devices, Private Traveler Information Service Providers

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		management, detours and pricing information. Although the Internet is the predominate network used for traveler information dissemination, a range of two-way wide-area wireless and fixed-point to fixed-point communications systems may be used to support the required data communications with the traveler. A variety of interactive devices may be used by the traveler to access information prior to a trip or en route including phone via a 511-like portal and web pages via smart phone, tablet, personal computer, and a variety of in-vehicle devices.		
TM01	Infrastructure-Based Traffic Surveillance	This service package includes traffic detectors, other surveillance equipment, the supporting field equipment, and Center to Field communications to transmit the collected data back to the Traffic Management Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Traffic Management Center). The data generated by this service package enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users and the Traveler Information Center physical object.	Existing	Causeway ITS Field Elements, Causeway Traffic Operations, DOTD CCTV, DOTD District 62 Traffic Operations, DOTD ITS Field Equipment, DOTD Statewide TMC, Northshore TMC, Parish ITS Field Equipment, Parish Traffic Operations
TM03	Traffic Signal Control	This service package provides the central control and monitoring equipment, communication links, and the signal control equipment that support traffic control at signalized intersections. A range of traffic signal control systems are represented by this service package ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests. This service package is generally an intra-jurisdictional package. Systems that achieve coordination across jurisdictions by using a common time base or other strategies that do not require real time coordination would also be represented by this package. Coordination of traffic signal systems using real-time communications is covered in the TM07-Regional Traffic Management service package. This service package is consistent with typical traffic signal control systems.	Existing	Causeway ITS Field Elements, Causeway Traffic Operations, DOTD District 02 Traffic Signal System, DOTD District 61 Traffic Signal System, DOTD District 62 Traffic Operations, DOTD District 62 Traffic Signal System, DPW, Northshore TMC, Parish Traffic Operations, Parish Traffic Signal System
TM05	Traffic Metering	This service package provides central monitoring and control, communications, and field equipment that support metering of traffic. It supports the complete range of metering strategies including ramp, interchange, and mainline metering. This package incorporates the instrumentation included in the TM01 service package (traffic sensors are used to	Planned	DOTD District 62 Traffic Operations, DOTD ITS Field Equipment, DOTD Statewide TMC, Northshore TMC

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		measure traffic flow and queues) to support traffic monitoring so responsive and adaptive metering strategies can be implemented. Also included is configurable field equipment to provide information to drivers approaching a meter, such as advance warning of the meter, its operational status (whether it is currently on or not, how many cars per green are allowed, etc.), lane usage at the meter (including a bypass lane for HOVs) and existing queue at the meter.		
TM06	Traffic Information Dissemination	This service package provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, travel restrictions, incident information, and emergency alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information. This package also covers the equipment and interfaces that provide traffic information from a traffic management center to the media (for instance via a direct tie-in between a traffic management center and radio or television station computer systems), Transit Management, Emergency Management, and Transportation Information Centers. A link to the Maintenance and Construction Management Center allows real time information on road/bridge closures and restrictions due to maintenance and construction activities to be disseminated.	Existing	Causeway ITS Field Elements, Causeway Police, Causeway Traffic Operations, DOTD District 62 Traffic Operations, DOTD DMS, DOTD ITS Field Equipment, DOTD Social Media, DOTD Statewide TMC, Emergency 911, Local Print and Broadcast Channels, Louisiana 511/ Website, Northshore TMC, Private Traveler Information Service Providers
TM07	Regional Traffic Management	This service package provides for the sharing of information and control among traffic management centers to support regional traffic management strategies. Regional traffic management strategies that are supported include inter-jurisdictional, real-time coordinated traffic signal control systems and coordination between freeway operations and traffic signal control within a corridor. This service package advances the TM03-Traffic Signal Control and TM05-Traffic Metering service packages by adding the communications links and integrated control strategies that enable integrated, interjurisdictional traffic management. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. This package relies principally on roadside instrumentation supported by the Traffic Signal Control and Traffic Metering service packages and adds hardware, software, and fixed-point communications capabilities to	Existing	Causeway Traffic Operations, DOTD District 02 Traffic Operation, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD MAP, DOTD Statewide TMC, Northshore TMC, Parish Traffic Operations

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		implement traffic management strategies that are coordinated between allied traffic management centers. Several levels of coordination are supported from sharing of information through sharing of device control between traffic management centers.		
TM08	Traffic Incident Management System	This service package manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. The service package includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and through regional coordination with other traffic management, maintenance and construction management and emergency management centers as well as rail operations and event promoters. Information from these diverse sources is collected and correlated by this service package to detect and verify incidents and implement an appropriate response. This service package supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications or resource coordination between centers. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination service package and dissemination of incident information to travelers through the Broadcast Traveler Information or Interactive Traveler Information service packages. The roadside equipment used to detect and verify incidents also allows the operator to monitor incident status as the response unfolds. The coordination with emergency management might be through a CAD system or through other communication with emergency personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel. This service package is closely related with the Public Safety service packages, which focus on services that support first responders. In particular, local management of the incident using an incident command system is covered by PS02.	Existing	Causeway ITS Field Elements, Causeway Police, Causeway Traffic Operations, DOTD CCTV, DOTD District 62 Traffic Operations, DOTD DMS, DOTD ITS Field Equipment, DOTD MAP, DOTD Social Media, DOTD Statewide TMC, Emergency 911, Local Emergency Operations Centers, Louisiana 511/ Website, LSP Troop L, Northshore TMC, Parish ITS Field Equipment, Parish Sheriffs Office, Parish Traffic Operations, Police Departments, Private Traveler Information Service Providers

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
TM09	Integrated Decision Support and Demand Management	This service package recommends courses of action to transportation operators in a corridor, downtown area, or other heavily traveled area. Recommendations are based on an assessment of current and forecast transportation network performance and environmental conditions. Multi-modal transportation operational strategies are created that consider all modes and all roads in the travel area to correct network imbalances and effectively manage available capacity. As part of the operational strategies, this service package may also recommend lane restrictions, transit, parking, and toll strategies to influence traveler route and mode choices to support active demand management programs and policies managing both traffic and the environment. Operational strategies, including demand management recommendations, are coordinated to support operational decisions by each transportation operator that are consistent with the recommended strategy. All recommended operational strategies are based on historical evaluation, real-time assessment, and forecast of the roadway network performance based on predicted travel demand patterns. This service package also collects air quality, parking availability, transit usage, and vehicle occupancy data to support operational strategies that manage and balance capacity and demand.	Planned	Causeway Traffic Operations, DOTD District 62 Traffic Operations, DOTD Statewide TMC, Northshore TMC, Parish Traffic Operations
TM13	Standard Railroad Grade Crossing	This service package manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate more advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Both passive (e.g., the crossbuck sign) and active warning systems (e.g., flashing lights and gates) are supported. (Note that passive systems exercise only the single interface between the ITS Roadway Equipment and the Driver in the physical view.) These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported to both highway and railroad officials through wayside interfaces and interfaces to the Traffic Management Center.	Existing	DOTD District 62 Traffic Signal System, DOTD ITS Field Equipment, Parish Traffic Operations, Parish Traffic Signal System, RR at Grade Crossing Controller

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
TM15	Railroad Operations Coordination	This service package provides an additional level of strategic coordination between freight rail operations and other transportation centers. Rail operations provides train schedules, maintenance schedules, and any other forecast events that will result in highway-rail intersection (HRI) closures. This information is used to develop forecast HRI closure times and durations that may be used in advanced traffic control strategies or to enhance the quality of traveler information.	Planned	DOTD District 62 Traffic Signal System, Parish Traffic Operations, Parish Traffic Signal System, RR at Grade Crossing Controller
TM19	Roadway Closure Management	This service package closes roadways to vehicular traffic when driving conditions are unsafe, maintenance must be performed, and other scenarios where access to the roadway must be prohibited. The service package includes automatic or remotely controlled gates or barriers that control access to roadway segments including ramps and traffic lanes. Remote control systems allow the gates to be controlled from a central location or from a vehicle at the gate/barrier location, improving system efficiency and reducing personnel exposure to unsafe conditions during severe weather and other situations where roads must be closed. Surveillance systems allow operating personnel to visually verify the safe activation of the closure system and driver information systems (e.g., DMS) provide closure information to motorists in the vicinity of the closure. The equipment managed by this service package includes the control and monitoring systems, the field devices (e.g., gates, warning lights, DMS, CCTV cameras) at the closure location(s), and the information systems that notify other systems of a closure. This service package covers general road closure applications; specific closure systems that are used at railroad grade crossings, drawbridges, reversible lanes, etc. are covered by other Traffic Management service packages.	Planned	DOTD District 62 Traffic Operations, Flood Monitoring System, LSP Troop L, Police Departments
TM20	Variable Speed Limits	This service package sets variable speed limits along a roadway to create more uniform speeds, to promote safer driving during adverse conditions (such as fog), and/or to reduce air pollution. Also known as speed harmonization, this service monitors traffic and environmental conditions along the roadway. Based on the measured data, the system calculates and sets suitable speed limits, usually by lane. Equipment over and along the roadway displays the speed limits and additional information such as basic safety rules and current traffic information. The system can be centrally monitored and controlled by a traffic management center or it can be autonomous. This service establishes variable speed limits and communicates the speed limits to drivers. Speed warnings and enforcement of speeds limits, including variable speed limits, is covered in the TM17-Speed Warning and	Planned	DOTD District 62 Traffic Operations, DOTD DMS, DOTD ITS Field Equipment, Northshore TMC

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		Enforcement service package. Variable speed limits are an Active Traffic Management (ATM) strategy and are typically used in conjunction with other ATM strategies (such as TM22-Dynamic Lane Management and Shoulder Use and TM23-Dynamic Roadway Warning).		
TM21	Speed Harmonization	This service package determines speed recommendations based on traffic conditions and weather information and uses connected vehicle technologies to assist in harmonizing speeds to these recommendations. The speed recommendations can be regulatory (e.g. variable speed limits) or advisory. The purpose of speed harmonization is to change traffic speed on links that approach areas of traffic congestion, bottlenecks, incidents, special events, and other conditions that affect flow. Speed harmonization assists in maintaining flow, reducing unnecessary stops and starts, and maintaining consistent speeds. The service package utilizes connected vehicle V2I communication to detect the precipitating roadway or congestion conditions that might necessitate speed harmonization, to generate the appropriate response plans and speed recommendation strategies for upstream traffic, and to broadcast such recommendations to the affected vehicles. The speed recommendations can be provided in-vehicle for connected vehicles, or through roadside signage for non-connected vehicles.	Planned	DOTD District 62 Traffic Operations, DOTD DMS, DOTD ITS Field Equipment, Northshore TMC
VS02	V2V Basic Safety	This service package exchanges basic safety messages with surrounding Connected Vehicles to support and augment the safety warning and control automation features identified in VS01. These exchanges support Connected Vehicle safety applications defined in SAE J2945/1: Emergency Electronic Brake Lights, Forward Crash Warning, Blind Spot Warning/Lane Change Warning, Intersection Movement Assist, Left Turn Assist, and Control Loss Warning. It also supports other safety applications that benefit from the exchange of basic safety messages that provide additional information about surrounding vehicles beyond what can be determined by vehicle-based sensors.	Planned	<None>
VS03	Situational Awareness	This service package shares information about potentially hazardous road conditions or road hazards with other vehicles to support enhanced driver warnings and control automation. Vehicles broadcast relevant road condition information that is collected by the vehicle, such as fog or icy roads. This service package supports the capability for connected vehicles to share situational awareness information even in areas where no roadside communications infrastructure exists. It can be useful to vehicles that are not fully equipped with sensors, or vehicles entering an area with	Planned	DOTD ITS Field Equipment, Parish ITS Field Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		hazardous conditions. Roadside communications infrastructure, if available, can extend the situational awareness range to cover wrong way vehicles where closing rates can require notification beyond DSRC communications range.		
WX01	Weather Data Collection	This service package collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. It also collects data from vehicles in the road network that can be used to directly measure or infer current environmental conditions. It leverages vehicle on-board systems that measure temperature, sense current weather conditions (rain and sun sensors) and also can monitor aspects of the vehicle operational status (e.g., use of headlights, wipers, and traction control system) to gather information about local environmental conditions. In addition, environmental sensor systems located on Maintenance and Construction Vehicles are also potential data sources. The collected environmental data is used by the Weather Information Processing and Distribution service package to process the information and make decisions on operations. The collected environmental data may be aggregated, combined with data attributes and sent to meteorological systems for data qualification and further data consolidation. The service package may also request and receive qualified data sets from meteorological systems.	Planned	DOTD ITS Field Equipment
WX02	Weather Information Processing and Distribution	This service package processes and distributes the environmental information collected from the Weather Data Collection service package. This service package uses the environmental data to detect environmental hazards such as icy road conditions, high winds, dense fog, etc. so operational centers and decision support systems can make decision on corrective actions to take. The continuing updates of road condition information and current temperatures can be used to more effectively deploy road maintenance resources, issue general traveler advisories, issue location specific warnings to drivers using the Traffic Information Dissemination service package, and aid operators in scheduling work activity.	Planned	DOTD District 62 Traffic Operations, DOTD Statewide TMC, Northshore TMC
WX03	Spot Weather Impact Warning	This service package will alert drivers and other travelers to unsafe conditions or road closure at specific points on the downstream roadway as a result of weather-related impacts, which include, but are not limited to high winds, flood conditions, ice, fog, dust storms, snow drifts, avalanches, and rock falls. The service packages is designed to use standalone weather and advisory systems to warn drivers and other travelers about inclement weather conditions that may impact travel conditions. Real time weather information is collected from	Planned	DOTD DMS, DOTD ITS Field Equipment, DOTD Statewide TMC, Northshore TMC

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		fixed environmental sensor stations, vehicle based sensors, weather services and advisory systems. The information is processed to determine the nature of the alert or warning to be delivered and then communicated to connected vehicles and personal devices. If the warning includes road closure then diversion information can be provided. For non-equipped vehicles the alerts or warnings will be provided via roadway signage. In addition, the roadway equipment may calculate the appropriate speed for current weather conditions and provide this information to the connected vehicle or on roadway signage.		

7 System Interfaces

The transportation system interfaces within this architecture are designed based on the National ITS Architecture and customized to align with the regional plan. Architecture diagrams showcase the transportation systems in the Northshore Regional ITS Architecture and highlight their interconnections. These connections facilitate information exchange and coordination of transportation services. Stakeholders can use these diagrams to identify integration opportunities. Each system in the region can be represented using two types of diagrams: an overall interconnect diagram and an element-specific architecture flow context diagram.

The interconnect context diagram illustrates connections between systems (referred to as 'Elements'), showing information sharing without specifying the type or direction of information flow. Meanwhile, the architecture flow context diagram focuses on a specific system and its interconnected systems, detailing the information being shared (architecture flows) and the flow direction. Descriptions of architecture flow definitions can be found in **Appendix A**. Additionally, **Appendix B** provides context flow and interconnect diagrams to enhance understanding of system interfaces and information flow. For more detailed flow diagrams related to each element, the RAD-IT database contains tailored interconnect and architecture flow diagrams.

8 Operational Concept

The Operational Concept outlines the roles and responsibilities (RR) that each participating agency must assume to deliver the ITS services specified in the ITS Architecture. As needs evolve, agreements may be necessary among all relevant parties to define new or additional roles. Clearly defining the roles and responsibilities of stakeholders in the region, along with agencies' willingness to accept these roles, is a crucial step toward achieving the shared objective of an interoperable ITS system across the Northshore region. **Table 7** summarizes the operational concept for the Northshore ITS architecture.

Table 7: Operational Concept

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
Archived Data Systems	Data is required for operations, performance measurement and planning. A repository for transportation related data will help agencies with rich information to support business functions.	LADOTD	Archive traffic operations data	Existing
Archived Data Systems	Data is required for operations, performance measurement and planning. A repository for transportation related data will help agencies with rich information to support business functions.	Local/Regional Public Safety Agencies, Louisiana State Police (Troop L)	Archive traffic crash reports	Existing
Archived Data Systems	Data is required for operations, performance measurement and planning. A repository for transportation related data will help agencies with rich information to support business functions.	NORPC	Aggregate, process, analyze, and store traffic operations data	Existing
Commercial Vehicle Operations	As the economy grows and commercial activities increase there is also an increase in commercial vehicle operations. Having a robust system to address needs of commercial vehicle operations will support economic growth.	LADOTD	infrastructure development	Existing
Commercial Vehicle Operations	As the economy grows and commercial activities increase	Louisiana State Police (Troop L)	credentials management and checks	Existing

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
	there is also an increase in commercial vehicle operations. Having a robust system to address needs of commercial vehicle operations will support economic growth.			
Emergency Management	There are a few emergency contingencies related to weather such as hurricane, flooding or icing. The emergency management system will seek to minimize the impacts of extreme events and restore transportation functions and help develop resilient networks and help protect lives.	GNOEC	Emergency response, Infrastructure monitoring, Motorists information systems, Traffic control	Existing
Emergency Management	There are a few emergency contingencies related to weather such as hurricane, flooding or icing. The emergency management system will seek to minimize the impacts of extreme events and restore transportation functions and help develop resilient networks and help protect lives.	LADOTD	Event monitoring, Motorist information system	Planned
Emergency Management	There are a few emergency contingencies related to weather such as hurricane, flooding or icing. The emergency management system will seek to minimize the impacts of extreme events and restore	LADOTD	Infrastructure monitoring, Resources for emergency, Traffic control	Existing

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
	transportation functions and help develop resilient networks and help protect lives.			
Emergency Management	There are a few emergency contingencies related to weather such as hurricane, flooding or icing. The emergency management system will seek to minimize the impacts of extreme events and restore transportation functions and help develop resilient networks and help protect lives.	Local/Regional Public Safety Agencies	Traffic control, incident response	Existing
Emergency Management	There are a few emergency contingencies related to weather such as hurricane, flooding or icing. The emergency management system will seek to minimize the impacts of extreme events and restore transportation functions and help develop resilient networks and help protect lives.	Louisiana State Police (Troop L)	Traffic control	Existing
Emergency Management	There are a few emergency contingencies related to weather such as hurricane, flooding or icing. The emergency management system will seek to minimize the impacts of extreme events and restore transportation functions and help develop resilient networks and help protect lives.	St. Helena Parish, St. Tammany Parish	emergency management, resource allocation	Existing

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
Emergency Management	There are a few emergency contingencies related to weather such as hurricane, flooding or icing. The emergency management system will seek to minimize the impacts of extreme events and restore transportation functions and help develop resilient networks and help protect lives.	Tangipahoa Parish, Washington Parish	emergency management , resource allocation	Existing
Freeway Management	Safety and mobility on the freeways will support economic growth and livability for all residents and travelers through the region.	GNOEC	Operate toll facility, Motorists information systems, Traffic control, Motorist assistance, Incident management, Incident response	Existing
Freeway Management	Safety and mobility on the freeways will support economic growth and livability for all residents and travelers through the region.	LADOTD	Operate toll facility, Event monitoring, Infrastructure monitoring, Motorist information system, Traffic control, Motorist assistance	Existing
Freeway Management	Safety and mobility on the freeways will support economic growth and livability for all residents and travelers through the region.	Local/Regional Public Safety Agencies	Traffic control, Speed enforcement, Incident response	Existing
Freeway Management	Safety and mobility on the freeways will support economic growth and livability for all residents and travelers through the region.	Louisiana State Police (Troop L)	Traffic control, Speed enforcement, Incident response,	Existing

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
			Incident management	
Freeway Management	Safety and mobility on the freeways will support economic growth and livability for all residents and travelers through the region.	Media, Tourism and Traveler Information Service Providers	Motorist information	Existing
Incident Management	Incidents can lead to secondary incidents and loss of lives or loss in productivity. An incident management system will facilitate mitigation of the impacts of incidents and help protect lives.	GNOEC	Infrastructure monitoring, Motorists information systems, Traffic control, Motorist assistance, Incident management, Incident response	Existing
Incident Management	Incidents can lead to secondary incidents and loss of lives or loss in productivity. An incident management system will facilitate mitigation of the impacts of incidents and help protect lives.	LADOTD	Event monitoring, Infrastructure monitoring, Motorist information system, Resources for emergency, Traffic control, Motorist assistance	Existing
Incident Management	Incidents can lead to secondary incidents and loss of lives or loss in productivity. An incident management system will facilitate mitigation of the impacts of incidents and help protect lives.	Local Emergency Medical	Medical response	Existing
Incident Management	Incidents can lead to secondary incidents and loss of lives or loss in productivity. An incident management system will facilitate	Local/Regional Public Safety Agencies	Traffic control, Incident response	Existing

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
	mitigation of the impacts of incidents and help protect lives.			
Incident Management	Incidents can lead to secondary incidents and loss of lives or loss in productivity. An incident management system will facilitate mitigation of the impacts of incidents and help protect lives.	Louisiana State Police (Troop L)	Traffic control, Incident response, Incident management	Existing
Incident Management	Incidents can lead to secondary incidents and loss of lives or loss in productivity. An incident management system will facilitate mitigation of the impacts of incidents and help protect lives.	Media, Tourism and Traveler Information Service Providers	Motorist information	Existing
Maintenance and Construction	Maintenance and construction will help improve the infrastructure and support socio-economic activities. A well maintained infrastructure will be critical to the economic growth of the region.	GNOEC	Infrastructure monitoring, Traffic control, Roadway maintenance and construction, Traffic data collection	Existing
Maintenance and Construction	Maintenance and construction will help improve the infrastructure and support socio-economic activities. A well-maintained infrastructure will be critical to the economic growth of the region.	LADOTD	Infrastructure monitoring, Traffic data collection, Traffic signal system maintenance and construction, Roadway maintenance and construction	Existing
Maintenance and Construction	Maintenance and construction will help improve the infrastructure and support socio-	St. Tammany Parish, Tangipahoa Parish,	infrastructure maintenance	Existing

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
	economic activities. A well-maintained infrastructure will be critical to the economic growth of the region.	Washington Parish		
Surface Street Management	Surface street management to reduce congestion and incidents will make businesses and services more accessible with fewer emissions or environmental impacts.	Cities, LADOTD	traffic data collection, traffic signal operations	Existing
Surface Street Management	Surface street management to reduce congestion and incidents will make businesses and services more accessible with fewer emissions or environmental impacts.	Cities, LADOTD	Traffic data collection, Traffic signal operations	Existing
Surface Street Management	Surface street management to reduce congestion and incidents will make businesses and services more accessible with fewer emissions or environmental impacts.	GNOEC	Traffic control, Traffic data collection	Existing
Transit Services	Transit plays a vital role in providing mobility for many giving them access to work, healthcare and other socio-economic activities.	City of Hammond	transit operations	Existing
Transit Services	Transit plays a vital role in providing mobility for many giving them access to work, healthcare and other socio-economic activities.	Public	Transit user	Existing
Traveler Information	Timely traveler information will help drivers make smarter decisions pre-trip and en-route. Travelers can change	GNOEC	Monitor infrastructure, Roadway maintenance and construction	Existing

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
	departure times or use other modes of transportation to meet their needs.			
Traveler Information	Timely traveler information will help drivers make smarter decisions pre-trip and en-route. Travelers can change departure times or use other modes of transportation to meet their needs.	LADOTD	Motorist information system, Roadway maintenance and construction	Existing
Traveler Information	Timely traveler information will help drivers make smarter decisions pre-trip and en-route. Travelers can change departure times or use other modes of transportation to meet their needs.	Media	Motorist information	Existing
Traveler Information	Timely traveler information will help drivers make smarter decisions pre-trip and en-route. Travelers can change departure times or use other modes of transportation to meet their needs.	Public	End user of traveler information	Existing
Traveler Information	Timely traveler information will help drivers make smarter decisions pre-trip and en-route. Travelers can change departure times or use other modes of transportation to meet their needs.	Tourism and Traveler Information Service Providers	traveler information	Existing

8.1 ITS Deployment Plan

The Northshore region currently incorporates ITS devices that were previously part of the New Orleans Regional ITS Architecture. To enhance the existing ITS framework, new devices have been proposed and will be gradually implemented to fill gaps. This section outlines the projects identified as part of the proposed Northshore Regional ITS Architecture.

Table 8: Proposed ITS Projects[1]

Name	Description	Service Scope	Geographic Scope	Timeframe	Service Packages	Priority	Design Cost ($1,000s)	Capital Cost ($1,000s)	O&M Cost ($1,000s)
Northshore TMC (District 62)	Retrofit office location for use as a temporary TMC location for the Northshore area until permanent location is built.	Traffic monitoring, incident detection and management, congestion mitigation, MAP dispatch, and support for first responders.	LADOTD District 62	1-2 years	DM01, MC05, MC06, PS01, PS02, PS03, PS08, PS09, PS10, PS11, PS12, PS13, PS14, PT14, TI01, TM01, TM03, TM05, TM06, TM07, TM08, TM09, TM20, TM21, WX02, WX03	1	6 – 15	120 – 200	50 – 145
CCTV (I-12 Corridor)	Provide CCTV to facilitate traffic monitoring for normal operations and during emergencies	The project is envisioned to include closed circuit television cameras with pan- tilt-zoom capability and communications and integration to TMC.	LA 3158 West 1077 LA 1077 LA 21 LA 59 LA 434	Active, 1-2 years	MC05, MC06, TM01, TM03, TM05, TM08, TM19, VS03, WX01	2	45 – 85	950 – 1,250	140 – 310
CCTV (Pearl Bridge on I-10)	Provide CCTV to facilitate traffic monitoring for normal operations and during emergencies	The project is envisioned to include closed circuit television cameras with pan- tilt-zoom capability and communications and integration to TMC.	East Pearl Bridge Middle Pearl Bridge West Pearl Bridge	1-2 years	MC05, MC06, TM01, TM03, TM05, TM08, TM19, VS03, WX01	3	30 – 90	620 – 1,250	95 – 310
CCTV (I-55 Corridor)	Provide CCTV to facilitate traffic monitoring for normal operations and during emergencies	The project is envisioned to include closed circuit television cameras with pan- tilt-zoom capability and communications and integration to TMC.	US 51 LA 442 LA 40 LA 16 LA 1042 LA 440 LA 38 LA 1053	1-2 years	MC05, MC06, TM01, TM03, TM05, TM08, TM19, VS03, WX01	4	55 – 105	1,100 – 1,450	165 – 360
Signal upgrades detection and communication (High Priority Corridors)	Upgrade existing signalized intersections with communications to support incident management and emergency evacuation.	Where needed, upgrades may include support poles, cabinets, controllers, detection, wiring, indications, signage, fiber optic communications and integration.	US 190 US 190B US 11 LA 443	1-2 years	MC05, PS03, PS13, TM01, TM03, TM07, TM13, TM15	5	170 – 290	3,400 – 4,150	510 – 1,050

[1] Updated costs are based on applicable adjusted unit costs as developed by the Intelligent Transportation Systems Joint Program Office. Raw data can be found at the following website: https://www.itskrs.its.dot.gov/costs/adjusted.

Name	Description	Service Scope	Geographic Scope	Timeframe	Service Packages	Priority	Design Cost ($1,000s)	Capital Cost ($1,000s)	O&M Cost ($1,000s)
CCTV (US 190 Corridor)	Provide CCTV to facilitate traffic monitoring for normal operations and during emergencies	Installation of closed circuit television cameras with pan- tilt-zoom capability and communications and integration to TMC.	LA 63 LA 441 LA 43 LA 21 US 11	2-3 years	MC05, MC06, TM01, TM03, TM05, TM08, TM19, VS03, WX01	6	40 – 80	780 – 1,050	115 – 260
MAP (Slidell)	Motorist Assistance Patrol	Deploy Motorist Assistance Patrol vehicles and services	Motorist Services (e.g., change tires, fuel, first aid, etc) - Traffic incident management - TMC Support	2-3 years	MC06, PS01, PS02, PS03, PS08, PS13, PS14, TM07, TM08	7	N/A	N/A	800
MAP (Mandeville-Covington)	Motorist Assistance Patrol	Deploy Motorist Assistance Patrol vehicles and services	Motorist Services (e.g., change tires, fuel, first aid, etc) - Traffic incident management - TMC Support	2-3 years	MC06, PS01, PS02, PS03, PS08, PS13, PS14, TM07, TM08	8	N/A	N/A	800
MAP (Hammond)	Motorist Assistance Patrol	Deploy Motorist Assistance Patrol vehicles and services	Motorist Services (e.g., change tires, fuel, first aid, etc) - Traffic incident management - TMC Support	2-3 years	MC06, PS01, PS02, PS03, PS08, PS13, PS14, TM07, TM08	9	N/A	N/A	800
DMS	Provision of DMS to facilitate traveler information for incident management, emergencies and congestion mitigation.	Field installation of DMS, communications and integration.	I-12 EB (west of LA 1077) LA 443 (NB) US 190	5+ years	MC06, TM06, TM08, TM19, TM20, TM21, WX03	10	55 – 90	1,100 – 1,250	165 - 310
Backbone Communications Upgrade and Integration (I-55)	Deploy a new communications hub building, upgrade and integrate local communication	Construct a new hub building at I-12/I-55 interchange, upgrade communications along I-55 to fiber optics and integration into ITS fiber backbone	I-55 corridor	5+ years	CVO08, PS01, TI01, TI02, TM01, TM03, TM05, TM06, TM07, TM08, TM21, VS03	11	65 - 110	1,260 – 1,575	190 – 395

Name	Description	Service Scope	Geographic Scope	Timeframe	Service Packages	Priority	Design Cost ($1,000s)	Capital Cost ($1,000s)	O&M Cost ($1,000s)
Backbone Communications Upgrade and Integration (I-59)	Deploy a new communications hub building, upgrade and integrate local communication	Construct a new hub building at I-10/I-59 interchange, upgrade communications along I-59 to fiber optics and integration into ITS fiber backbone	I-59 corridor	5+ years	CVO08, PS01, TI01, TI02, TM01, TM03, TM05, TM06, TM07, TM08, TM21, VS03	12	65 - 110	1,260 – 1,575	190 – 395
DMS Decommission	Decommission DMS sites including removing signs, structures, and cabinets	Decommission one DMS site. May include modifications to communications.	Statewide	5+ years	MC06, TM06, TM08, TM19, TM20, TM21, WX03	13	5 - 15	50 - 150	N/A

8.2 Operations and Maintenance of Regional ITS

DOTD Section 56 (ITS) is responsible for statewide operations and maintenance (O&M) support of ITS equipment on state and federal routes. District offices or municipalities handle maintenance for LADOTD Traffic Signals through agreements. On other routes, the facility owner assumes responsibility for the ITS. Notably, regional ITS systems lack dedicated funding structures for periodic maintenance. Given the gap between transportation funding resources and demand, it's crucial to strike a balance between capital costs and O&M costs over the life cycle of any ITS. As the Northshore region aims to expand and enhance existing ITS, identifying the responsible agency for proposed ITS projects and assessing necessary O&M resources becomes paramount. Additionally, increased ITS deployment in the region may reduce available funds for subsequent deployments.

In this document, O&M responsibilities are addressed in two sections: one defining agency-specific O&M responsibilities and the other specifying O&M funding requirements. **Table 7** in the Operational Concept section outlines maintenance responsibilities assigned to specific agencies for each applicable service package. While O&M arrangements may vary at the project level based on involved agencies, the operations and maintenance requirements section under each service package provides guidance on which agency should assume maintenance responsibilities for each ITS component.

Regarding long-term funding, there is no dedicated maintenance funding for any ITS in the region. LADOTD's statewide maintenance budget of $3.5 million annually covers routine and responsive (emergency) maintenance. **Table 8** outlines O&M funding requirements for all planned ITS as well as identifies capital cost requirements for ITS. For most systems, an estimated cost serves as the annual O&M cost. Where a specific value isn't provided, an assumption of 10% of the capital cost as the annual O&M cost was deemed reasonable.

9 Functional Requirements

Every ITS system operated by stakeholders must fulfill specific functions to effectively deliver the desired ITS services within the region. The Northshore Regional ITS Architecture broadly outlines the primary functions that each system should perform. These high-level requirements are categorized into functional areas, aligning with the selected ITS services.

Given the intricate details of the functional requirements, they are not fully included in this report. However, these functional requirements are accessible by generating a report from the RAD-IT Architecture source file. Interested parties can request access to this file from the LADOTD ITS Section. **Table 9** provides a sample of the report output, but for comprehensive information, referring to the RAD-IT Architecture file is recommended.

Table 9: Functional Requirements

Element Name	Functional Object	Functional Object Description	Requirement	Status
Causeway ITS Field Elements	Roadway Barrier System Control	Roadway Barrier System Control' includes the field equipment that controls barrier systems used to control access to transportation facilities and infrastructure. Barrier systems include automatic or remotely controlled gates, barriers and other access control systems.	The field element shall return barrier system operational status to the controlling center., The field element shall return barrier system fault data to the maintenance center for repair., The field element shall receive requests for access from approaching vehicles using field-vehicle communications and validate and authenticate the requests., The field element shall grant access only to qualified vehicles., The field element shall communicate access permission status and access instructions to approaching vehicles using field-vehicle communications., 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.	Existing
Causeway ITS Field Elements	Roadway Basic Surveillance	Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.	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., The field element shall return sensor and CCTV system operational status to the controlling center., The field element shall return sensor and CCTV system fault data to the controlling center for repair., The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Existing
Causeway ITS Field Elements	Roadway Infrastructure Monitoring	Roadway Infrastructure Monitoring' monitors the condition of pavement, bridges, tunnels, associated hardware, and other transportation-related infrastructure (e.g., culverts). It includes sensors that monitor the infrastructure and the communications necessary to report this data to a center or vehicle-based maintenance system.	The field element shall provide operational status for the infrastructure condition monitoring sensors to the maintenance center., The field element shall provide fault data for the infrastructure condition monitoring sensors to the maintenance center for repair.	Existing
Causeway ITS Field Elements	Roadway Traffic Information Dissemination	Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.	The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair., The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center., 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	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			center control., The field element shall include dynamic message 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).	
Causeway ITS Field Elements	RSE Device Management	RSE Device Management' provides executive control and monitoring of the RSE hardware and installed software applications. It monitors the operational status of the hardware and other attached field devices and detects and reports fault conditions. A back office interface supports application installation, upgrade, and configuration as well as remote control of the operating mode and hardware configuration settings and initiation of remote diagnostics. A local interface is provided to field personnel for local monitoring and diagnostics, supporting field maintenance, repair, and replacement.	The field element shall send collected fault data to the maintenance center for repair., The field element shall send operational status of connected field equipment to the maintenance center.	Existing
Causeway ITS Field Elements	RSE Traffic Monitoring	RSE Traffic Monitoring' monitors the basic safety messages that are shared between connected vehicles and distills this data into traffic flow measures that can be used to manage the network in combination with or in lieu of traffic data collected by infrastructure-based sensors. As connected vehicle penetration rates increase, the measures provided by this application can expand beyond vehicle speeds that are directly reported by vehicles to include estimated volume, occupancy, and other measures. This object also supports incident detection by monitoring for changes in speed and vehicle control events that indicate a potential incident.	The field element shall communicate with on-board equipment on passing vehicles to collect current vehicle position, speed, and heading and a record of previous events (e.g., starts and stops, link travel times) that can be used to determine current traffic conditions., The field element shall aggregate and forward collected probe information to the center.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Causeway ITS Field Elements, DOTD District 61 Traffic Signal System	Roadway Signal Control	Roadway Signal Control' includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, detectors, conflict monitors, signal heads, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. It represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians. In advanced, future implementations, environmental data may be monitored and used to support dilemma zone processing and other aspects of signal control that are sensitive to local environmental conditions.		
Causeway ITS Field Elements, DOTD ITS Field Equipment	Roadway Incident Detection	Roadway Incident Detection' provides incident detection using traffic detectors and surveillance equipment. It monitors for unusual traffic conditions that may indicate an incident or processes surveillance images, watching for potential incidents. It provides potential incident information as well as traffic flow and images to the center for processing and presentation to traffic operations personnel.	The field element shall provide operational status and fault data for the incident detection devices to the traffic management center., The field element shall remotely process video data and provide an indication of potential incidents to the traffic management center., The field element shall collect, process, and send traffic images to the center for incident detection and further analysis., The field element's video devices shall be remotely controlled by a traffic management center.	Existing
Causeway ITS Field Elements, DOTD ITS Field Equipment	Roadway Warning	Roadway Warning' includes the field equipment used to warn drivers approaching hazards on a roadway. Warnings may be generated in response to roadway weather conditions, road surface conditions, traffic conditions including queues, obstacles or animals in the roadway, and any other transient events that can be sensed. The equipment monitors traffic and roadway conditions and may send data to a Traffic Management Center for processing or may process it to determine when a warning should be issued. When it is determined that a		

Element Name	Functional Object	Functional Object Description	Requirement	Status
		warning should be issued, the equipment is used to alert approaching drivers via dynamic warning signs, flashing lights, in-vehicle messages, etc.		
Causeway Police	Emergency Call-Taking	Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.	The emergency call-taking 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., The emergency call-taking center shall receive emergency call information from vehicles and present the possible incident information to the emergency system operator., The emergency call-taking center shall receive emergency call information from other emergency management centers, e.g. mayday service providers, and present the possible incident information to the emergency system operator., The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator., The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident., The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence., The emergency call-taking center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing
Causeway Police	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.	The center shall receive traffic images to support dispatch of emergency vehicles., The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control., The center shall relay location and incident details to the responding vehicles., The center shall store and maintain the emergency service responses in an action log., The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle., The center shall coordinate response to incidents with other	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			Emergency Management centers to ensure appropriate resources are dispatched and utilized., The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	
Causeway Police	Emergency Incident Command	Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.	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., The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident., The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers., The center shall track and maintain resource information and action plans pertaining to the incident command., The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Causeway Police	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.	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., The center shall provide information to the media concerning the status of an emergency response., The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations., The center shall receive event scheduling information from Event Promoters., 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., The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers., The center shall provide the capability to remotely control and monitor CCTV systems normally operated by a traffic management center., The center shall support remote control of field equipment normally under control of the traffic management center including traffic signals, dynamic message signs, gates, and barriers., The center shall retrieve information from public health systems to increase preparedness for, and implement a response to biological, chemical, radiation, and other public health emergencies., The center shall collect information about the status of the recovery efforts for the infrastructure during disasters., The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies., The center shall assimilate the damage assessment 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., The center shall provide strategic emergency response capabilities provided by an Emergency Operations	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			Center for large-scale incidents and disasters., The center shall develop, coordinate with other agencies, and store emergency response plans., The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations., The center shall provide the overall status of infrastructure recovery efforts to traveler information providers and media., The center shall provide the capability to identify neighborhoods and businesses that should be informed of an emergency situation based on information collected about incidents including their severity, impacted locations, and recovery schedule., The center shall provide the capability to communicate information about emergency situations to local population through the Emergency Telecommunications System.	
Causeway Police	Emergency Routing	Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.	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., The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes., The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center., The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information., The center shall collect current traffic and road condition information for emergency vehicle route calculation., The center shall receive asset restriction information to support the dispatching of appropriate emergency resources., The center shall receive status information from care facilities to determine the appropriate facility and its location.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Causeway Traffic Operations	TMC Basic Surveillance	TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.	The center shall distribute road network conditions data (raw or processed) based on collected and analyzed traffic sensor and surveillance data to other centers., The center shall monitor, analyze, and store multimodal crossing, high occupancy vehicle (HOV) and high occupancy toll (HOT) lane sensor data under remote control of the center., The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution., The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each)., The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center., The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Existing
Causeway Traffic Operations	TMC Incident Detection	TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions	The center shall collect and store traffic flow and image data from the field equipment to detect and verify incidents., The center shall provide video and traffic sensor control commands to the field equipment to detect and verify incidents., The center shall provide road network conditions and traffic images to emergency management centers to support the detection, verification, and classification of incidents., The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters and traveler information service providers., 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., The center shall exchange incident and threat information with emergency management centers as well as maintenance and construction centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Causeway Traffic Operations	TMC Incident Dispatch Coordination	TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.	The center shall monitor incident response performance and calculate incident response and clearance times., The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers., 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., The center shall support requests from emergency management centers to remotely control sensor and surveillance equipment located in the field, provide special routing for emergency vehicles, and to provide responding emergency vehicles with signal preemption., The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations., 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. 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., The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information., The center shall coordinate information and controls with other traffic management centers., The center shall exchange road network status assessment information with emergency management and maintenance centers including an assessment of damage sustained by	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			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., The center shall provide road network conditions and traffic images to emergency management centers, maintenance and construction centers, and traveler information service providers., The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.	
Causeway Traffic Operations	TMC Multimodal Crossing Management	TMC Multimodal Crossing Management' remotely monitors and manages multimodal crossings, including draw bridges and other crossings between highway traffic and other modes. Equipment controlled includes warning lights, gates, dynamic message signs, and other systems that provide driver information and control traffic at multimodal crossings. Railroad grade crossings are covered by other functional objects.	The center shall distribute multimodal crossing information to other centers for dissemination to travelers., The center shall remotely control driver information systems (such as dynamic messages signs, highway advisory radios (HAR), and equipment that controls warning lights and gates) to notify drivers of closure durations and times at multimodal crossings., The center shall collect operational status for the equipment at multimodal crossings., The center shall collect fault data for the equipment at multimodal crossings for repair.	Existing
Causeway Traffic Operations	TMC Roadway Equipment Monitoring	TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared., The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status., The center shall collect and store CCTV surveillance system (traffic, pedestrian) operational status., The center shall collect and store CCTV surveillance system (traffic, pedestrian) fault data send to the maintenance center for repair., The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair., The center shall collect environmental sensor equipment fault data and send to the maintenance center for repair., The center shall collect environmental sensor operational status.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Causeway Traffic Operations	TMC Situation Data Management	TMC Situation Data Management' collects, assimilates, and disseminates vehicle probe data collected from roadside short range communications equipment and centers controlling transit vehicles, toll collection points, and route-guided vehicles. It estimates traffic and road conditions based on the aggregated probe data and disseminates this information to other centers.	The center shall collect fault data for the roadside probe data collection equipment for repair., The center shall collect operational status for the roadside probe data collection equipment., The center shall collect probe data from payment administrative centers containing travel times between toll collection points for those vehicles equipped for electronic toll collection; the data may be aggregated and processed at the sending center., The center shall collect traffic data from traveler information centers based on data from their subscriber vehicles; the data may be aggregated and initial link time calculations performed at the sending center., The center shall collect traffic probe data from vehicles via roadside field equipment.	Existing
Causeway Traffic Operations	TMC Traffic Information Dissemination	TMC Traffic Information Dissemination' disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers., The center shall provide the capability for center personnel to control the nature of the data that is available to non-traffic operations centers and the media., The center shall distribute traffic data to the media., The center shall distribute traffic data to maintenance and construction centers, transit centers, emergency management centers, parking facilities, and traveler information providers., The center shall retrieve locally stored traffic information, including current and forecasted traffic information, road and weather conditions, traffic incident information, information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements), and the definition of the road network itself., The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair., The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.)., The center shall remotely control driver information systems that communicate directly from a center to the vehicle radio (such as Highway Advisory Radios) for dissemination of traffic and other information to drivers.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Causeway Traffic Operations	TMC Traffic Management Decision Support	TMC Traffic Management Decision Support' recommends courses of action to the traffic operator based on current and forecast road and traffic conditions. Traffic incidents, special events, maintenance activities and other events or conditions that impact capacity or demand are monitored. Historical data and models are used to compare the impact of potential courses of action and make recommendations to the operator. Decisions are supported through presentation of filtered and fused network-wide road and traffic conditions that identify network imbalances and recommended courses of action. The recommended actions may include predefined incident response plans, signal timing plan changes, DMS/HAR messages, truck restrictions, lane control strategies, metering strategies, and adjustment of variable speed limits. Multimodal strategies may also be recommended that include suggested transit strategies and suggested route and mode choices for travelers. Once a course of action is selected, traffic operations personnel implement these actions within the Traffic Management Center and coordinate the response with other centers in the region.	The recommended actions shall include predefined incident response plans, signal timing plan changes, DMS/HAR messages, lane control strategies and freeway control strategies including ramp metering, interchange metering, and mainline metering., The center shall provide center personnel with an integrated regional view of current and forecast road and traffic conditions including traffic incidents, special events, maintenance activities and other events or conditions that impact capacity or demand., The center shall compare the impact of potential courses of action and make recommendations to the operator., The center shall provide an interface to center personnel to input control parameters for the decision support process and receive recommended actions and supporting information presentation., The recommended actions shall include multimodal strategies that include suggested transit strategies and suggested route and mode choices for travelers., The center shall identify network imbalances and potential courses of action.	Existing
Causeway Traffic Operations	TMC Traffic Network Performance Evaluation	TMC Traffic Network Performance Evaluation' measures traffic network performance and predicts travel demand patterns to support traffic flow optimization, demand management, and incident management. It collects traffic data from sensors and surveillance equipment as well as input from other Traffic Management Centers, emissions management, transit operations, and event promoters and uses this information to measure traffic network performance. It collects route planning information from transportation information centers and integrates and uses this information to predict future traffic conditions. The planned control strategies can be passed back to the transportation information center so that the intended strategies can be reflected in future route planning.	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center to support overall network performance evaluations., The center shall exchange traffic information with other traffic management centers, including incidents, congestion data, traffic data, signal timing plans, and real-time signal control information to support overall network performance evaluations., The center shall exchange information with transit management centers including details current transit routes, the level of service on each route, and the progress of individual vehicles along their routes for use in forecasting demand and estimating current transportation network performance., The center shall collect and store anticipated route information from traveler information centers to support overall network performance	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			evaluations and predictions., This center shall use the collected information to measure overall current and forecast network performance and predict travel demand patterns., The center shall provide an interface to the archive data repository to enable the operator to retrieve historical operating data for use in planning to predict future traffic patterns and conditions.	
Causeway Traffic Operations, DOTD District 02 Traffic Operation, DOTD District 61 Traffic Operations, DOTD ITS Section	TMC Signal Control	TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.		
Causeway Traffic Operations, DOTD District 62 Traffic Operations, Northshore TMC, DOTD Statewide TMC, DPW, LSP Troop L	TMC Data Collection	TMC Data Collection' collects and stores information that is created in the course of traffic operations performed by the Traffic Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.		
Causeway Traffic Operations, DOTD Statewide TMC	TMC Regional Traffic Management	TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.	The center shall exchange traffic control information with other traffic management centers to support remote monitoring and control of traffic management devices (e.g. signs, sensors, signals, cameras, etc.)., The center shall exchange traffic information with other traffic management centers including incident information, congestion data, traffic data, signal timing plans, and real-time signal control information.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
CVO	CV On-Board Cargo Monitoring	CV On-Board Cargo Monitoring' monitors the location and status of the commercial vehicle and its cargo. It sends the collected data to appropriate centers and roadside facilities, including emergency management in the case of HAZMAT incidents. Depending on the nature of the cargo, it may include sensors that measure temperature, pressure, load leveling, acceleration, and other attributes of the cargo.	The commercial vehicle shall compute the location of the commercial vehicle and its freight equipment., The commercial vehicle shall monitor on-board systems and record measures such as weight, vehicle security status, vehicle safety status, vehicle identity, driver status, driver safety status, distance traveled, and brake condition.	Existing
CVO	CV On-Board Electronic Screening Support	CV On-Board Electronic Screening Support' exchanges information with roadside facilities, providing information such as driver, vehicle, and carrier identification to roadside facilities that can be used to support electronic screening. Pass/pull-in messages are received and presented to the commercial vehicle driver and screening events are recorded. Additional information, including trip records (e.g., border clearance information), safety inspection records, cargo information, and driver status information may also be collected, stored, and made available to the roadside facility.	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., The commercial vehicle shall receive electronic screening (pass/pull-in) messages from the roadside check facilities and present them to the driver in either audible or visual forms.	Existing
CVO	CV On-Board Safety and Security	CV On-Board Safety and Security' collects and processes vehicle and driver safety and security information and provides safety and security information to the Fleet and Freight Management Center. It also supplies this information to the roadside facilities both at mainline speeds and while stopped for inspections. Safety information may also be provided at predetermined trigger areas using wireless communications. The capability to alert the commercial vehicle driver whenever there is a critical safety or security problem or potential emergency is also provided. It also supports on-board driver safety log maintenance and checking.	The commercial vehicle shall receive safety and security messages from the roadside check facilities and present them to the driver in either audible or visual forms.	Existing
CVO	CV On-Board Trip Monitoring	CV On-Board Trip Monitoring' provides the capabilities to support fleet management with automatic vehicle location and automated mileage and fuel reporting and auditing. In addition, this equipment is used to monitor the planned route and notify the Fleet and Freight Management Center of any deviations.	The commercial vehicle shall provide details of the route to the driver as received from the commercial vehicle fleet management center., The commercial vehicle shall compute the location of the commercial vehicle and its freight equipment based on inputs from commercial vehicle measures (e.g. identity, distance traveled, etc.) and a positioning system.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD CCTV	Roadway Work Zone Traffic Control	Roadway Work Zone Traffic Control' controls traffic in areas of the roadway where maintenance and construction activities are underway, monitoring and controlling traffic using field equipment such as CCTV cameras, dynamic messages signs, and gates/barriers. Work zone speeds and delays are provided to the motorist prior to the work zones.	The field element shall collect, process, and send work zone images to the center for further analysis and distribution, under center control.	Planned
DOTD CCTV, DOTD District 62 Traffic Signal System, Parish ITS Field Equipment	Roadway Basic Surveillance	Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.		
DOTD District 02 Traffic Operation	Emergency Evacuation Support	Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.	The center shall monitor the progress of the reentry process., 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., The center shall request resources from transit agencies as needed to support the evacuation., The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster., The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region., The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed., 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., The center shall retrieve information from public health systems to plan for and implement evacuations or in-place sheltering for biological, chemical, radiation, and other public health emergencies., The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry., The center shall monitor the progress or status of the evacuation once it begins	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			and exchange tactical plans, prepared during the incident, with allied agencies.	
DOTD District 02 Traffic Signal System, DOTD District 62 Traffic Signal System	Roadway Signal Control	Roadway Signal Control' includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, detectors, conflict monitors, signal heads, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. It represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians. In advanced, future implementations, environmental data may be monitored and used to support dilemma zone processing and other aspects of signal control that are sensitive to local environmental conditions.	The field element shall report current preemption status to the center., The field element shall return traffic signal controller operational status to the center., The field element shall return traffic signal controller fault data to the center., The field element shall report the current signal control information to the center., The field element shall control traffic signals under center control.	Existing
DOTD District 61 Traffic Operations	Emergency Evacuation Support	Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster., The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed., The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.		
DOTD District 62 Traffic Operations	Emergency Evacuation Support	Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.	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., The center shall monitor the progress of the reentry process., 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., The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry., The center shall request resources from transit agencies as needed to support the evacuation., 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., The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster., The center shall retrieve information from public health systems to plan for and implement evacuations or in-place sheltering for biological, chemical, radiation, and other public health emergencies., The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed., The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD District 62 Traffic Operations	Emergency Incident Command	Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.	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., The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers., The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
DOTD District 62 Traffic Operations	TMC Advanced Rail Crossing Management	TMC Advanced Rail Crossing Management' monitors and controls rail crossing traffic control equipment at advanced crossings that provide additional information on approaching trains, detect and report obstructions on the grade crossing, and communicate directly with equipped vehicles approaching the crossing. It remotely monitors and reports the status of the rail crossing equipment and sends control plan updates to the equipment. It also provides enhanced coordination between rail operations and traffic management centers that supports forecast of closure times and durations that may be applied to advanced traffic control strategies or delivered as enhanced traveler information.	The center shall collect incident information related to a highway-rail intersection (HRI), such as intersection blockages or crashes or equipment malfunctions., The center shall collect highway-rail intersection (HRI) equipment operational status and compare against the control information sent by the center., The center shall remotely control highway-rail intersection (HRI) equipment located in the field., The center shall accept collect highway-rail intersection (HRI) advisory or alert data from rail operations centers., 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
DOTD District 62 Traffic Operations	TMC Basic Surveillance	TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution., The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each)., The center	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		traffic operations personnel and made available to other centers.	shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center., The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	
DOTD District 62 Traffic Operations	TMC Evacuation Support	TMC Evacuation Support' supports development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. A traffic management strategy is developed based on anticipated demand, the capacity of the road network including access to and from the evacuation routes, and existing and forecast conditions. The strategy supports efficient evacuation and also protects and optimizes movement of response vehicles and other resources that are responding to the emergency.	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., The center shall coordinate evacuation information and controls with other traffic management centers.	Planned
DOTD District 62 Traffic Operations	TMC Roadway Equipment Monitoring	TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared., The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status., The center shall collect and store CCTV surveillance system (traffic, pedestrian) operational status., The center shall collect and store CCTV surveillance system (traffic, pedestrian) fault data send to the maintenance center for repair., The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Existing
DOTD District 62 Traffic Operations	TMC Signal Control	TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic	The center shall collect traffic signal controller operational status and compare against the control information sent by the center., The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule., The center shall collect traffic signal controller fault data from the field., The center shall remotely control traffic signal controllers.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.		
DOTD District 62 Traffic Operations	TMC Standard Rail Crossing Management	TMC Standard Rail Crossing Management' monitors and controls rail crossing traffic control equipment. This version provides basic support for standard active warning systems at grade crossings. It remotely monitors and reports the status of the rail crossing equipment and sends control plan updates to the equipment.		
DOTD District 62 Traffic Operations Archive	Archive Data Repository	Archive Data Repository' collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. It includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. It includes the capability to define a data registry that allows registration of data identifiers or data definitions for interoperable use throughout a region. It supports a broad range of 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. Repositories may be established to support operations planning, performance monitoring and management, and policy and investment decisions.	The center shall collect data from data distribution systems and other data sources., The center shall collect data from centers., The center shall store collected data in an information repository., The center shall respond to requests from the administrator interface function to manage the archive data., The center shall respond to requests for archive data from archive data users (centers, field devices).	Existing
DOTD District 62 Traffic Operations Archive	Archive Data Repository	Archive Data Repository' collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. It includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. It includes the capability to define a data registry that allows registration of data identifiers or data definitions for interoperable use throughout a region. It supports a broad range of implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-	The center shall respond to requests from the administrator interface function to manage center-sourced data collection., The center shall perform quality checks on collected data., The center shall notify the system operator of errors related to data collection, analysis and archival., The center shall include capabilities for archive to archive coordination., 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

Element Name	Functional Object	Functional Object Description	Requirement	Status
		scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region. Repositories may be established to support operations planning, performance monitoring and management, and policy and investment decisions.		
DOTD District 62 Traffic Operations Archive	Archive Government Reporting	Archive Government Reporting' selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements. It provides transportation system statistics and performance measures in required formats to support investment and policy decisions.	The center shall provide the capability to format data suitable for input into government reports., The center shall respond to requests for government report data., The center shall provide archive data to federal, state, and local government reporting systems., 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
DOTD District 62 Traffic Operations Archive, DOTD Statewide TMC	Archive Situation Data Archival	Archive Situation Data Archival' collects and archives traffic, roadway, and environmental information for use in off-line planning, research, and analysis. It controls and collects information directly from equipment at the roadside, reflecting the deployment of traffic detectors that are used primarily for traffic monitoring and planning purposes, rather than for traffic management. It also collects situation data from connected vehicles. The data collected, quality checks performed, and aggregation strategies are defined to support transportation system performance monitoring and management.	The center shall provide the capability to adjust the collection of field-sourced data based on the statistical measures., The center shall provide the capability to execute methods on the incoming field data such as aggregation and statistical measures before the data is stored in the archive., The center shall respond to requests from the administrator interface function to manage field-sourced data collection., The center shall collect data from roadside devices.	Existing
DOTD District 62 Traffic Operations, DOTD ITS Section	MCM Incident Management	MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.		
DOTD District 62 Traffic Operations, DOTD ITS Section	TMC Barrier System Management	TMC Barrier System Management' remotely monitors and controls barrier systems for transportation facilities and infrastructure under control of center personnel. Barrier systems include automatic or remotely controlled gates, barriers and other access control systems. It also provides an interface to other		

Element Name	Functional Object	Functional Object Description	Requirement	Status
		centers to allow monitoring and control of the barriers from other centers (e.g., public safety or emergency operations centers).		
DOTD District 62 Traffic Operations, DOTD ITS Section	TMC Demand Management Coordination	TMC Demand Management Coordination' provides the capability to gather information on regional toll, parking, and transit usage and request changes to pricing and other mechanisms to manage overall transportation demand.		
DOTD District 62 Traffic Operations, DOTD ITS Section	TMC Regional Traffic Management	TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.		
DOTD District 62 Traffic Operations, DOTD ITS Section	TMC Traffic Information Dissemination	TMC Traffic Information Dissemination' disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.		
DOTD District 62 Traffic Operations, DOTD ITS Section	TMC Traffic Network Performance Evaluation	TMC Traffic Network Performance Evaluation' measures traffic network performance and predicts travel demand patterns to support traffic flow optimization, demand management, and incident management. It collects traffic data from sensors and surveillance equipment as well as input from other Traffic Management Centers, emissions management, transit operations, and event promoters and uses this information to measure traffic network performance. It collects route planning information from transportation information centers and integrates and uses this information to predict future traffic conditions. The planned control strategies can be passed back to the		

Element Name	Functional Object	Functional Object Description	Requirement	Status
		transportation information center so that the intended strategies can be reflected in future route planning.		
DOTD District 62 Traffic Operations, DOTD ITS Section, DOTD Statewide TMC, Northshore TMC	TMC Traffic Management Decision Support	TMC Traffic Management Decision Support' recommends courses of action to the traffic operator based on current and forecast road and traffic conditions. Traffic incidents, special events, maintenance activities and other events or conditions that impact capacity or demand are monitored. Historical data and models are used to compare the impact of potential courses of action and make recommendations to the operator. Decisions are supported through presentation of filtered and fused network-wide road and traffic conditions that identify network imbalances and recommended courses of action. The recommended actions may include predefined incident response plans, signal timing plan changes, DMS/HAR messages, truck restrictions, lane control strategies, metering strategies, and adjustment of variable speed limits. Multimodal strategies may also be recommended that include suggested transit strategies and suggested route and mode choices for travelers. Once a course of action is selected, traffic operations personnel implement these actions within the Traffic Management Center and coordinate the response with other centers in the region.		
DOTD District 62 Traffic Operations, DOTD ITS Section, DOTD Statewide TMC, Northshore TMC	TMC Traffic Metering	TMC Traffic Metering' provides center monitoring and control of traffic metering systems including on ramps, through interchanges, and on the mainline roadway. All types of metering are covered including pre-timed/fixed time, time-based, dynamic and adaptive metering strategies and special bypasses. Metering rates can be calculated based upon historical data or current conditions including traffic, air quality, etc.		

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD District 62 Traffic Operations, DOTD ITS Section, DPW	MCM Work Zone Management	MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.		
DOTD District 62 Traffic Operations, DOTD ITS Section, LSP Troop L	TMC Incident Dispatch Coordination	TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.		
DOTD District 62 Traffic Operations, DOTD MAP, Emergency 911, HAZMAT Mobil Response, Local Emergency Medical Service, Parish Fire Department	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the		

Element Name	Functional Object	Functional Object Description	Requirement	Status
		appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.		
DOTD District 62 Traffic Operations, DOTD Statewide TMC	TMC Evacuation Support	TMC Evacuation Support' supports development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. A traffic management strategy is developed based on anticipated demand, the capacity of the road network including access to and from the evacuation routes, and existing and forecast conditions. The strategy supports efficient evacuation and also protects and optimizes movement of response vehicles and other resources that are responding to the emergency.	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., 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.	Existing
DOTD District 62 Traffic Operations, DOTD Statewide TMC, LSP Troop L, Northshore TMC	TMC Safeguard System Management	TMC Safeguard System Management' remotely monitors and controls safeguard systems for transportation facilities and infrastructure. Safeguard systems include blast shielding, exhaust systems and other automatic or remotely controlled systems intended to mitigate the impact of an incident. When access to a transportation facility is impacted by the activation of a safeguard system, impacted systems and travelers are notified.		
DOTD District 62 Traffic Operations, DOTD Statewide TMC, Northshore TMC	TMC Work Zone Traffic Management	TMC Work Zone Traffic Management' coordinates work plans with maintenance systems so that work zones are established that have minimum traffic impact. Traffic control strategies are implemented to further mitigate traffic impacts associated with work zones that are established, providing work zone information to driver information systems such as dynamic message signs.	The center shall receive work zone images from a maintenance center., The center shall remotely control driver information systems (such as dynamic messages signs, highway advisory radios) to advise drivers of activity around a work zone., The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible traffic incident, and provide work plan feedback to the sending center., The center shall collect fault data for the driver	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
			information systems equipment in work zones for repair., The center shall collect operational status for the driver information systems equipment in work zones., The center shall analyze work zone images for indications of a possible incident.	
DOTD District 62 Traffic Operations, DPW	MCM Infrastructure Monitoring	MCM Infrastructure Monitoring' monitors the condition of pavement, bridges, tunnels, associated hardware, and other transportation-related infrastructure (e.g., culverts). It monitors the infrastructure, collecting data from both fixed and vehicle-based sensors. In addition to specialized infrastructure monitoring sensors, it also monitors the broader population of equipped vehicles for vertical acceleration data and other situation data that may be used to determine current pavement condition.		
DOTD District 62 Traffic Operations, Emergency Management Department, Local Emergency Operations Centers, LSP Troop L	Emergency Secure Area Sensor Management	Emergency Secure Area Sensor Management' manages sensors that monitor secure areas in the transportation system, processes the collected data, performs threat analysis in which data is correlated with other sensor, surveillance, and advisory inputs, and then disseminates resultant threat information to emergency personnel and other agencies. In response to identified threats, the operator may request activation of barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. The sensors may be in secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. The types of sensors include acoustic, threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, motion and object sensors.		

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD District 62 Traffic Operations, Emergency Management Department, Local Emergency Operations Centers, LSP Troop L	Emergency Secure Area Surveillance	Emergency Secure Area Surveillance' monitors surveillance inputs from secure areas in the transportation system. The surveillance may be of secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. It provides both video and audio surveillance information to emergency personnel and automatically alerts emergency personnel of potential incidents.		
DOTD District 62 Traffic Operations, Northshore TMC	Emergency Data Collection	Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.	The center shall receive and respond to requests from ITS Archives for either a catalog of the emergency management data or for the data itself., The emergency management center shall produce sample products of the data available., The emergency management 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., The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.	Planned
DOTD District 62 Traffic Signal System	Roadway Field Management Station Operation	Roadway Field Management Station Operation' supports direct communications between field management stations and the local field equipment under their control.		
DOTD District 62 Traffic Signal System, Parish Traffic Signal System	Roadway Standard Rail Crossing	Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be		

Element Name	Functional Object	Functional Object Description	Requirement	Status
		interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.		
DOTD DMS	Roadway Traffic Information Dissemination	Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.	The field element shall include dynamic message 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
DOTD ITS Field Equipment	Roadway Basic Surveillance	Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.	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., The field element shall collect, digitize, and send multimodal crossing and high occupancy vehicle (HOV), and high occupancy toll (HOT) lane sensor data to the center for further analysis and storage., The field element shall return sensor and CCTV system operational status to the controlling center., The field element shall return sensor and CCTV system fault data to the controlling center for repair., The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Existing
DOTD ITS Field Equipment	Roadway Multimodal Crossing Control	Roadway Multimodal Crossing Control' monitors multimodal crossings and monitors and controls traffic control equipment in the vicinity of the crossing. Equipment controlled includes warning lights, gates, dynamic message signs, and other systems associated with multimodal crossings. It manages draw bridges and miscellaneous other crossings between highway traffic and other modes. Railroad grade crossings are covered by other functional objects.	The field element shall include driver information systems (such as dynamic messages signs, highway advisory radios (HAR), and equipment that controls warning lights and gates) that advise drivers at multimodal crossings, under center control., The field element shall include sensors to monitor requests from non-highway traffic to cross at multimodal crossings for specified durations (such as draw bridges and miscellaneous other interference crossings between highway traffic and other modes such as river traffic, aircraft, etc.); the sensors are under center control., The field element shall include signals to control traffic at multimodal crossings on surface streets, under center control., The field element shall provide operational status for the sensors, signals, and driver information systems equipment at multimodal crossings to	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
			the center., The field element shall forward all requests for right-of-way at multimodal crossings to the controlling center., The field element shall provide fault data for the sensors, signals, and driver information systems equipment at multimodal crossings to the center for repair.	
DOTD ITS Field Equipment	Roadway Traffic Information Dissemination	Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.	The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair., The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center., The field element shall include dynamic message signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Existing
DOTD ITS Field Equipment	Roadway Traffic Metering	Roadway Traffic Metering' includes the field equipment used to meter traffic on ramps, through interchanges, and on the mainline roadway. The equipment includes dynamic messages signs to provide guidance and information to drivers at and approaching a meter, including information for any special bypass lanes.	The field element shall monitor operation of ramp, interchange, and mainline meters and report to the center any conflicts between received control plans and current system operation., The field element shall return ramp, interchange, and mainline meter operational status to the controlling center., The field element shall return ramp, interchange, and mainline meter fault data to the maintenance center for repair., The field element shall provide indications to the driver that the metering system is active and provide safe transitions between active and inactive status., The field element shall regulate the flow of traffic on ramps, interchanges, and the mainline, under center control.	Planned
DOTD ITS Field Equipment	Roadway Variable Speed Limits	Roadway Variable Speed Limits' includes the field equipment, physical overhead lane signs and associated control electronics that are used to manage and control variable speed limits systems. This equipment monitors traffic and environmental conditions along the roadway. The system can be centrally monitored and controlled by a Traffic Management Center or it can be autonomous, calculating and setting suitable speed limits, usually by lane. This application displays the speed limits and additional information such as basic safety rules and current traffic information to drivers.		

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD ITS Field Equipment	Roadway Work Zone Traffic Control	Roadway Work Zone Traffic Control' controls traffic in areas of the roadway where maintenance and construction activities are underway, monitoring and controlling traffic using field equipment such as CCTV cameras, dynamic messages signs, and gates/barriers. Work zone speeds and delays are provided to the motorist prior to the work zones.	The field element shall control access to the work zone using automated gate or barrier systems. This includes automated flagger assistance devices that include automated gate arms and other automated gate/barrier systems., The field element shall collect, process, and send work zone images to the center for further analysis and distribution, under center control., 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., 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., 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., 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
DOTD ITS Field Equipment	RSE Device Management	RSE Device Management' provides executive control and monitoring of the RSE hardware and installed software applications. It monitors the operational status of the hardware and other attached field devices and detects and reports fault conditions. A back office interface supports application installation, upgrade, and configuration as well as remote control of the operating mode and hardware configuration settings and initiation of remote diagnostics. A local interface is provided to field personnel for local monitoring and diagnostics, supporting field maintenance, repair, and replacement.	The field element shall send collected fault data to the maintenance center for repair., The field element shall send operational status of connected field equipment to the maintenance center.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD ITS Field Equipment	RSE Traffic Monitoring	RSE Traffic Monitoring' monitors the basic safety messages that are shared between connected vehicles and distills this data into traffic flow measures that can be used to manage the network in combination with or in lieu of traffic data collected by infrastructure-based sensors. As connected vehicle penetration rates increase, the measures provided by this application can expand beyond vehicle speeds that are directly reported by vehicles to include estimated volume, occupancy, and other measures. This object also supports incident detection by monitoring for changes in speed and vehicle control events that indicate a potential incident.	The field element shall aggregate and forward collected probe information to the center.	Planned
DOTD ITS Section	Emergency Evacuation Support	Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans., The center shall monitor the progress of the reentry process., 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., 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., The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry., The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed., The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region., 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., The center shall request resources from transit agencies as needed to support the evacuation., The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD ITS Section	Emergency Incident Command	Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers., The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
DOTD ITS Section	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It	The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations., The center shall receive event scheduling information from Event Promoters., The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations., The center shall provide information to the media concerning the status of an emergency response., 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., The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers., The center shall collect information about the status of the recovery efforts for the infrastructure during disasters., The center shall provide the overall status of infrastructure recovery efforts to traveler information providers and media., The center shall provide the capability to implement response plans	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.	and track progress through the incident by exchanging incident information and response status with allied agencies., The center shall assimilate the damage assessment 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., The center shall develop, coordinate with other agencies, and store emergency response plans., The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters., The center shall support remote control of field equipment normally under control of the traffic management center including traffic signals, dynamic message signs, gates, and barriers., The center shall provide the capability to communicate information about emergency situations to local population through the Emergency Telecommunications System., The center shall provide the capability to remotely control and monitor CCTV systems normally operated by a traffic management center., 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., The center shall provide the capability to identify neighborhoods and businesses that should be informed of an emergency situation based on information collected about incidents including their severity, impacted locations, and recovery schedule.	
DOTD ITS Section	ITS Management Support	ITS Management Support' provides management of the ITS Object. This includes management of regulatory information and policies, management of application processes, management of communication system configuration and update management, communications interfaces, protocol-specific techniques to ensure interoperability such as service advertisements, communications congestion management and interference management, local device states and		

Element Name	Functional Object	Functional Object Description	Requirement	Status
		communications information, billing management, fault management, service level and performance monitoring.		
DOTD ITS Section	MCM Maintenance Decision Support	MCM Maintenance Decision Support' recommends maintenance courses of action based on current and forecast environmental and road conditions and additional application specific information. Decisions are supported through understandable presentation of filtered and fused environmental and road condition information for specific time horizons as well as specific maintenance recommendations that are generated by the system based on this integrated information. The recommended courses of action are supported by information on the anticipated consequences of action or inaction, when available.		
DOTD ITS Section	MCM Roadway Maintenance	MCM Roadway Maintenance' provides overall management and support for routine maintenance on a roadway system or right-of-way. Services managed include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of non-ITS equipment on the roadway (e.g., signs, gantries, cabinets, guard rails, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling routine maintenance activities. See also MCM Field Equipment Maintenance for maintenance of ITS field equipment.	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., The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance., 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
DOTD ITS Section	MCM Roadway Maintenance	MCM Roadway Maintenance' provides overall management and support for routine maintenance on a roadway system or right-of-way. Services managed include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of non-	The center shall report the status of roadway maintenance activities to the centers that operate the equipment., 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	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		ITS equipment on the roadway (e.g., signs, gantries, cabinets, guard rails, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling routine maintenance activities. See also MCM Field Equipment Maintenance for maintenance of ITS field equipment.	roadway, alternate routes, anticipated delays, closure times, and durations.	
DOTD ITS Section	TMC Roadway Equipment Monitoring	TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.	Existing
DOTD ITS Section, DOTD MAP, LSP Troop L	TMC Incident Detection	TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions		
DOTD ITS Section, DOTD Statewide TMC	TMC Service Patrol Management	TMC Service Patrol Management' supports dispatch and communication with service patrol vehicles that monitor roads to aid motorists, offering rapid response to minor incidents.	The center shall track the location and status of service patrol vehicles., 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., The center shall store the current status of all service patrol vehicles available for dispatch and those that have been dispatched., The center shall dispatch roadway service	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			patrol vehicles to identified incident locations.	
DOTD ITS Section, DPW	TMC Work Zone Traffic Management	TMC Work Zone Traffic Management' coordinates work plans with maintenance systems so that work zones are established that have minimum traffic impact. Traffic control strategies are implemented to further mitigate traffic impacts associated with work zones that are established, providing work zone information to driver information systems such as dynamic message signs.		
DOTD ITS Section, DPW, LSP Troop L	TMC Basic Surveillance	TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.		
DOTD MAP, DOTD Statewide TMC, Emergency 911, LSP Troop L, Northshore TMC, Parish Sheriffs Office, Police Departments	Emergency Routing	Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.		
DOTD MAP, DOTD Statewide TMC, Emergency Management Department, Northshore TMC	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.		

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD MAP, Emergency 911, Emergency Management Department, Local Emergency Operations Centers, Parish Fire Department	Emergency Incident Command	Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.		
DOTD MAP, Emergency 911, Police Departments	Emergency Evacuation Support	Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public		

Element Name	Functional Object	Functional Object Description	Requirement	Status
		health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.		
DOTD MAP, Emergency Management Department, Local Emergency Medical Service, LSP Troop L	Emergency Call-Taking	Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.		
DOTD MAP, LSP Troop L	TMC Evacuation Support	TMC Evacuation Support' supports development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. A traffic management strategy is developed based on anticipated demand, the capacity of the road network including access to and from the evacuation routes, and existing and forecast conditions. The strategy supports efficient evacuation and also protects and optimizes movement of response vehicles and other resources that are responding to the emergency.		
DOTD MAP, Northshore TMC	TMC Service Patrol Management	TMC Service Patrol Management' supports dispatch and communication with service patrol vehicles that monitor roads to aid motorists, offering rapid response to minor incidents.	The center shall track the location and status of service patrol vehicles., 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., The center shall store the current status of all service patrol vehicles available for dispatch and those that have been dispatched., The center shall dispatch roadway service patrol vehicles to identified incident locations.	Planned
DOTD Social Media	TIC Traveler Information Broadcast	TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is	The center shall disseminate weather information to travelers., The center shall disseminate event information to travelers., The center shall disseminate traffic and highway condition information to travelers, including incident information, detours and road closures, event information,	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		broadcast to all equipped traveler interface systems and vehicles.	recommended routes, and current speeds on specific routes., The center shall disseminate maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities.	
DOTD Social Media, Local Print and Broadcast Channels, Louisiana 511/ Website	TIC Data Collection	TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.		
DOTD Social Media, Local Print and Broadcast Channels, Louisiana 511/ Website	TIC Road Weather Advisories and Warnings	TIC Road Weather Advisories and Warnings' collects, aggregates, and processes environmental situation data (aka environmental probe data) from connected vehicles. Environmental situation data may be collected through direct wide area wireless communications with vehicles or through short range communications equipment at the roadside. Aggregated environmental conditions information are distributed to other centers that use the information to support transportation operations and traveler information services.		
DOTD Social Media, Louisiana 511/ Website	TIC Traveler Information Broadcast	TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.	The center shall provide traffic and incident data to the media., The center shall provide the capability for a system operator to control the type and update frequency of broadcast traveler information.	Planned
DOTD Social Media, Louisiana 511/ Website, Private	TIC Interactive Traveler Information	TIC Interactive Traveler Information' disseminates personalized traveler information including traffic and road conditions, transit information, parking information, maintenance and construction information, multimodal information, event information, and weather		

Element Name	Functional Object	Functional Object Description	Requirement	Status
Traveler Information Service Providers		information. Tailored information is provided based on the traveler's request in this interactive service.		
DOTD Social Media, Louisiana 511/ Website, Transit Information Center	TIC Emergency Traveler Information	TIC Emergency Traveler Information' provides emergency information to the public, including wide-area alerts and evacuation information. It provides emergency alerts, information on evacuation zones and evacuation requirements, evacuation destinations and shelter information, available transportation modes, and traffic and road conditions at the origin, destination, and along the evacuation routes. In addition to general evacuation information, personalized information including tailored evacuation routes, service information, and estimated travel times is also provided based on traveler specified origin, destination, and route parameters. Updated information is provided throughout the evacuation and subsequent reentry as status changes and plans are adapted.		
DOTD Statewide TMC	Archive Data Repository	Archive Data Repository' collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. It includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. It includes the capability to define a data registry that allows registration of data identifiers or data definitions for interoperable use throughout a region. It supports a broad range of 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. Repositories may be established to support operations planning, performance monitoring and management, and policy and investment decisions.	The center shall collect data from centers., The center shall store collected data in an information repository., The center shall respond to requests from the administrator interface function to manage the archive data., The center shall respond to requests for archive data from archive data users (centers, field devices).	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD Statewide TMC	Archive Data Repository	Archive Data Repository' collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. It includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. It includes the capability to define a data registry that allows registration of data identifiers or data definitions for interoperable use throughout a region. It supports a broad range of 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. Repositories may be established to support operations planning, performance monitoring and management, and policy and investment decisions.	The center shall collect data from data distribution systems and other data sources., The center shall respond to requests from the administrator interface function to manage center-sourced data collection., 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)., The center shall perform quality checks on collected data., The center shall notify the system operator of errors related to data collection, analysis and archival., The center shall include capabilities for archive to archive coordination., 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
DOTD Statewide TMC	Archive Government Reporting	Archive Government Reporting' selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements. It provides transportation system statistics and performance measures in required formats to support investment and policy decisions.	The center shall provide the capability to format data suitable for input into government reports., The center shall provide archive data to federal, state, and local government reporting systems., 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
DOTD Statewide TMC	Archive Government Reporting	Archive Government Reporting' selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements. It provides transportation system statistics and performance measures in required formats to support investment and policy decisions.	The center shall respond to requests for government report data.	Existing
DOTD Statewide TMC	Archive On-Line Analysis and Mining	Archive On-Line Analysis and Mining' provides advanced data analysis, summarization, and mining features that facilitate discovery of information, patterns, and correlations in large data sets. Multidimensional analysis, selective summarization and expansion of data details, and many other advanced analysis services may be offered. Complex performance		

Element Name	Functional Object	Functional Object Description	Requirement	Status
		measures that are derived from multiple data sources may also be produced.		
DOTD Statewide TMC	Emergency Data Collection	Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.	The center shall receive and respond to requests from ITS Archives for either a catalog of the emergency management data or for the data itself., The emergency management center shall produce sample products of the data available., The emergency management 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., The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.	Existing
DOTD Statewide TMC	Emergency Early Warning System	Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.	The center shall broadcast wide-area alerts and advisories to commercial vehicle administration centers and roadside check facilities for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall broadcast wide-area alerts and advisories to toll administration centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall broadcast wide-area alerts and advisories to transit management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD Statewide TMC	Emergency Early Warning System	Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data., 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., The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers., The center shall receive incident information from other transportation management centers to support the early warning system., 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., The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
DOTD Statewide TMC	Emergency Evacuation Support	Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry., 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., The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans., The center shall request resources from transit agencies as needed to support the evacuation., The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster., The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.	Cross) in the region., 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., The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed., 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., The center shall monitor the progress of the reentry process.	
DOTD Statewide TMC	Emergency Incident Command	Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.	The center shall track and maintain resource information and action plans pertaining to the 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., The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident., The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers., The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
DOTD Statewide TMC	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the	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., The center shall receive event scheduling information from Event Promoters., The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters., The center shall provide the capability to implement response plans and track progress through the incident by	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.	exchanging incident information and response status with allied agencies., 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., The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers., The center shall develop, coordinate with other agencies, and store emergency response plans.	
DOTD Statewide TMC	MCM Data Collection	MCM Data Collection' collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.	The center shall collect maintenance and construction data (such as field equipment status, infrastructure status, maintenance and construction activity data) gathered from roadway, traffic, and other maintenance and construction sources.	Existing
DOTD Statewide TMC	MCM Incident Management	MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.	The maintenance 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., The maintenance center shall provide work zone activities affecting the road network during traffic incidents 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., The maintenance 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., The maintenance center shall respond to requests from	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			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., The maintenance center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations., The maintenance center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.	
DOTD Statewide TMC	MCM Work Zone Management	MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.	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., 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., The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media., The center shall collect real-time information on the state of the road network including current traffic and road conditions to support work zone scheduling and 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

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD Statewide TMC	TIC Data Collection	TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.	The center shall collect, process, and store maintenance and construction information, including scheduled maintenance and construction work activities and work zone activities., 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.	Existing
DOTD Statewide TMC	TIC Emergency Traveler Information	TIC Emergency Traveler Information' provides emergency information to the public, including wide-area alerts and evacuation information. It provides emergency alerts, information on evacuation zones and evacuation requirements, evacuation destinations and shelter information, available transportation modes, and traffic and road conditions at the origin, destination, and along the evacuation routes. In addition to general evacuation information, personalized information including tailored evacuation routes, service information, and estimated travel times is also provided based on traveler specified origin, destination, and route parameters. Updated information is provided throughout the evacuation and subsequent reentry as status changes and plans are adapted.	The center shall disseminate wide-area alert information to the traveler interface systems, 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., The center shall disseminate emergency evacuation information to the traveler interface systems, 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., 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
DOTD Statewide TMC	TIC Emergency Traveler Information	TIC Emergency Traveler Information' provides emergency information to the public, including wide-area alerts and evacuation information. It provides emergency alerts, information on evacuation zones and evacuation requirements, evacuation destinations and shelter information, available transportation modes, and traffic and road conditions at the origin, destination, and along the evacuation routes. In addition to general evacuation information, personalized information including tailored evacuation routes, service information, and estimated travel times is also provided based on traveler specified origin, destination,	The center shall provide evacuation information to shelter providers.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
		and route parameters. Updated information is provided throughout the evacuation and subsequent reentry as status changes and plans are adapted.		
DOTD Statewide TMC	TIC Operations Data Collection	TIC Operations Data Collection' collects and stores information that is collected about the transportation information service including data on the number of clients serviced and the services that were provided. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.	The center shall collect traveler information data, such as parking lot data, rideshare data, road network use data, vehicle probe data, and other data from traveler information system operations.	Planned
DOTD Statewide TMC	TIC Operations Data Collection	TIC Operations Data Collection' collects and stores information that is collected about the transportation information service including data on the number of clients serviced and the services that were provided. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.	The transportation information center shall produce sample products of the data available., The center shall receive and respond to requests from ITS Archives for either a catalog of the traveler information data or for the data itself.	Existing
DOTD Statewide TMC	TIC Situation Data Management	TIC Situation Data Management' manages connected vehicle situation data collection, quality controls, filtering, aggregation, and storage. Through this process, raw data reported by connected vehicles are transformed into information products that can be accessed and used to support transportation operations and traveler information. The distribution of the connected vehicle-derived information products is handled by other functional objects.	The center shall collect traffic probe data (speeds, travel times, etc.) from appropriately equipped vehicles and short range communications equipment., The center shall aggregate collected traffic probe data, calculate route segment travel times, route segment speeds, route usage, and road weather information for dissemination to other centers.	Planned
DOTD Statewide TMC	TMC Basic Surveillance	TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.	The center shall distribute road network conditions data (raw or processed) based on collected and analyzed traffic sensor and surveillance data to other centers., The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution., The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each)., The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center., The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			field elements under remote control of the center.	
DOTD Statewide TMC	TMC Basic Surveillance	TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.	The center shall monitor, analyze, and store multimodal crossing, high occupancy vehicle (HOV) and high occupancy toll (HOT) lane sensor data under remote control of the center.	Planned
DOTD Statewide TMC	TMC Incident Detection	TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions	The center shall collect and store traffic flow and image data from the field equipment to detect and verify incidents., The center shall provide video and traffic sensor control commands to the field equipment to detect and verify incidents., The center shall exchange incident and threat information with emergency management centers as well as maintenance and construction centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Planned
DOTD Statewide TMC	TMC Incident Detection	TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions	The center shall provide road network conditions and traffic images to emergency management centers to support the detection, verification, and classification of incidents., The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters and traveler information service providers.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD Statewide TMC	TMC Incident Dispatch Coordination	TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations., 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. 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., The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information., The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers., The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.	Existing
DOTD Statewide TMC	TMC Incident Dispatch Coordination	TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance	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., The center shall monitor incident response performance and calculate incident response and clearance times., The center shall provide road network conditions and traffic images to emergency management centers, maintenance and construction centers, and traveler information service providers., The center shall exchange road network status assessment	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
		measures such as incident response and clearance times.	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., The center shall coordinate information and controls with other traffic management centers.	
DOTD Statewide TMC	TMC Roadway Equipment Monitoring	TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status., The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Planned
DOTD Statewide TMC	TMC Roadway Equipment Monitoring	TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared., The center shall collect and store CCTV surveillance system (traffic, pedestrian) operational status., The center shall collect and store CCTV surveillance system (traffic, pedestrian) fault data send to the maintenance center for repair.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD Statewide TMC	TMC Signal Control	TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule., The center shall remotely control traffic signal controllers.	Planned
DOTD Statewide TMC	TMC Traffic Information Dissemination	TMC Traffic Information Dissemination' disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers., The center shall provide the capability for center personnel to control the nature of the data that is available to non-traffic operations centers and the media., The center shall distribute traffic data to maintenance and construction centers, transit centers, emergency management centers, parking facilities, and traveler information providers., The center shall retrieve locally stored traffic information, including current and forecasted traffic information, road and weather conditions, traffic incident information, information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements), and the definition of the road network itself., The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair., The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.).	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD Statewide TMC	TMC Traffic Network Performance Evaluation	TMC Traffic Network Performance Evaluation' measures traffic network performance and predicts travel demand patterns to support traffic flow optimization, demand management, and incident management. It collects traffic data from sensors and surveillance equipment as well as input from other Traffic Management Centers, emissions management, transit operations, and event promoters and uses this information to measure traffic network performance. It collects route planning information from transportation information centers and integrates and uses this information to predict future traffic conditions. The planned control strategies can be passed back to the transportation information center so that the intended strategies can be reflected in future route planning.	The center shall exchange information with transit management centers including details current transit routes, the level of service on each route, and the progress of individual vehicles along their routes for use in forecasting demand and estimating current transportation network performance., The center shall collect and store anticipated route information from traveler information centers to support overall network performance evaluations and predictions., This center shall use the collected information to measure overall current and forecast network performance and predict travel demand patterns., The center shall provide an interface to the archive data repository to enable the operator to retrieve historical operating data for use in planning to predict future traffic patterns and conditions.	Planned
DOTD Statewide TMC	TMC Traffic Network Performance Evaluation	TMC Traffic Network Performance Evaluation' measures traffic network performance and predicts travel demand patterns to support traffic flow optimization, demand management, and incident management. It collects traffic data from sensors and surveillance equipment as well as input from other Traffic Management Centers, emissions management, transit operations, and event promoters and uses this information to measure traffic network performance. It collects route planning information from transportation information centers and integrates and uses this information to predict future traffic conditions. The planned control strategies can be passed back to the transportation information center so that the intended strategies can be reflected in future route planning.	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center to support overall network performance evaluations., The center shall exchange traffic information with other traffic management centers, including incidents, congestion data, traffic data, signal timing plans, and real-time signal control information to support overall network performance evaluations.	Existing
DOTD Statewide TMC, Emergency Management Department, Local Emergency Operations Centers, LSP	Emergency Environmental Monitoring	Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.		

Element Name	Functional Object	Functional Object Description	Requirement	Status
Troop L, Northshore TMC				
DOTD Statewide TMC, Northshore TMC	MCM Data Collection	MCM Data Collection' collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.	The maintenance and construction management center shall produce sample products of the data available., The center shall receive and respond to requests from ITS Archives for either a catalog of the maintenance and construction data or for the data itself., The maintenance and construction management 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
DOTD Statewide TMC, Northshore TMC	TMC Multimodal Crossing Management	TMC Multimodal Crossing Management' remotely monitors and manages multimodal crossings, including draw bridges and other crossings between highway traffic and other modes. Equipment controlled includes warning lights, gates, dynamic message signs, and other systems that provide driver information and control traffic at multimodal crossings. Railroad grade crossings are covered by other functional objects.	The center shall remotely control traffic signal controllers for use at major multimodal crossings., The center shall distribute multimodal crossing information to other centers for dissemination to travelers., The center shall remotely control driver information systems (such as dynamic messages signs, highway advisory radios (HAR), and equipment that controls warning lights and gates) to notify drivers of closure durations and times at multimodal crossings., The center shall collect operational status for the equipment at multimodal crossings., The center shall collect fault data for the equipment at multimodal crossings for repair.	Planned
DOTD Statewide TMC, Northshore TMC	TMC Reversible Lane Management	TMC Reversible Lane Management' remotely monitors and controls reversible lanes. It provides an interface to reversible lane field equipment (traffic sensors, surveillance equipment, lane control signals, physical lane access controls, etc.) and to traffic operations personnel to support central monitoring and control of these facilities.	The center shall monitor the use of reversible lanes and detect wrong-way vehicles in reversible lanes using sensor and surveillance information, and the current lane control status (which direction the lane is currently operating)., The center shall provide the capability for center personnel to control access and management of reversible lane facilities, including the direction of traffic flow changes during the day, especially between the peak hours and dedication of more lanes to the congestion direction during special events., The center shall remotely control automated reversible lane equipment and driver information systems (such as lane control signals) that control traffic in reversible lanes on surface streets., The center shall remotely control devices to detect traffic in reversible lanes, including wrong-way vehicles., The center shall	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
			collect fault data for the reversible lane field equipment and send to the maintenance center for repair., The center shall collect operational status for the reversible lane field equipment., The center shall remotely control automated reversible lane equipment and driver information systems (such as lane control signals) that control traffic in reversible lanes on freeways.	
DOTD Statewide TMC, Northshore TMC	TMC Situation Data Management	TMC Situation Data Management' collects, assimilates, and disseminates vehicle probe data collected from roadside short range communications equipment and centers controlling transit vehicles, toll collection points, and route-guided vehicles. It estimates traffic and road conditions based on the aggregated probe data and disseminates this information to other centers.	The center shall collect fault data for the roadside probe data collection equipment for repair., The center shall collect operational status for the roadside probe data collection equipment., The center shall collect traffic data from traveler information centers based on data from their subscriber vehicles; the data may be aggregated and initial link time calculations performed at the sending center., The center shall collect traffic probe data from vehicles via roadside field equipment.	Planned
DOTD Statewide TMC, Northshore TMC	TMC Speed Warning	TMC Speed Warning' supports remote control and monitoring of reduced speed zone warning roadside equipment. It provides the location and extent of the reduced speed zone, the posted speed limit(s) with information about the applicability of the speed limit(s) (e.g., time of day, day of week, seasonality, relevant vehicle types) and information about associated road configuration changes including lane merges and shifts. It monitors field equipment operation and reports current status to the operator.		
DOTD Statewide TMC, Northshore TMC	TMC Variable Speed Limits	TMC Variable Speed Limits' provides center monitoring and control of variable speed limits systems. It monitors data on traffic and environmental conditions collected from sensors along the roadway. Based on the measured data, it calculates and sets suitable speed limits usually by lane. It controls equipment that posts the current speed limits and displays additional information such as basic safety rules and current traffic information to drivers.		

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD Weights + Enforcement	CVCE Electronic Screening	CVCE Electronic Screening' supports electronic credentials and safety screening of commercial vehicles at mainline speeds. It processes the data from the commercial vehicles along with accessed database information to determine whether a pull-in message is needed. It may also generate random pull-in messages with provisions for facility operators and enforcement officials to have manual override capabilities.		
DOTD Weights + Enforcement	CVCE Safety and Security Inspection	CVCE Safety and Security Inspection' supports the roadside safety inspection process, including wireless roadside inspections that are conducted remotely. It reads on-board safety data at mainline speeds to rapidly check the vehicle and driver and accesses historical and current safety data after identifying vehicles at mainline speeds or while stopped at the roadside. The capabilities to process safety data and issue pull-in messages or provide warnings to the driver, carrier, and enforcement agencies are also provided. It includes hand held or automatic devices to rapidly inspect the vehicle and driver, including driver logs. Results of screening and summary safety inspection data are stored and maintained. Since a vehicle may cross jurisdictional boundaries during a trip, it supports the concept of a last clearance event record carried on the vehicle tag. The last clearance event record reflects the results of the roadside verification action. For example, if the vehicle is pulled over in State A and undergoes credential, weight, and safety checks, the results of the clearance process are written to the vehicle s tag. If the vehicle continues the trip and passes a roadside station in State B, the State B station has access to the results of the previous pull-in because it can read the last clearance event record written by the State A roadside station. It associates high-risk cargo with the container/chassis, manifest, carrier, vehicle and driver transporting it.		

Element Name	Functional Object	Functional Object Description	Requirement	Status
DOTD Weights + Enforcement	CVCE Weigh-In-Motion	CVCE Weigh-In-Motion' measures and records axle weights and gross vehicle weight without requiring the vehicle to come to a stop. Both permanent and portable installations are supported and may be performed in conjunction with electronic clearance or as a separate application.		
DOTD Weights + Enforcement, LSP Troop L	CVAC Data Collection	CVAC Data Collection' collects and stores commercial vehicle information that is collected in the course of Commercial Vehicle Administration Center operations. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.		
DOTD Weights + Enforcement, LSP Troop L	CVAC Information Exchange	CVAC Information Exchange' supports the exchange of safety, credentials, permit data, and other data concerning the operation of commercial vehicles among jurisdictions. The object also supports the exchange of safety (e.g., driver logs), credentials, permit, and operations data between systems (for example, an administrative center and the roadside check facilities) within a single jurisdiction. Data are collected from multiple authoritative sources and packaged into snapshots (top-level summary and critical status information) and profiles (detailed and historical data). Data is made available to fleet operators and other information requestors on request or based on subscriptions established by the requestor.		
DOTD Weights + Enforcement, LSP Troop L	CVAC Safety and Security Administration	CVAC Safety and Security Administration' provides commercial vehicle safety and security criteria to roadside check facilities, collects and reviews safety and security data from the field and distributes safety and security information to other centers, carriers, and enforcement agencies. It also supports wireless roadside inspections, including carrier enrollment, managing and distributing information about trigger areas where wireless inspections may occur, and monitoring the condition of the commercial vehicle and driver using wireless communications at identified trigger areas. It supports the collection and review of carrier and driver safety and security data and supports		

Element Name	Functional Object	Functional Object Description	Requirement	Status
		determination of the carrier and driver safety and security ratings. It clears the out-of-service status when the responsible carrier or driver reports that deficiencies flagged during inspections have been corrected.		
DOTD Weights + Enforcement, LSP Troop L	CVCE Citation and Accident Electronic Recording	CVCE Citation and Accident Electronic Recording' documents accidents, citations, and violations identified during roadside safety inspections and forwards the information to the Commercial Vehicle Administration Center for processing. It collects data from the vehicle to help characterize the circumstances surrounding the accident.		
DPW	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.	The center shall provide the capability to communicate information about emergency situations to local population through the Emergency Telecommunications System., 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., The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations., The center shall provide the overall status of infrastructure recovery efforts to traveler information providers and media., The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies., The center shall develop, coordinate with other agencies, and store emergency response plans., The center shall assimilate the damage assessment 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., The center shall retrieve information from public health systems to increase preparedness for, and implement a response to biological, chemical, radiation, and other public health emergencies., The center shall provide the capability for center personnel to provide inputs to the management of	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			incidents, disasters and evacuations., The center shall provide the capability to identify neighborhoods and businesses that should be informed of an emergency situation based on information collected about incidents including their severity, impacted locations, and recovery schedule., The center shall receive event scheduling information from Event Promoters., The center shall collect information about the status of the recovery efforts for the infrastructure during disasters., The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters., The center shall provide information to the media concerning the status of an emergency response., The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers., 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.	
DPW	TMC Roadway Equipment Monitoring	TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).		

Element Name	Functional Object	Functional Object Description	Requirement	Status
DPW	TMC Signal Control	TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.	The center shall remotely control traffic signal controllers., The center shall collect traffic signal controller fault data from the field., The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.	Planned
Emergency 911	Emergency Call-Taking	Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator., The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency., The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident., The emergency call-taking center shall receive emergency call information from other emergency management centers, e.g. mayday service providers, and present the possible incident information to the emergency system operator., The emergency call-taking 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., The emergency call-taking center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator., The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Emergency 911	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.	The center shall provide the capability to request remote control of traffic surveillance devices., The center shall receive traffic images to support dispatch of emergency vehicles.	Planned
Emergency 911	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched., The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized., The center shall relay location and incident details to the responding vehicles., The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control., The center shall store and maintain the emergency service responses in an action log., The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
Emergency 911, Emergency Management Department	Emergency Early Warning System	Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.		
Emergency 911, Emergency Management Department, HAZMAT Mobil Response, LSP Troop L	Emergency Commercial Vehicle Response	Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information		

Element Name	Functional Object	Functional Object Description	Requirement	Status
		concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.		
Emergency 911, Emergency Management Department, Local Emergency Operations Centers, LSP Troop L	Emergency Data Collection	Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.		
Emergency 911, Emergency Management Department, LSP Troop L	Emergency Notification Support	Emergency Notification Support' receives emergency notification messages from vehicles or personal handheld devices, determines an appropriate response, and either uses internal resources or contacts a local agency to provide that response. The nature of the emergency is determined based on the information in the received message as well as other inputs. This object effectively serves as an interface between automated collision notification systems and the local public safety answering point for messages that require a public safety response. This capability depends on an up-to-date registry of public safety answering points/response agencies by coverage area, the type of emergency, and hours of service.		
Emergency 911, Local Emergency Operations Centers	Emergency Call-Taking	Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.	The emergency call-taking center shall send a request for remote control of Closed-circuit Television (CCTV) systems from a traffic management center in order to verify the reported incident.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
Emergency Management Department	Emergency Evacuation Support	Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.	The center shall request resources from transit agencies as needed to support the evacuation., The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster., The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry., The center shall monitor the progress of the reentry process., The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans., The center shall retrieve information from public health systems to plan for and implement evacuations or in-place sheltering for biological, chemical, radiation, and other public health emergencies., The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed., The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region., 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., 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., The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Emergency Management Department	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.	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., The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies., The center shall develop, coordinate with other agencies, and store emergency response plans., The center shall provide the capability to communicate information about emergency situations to local population through the Emergency Telecommunications System., The center shall assimilate the damage assessment 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., The center shall provide the capability to identify neighborhoods and businesses that should be informed of an emergency situation based on information collected about incidents including their severity, impacted locations, and recovery schedule., The center shall retrieve information from public health systems to increase preparedness for, and implement a response to biological, chemical, radiation, and other public health emergencies., The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers., The center shall provide the overall status of infrastructure recovery efforts to traveler information providers and media., The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters., 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., The center shall receive event	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			scheduling information from Event Promoters., The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations., The center shall provide information to the media concerning the status of an emergency response., The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations., The center shall collect information about the status of the recovery efforts for the infrastructure during disasters., The center shall manage coordinated inter-agency responses to incidents at an international border.	
Emergency Management Department	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.	The center shall support remote control of field equipment normally under control of the traffic management center including traffic signals, dynamic message signs, gates, and barriers., The center shall provide the capability to remotely control and monitor CCTV systems normally operated by a traffic management center.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
Flood Monitoring System	Roadway Environmental Monitoring	Roadway Environmental Monitoring' measures environmental conditions and communicates the collected information back to a center where it can be monitored and analyzed or to other field devices to support communications to vehicles. A broad array of weather and road surface information may be collected. Weather conditions that may be measured include temperature, wind, humidity, precipitation, and visibility. Surface and sub-surface sensors can measure road surface temperature, moisture, icing, salinity, and other metrics.		
HAZMAT Mobil Response	Emergency Environmental Monitoring	Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.	The center shall collect current and forecast road and weather information from weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Local Emergency Medical Service	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.	The center shall relay location and incident details to the responding vehicles., The center shall store and maintain the emergency service responses in an action log., The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized., The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched., The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Local Emergency Medical Service	Emergency Routing	Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information., The center shall collect current traffic and road condition information for emergency vehicle route calculation., The center shall receive asset restriction information to support the dispatching of appropriate emergency resources., The center shall receive status information from care facilities to determine the appropriate facility and its location.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Local Emergency Medical Service, Parish Fire Department	Emergency Routing	Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center., 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., The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Planned
Local Emergency Medical Service, Parish Fire Department, Parish Sheriffs Office	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Planned
Local Emergency Operations Centers	Emergency Call-Taking	Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident., The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency., The emergency call-taking 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., The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence., The emergency call-taking center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator., The emergency call-taking center shall receive emergency notification information from other	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			public safety agencies and present the possible incident information to the emergency system operator., The emergency call-taking center shall receive emergency call information from other emergency management centers, e.g. mayday service providers, and present the possible incident information to the emergency system operator., The emergency call-taking center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	
Local Emergency Operations Centers	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized., The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle., The center shall relay location and incident details to the responding vehicles., The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched., The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control., The center shall store and maintain the emergency service responses in an action log.	Existing
Local Emergency Operations Centers	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.	The center shall receive traffic images to support dispatch of emergency vehicles.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
Local Emergency Operations Centers	Emergency Early Warning System	Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies)., The center shall broadcast wide-area alerts and advisories to transit management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data., 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., The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall process status information from each of the centers	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			that have been sent the wide-area alert., The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers., 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., The center shall support the entry of alert and advisory information directly from the emergency system operator.	
Local Emergency Operations Centers	Emergency Early Warning System	Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.	The center shall receive incident information from other transportation management centers to support the early warning system.	Planned
Local Emergency Operations Centers	Emergency Evacuation Support	Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry., The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed., The center shall retrieve information from public health systems to plan for and implement evacuations or in-place sheltering for biological, chemical, radiation, and other public health emergencies., The center shall monitor the progress of the reentry process., The center shall request resources from transit agencies as needed to support the evacuation., 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., The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster., The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans., The center shall provide traveler information systems with evacuation guidance	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.	including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return., The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	
Local Emergency Operations Centers	Emergency Evacuation Support	Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Planned
Local Emergency Operations Centers	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to	The center shall provide the capability to communicate information about emergency situations to local population through the Emergency Telecommunications System., The center shall receive event scheduling information from Event Promoters., 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., The center shall provide strategic	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.	emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters., The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies., The center shall develop, coordinate with other agencies, and store emergency response plans., The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations., The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers., The center shall assimilate the damage assessment 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., The center shall provide the capability to identify neighborhoods and businesses that should be informed of an emergency situation based on information collected about incidents including their severity, impacted locations, and recovery schedule., The center shall provide the overall status of infrastructure recovery efforts to traveler information providers and media., The center shall provide information to the media concerning the status of an emergency response., The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations., 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., The center shall collect information about the status of the recovery efforts for the infrastructure during disasters.	

Element Name	Functional Object	Functional Object Description	Requirement	Status
Local Print and Broadcast Channels	TIC Emergency Traveler Information	TIC Emergency Traveler Information' provides emergency information to the public, including wide-area alerts and evacuation information. It provides emergency alerts, information on evacuation zones and evacuation requirements, evacuation destinations and shelter information, available transportation modes, and traffic and road conditions at the origin, destination, and along the evacuation routes. In addition to general evacuation information, personalized information including tailored evacuation routes, service information, and estimated travel times is also provided based on traveler specified origin, destination, and route parameters. Updated information is provided throughout the evacuation and subsequent reentry as status changes and plans are adapted.	The center shall disseminate emergency evacuation information to the traveler interface systems, 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
Local Print and Broadcast Channels	TIC Traveler Information Broadcast	TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.	The center shall disseminate traffic and highway condition information to travelers, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.	Existing
Local Print and Broadcast Channels	TIC Traveler Information Broadcast	TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.	The center shall provide traffic and incident data to the media., The center shall disseminate transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information to travelers., The center shall disseminate air quality information to travelers., The center shall disseminate event information to travelers., The center shall disseminate parking information to travelers, including location, availability, and fees., The center shall disseminate maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
Local Print and Broadcast Channels	TIC Trip Planning	TIC Trip Planning' provides pre-trip and en route trip planning services for travelers. It receives origin, destination, constraints, and preferences and returns trip plan(s) that meet the supplied criteria. Trip plans may be based on current traffic and road conditions, transit schedule information, and other real-time traveler information. Candidate trip plans are multimodal and may include vehicle, transit, and alternate mode segments (e.g., rail, ferry, bicycle routes, and walkways) based on traveler preferences. It also confirms the trip plan for the traveler and supports reservations and advanced payment for portions of the trip. The trip plan includes specific routing information and instructions for each segment of the trip and may also include information and reservations for additional services (e.g., parking) along the route.		
Louisiana 511/ Website	TIC Traveler Information Broadcast	TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.	The center shall disseminate traffic and highway condition information to travelers, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes., The center shall disseminate weather information to travelers., The center shall disseminate event information to travelers., The center shall disseminate maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities.	Existing
Louisiana 511/ Website	TIC Traveler Telephone Information	TIC Traveler Telephone Information' services voice-based traveler requests for information that supports traveler telephone information systems like 511. It takes requests for traveler information, which could be voice-formatted traveler requests, dual-tone multi-frequency (DTMF)-based requests, or a simple traveler information request, and returns the requested traveler information in the proper format. In addition to servicing requests for traveler information, it also collects and forwards alerts and advisories to traveler telephone information systems.	The center shall provide information on traffic conditions in the requested voice format and for the requested location., The center shall provide the capability to support both specific caller requests as well as bulk upload of regional traveler information., The center shall provide weather and event information in the requested voice format and for the requested location., The center shall provide work zone and roadway maintenance information in the requested voice format and for the requested location., The center shall provide the capability to process traveler information requests from a traveler telephone information system., The center shall provide the capability to process dual-tone multi-frequency (DTMF)-based requests (touch-tone)	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			for traveler information from a traveler telephone information system., 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.	
LSP Troop L	CV On-Board Electronic Screening Support	CV On-Board Electronic Screening Support' exchanges information with roadside facilities, providing information such as driver, vehicle, and carrier identification to roadside facilities that can be used to support electronic screening. Pass/pull-in messages are received and presented to the commercial vehicle driver and screening events are recorded. Additional information, including trip records (e.g., border clearance information), safety inspection records, cargo information, and driver status information may also be collected, stored, and made available to the roadside facility.		
LSP Troop L	CV On-Board Safety and Security	CV On-Board Safety and Security' collects and processes vehicle and driver safety and security information and provides safety and security information to the Fleet and Freight Management Center. It also supplies this information to the roadside facilities both at mainline speeds and while stopped for inspections. Safety information may also be provided at predetermined trigger areas using wireless communications. The capability to alert the commercial vehicle driver whenever there is a critical safety or security problem or potential emergency is also provided. It also supports on-board driver safety log maintenance and checking.		
LSP Troop L	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.	The center shall relay location and incident details to the responding vehicles., The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle., The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched., The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control., The center shall	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			store and maintain the emergency service responses in an action log.	
LSP Troop L	Emergency Early Warning System	Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies)., 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., The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall process status information from each of the centers that have been sent the wide-area alert., The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers., The center shall receive incident information from other transportation management centers to support the early warning system., The center shall present the alert and advisory information and the status of the actions taken in response to the	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			alert by the other centers to the emergency system operator as received from other system inputs., The center shall support the entry of alert and advisory information directly from the emergency system operator.	
LSP Troop L	Emergency Early Warning System	Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
LSP Troop L	Emergency Evacuation Support	Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans., The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry., 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., The center shall monitor the progress of the reentry process., 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., The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed., The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region., The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster., The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
LSP Troop L	Emergency Incident Command	Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that	The center shall track and maintain resource information and action plans pertaining to the incident command., The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers., The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident., The center shall assess the status of responding emergency vehicles as part of an incident command., The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information,	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.	evacuation advice as well as traffic, road, and weather conditions.	
LSP Troop L	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.	The center shall develop, coordinate with other agencies, and store emergency response plans., The center shall provide the overall status of infrastructure recovery efforts to traveler information providers and media., The center shall assimilate the damage assessment 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., The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers., 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., The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters., The center shall receive event scheduling information from Event Promoters., The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations., The center shall collect information about the status of the recovery efforts for the infrastructure during disasters., The center shall provide the capability to communicate information about emergency situations to local population through the Emergency	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			Telecommunications System., The center shall provide information to the media concerning the status of an emergency response., 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., The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations., The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies., The center shall provide the capability to identify neighborhoods and businesses that should be informed of an emergency situation based on information collected about incidents including their severity, impacted locations, and recovery schedule.	
NORPC	Archive Government Reporting	Archive Government Reporting' selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements. It provides transportation system statistics and performance measures in required formats to support investment and policy decisions.	The center shall provide the capability to format data suitable for input into government reports., The center shall respond to requests for government report data.	Existing
NORPC	Emissions Data Collection	Emissions Data Collection' collects and stores air quality and emissions management information that is collected in the course of Emissions Management Center operations. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.	The emissions management 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., The emissions management center shall produce sample products of the data available.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
NORPC	Emissions Data Management	Emissions Data Management' collects and stores air quality and vehicle emissions information by remotely monitoring and controlling area wide and point sensors. General air quality measures are distributed as general traveler information and also may be used in demand management programs. Collected roadside emissions are analyzed and used to detect, identify, and notify concerned parties regarding vehicles that exceed emissions standards.	The center shall collect, analyze, and store wide area pollution data collected from connected vehicles and roadside sensors.	Existing
Northshore TMC	Archive Data Repository	Archive Data Repository' collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. It includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. It includes the capability to define a data registry that allows registration of data identifiers or data definitions for interoperable use throughout a region. It supports a broad range of 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. Repositories may be established to support operations planning, performance monitoring and management, and policy and investment decisions.	The center shall collect data from data distribution systems and other data sources., The center shall respond to requests from the administrator interface function to manage center-sourced data collection., The center shall collect data from centers., 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)., The center shall store collected data in an information repository., The center shall perform quality checks on collected data., The center shall notify the system operator of errors related to data collection, analysis and archival., The center shall respond to requests from the administrator interface function to manage the archive data., The center shall include capabilities for archive to archive coordination., 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., The center shall respond to requests for archive data from archive data users (centers, field devices).	Planned
Northshore TMC	Emergency Early Warning System	Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public	The center shall broadcast wide-area alerts and advisories to commercial vehicle administration centers and roadside check facilities for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall broadcast wide-area	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
		notification using ITS traveler information systems, where appropriate.	alerts and advisories to toll administration centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall broadcast wide-area alerts and advisories to transit management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data., 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., The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property., The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers., The center shall receive incident information from other transportation management centers to support the early warning system., 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., The center shall support the entry of alert and advisory information directly from the emergency system operator.	

Element Name	Functional Object	Functional Object Description	Requirement	Status
Northshore TMC	Emergency Evacuation Support	Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region., The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry., 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., 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., 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., The center shall monitor the progress of the reentry process., The center shall request resources from transit agencies as needed to support the evacuation., The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed., The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans., The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Planned
Northshore TMC	Emergency Incident Command	Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous	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., The center shall track and maintain resource information and action plans pertaining to the incident command., The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers., The center shall provide tactical decision support, resource coordination, and communications integration for first	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
		material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.	responders to support local management of an incident., The center shall assess the status of responding emergency vehicles as part of an incident command.	
Northshore TMC	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.	The center shall receive event scheduling information from Event Promoters., 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., The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies., The center shall develop, coordinate with other agencies, and store emergency response plans., The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers., 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., The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
Northshore TMC	MCM Incident Management	MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.	The maintenance 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., The maintenance center shall provide work zone activities affecting the road network during traffic incidents 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., The maintenance 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., The maintenance 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., The maintenance center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations., The maintenance center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Planned
Northshore TMC	MCM Work Zone Management	MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and	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	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
		closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.	administration., 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., 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., The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media., The center shall collect real-time information on the state of the road network including current traffic and road conditions to support work zone scheduling and management.	
Northshore TMC	TIC Data Collection	TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.	The center shall collect, process, and store maintenance and construction information, including scheduled maintenance and construction work activities and work zone activities., 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
Northshore TMC	TIC Emergency Traveler Information	TIC Emergency Traveler Information' provides emergency information to the public, including wide-area alerts and evacuation information. It provides emergency alerts, information on evacuation zones and evacuation requirements, evacuation destinations and shelter information, available transportation modes, and traffic and road conditions at the origin, destination, and along the evacuation routes. In addition to general evacuation information, personalized information including tailored evacuation routes, service information, and estimated travel times is also provided based on traveler specified origin, destination, and route parameters. Updated	The center shall disseminate wide-area alert information to the traveler interface systems, 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., The center shall provide evacuation information to shelter providers., 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., The center shall disseminate emergency evacuation information to the traveler interface systems, including evacuation zones, shelter information, available transportation	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
		information is provided throughout the evacuation and subsequent reentry as status changes and plans are adapted.	modes, road closures and detours, changes to transit services, and traffic and road conditions at the origin, destination, and along the evacuation routes.	
Northshore TMC	TIC Operations Data Collection	TIC Operations Data Collection' collects and stores information that is collected about the transportation information service including data on the number of clients serviced and the services that were provided. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.	The transportation information center shall produce sample products of the data available., The center shall receive and respond to requests from ITS Archives for either a catalog of the traveler information data or for the data itself., The center shall collect traveler information data, such as parking lot data, rideshare data, road network use data, vehicle probe data, and other data from traveler information system operations.	Planned
Northshore TMC	TIC Situation Data Management	TIC Situation Data Management' manages connected vehicle situation data collection, quality controls, filtering, aggregation, and storage. Through this process, raw data reported by connected vehicles are transformed into information products that can be accessed and used to support transportation operations and traveler information. The distribution of the connected vehicle-derived information products is handled by other functional objects.	The center shall aggregate collected traffic probe data, calculate route segment travel times, route segment speeds, route usage, and road weather information for dissemination to other centers., The center shall collect traffic probe data (speeds, travel times, etc.) from appropriately equipped vehicles and short range communications equipment.	Planned
Northshore TMC	TMC Basic Surveillance	TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.	The center shall distribute road network conditions data (raw or processed) based on collected and analyzed traffic sensor and surveillance data to other centers., The center shall monitor, analyze, and store multimodal crossing, high occupancy vehicle (HOV) and high occupancy toll (HOT) lane sensor data under remote control of the center., The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution., The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each)., The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center., The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
Northshore TMC	TMC Evacuation Support	TMC Evacuation Support' supports development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. A traffic management strategy is developed based on anticipated demand, the capacity of the road network including access to and from the evacuation routes, and existing and forecast conditions. The strategy supports efficient evacuation and also protects and optimizes movement of response vehicles and other resources that are responding to the emergency.	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., The center shall coordinate evacuation information and controls with other traffic management centers.	Planned
Northshore TMC	TMC HOV Lane Management	TMC HOV Lane Management' provides center monitoring and control of HOV lanes. It coordinates freeway ramp meters and connector signals with HOV lane usage signals to provide preferential treatment to HOV lanes. In advanced implementations, it automatically detects HOV violators.		
Northshore TMC	TMC Incident Detection	TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions	The center shall collect and store traffic flow and image data from the field equipment to detect and verify incidents., The center shall provide video and traffic sensor control commands to the field equipment to detect and verify incidents., The center shall provide road network conditions and traffic images to emergency management centers to support the detection, verification, and classification of incidents., The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters and traveler information service providers., The center shall exchange incident and threat information with emergency management centers as well as maintenance and construction centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Planned
Northshore TMC	TMC Incident Dispatch Coordination	TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as	The center shall coordinate information and controls with other traffic management centers., 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	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
		coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.	extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery., The center shall provide road network conditions and traffic images to emergency management centers, maintenance and construction centers, and traveler information service providers., The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers., The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers., The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information., 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. 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., The center shall monitor incident response performance and calculate incident response and clearance times., 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., The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	

Element Name	Functional Object	Functional Object Description	Requirement	Status
Northshore TMC	TMC Multi-Modal Coordination	TMC Multi-Modal Coordination' supports center-to-center coordination between the Traffic Management and Transit Management Centers. It monitors transit operations and provides traffic signal priority for transit vehicles on request from the Transit Management Center.		
Northshore TMC	TMC Regional Traffic Management	TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.	The center shall exchange traffic information with other traffic management centers including incident information, congestion data, traffic data, signal timing plans, and real-time signal control information., The center shall exchange traffic control information with other traffic management centers to support remote monitoring and control of traffic management devices (e.g. signs, sensors, signals, cameras, etc.).	Planned
Northshore TMC	TMC Road Weather Advisories and Warnings	TMC Road Weather Advisories and Warnings' provides road weather advisories to drivers and other travelers. Advisories are based on environmental information collected from a variety of data sources, including data collected from roadside sensors and connected vehicles.		
Northshore TMC	TMC Roadway Equipment Monitoring	TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared., The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status., The center shall collect and store CCTV surveillance system (traffic, pedestrian) operational status., The center shall collect and store CCTV surveillance system (traffic, pedestrian) fault data send to the maintenance center for repair., The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
Northshore TMC	TMC Signal Control	TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule., The center shall remotely control traffic signal controllers., The center shall collect traffic signal controller fault data from the field.	Planned
Northshore TMC	TMC Traffic Information Dissemination	TMC Traffic Information Dissemination' disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers., The center shall provide the capability for center personnel to control the nature of the data that is available to non-traffic operations centers and the media., The center shall distribute traffic data to maintenance and construction centers, transit centers, emergency management centers, parking facilities, and traveler information providers., The center shall retrieve locally stored traffic information, including current and forecasted traffic information, road and weather conditions, traffic incident information, information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements), and the definition of the road network itself., The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair., The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.).	Planned
Northshore TMC	TMC Traffic Network Performance Evaluation	TMC Traffic Network Performance Evaluation' measures traffic network performance and predicts travel demand patterns to support traffic flow optimization, demand management, and incident management. It collects traffic data from sensors and surveillance equipment as well as input from other Traffic Management Centers, emissions management, transit operations, and event promoters and uses this information to measure	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center to support overall network performance evaluations., The center shall exchange traffic information with other traffic management centers, including incidents, congestion data, traffic data, signal timing plans, and real-time signal control information to support overall network performance evaluations., The center shall exchange	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
		traffic network performance. It collects route planning information from transportation information centers and integrates and uses this information to predict future traffic conditions. The planned control strategies can be passed back to the transportation information center so that the intended strategies can be reflected in future route planning.	information with transit management centers including details current transit routes, the level of service on each route, and the progress of individual vehicles along their routes for use in forecasting demand and estimating current transportation network performance., The center shall collect and store anticipated route information from traveler information centers to support overall network performance evaluations and predictions., This center shall use the collected information to measure overall current and forecast network performance and predict travel demand patterns., The center shall provide an interface to the archive data repository to enable the operator to retrieve historical operating data for use in planning to predict future traffic patterns and conditions.	
Northshore TMC, DOTD Social Media, DOTD Statewide TMC, Private Traveler Information Service Providers, Transit Information Center	TIC Traveler Telephone Information	TIC Traveler Telephone Information' services voice-based traveler requests for information that supports traveler telephone information systems like 511. It takes requests for traveler information, which could be voice-formatted traveler requests, dual-tone multi-frequency (DTMF)-based requests, or a simple traveler information request, and returns the requested traveler information in the proper format. In addition to servicing requests for traveler information, it also collects and forwards alerts and advisories to traveler telephone information systems.		
Northshore TMC, DOTD Statewide TMC	MCM Reduced Speed Zone Warning	MCM Reduced Speed Zone Warning' supports remote control and monitoring of reduced speed zone warning roadside equipment. It provides posted speed limits and associated schedules and information about associated road configuration changes including lane merges and shifts. It monitors field equipment operation and reports current status to the operator.		

Element Name	Functional Object	Functional Object Description	Requirement	Status
Northshore TMC, DOTD Statewide TMC	TMC Environmental Monitoring	TMC Environmental Monitoring' assimilates current and forecast road conditions and surface weather information using a combination of weather service provider information, information collected by other centers such as the Maintenance and Construction Management Center, data collected from environmental sensors deployed on and about the roadway, and information collected from connected vehicles. The collected environmental information is monitored and presented to the operator. This information can be used to issue general traveler advisories and support location specific warnings to drivers.		
Northshore TMC, Transit Information Center	TIC Traveler Information Broadcast	TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.		
Parish Fire Department	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.	The center shall relay location and incident details to the responding vehicles., The center shall store and maintain the emergency service responses in an action log., The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control., The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized., The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Parish Fire Department	Emergency Routing	Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.	The center shall receive status information from care facilities to determine the appropriate facility and its location., The center shall receive asset restriction information to support the dispatching of appropriate emergency resources., The center shall collect current traffic and road condition information for emergency vehicle route calculation., The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Parish ITS Field Equipment	Roadway Incident Detection	Roadway Incident Detection' provides incident detection using traffic detectors and surveillance equipment. It monitors for unusual traffic conditions that may indicate an incident or processes surveillance images, watching for potential incidents. It provides potential incident information as well as traffic flow and images to the center for processing and presentation to traffic operations personnel.		
Parish ITS Field Equipment	Roadway Standard Rail Crossing	Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI)., 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., The field element shall close the highway-rail intersection (HRI) when a train is approaching using gates, lights/signs, barriers, and traffic control signals., The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the rail wayside equipment.	Existing
Parish ITS Field Equipment	Roadway Standard Rail Crossing	Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced	The field element shall forward rail traffic advisories received from the Wayside Equipment to the traffic management center., 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., The field element shall collect pedestrian images and pedestrian sensor data, and respond to pedestrian crossing requests via display, audio signal, or other manner., 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	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
		wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.	the current status of the tracks and whether a train is approaching.	
Parish Sheriffs Office	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.	The center shall relay location and incident details to the responding vehicles., The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized., The center shall store and maintain the emergency service responses in an action log., The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched., The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Parish Sheriffs Office	Emergency Incident Command	Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident., The center shall track and maintain resource information and action plans pertaining to the incident command., The center shall assess the status of responding emergency vehicles as part of an incident command., The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers., The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Parish Sheriffs Office	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.	The center shall provide information to the media concerning the status of an emergency response., The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies., The center shall assimilate the damage assessment 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., The center shall provide the capability to identify neighborhoods and businesses that should be informed of an emergency situation based on information collected about incidents including their severity, impacted locations, and recovery schedule., The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters., The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers., The center shall receive event scheduling information from Event Promoters., The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations., The center shall collect information about the status of the recovery efforts for the infrastructure during disasters., The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations., 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., The center shall develop, coordinate with other agencies, and store emergency response plans., The center shall provide the capability to communicate information about emergency situations to local population through the Emergency Telecommunications System., The center shall provide the overall status	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			of infrastructure recovery efforts to traveler information providers and media., 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.	
Parish Traffic Operations	TMC Signal Control	TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule., The center shall remotely control traffic signal controllers., The center shall collect traffic signal controller fault data from the field., The center shall collect traffic signal controller operational status and compare against the control information sent by the center.	Existing
Parish Traffic Signal System	Roadway Signal Control	Roadway Signal Control' includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, detectors, conflict monitors, signal heads, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. It represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians. In advanced, future implementations, environmental data may be monitored and used to support dilemma zone processing and other aspects of signal control that are sensitive to local environmental conditions.	The field element shall report current preemption status to the center., The field element shall return traffic signal controller fault data to the center., The field element shall return traffic signal controller operational status to the center., The field element shall report the current signal control information to the center., The field element shall control traffic signals under center control.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Personal Devices	Personal Interactive Traveler Information	Personal Interactive Traveler Information' provides traffic information, road conditions, transit information, yellow pages (traveler services) information, special event information, and other traveler information that is specifically tailored based on the traveler's request and/or previously submitted traveler profile information. It also supports interactive services that support enrollment, account management, and payments for transportation services. The interactive traveler information capability is provided by personal devices including personal computers and personal portable devices such as smart phones.		
Personal Devices	Personal Traveler Information Reception	Personal Traveler Information Reception' receives formatted traffic advisories, road conditions, traffic regulations, transit information, broadcast alerts, and other general traveler information broadcasts and presents the information to the traveler. The traveler information broadcasts are received by personal devices including personal computers and personal portable devices such as smart phones.	The personal traveler interface shall provide broadcast traveler information in audio or manual form., The personal traveler interface shall receive transit information from a center and present it to the traveler.	Planned
Personal Devices	Personal Traveler Information Reception	Personal Traveler Information Reception' receives formatted traffic advisories, road conditions, traffic regulations, transit information, broadcast alerts, and other general traveler information broadcasts and presents the information to the traveler. The traveler information broadcasts are received by personal devices including personal computers and personal portable devices such as smart phones.	The personal traveler interface shall receive event information from a center and present it to the traveler., The personal traveler interface shall receive broadcast evacuation information and present it to the traveler., The personal traveler interface shall receive broadcast wide-area alerts and present it to the traveler., The personal traveler interface shall present information to the traveler in audible or visual forms, consistent with a personal device., The personal traveler interface shall receive traffic information from a center and present it to the traveler.	Existing
Police Departments	Emergency Dispatch	Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control., The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle., The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized., The center shall store the current status of all emergency vehicles available for	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			dispatch and those that have been dispatched., The center shall relay location and incident details to the responding vehicles., The center shall store and maintain the emergency service responses in an action log.	
Police Departments	Emergency Incident Command	Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident., The center shall assess the status of responding emergency vehicles as part of an incident command., The center shall track and maintain resource information and action plans pertaining to the 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., The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Police Departments	Emergency Response Management	Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during	The center shall provide information to the media concerning the status of an emergency response., The center shall provide the capability to communicate information about emergency situations to local population through the Emergency Telecommunications System., The center shall develop, coordinate with other agencies, and store emergency response plans., The center shall collect information about the status of the recovery efforts for the infrastructure during disasters., 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., The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers., The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.	incidents and disasters., 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., The center shall receive event scheduling information from Event Promoters., The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies., The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations., The center shall assimilate the damage assessment 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., The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations., The center shall retrieve information from public health systems to increase preparedness for, and implement a response to biological, chemical, radiation, and other public health emergencies., The center shall provide the overall status of infrastructure recovery efforts to traveler information providers and media., The center shall provide the capability to identify neighborhoods and businesses that should be informed of an emergency situation based on information collected about incidents including their severity, impacted locations, and recovery schedule.	
Private Traveler Information Service Providers	TIC Data Collection	TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road	The center shall collect, process, and store air quality information., The center shall collect, process, and store parking information, including location, availability, and fees.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
		conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.		
Private Traveler Information Service Providers	TIC Data Collection	TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.	The center shall collect, process, and store transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information., The center shall collect, process, and store maintenance and construction information, including scheduled maintenance and construction work activities and work zone activities., 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., The center shall collect, process, and store toll fee information., The center shall collect, process, and store event information., The center shall collect, process, and store current and forecast road conditions and surface weather conditions.	Existing
Private Traveler Information Service Providers	TIC Emergency Traveler Information	TIC Emergency Traveler Information' provides emergency information to the public, including wide-area alerts and evacuation information. It provides emergency alerts, information on evacuation zones and evacuation requirements, evacuation destinations and shelter information, available transportation modes, and traffic and road conditions at the origin, destination, and along the evacuation routes. In addition to general evacuation information, personalized information including tailored evacuation routes, service information, and estimated travel times is also provided based on traveler specified origin, destination, and route parameters. Updated information is provided throughout the evacuation and subsequent reentry as status changes and plans are adapted.	The center shall disseminate wide-area alert information to the traveler interface systems, 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., The center shall provide evacuation information to shelter providers., The center shall disseminate emergency evacuation information to the traveler interface systems, 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., 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

Element Name	Functional Object	Functional Object Description	Requirement	Status
Private Traveler Information Service Providers	TIC Traveler Information Broadcast	TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.	The center shall disseminate air quality information to travelers., The center shall disseminate parking information to travelers, including location, availability, and fees.	Planned
Private Traveler Information Service Providers	TIC Traveler Information Broadcast	TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.	The center shall disseminate event information to travelers., The center shall disseminate toll fee information to travelers., The center shall disseminate transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information to travelers., The center shall disseminate traffic and highway condition information to travelers, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes., The center shall provide traffic and incident data to the media., The center shall provide the capability for a system operator to control the type and update frequency of broadcast traveler information., The center shall disseminate weather information to travelers., The center shall disseminate maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities.	Existing
RR at Grade Crossing Controller	Roadway Standard Rail Crossing	Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI)., The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.		
RR at Grade Crossing Controller	Roadway Standard Rail Crossing	Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.	The field element shall forward rail traffic advisories received from the Wayside Equipment to the traffic management center., 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., The field element shall close the highway-rail intersection (HRI) when a train is approaching using gates, lights/signs, barriers, and traffic control signals., 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., 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
Transit	Transit Center Fare Management	Transit Center Fare Management' manages fare collection and passenger load management at the transit center. It provides the back office functions that support transit fare collection, supporting payment reconciliation with links to financial institutions and enforcement agencies for fare violations. It collects data required to determine accurate ridership levels, establish fares, and distribute fare information. It loads fare data into the vehicle prior to the beginning of normal operations and unloads fare collection data from the vehicle at the close out of normal operations. It manages allow/block lists and performs token validation.	The center shall provide the capability for a system operator to manage the transit fares and control the exchange of transit fare information., The center shall provide transit fare information to traveler information providers upon request., The center shall maintain a list of invalid traveler credit identities or bad tag lists that can be forwarded to transit vehicles and transit stops or stations., The center shall manage the actual value of transit fares for each segment of each regular transit route, including the transmission of the information to transit vehicles and transit stops or stations., The center shall exchange fare and load information with other transit management centers, including potential Centralized Payments facilities., The center shall collect fare statistics data to implement variable and flexible fare structures., The center	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
			shall collect data on fare payment violations and send the data, including images of the violator, to the appropriate enforcement agency., The center shall support the payment of transit fare transactions using data provided by the traveler cards / payment instruments., The center shall process the financial requests from the transit vehicles or roadside and manage an interface to a Financial Institution., The center shall process requests for transit fares to be paid in advance.	
Transit	Transit Center Fixed-Route Operations	Transit Center Fixed-Route Operations' manages fixed route transit operations. It supports creation of schedules, blocks and runs for fixed and flexible route transit services. It allows fixed-route and flexible-route transit services to disseminate schedules and automatically updates customer service operator systems with the most current schedule information. It also supports automated dispatch of transit vehicles. Current vehicle schedule adherence and optimum scenarios for schedule adjustment are also provided. It also receives and processes transit vehicle loading data.	The center shall generate special routes and schedules to support an incident, disaster, evacuation, or other emergency., The center shall generate transit routes and schedules based on such factors as parameters input by the system operator, road network conditions, incident information, operational data on current routes and schedules, and digitized map data., The center shall provide the interface to the system operator to control the generation of new routes and schedules (transit services) including the ability to review and update the parameters used by the routes and schedules generation processes and to initiate these processes, The center shall collect transit operational data for use in the generation of routes and schedules., The center shall manage large deviations of individual transit vehicles, deviations in rural areas, and deviations of large numbers of vehicles., The center shall exchange information with Maintenance and Construction Operations concerning work zones, roadway conditions, asset restrictions, work plans, etc., The center shall disseminate up-to-date schedules and route information to other centers for fixed and flexible route services., The center shall provide an interface to the archive data repository to enable the operator to retrieve historical operating data for use in planning transit routes and schedules., The center shall dispatch fixed route or flexible route transit vehicles., The center shall provide instructions or corrective actions to the transit vehicle operators based upon operational needs.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Transit	Transit Center Information Services	Transit Center Information Services' collects the latest available information for a transit service and makes it available to transit customers and to Transportation Information Centers for further distribution. Customers are provided information at transit stops and other public transportation areas before they embark and on-board the transit vehicle once they are en route. Information provided can include the latest available information on transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events. In addition to general service information, tailored information (e.g., itineraries) are provided to individual transit users.	The center shall broadcast transit advisory data, including alerts and advisories pertaining to major emergencies, or man made disasters., 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., The center shall provide travelers using public transportation with traffic and advisory information upon request. Such information may include transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, and special events.	Planned
Transit	Transit Center Information Services	Transit Center Information Services' collects the latest available information for a transit service and makes it available to transit customers and to Transportation Information Centers for further distribution. Customers are provided information at transit stops and other public transportation areas before they embark and on-board the transit vehicle once they are en route. Information provided can include the latest available information on transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events. In addition to general service information, tailored information (e.g., itineraries) are provided to individual transit users.	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., The center shall enable yellow pages (including non-motorized transportation) information to be output to the traveler., The center shall provide transit information to the media including details of deviations from schedule of regular transit services.	Existing
Transit	Transit Center Multi-Modal Coordination	Transit Center Multi-Modal Coordination' supports transit service coordination between transit properties and coordinates with other surface and air transportation modes. As part of service coordination, it shares schedule and trip information, as well as transit transfer cluster (a collection of stop points, stations, or terminals where transfers can be made conveniently) and transfer point information between Multimodal Transportation Service Providers, Transit Agencies, and ISPs. An interface to Traffic Management also supports demand management strategies.	The center shall accept requests from traffic management to change routes and schedules as part of the implementation of demand management strategies.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
Transit	Transit Center Multi-Modal Coordination	Transit Center Multi-Modal Coordination' supports transit service coordination between transit properties and coordinates with other surface and air transportation modes. As part of service coordination, it shares schedule and trip information, as well as transit transfer cluster (a collection of stop points, stations, or terminals where transfers can be made conveniently) and transfer point information between Multimodal Transportation Service Providers, Transit Agencies, and ISPs. An interface to Traffic Management also supports demand management strategies.	The center shall share transfer cluster and transfer point information with other transit centers. A transfer cluster is a collection of stop points, stations, or terminals where transfers can be made conveniently., The center shall coordinate schedules and services with traffic management, parking management, and event planning systems., The center shall provide transit operations personnel with the capability to control and monitor transit service coordination activities.	Existing
Transit	Transit Center Paratransit Operations	Transit Center Paratransit Operations' manages demand responsive transit services, including paratransit services. It supports planning and scheduling of these services, allowing paratransit and other demand response transit services to plan efficient routes and better estimate arrival times. It also supports automated dispatch of paratransit vehicles and tracks passenger pick-ups and drop-offs. Customer service operator systems are updated with the most current schedule information.	The center shall dispatch demand response (paratransit) transit vehicles., The center shall process trip requests for demand responsive transit services, i.e. paratransit. Sources of the requests may include traveler information service providers., The center shall collect the log of passenger boardings and alightings from the paratransit vehicles.	Existing
Transit	Transit Center Paratransit Operations	Transit Center Paratransit Operations' manages demand responsive transit services, including paratransit services. It supports planning and scheduling of these services, allowing paratransit and other demand response transit services to plan efficient routes and better estimate arrival times. It also supports automated dispatch of paratransit vehicles and tracks passenger pick-ups and drop-offs. Customer service operator systems are updated with the most current schedule information.	The center shall disseminate up-to-date schedules and route information to other centers for demand responsive transit services (paratransit)., The center shall exchange information with Maintenance and Construction Operations concerning work zones, roadway conditions, asset restrictions, work plans, etc., that affect paratransit operations, The center shall monitor the operational status of the demand response vehicles including status of passenger pick-up and drop-off., The center shall generate demand response transit (including paratransit) routes and schedules based on such factors as parameters input by the system operator, what other demand responsive transit schedules have been planned, the availability and location of vehicles, the relevance of any fixed transit routes and schedules, road network information, and incident information.	Planned
Transit	Transit Center Passenger Counting	Transit Center Passenger Counting' receives and processes transit vehicle loading data using two-way	The center shall make the compiled ridership data available to the system operator., The center shall calculate transit ridership data by route, route	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		communications from equipped transit vehicles.	segment, transit stop, time of day, and day of week based on the collected passenger count information., The center shall collect passenger count information from each transit vehicle.	
Transit	Transit Center Security	Transit Center Security' monitors transit vehicle operator or traveler activated alarms received from on-board a transit vehicle. It supports transit vehicle operator authentication and provides the capability to remotely disable a transit vehicle. It also includes the capability to alert operators and police to potential incidents identified by these security features.	The center shall provide transit incident information along with other service data to emergency centers., The center shall support the back-office portion of functionality to authenticate transit vehicle operators., The center shall provide support to remotely disable (or reset the disabling of) a transit vehicle in service., 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., 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., 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., The center shall send wide-area alert information to travelers (on-board transit vehicles or at stations/stops) and transit vehicle operators., 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., The center shall receive threat information and status on the integrity of the transit infrastructure.	Existing
Transit	Transit Center Vehicle Assignment	Transit Center Vehicle Assignment' assigns individual transit vehicles to vehicle blocks and downloads this information to the transit vehicle. It also provides an exception handling process for the vehicle assignment function to generate new, supplemental vehicle assignments when required by changes during the operating day. It provides an inventory management function for the transit facility which stores functional attributes about each of the vehicles owned by the transit operator. These attributes permit the planning and assignment functions to match vehicles with routes based	The center shall provide an exception handling process for the vehicle assignment function. This process shall generate new supplemental vehicle assignments as required due to change events which occur during the operating day., The center shall download vehicle assignments to the transit vehicle prior to the start of the day's operations., The center shall assign individual transit vehicles to transit blocks., The center shall provide an inventory management function for the transit facility that stores functional attributes about each vehicle owned by the transit operator. The functional attributes permit the planning and assignment functions to match	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
		on suitability for the types of service required by the particular routes.	vehicles with routes based on suitability for the types of service required by the particular routes., The center shall provide transit operations personnel with the capability to update transit vehicle assignments and receive reports on transit vehicle inventory status., The center shall generate transit vehicle availability listings, current and forecast, to support transit vehicle assignment planning.	
Transit	Transit Center Vehicle Tracking	Transit Center Vehicle Tracking' monitors transit vehicle location. The location information is collected via a data communication link between the transit vehicles and the transit center. The location information is presented to the transit operator on a digitized map of the transit service area. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time. The real-time schedule information is disseminated to other information providers, which furnish the information to travelers.	The center shall provide transit operational data to traveler information service providers., The center shall determine adherence of transit vehicles to their assigned schedule., The center shall monitor the locations of all transit vehicles within its network., The center shall provide collected transit probe data to traffic management centers and traveler information service providers for use in measuring current traffic conditions.	Existing
Transit	Transit Garage Maintenance	Transit Garage Maintenance' provides advanced maintenance functions for the transit property. It collects operational and maintenance data from transit vehicles, manages vehicle service histories, and monitors operators and vehicles. It collects vehicle mileage data and uses it to automatically generate preventative maintenance schedules for each vehicle by utilizing vehicle tracking data. In addition, it provides information to service personnel to support maintenance activities and records and verifies that maintenance work was performed.	The center shall assign technicians to a transit vehicle maintenance schedule, based upon such factors as personnel eligibility, work assignments, preferences and seniority., The center shall verify that the transit vehicle maintenance activities were performed correctly, using the transit vehicle's status, the maintenance personnel's work assignment, and the transit maintenance schedules., The center shall collect operational and maintenance data from transit vehicles., The center shall generate transit vehicle maintenance schedules that identify the maintenance or repair to be performed and when the work is to be done., The center shall generate transit vehicle availability listings, current and forecast, to support transit vehicle assignment planning based, in part, on the transit vehicle maintenance schedule., The center shall generate a time-stamped maintenance log of all maintenance activities performed on a transit vehicle., The center shall provide transit operations personnel with the capability to update transit vehicle maintenance information and receive reports on all transit vehicle operations data.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Transit	Transit Garage Maintenance	Transit Garage Maintenance' provides advanced maintenance functions for the transit property. It collects operational and maintenance data from transit vehicles, manages vehicle service histories, and monitors operators and vehicles. It collects vehicle mileage data and uses it to automatically generate preventative maintenance schedules for each vehicle by utilizing vehicle tracking data. In addition, it provides information to service personnel to support maintenance activities and records and verifies that maintenance work was performed.	The center shall monitor the condition of a transit vehicle to analyze brake, drive train, sensors, fuel, steering, tire, processor, communications equipment, and transit vehicle mileage to identify mileage based maintenance, out-of-specification or imminent failure conditions.	Planned
Transit Data Archive	Archive Data Repository	Archive Data Repository' collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. It includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. It includes the capability to define a data registry that allows registration of data identifiers or data definitions for interoperable use throughout a region. It supports a broad range of 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. Repositories may be established to support operations planning, performance monitoring and management, and policy and investment decisions.	The center shall collect data from data distribution systems and other data sources., The center shall respond to requests from the administrator interface function to manage center-sourced data collection., The center shall collect data from centers., 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)., The center shall store collected data in an information repository., The center shall perform quality checks on collected data., The center shall respond to requests from the administrator interface function to manage the archive data., The center shall include capabilities for archive to archive coordination., 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., The center shall respond to requests for archive data from archive data users (centers, field devices)., The center shall provide a mechanism for archive data users to request archive data by meta-data range.	Existing

Element Name	Functional Object	Functional Object Description	Requirement	Status
Transit Data Archive	Archive Data Repository	Archive Data Repository' collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. It includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. It includes the capability to define a data registry that allows registration of data identifiers or data definitions for interoperable use throughout a region. It supports a broad range of 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. Repositories may be established to support operations planning, performance monitoring and management, and policy and investment decisions.	The center shall notify the system operator of errors related to data collection, analysis and archival.	Planned
Transit Data Archive	Archive Government Reporting	Archive Government Reporting' selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements. It provides transportation system statistics and performance measures in required formats to support investment and policy decisions.	The center shall provide the capability to format data suitable for input into government reports., 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
Transit Data Archive	Archive Government Reporting	Archive Government Reporting' selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements. It provides transportation system statistics and performance measures in required formats to support investment and policy decisions.	The center shall respond to requests for government report data., The center shall provide archive data to federal, state, and local government reporting systems.	Existing
Transit Data Archive	Archive Situation Data Archival	Archive Situation Data Archival' collects and archives traffic, roadway, and environmental information for use in off-line planning, research, and analysis. It controls and collects information directly from equipment at the roadside, reflecting the deployment of traffic detectors that are used primarily for traffic monitoring and planning purposes, rather than for traffic management. It also collects situation data from connected vehicles. The data collected, quality		

Element Name	Functional Object	Functional Object Description	Requirement	Status
		checks performed, and aggregation strategies are defined to support transportation system performance monitoring and management.		
Transit Information Center	TIC Data Collection	TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.	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
Transit Information Center	TIC Data Collection	TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.	The center shall collect, process, and store transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information., The center shall collect, process, and store maintenance and construction information, including scheduled maintenance and construction work activities and work zone activities.	Existing
Transit Information Center	TIC Trip Planning	TIC Trip Planning' provides pre-trip and en route trip planning services for travelers. It receives origin, destination, constraints, and preferences and returns trip plan(s) that meet the supplied criteria. Trip plans may be based on current traffic and road conditions, transit schedule information, and other real-time traveler information. Candidate trip plans are multimodal and may include vehicle, transit, and alternate mode segments (e.g., rail, ferry, bicycle routes, and walkways) based on traveler preferences. It also confirms the trip plan for the traveler and supports reservations and advanced payment for portions of the	The center shall provide the capability to provide specific pre-trip and en route directions to travelers (and drivers), including costs, arrival times, and transfer points., The center shall exchange route segment information with other centers outside the area served by the local center.	Planned

Element Name	Functional Object	Functional Object Description	Requirement	Status
		trip. The trip plan includes specific routing information and instructions for each segment of the trip and may also include information and reservations for additional services (e.g., parking) along the route.		

10 Standards

Standardizing the flow of information among ITS systems is a critical step in cost-effectively integrating intelligent transportation systems (ITS) across the region. ITS standards play a foundational role in creating an open ITS environment that achieves the goal of interoperability. By adhering to standards, we enable the deployment of interoperable systems at local, regional, and national levels without stifling innovation as technology evolves. ITS standards allow for:

1. Interoperability and Innovation:
    a. ITS standards ensure that different systems can seamlessly communicate and exchange data. When systems adhere to common standards, they can work together effectively, regardless of their origin or purpose.
    b. Importantly, standards don't hinder innovation. Instead, they provide a stable foundation upon which new approaches and technologies can build. Innovators can focus on creating novel solutions within the established framework.
2. Interchangeability and Expandability:
    a. Standardized interfaces allow for interchangeability. When an agency adopts ITS standards, it gains the flexibility to choose from multiple vendors for products and applications. This competition helps keep prices competitive over the long term.
    b. Additionally, standardized systems are more expandable. As needs evolve or new services emerge, agencies can seamlessly integrate additional components without major disruptions.
3. Standards Development Organizations (SDOs):
    a. SDOs play a pivotal role in developing and maintaining ITS standards. These organizations collaborate with industry experts, researchers, and practitioners to create robust, widely accepted standards.
    b. Communication standards often overlap in applicability, providing agencies with choices. This flexibility allows each agency to select the most suitable standard for its specific needs.
4. Decision-Making and Implementation:
    a. Before designing ITS systems, all stakeholders involved in relevant ITS services should collectively decide on the standards to be used. These decisions impact system design, procurement, and implementation.

b. Once agreed upon, these standards become the blueprint for future systems. Consistency ensures smooth integration and reduces the risk of compatibility issues.

Table 10 offers a glimpse of the standards output, but the complete set of identified standards for the Northshore ITS architecture resides in the RAD-IT Architecture file. Interested parties can access the detailed standards information from the RAD-IT Architecture source file, which provides comprehensive guidance for implementing interoperable and efficient ITS solutions.

Table 10: ITS Standards

SDO	Standard Title	Standard Number
Advanced Traffic Controller Joint Committee	Advanced Transportation Controller	ITE ATC 5201
Advanced Traffic Controller Joint Committee	Application Programming Interface Standard for the Advanced Transportation Controller	ITE ATC 5401
Advanced Traffic Controller Joint Committee	Intelligent Transportation System Standard Specification for Roadside Cabinets	ITE ATC 5301
Advanced Traffic Controller Joint Committee	Model 2070 Controller Standard	ITE ATC 5202
International Organization for Standardization	Intelligent transport systems -- Communications access for land mobiles (CALM) -- Architecture	ISO 21217
National Electrical Manufacturers Association	Cyber and Physical Security for Intelligent Transportation Systems	NEMA TS 8
National Electrical Manufacturers Association	Hardware Standards for Dynamic Message Signs (DMS) With NTCIP Requirements	NEMA TS4
National Electrical Manufacturers Association	Portable Traffic Signal Systems (PTSS) Standard	NEMA TS 5
National Electrical Manufacturers Association	Traffic Controller Assemblies with NTCIP Requirements	NEMA TS2
National Institute for Standards and Technology	Security Requirements for Cryptographic Modules	NIST FIPS PUB 140-2
Not Applicable	Dedicated Short-Range Communications Roadside Unit Specifications (FHWA-JPO-17-589)	CTI 4001

11 Agreements

In this section, agreements are outlined related to information exchange between stakeholder organizations whose Intelligent Transportation Systems (ITS) are involved in sharing data. These agreements pertain to both existing and future collaborations. Although there is information sharing between stakeholders (ex. LADOTD ITS shares CCTV streams with LSP Troop L), currently no agreements exist between stakeholders for information sharing. A framework for cooperation and data sharing, ensuring smooth implementation of relevant projects should be established as the ITS architecture develops.

12 Maintenance Plan

The regional ITS Architecture, to be effective, will require continued maintenance as the ITS grows and new needs arise. FHWA, through CFR 940.9 (f), has made a requirement for the continued maintenance of this architecture.

> *"The agencies and other stakeholders participating in the development of the regional ITS architecture shall develop and implement procedures and responsibilities for maintaining it, as needs evolve within the region."*

On their website[3], FHWA published *Regional ITS Architecture Guidance Document* with the intent to "describe(s) a process for creating a regional ITS architecture with supporting examples of each architecture product." The November 2020 document[4] also presents an approach for transportation planning and project development processes.

This document also seeks to answer questions around architecture maintenance including:

- Who: Roles and responsibilities for the maintenance effort
- When: Update timetable
- What: Architecture baseline
- How: Approach to Architecture Maintenance, including the change management process and documented maintenance plan

12.1 Why Maintain a Regional ITS Architecture

The regional ITS architecture is a dynamic framework that must adapt to changing circumstances. Here are some key factors that can lead to changes in a regional ITS architecture:

1. Changes in Regional Needs: As transportation requirements evolve, the regional ITS architecture should be updated to address new challenges. These changes may be reflected in planning documents like the Regional Transportation Plan, the TIP (Transportation Improvement Program), and the ITS Strategic Plan.

[3] https://ops.fhwa.dot.gov/its_arch_imp/guidance.htm - Accessed April 2024
[4] *Regional ITS Architecture Guide* – Prepared by National ITS Architecture Team, Prepared for ITS JPO - raguide.pdf (arc-it.net)

2. New Stakeholders: When new organizations or entities become involved in ITS, the architecture should be adjusted to incorporate their services, interfaces, and information flows. This could happen due to organizational changes or geographic expansion.
3. Scope of Services Considered: The range of services covered by the regional ITS architecture may expand over time. Updates to ARC-IT (Architecture Reference for Cooperative and Intelligent Transportation) can introduce new service packages or refine existing ones. Regions should consider these changes in the context of their specific needs.
4. Stakeholder or Element Name Changes: Agencies may rebrand, merge, or split, leading to changes in their names. Similarly, project definitions can impact element names. Keeping the architecture up-to-date with accurate stakeholder and element names is essential.
5. Interactions with Other Architectures: Regional ITS architectures don't exist in isolation. They interface with neighboring regions and statewide architectures. Changes in one architecture may necessitate adjustments in another to maintain consistency.
6. Project Definition or Implementation: Actual projects may alter the architecture by adding, removing, or modifying services, elements, interfaces, or information flows.

Maintaining an up-to-date regional ITS architecture ensures effective planning, coordination, and implementation of intelligent transportation systems.

12.2 Who Maintains the Regional ITS Architecture

While achieving consensus on the regional ITS architecture involves participation from all stakeholders, typically one or two agencies take the lead in maintaining it. Although specific responsibilities often fall to an individual within the primary organization, architecture maintenance is a recurring, long-term task. Therefore, it's crucial that the responsible agency accepts this duty. While delegation to an individual may occur, the overall responsibility should be clearly defined for an institution or agency within the region. This approach ensures continuity beyond individual variations and career changes. Sometimes, multiple agencies within regional ITS coordinating councils or other groups share this responsibility.

The role of the ITS architecture maintainer closely resembles that of a regional planning body. In alignment with its mission, the maintainer has the authority to initiate, update, and document changes in regional planning documents. For the Northshore Regional ITS Architecture, the Louisiana Department of Transportation and Development (LADOTD) assumes the role of the ITS Architecture keeper and maintainer.

Similar to regional transportation plans, architecture maintenance is an ongoing, essential effort. To effectively manage ITS architecture maintenance, LADOTD must have staff with the following qualifications:

1. Knowledge of Existing Regional ITS Architecture: This entails a detailed technical understanding of the various components within the architecture and how modifications impact each part.

2. Understanding of Regional Transportation Systems: Collaboratively shared among agencies and stakeholders involved in maintenance, this understanding ensures effective decision-making.
3. Familiarity with Architecture Tools: LADOTD should be well-versed in the tools used for creating and updating the architecture. For example, knowledge of the RAD-IT architecture tool, is crucial.

As the agency responsible for maintenance, LADOTD must either possess the necessary skills within its organization or engage a qualified consultant. Regardless, adequate funding is essential to support ongoing maintenance. The recommended minimum resources for ITS architecture maintenance management include:

- ITS Architecture Manager: One individual to oversee the architecture.
- RAD-IT and ITS Planning Training: Two individuals trained in RAD-IT and ITS Planning. Comprehensive training is necessary due to the novelty of this functional area.
- Monthly Man-Hours: Approximately sixteen man-hours per month dedicated to ITS architecture maintenance. This can be performed by the manager or a designated team member.
- Update Management: Ensuring the Regional ITS Architecture RAD-IT source file aligns with project-level ITS architectures.
- Consultant Support: A qualified consultant, to assist with maintenance activities.

While LADOTD leads maintenance efforts, coordination with other agencies is crucial. LADOTD must collaborate closely with major stakeholders in the region, including:

- Louisiana Department of Transportation and Development (LADOTD) District 62
- LADOTD ITS Section (Section 56)
- Louisiana State Police (Troop L)
- New Orleans Regional Planning Commission

Additional stakeholders may be involved based on ITS development and deployment activities. LADOTD will establish agreements to create a management/oversight function overseeing regional ITS architecture maintenance. This committee should include at least two LADOTD representatives, one Metropolitan Planning Organization (MPO) representative, and one Federal Highway Administration (FHWA) representative.

Following MPO adoption of the architecture, regular reviews of the Regional ITS Architecture items are recommended. These reviews should cover progress in ITS implementation projects, the accuracy of the RAD-IT source file, future deployment plans, changes in State and National ITS Architectures, and any needed updates to the Northshore Regional ITS Architecture.

12.3 When to Update the Regional ITS Architecture

The update interval for regional Intelligent Transportation Systems (ITS) architecture can vary based on different factors.

- Timetable for Updates:

a. The timing for updating or changing the regional ITS architecture depends on various factors, including how the architecture is used and the available funding and staffing resources.
b. There is no fixed timetable that applies universally to all regions, but LADOTD uses a minimum of 5 years for a full update of the RAD-IT files and report.

- Approaches to Update Interval:
  a. Periodic Maintenance (currently on 1 year cycle):
     i. Ties architecture maintenance to recurring transportation planning activities.
     ii. Drawback: Changes in support of ITS projects may not be updated promptly.
     iii. Publication and versioning costs are minimized since there's only one new version per maintenance cycle.
  b. Exception Maintenance:
     i. Changes are made as needed, initiated by specific requirements.
     ii. Convenient for addressing consistency issues related to Federal Highway Administration (FHWA) regulations (Code of Federal Regulation 940).
     iii. May be costlier than periodic maintenance due to frequent updates.
     iv. Publication and versioning costs depend on the frequency of changes.

The Regional ITS Architecture should be reviewed annually, at a minimum, with architecture updates performed frequently enough to keep pace with new implementations. Periodic and exception maintenance should include integrating completed projects into the RAD-IT source file. A one page summary of the change shall be added as an appendix to the Regional ITS Architecture Report.

The regional Intelligent Transportation Systems (ITS) architecture should undergo a comprehensive update every five years, ideally preceding the annual periodic refresh of the Regional Transportation Improvement Program. In accordance with the Department of Transportation and Development's (DOTD) recommendation, the MPO Technical Advisory Committee will formally accept any revisions, changes, or updates to the ITS architecture.

The following list includes many of the events that may cause change to a regional ITS architecture:

1. **Changes in Regional Needs:**
   a. Regional ITS architectures are designed to address regional transportation planning needs.
   b. Over time, these needs can evolve, requiring updates to the corresponding aspects of the regional ITS architecture.
   c. Expressing these changes in planning documents, such as the Regional Transportation Plan, is essential.
2. **Introduction of New Stakeholders:**
   a. As regional needs change, new stakeholders may become involved.
   b. The relevant parts of the regional ITS architecture addressing these needs should be updated.

3. **Expansion of Service Scope:**
    a. The range of services considered within the regional ITS architecture may expand.
    b. This expansion could result from updates to the National ITS Architecture, which includes new user services or better definitions of existing elements.
4. **Changes in Stakeholder or Element Names:**
    a. Agency names or element descriptions may change due to mergers, splits, or renaming.
    b. Element names can also evolve as projects are defined.
    c. The regional ITS architecture should use current, accurate names for stakeholders and elements.
5. **Interactions with Other Architectures:**
    a. A regional ITS architecture covers not only elements within a region but also interfaces to adjoining regions.
    b. Changes in one region's architecture may require adjustments in an adjoining region to maintain consistency.
    c. Overlapping architectures (e.g., statewide and regional ITS architectures) may also necessitate mutual updates.
6. **Project Definitions and Implementation:**
    a. Project definitions can lead to additions, removals, or modifications of elements, interfaces, or information flows in the regional ITS architecture.
    b. Updates ensure that the architecture accurately reflects both current and future regional ITS implementation.
7. **Project Addition or Deletion:**
    a. Occasionally, projects are added or removed during the planning process or project delivery.
    b. Aspects of the regional ITS architecture associated with these projects may need expansion, changes, or removal.
8. **Changes in Project Priority:**
    a. Funding constraints or other factors may alter planned project sequencing.
    b. Adjusting project priorities can impact related projects in the region.

12.4 What Will be Maintained?

In the context of a regional Intelligent Transportation Systems (ITS) architecture, the term "baseline" refers to the constituent parts that will be regularly maintained. These parts encompass various elements within the architecture. The decision of whether a specific component should be part of the baseline is considered in this section. Notably, baseline parts are annually updated within the regional ITS architecture RAD-IT file, and a more comprehensive update occurs every five years within the official document. The parts discussed are:

1. Description of Region:
    a. Includes geographic scope, functional scope, and architecture timeframe.
    b. Geographic scope defines the ITS elements within the region, including any necessary communication with elements outside the region.

   c. Functional scope specifies the services included in the regional ITS architecture.
   d. Architecture timeframe represents the future years considered by the architecture.
2. List of Stakeholders:
   a. Stakeholders play a crucial role in defining the architecture.
   b. Changes in stakeholders (consolidation or separation) should be reflected in the architecture.
   c. Engaging previously uninvolved stakeholders ensures the architecture represents their ITS requirements.
3. Connection to Planning Goals, Strategies, and Objectives:
   a. Links the regional ITS architecture to attributes used by regional planners.
   b. Connects regional goals, strategies, or objectives to architecture service packages or projects.
   c. Bridges community needs with ITS deployment.
4. Roles and Responsibilities:
   a. Accurately represents stakeholders' consensus vision for ITS operation.
   b. Review and update roles and responsibilities to reflect deployed elements and current stakeholder views.
5. List of ITS Elements:
   a. Inventory of ITS elements is essential.
   b. Changes in stakeholders and roles may impact the inventory.
   c. Recent ITS element implementations may change their status (e.g., from planned to existing).
6. ITS Services:
   a. Defined by service packages and user needs.
   b. Provides details on currently deployed or planned ITS capabilities in the region.
   c. Service packages describe how elements are connected to deliver ITS services.
7. List of Agreements:
   a. Identifies information crossing agency boundaries.
   b. Updates to agreements follow changes in roles, responsibilities, or interfaces between elements.
8. Interfaces between Elements (Interconnects and Information Flows):
   a. Detailed descriptions of how various ITS systems integrate over the architecture timeframe.
   b. Key aspect of the architecture baseline, subject to change during maintenance.
9. Functional Requirements:
   a. High-level functions allocated to ITS elements.
   b. Serve as a starting point for defining projects aligned with portions of the regional ITS architecture.
10. Applicable ITS Standards:
   a. Selection of standards relevant to the regional ITS architecture.
   b. Ensures consistency and interoperability.

12.5 How Will the Architecture be Maintained?

DOTD Section 56 (ITS) is tasked with overseeing and maintaining the regional Intelligent Transportation Systems (ITS) architecture. LADOTD will rely on contracted consulting services for ITS Traffic Incident Management (TIM) Program, TMC Operations Staffing and Systems Engineering Support for this effort. The guidelines contained within FHWA's referenced *Regional ITS Architecture Guide* – November 5, 2020 will be helpful in this ongoing architecture maintenance. In summary, LADOTD's Section 56 oversees the regional ITS architecture, and will collaborate with contracted consultants while following FHWA guidelines.

Appendix A – Architecture Flow Definitions

Appendix B – ITS Architecture Flow Diagrams

Appendix C – Copies of Agreements

Appendix D – Stakeholder Meeting Minutes