Baton Rouge Intelligent Transportation Systems Architecture Updates

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Stantec Consulting Services, Inc.

BATON ROUGE INTELLIGENT TRANSPORTATION SYSTEMS ARCHITECTURE UPDATES

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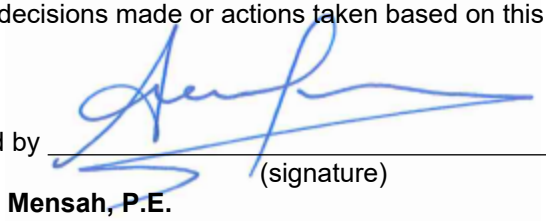
Prepared by 
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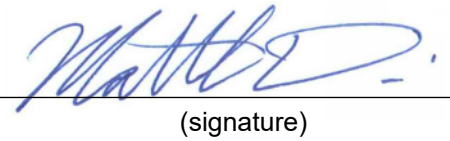
Stephen Mensah, P.E.

Reviewed by 
(signature)

Matt Davis, P.E.

Approved by 
(signature)

Derrick Goudeau, P.E.

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Abbreviations

AAM	Active Arterial Management
AASHTO	American Association of State Highway and Transportation Officials
ADMS	Archived Data Management System
AID	Automated Incident Detection
AMBER	America's Missing: Broadcast Emergency Resources
ARM	Adaptive Ramp Metering
ATIS	Advanced Traveler Information System
ATM	Active Traffic Management
ATMS	Active Traffic Management System
AVL	Automated Vehicle Location
C2C	Center to Center
CAD	Computer Aided Dispatch
CARB-D	Capital Area Road and Bridge District
CAV	Connected Autonomous Vehicle
CB	Citizen Band (radio)
CCTV	Closed-Circuit Television
CO	Carbon Monoxide

DAR	Data Archival and Reporting
DLUC	Dynamic Lane Use Control
DMC	Dynamic Merge Control
DMS	Dynamic Message Sign
DOTD	Louisiana Department of Transportation and Development
DSRC	Dedicated Short Range Communications
DSS	Decision Support System / Response Plans
EM	Event Management
ESRI	Environmental Systems Research Institute
FHWA	Federal Highway Administration
FRATIS	Freight Advanced Traveler Information System
GIS	Geographical Information System
GPS	Global Positioning System
HAR	Highway Advisory Radio
HOV	High Occupancy Vehicle
HVAC	Heating, Ventilation, and Air-Conditioning
ICM	Integrated Corridor Management
IT	Information Technology
ITS	Intelligent Transportation Systems
LTRC	Louisiana Transportation Research Center

MAP	Motorist Assistance Patrol
MBI	Map-Based Interface
NOC	Network Operations Center
NOx	Nitrogen Oxide
NTCIP	National Transportation Communication for ITS Protocol
OBU	Onboard Unit
PSA	Public Service Announcement
PVMS	Portable Variable Message Sign
QW	Queue Warning
RAD-IT	Regional Architecture Development for Intelligent Transportation
RDS	Radar Detection System
RFID	Radio Frequency Identification
RMS	Ramp Metering System
RSU	Roadside Unit
RWIS	Roadside Weather Information System
SAS	Security and Administration
SEA	System Engineering Analysis
SPaT	Signal Phase and Timing
SSP	Safety Service Patrol
TIC	Transportation Information Center

TMC	Traffic Management Center
TOC	Traffic Operations Center
TSMO	Transportation Systems Management and Operations
TT	Travel Times
VDS	Vehicle Detection System
VHT	Vehicle-Hours Traveled
VLC	Visible Light Communication
VMT	Vehicle Miles Traveled
VPHPL	Vehicles Per Hour Per Lane
VSL	Variable Speed Limit
WZ-ITS	Work Zone ITS
WWD	Wrong Way Driver

1.0 INTRODUCTION

The Baton Rouge Regional ITS Architecture document serves as the planning document for the deployment, operations, and maintenance of intelligent transportation systems (ITS) within the Baton Rouge MPO boundary. The MPO is administered by the Capital Region Planning Commission. This architecture reflects stakeholder consensus on the existing and emerging transportation needs for the region, and a path forward to address these challenges using advanced technology. This document identifies key partners for collaboration and resource planning as well as to meet the federal requirement stipulated in Code of Federal Regulation (CFR) 940.09 to make ITS project deployments eligible for federal funds. Per the requirements of CFR 940.09 the following are the specific requirements that must be addressed in the ITS architecture:

- Description of region
- Identification of participating agencies and other stakeholders
- Operational concept that describes the roles and responsibilities of participating agencies and stakeholders in operation and maintenance of the system
- Any agreements (existing and new) required for operations
- System functional requirements
- Interface requirements and information exchanges with planned and existing systems and subsystems
- Identification of ITS standards supporting regional and nation interoperability
- Sequence of projects required for implementation

The Louisiana Department of Transportation and Development (DOTD) is the lead stakeholder for the development and maintenance of the ITS architecture. The previous update to the ITS architecture was completed in March 2015. DOTD undertakes updates on a five-year cycle. The projects identified in this document were developed to address challenges that were identified during the stakeholder engagement.

1.1 METHODOLOGY

The framework for the identification and description of desired services uses the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT). ARC-IT provides a common framework for planning, defining and integrating ITS[1]. The National ITS Architecture (NIA) and the Connected Vehicle Reference Implementation Architecture (CVRIA) preceded ARC-IT, but in 2017 NIA and CVRIA were merged to form ARC-IT. The 2015 Baton Rouge ITS Architecture was developed using the NIA framework and the companion Turbo Architecture software to define functions and data exchanges between ITS elements or stakeholders to provided desired services. This update used the Regional Architecture Development for Intelligent Transportation (RAD-IT) which is the companion software that supports the current ARC-IT framework for development of regional ITS architectures.

[1] https://local.iteris.com/arc-it/index.html (Accessed July 2021)

BATON ROUGE INTELLIGENT TRANSPORTATION SYSTEMS ARCHITECTURE UPDATES

Introduction

The Stantec project team that was tasked with leading the updates to the regional ITS architecture approached the process using the steps below:

1. Reviewed existing planning documents which included the 2015 ITS architecture and the Long-Range Transportation Plan (LRTP) for the Baton Rouge MPO area, MOVE 2046 Metropolitan Transportation Plan (MTP). This review helped to identify the vision, goals and objectives the stakeholders previously set for the region, the demographic changes and its impact on existing transportation system and emerging challenges.

2. Identified all stakeholders that could impact transportation planning, operations and maintenance in the region. The MPO Technical Advisory Committee (TAC) played a key role in identifying new stakeholders.

3. Held a series of meetings with stakeholders starting with the project kick-off meeting and a stakeholder workshop that elicited inputs from the stakeholders. These meetings offered opportunities to discuss existing and emerging transportation issues and potential solutions using services from ARC-IT.

4. Used the RAD-IT software to capture existing and planned functions and data integration to address transportation needs.

5. Developed the planning document for stakeholder review and updates and submitted the final Baton Rouge Regional ITS Architecture for use.

2.0 ARCHITECTURE SCOPE

The Baton Rouge Regional ITS Architecture is a roadmap for transportation systems integration. The architecture was developed through a cooperative effort by the region's transportation agencies, covering multimodal transportation in the region. It represents a shared vision of how each agency's systems will work together, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in the region. The architecture provides an overarching framework that that includes the region's transportation organizations and various transportation projects developed to address needs. Using the architecture, each transportation project can be viewed as an element of the overall transportation system, providing visibility into the relationship between individual transportation projects and ways to cost-effectively build an integrated transportation system over time. This chapter establishes the geographic scope of the architecture and ITS services that are covered, and a logical sequence for project deployment.

2.1 GEOGRAPHIC SCOPE

The region for which this ITS Architecture is being developed corresponds with the study boundary of the Baton Rouge Metropolitan Planning Organization. The MPO boundary is provided in **Figure** 1 and shows the primary region of interest.

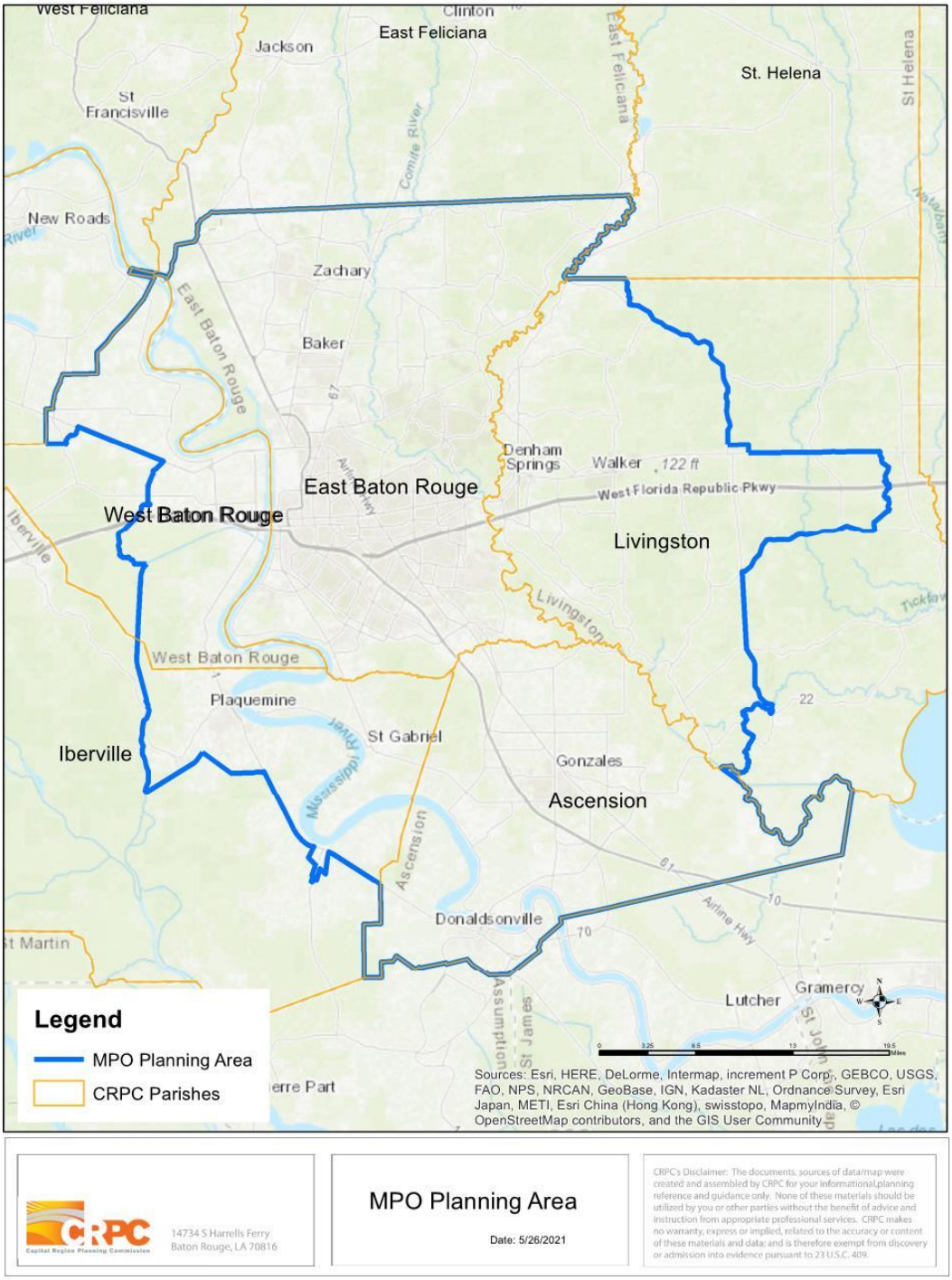

Figure 1: Baton Rouge MPO Boundary

2.2 SERVICE SCOPE

The Baton Rouge area continues to grow and along with that comes increased vehicle miles of travel (VMT). TomTom reported recently that Baton Rouge is the fourth most congested city in the United States with only New York, Los Angeles and Miami reporting higher congestion[2]. Urbanized areas do not afford many opportunities for capacity expansion by adding more travel lanes. Other avenues to enhance or preserve capacity have to be pursued and intelligent transportation systems help meet this challenge. This regional ITS Architecture covers a range of ITS services to address the mobility, safety, environmental and communications needs associated with transportation in the Baton Rouge MPO region. The stakeholders expressed interest in all the major service areas under the ARC-IT framework. Therefore, the services desired for the Baton Rouge area are drawn from the following service areas:

- Commercial Vehicle Operations
- Data Management
- Maintenance and Construction
- Parking Management
- Public Safety
- Public Transportation
- Support
- Sustainable Travel
- Traffic Management
- Traveler Information
- Vehicle Safety
- Weather

2.3 RELATIONSHIP TO PLANNING

The Baton Rouge Regional ITS Architecture is an integral component in planning for the operations and maintenance strategies that are addressed by the regional transportation planning process. This architecture provides a framework that connects operations and maintenance objectives and strategies with the integrated transportation system improvements that are implemented as a progressive series of ITS projects. The architecture also is used to define the data needs associated with performance monitoring that support an informed planning process. The planning objectives, strategies, and associated performance measures from the regional plan are discussed. Additional details of these planning elements related to ITS services are in the RAD-IT database.

2.4 GOALS AND OBJECTIVES

ITS implementation in the Baton Rouge area is deemed as a tool to help the transportation providers address issues associated with mobility, safety and the environment and the necessary integration between stakeholders. The goals and objectives of the Baton Rouge regional ITS architecture are therefore taken

[2] United States of America traffic report | TomTom Traffic Index (Accessed 2/15/2022)

from the LRTP to be consistent with the regional goals and objectives envisioned by stakeholders. **Table 1** summarizes the goals and objectives for ITS Implementation in the project area.

Table 1 – Planning Objectives

Number	Name	Description	Source	Performance Measure Category	Performance Measure
1	Improve and expand transportation choices	Improve mobility and access across the region for pedestrians and bicyclists. Make public transportation a viable and affordable choice as a mode of transportation. Improve and expand regional transit coverage to give citizens more transportation options. Support shared mobility options to put more people into fewer vehicles. Support convenient and affordable access to local and regional air, rail, and water transportation.	MOVE 2046	None	None
2	Improve safety and security	Reduce motor vehicle crash fatalities and serious injuries. Reduce pedestrian and bicycle crash fatalities and serious injuries. Enhance corridors with safety improvements that consider the community context. Support coordination among local and state stakeholders to improve enforcement of traffic regulations, transportation safety education, and emergency response. Increase the redundancy and diversity of the transportation system to provide emergency alternatives for evacuation and access during disruptive man-made or natural incidents. Support the improvement of transit safety and security for all transit providers in the region.	MOVE 2046	Safety	Fatal Crashes, Injury Crashes, PDO Crashes
3	Provide a reliable and high performing transportation	Enhance regional connectivity across all transportation modes. Maintain the transportation infrastructure, facilities, and assets in a good state of repair. Improve mobility by reducing traffic congestion and delay. Prepare for technological advances that will efficiently and dynamically manage roadway demand and capacity and overall systems operations.	MOVE 2046	Bridge Condition Index	Percentage of NHS Bridge Decks in Good Condition
				Pavement Condition Index	Percentage of Interstate pavements in Good condition
					Percentage of non-Interstate NHS pavements in Good condition
				Safety	Fatal Crashes, Injury Crashes, PDO Crashes

Architecture Scope

Number	Name	Description	Source	Performance Measure Category	Performance Measure
				Travel Time Reliability	Buffer Time Index, Planning Time Index
4	Support the economic vitality of the region	Improve the transportation system to enhance workforce development, economic competitiveness, support recreation and tourism, and to provide access to regional, national, and global markets. Use transportation improvements to support vibrant activity centers and that are consistent with local plans for growth and economic development. Improve and enhance the mobility of freight by truck, rail, and other modes. Support a fiscally constrained 25-year Metropolitan Transportation Plan that addresses existing and future needs while maximizing projected revenues.	Metropolitan Transportation Plan Plan Build Grow MOVE2042	Travel Time Reliability	Buffer Time Index, Planning Time Index
5	Consider the relationship of transportation and environment	Build resiliency into the transportation system across all modes, especially to address known points of failure and to effectively manage and mitigate stormwater runoff. Minimize or avoid adverse impacts from transportation improvements to the natural environment. Provide an inclusive setting for regional transportation decision-making. Support the reduction of transportation-related greenhouse gas emissions and the improvement of air quality.	MOVE 2046	Air Quality	CO2 Emissions
6	Provide an equitable transportation system	Ensure transportation improvements provide equitable benefits across the region. Minimize or avoid adverse impacts from transportation improvements to the human environment, such as historic sites, recreational areas, and environmental justice populations. Improve regional mobility choices for underserved communities.	Baton Rouge MTP 2037 Metropolitan Transportation Plan (June 2013)	Accessibility	Benefits per income group
				Travel Time Reliability	Buffer Time Index, Planning Time Index

3.0 ITS STAKEHOLDERS

Identifying stakeholders is an important component of the ITS architecture because effective mobility and safety involves the integration of multiple stakeholders and their transportation systems. This section describes the stakeholders identified for the Baton Rouge Regional ITS Architecture. Every stakeholder in this section is related to one or more of the transportation inventory elements described in the next chapter, either as an individual stakeholder or as a member of a stakeholder group.

Table 2 – ITS Stakeholders

Stakeholder Name	Stakeholder Description
Ascension Parish	Ascension Parish is one of the primary regional government agencies that is responsible for traffic management, emergency response and management, and other transportation system management activities within its jurisdiction.
Baton Rouge Metropolitan Airport	The Baton Rouge Metropolitan Airport (BTR) is serviced by four major airlines to five hub airports. There are over 60 jet flights daily providing single connection via hub airports to final destinations both local and international. Over 1.6 million residents from across south Louisiana and southwest Mississippi are served by this airport. The airport is also responsible for operating field devices and parking management. Airport authority is also responsible for emergency, parking, and traffic management within the airport.
Capital Area Transit System (CATS)	Capital Area Transit System (CATS) is the regional transit agency in the metropolitan Baton Rouge area. CATS serves the region with several routes and a full service transit vehicle fleet.
Capital Region Planning Commission (CRPC)	The Capital Region Planning Commission (CRPC) is a Council of Governments serving the eleven-parish Capital Region. CRPC is the Baton Rouge area's designated Metropolitan Planning Organization (MPO), which each metropolitan area must have in order to carry out regional transportation planning efforts and receive federal highway funds. As the regional MPO, the Capital Region Planning Commission focuses a great deal of its resources on transportation planning issues and activities, which includes highway planning, the regional ridesharing program, and air quality issues. In addition, CRPC is one of eight sub-state planning and development districts, which cover all 64 parishes in the state of Louisiana. Toward that end, CRPC provides technical assistance for economic development, comprehensive planning, and zoning to its members.
City of Baton Rouge/Parish of East Baton Rouge	The City of Baton Rouge is one of the primary regional government agencies that is responsible for traffic management, emergency response and management, and other transportation system management activities within its jurisdiction.
Governor's Office of Homeland Security And Emergency Preparedness (GOHSEP)	The Governor's Office of Homeland Security and Emergency Preparedness leads, coordinates, and supports the emergency management system, in order to protect lives and prevent the loss of property from all hazards. GOHSEP is responsible for planning and managing emergency response to major disasters on a statewide basis.
Iberville Parish	Iberville Parish is one of the primary regional government agencies that is responsible for traffic management, emergency response and management, and other transportation system management activities within its jurisdiction.
Louisiana Department of Transportation and Development (DOTD)	Louisiana Department of Transportation and Development (DOTD) is an arm of the Louisiana government responsible for statewide transportation. DOTD's responsibilities also include statewide transportation system operations. This stakeholder group includes all 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 Baton Rouge region as well as for the entire state.
Livingston Parish	The Livingston Parish is one of the primary regional government agencies that is responsible for traffic management, emergency response and management, and other transportation system management activities within its jurisdiction.

ITS Stakeholders

Stakeholder Name	Stakeholder Description
Louisiana Motor Transport Association (LMTA)	The Louisiana Motor Transport Association was founded in 1939. LMTA represents trucking and related industry companies throughout the state and the nation. The membership includes every type of motor carrier in Louisiana - regulated and exempt; intrastate and interstate; for-hire and private. LMTA works to protect the right to do business by defending the trucking industry in Baton Rouge and Washington, DC. LMTA champions the industry by being an advocate on laws and regulation.
Local Public Safety Agencies	This stakeholder group is responsible for operating local police, fire, and EMS offices and vehicles throughout region. This stakeholder group includes all the regional agencies that are involved in emergency, fire, police, and other public safety/emergency response activities. The list of agencies included in this stakeholder group is as follows: Baton Rouge Police Department, West Baton Rouge Parish Sheriff's Office, East Baton Rouge Parish Sheriff's Office, Iberville Parish Sheriff's Office, Ascension Parish Sheriff's Office, Livingston Parish Sheriff's Office, Baker Police Department, Zachary Police Department, Gonzales Police Department, Denham Springs Police Department, Brusly Police Department, Walker Police Department, West Baton Rouge Parish Office of Homeland Security/Emergency Preparedness and 911, Iberville Parish Office of Emergency Preparedness, Ascension Parish Office of Homeland Security and Emergency Preparedness, East Baton Rouge Parish Mayor's Office of Homeland Security and Emergency Preparedness (MOHSEP) and Livingston Parish Office of Homeland Security and Livingston Parish 911 Center.
Local Traffic Management Agencies	This stakeholder group includes all the regional agencies that are involved in traffic operations and management activities. The list of agencies included in this stakeholder group is as follows: West Baton Rouge Parish Department of Public Works, Livingston Parish Department of Public Works, and Ascension Parish Department of Public Works.
Louisiana Transportation Research Center (LTRC)	Responsible for transportation technology research, training and continuing education, technology transfer, and problem-solving services for Louisiana Transportation community
Louisiana State Police Troop A	Louisiana State Police agency is responsible for operating Louisiana State Police Centers. The activities include Computer Aided Dispatch database, which collects incident/emergency detection, dispatch, response, status information related to the Louisiana State Police officers/equipment, and Louisiana State Police vehicles. LSP Troop A is responsible for the Baton Rouge area.
Media	This stakeholder group includes local TV/Radio Channels, and print media that is responsible for receiving and distributing transportation information like traffic conditions, incidents and road weather conditions.
Port of Greater Baton Rouge	The Port of Greater Baton Rouge ranks among the top U.S. ports in total tonnage. It is located in Port Allen on the Mississippi River and part of the Louisiana Maritime industry and overall economy. The port is at the convergence of the Mississippi River and the Gulf Intracoastal Waterway and provides connection to other inland ports and other ports in the Gulf and Atlantic seaboard. The port also provides excellent access to diverse intermodal transportation facilities including truck and rail. The port is in close proximity to major freeways and interstates.
Public (Traveler)	Members of the general public own and operate various devices/systems to access ITS information, including PDAs, cell phones, and personal computers.
Tourism and Travel Information Service Providers	Various tourism agencies, chambers of commerce, hotel associations, motorist services, and traveler information providers.
West Baton Rouge Parish	West Baton Rouge Parish is a regional government agency that is responsible for traffic management, emergency response and management, and other transportation system management activities within its jurisdiction.

4.0 ITS INVENTORY

An inventory of existing and planned transportation systems is the basis for the Baton Rouge Regional ITS Architecture. The transportation system inventory is based on input from stakeholders throughout the region. The inventory includes a list of ITS elements and the associated stakeholder responsible for system operation as summarized in **Table 3**. This section describes surface transportation inventory elements for the region. A transportation element can be either a traffic management center, support, vehicle, traveler, or field equipment. Each transportation element listed below has one or more stakeholders associated with it. To reduce the complexity of the architecture, transportation elements with like functionality may be grouped together. In addition, physical standards may be identified that define the form, fit and function of individual ITS elements to enable interchangeability, vendor independence and facilitate future interconnections.

Table 3: ITS Inventory

Element Name	Element Description	Element Status	Stakeholder
Archived Data Users	This element represents Capital Region Planning Commission (CRPC) and other planning and research agencies in the region that use the transportation data for transportation planning purposes. The primary example can be the technical advisory committee formed by CRPC making use of operations data for future planning and other system planning and deployment purposes.	Existing	Capital Region Planning Commission (CRPC)
Ascension Parish Transportation and Engineering	The department is responsible for the planning, design and construction of local road projects within Ascension Parish. This includes new roads, turn lanes, mill and overlay projects, round-abouts, widening, signage upgrades, safety improvements, intersection lighting, major street lighting projects and major bridge projects.	Existing	Ascension Parish
Baton Rouge TMC	This element represents the traffic operations center that is responsible for traffic management activities within the Baton Rouge Regional ITS Architecture. The typical activities include traffic monitoring, traffic data collection, operation of ITS elements (CCTV, DMS, etc.), detection and verification of incidents, traffic signal monitoring, and other traffic management related activities. This also includes communicating with other agencies, districts, TMCs, and DOTD departments for roadway maintenance activities.	Existing	DOTD
Capital Region Planning Commission (CRPC)	CRPC represents the Baton Rouge MPO and is responsible for transportation planning and policy making. CRPC is made up of representatives from local government and transportation authorities. The Baton Rouge MPO is made up of eleven Parishes: Ascension, East Baton Rouge, East Feliciana, Iberville, Livingston, Point Coupee, St Helena, Tangipahoa, Washington, West Baton Rouge and West Feliciana.	Existing	Capital Region Planning Commission (CRPC)
CATS Management Center	This element represents the regional transit system for the Baton Rouge metropolitan area.	Existing	Capital Area Transit System (CATS)
CATS Transit Vehicles	CATS Transit Vehicles	Existing	Capital Area Transit System (CATS)
City-Parish DPW Traffic Engineering Division	This element represents City of Baton Rouge/East Baton Rouge Parish DPW traffic engineering division. The traffic engineering division is responsible for traffic operations management within the city jurisdiction.	Existing	City of Baton Rouge/Parish of East Baton Rouge
City-Parish Emergency Response Operations 911	This element represents the City-Parish emergency response operations including City fire, police, 911, and any other emergency response operators housed in the ATM/EOC building. This element is responsible for the emergency response operations and management within the City of Baton Rouge and East Baton Rouge Parish jurisdiction	Existing	City of Baton Rouge/Parish of East Baton Rouge
City-Parish Emergency Vehicles	This element represents emergency vehicles operated and maintained by the City of Baton Rouge/East Baton Rouge Parish emergency personnel. These vehicles include emergency, fire, and police vehicles owned by city-parish.	Existing	City of Baton Rouge/Parish of East Baton Rouge
City-Parish ITS Field Devices	This element represents several ITS field devices operated by the city-parish traffic engineering division.	Existing	City of Baton Rouge/Parish of East Baton Rouge
City-Parish Website	This element represents the City of Baton Rouge/East Baton Rouge Parish website which directly or indirectly provides transportation information to travelers.	Existing	City of Baton Rouge/Parish of East Baton Rouge
DOTD District 61 Maintenance Division,	This element represents district maintenance department that is responsible for all the roadway construction, maintenance, and	Existing	DOTD

Element Name	Element Description	Element Status	Stakeholder
DOTD District 62 Maintenance Division	repair within the district jurisdiction. This element also helps coordinating with other departments for scheduling of maintenance activities. The MPO boundary includes parishes within the jurisdiction of DOTD District 61 and DOTD District 62.		
DOTD District 61 ITS Field Devices	This element includes the equipment distributed on and along the roadway that monitors and controls traffic and monitors and manages the roadway itself. Equipment includes traffic detectors, dynamic message signs, CCTV cameras and video image processing systems, grade crossing warning systems, and freeway ramp metering systems.	Existing	DOTD
DOTD District 61 Traffic Operations	This element represents traffic operations center or traffic engineering division within the district office that is responsible for traffic management activities within the district jurisdiction. The typical activities include traffic monitoring, traffic data collection, operation of ITS elements (CCTV,DMS,etc.), detection and verification of incidents, traffic signal operations, and other traffic management related activities. This also includes communicating with other departments like maintenance for roadway maintenance activities.	Existing	DOTD
DOTD District 62 ITS Field Devices	This element includes the equipment distributed on and along the roadway that monitors and controls traffic and monitors and manages the roadway itself. Equipment includes traffic detectors, environmental sensors, dynamic message signs, CCTV cameras and video image processing systems, grade crossing warning systems, and freeway ramp metering systems.	Existing	DOTD
DOTD District 62 Traffic Operations	This element represents traffic operations center or traffic engineering division within the district office that is responsible for traffic management activities within the district jurisdiction. The typical activities include traffic monitoring, traffic data collection, operation of ITS elements (CCTV,DMS,etc.), detection and verification of incidents, traffic signal operations, and other traffic management related activities. This also includes communicating with other departments like maintenance for roadway maintenance activities.	Existing	DOTD
DOTD ITS Division Maintenance Vehicles	This element represents all the vehicles and associated equipment that assist in ITS field equipment maintenance and repair activities.	Existing	DOTD
DOTD ITS Section	This element represents ITS Section (Section 56) under the LA DOTD. The ITS section is responsible for state-wide Operations center located in DOTD headquarters. Also, the ITS section is responsible for management information systems for transportation, state-wide ITS elements operations, and maintenance. The ITS section is also responsible for maintenance of all ITS equipment in the state including District 61 and District 62.	Existing	DOTD
DOTD Planning and Programming Division	This element represents DOTD Planning and Programming division that is responsible for collecting and distributing myriad of transportation data including traffic counts, roadway inventory, infrastructure (pavement, tunnel, bridges, etc.) maintenance status, etc.	Existing	DOTD
DOTD Weights and Standards Division	This element represents Weights and Standards division responsible for commercial vehicle checking and permit issuance.	Existing	DOTD
Livingston Parish DPW	Livingston Parish DPW is responsible for operating local field devices including traffic signal systems and parking systems.	Existing	Livingston Parish
Local Emergency Operations Centers	This element represents emergency dispatch centers operated by local agencies including 911, emergency, and fire response dispatch center.	Existing	Local Public Safety Agencies
Local Public Safety Agencies	This refers to all the local public safety agencies including police, fire, emergency services.	Existing	Local Public Safety Agencies

ITS Inventory

Element Name	Element Description	Element Status	Stakeholder
Local Traffic Operations	This element represents local (city/town) DPW traffic engineering operations within their own jurisdiction	Existing	Local Traffic Management Agencies
Louisiana 511	This element provides traveler information service provided by the LA DOTD in conjunction with private partner.	Existing	DOTD
Louisiana State Police - Troop A	This element represents Louisiana State Police department; the Baton Rogue metropolitan area is covered by troop A.	Existing	LSP Troop A
Louisiana State Police Vehicles	Louisiana State Police Vehicles	Existing	LSP Troop A
Louisiana Transportation Research Center (LTRC)	This element represented the LTRC that performs short-term and long-term research and provides technology assistance, engineering training and continuing education, technology transfer, and problem-solving services to DOTD and others in the transportation community.	Existing	Louisiana Transportation Research Center (LTRC)
Media	This element provides information to the public using television and radio broadcasts, websites, and social media	Existing	Media
MOHSEP	This element represents Mayor's Office of Homeland Security and Emergency Preparedness. MOHSEP is responsible for emergency response to major disaster in East Baton Rouge Parish. The division is also responsible for the ATM/EOC operations center that houses several traffic, ITS, and emergency response providers from city and state agency and the ATM-EOC facility.	Existing	City of Baton Rouge/Parish of East Baton Rouge
Motorist Assistance Patrol	This element represents the motorist assistance patrol vehicles operated and maintained by DOTD ITS	Existing	DOTD
Parish OHEP	This element refers to the Office of Emergency Preparedness and Homeland Security department within each Parish in the MPO which is responsible for developing parish wide emergency operations plan in accordance with state and federal guidelines. The plan details emergency assignments before, during, and following any declared emergency.	Existing	Local Public Safety Agencies
Port of Baton Rouge	This Stakeholder represents the Ports which are transfer points or multimodal facilities	Existing	Port of Greater Baton Rouge
Statewide TMC	This element represents the Statewide TMC located in the DOTD headquarters annex building in Baton Rouge. The Statewide TMC provides supplemental support to the Baton Rouge TMC. The Statewide TMC operates 24/7.	Existing	DOTD
Tourism and Travel Service Information Sources	Private Tourism and Traveler Information Websites, local hotel associations, visitor centers, etc.	Existing	Tourism and Travel Information Service Providers
Traveler	Motorist or user of the regional transportation system	Existing	Public (Traveler)
WBR Parish DPW	West Baton Rouge Parish DPW is responsible for operating local field devices including traffic signal systems and parking systems.	Existing	Local Traffic Management Agencies
Work Zone ITS	Work Zone ITS includes all or any ITS systems that can be deployed for roadway construction, maintenance, rehabilitation or any other services to facilitate transportation management and operations in a work zone such as vehicle detection, work zone intrusion alarms, queue warning and management, safety service patrol, and traveler information.	Planned	DOTD Contractor

5.0 ITS SERVICES

ITS services, or service packages, describe what can be done to improve the efficiency, safety and convenience of the regional transportation system through better information, advanced systems and new technologies. Some services are specific to one primary stakeholder while others require broad stakeholder participation. The ITS services that meet the transportation needs in the region are described in detail in **Appendix A**.

6.0 USER NEEDS

User Needs describe services or functions that are desired or gaps in existing system that limits delivery of desired services i.e. mobility, safety, communications and minimize environmental impacts. They are written from the perspective of a system user or stakeholder in that system and are categorized by the ITS Service Packages that comprise the Baton Rouge Regional Architecture. Service Packages provide an accessible, service-oriented perspective to the overall system architecture used to describe the region or project. They identify the pieces of the physical view that are required to implement a particular ITS service. Each of these service packages has a set of User Needs associated with it that can be used as the basis for stakeholder validation, setting proper expectations and eliciting requirements for the systems and devices to be implemented. DOTD is currently transitioning its TMC operations to use more Transportation Systems Management and Operations (TSMO) strategies to enhance safety and travel time reliability for the traveling public as well as maximize the capacity of the existing transportation infrastructure. The TSMO strategies identified by DOTD include expansion of the ITS infrastructure to include the following capabilities or enhance existing ones:

- Road Weather Management
- Adaptive Ramp Meter Operations
- Emergency and Special Events Management
- Work Zone Management
- Connected and Automated Vehicles (CAV)
- Performance Measures
- Advanced Traffic Signal Systems
- Managed Lanes
- Integrated Corridor Management (ICM)
- Traffic Management Centers (TMCs) including Virtual TMCs
- Advanced Traffic Management System Software Upgrades

To facilitate ICM, for instance, it is important to develop a Memorandum of Understanding (MOU) with Municipalities/Parishes/State Agencies to establish corridors for traffic management, detour routes for emergencies and incidents, traffic signal timing plans and other operational strategies that impacts traffic in those jurisdictions. The subsequent sections describe specific needs that were identified through the stakeholder engagement process.

6.1 TRANSPORTATION CHALLENGES

6.1.1 Traveler Information

Stakeholders desire traveler information systems with wider reach to the public to facilitate good decisions by travelers and more efficient operations of the roadway. Traveler information systems are desired to provide situational awareness of roadways to the public on congestion, incidents, weather related impacts to roadways, work zones, special events and any other activities that impact mobility and safety on the roadways. The following locations were brought up by the stakeholders as decision points that need traveler information facilitated by devices such as dynamic message signs:

- I-10 EB between Citi Place and other major interchanges on I-10 EB
- I-10 EB upstream of Bluebonnet Boulevard or Siegen Lane
- I-12 WB near Juban Road or Satsuma
- I-110 corridor north of Airline Highway

6.1.2 Enhanced Camera Coverage

Gaps in camera coverage have been identified in the existing ITS infrastructure. The locations identified are listed below:

- I-12 between Walker Road and Juban Rd.
- I-12 near LA 63 in Satsuma[3]
- I-10 Westbound near Grosse Tete
- I-10 near Bluff Road (Overpass) and LA 73
- LA 1 – Around Brusly/Addis
- US190 Westbound (Old Bridge)
- Scotland Avenue/Scenic Highway

Generally the TMC operators desire enhanced camera coverage in corridors where MAP service are deployed to help with rapid detection and verification of incidents and faster deployment of MAP.

6.1.3 Coordination and Incident Management and Maintenance

Debris on roadway, including stalled vehicles which remain there for extended periods of time, can be hazards to the motoring public especially on the high speed interstate system. Rapid removal of debris or any other obstacles on the roadway and clear zones is desired. One of the issues identified is that roadway maintenance crews do not have resources and the people to expedite cleanup and debris pick-up. It has been proposed that special attention be given to critical corridors such as the bridges to expedite towing at those locations and roadway debris removal. There used to be an incentive program to help address this issue but that is no longer the case. Other ideas floated include having MAP specifically for the bridges across the Mississippi River. The MAP vehicles currently being used are capable of pushing or pulling vehicles but cannot tow. A MAP tow vehicle may need to be acquired to help, particularly during all the extended construction zones anticipated in the near future along the I-10 corridor.

[3] This location appears to be outside the MPO boundary, but may be included in the Baton Rouge Regional ITS Plan.

6.1.4 MAP Coverage

Motorist Assistant Patrol has been a huge success with the public and expansion of this service is desired. **Figure 2** shows the existing and proposed coverage of MAP. Extension of MAP services on I-10 to close gaps in service on I-10 from Highland Rd. to LaPlace, the Atchafalaya Basin Bridge and Whiskey Bay has been proposed. Providing MAP service specifically for the Mississippi River Bridge to move stalled vehicles and keep travel lanes open has also been proposed. MAP currently does not have the ability to tow vehicles off the road. The challenge with providing MAP service is funding.

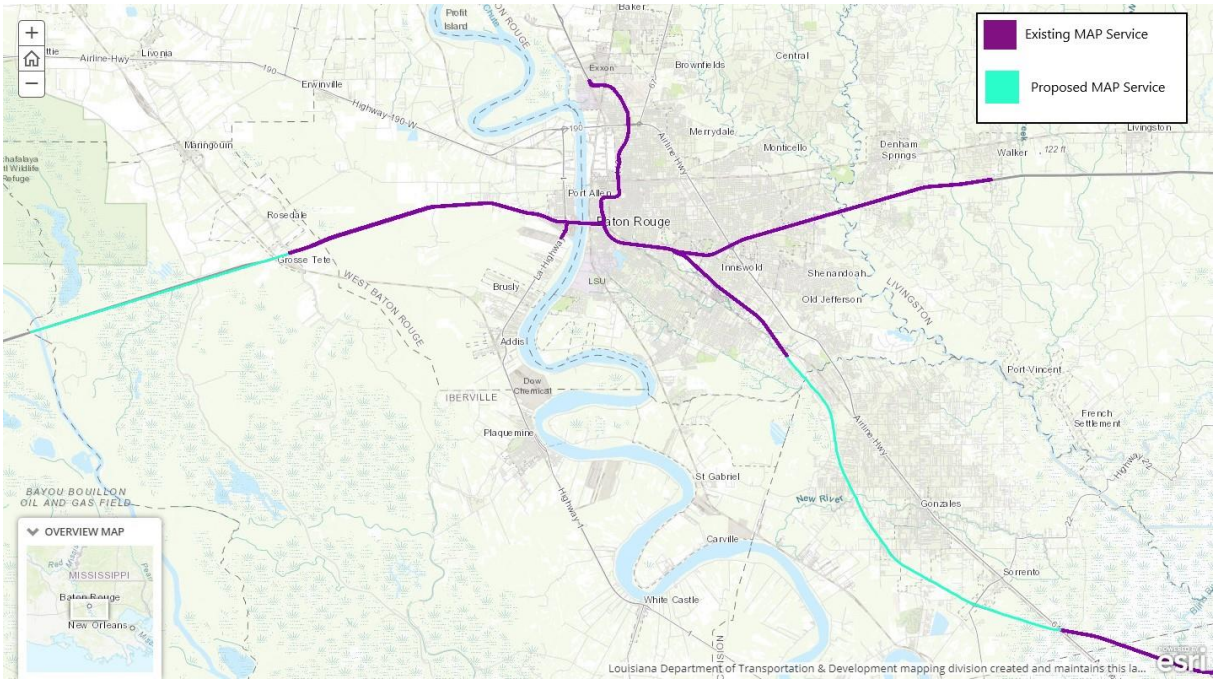

Figure 2: MAP Patrol Routes

6.1.5 Work Zones Management

Work zones pose significant hazard to travelers because of the changes in roadway configuration and the traffic control devices placed in travel lanes to channel traffic safely around the work zone. The stakeholders anticipate more work zones with the passage of the infrastructure bill and therefore the need to address work zone safety. Some of the ideas floated during stakeholder engagement included the potential to use field devices with connectivity that can also be integrated into the DOTD ATMS for TMCs to manage traffic through work zones. Contractor may also provide devices to enhance safety and management of traffic within work zone. These devices may be queue detection and advance warning systems, camera coverage and MAP. A web portal may be provided for TMC access and coordination. This has been done in Lake Charles on past projects. The challenges are typically reliability of wireless communication with field devices. Integration of contractor field devices into the TMC ATMS may require a system engineering analysis (SEA) to ensure the systems will communicate as well as envisioned.

6.1.6 Weather Management

The weather-related challenges include wind damage and flooding from hurricanes, freezing of roadway travel surfaces from low temperatures and fog. Freezing has more adverse effect on elevated roadways such as I-110, I-10 near Atchafalaya and bridge crossings. Significant flooding cut off segments of I-10 and I-12 and several other arterials during the 2016 flood. Other heavy rain events have caused flooding on many other roadways. The traveling public desires timely and accurate information on the roadway conditions for mobility and safety. Another challenge faced with the TMC operations staff is the management of the roadways with regard to weather events. Communicating the impact of weather on road networks goes through a several levels of staff and by the time the TMC staff receive vetted information for them to post to the public, sometimes the conditions have changed and the roadways are not in the state the public is informed. This can erode confidence in the traveler information system. DOTD ITS has initiated the process to upgrade the traveler information system (also known as 511) as part of ITS system integration projects which are ongoing. There is inherent delay in collecting and verifying information but understanding the process is helpful and new systems will try to improve this. Environmental Sensor Stations could be installed over rivers to detect water level and send warning if bridges are flooded. The TMC operations staff have also recommended fog warning systems to help warn motorists of dangerous conditions.

6.1.7 Public Transportation

Transit services need to be expanded to make it accessible and easy to use. The Capital Area Transit (CATS) currently does not operate west of the Mississippi River. CATS operations are limited to the corporate limits of Baton Rouge and Baker. There is a need for feeder services that will connect travelers to the bus rapid transit (BRT) proposed. This would require a clear understanding of the origin of travelers and their destinations. The stakeholders recommended reexamination of the route structure and technology options to enhance the use of transit. Other stakeholders expressed the need for a multimodal transit agency that takes advantage rail and all the novel mobility options including micro-transit. Currently a commuter rail transit system from Baton Route to New Orleans is being explored. Transit has been identified as the key driver to attract more business investment opportunities. Furthermore, stakeholders desire to change the culture around transit systems to one that attracts and caters to the needs of users of all demographics and eschews the notion that transit is only for those that don't have the option of a personal car. To enhance transit operations, transit signal priority and intermittent bus lanes have also been identified as feasible options on I-10, I-12, Florida Boulevard, and Nicholson Road. Part of the challenges with expanding transit services west of the Mississippi River is the heavy congestion on the bridge and its adverse effect arrival time reliability. Real time signage with bus arrival times are also desired. Paratransit services are also currently provided and the vehicles operated by AB Transit and the vehicles tracked using Trapeze. CATS is working on the plan to demonstrate multimodal micro transit services and a pop-up transit facility near Scotland Avenue. This will allow people to transfer to the bus system and service areas such as the hospital in Zachary, Louisiana. If the board approves it, CATS will pursue these demonstrations soon.

The stakeholder group showed interest in seeing several services improvements to the transit system implemented to enhance transit operations. These include realtime transit information sent to transit rider personal devices, transit vehicle safety, multimodal coordination, supporting visually impaired to guide them to appropriate bus and route, and integrated multimodal electronic payment to support the use of smart cards or devices to pay across services such as transit fares, tolls and parking.

6.1.8 Parking Management

The stakeholders desire smart parking facilities developed with active management of the facilities using ITS. This would include the deployment of detection at individual parking spots in garages and use of message signs or information sent through apps to guide travelers to available spots or garages with parking availability. Furthermore, smart park and ride facilities will help alleviate congestion and improve environmental quality.

6.1.9 Performance Measures

DOTD is transitioning to TSMO strategies to manage the transportation network and that requires data and analytic tools to measure or predict network performance and evaluate strategies. Furthermore part of the MAP 21 requirements is that States develop performance measures and set targets. DOTD has piloted the use of some probe data such as WayCare to improve operations. Other probe data (INRIX) are also used for operations. DOTD is upgrading its advanced transportation management system (ATMS) which should unlock new capabilities to help meet these requirements for implementation of TSMO strategies and performance measures.

6.1.10 Active Traffic Management

DOTD is also exploring the use of active traffic management (ATM) strategies to better manage congestions and make the roadways safer. High Occupancy Vehicle (HOV) operations have been proposed for the I-12 corridor. Currently the queue warning system on the I-10 corridor west of the Mississippi River bridge is being expanded to begin west of LA 77 near Grosse Tete, Louisiana and will include additional detection to track changes in vehicle speeds along the route. Reversible lanes have been proposed as well but no corridors have been identified yet. Also ICM has been proposed to help manage congestion. DOTD pursued grant funding for ICM for management of the I-10 and Airline Highway corridor. Variable speed limit (VSL) has also been proposed to help manage traffic through congested corridors and enhance safety.

Ramp Meters exist in the I-12 corridor from Essen Lane to Juban Road. Currently the ramps operate as fixed time and are activated for specific time of day operations. For the morning peak period the ramps in the westbound direction are activated and during the afternoon peak the ramps on the eastbound direction are activated. There are no activations of the ramp meters in the event of an incident or any congestion that occurs outside of the activation periods. DOTD has recognized the limitation in benefits this time-of-day activations impose on capacity and has therefore decided to improve the ramp meters to operate adaptively. This update is scheduled to let in 2022.

Ramp meters were also proposed for the I-10 corridor from Dalrymple Drive to LA 73. The design was completed in 2016; however, the construction of the ramp meters has been put on hold since. The major reasons being that there is a concern that the access ramps in the corridor may be too short. The storage lengths on the ramps may not be sufficient to prevent queues from adversely impacting the adjacent arterials. This may be mitigated by increasing ramp lengths and adding more lanes however this may be difficult to achieve due to constraints in the corridor. The I-10 widening has been proposed and at this time it is not known how the ramps will be impacted and if ramp meters will be feasible after the widening project. DOTD has had positive results from the Adaptive traffic signal systems have been proposed by CRPC and DOTD District 61 to address challenges with mobility. The City of Baton Rouge is considering the implementation of adaptive ramp meters where significant benefits will be realized under the MOVEBR Program. DOTD has seen positive results from the adaptive signal systems implemented in Lake Charles when they work properly. DOTD District 61 noted that there are high initial costs, high long term maintenance costs, and third party costs for software maintenance and offsite hosting. A proper funding mechanism for planning, implementation and maintenance would have to be put in place first to ensure the system works as intended and to realize the full benefits of adaptive signal control.

6.1.11 Artificial Intelligence

Artificial Intelligence (AI) applications in transportation is gaining ascendancy and can help make sense of the plethora of the transportation data generated through TMC operations and provide insights into big data to address mobility and safety needs of the region. AI has been used in decision support systems (DSS) to enhance transportation management strategies and ease the burden on TMC operations staff. For instance as the number of cameras deployed in the field continue to increase, they will become too many for TMC operators to monitor effectively and AI based incident detection systems could help address the gap. AI can also be used for detection of vulnerable road users such as pedestrians and cyclists etc.

6.1.12 Commercial Vehicle Operations

The American Transportation Research Institute (ATRI) bottleneck analysis for freight congestion in the year 2021 has identified I-10 at I-110 in Baton Rouge as the 16th highest in the nation[4]. For trucks traveling through this location in Baton Rouge, the peak average speed is 30.6mph, the non-peak average speed is 40.8mph and the overall average speed is 37.4mph. The effect of this congestion significantly reduces mobility through the I-10, I-110 and I-12 corridors as well as other arterials in the region. Such low speeds have contributed to some fatal crashes in the I-10 corridor. DOTD is currently enhancing its queue warning system in the I-10 corridor to help improve safety. LMTA recommended the development of commercial vehicle parking facilities at strategic locations to facilitate commercial vehicle operations (CVO) with in the region. DOTD has not had any internal discussions yet on this need but acknowledged this would be a good idea. DOTD District 61 proposed a possible discussion with and development of agreements with commercial properties with existing large parking lots for overnight parking for commercial vehicles. Another option would be to acquire large real estate to develop into truck parking facilities. The DOTD right of way (ROW) does not currently have that space available. Ultimately when a site is identified and the truck

[4] https://truckingresearch.org/wp-content/uploads/2022/02/bn016-2022.pdf (Accessed 2/9/2022)

parking developed, inclusion of ITS systems such as freight advanced traveler information (FRATIS) to provide realtime parking space availability that can be sent to truck drivers and dispatchers will facilitate route planning. Other needs identified CVO focused on commercial vehicle safety services where alerts can be sent to commercial vehicles to mitigate secondary crashes. Other needs identified include advance roadway warnings for road closures and other incidents.

6.1.13 Electric Charing Stations

The Louisiana Department of Environmental Quality (DEQ) has deployed some electric vehicle charging stations in the State and has plans to add some more. DEQ collaborates with the Clean Cities Coalition to assist municipalities identify suitable locations for deployment. It appears the City of Baton Rouge and DOTD do not have clear policies yet concerning placement of stations. DOTD ITS Section is not currently planning on getting involved in charging stations.

6.1.14 Special Event Management

DOTD recommend the need for special events management to develop event specific operational strategies. Even though the local police help with traffic management the coordination with TMC is lacking unless events impact the interstate systems. Most of the ITS deployments have focused on interstate systems and there are few deployments on surface streets and for that matter the TMC cannot really help with surface street management. The surface Streets have been identified as main source of challenges during special events. Some of the solutions propose to include the following:

- Use Integrated or Connected Portable Devices (CCTVs and DMS)
- Use a Special Events Coordinator from the Baton Rouge Police Department (BRPD) to coordinate traffic management during special events especially it is going to have extensive impacts.

At the moment, there are no portable signs that are integrated with the TMC to communicate with and operate remotely. Contractors are required to use connected portable devices for work zones on some mega projects in Louisiana, however these are not integrated with the TMCs for operations and management. This can be recommended for special events depending on the scale of impact to the transportation system. Louisiana State University (LSU) football games tend to impact mobility significantly in the area especially College Drive, Dalrymple Drive and streets in downtown Baton Rouge. Some connected portable devices can be deployed in these corridors to help with traffic management.

6.2 DESIRED FUNCTIONS

6.2.1 CVO03: Electronic Clearance (Safety)

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.

Table 4 – CVO03: Electronic Clearance Needs

Number	Need
01	Commercial Vehicle Administration needs to be able to determine the weight and other characteristics of commercial vehicles operating on its roadways as part of the clearance process.
02	Commercial Vehicle Administration needs to collect and maintain electronic records of commercial vehicles and drivers operating on its roadways in order to support efficient clearance operations.
03	Commercial Vehicle Administration needs to be able to coordinate electronic credentials and safety records with other commercial vehicle administration agencies concerning commercial vehicles and drivers operating on its roadways in order to support efficient clearance operations.
04	Commercial Vehicle Administration needs to be able to perform electronic clearance of commercial vehicle credentials and safety records of a commercial vehicle and its driver in order to maintain the smooth flow of goods through its roadways.
05	Commercial Vehicle Administration needs to be able to inform the appropriate parties of issues dealing with the clearance of a commercial vehicle or its driver in order to maintain the smooth flow of goods through its roadways.

6.2.2 CVO15: Fleet and Freight Security (Safety)

This service package provides enhanced security for commercial vehicle fleets and freight. Internal and external alerts and advisories are monitored to identify potential threats to the safety and security of the fleet and freight. It provides for the planning and tracking of three aspects of commercial vehicle shipments. For each shipment, the commercial vehicle, the freight equipment, and the commercial vehicle driver are monitored for consistency with the planned assignment. Any unauthorized changes are determined by the Fleet and Freight Management Center and then the appropriate people and Centers are notified. As the freight is shipped and tracked, security and public safety agencies may also interrogate the freight container to determine if it has been breached and to identify container contents. Once a route has been assigned, changes must be coordinated. Commercial Vehicle Drivers are alerted to any changes in route from the planned route and given an opportunity to justify a rerouting. Any unauthorized or unexpected route changes by the Commercial Vehicle will register a route deviation alert with the Fleet and Freight Management Center, which can notify local public safety agencies of the route deviation when appropriate (e.g., if there is safety sensitive HAZMAT being carried). Freight managers may decide to take further action on the alerts and/or provide responses that explain that the alerts are false alarms. If no explanation is received, the Fleet and Freight Management Center may notify the Emergency Management Center.

Table 5 – CVO15: Fleet and Freight Security Needs

Number	Need
01	Fleet and Freight Management needs to be able to track the location and monitor the status of its freight being carried in order to provide efficient movement of goods for its clients.
02	Fleet and Freight Management needs to determine the status of the contents of a container in order to provide safe and efficient movement of goods.
03	Fleet and Freight Management needs to be able to alert the appropriate emergency management center if a breach or problem is detected with the container or its contents.
04	Fleet and Freight Management needs to be able to provide the contents and status of a container to security and public safety agencies.
05	Fleet and Freight Management needs to be able to provide the status of a freight shipment to customers, terminals, and other distribution and logistics systems.

6.2.3 DM01: ITS Data Warehouse (Informational)

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.

Table 6 – DM01: ITS Data Warehouse Needs

Number	Need
01	System operators need to be able to store data for long term access by themselves and other operators.
02	System operators need to be able to query for and receive archive data products containing freeway data, tolling data, arterial data, parking data, transit and ridesharing data, incident management data, safety-related data, CVO data, environmental and weather data, vehicle and passenger data and intermodal operations data.
03	System operators need to be able to manage data processing with regard to data archive functions, including data aggregation, data tagging (processed, edited, raw, transformed, etc.), data storage timing and longevity, data quality analysis, data formatting and metadata assignments.

6.2.4 MC05: Roadway Maintenance and Construction (Management)

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.

Table 7 – MC05: Roadway Maintenance and Construction Needs

Number	Need
01	Maintenance and construction operations need to be able to schedule maintenance and construction on a roadway system or right-of-way.
02	Maintenance and construction operations need to be able to collect environmental conditions information from various weather sources in order to aid in scheduling maintenance and construction activities.
03	Maintenance and construction operations need to coordinate maintenance and construction activities with traffic and other management agencies.
04	Maintenance and construction operations need to be able to monitor the status of ITS field equipment and coordinate with Traffic Operations on the maintenance of the equipment.

6.2.5 MC06: Work Zone Management (Safety)

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.

Table 8 – MC06: Work Zone Management Needs

Number	Need
01	Maintenance and construction operations need to be able to manage work zones and control traffic in areas of the roadway where maintenance, construction, and utility work activities are underway.
02	Maintenance and construction operations need to be able to inform the driver of upcoming work zones, including reduced speeds, lanes affected, and delays.
03	Maintenance and construction operations need to be able to coordinate work zone information with other agencies (e.g., traveler information, traffic operations, and other maintenance and construction centers).
04	Maintenance and construction operations need to be able to provide control of field equipment in all maintenance and construction areas, including fixed, portable, and truck-mounted devices supporting both stationary and mobile work zones.

6.2.6 MC07: Work Zone Safety Monitoring (Safety)

This service package provides warnings to maintenance personnel within a work zone about potential hazards within the work zone. It enables vehicles or the infrastructure to provide warnings to workers in a work zone when a vehicle is moving in a manner that appears to create an unsafe condition (e.g., moving at high speed or entering the work zone).

Table 9 – MC07: Work Zone Safety Monitoring Needs

Number	Need	Comment
01	Maintenance and Construction operations need to be able to provide warnings about hazards in the work zone to maintenance personnel, such as a vehicle moving in a manner that appears to create an unsafe condition.	
02	Maintenance and Construction operations need to be able to monitor for hazards in the work zone.	
03	Maintenance and Construction operations need to be able to monitor operational status of work zone safety devices.	

6.2.7 PS01: Emergency Call-Taking and Dispatch (Safety)

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.

Table 10 – PS01: Emergency Call-Taking and Dispatch Needs

Number	Need
01	Emergency Management needs to provide basic public safety call-taking and dispatch of emergency vehicles in order to provide safe and rapid deployment of appropriate resources to an emergency.

Number	Need
02	Emergency Management needs to coordinate with other emergency management operations in order to support emergency notification between agencies.
03	Emergency Management needs to process current and historical weather and road conditions data from multiple sources in order to generate warnings and route advisories for individual emergency responders or emergency response dispatchers.
04	Emergency Management needs to provide emergency responders with road weather warnings and advisories.
05	Emergency Management needs to provide routing information to the emergency responders.

6.2.8 PS02: Emergency Response (Environmental)

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.

Table 11 – PS02: Emergency Response Needs

Number	Need
01	Emergency Management needs to be able to obtain information from the incident scene to support incident response.
02	Emergency Management needs to provide response in the field to incidents and emergency situations.
03	Emergency Management needs to coordinate with other emergency management operations in order to support emergency response

6.2.9 PS03: Emergency Vehicle Preemption (Safety)

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.

Table 12 – PS03: Emergency Vehicle Preemption Needs

Number	Need
01	Emergency Management needs to be able to request signal preemption from Traffic Operations for a specific emergency vehicle.
02	Emergency Management needs to be able request signal preemption locally for one or more signals the vehicle is approaching so that it may quickly and safely cross the intersections.
03	Traffic Management needs to be able to adjust signal timing to provide signal preemption for an emergency vehicle based upon a request from Emergency Management.
04	Traffic Management needs to be able to support local adjustments to signal timing based upon a local preemption request and transition back to normal traffic signal operations after providing emergency vehicle preemption.

6.2.10 PS08: Roadway Service Patrols (Safety)

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.

Table 13 – PS08: Roadway Service Patrols Needs

Number	Need
01	Roadway Service Patrol Operations need to be able to monitor service patrol vehicle locations and dispatch service patrol vehicles to identified incident locations.
02	Roadway Service Patrol Operations need to be able to monitor roads and aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) in order to minimize disruption to the traffic stream.
03	Roadway Service Patrol Operations need to be able to share incident information collected by the service patrol with traffic, maintenance and construction, and traveler information systems.

6.2.11 PS09: Transportation Infrastructure Protection (Safety)

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.

Table 14 – PS09: Transportation Infrastructure Protection Needs

Number	Need
01	Traffic Operations and Emergency Management need to be able to monitor transportation infrastructure (e.g., bridges, tunnels and management centers) for potential threats in order to control access, preclude an incident, and mitigate the impact of an incident if it occurs.
02	Traffic Operations and Emergency Management need to be able to notify agencies if a threat is detected.
03	Traffic Operations and Emergency Management need to be able to collect advisories from other agencies related to detected threats.
04	Traffic Operations in response to threats needs to be able to activate the barrier and/or safeguard systems in order to deter an incident, control access to an area or mitigate the impact of an incident.

6.2.12 PS10: Wide-Area Alert (Safety)

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 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.

Table 15 – PS10: Wide-Area Alert Needs

Number	Need
01	Emergency Management needs to be able to verify the reported emergency situation in order to activate the alert system.
02	Emergency Management needs to be able 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, using ITS technologies such as dynamic message signs, highway advisory radios, in-vehicle displays, transit displays, 511 traveler information systems, and traveler information web sites.
03	Emergency Management needs to be able to broadcast emergency information to traffic agencies, transit agencies, information service providers, toll operators, and others that operate ITS systems.

6.2.13 PS11: Early Warning System (Safety)

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.

Table 16 – PS11: Early Warning System Needs

Number	Need
01	Emergency Management needs to be able to collect potential threats, alerts, and advisories from various ITS systems to identify emergencies.
02	Emergency Management needs to be able to alert all relevant agencies of detected emergencies.

6.2.14 PS12: Disaster Response and Recovery (Safety)

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 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.

Table 17 – PS12: Disaster Response and Recovery Needs

Number	Need
01	Emergency Management needs to support integration between transportation systems and the public safety, emergency management, public health, and other allied organizations that form the overall disaster response.
02	Emergency Management needs to support coordination of emergency response plans issued by various agencies in order plan for regional response to disasters.
03	Emergency Management needs to be able to track and coordinate the transportation professionals, equipment, and materials that constitute the disaster response in order to respond to and recover from disasters.
04	Emergency Management needs to be able to provide to other regional centers information about the transportation system in the vicinity of the disaster.

6.2.15 PS13: Evacuation and Reentry Management (Safety)

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.

Table 18 – PS13: Evacuation and Reentry Management Needs

Number	Need
01	Emergency Management needs to support evacuation of the general public from disaster area.
02	Emergency Management needs to coordinate evacuation plans among the federal, state, and local transportation, emergency, and law enforcement agencies that may be involved in a large-scale evacuation.
03	Emergency Management needs to share evacuation information with traffic management agencies in order to implement special traffic control strategies to control evacuation traffic.
04	Emergency Management needs to share evacuation information with transit agencies in order to remove people from an evacuated area while making efficient use of limited capacity.
05	Emergency Management needs to manage subsequent reentry of the general public to the disaster area.

6.2.16 PS14: Disaster Traveler Information (Safety)

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 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.

Table 19 – PS14: Disaster Traveler Information Needs

Number	Need
01	Emergency Management and Traveler Information need to be able to provide general public real-time disaster and evacuation information using ITS traveler information systems.
02	Traveler Information needs to be able to collect disaster related information from multiple sources including traffic, transit, public safety, emergency management, shelter provider, and travel service provider organizations.
03	Emergency Management and Traveler Information need to be able to provide evacuees with information including a shelter that matches their needs, including location, availability, and routing.
04	Emergency Management and Traveler Information need to be able to provide information concerning roadside resources including information provided by other evacuees to help understand availability of resources.
05	Emergency Management and Traveler Information need to be able to provide evacuees with information regarding when they can return to their area, including routes and road conditions.

6.2.17 PT01: Transit Vehicle Tracking (Mobility)

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.

Table 20 – PT01: Transit Vehicle Tracking Needs

Number	Need
01	Transit Operations needs to be able to monitor the location of transit vehicles in order to improve decision making by transit operators and provide more accurate information to travelers .
02	Transit Operations needs to be able to determine whether each transit vehicle is adhering to its schedule.
03	Transit Operations needs to be able to send transit vehicle location and schedule adherence data to other centers in order to support traveler information and traffic operations.

6.2.18 PT02: Transit Fixed-Route Operations (Mobility)

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.

Table 21 – PT02: Transit Fixed-Route Operations Needs

Number	Need
01	Transit Operations needs to be able to create and update schedules for fixed route or flexible route transit routes in order to plan transit operations.
02	Transit Operations needs to be able to disseminate transit schedules for fixed route or flexible route transit routes to traveler information centers.
03	Transit Operations needs to be able to dispatch transit vehicles for fixed route or flexible route runs.
04	Transit Operations need to be able to schedule blocks (vehicle assignments) and runs (operator assignments) for fixed route or flexible route transit operations.
05	Transit Operations need to be able to monitor transit vehicle schedule adherence in order to manage fixed route or flexible route transit operations.
06	Transit Operations need to have real time information about the road network in order to increase the effectiveness of operations for fixed route or flexible route transit.

6.2.19 PT03: Dynamic Transit Operations (Mobility)

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.

Table 22 – PT03: Dynamic Transit Operations Needs

Number	Need
01	Transit Operations needs to be able to take reservations for demand response trips that include the travelers' origin, destination, and departure time in order to do demand response scheduling.
02	Transit Operations needs to be able to schedule demand response transit vehicles based upon travelers trip requests.
03	Transit Operations needs to provide and update manifests to properly manage demand response transit vehicles based upon traveler requests.
04	Transit Operations needs to be able to monitor the real-time location of demand response transit vehicles.
05	Transit Operations need to have real time information about the road network in order to increase the effectiveness of operations for demand response transit.

6.2.20 PT05: Transit Security (Mobility)

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 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.

Table 23 – PT05: Transit Security Needs

Number	Need
01	Transit Operations needs to be able to monitor conditions on a transit vehicle in order to provide a secure environment for travelers.
02	Transit Operations needs to be able to monitor transit stops and transit stations in order to provide a secure environment for travelers.

Number	Need
03	Transit Operations needs to be able to monitor transit secure areas such as bus or rail yards and transit infrastructure such as tracks and tunnels in order to provide security for transit assets.
04	Transit Operations needs to be able to authenticate operators of transit vehicles and perform remote disabling of vehicles if necessary in order to ensure secure operation of the vehicles.
05	Transit Operations needs to be able to alert emergency services to incidents on vehicles, at stations/stops, or other monitored assets.
06	Transit Operations needs to be able to inform traveler information systems or the media regarding transit related incidents in order to keep the traveling public informed of the impacts these incidents may have on their trips.

6.2.21 PT06: Transit Fleet Management (Mobility)

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.

Table 24 – PT06: Transit Fleet Management Needs

Number	Need
01	Transit Operations needs to able to remotely monitor transit vehicle operating conditions in order to determine if maintenance of the vehicle is needed.
02	Transit Operations needs to be able to perform maintenance scheduling of transit vehicles including real time requests for actions by the vehicle operator.
03	Transit Operations needs to be able to assign specific vehicles to blocks in order to perform vehicle allocation.
04	Transit Operations needs to be able to assign transit operators to runs.

6.2.22 PT08: Transit Traveler Information (Mobility)

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.

Table 25 – PT08: Transit Traveler Information Needs

Number	Need
01	Transit Operations needs to be able to provide static and real time transit information to traveler information systems and the media in order to increase travelers' ability to plan and manage their trips.
02	Transit Operations needs to be able to provide static and real time transit information directly to travelers either pre-trip or en route in order to support traveler trip decisions.
03	Transit Operations needs to be able to share static and real time transit information with other transit operations in order to facilitate multisystem trip planning.

6.2.23 PT14: Multi-modal Coordination (Mobility)

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.

Table 26 – PT14: Multi-modal Coordination Needs

Number	Need
01	Transit Operations needs to be able to coordinate service information with other Transit Operations in order to improve operations.
02	Transit Operations needs to be able to coordinate with other transportation modes (e.g. ferry operations, airports) in order to improve service connections with these other modes.
03	Transit Operations needs to coordinate with other centers (e.g. traffic, parking, and event promoters) in order to share system information.

6.2.24 ST01: Emissions Monitoring (Environmental)

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.

Table 27 – ST01: Emissions Monitoring Needs

Number	Need
01	Emissions Management needs to be able to measure wide area pollution data in order to monitor wide area pollution levels.
02	Emissions Management needs to be able to measure vehicle emissions data collected from individual vehicles at the roadside in order to identify high emitting vehicles.
03	Emission Management needs to be able to provide summary emission information or warning to drivers.
04	Emissions Management needs to be able to provide wide area pollution information to the media, traveler information centers, and other transportation centers in order to support traveler information and transportation operations.
05	Emissions Management needs to be able to send information about vehicles with excessive emissions to the appropriate Department of Motor Vehicles (DMV) or law enforcement.

6.2.25 TI01: Broadcast Traveler Information (Mobility)

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.

Table 28 – TI01: Broadcast Traveler Information Needs

Number	Need
01	Traveler Information needs to be able to collect timely, accurate, and reliable traffic, transit, and other road conditions data from multiple sources in order to broadcast the latest conditions affecting travelers.
02	Traveler Information needs to be able to inform as much of the traveling public as possible using any available broadcast media to increase mobility and safety through better information.
03	Travelers need access to timely, accurate, and reliable traffic, transit, and other travel conditions in order to make informed decisions about their travel.

6.2.26 TI02: Personalized Traveler Information (Mobility)

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 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.

Table 29 – TI02: Personalized Traveler Information Needs

Number	Need
01	Traveler Information needs to be able to collect timely, accurate, and reliable traffic, transit, and other road conditions data from multiple sources in order to inform individual travelers of the latest conditions affecting their travel.
02	Traveler Information needs to be able to inform as much of the traveling public as possible using any available interactive media to increase mobility and safety through better information.
03	Travelers, including drivers or passengers, need access to timely, accurate, and reliable traffic, transit, and other travel conditions in order to make informed decisions about their travel.
04	Travelers, including drivers or passengers, need to be able to request specific and customized information concerning current and future travel conditions in order to make decisions about their own travel.

6.2.27 TI05: Travel Services Information and Reservation (Convenience)

This service package provides travel service information and reservation services to the traveler pre-trip and while en route. This includes information for tourist attractions, lodging, dining, service stations, parking, emergency services, and other services and businesses of interest to the traveler.

Table 30 – TI05: Travel Services Information and Reservation Needs

Number	Need
01	Travelers need to quickly locate nearby support facilities such as car service/repair stations, hospitals or police stations, etc. in order to feel safer and more confident when traveling to new areas.
02	Travelers need to be able to request and reserve services in advance to reduce the amount of time waiting and increase their mobility.

Number	Need
03	Traveler Information needs to support secure payment transactions in order to provide complete and trusted services for their travelers.

6.2.28 TM01: Infrastructure-Based Traffic Surveillance (Informational)

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.

Table 31 – TM01: Infrastructure-Based Traffic Surveillance Needs

Number	Need
01	Traffic Operations need to be able to monitor the road network using infrastructure devices in order to detect and verify incidents and support implementation of traffic operational strategies.
02	Traffic Operations need to be able to monitor the infrastructure devices used for road network monitoring in order to detect faults in equipment or communications.
03	Traffic Operations need to be able to send network monitoring data to other centers in order to support traveler information.

6.2.29 TM03: Traffic Signal Control (Mobility)

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.

Table 32 – TM03: Traffic Signal Control Needs

Number	Need
01	Traffic Operations need to be able to remotely control traffic signals at intersections under their jurisdiction
02	Traffic Operations need to be able to manage and implement control plans in order to coordinate signalized intersections.
03	Traffic Operations need to be able to monitor and control pedestrian crossing aspects of traffic signals in order to facilitate safe pedestrian crossings at the intersection.
04	Traffic Operations need to monitor the status of traffic signal control equipment.

6.2.30 TM05: Traffic Metering (Mobility)

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 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.

Table 33 – TM05: Traffic Metering Needs

Number	Need
01	Traffic Operations need to be able to monitor and control traffic metering equipment in order to regulate the flow of traffic on ramps, interchanges, and the mainline.
02	Traffic Operations need to monitor the status of traffic metering equipment.
03	Traffic Operations need to be able to implement control strategies utilizing the traffic metering equipment on ramps, interchanges, and on the mainline.

6.2.31 TM06: Traffic Information Dissemination (Informational)

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.

Table 34 – TM06: Traffic Information Dissemination Needs

Number	Need
01	Traffic Operations need to be able to provide traffic and incident information to drivers using roadside devices such as dynamic message signs and highway advisory radio.
02	Traffic Operations need to be able to monitor roadside devices used to provide traffic and traveler information to drivers.
03	Traffic Operations need to be able to provide traffic and incident information, including images to the media.
04	Traffic Operations need to be able to provide traffic and incident information, including images to traveler information, transit, maintenance and emergency centers.

6.2.32 TM07: Regional Traffic Management (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 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.

Table 35 – TM07: Regional Traffic Management Needs

Number	Need
01	Traffic Operations need to exchange traffic and incident data with other Traffic Management Centers in order to support regional coordination spanning jurisdictional boundaries.
02	Traffic Operations need to exchange traffic control data with other traffic management centers to support inter-jurisdictional, real-time coordinated traffic signal control systems and coordination between freeway operations and traffic signal control within a corridor.

6.2.33 TM08: Traffic Incident Management System (Mobility)

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.

Table 36 – TM08: Traffic Incident Management System Needs

Number	Need
01	Traffic Operations need to detect and verify incidents on roadways using CCTV and field sensors.
02	Traffic Operations need to share incident information with other ITS centers in order to coordinate incident response.
03	Traffic Operations need to obtain incident information from other ITS centers in order to coordinate incident response
04	Emergency Operations need to be able to dispatch emergency assets to a traffic incident.
05	Traffic Operations need to coordinate requests for resources with emergency and maintenance centers in order to support cleanup after the incident.

6.2.34 TM09: Integrated Decision Support and Demand Management (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.

Table 37 – TM09: Integrated Decision Support and Demand Management Needs

Number	Need
01	Traffic Operations need to be able to use current and forecast road and traffic conditions to develop traffic management plans.
02	Traffic Operations need to be able to develop operational decisions based upon analysis of current and forecast road and traffic conditions.
03	Traffic Operations need to be able to collect information describing multi-source, real-time data (both infrastructure and vehicle based) on arterials, freeways, and transit systems to develop operational decisions that can be applied to corridors or to the region as a whole.
04	Traffic Operations needs to be able to collect information from transit, parking, and toll operations in order to support development of demand management strategies.
05	Traffic Operations needs to be able to implement demand management strategies in order to correct network imbalances and effectively manage available capacity.
06	Traffic Operations needs to be able to collect emissions data to support development of demand management strategies.

6.2.35 TM16: Reversible Lane Management (Management)

This service package provides for the management of reversible lane facilities. In addition to standard surveillance capabilities, this service package includes sensory functions that detect wrong-way vehicles and other special surveillance capabilities that mitigate safety hazards associated with reversible lanes. The package includes the field equipment, physical lane access controls, and associated control electronics that manage and control these special lanes. This service package also includes the equipment used to electronically reconfigure intersections and manage right-of-way to address dynamic demand changes and special events.

Table 38 – TM16: Reversible Lane Management Needs

Number	Need
01	Traffic Operations need to be able to manage reversible lane facilities in order to allow lanes to be signed for operation in different directions at different times of the day.
02	Traffic Operations need to be able to ensure safe operation of reversible lanes through wrong-way vehicle detection and other special surveillance capabilities in order to mitigate safety hazards associated with reversible lanes.
03	Traffic Operations need to be able to control the field equipment, physical lane access controls, and associated control electronics that manage and control these special lanes.
04	Traffic Operations need to be able to provide current reversible lane status information to drivers.

6.2.36 WX01: Weather Data Collection (Environmental)

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.

Table 39 – WX01: Weather Data Collection Needs

Number	Need
01	Traffic operations or maintenance and construction operations need be able to collect road conditions and weather data from environmental sensors on or in the vicinity of the roadway.
02	Traffic operations need to be able to collect road conditions and weather data from vehicle on-board sensors.
03	Traffic operations and maintenance and construction operations need to share collected environmental data with each other.
04	Traffic operations and Maintenance and construction need to be able to receive environmental data from Weather operations.
05	Maintenance and construction operations need to be able to collect road conditions and weather data from maintenance vehicle on-board sensors.
06	Weather Systems need be able to collect road conditions and weather data from environmental sensors on or in the vicinity of the roadway.

7.0 ROLES AND RESPONSIBILITIES

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

Table 40 – Roles and Responsibilities

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
Commercial Vehicle Operations	Commercial vehicle operations are vital for commerce and therefore systems that reduce cost and enhance operations for commercial vehicles are required. Commercial vehicle operations (CVO) represents the administrative functions that support commercial vehicle credentials, tax, and safety regulation. These functions may be embodied in the commercial vehicle information systems network (CVISN) or performance and registration information system management (PRISM).	DOTD	Provide commercial vehicle operations data	Existing
		LSP Troop A	Provide commercial vehicle enforcement data, Provide commercial vehicle incident data	Existing
Emergency Management	The Governor's Office for Homeland Security and Emergency Preparedness (GOHSEP) coordinates with local, regional and state emergency management agencies and local public safety agencies to manage all emergencies. The transportation infrastructure especially the state highway system is a key asset that is used for evacuation. GOHSEP coordinates with DOTD and other stakeholders to develop evacuation plans and implement strategies and technologies to facilitate emergency evacuation. DOTD provides real-time information on traffic and roadway conditions to help assess the evacuation strategy and also for traveler information. Public transit providers provides buses to facilitate evacuation for the public. LSP monitors the evacuation and provides traffic control as needed.	Capital Area Transit System (CATS)	Provide support for emergency evacuation	Existing
Emergency Management	The Governor's Office for Homeland Security and Emergency Preparedness (GOHSEP) coordinates with local, regional and state emergency management agencies and local public safety agencies to manage all emergencies. The transportation infrastructure especially the state highway system is a key asset that is used for evacuation. GOHSEP coordinates with DOTD and other stakeholders to develop evacuation plans and implement strategies and technologies to facilitate emergency evacuation. DOTD provides real-time information on traffic and roadway conditions to help assess the evacuation strategy and also for traveler information. Public transit providers provides buses to facilitate evacuation for the public. LSP monitors the evacuation and provides traffic control as needed.	Capital Region Planning Commission (CRPC)	Provide demographic data	Existing
		City of Baton Rouge/Parish of East Baton Rouge	Provide emergency support	Existing
		GOHSEP	Coordinate emergency management operations, Provide resources to support emergency management	Existing
		DOTD	Evacuation plan coordination, Emergency traveler information, Emergency network surveillance	Existing
		Local Public Safety Agencies	Provide emergency operations data	Existing
		Local Traffic Management Agencies	Emergency operations support	Existing

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
		LSP Troop A	Evacuation and re-entry coordination, Roadway closure , Evacuation monitoring	Existing
		Media, Tourism and Travel Information Service Providers	Emergency information dissemination	Existing
		Public (Traveler)	Emergency information end user	Existing
Freeway Management	Freeway management refers to the use of various strategies to monitor and control traffic for optimal operations of the freeway system. The strategies include travel demand management, incident management and traveler information. Other managed lane concepts for freeway management include as HOV/HOT, dynamic shoulder use. DOTD is currently exploring the potential to use managed lanes in the I-12 corridor.	Capital Area Transit System (CATS)	Support travel demand management	Existing
		City of Baton Rouge/Parish of East Baton Rouge	Traffic control, Incident response	Existing
		DOTD	Network surveillance, Traveler information dissemination, Motorist assistance	Existing
		Local Public Safety Agencies	Incident response, Incident management	Existing
		Local Traffic Management Agencies	Traffic control	Existing
		LSP Troop A	Speed enforcement, Incident response, Incident management	Existing
		Media, Tourism and Travel Information Service Providers	Traveler information dissemination	Existing
		Public (Traveler)	End user of traveler information	Existing
Incident Management	The incident management subsystem is activated once a TMC operator receives an alert. The operator describes the details of the incident (severity; lanes blocked, HAZMAT, etc.). The incident management system supports operators to manage the incident using predefined incident response plans developed by the stakeholders for the location, incident type, severity and real-time traffic conditions. DOTD, LSP, Local Public Safety Agencies collaborate for incident response and coordination. These agencies secure the incident scene and ensure rapid clearance of debris or obstacles that may impede normal flow of traffic. The TMC operator is responsible for traveler information and detour route information. The	City of Baton Rouge/Parish of East Baton Rouge	Incident response	Existing
		DOTD	Incident response, Detour route management, Public information	Existing
		Local Public Safety Agencies, LSP Troop A	Incident response, Incident management	Existing

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
	available field devices are used for incident monitoring and estimating and incident clearance times and also evaluating performance of detour route.	Local Traffic Management Agencies	Traffic control	Existing
		Media, Tourism and Travel Information Service Providers	Traveler information dissemination	Existing
Information Management	The Information Management System for the Baton Rouge ITS System represents the functions that collect, process, store and utilize transportation data. The data includes traffic count data, speed, crashes, CVO, public transit, parking, including operational data generated from ITS operations. Currently there is no central repository for transportation data with several stakeholders archiving and maintaining data for business needs. A centralized information management system is desired. The system should log and store operational inputs and data collected by field devices. The data should be stored for a configurable amount of time, and reporting systems should allow users to create pre-defined reports or reports based on select data elements. The system should be capable of providing regional reports or reports within smaller geographic boundaries or specific corridors using analytical tools. Examples of reports may include an incident report, traffic conditions report, work zones report, and maintenance reports. The data should be available to stakeholders to enhance decision making for planning, design and maintenance.	Capital Area Transit System (CATS)	Provide transit ridership data, Provide transit operations data	Existing
		Capital Region Planning Commission (CRPC)	Archived data administrator	Existing
		Capital Region Planning Commission (CRPC)	Operations and maintenance of ADMS, Provide user access to ADMS	Existing
		City of Baton Rouge/Parish of East Baton Rouge	Provide traffic operations data	Existing
		DOTD	Provide transportation operations data	Existing
		Local Public Safety Agencies	Provide emergency operations data	Existing
		Local Traffic Management Agencies	Archive transportation operations data	Existing
		Louisiana Transportation Research Center (LTRC)	Archive transportation data, Archived data products	Existing
		LSP Troop A	Provide commercial vehicle enforcement data, Provide commercial vehicle incident data	Existing
		Port of Greater Baton Rouge	Provide freight commercial vehicle data	Existing
Maintenance and Construction	Maintenance and construction management refers to systems that are used to track maintenance activities including ITS field devices to preserve and maintain the existing transportation system. The maintenance requirements may include	Capital Region Planning Commission (CRPC)	Infrastructure planning	Existing

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
	activities such as pavement repair, debris removal, and management of construction operations.	City of Baton Rouge/Parish of East Baton Rouge	Surface street maintenance	Existing
		DOTD	Traffic data collection, Traffic signal system maintenance and construction, Roadway maintenance and construction	Existing
		Local Traffic Management Agencies	Traffic signal system maintenance and construction, Roadway maintenance and construction	Existing
Surface Street Management	Surface street management refers to the use of various strategies to monitor and control traffic for optimal operations of the state highway system with the architecture region. The functions include traffic analysis, travel demand management, incident management strategies and traveler information. Louisiana State Police and Local Public Safety Agencies handle incidents and traffic control.	City of Baton Rouge/Parish of East Baton Rouge	Provide traffic operations data, Traffic control, Incident response, Surface street maintenance	Existing
		DOTD	Network surveillance, Traffic signal system operations, Surface street data collection	Existing
		Local Public Safety Agencies	Incident response and management, Traffic control	Existing
		Local Traffic Management Agencies	Traffic control	Existing, Planned
		LSP Troop A	Speed enforcement, Incident response, Incident management	Existing
		Media, Tourism and Travel Information Service Providers	Traveler information dissemination	Existing
		Public (Traveler)	End user of traveler information	Existing
Transit Services	Transit management is focused on enhancing transit user experience by deploying technologies that the transit agency and rider can use to access transit rider information, request services, perform electronic transactions and reservations. For the transit provider these technologies include computer aided dispatch, real -time transit vehicle tracking for expected arrival times and schedule adherence, electronic fare collection etc. There are other ITS technologies that can be implemented to support transit such as transit signal preemption.	Capital Area Transit System (CATS)	Transit provider, Transit data collection	Existing
		Capital Region Planning Commission (CRPC)	Transit coordination and planning	Existing
		City of Baton Rouge/Parish of East Baton Rouge	Transit data collection	Existing

Roles and Responsibilities

RR Area Name	RR Area Description	Stakeholder	RR Description	RR Status
Traveler Information	Traveler information represents the functions that collects, processes and disseminates transportation information to the traveling public. DOTD uses several different channels to disseminate traveler information. There are several dynamic message signs deployed within the area as part of the ITS infrastructure operated by the TMC. The TMC operators use the DMS to provide roadway advisories, travel times or PSAs to motorists. DOTD also has social media handles including Twitter that it uses to disseminate traveler information. DOTD has also partnered with local media and provides live video streams from cameras by the roadside to be used for traveler information. The TMC reports congestion, incidents or any events that disrupt the normal flow of traffic and cause significant delays to the traveling public. The media and other information service providers broadcast transportation system information based on information provided by DOTD. The 511 information system is an integral part of traveler information system that can be accessed via voice calls (Interactive Voice Response) or web interface.	DOTD, Media, Tourism and Travel Information Service Providers	Traveler information dissemination	Existing
		Public (Traveler)	End user of traveler information	Existing

7.1 FUNCTIONALITY

Each ITS system operated by the stakeholders must perform certain functions to effectively deliver the envisioned project capabilities. The primary functions that each system needs to perform are broadly defined in this Regional Architecture as a set of Functional Objects that make up the physical elements of the architecture. As projects are implemented, requirements will need to be written to determine what each element must do to achieve its given set of functions. Those requirements can be traced back to the needs of the Stakeholders for every project. **Appendix C** shows the functional objects table which provides information about the element names and their functional descriptions.

8.0 AGREEMENTS

This section identifies the list of existing and future agreements between each of the stakeholder organizations whose ITS systems will be exchanging information. This list identifies the agreements that should be established but does not define the agreements themselves.

Table 41 – Agreements

Agreement Number	Agreement Title	Agreement Type	Agreement Status	Description	Associated Stakeholders
1	ATM/EOC Communications Building	Memorandum of Understanding	Existing	Memorandum of Understanding For S.P. No. 700-17-0161Advanced Traffic Management Communications Building Cost sharing for ATM/EOC facility operations and maintenance Executed: Feb. 26,1998No term indicated	City of Baton Rouge/Parish of East Baton Rouge FHWA DOTD City of Baton Rouge/Parish of East Baton Rouge FHWA DOTD
2	ATM/EOC Operations Center	Funding Agreement	Existing	Memorandum of Understanding For S.P. Nos. 742-17-0119, 742-17-0120, & 742-17-0121Agreement for the design and construction of the ATM/EOC Executed: Oct. 9, 1998No term indicated	City of Baton Rouge/Parish of East Baton Rouge DOTD
3	ATM/EOC Operations/Maintenance	Funding Agreement	Existing	For S.P. No. 742-17-0120 Advanced Traffic Management/Emergency Operations Center Defines Capital Outlay and Operations and Maintenance Executed: March 18, 1999No term indicated	City of Baton Rouge/Parish of East Baton Rouge FHWA DOTD
4	ATM/EOC Operations/Maintenance (Clarifications)	Funding Agreement	Existing	Memorandum of Understanding	City of Baton Rouge/Parish of East Baton Rouge FHWA DOTD
5	Command and Control For TIM (I-10 between Baton Rouge and Lafayette)	Funding Agreement	Existing	Memorandum of Understanding Command and Control For Traffic Incident Management on I-10 between Baton Rouge and Lafayette, LA SP, DOTD, St. Martin Parish Sheriff, Breaux Bridge PD, Henderson PD, Iberville Parish Sheriff, Bayou Blue Vol. FD, Grosse	City of Baton Rouge/Parish of East Baton Rouge

Agreements

Agreement Number	Agreement Title	Agreement Type	Agreement Status	Description	Associated Stakeholders
				Tete/Rosedale Vol. FD, Lafayette Parish Sheriff, Layette PD, Carencro PD, Sunset PD, Grande Coteau PD, Opelousas PD, St. Landry Parish Sheriff, Port Barre PD, Krotz Springs PD, Pointe Coupee Parish Sheriff, WBR Sheriff, BR PD, Village of Grosse/Tete PD, St. Martin Parish FD, & St. Martin Parish Fire District Establishes guidelines and procedures for the management of vehicular crashes and breakdowns, spilled cargo and any other event that impedes the normal flow of traffic on I-10 between BR and Lafayette. Executed: March 2006 No term indicated	DOTD Local Public Safety Agencies Local Traffic Management Agencies LSP Troop A Pointe Coupee Parish West Baton Rouge Parish

9.0 ITS PROJECTS

The Baton Rouge Regional ITS Architecture is implemented one ITS project at a time. This chapter lists the projects that have been identified as part of the regional ITS architecture definition.

Table 42 – ITS Projects

Name	Description	Service and Geographic Scope	Priority	Service Packages	Lead Agency
US 190 ITS Deployment Phase 2	Develop Phase 2 of this project to fill in any gaps. Previous deployment was affected by permit requirements to bore through levee and cross the Morganza Spill Way	Secure permitting and deploy fiber optics (48 count), conduit and pullboxes to fill in the gaps in fiber optic communication in the US 190 corridor	High	SU07	DOTD
I-12 Adaptive Ramp Metering Upgrades	Deploy adaptive ramp metering operations in the I-12 corridor to better manage congestion and incidents and enhance travel time reliability and safety.	I-12 Corridor from Essen Lane to Walker Road	High	TM01, TM05, TM08, DM02	DOTD
Commercial Vehicle Parking and Freight Advanced Traveler Information System (FRATIS)	Develop commercial vehicle parking facilities to support commercial vehicle operations into and through Baton Rouge. This will also include development of freight advance traveler information system to provide realtime parking availability to commercial vehicle drivers.	Baton Rouge or within the MPO	High	CVO01, CVO05	CRPC
I-12 Managed Lanes	Deployment of managed lanes in the I-12 corridor to enhance travel time reliability for qualifying vehicles.	I-12 Corridor within East Baton Rouge and Livingston Parishes	High	TI01, TM01, TM10, TM11, TM22, TM26	DOTD
Transit Operations Enhancements	Enhance transit operational safety and efficiency for all users.	The service scope will include transit pedestrian indication, transit vehicle at station or stop warnings, multimodal, route ID for visually impaired and multimodal coordination. Also include integrated multimodal electronic payment.	High	PT11, PT12, PT13, PT14, PT15, PT 16, PT18	CATS
Procure Advanced Traffic Management System (ATMS), Advanced Traveler Information System (ATIS) and Video Distribution Management System (VDMS) Software	Upgrade the ATMS/ATIS/VDMS software to support existing and new operational systems and enhance efficiency of traffic management operations staff	Statewide including Baton Rouge Traffic Management Center (TMC)	High	DM01, DM02, SU03, TM07	DOTD
Motorist Assistance Patrol	Provide MAP service to close gaps in the I-10 corridor between Highland Road to US61 and further extend services westward from LA 77 toward the Atchafalaya Basin Bridge and Whiskey Bay	I-10 Corridor	High	PS08	DOTD

Name	Description	Service and Geographic Scope	Priority	Service Packages	Lead Agency
Artificial Intelligence Decision Support System (AI-DSS)	Develop and deploy artificial intelligence system to facilitate regional management of transportation assets for realtime operations and efficiency. The AI-DSS will aid TMC Operators to manage the roadway system by suggesting strategies and evaluating mobility and safety based on strategies proposed.	TMC Operations	High	DM02, TM09	DOTD
Enhanced Traffic Monitoring	Deploy cameras to fill in gaps in TMC visibility of roadways to facilitate incident and congestion management	I-12 between Walker Road and Juban Rd. I-12 near LA 63 in Satsuma I-10 Westbound near Grosse Tete I-10 near LA 415 I-10 near Bluff (Overpass) and LA 73 LA 1 – Around Brusly/Addis US190 Westbound (Old Bridge) Scotland Avenue/Scenic Highway	High	TM01, TM07, TM08	DOTD
Traveler Information	Enhance traveler information at decision points to facilitate diversion routing and better manage congestion and incidents including connected vehicle applications for in-vehicle signage	I-10 EB DMS between Citi Place and other major interchanges on I-10 EB I-10 EB DMS desired upstream of Bluebonnet Boulevard or Siegen Lane I-12 WB near Juban Road or Satsuma I-110 corridor north of US 61 I-10 EB DMS desired upstream of Bluebonnet Boulevard or Siegen Lane	High	TI01, TI07	DOTD
Lane Control Signals	Deploy lane control signals on the approaches to the Mississippi River Bridge to help with congestion and incident management.	LA 415 interchange to the Washington Street interchange	Medium	TM01, TM06, TM08, TM22	DOTD
Electric Vehicle Charging Stations	Expand electric vehicle charging stations to facilitate adoption of electric vehicles	Deployment within short driving distance of all major arterials including I-10, I-12 and I-110.	Medium	ST05	DEQ
Integrated Corridor Management	Use integrated corridor management strategies to manage the transportation infrastructure or assets in the I-10 and I-12 corridors.	I-10, I-12, US 61, US 190	Medium	CVO05, PM01, PM02, PM04, PT02, PT03, PT09, PT10, PT14, PT18, SU01, ST06, TM01, TM07, TM09, TM11, TI01, TI06	DOTD

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ITS Projects

Name	Description	Service and Geographic Scope	Priority	Service Packages	Lead Agency
Road Weather Information System	Deploy road weather information system to provide situational awareness with visibility, precipitation and flooding in critical corridors to manage traffic and enhance safety for road users.	I-10 near Atchafalaya and Mississippi River bridge crossings I-110 corridor I-12 corridor	Medium	WX01, WX02, WX03, WX04	DOTD
Smart Parking	Develop smart parking facilities that will monitor parking spots in realtime and provide information to motorists and route they to available spots in parking garages or lots.	Public parking spaces downtown	Low	PM01, PM04, PM05	CRPC
I-10 Ramp Metering Deployment	Deploy ramp meters on I-10 to manage congestion and incidents	I-10 from Dalrymple Road to LA 73	Low	TM01, TM05, TM08, DM02	DOTD

10.0 ITS ARCHITECTURE MAINTENANCE

This section discusses the proposed Maintenance Plan for the regional ITS Architecture. FHWA's Final Rule on ITS Architecture and Standards (23 CFR Part 940) requires development of an architecture maintenance plan. Paragraph 940.9 (f) states that:

"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."

In January 2004, FHWA issued guidance for developing and maintaining regional ITS infrastructure[5]. The Maintenance Plan for the Baton Rouge Regional ITS Architecture is based on the guidelines provided by FHWA's White Paper 1 on what should be contained in an architecture maintenance plan to be compliant with FHWA requirements. The White Paper on this subject is available at http://ops.fhwa.dot.gov/its_arch_imp/policy_1.htm. This report provides some background on the need for architecture maintenance and addresses key issues under the following headings:

- Why Maintain a Regional ITS Architecture?
- Who Will Maintain the Architecture?
- When will the Architecture be updated?
- What will be maintained?
- How will the Architecture be maintained?

10.1 WHY MAINTAIN A REGIONAL ITS ARCHITECTURE?

As ITS projects are implemented, this architecture document will need to be updated to reflect new ITS priorities and strategies that emerge through the transportation planning process. It will also need to be updated to account for expansion in ITS scope and to allow for the evolution and incorporation of new ideas. The goal of the maintenance plan is to guide controlled updates to the regional ITS architecture baseline so that it continues to accurately reflect the region's existing ITS capabilities and plans.

[5] http://ops.fhwa.dot.gov/its_arch_imp/guidance.htm

10.2 WHO WILL MAINTAIN THE ARCHITECTURE?

Ideally, all stakeholders should participate in the architecture maintenance process. In practice, typically, one or two agencies take the lead responsibility to maintain the regional ITS architecture. The primary requirements of the regional architecture maintainer are the mission/authority to perform such functions and the necessary skills to perform the same. The mission of the ITS architecture maintainer most closely resembles a regional planning body that, as consistent with its mission, has the authority to initiate, update, and document changes in regional planning documents. For the Baton Rouge ITS Architecture, the DOTD will continue the role of the ITS Architecture keeper and maintainer. Architecture maintenance is recurring and is a necessary long-term effort. To be effective in ITS architecture maintenance, DOTD will need to have staff that:

- Is knowledgeable of the existing regional ITS architecture. This implies a detailed technical understanding of the various parts of the architecture and how changes would affect each part.
- Understands transportation systems in the region. This understanding can reside jointly in the group of agencies/ stakeholders who participate in the maintenance process.
- Understands the tools used to create (and to update) the architecture. This might include, for example, knowledge of the Regional Architecture Development for Intelligent Transportation tool, if that is used to hold some of the architecture information.

As the agency with the lead responsibility for maintaining the architecture, DOTD needs to have the skills within its own organization and/or use a qualified consultant. In either case, the agency needs the necessary funding to support the maintenance effort. Although DOTD will lead the architecture maintenance activities, like all other regional planning activities, ITS architecture maintenance will take close coordination between other major stakeholders[6] in the region, including:

- DOTD District 61
- DOTD District 62
- DOTD ITS Section
- CRPC
- Louisiana State Police (Troop A)

Following this architecture adoption by the MPO, it is recommended that the Regional ITS Architecture Maintenance Committee meet at least once a year to:

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[6] Note – Other stakeholders may be included as necessary based on ITS development and deployment activities.

- Review progress in ITS implementation projects
- Verify that the regional ITS architecture Regional Architecture Development for Intelligent Transportation source file is kept up to date with the region's ITS projects
- Update plans for future deployments by each regional stakeholder
- Review changes in State and National ITS Architectures, regulations, and any requirements
- Determine any needs for an update to the Baton Rouge Regional ITS Architecture

10.3 WHEN WILL THE ARCHITECTURE BE UPDATED?

The regional ITS architecture is not static. It must change as plans change, as ITS projects are implemented, and as the ITS needs and services evolve in the region. At a minimum, the regional ITS architecture should be reviewed annually by the Regional ITS Architecture Maintenance Committee. The Regional ITS Architecture Maintenance Committee may meet and perform architecture updates more frequently to keep with the pace of the region's ITS implementation. Annual or more frequent updates will include integrating completed projects into the regional ITS architecture RAD-IT source file. A one-page summary of any changes should be added as an appendix to this regional ITS architecture document.

Regardless of the frequency selected for periodic updates, it is recommended that the Committee recognize the potential need for "Exception Maintenance" to occur in the event of major project implementations, major revisions to the National ITS Architecture, or to meet the requirements of future regulations.

It is recommended that the regional ITS architecture is fully updated every five years, prior to the periodic updating of the Regional Transportation Improvement Program (TIP), which occurs once a year. Upon recommendation of the Regional Architecture Maintenance Committee, the MPO Technical Advisory Committee will make a resolution to accept any revisions/changes/updates to the ITS architecture. The following list includes many of the events that may cause change to a regional ITS architecture:

10.3.1 Changes in Regional Needs

Regional ITS architectures are created to support transportation planning in addressing regional needs. Over time these needs can change and the corresponding aspects of the regional ITS architecture that addresses these needs may need to be updated. These changes in needs should be expressed in updates to planning documents such as the Regional Transportation Plan.

10.3.2 New Stakeholders

Regional ITS architectures are created to support transportation planning in addressing regional needs. Over time these needs can change and the corresponding aspects of the regional ITS architecture that addresses these needs may need to be updated. These changes in needs should be expressed in updates to planning documents such as the Regional Transportation Plan.

10.3.3 Changes in scope of service considered

The range of services considered by the regional ITS architecture expands. This might happen because the National ITS Architecture has been expanded and updated to include new user services or to better define how existing elements satisfy the user services. The National ITS Architecture may have expanded to include a user service that has been discussed in a region, but not in the regional ITS architecture, or was included in only a very cursory manner. Changes in the National ITS Architecture are not of themselves a reason to update a regional ITS architecture, but a region may want to consider any new services in the context of their regional needs.

10.3.4 Changes in stakeholder of element names

An agency's name or the name used to describe their element(s) undergoes change. Transportation agencies occasionally merge, split, or just renames them. In addition, element names may evolve as projects are defined. The regional ITS architecture should be updated to use the current, correct names for both stakeholders and elements.

10.3.5 Changes in other architectures

A regional ITS architecture covers not only elements and interfaces within a region, but also interfaces to elements in adjoining regions. Changes in the regional ITS architecture in one region may necessitate changes in the architecture in an adjoining region to maintain consistency between the two. Architectures may also overlap (e.g., a statewide ITS architecture and a regional ITS architecture for a region within the state) and a change in one might necessitate a change in the other. There are several changes relating to project definition that will cause the need for updates to the regional ITS architecture.

10.3.6 Changes due to Project Definitions or Implementation

When defined or implemented, a project may add, subtract or modify elements, interfaces, or information flows from the regional ITS architecture. Because the regional ITS architecture is meant to describe the current, as well as future, regional implementation of ITS, it must be updated to correctly reflect how the developed projects integrate into the region.

10.3.7 Changes due to Project Addition/Deletion

Occasionally a project will be added or deleted through the planning process, or through project delivery, and some aspects of the regional ITS architecture that are associated with the project may be expanded, changed, or removed.

10.3.8 Changes in Project Priority

Due to funding constraints, or other considerations, the planned project sequencing may change. Delaying a project may have a ripple effect on other projects that depend on it. Raising the priority for a project's implementation may impact other projects that are related to it.

10.4 WHAT WILL BE MAINTAINED?

Those constituent parts of a regional ITS architecture that will be maintained are referred to as the "baseline." This section considers the different "parts" of the regional ITS architecture and whether they should be a part of the baseline. Baseline parts are annually updated within the regional ITS architecture RAD-IT file and every five years within the document. The parts discussed are:

- Description of Region
- Participating Agencies and Stakeholders
- Operational Concept
- Agreements
- System Functional Requirements
- Interface Requirements
- ITS Standards
- Sequence of Projects

One of the benefits of a regional ITS architecture is to enable the efficient exchange of information between ITS elements in a region and with elements outside the region. Efficiency refers to the economical deployment of ITS elements and their interfaces. The result of these ITS deployments should be contributions to the safe and efficient operation of the surface transportation network. Each of the components in the regional ITS architecture below has a role in this economy and an appropriate effort should be levied to maintain them.

10.4.1 Description of Region

This description includes the geographic scope, service scope, architecture timeframe and maintainer, and helps frame each of the following parts of a regional ITS architecture. Geographic scope defines the ITS elements that are "in" the region, although additional ITS elements outside the region may need to be described if they communicate ITS information to elements inside the region. Service scope defines which services are included in a regional ITS architecture. Architecture timeframe is the time (in years) into the future that the regional ITS architecture will consider.

10.4.2 List of Stakeholders

Stakeholders are of great importance to the definition of the architecture. Within a region, they may consolidate, or separate and such changes should be reflected in the architecture. Furthermore, stakeholders that have not been engaged in the past may be approached through outreach to be sure that the regional ITS architecture represents their ITS requirements as well. The stakeholders should be described in architecture documentation (and may also reside in a database representing aspects of the regional ITS architecture). Their listing and description should be part of the baseline.

10.4.3 Operational Concepts

It is crucial that the operational concepts which might be represented as roles and responsibilities or as customized market packages in a regional ITS architecture accurately represent the consensus vision of

how the stakeholders want their ITS to operate for the benefit of surface transportation users. These should be reviewed and, if necessary, changed to represent both what has been deployed (which may have been shown as “planned” in the earlier version of the regional ITS architecture) and the current consensus view of the stakeholders. Many of the remaining maintenance efforts will depend on the outcome of the changes made here. The operational concept will reside in the architecture documentation and possibly in a diagramming tool if a customized market package approach is used and should be part of the baseline.

10.4.4 List of ITS Elements

The inventory of ITS elements is a key aspect of the regional ITS architecture. Changes in stakeholders as well as operational concepts may impact the inventory of ITS elements. Furthermore, recent implementation of ITS elements may change their individual status (e.g., from planned to existing). The list of elements is often contained in architecture documentation and is key information in any architecture database. It is a key aspect of the baseline.

10.4.5 List of Agreements

One of the greatest values of a regional ITS architecture is to identify where information will cross an agency boundary, which may indicate a need for an agency agreement. An update to the list of agreements can follow the update to the Operational Concept and/or interfaces between elements. The list of agreements will usually be found in the architecture documentation. This listing should be a part of the baseline.

10.4.6 Interfaces between Elements

Interfaces between elements define the “details” of the architecture. They are the detailed description of how the various ITSs are or will be integrated throughout the timeframe of the architecture. These details are usually held in the RAD-IT source file. They are a key aspect of the architecture baseline and one that will likely see the greatest amount of change during the maintenance process.

10.4.7 System Functional Requirements

High-level functions are allocated to ITS elements as part of the regional ITS architecture. These can serve as a starting point for the functional definition of projects that map to portions of the regional ITS architecture. This information is he usually held in RAD-IT source file.

10.4.8 Applicable ITS Standards

The selection of standards depends on the information exchange requirements. In addition, the maintenance process should consider how ITS standards may have evolved and matured since the last update and consider how any change in the “standards environment” may impact previous regional standards choices (especially where competing standards exist). For example, if Extensive Markup Language (XML) based Center-To-Center standards reach a high level of maturity, reliability, and cost-effectiveness, then a regional standards technology decision may be made to transition from investments in other standards technologies (e.g., Common Object Request Broker Architecture (CORBA) to XML). The

description of the standards environment for the region, as well as the details of which standards apply to the architecture, should be part of the baseline.

10.4.9 Project Sequencing

While project sequencing is partly determined by functional dependencies (e.g., “surveillance” must be a precursor to “traffic management”), the reality is that most project sequences are local policy decisions. Project sequences should be reviewed to make sure that they are in line with current policy decisions. Furthermore, policy makers should be informed of the sequences and their input should be sought to make the project sequences coincide with their expectations. This is crucial to eliminate the possibility of the regional ITS architecture becoming irrelevant. The project sequencing should be included in the architecture documentation and may also be held in a spreadsheet or database.

10.5 HOW WILL THE ARCHITECTURE BE MAINTAINED?

DOTD ITS Section (Section 56) will oversee and ensure that the regional architecture is maintained. DOTD will utilize its contracted consulting services contract for ITS Traffic Incident Management (TIM) Program TMC Operations Staffing and Systems Engineering Support for this effort. The guidelines contained within FHWA’s Regional ITS Architecture Maintenance White Paper will be helpful in guiding the maintenance effort. In addition to detailing the recommended maintenance process, the White Paper also contains examples of Maintenance Plans developed by a range of agencies and regions throughout the country.

10.6 ITS FUNDING

DOTD ITS Section has a capital budget of $14 million each year as part of the ITS funding program, which is allocated statewide on a prioritized basis depending on need for capital projects and maintenance of existing ITS infrastructure. Ideally, each region should receive dedicated funds to apply toward ITS needs; however, there is currently no dedicated funding for the Baton Rouge region. As part of the follow-up to this architecture effort, it is recommended that the MPO, being the regional planning entity, work together with DOTD and the other Baton Rouge stakeholders to pursue funding sources for the ITS deployment within the region.

Appendix A SERVICES

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

Table 43 – ITS Service Packages

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
CVO01	Carrier Operations and Fleet Management	This service package manages a fleet of commercial vehicles. The Fleet and Freight Management Center monitors the vehicle fleet and can provide routes using either an in-house capability or an external provider. Routes generated by either approach are constrained by hazardous materials and other restrictions (such as height or weight). A route is electronically sent to the Commercial Vehicle with any appropriate dispatch instructions. The location of the Commercial Vehicle can be monitored by the Fleet and Freight Management Center and routing changes can be made depending on current road network conditions. This service package also supports maintenance of fleet vehicles with on-board monitoring equipment. Records of vehicle mileage, preventative maintenance and repairs are maintained.	Existing	Port of Baton Rouge
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 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.	Existing	Port of Baton Rouge
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.	Existing	DOTD Weights and Standards Division, Local Public Safety Agencies, Port of Baton Rouge
CVO04	CV Administrative Processes	This service package supports program administration and enrollment and provides for electronic application, processing, fee collection, issuance, and distribution of CVO credential and tax filing. Through this process, carriers, drivers, and vehicles may be enrolled in a variety of programs including electronic clearance and wireless inspection programs which allow commercial vehicles to be screened at mainline speeds. Through this enrollment process, current profile databases are maintained in the Commercial Vehicle Administration Center and snapshots of this data are made available to the roadside check facilities. Current program status is maintained and made available to carriers, drivers, and other authorized users of the data. Enrolled carriers are provided the option to review and challenge the collected data. Commercial Vehicle Administration Centers can share current program status and credential information with other Centers, so that it is possible for any Commercial Vehicle Administration Center to have access to all credentials, credential fees, credentials status and safety status information. In addition, it is possible for one Commercial Vehicle Administration Center to collect HAZMAT route restrictions information from other Commercial Vehicle Administration Centers and then act as a clearinghouse for this route restrictions information.	Existing	DOTD Weights and Standards Division, Local Public Safety Agencies

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
CVO05	Commercial Vehicle Parking	This service package provides parking information to commercial vehicle operators both pre-trip and en route. The parking information will be based on information collected from each truck parking area using individual sensors in each space, or in/out sensors for the area. The raw data is processed by state DOT or third party providers and supplied to fleet managers, to mobile devices used by commercial vehicle operators, to DMS on the roadway or directly to in vehicle systems as commercial vehicles approach roadway exits with key facilities such as parking. This service package also provides the ability for the commercial vehicle driver, or fleet manager to request a parking reservation.	Planned	Ascension Parish Transportation and Engineering, Baton Rouge TMC, Capital Region Planning Commission (CRPC), City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, Louisiana 511, Port of Baton Rouge, Statewide TMC, WBR Parish DPW
CVO06	Freight Signal Priority	The Freight Signal Priority service package (FSP) provides traffic signal priority for freight and commercial vehicles traveling in a signalized network. The goal of the freight signal priority service package is to reduce stops and delays to increase travel time reliability for freight traffic, and to enhance safety at intersections.	Planned	Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Statewide TMC
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	DOTD Weights and Standards Division, Local Public Safety Agencies, Port of Baton Rouge

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	Local Public Safety Agencies
CVO09	Freight-Specific Dynamic Travel Planning	This service package provides both pre-trip and en route travel planning, routing, and commercial vehicle related traveler information, which includes information such as truck parking locations and current status. The information will be based on data collected from the commercial fleet as well as general traffic data collection capabilities. The information, both real time and static can be provided directly to fleet managers, to mobile devices used by commercial vehicle operators, or directly to in vehicle systems as commercial vehicles approach roadway exits with key facilities such as parking. The service package can also provide oversize/ overweight permit information to commercial managers.	Planned	Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Port of Baton Rouge, WBR Parish DPW
CVO10	Road Weather Information for Freight Carriers	The service package is a special case of the Road Weather Advisories and Warnings for Motorists service package that focuses on Freight Carrier users. It provides the capability to collect road weather data from connected vehicles and using that data to develop short term warnings or advisories that can be provided to individual commercial vehicles or to commercial vehicle dispatchers. The information may come from either vehicles operated by the general public and commercial entities (including passenger cars and trucks) or specialty vehicles and public fleet vehicles (such as snowplows, maintenance trucks, and other agency pool vehicles). The raw data will be processed in a controlling center to generate road segment-based data outputs. The processing will also include a road weather commercial vehicle alerts algorithm to generate short time horizon alerts that will be pushed to user systems and available to commercial vehicle dispatchers. In addition the information collected can be combined with observations and forecasts from other sources to provide medium (next 2-12 hours) or long term (more than 12 hours) advisories through a variety of interfaces including web based and connected vehicle based interfaces.	Planned	Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, Louisiana 511, Media, Port of Baton Rouge, Statewide TMC, WBR Parish DPW

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
CVO11	Freight Drayage Optimization	This service package covers the information exchanges between all intermodal parties to provide current drayage truck load matching and container availability and appointment scheduling at railroad and steamship line terminals. It includes a link from drivers and freight management systems dispatchers to an intermodal terminal reservation system and integrates an appointment function with Terminal Queue Status and Load Matching. The service package provides information to the dispatcher and driver concerning the availability status for pickup of a container at an intermodal terminal. It also provides drivers and dispatchers with both intermodal terminal queue length, and estimated time from the back of the queue to the gate.	Existing	Port of Baton Rouge
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.	Existing	Baton Rouge TMC, Local Emergency Operations Centers, Local Public Safety Agencies, Louisiana State Police - Troop A, MOHSEP, Parish OHEP, Port of Baton Rouge, Statewide TMC
CVO13	Roadside HAZMAT Security Detection and Mitigation	This service package provides the capability to detect and classify security sensitive HAZMAT on commercial vehicles using roadside sensing and imaging technology. Credentials information can be accessed to verify if the commercial driver, vehicle and carrier are permitted to transport the identified HAZMAT. If the credentials analysis and sensed HAZMAT information do not agree, the vehicle can be signaled to pull off the highway, and if required, an alarm can be sent to Emergency Management to request they monitor, traffic stop or disable the vehicle.	Existing	Local Emergency Operations Centers, Local Public Safety Agencies, Louisiana State Police - Troop A, MOHSEP, Parish OHEP

Appendix A Services

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
CVO15	Fleet and Freight Security	This service package provides enhanced security for commercial vehicle fleets and freight. Internal and external alerts and advisories are monitored to identify potential threats to the safety and security of the fleet and freight. It provides for the planning and tracking of three aspects of commercial vehicle shipments. For each shipment, the commercial vehicle, the freight equipment, and the commercial vehicle driver are monitored for consistency with the planned assignment. Any unauthorized changes are determined by the Fleet and Freight Management Center and then the appropriate people and Centers are notified. As the freight is shipped and tracked, security and public safety agencies may also interrogate the freight container to determine if it has been breached and to identify container contents. Once a route has been assigned, changes must be coordinated. Commercial Vehicle Drivers are alerted to any changes in route from the planned route and given an opportunity to justify a rerouting. Any unauthorized or unexpected route changes by the Commercial Vehicle will register a route deviation alert with the Fleet and Freight Management Center, which can notify local public safety agencies of the route deviation when appropriate (e.g., if there is safety sensitive HAZMAT being carried). Freight managers may decide to take further action on the alerts and/or provide responses that explain that the alerts are false alarms. If no explanation is received, the Fleet and Freight Management Center may notify the Emergency Management Center.	Existing	Local Public Safety Agencies, Port of Baton Rouge
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	Archived Data Users, Baton Rouge TMC, Capital Region Planning Commission (CRPC), CATS Management Center, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section, DOTD Planning and Programming Division, Local Emergency Operations Centers, Louisiana State Police - Troop A, Louisiana Transportation Research Center (LTRC)

Appendix A Services

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
DM02	Performance Monitoring	The Performance Monitoring service package uses information collected from detectors and sensors, connected vehicles, and operational data feeds from centers to support performance monitoring and other uses of historical data including transportation planning, condition monitoring, safety analyses, and research. The information may be probe data information obtained from vehicles in the network to determine network performance measures such as speed and travel times, or it may be information collected from the vehicles and processed by the infrastructure, e.g. environmental data and infrastructure conditions monitoring data. Additional data are collected including accident data, road condition data, road closures and other operational decisions to provide context for measured transportation performance and additional safety and mobility-related measures. More complex performance measures may be derived from the collected data.	Existing	DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section
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, Planned	Ascension Parish Transportation and Engineering, City-Parish ITS Field Devices, DOTD District 61 Maintenance Division, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Division Maintenance Vehicles, DOTD ITS Section, Livingston Parish DPW, WBR Parish DPW
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.	Existing	Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, City-Parish Website, DOTD District 61 Maintenance Division, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Division Maintenance Vehicles, DOTD ITS Section, Local Traffic Operations, Louisiana 511, Louisiana State Police - Troop A
MC07	Work Zone Safety Monitoring	This service package provides warnings to maintenance personnel within a work zone about potential hazards within the work zone. It enables vehicles or the infrastructure to provide warnings to workers in a work zone when a vehicle is moving in a manner that appears to create an unsafe condition (e.g., moving at high speed or entering the work zone).	Planned	DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
MC08	Maintenance and Construction Activity Coordination	This service package supports the dissemination of maintenance and construction activity to centers that can utilize it as part of their operations, or to Transportation Information Centers who can provide the information to travelers. Center to center coordination of work plans supports adjustments to reduce disruption to regional transportation operations.	Existing	Capital Region Planning Commission (CRPC), City-Parish Website, DOTD District 61 Maintenance Division, DOTD District 62 Maintenance Division, DOTD ITS Section, Louisiana 511
PM01	Parking Space Management	This service package monitors and manages parking spaces in lots, garages, and other parking areas and facilities. It assists in the management of parking operations by monitoring parking lot ingress and egress, parking space occupancy and availability. Infrastructure-based detectors and/or connected vehicles may be used to monitor parking occupancy. The service package shares collected parking information with local drivers and information providers for broader distribution.	Planned	Capital Region Planning Commission (CRPC), DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Tourism and Travel Service Information Sources, Traveler
PM02	Smart Park and Ride System	This service package provides real-time information on Park and Ride capacity and supports traveler's decision-making on where best to park and make use of transit alternatives. Transit operators are provided arrival information to support efficient pickup and drop offs and drivers switching to transit are offered current transit information.	Planned	CATS Management Center, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Louisiana 511
PM03	Parking Electronic Payment	This service package supports electronic collection of parking fees. This includes all types of parking fee collection including short term and long term parking and pay-for-use loading zones. It collects parking fees from in-vehicle equipment, contact or proximity cards, or any smart payment device. This service package supports both payment via a local point of sale in the parking area or direct payment via wide area wireless communications. User accounts may be established to facilitate secure payment using only a secure ID and enhance services offered to frequent customers.	Planned	Ascension Parish Transportation and Engineering, Livingston Parish DPW, Local Public Safety Agencies, Traveler, WBR Parish DPW
PM04	Regional Parking Management	This service package supports communication and coordination between equipped parking facilities and also supports regional coordination between parking facilities and traffic and transit management systems. This service package also shares information with transit management centers and transportation information centers to support multimodal travel planning. Information including current parking availability, system status, and operating strategies are shared to enable local parking facility management that supports regional transportation strategies.	Planned	Ascension Parish Transportation and Engineering, Baton Rouge TMC, Capital Region Planning Commission (CRPC), CATS Management Center, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, Louisiana 511, Media, Statewide TMC, Tourism and Travel Service Information Sources, WBR Parish DPW

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Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
PM05	Parking Reservations	This service package manages parking reservations, allowing a traveler to reserve parking as part of the trip planning process. Parking reservations may be part of a trip plan provided by a Transportation Information Center (TIC) based on parking information provided by one or more parking facilities. This parking plan is provided to the traveler/driver, which includes the option to make a reservation if available. If the parking reservation is selected by the traveler/driver, then the TIC will negotiate the parking reservation with the parking facility and provide a confirmation to the traveler/driver.	Planned	City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Livingston Parish DPW, Louisiana 511, Tourism and Travel Service Information Sources, Traveler
PM06	Loading Zone Management	This service package manages the occupancy of spaces in a loading/ unloading zone. It monitors the current status of each loading/unloading zone space under its control and makes this information available to arriving vehicles. The service package also operates a reservation system for loading zones, providing the capability for loading zone users, including commercial vehicle drivers or fleet operators, to reserve and pay for future use of a loading/unloading space. Interfaces to the general Vehicle OBE are included since loading zones may be used by any vehicle, though commercial vehicles are the most frequent users.	Planned	Ascension Parish Transportation and Engineering, Capital Region Planning Commission (CRPC), City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Livingston Parish DPW, Louisiana 511, Traveler, WBR Parish DPW
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	City-Parish Emergency Response Operations 911, City-Parish Emergency Vehicles, Local Emergency Operations Centers, Louisiana State Police - Troop A, Louisiana State Police Vehicles, Motorist Assistance Patrol
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, Planned	Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, City-Parish Emergency Vehicles, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Local Emergency Operations Centers, Local Public Safety Agencies, Louisiana State Police - Troop A, Louisiana State Police Vehicles, Motorist Assistance Patrol, Parish OHEP

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Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
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.	Existing	City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, City-Parish Emergency Vehicles, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, Louisiana State Police Vehicles
PS06	Incident Scene Pre-Arrival Staging Guidance for Emergency Responders	This service package will provide situational awareness to and coordination among emergency responders - upon dispatch, while en route to establish incident scene work zones, upon initial arrival and staging of assets, and afterward if circumstances require additional dispatch and staging. It collects a variety of data from emergency, traffic, and maintenance centers. It includes a vehicle and equipment staging function that supplies the en route responders with additional information about the scene of an incident that they can use to determine where to stage personnel and equipment prior to their arrival on-scene. The service package also includes a dynamic routing function which provides emergency responders with real-time navigation instructions to travel from their base to the incident scene, accounting for traffic conditions, road closures, and snowplow reports if needed. In addition it includes an emergency responder status reporting function which continuously monitors the location of the en route responder vehicles as well as the vehicles already on-scene. The function develops and maintains the current position of the responder's vehicles and provides updates for estimated time of arrival (ETA).	Existing	Baton Rouge TMC, City-Parish Emergency Response Operations 911, City-Parish Emergency Vehicles, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Emergency Operations Centers, Local Public Safety Agencies, Louisiana State Police - Troop A, MOHSEP, Parish OHEP
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	Baton Rouge TMC, Capital Region Planning Commission (CRPC), City-Parish Emergency Response Operations 911, City-Parish Emergency Vehicles, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section, Louisiana State Police - Troop A, Louisiana State Police Vehicles, Motorist Assistance Patrol, Statewide TMC, WBR Parish DPW

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
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	Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, City-Parish ITS Field Devices, DOTD District 61 Maintenance Division, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD District 62 Maintenance Division, DOTD ITS Section, Livingston Parish DPW, Local Traffic Operations, MOHSEP, Motorist Assistance Patrol, Parish OHEP, WBR Parish DPW
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 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.	Existing	Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, City-Parish ITS Field Devices, City-Parish Website, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Local Public Safety Agencies, Louisiana 511, Louisiana State Police - Troop A, Media, MOHSEP, Parish OHEP, Traveler
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.	Existing	Baton Rouge TMC, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, Local Public Safety Agencies, Louisiana State Police - Troop A, MOHSEP, Parish OHEP

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 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.	Existing	Ascension Parish Transportation and Engineering, Baton Rouge TMC, CATS Management Center, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Emergency Operations Centers, Local Public Safety Agencies, Local Traffic Operations, Louisiana State Police - Troop A, Parish OHEP, WBR Parish DPW

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.	Existing	Ascension Parish Transportation and Engineering, Baton Rouge TMC, Capital Region Planning Commission (CRPC), CATS Management Center, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, City-Parish Website, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Emergency Operations Centers, Local Public Safety Agencies, Local Traffic Operations, Louisiana 511, Louisiana State Police - Troop A, Parish OHEP, WBR Parish DPW

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
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 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.	Existing	Baton Rouge TMC, City-Parish Emergency Response Operations 911, Louisiana 511, Louisiana State Police - Troop A, Media, Parish OHEP, Tourism and Travel Service Information Sources, Traveler
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	CATS Management Center, CATS Transit Vehicles, Local Public Safety Agencies
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	CATS Management Center, CATS Transit Vehicles

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	CATS Management Center, CATS Transit Vehicles
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).	Planned	CATS Management Center, CATS Transit Vehicles
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 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.	Existing	CATS Management Center, CATS Transit Vehicles, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, Local Public Safety Agencies, Louisiana State Police - Troop A
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	CATS Management Center, CATS Transit Vehicles

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
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.	Planned	CATS Management Center, CATS Transit Vehicles
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.	Existing	CATS Management Center, CATS Transit Vehicles, Media, Traveler
PT09	Transit Signal Priority	The Transit Signal Priority service package uses transit vehicle to infrastructure communications to allow a transit vehicle to request priority at one or a series of intersections. The service package provides feedback to the transit driver indicating whether the signal priority has been granted or not. This service package can contribute to improved operating performance of the transit vehicles by reducing the time spent stopped at a red light.	Planned	CATS Management Center, CATS Transit Vehicles, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations
PT10	Intermittent Bus Lanes	This service package provides dedicated bus lanes during peak demand times to enhance transit operations mobility. An intermittent bus lane is a lane that can change its status from regular lane (accessible for all vehicles) to bus lane, for the time strictly necessary for a bus or set of buses to pass. The status of the IBL is communicated to drivers using roadside message signs and through in-vehicle signage. The creation and removal of dedicated bus lanes is managed through coordination between traffic and transit centers.	Planned	Baton Rouge TMC, CATS Management Center, CATS Transit Vehicles, DOTD District 61 Traffic Operations, DOTD ITS Section, Louisiana 511, Statewide TMC
PT11	Transit Pedestrian Indication	The Transit Pedestrian Indication service package provides vehicle to device communications to inform pedestrians at a station or stop about the presence of a transit vehicle. In addition, this service package would inform the transit vehicle operator about the presence of pedestrians nearby and those waiting for the bus. It would help prevent collisions between transit vehicles and pedestrians.	Planned	CATS Transit Vehicles, Traveler
PT12	Transit Vehicle at Station/Stop Warnings	The Transit Vehicle at Station/Stop Warnings service package inform nearby vehicles of the presence of a transit vehicle at a station or stop. The service package also indicates the intention of the transit vehicle in terms of pulling into or out of a station/stop.	Planned	CATS Management Center, CATS Transit Vehicles, Traveler
PT13	Vehicle Turning Right in Front of a Transit Vehicle	The Vehicle Turning Right in Front of a Transit Vehicle (VTRFTV) service package determines the movement of vehicles near to a transit vehicle stopped at a transit stop and provides an indication to the transit vehicle operator that a nearby vehicle is pulling in front of the transit vehicle to make a right turn. This service package will help the transit vehicle determine if the area in front of it will not be occupied as it begins to pull away from a transit stop.	Planned	CATS Transit Vehicles
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.	Existing	CATS Management Center, CATS Transit Vehicles, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations

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Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
PT15	Transit Stop Request	This service package allows a transit passenger to send a stop request to an approaching transit vehicle. The transit vehicle receives the request and notifies the vehicle operator of the stop request.	Existing	CATS Management Center, CATS Transit Vehicles, Traveler
PT16	Route ID for the Visually Impaired	This service package assists visually impaired travelers to identify the appropriate bus and route to their intended destination. It provides information from bus stop infrastructure to visually impaired travelers portable devices that can be converted to audible information regarding the appropriate bus and route. It also allows the visually impaired traveler to query the portable device to identify route options.	Planned	CATS Management Center, CATS Transit Vehicles, Traveler
PT18	Integrated Multi-Modal Electronic Payment	The Integrated Multi-Modal Electronic Payment (IMMEP) service package provides electronic payment capability for transit fares, tolls, road use, parking, and other areas requiring electronic payments. IMMEP enables the provision of payment for transportation services using a single account for multiple public transportation providers. The transportation user establishes an account with a financial service provider (modeled as the Payment Administration Center (PAC)), and the PAC communicates with various public transportation providers to coordinate charges. IMMEP also supports the management of transportation user access rights (i.e., this user can use the subway but not the bus). Payment transactions are centralized; the user provides only a secure, registered token (the 'secureID') to the transportation provider's access control equipment. The transportation provider uses that token and context to initiate transactions with the PAC.	Planned	CATS Management Center, CATS Transit Vehicles, Traveler
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.	Existing	Capital Region Planning Commission (CRPC)
ST05	Electric Charging Stations Management	The Electric Charging Station Management service package provides an exchange of information between the electric vehicle and charging station to manage the charging operation. The agency or company operating the charging station can use vehicle information such as the capability of the vehicle (e.g. operational status of the electrical system, how many amps can the vehicle handle, and % charge complete) to determine that the charge is being properly applied and determine an estimated time to complete charging.	Planned	Capital Region Planning Commission (CRPC), CATS Management Center, City-Parish DPW Traffic Engineering Division, City-Parish Website, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511, Media, Tourism and Travel Service Information Sources

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Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
ST06	HOV/HOT Lane Management	This service package manages high-occupancy vehicle (HOV) and high-occupancy toll (HOT) lanes by coordinating freeway ramp meters and connector signals with HOV lane usage signals. Preferential treatment is given to HOV lanes using special bypasses, reserved lanes, and exclusive rights-of-way that may vary by time of day. Vehicle occupancy can be detected to verify HOV compliance and to notify enforcement agencies of violations. For HOT lane configurations, tolls are collected for vehicles that do not meet the high-occupancy criteria for the lane.	Planned	Baton Rouge TMC, CATS Management Center, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Local Traffic Operations, Louisiana 511, Media, Statewide TMC
SU01	Connected Vehicle System Monitoring and Management	This service package provides monitoring, management and control services necessary to other applications and/or devices operating within the Connected Vehicle Environment. This service package maintains and monitors the performance and configuration of the connected vehicle system. This includes tracking and management of the infrastructure configuration as well as detection, isolation, and correction of infrastructure service problems. It also includes monitoring of performance of the infrastructure and mobile equipment, which includes RSEs, OBEs, the back office applications, as well as the communication links that connect the system.	Planned	Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section
SU02	Core Authorization	This service package manages the authorization mechanisms to define roles, responsibilities and permissions for connected vehicle applications . This allows system administrators to establish operational environments where different connected vehicle system users may have different capabilities. For instance, some Mobile elements may be authorized to request signal priority, or some Centers may be permitted to use the geographic broadcast service, while those without those permissions would not.	Planned	Baton Rouge TMC, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Statewide TMC
SU03	Data Distribution	This service package manages the distribution of data from data providers to data consumers and protects those data from unauthorized access. It informs data providers of how to provide data, manages data subscriptions, and provides data forwarding capabilities. The service package also maintains a directory of System Users that want data and supports multiple distribution mechanisms including publish-subscribe and directly from data provider to data consumer. It allows data consumers to specify (and change the specification of) data they wish to receive.	Planned	Archived Data Users, Baton Rouge TMC, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
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.	Existing	Baton Rouge TMC, CATS Management Center, City-Parish DPW Traffic Engineering Division, City-Parish Website, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Local Emergency Operations Centers, Local Public Safety Agencies, Louisiana 511, Media, Tourism and Travel Service Information Sources, Traveler
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 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.	Existing	CATS Management Center, City-Parish Website, Louisiana 511, Media, Tourism and Travel Service Information Sources, Traveler
TI05	Travel Services Information and Reservation	This service package provides travel service information and reservation services to the traveler pre-trip and while en route. This includes information for tourist attractions, lodging, dining, service stations, parking, emergency services, and other services and businesses of interest to the traveler.	Existing	CATS Management Center, Louisiana 511, Tourism and Travel Service Information Sources, Traveler
TI06	Dynamic Ridesharing and Shared Use Transportation	This service package addresses dynamic ridesharing/ride matching services to travelers and other forms of shared use transportation. Dynamic ridesharing allows travelers to arrange carpool trips through a personal device with a wireless connection to a ride matching system (e.g., a web-based application). It uses inputs from both passengers and drivers pre-trip, during the trip, and post-trip . These inputs are then translated into “optimal” pairings between passengers and drivers to provide both with a convenient route between their two origin and destination locations. After the trip, information is provided back to the service package to improve the user’s experience for future trips. The shared use aspect of the service package addresses three types of shared use that may be arranged using an internet connected personal device. In the first type, a traveler arranges for the temporary use of a vehicle. In the second type of shared use, a traveler arranges for a vehicle to pick them up at a specific location and take them to another location. The second type of shared use may be implemented as a ride matching or ridesharing service, including those provided by Uber and Lyft. The third type of shared use is a bikeshare capability.	Existing	CATS Management Center, Traveler

Appendix A Services

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
TI07	In-Vehicle Signage	This service package augments regulatory, warning, and informational signs and signals by providing information directly to drivers through in-vehicle devices. The information provided would include static sign information (e.g., stop, curve warning, guide signs, service signs, and directional signs) and dynamic information (e.g., current signal states including highway intersection and highway-rail intersection status and local conditions warnings identified by local environmental sensors). This service package also includes the capability for maintenance and construction, emergency, and transit vehicles to transmit sign information to vehicles in the vicinity so that in vehicle signing can be used without fixed infrastructure in areas such as work zones, around incidents, and at bus stops.	Planned	DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Statewide TMC
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	Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Local Traffic Operations, Louisiana 511
TM01	Infrastructure-Based Traffic Surveillance (Instance 1)	This service package includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the Traffic Management Subsystem. 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 Subsystem). 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 Information Service Provider Subsystem.	Existing	Baton Rouge TMC, DOTD ITS Section
TM02	Vehicle-Based Traffic Surveillance	This service package uses probe data information obtained from vehicles in the network to support traffic operations, including incident detection and the implementation of localized operational strategies. Since traffic data is collected from vehicles, travel times and other related traffic performance measures are available. This service package includes the capability to collect data from Connected Vehicles so that "probe" data can be collected from all equipped vehicles, providing access to a large vehicle population as penetration increases. Incident detection enables transportation agencies to determine the location of potential incidents so the agencies can respond more quickly to the incident and mitigate any negative impacts to the transportation network. Vehicle data that can be used to detect potential incidents include changes in vehicle speeds indicating the disruption of traffic flow, when a vehicle's safety systems have been activated or deployed, or sudden vehicle turns or deceleration at a specific location (indicating a potential obstacle in the roadway).	Existing	Baton Rouge TMC, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
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	Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, Livingston Parish DPW, Local Traffic Operations, WBR Parish DPW
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 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.	Existing	Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section
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,	Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Local Traffic Operations, Louisiana 511

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
TM06	Traffic Information Dissemination (Instance 1)	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 Information Service Providers. A link to the Maintenance and Construction Management subsystem allows real time information on road/bridge closures and restrictions due to maintenance and construction activities to be disseminated. The sharing of transportation operations data described in this service package also supports other services like ATMS09- Traffic Decision Support and Demand Management.	Existing	Baton Rouge TMC, DOTD ITS Section
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 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.	Existing	Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, WBR Parish DPW
TM07	Regional Traffic Management (Instance 1)	This service package provides for the sharing of traffic 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 ATMS03-Traffic Signal Control and ATMS04-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 to fixed-point communications capabilities to 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 control between traffic management centers.	Existing	Baton Rouge TMC, DOTD ITS Section

Appendix A Services

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
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	Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, City-Parish ITS Field Devices, DOTD District 61 Maintenance Division, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Emergency Operations Centers, Local Public Safety Agencies, Local Traffic Operations, Louisiana 511, Louisiana State Police - Troop A, Media, Parish OHEP, WBR Parish DPW
TM08	Traffic Incident Management System (Instance 1)	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 center subsystems. 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 field personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel.	Existing	Baton Rouge TMC, DOTD ITS Section

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.	Existing	Baton Rouge TMC, Capital Region Planning Commission (CRPC), DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Louisiana State Police - Troop A
TM09	Integrated Decision Support and Demand Management (Instance 1)	This service package recommends courses of action to traffic operations personnel based on an assessment of current and forecast road network performance. Recommendations may include predefined incident response plans and regional surface street and freeway control strategies that correct network imbalances. Where applicable, this service package also recommends transit, parking, and toll strategies to influence traveler route and mode choices to support travel demand management (TDM) programs and policies managing both traffic and the environment. TDM recommendations are coordinated with transit, parking, and toll administration centers to support regional implementation of TDM strategies. Incident response and congestion management recommendations are implemented by the local traffic management center and coordinated with other regional centers by other service packages (see ATMS07-Regional Traffic Management and ATMS08-Traffic Incident Management). All recommendations are based on historical evaluation, real-time assessment, and forecast of the roadway network performance based on predicted travel demand patterns. Traffic data is collected from sensors and surveillance equipment as well as other transportation management centers (see ATIS06-Transportation Operations Data Sharing). Forecasted traffic loads are derived from historical data and route plans supplied by the Information Service Provider Subsystem. This service package also collects air quality, parking availability, transit usage, and vehicle occupancy data to support TDM, where applicable.	Existing	Baton Rouge TMC, DOTD ITS Section
TM10	Electronic Toll Collection	The Electronic Toll Collection service package provides toll operators with the ability to collect tolls electronically and detect and process violations. The fees that are collected may be adjusted to implement demand management strategies. Field-Vehicle Communication between the roadway equipment and the vehicle is required as well as Fixed Point-Fixed Point interfaces between the toll collection equipment and transportation authorities and the financial infrastructure that supports fee collection. Toll violations are identified and electronically posted to vehicle owners. Standards, inter-agency coordination, and financial clearinghouse capabilities enable broad interoperability for these services.	Planned	Baton Rouge TMC, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Local Traffic Operations, Louisiana 511

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
TM11	Road Use Charging	The Road Use Charging service package supports the capability to charge fees to roadway vehicle owners for using specific roadways with potentially differential payment rates based on time-of-day, which specific roadway is used, and class of vehicle or other vehicle-based criteria (a local policy decision by each roadway owner). These payment schemes could be forms of Vehicle Miles Traveled (VMT) or other schemes that are yet to be defined. Vehicle owners need only register with a single payment entity of their choice (a participating state, municipal, or regional DOT, an authority, or a private entity), and payments are reconciled by the entity receiving payment (and travel history) with all roadway owners that participate in the road use payment scheme, which may also include the Federal government. Vehicle owners would pay nothing for distances traveled where there are no payments required (e.g. in jurisdictions that have not implemented a distance-based payment or for roadway operators that collect payment using traditional tolls), although a Federal payment rate might cover some or all roadway operations (a Federal policy decision). Basic operation depends on the vehicle tracking its own location, and periodically reporting its travel history to the registered entity receiving payment using connected vehicle communications.	Planned	Capital Region Planning Commission (CRPC), DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations
TM12	Dynamic Roadway Warning	This service package includes systems that dynamically warn drivers approaching hazards on a roadway. Such hazards include roadway weather conditions, road surface conditions, traffic conditions including queues, obstacles or animals in the roadway and any other transient event that can be sensed. These dynamic roadway warning systems can alert approaching drivers via warning signs, flashing lights, in-vehicle messages, etc. Such systems can increase the safety of a roadway by reducing the occurrence of incidents. The system can be centrally monitored and controlled by a traffic management center or it can be autonomous. Speed warnings that consider the limitations of a given vehicle for the geometry of the roadway (e.g., rollover risk for tall vehicles) are not included in this service package but are covered by the TM17 – Speed Warning and Enforcement service package. Roadway warning systems, especially queue warning systems are an Active Traffic Management (ATM) strategy and are typically used in conjunction with other ATM strategies (such as TM20-Variable Speed Limits and TM22-Dynamic Lane Management and Shoulder Use).	Existing	Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, Statewide TMC, WBR Parish DPW
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.	Planned	Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, WBR Parish DPW

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
TM16	Reversible Lane Management	This service package provides for the management of reversible lane facilities. In addition to standard surveillance capabilities, this service package includes sensory functions that detect wrong-way vehicles and other special surveillance capabilities that mitigate safety hazards associated with reversible lanes. The package includes the field equipment, physical lane access controls, and associated control electronics that manage and control these special lanes. This service package also includes the equipment used to electronically reconfigure intersections and manage right-of-way to address dynamic demand changes and special events.	Planned	Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, WBR Parish DPW
TM22	Dynamic Lane Management and Shoulder Use	This service package provides for active management of travel lanes along a roadway. The package includes the field equipment, physical overhead lane signs and associated control electronics that are used to manage and control specific lanes and/or the shoulders. This equipment can be used to change the lane configuration on the roadway according to traffic demand and lane destination along a typical roadway section or on approach to or access from a border crossing, multimodal crossing or intermodal freight depot. This package can be used to allow temporary or interim use of shoulders as travel lanes. The equipment can be used to electronically reconfigure intersections and interchanges and manage right-of-way dynamically including merges. Also, lanes can be designated for use by special vehicles only, such as buses, high occupancy vehicles (HOVs), vehicles attending a special event, etc. Prohibitions or restrictions of types of vehicles from using particular lanes can be implemented. The lane management system can be centrally monitored and controlled by a traffic management center or it can be autonomous. This service also can include automated enforcement equipment that notifies the enforcement agency of violators of the lane controls. Dynamic lane management and shoulder use is an Active Traffic Management (ATM) strategy and is typically used in conjunction with other ATM strategies (such as TM20-Variable Speed Limits and TM12-Dynamic Roadway Warning).	Planned	Baton Rouge TMC, Capital Region Planning Commission (CRPC), DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Statewide TMC DOTD ITS Section
TM 26		This service package supports the detection and enforcement of roadway control signals. A common implementation of this capability is “red light enforcement” for signalized intersections. Information documenting a vehicle entering the intersection when the light is red is captured and conveyed to an enforcement agency. This service package is a logical predecessor to “Intersection Safety Warning” and “Intersection Collision Avoidance”, where the signal violation detection is also used to reduce the likelihood of a traffic accident. This same relationship also exists to “Mixed Use Warning Systems” and “Automated Non-Vehicular Road User Protection”, since pedestrians, bicyclists, and other non-vehicle traffic may be threatened by signal violations.	Planned	Baton Rouge TMC DOTD District 61 ITS Field Devices DOTD District 61 Traffic Operations DOTD District 62 ITS Field Devices DOTD District 62 Traffic Operations

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
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	Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Media
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	Baton Rouge TMC, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section
WX03	Spot Weather Impact Warning	This service package will alert drivers 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, or fog. The service packages is designed to use standalone weather systems to warn drivers about inclement weather conditions that may impact travel conditions. Real time weather information is collected from fixed environmental sensor stations and vehicle based sensors. The information is processed to determine the nature of the alert or warning to be delivered and then communicated to connected vehicles. 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.	Planned	Baton Rouge TMC, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section
WX04	Roadway Micro-Prediction	This service package supports advanced systems which use environmental information collected from ITS roadway equipment or from the Surface Transportation Weather Service, along with advanced algorithms, to create micro-predictions of roadway conditions which can support improved safety warnings and maintenance planning and dispatch.	Planned	Baton Rouge TMC, DOTD District 61 Maintenance Division, DOTD District 61 ITS Field Devices, DOTD District 61 Traffic Operations, DOTD District 62 ITS Field Devices, DOTD District 62 Traffic Operations, DOTD ITS Section, Statewide TMC

Appendix B INTERFACES DETAILS AND INFORMATION FLOW DEFINITIONS

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

A context diagram shows a particular system and all other systems with which it shares information. Interconnects are represented as single lines and indicate information sharing without specifying the type of information being shared or the direction of the information movement. Following each interconnect context diagram are a series of information flow diagrams showing the information (i.e., information flows) movement between the various systems. Descriptions of the information flows are included at the end of the chapter.

Information about the interfaces of the systems in the region is contained in the RAD-IT database. RAD-IT can be used to create tailored interconnect and information flow diagrams for any system in the database.

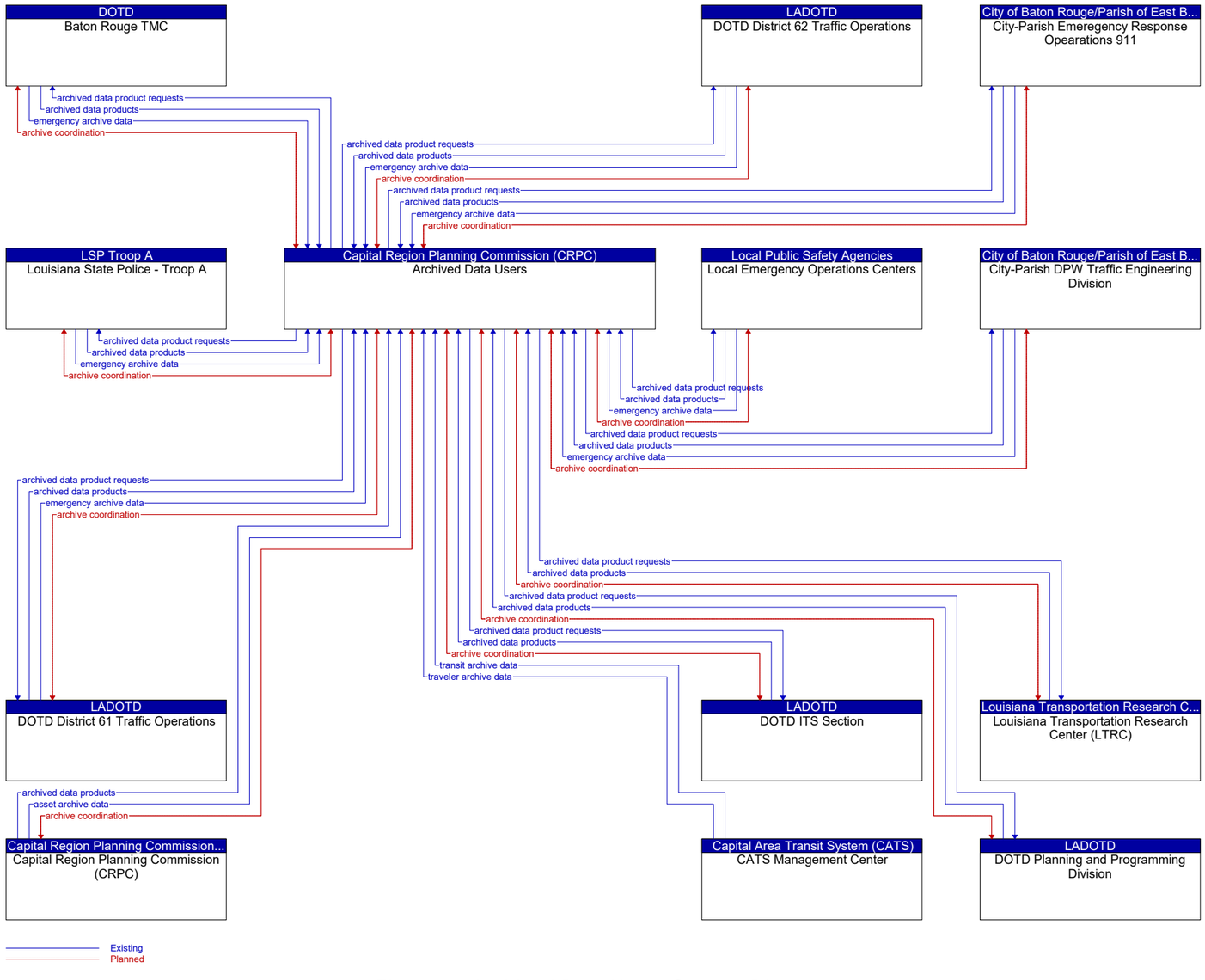

Figure 3: Archived Data Users Context Diagram

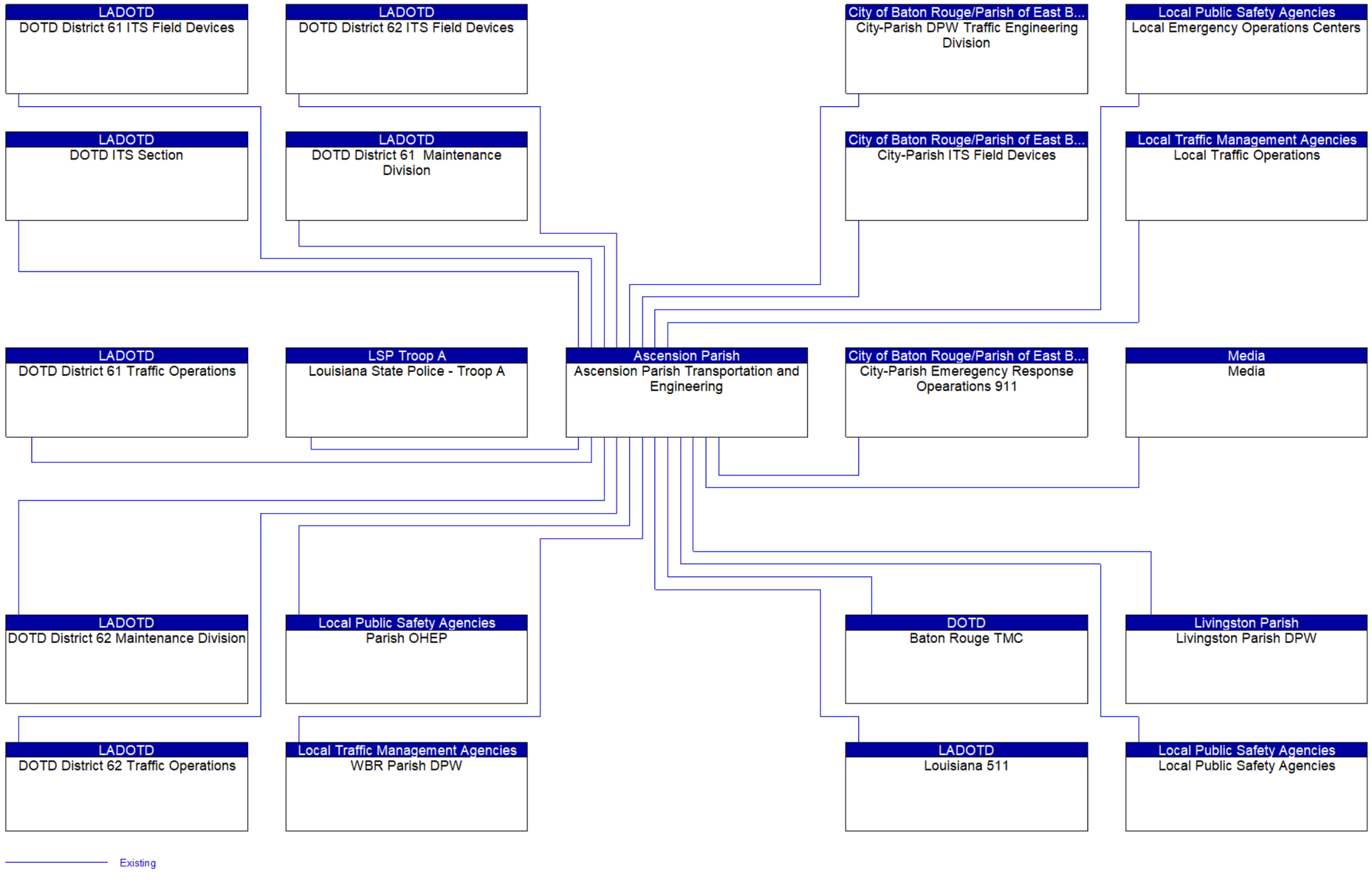

Figure 4: Ascension Parish Transportation and Engineering Context Diagram

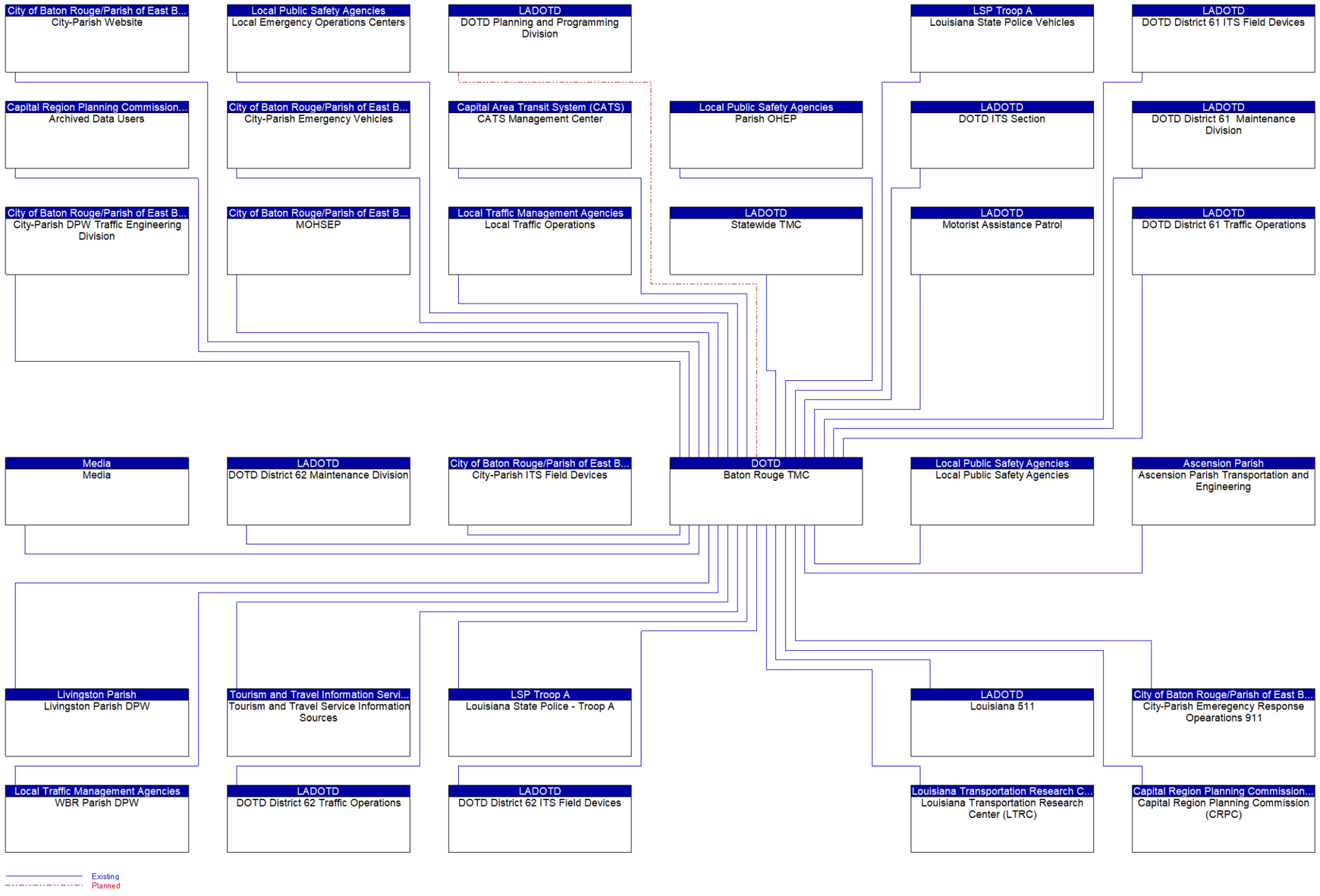

Figure 5: Baton Rouge TMC Context Diagram

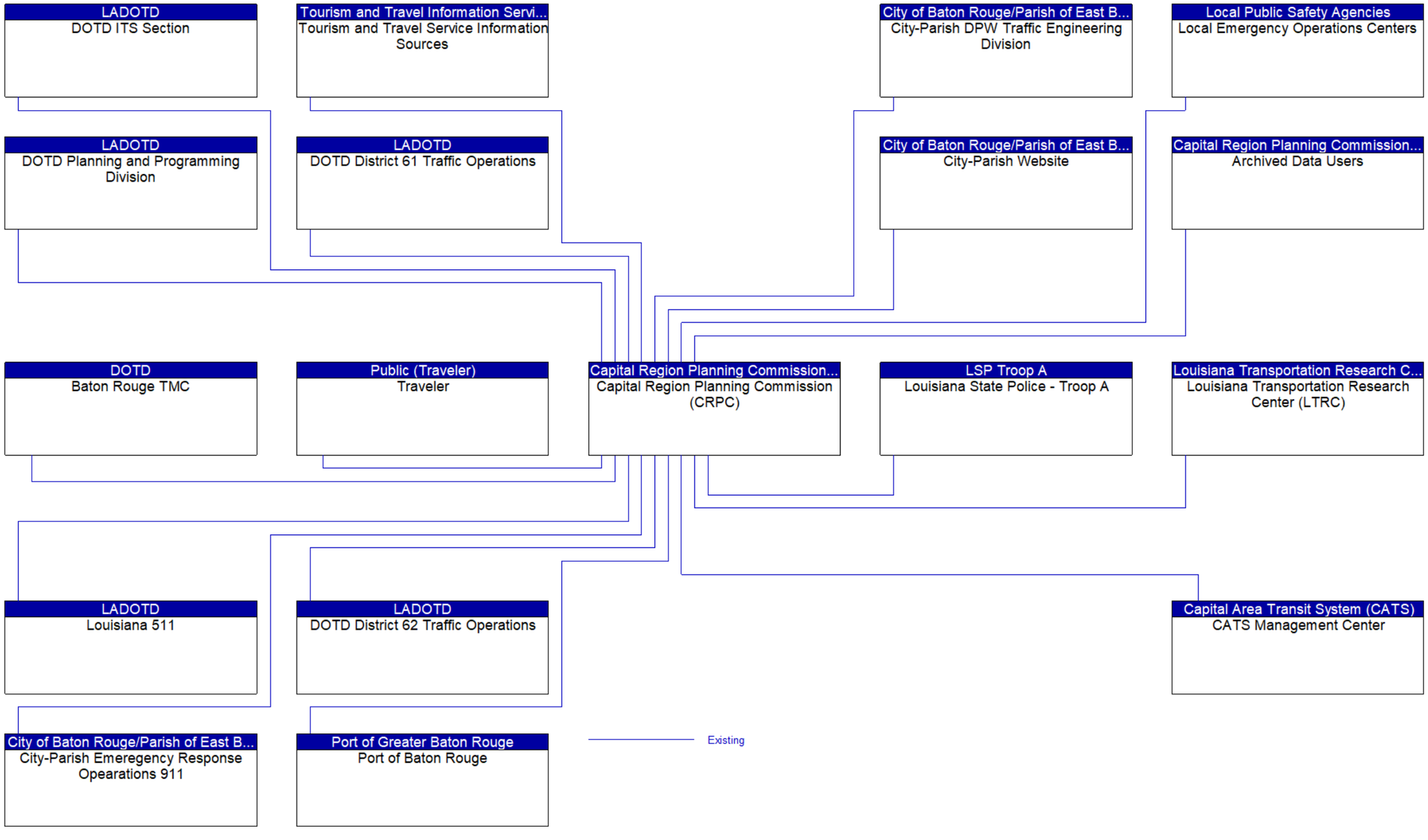

Figure 6: Capital Region Planning Commission (CRPC) Context Diagram

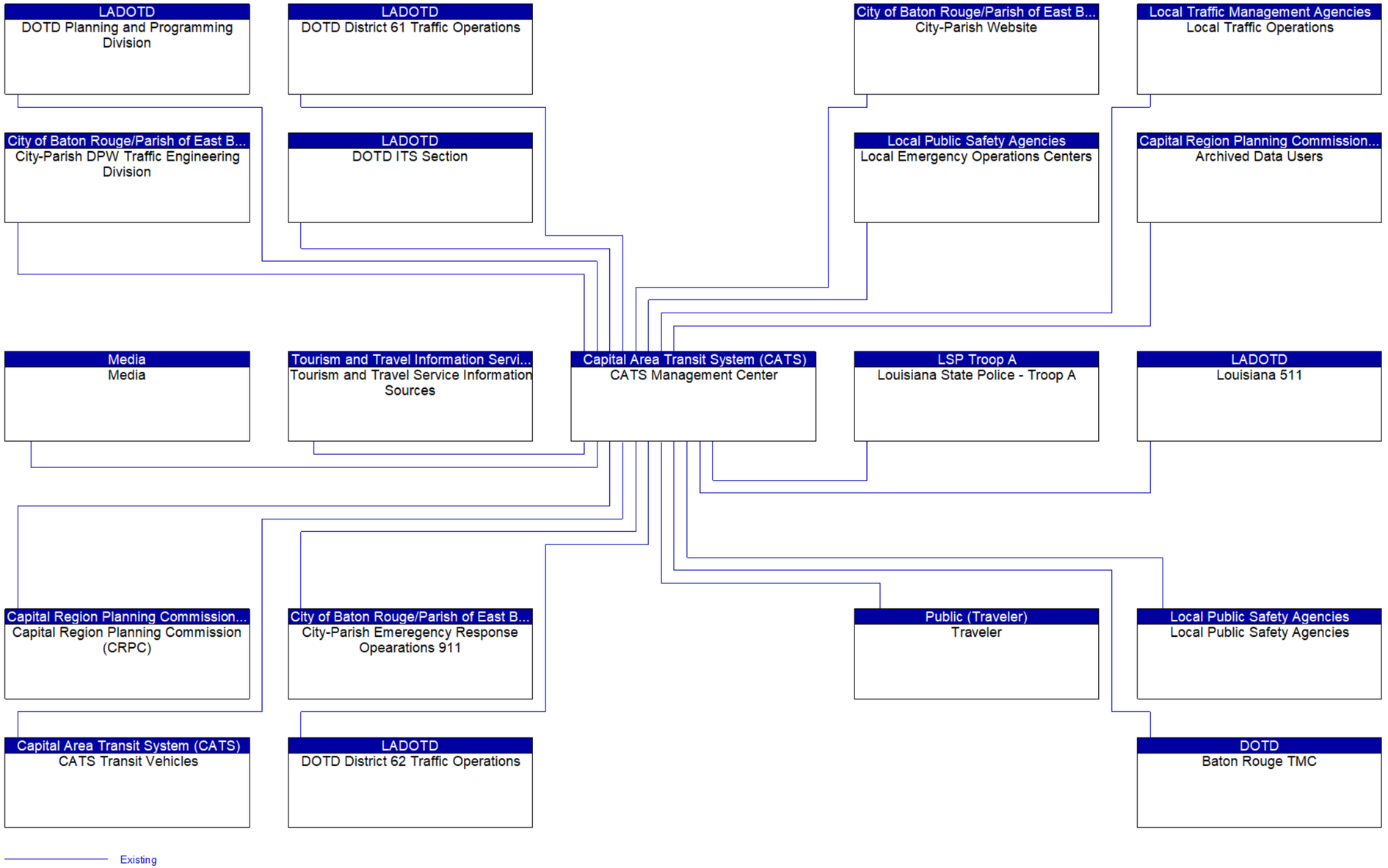

Figure 7: CATS Management Center Context Diagram

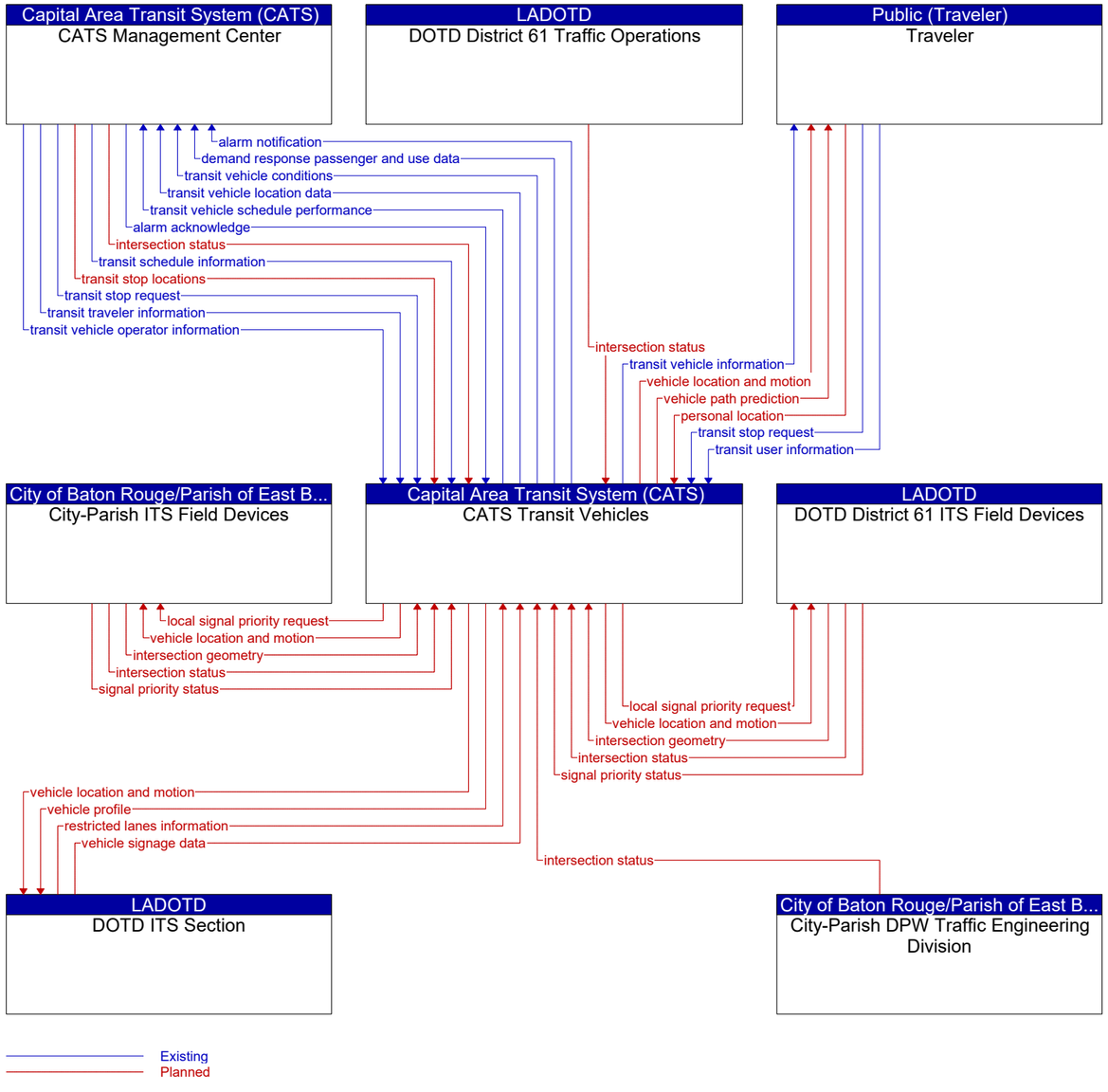

Figure 8: CATS Transit Vehicles Context Diagram

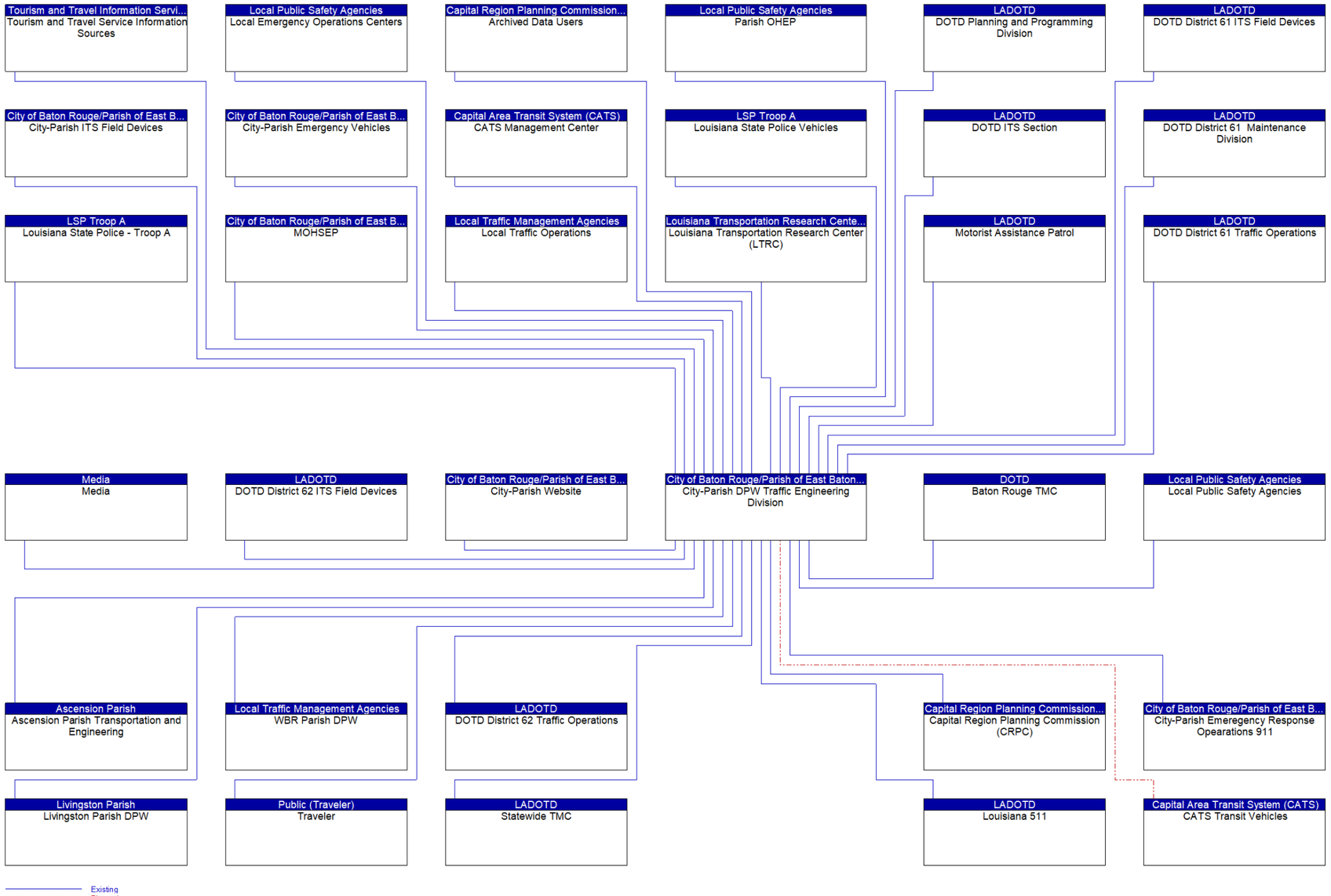

Figure 9: City-Parish DPW Traffic Engineering Division Context Diagram

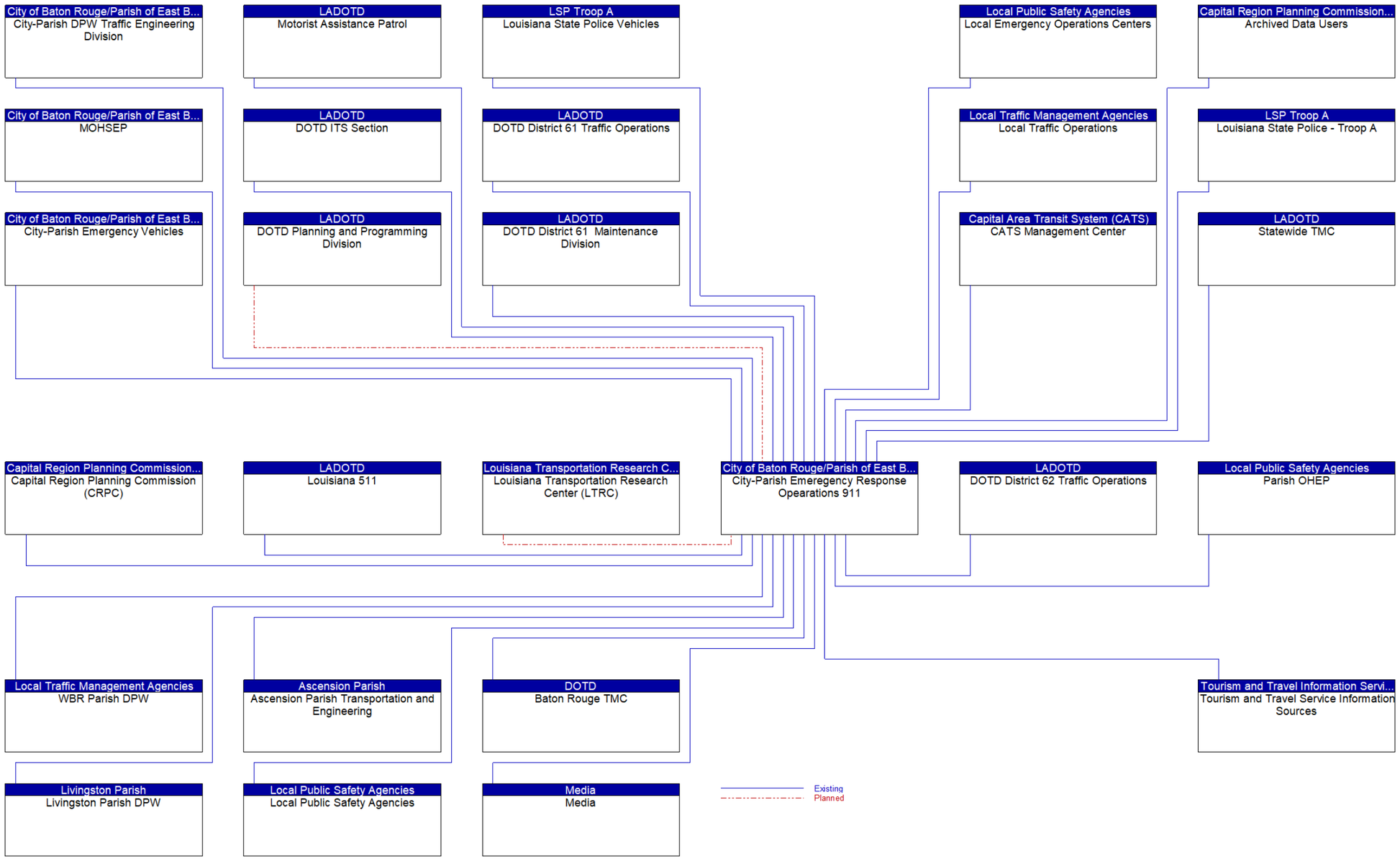

Figure 10: City-Parish Emergency Response Operations 911 Context Diagram

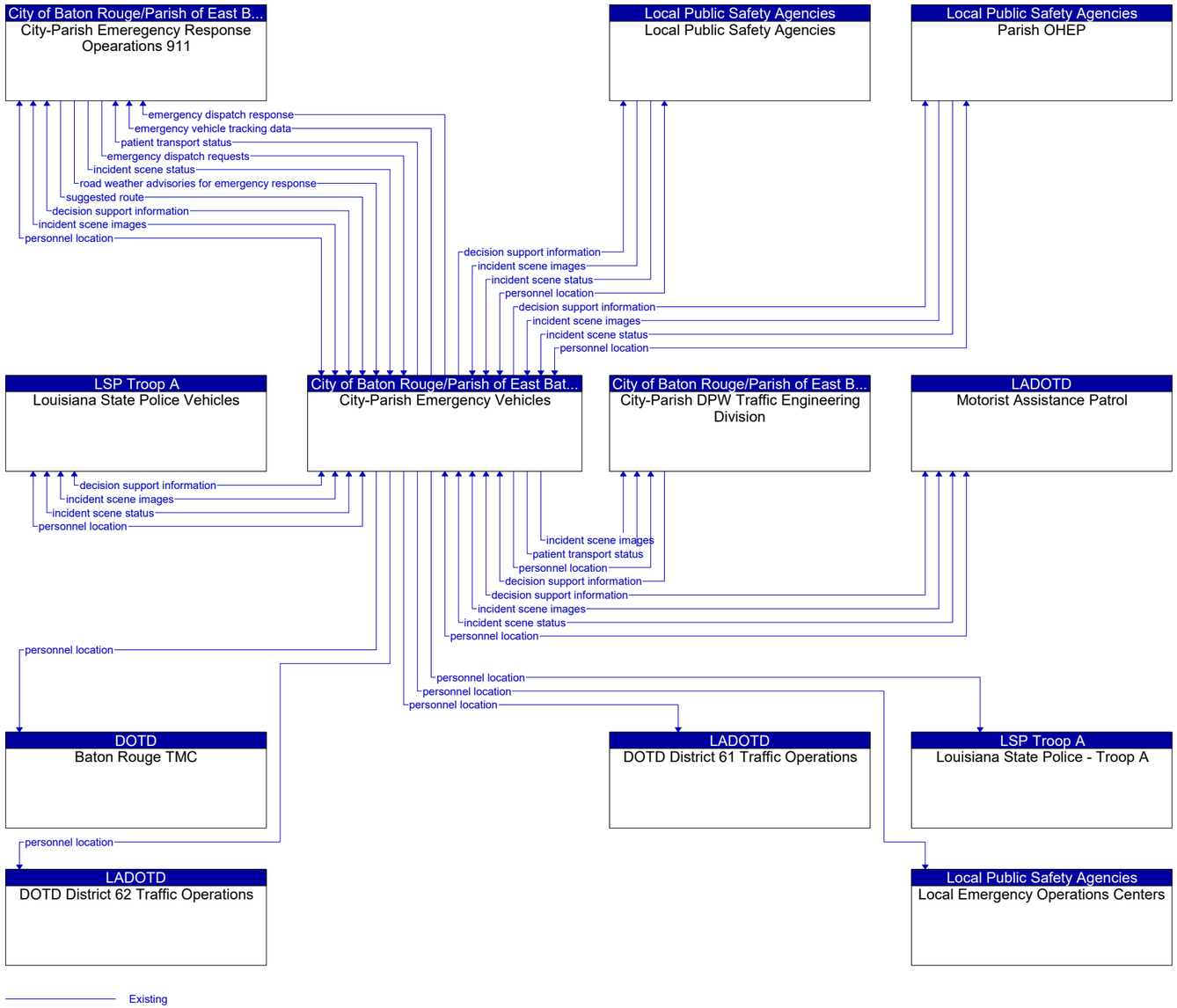

Figure 11: City-Parish Emergency Vehicles Context Diagram

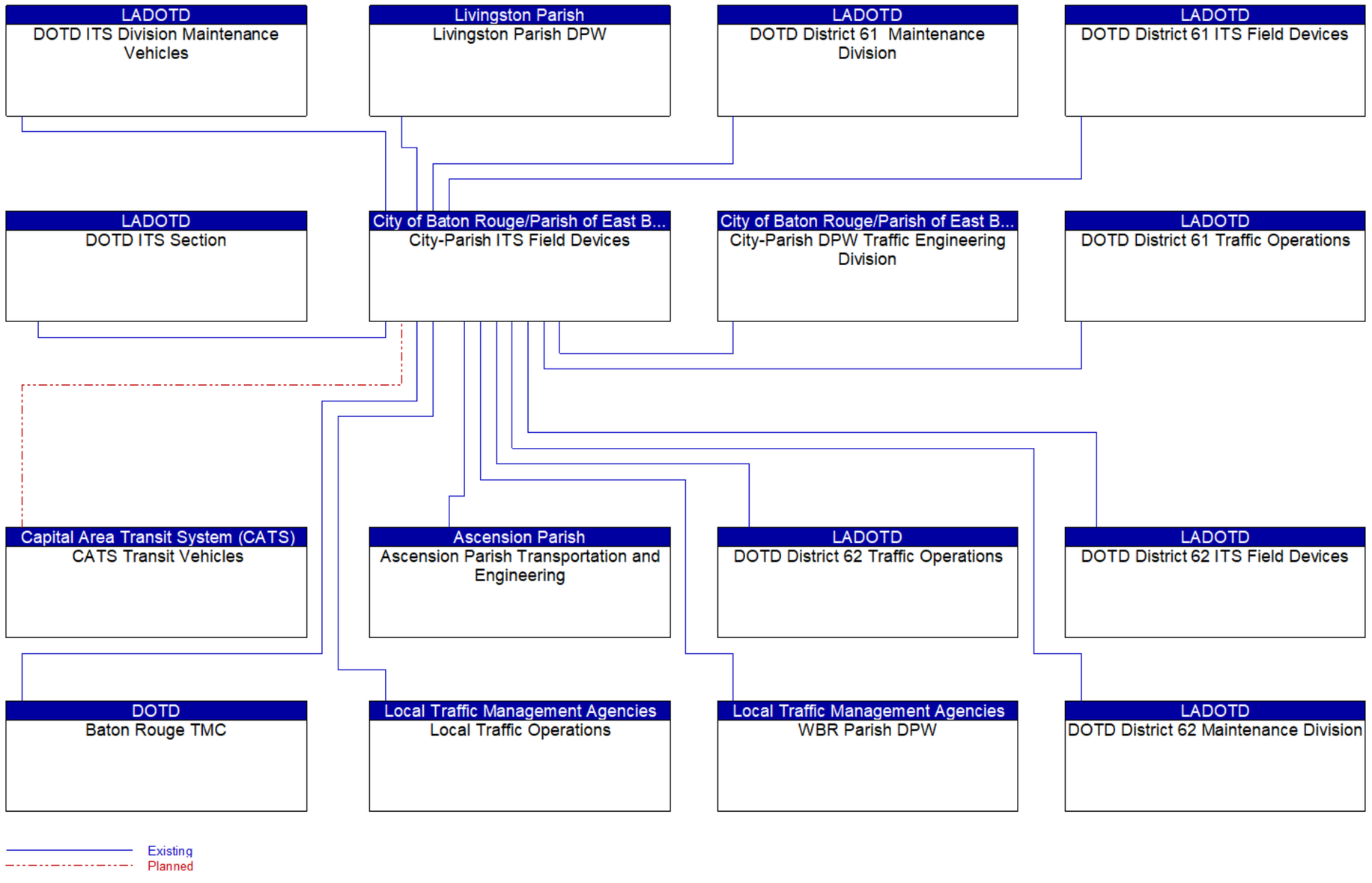

Figure 12: City-Parish ITS Field Devices Context Diagram

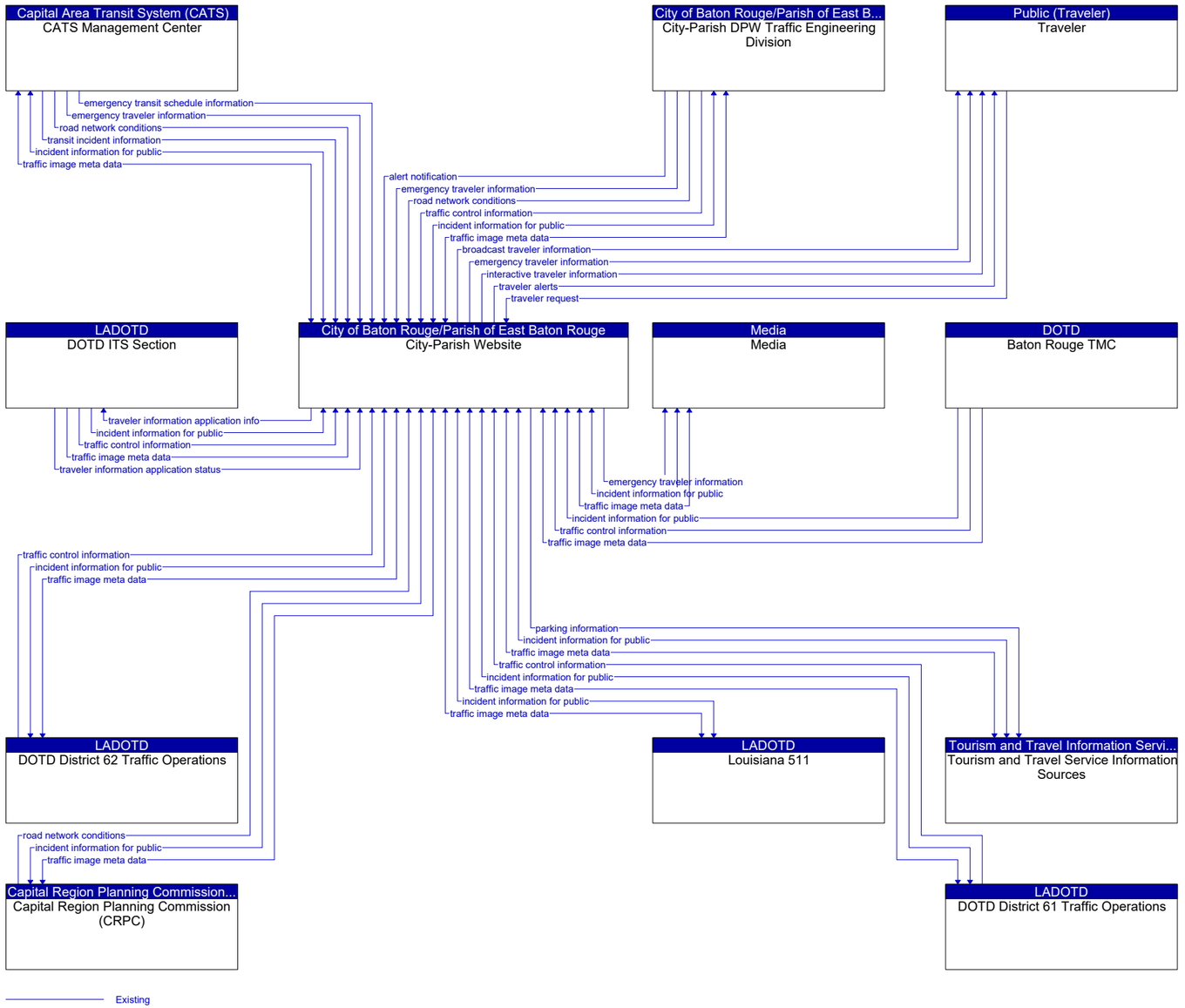

Figure 13: City-Parish Website Context Diagram

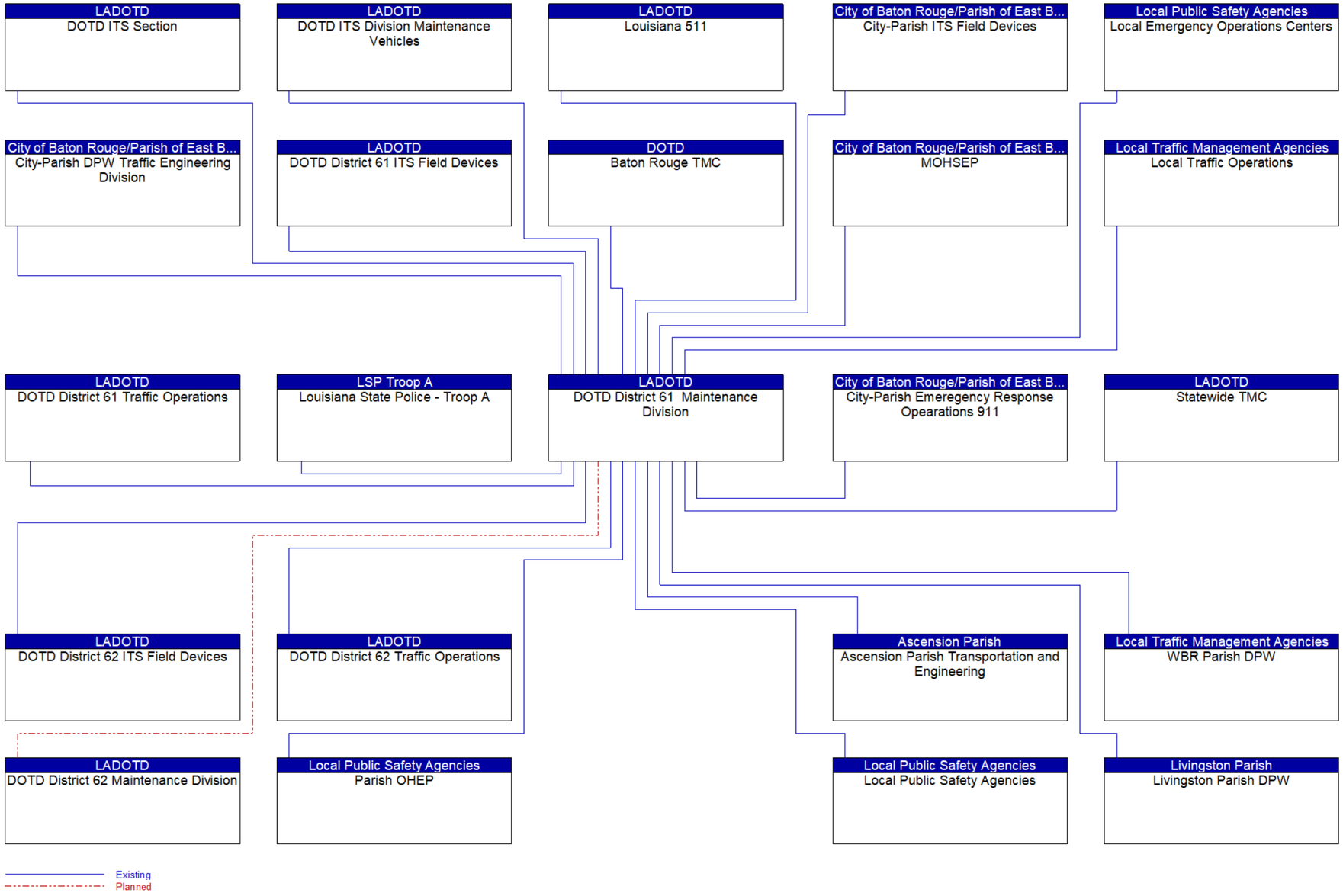

Figure 14: DOTD District 61 Maintenance Division Context Diagram

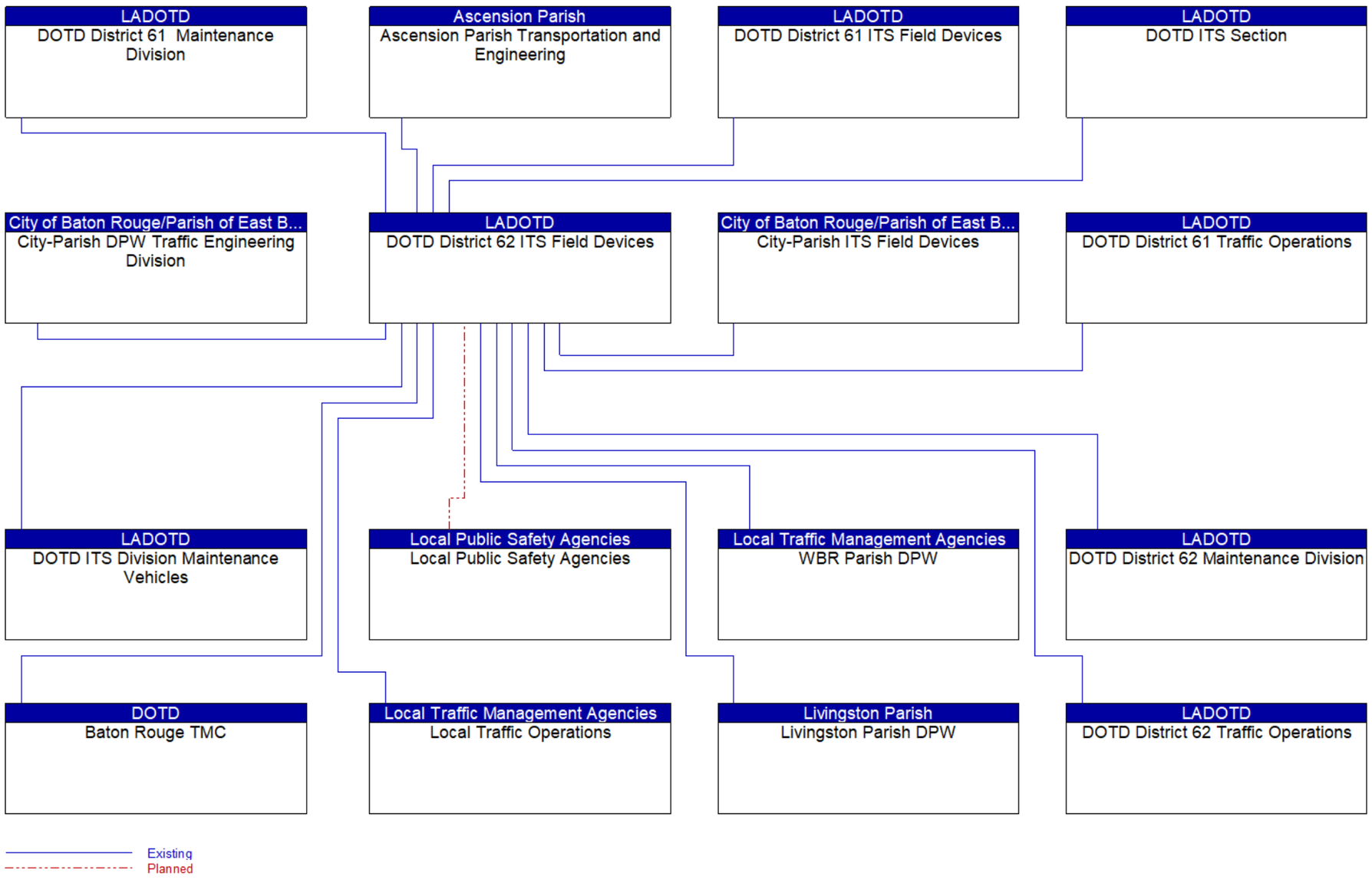

Figure 15: DOTD District 61 ITS Field Devices Context Diagram

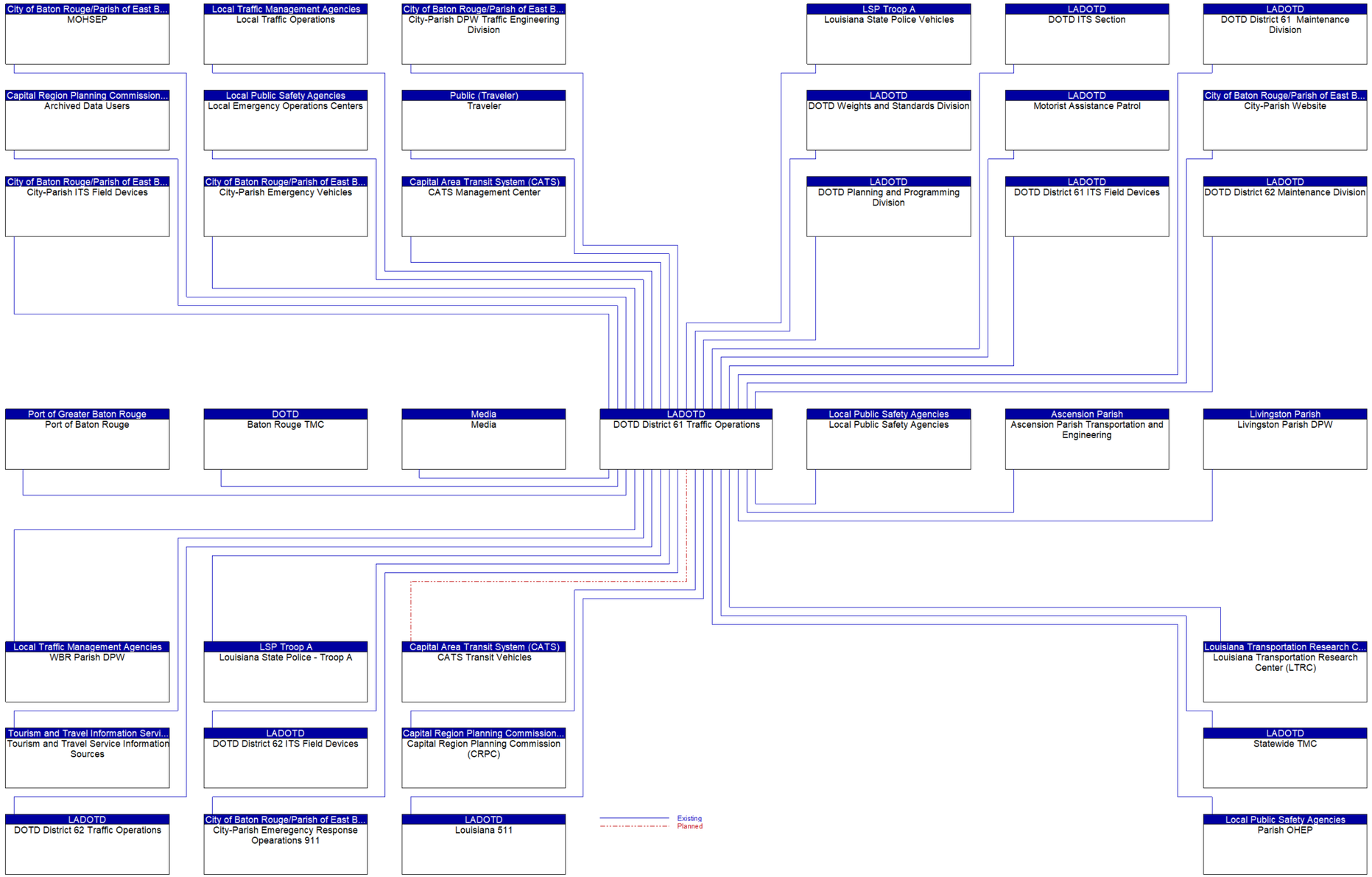

Figure 16: DOTD District 61 Traffic Operations Context Diagram

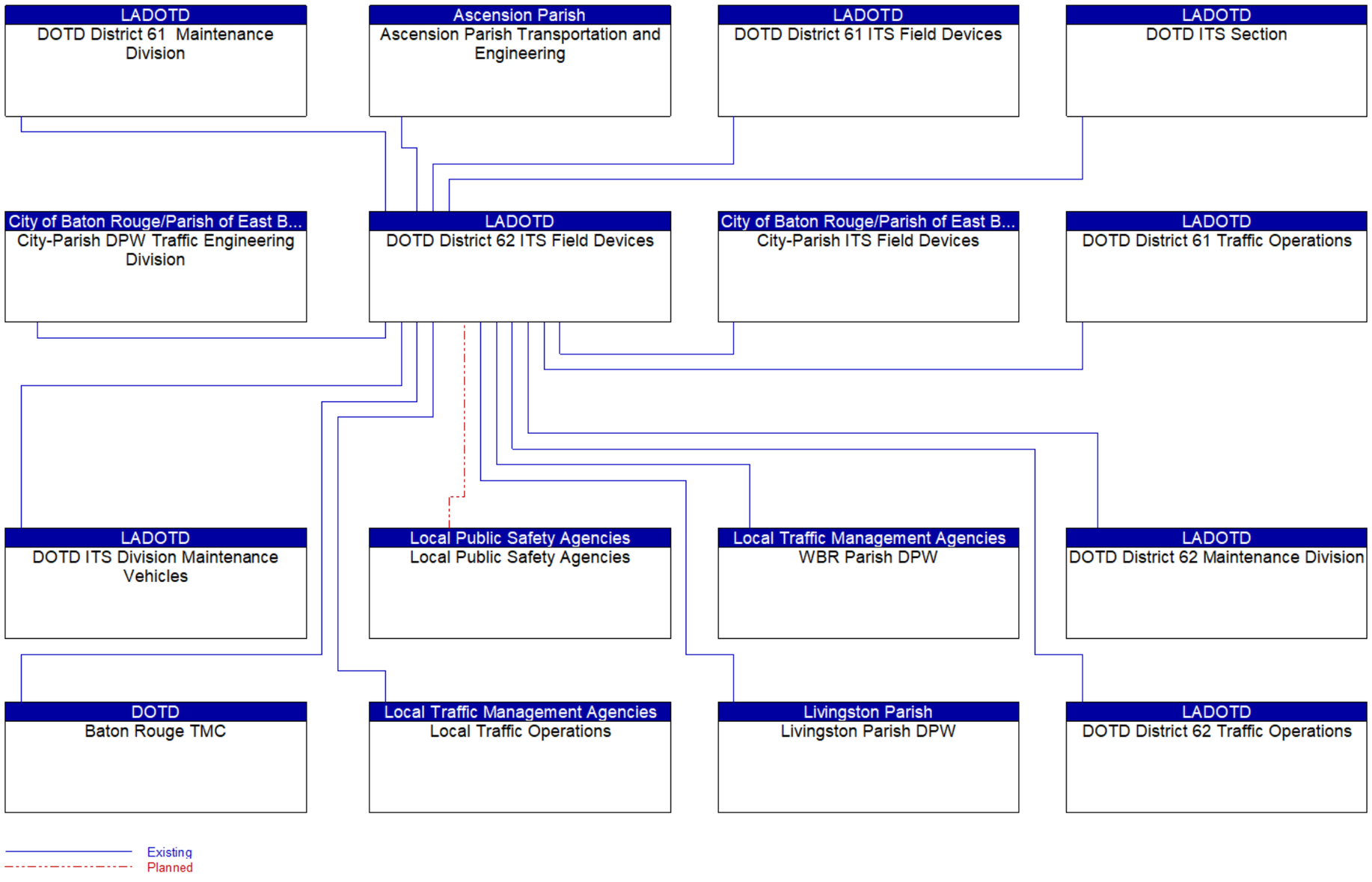

Figure 17: DOTD District 62 ITS Field Devices Context Diagram

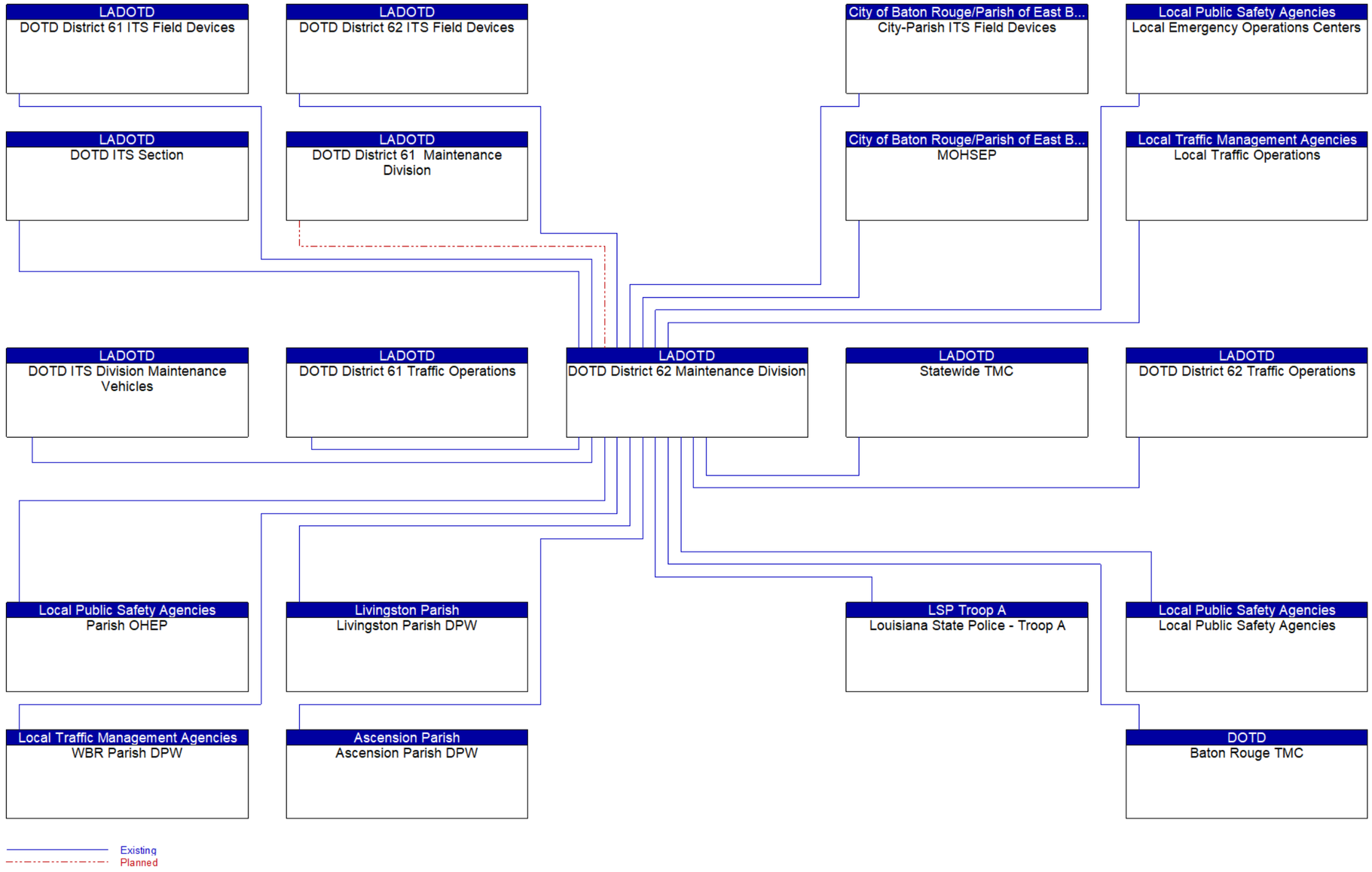

Figure 18: DOTD District 62 Maintenance Division Context Diagram

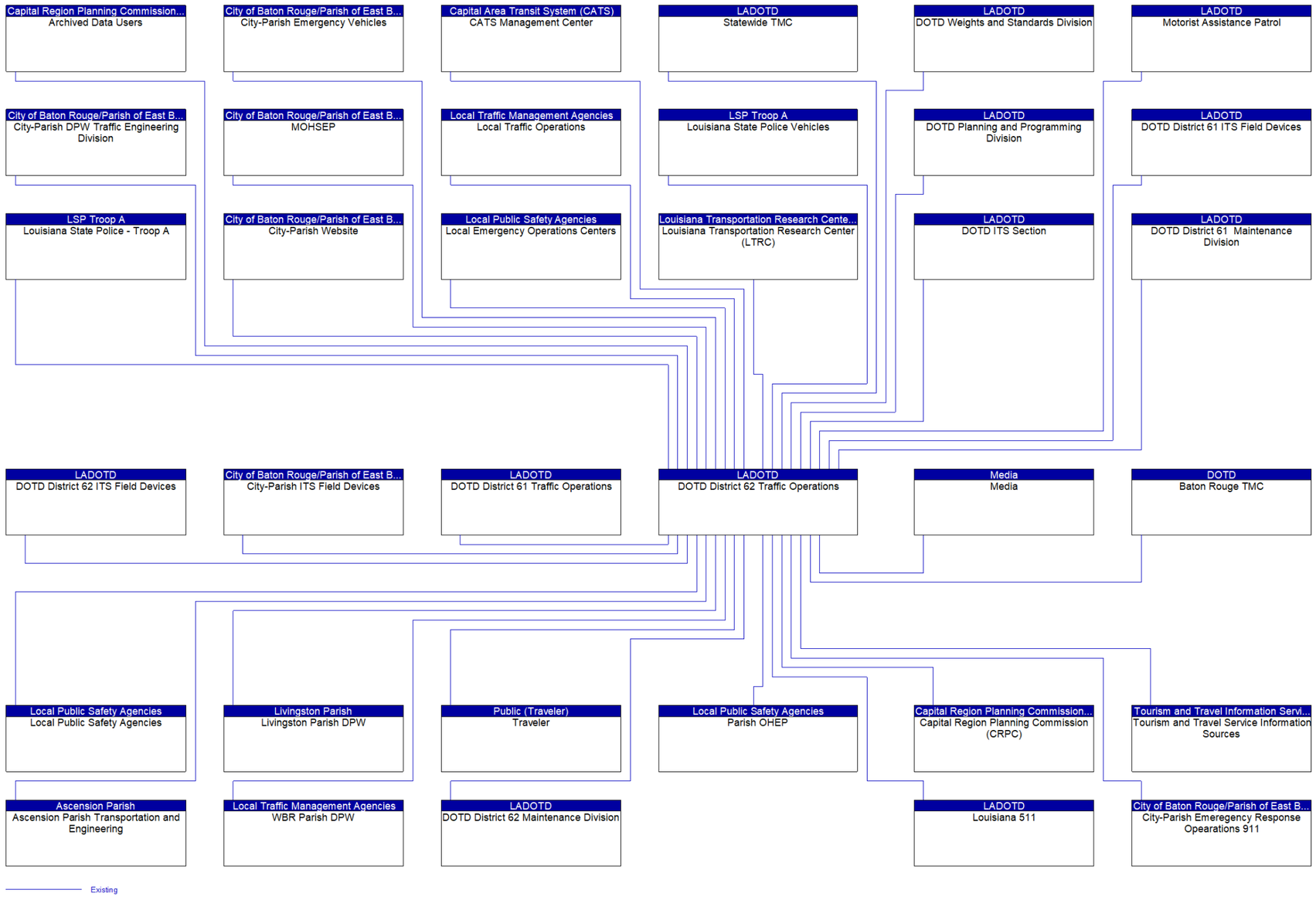

Figure 19: DOTD District 62 Traffic Operations Context Diagram

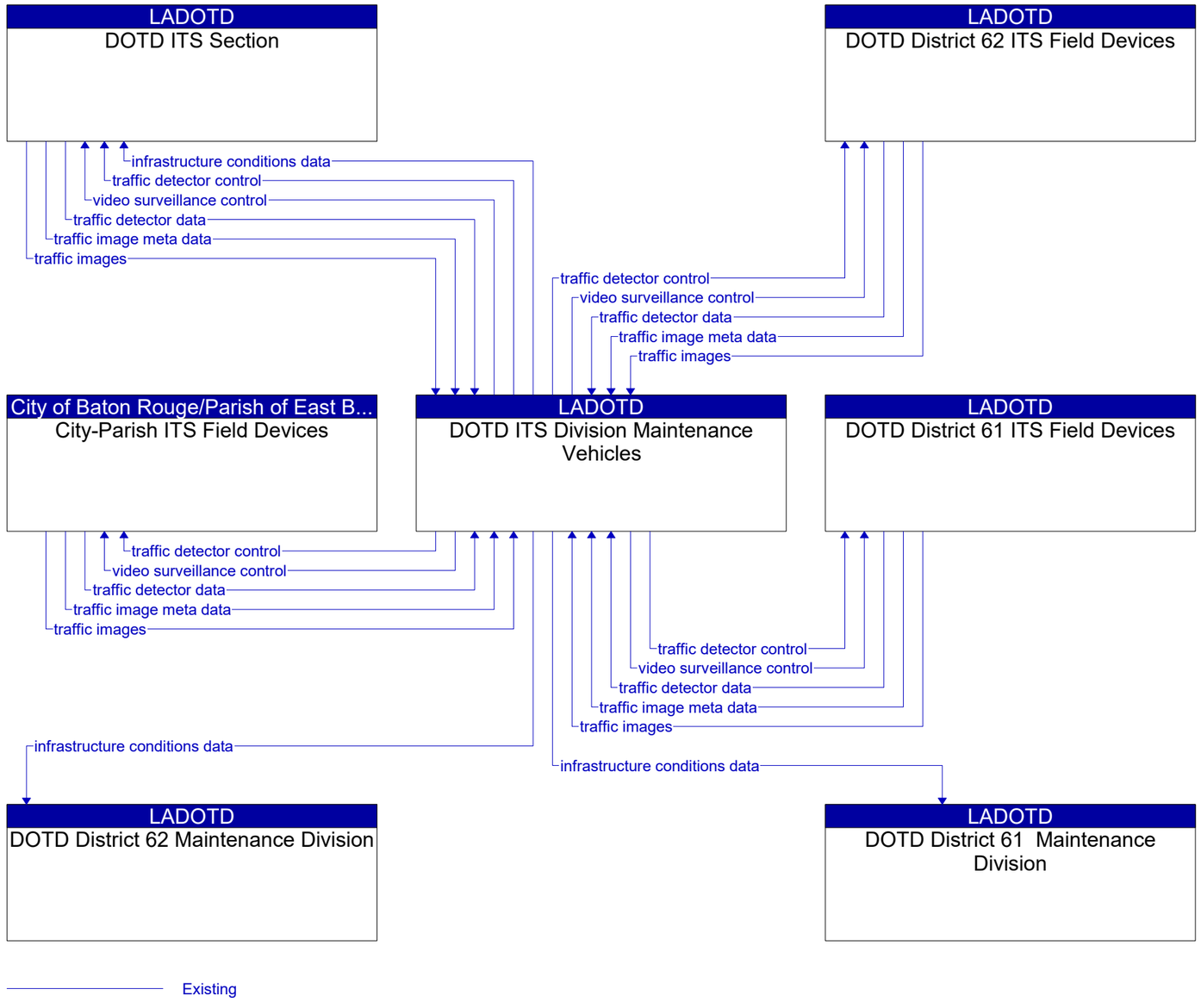

Figure 20: DOTD ITS Division Maintenance Vehicles Context Diagram

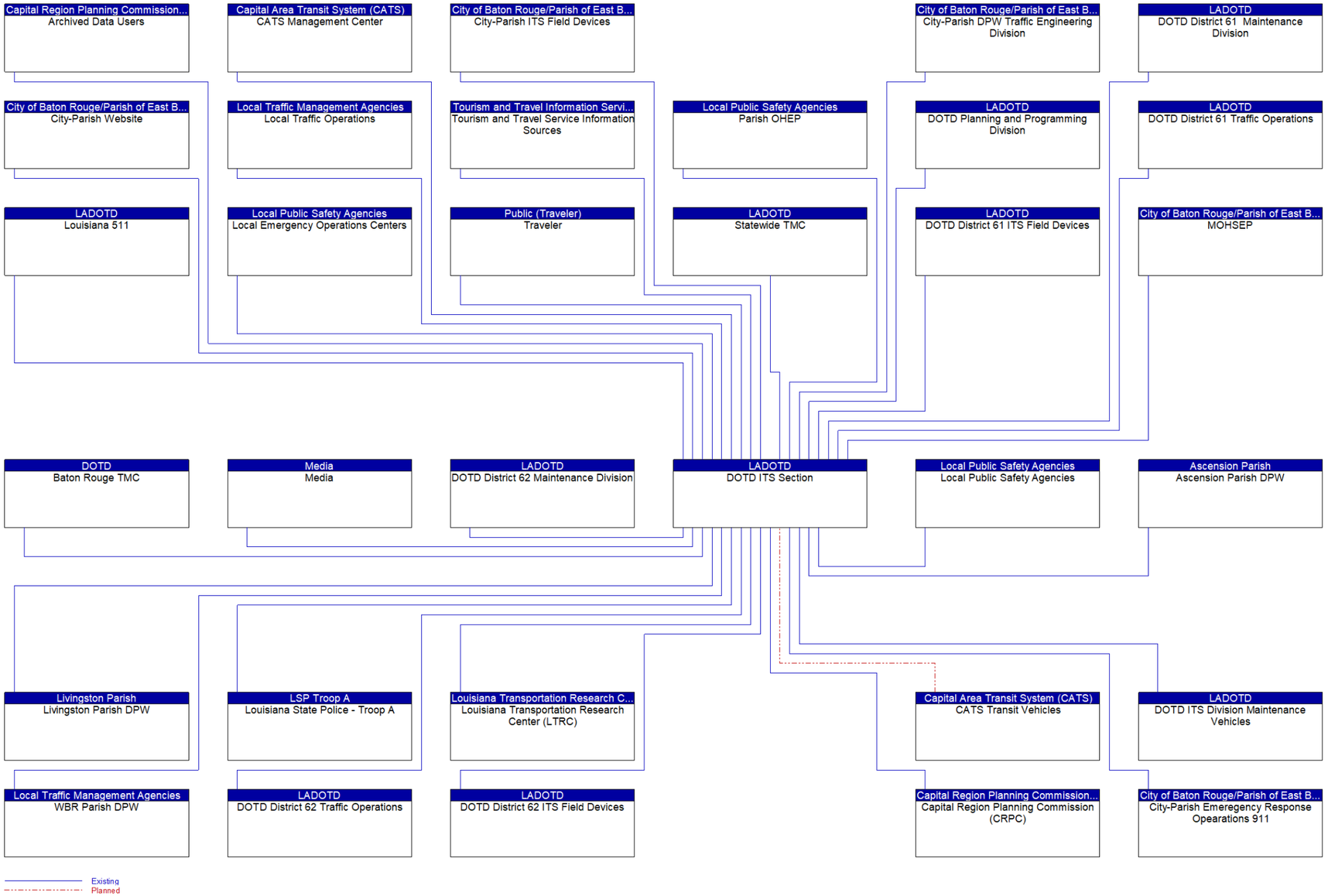

Figure 21: DOTD ITS Section Context Diagram

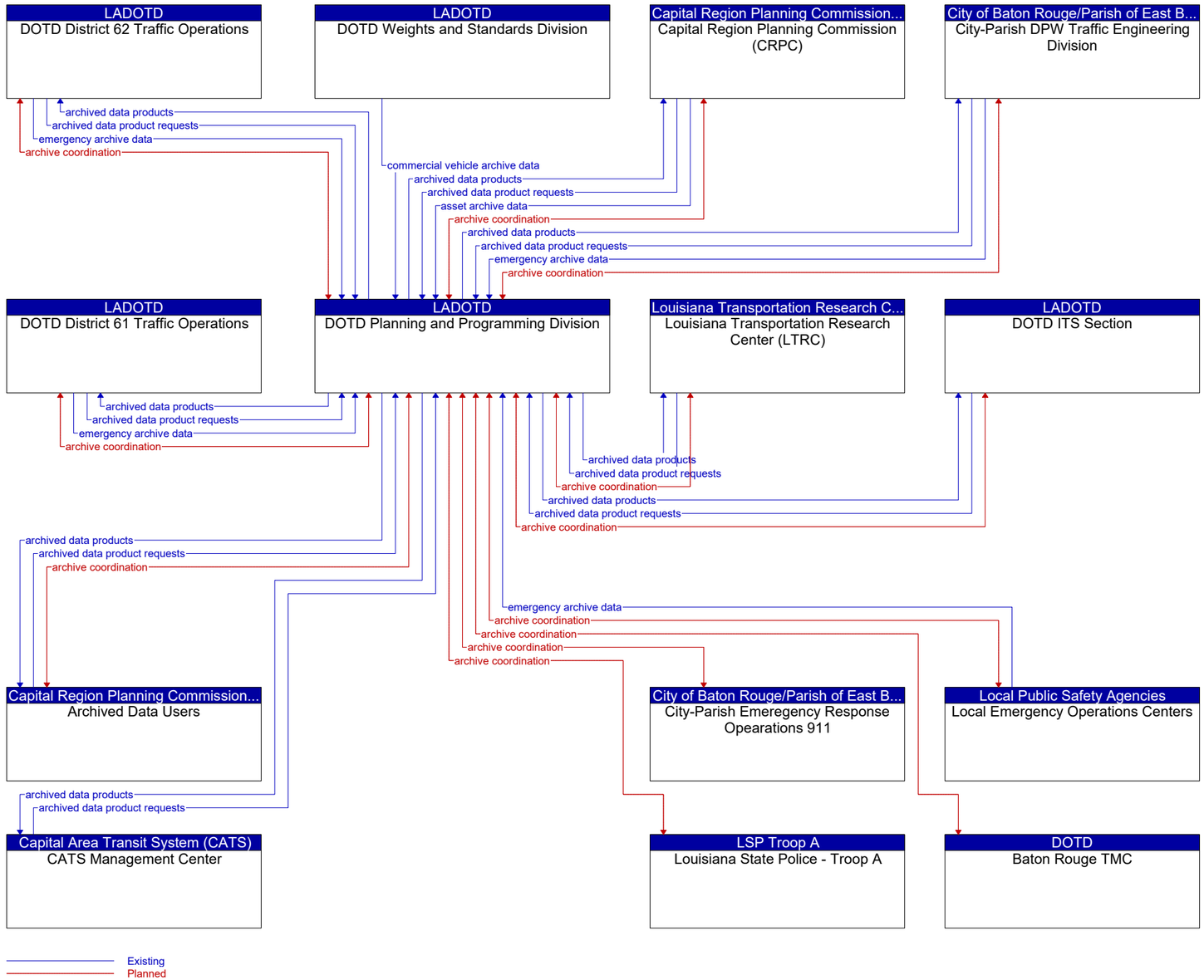

Figure 22: DOTD Planning and Programming Division Context Diagram

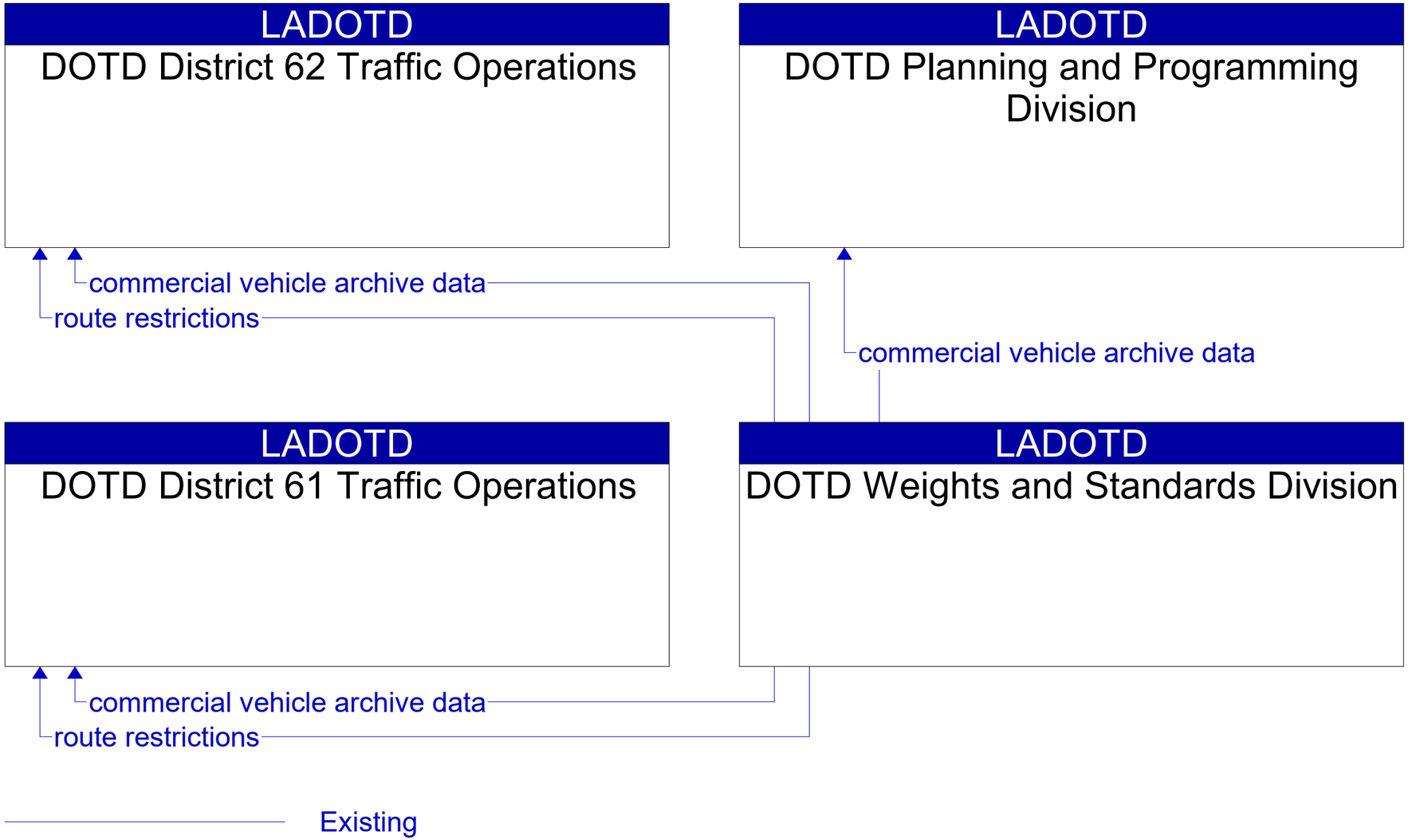

Figure 23: DOTD Weights and Standards Division Context Diagram

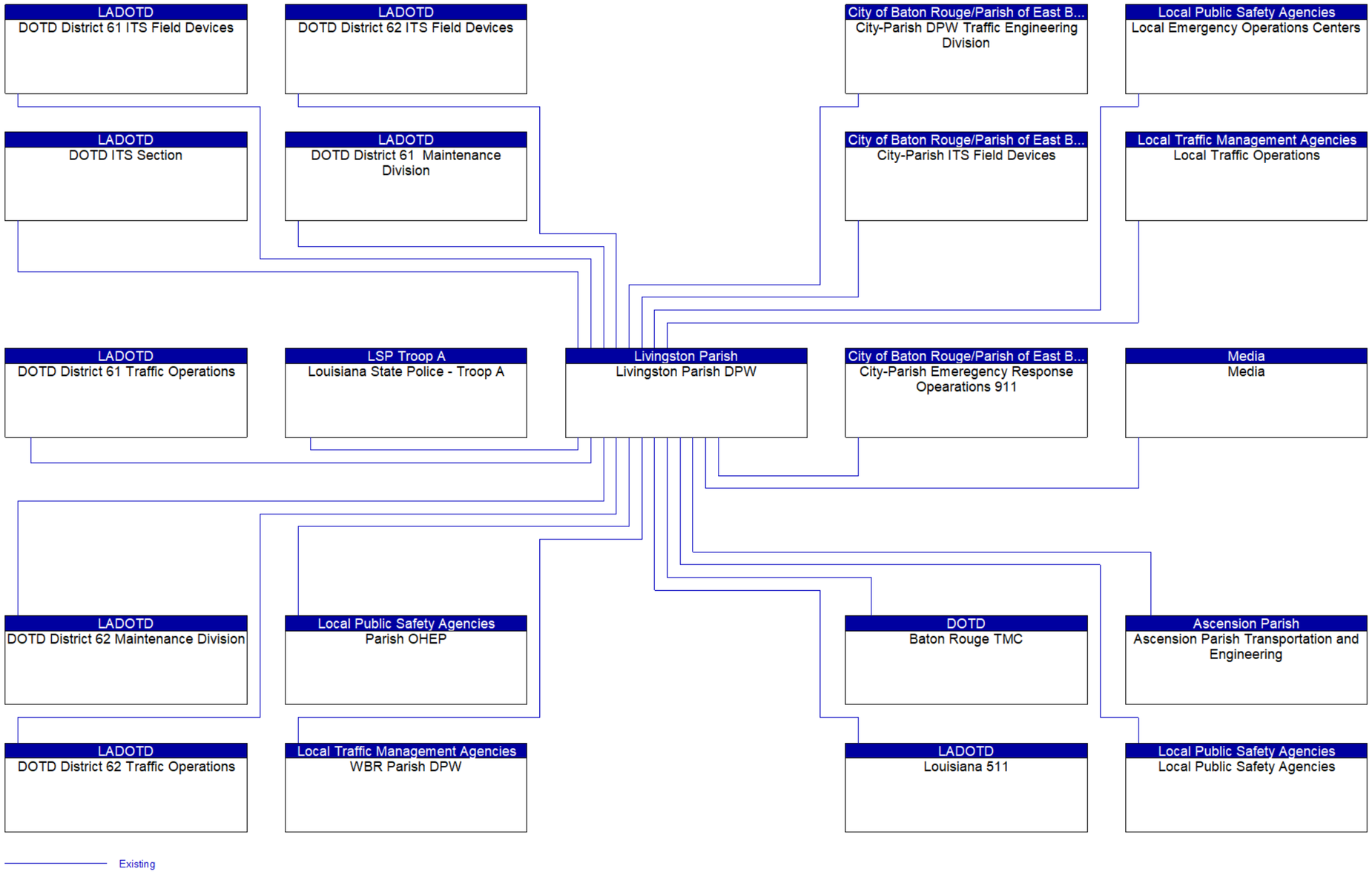

Figure 24: Livingston Parish DPW Context Diagram

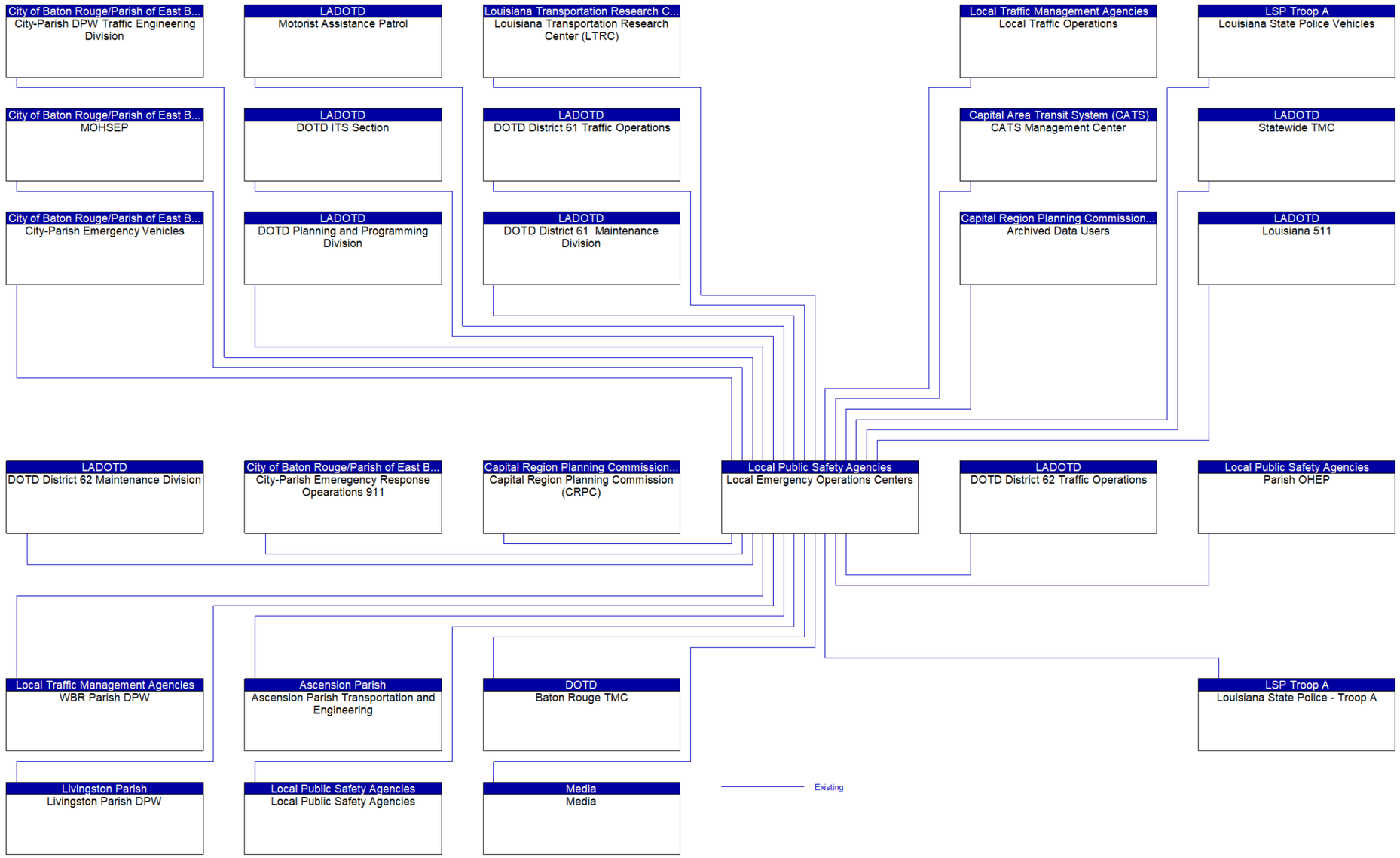

Figure 25: Local Emergency Operations Centers Context Diagram

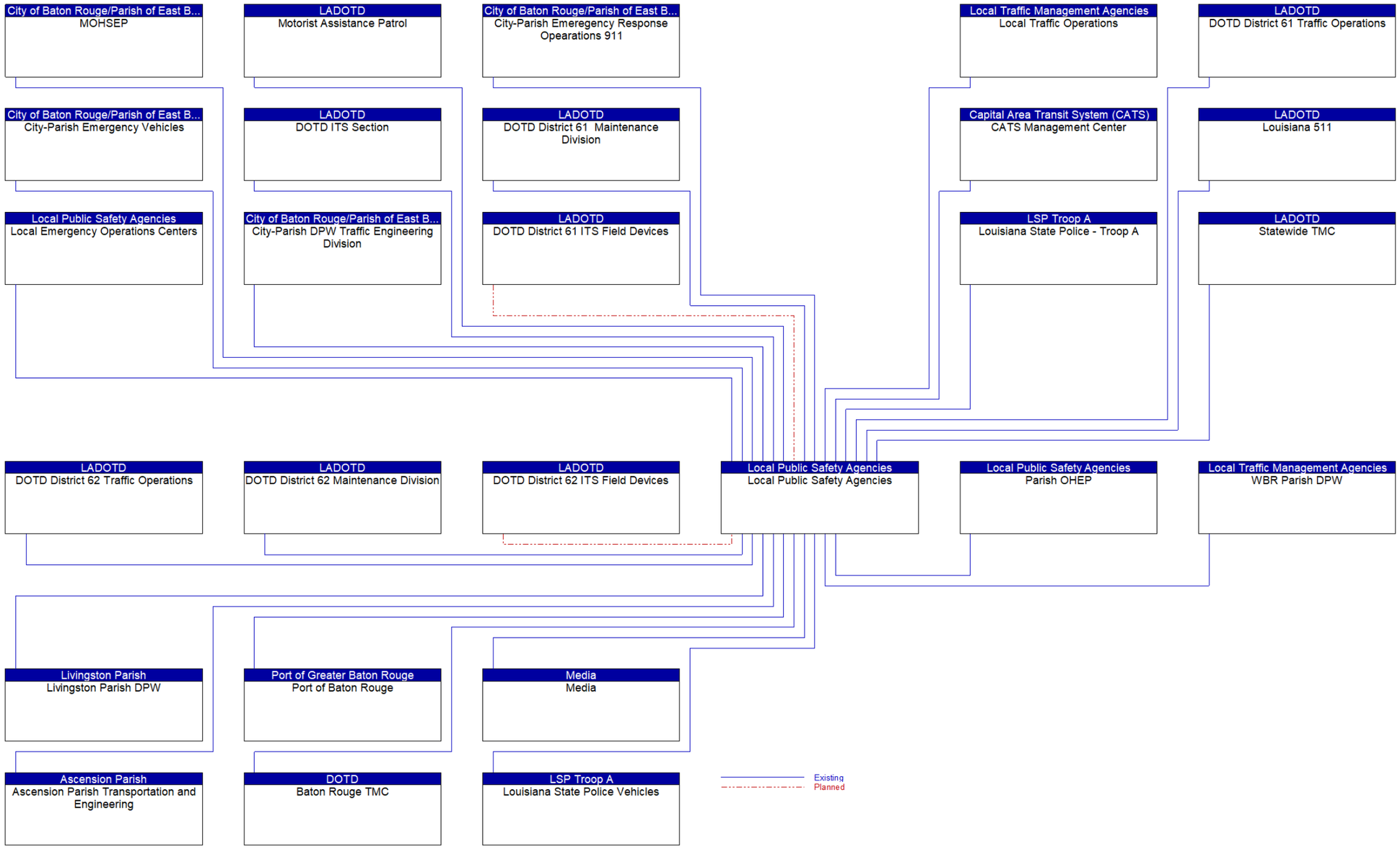

Figure 26: Local Public Safety Agencies Context Diagram

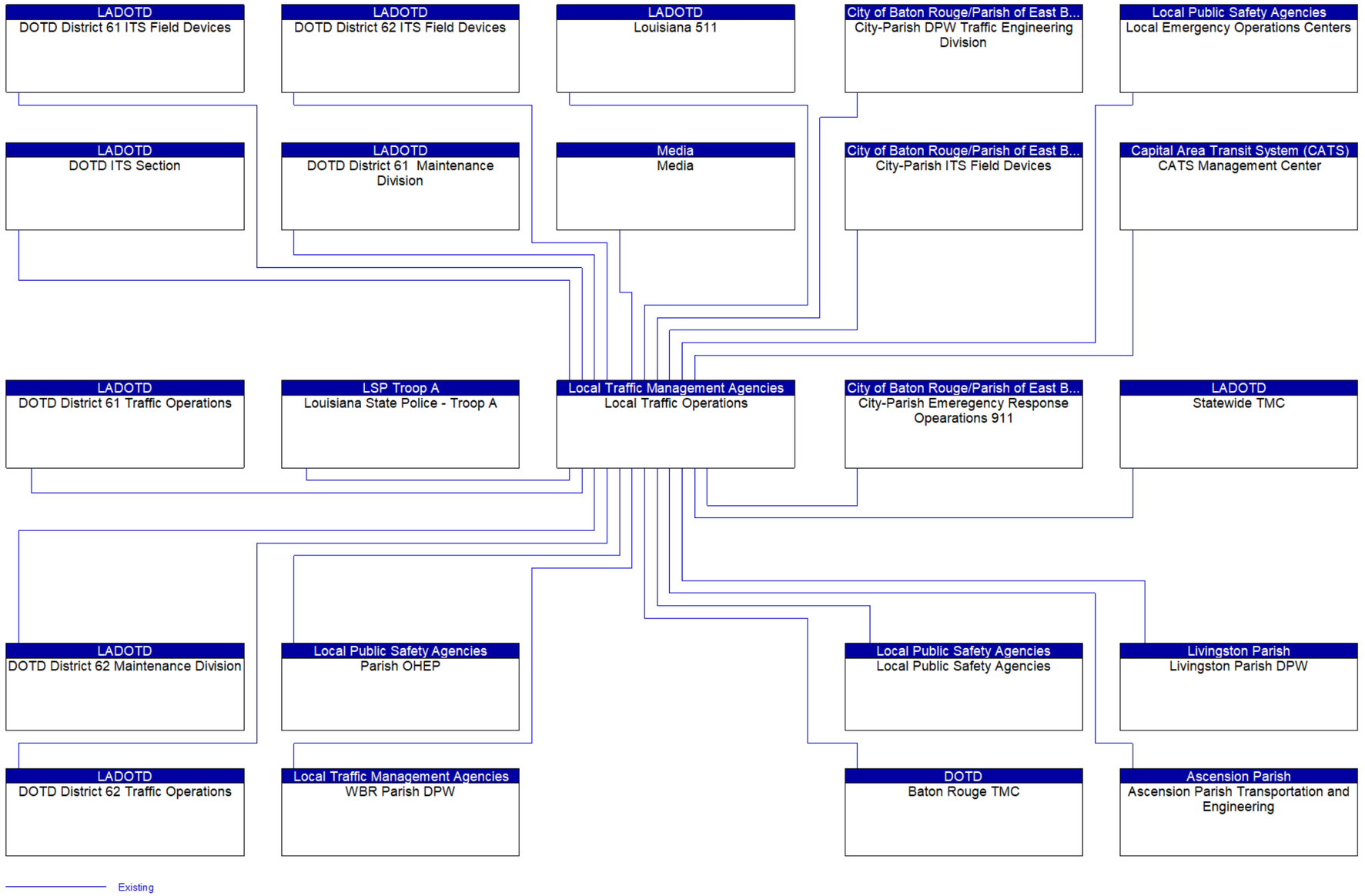

Figure 27: Local Traffic Operations Context Diagram

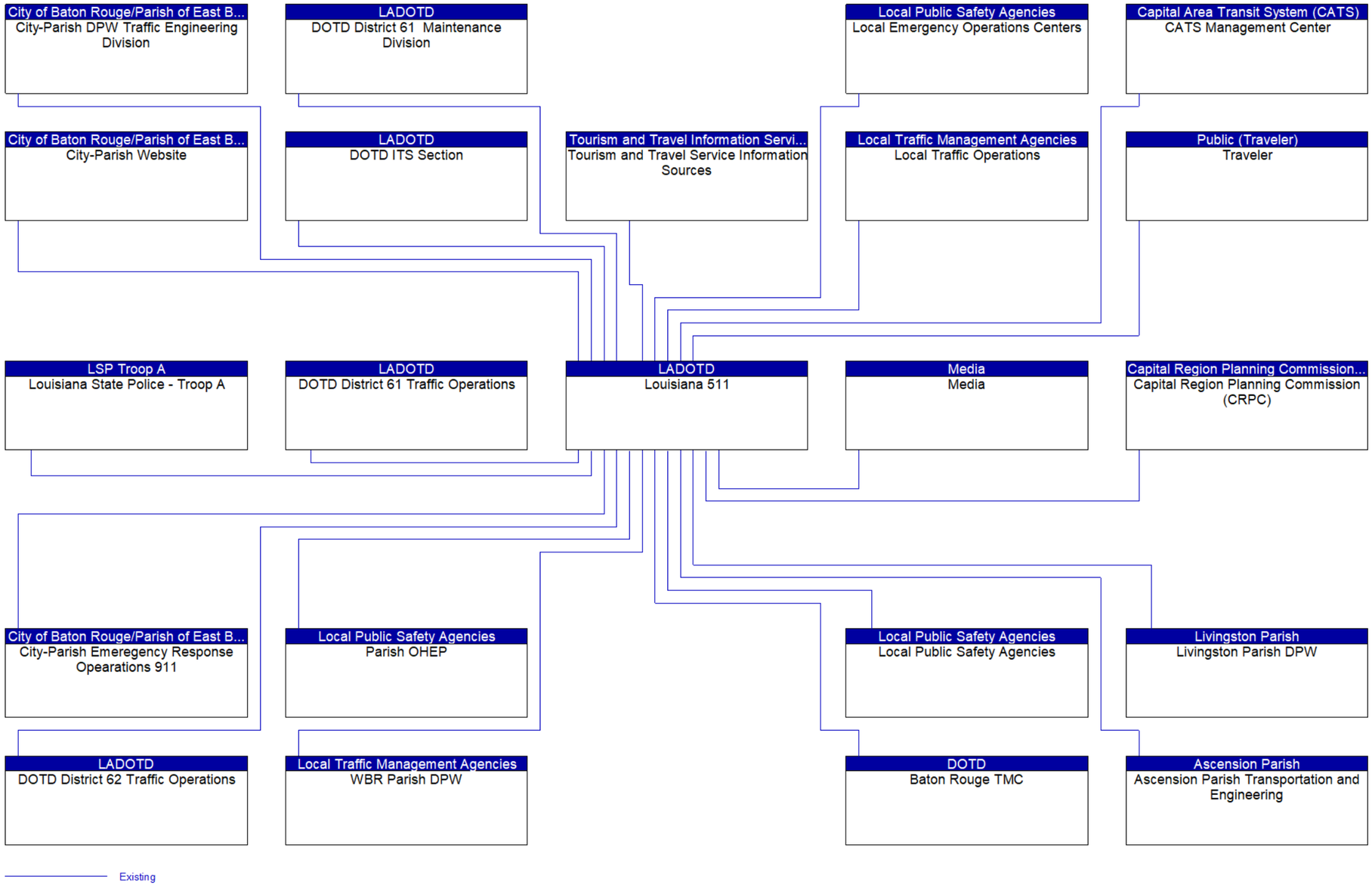

Figure 28: Louisiana 511 Context Diagram

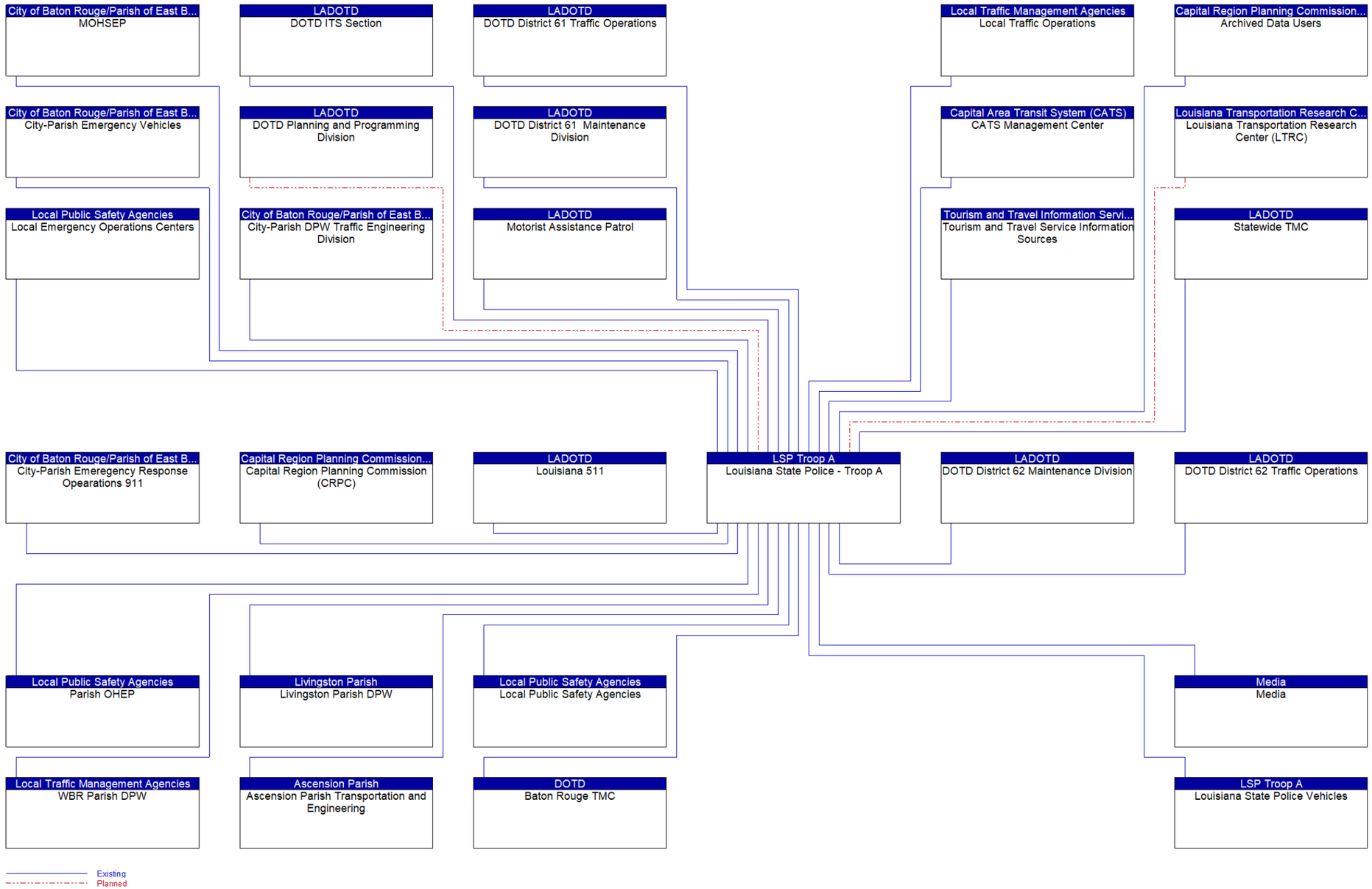

Figure 29: Louisiana State Police - Troop A Context Diagram

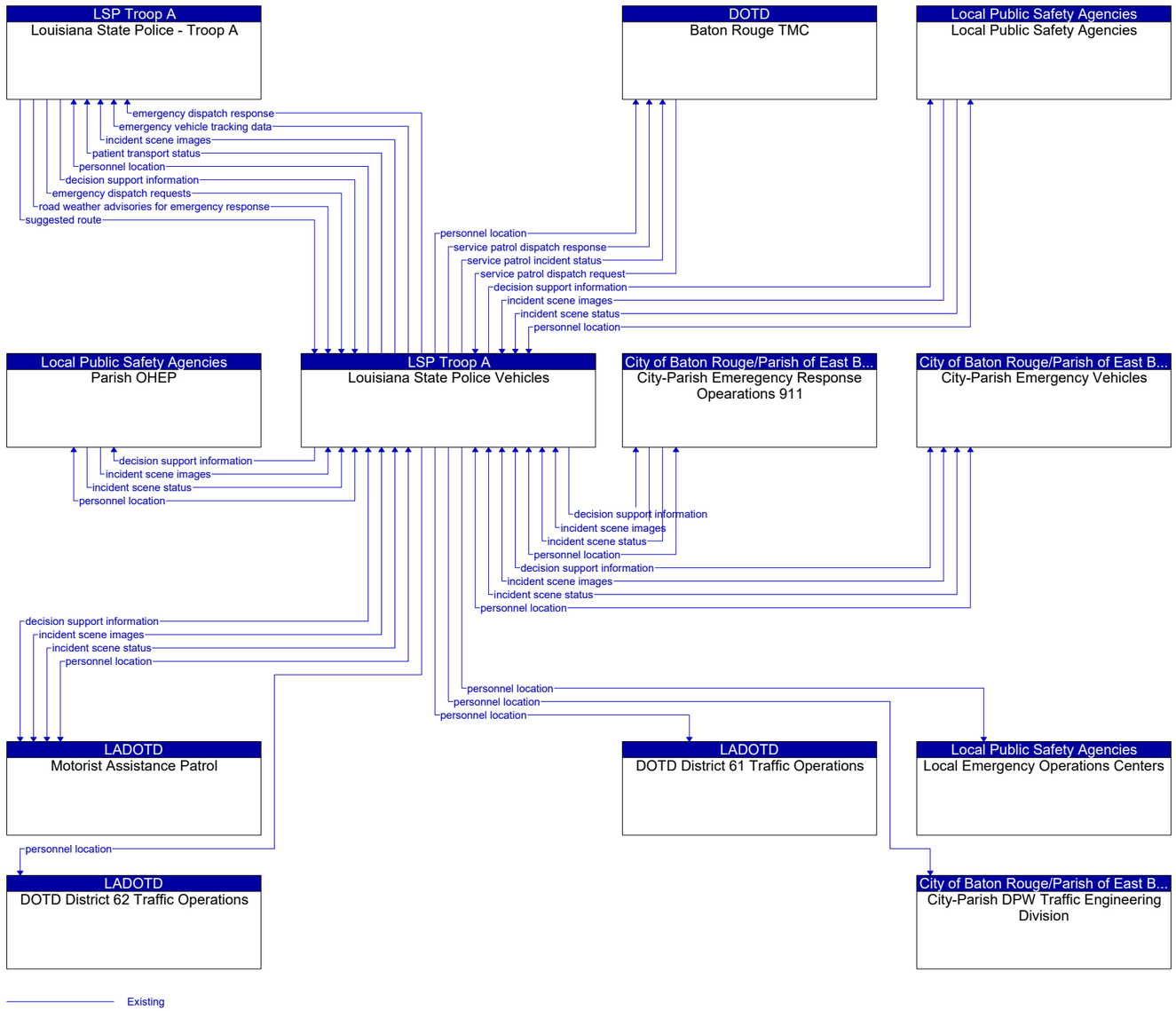

Figure 30: Louisiana State Police Vehicles Context Diagram

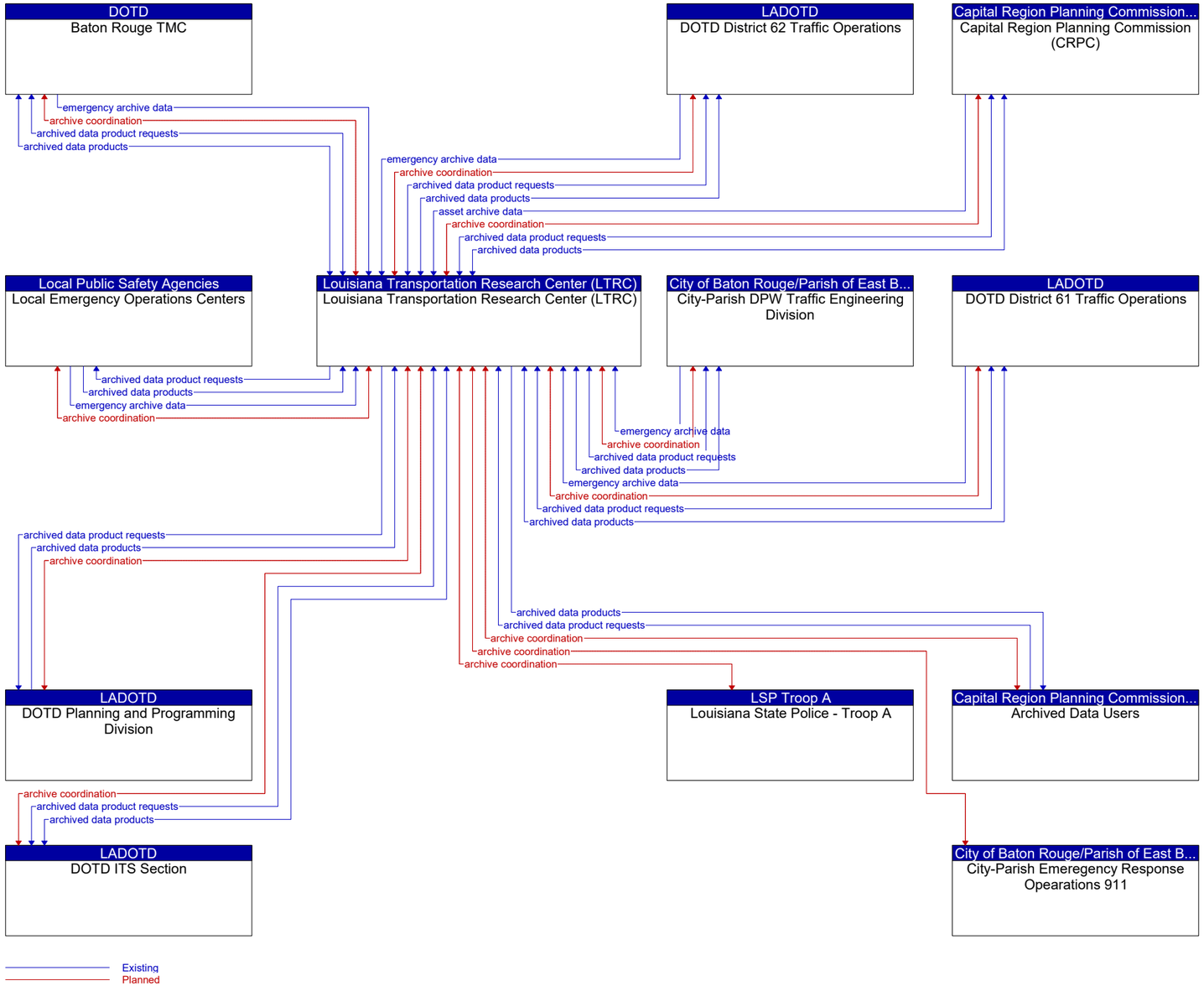

Figure 31: Louisiana Transportation Research Center (LTRC) Context Diagram

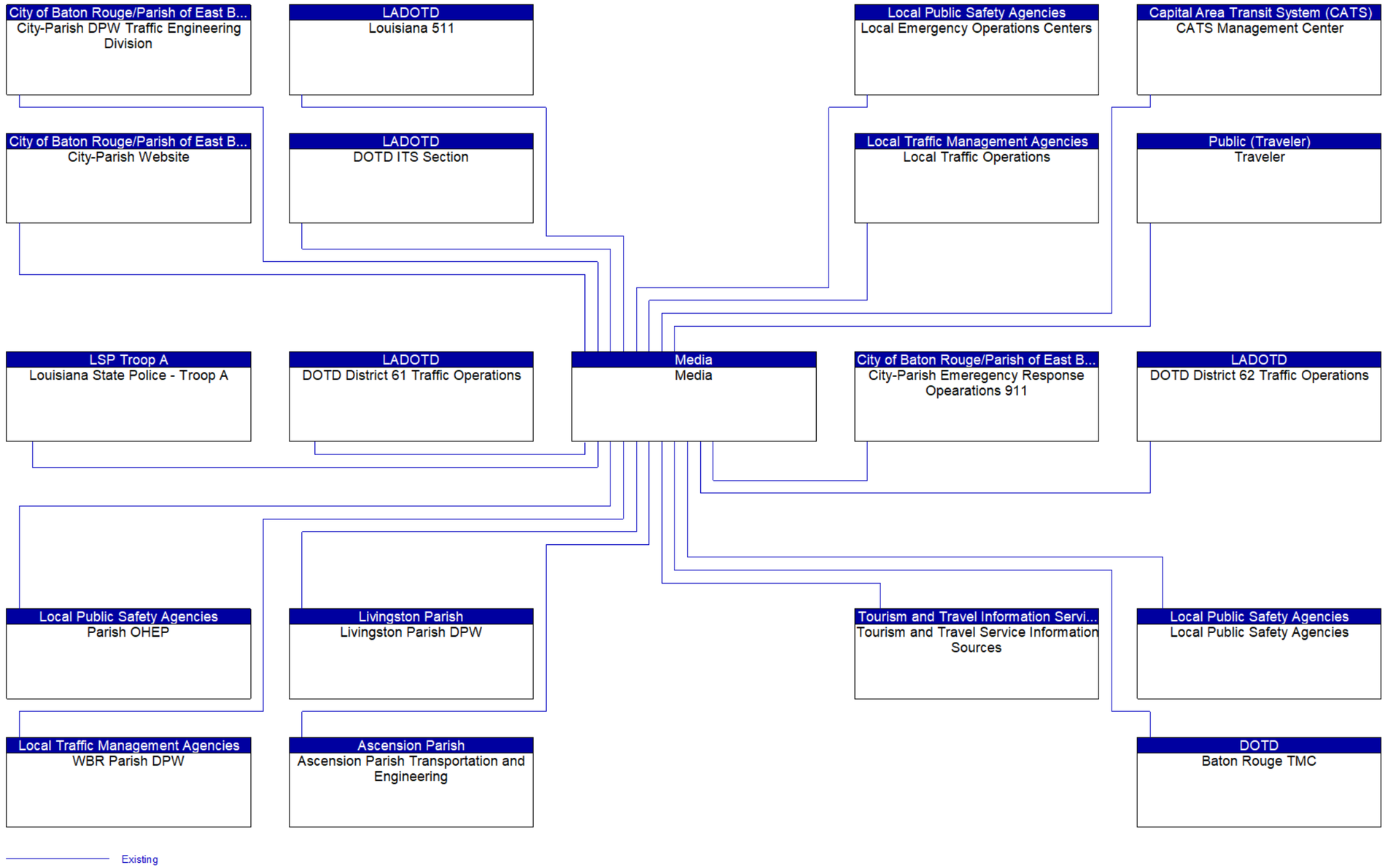

Figure 32: Media Context Diagram

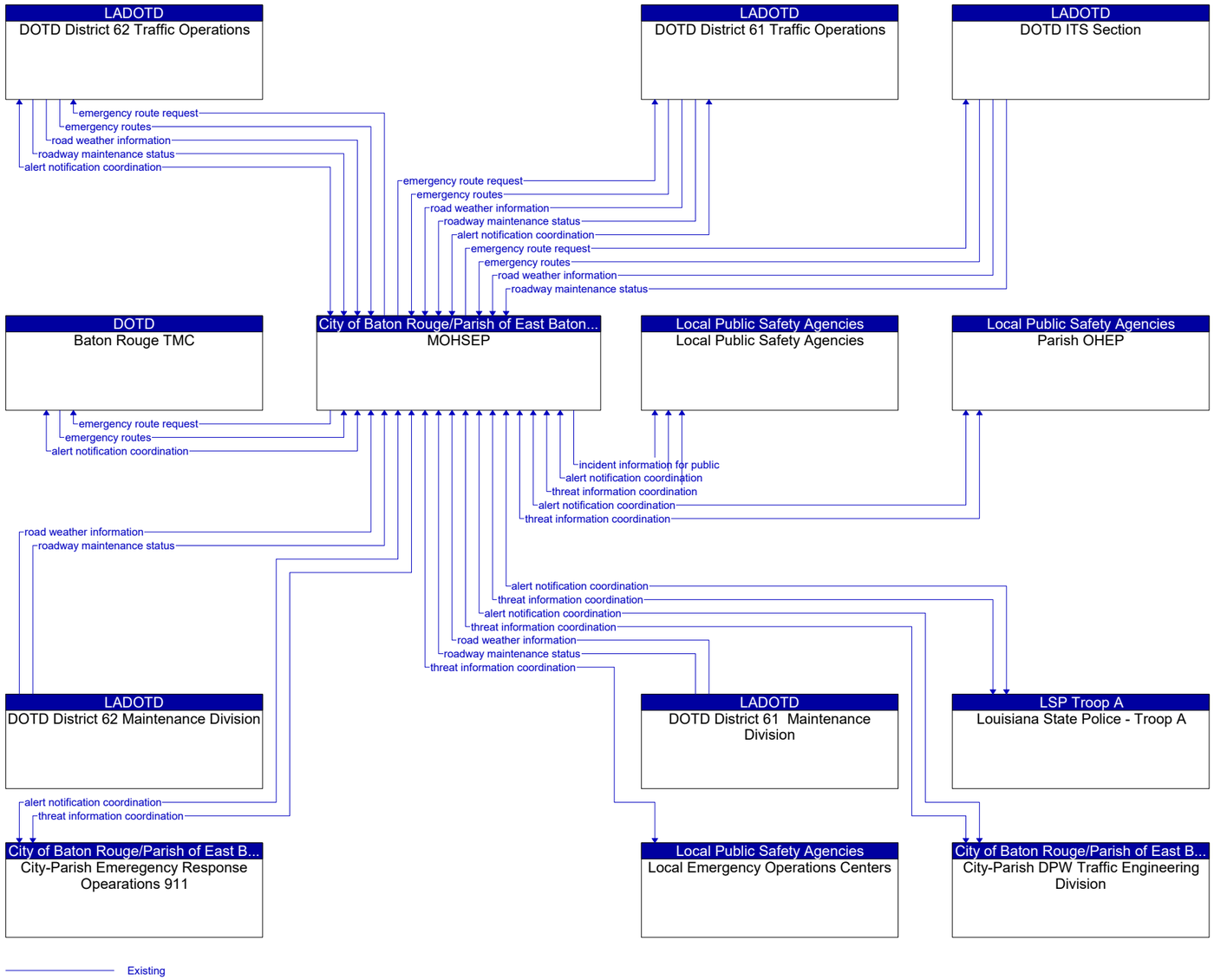

Figure 33: MOHSEP Context Diagram

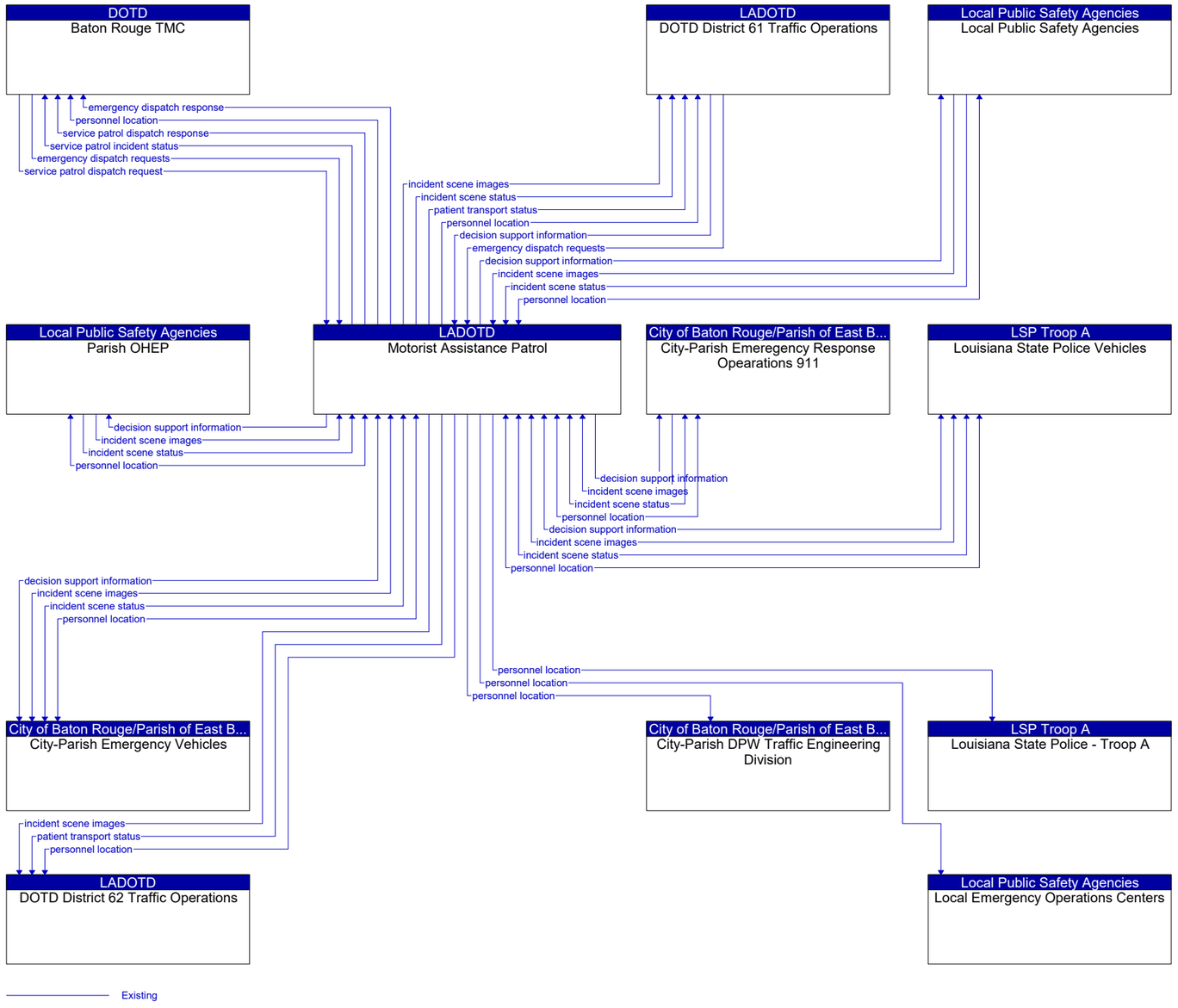

Figure 34: Motorist Assistance Patrol Context Diagram

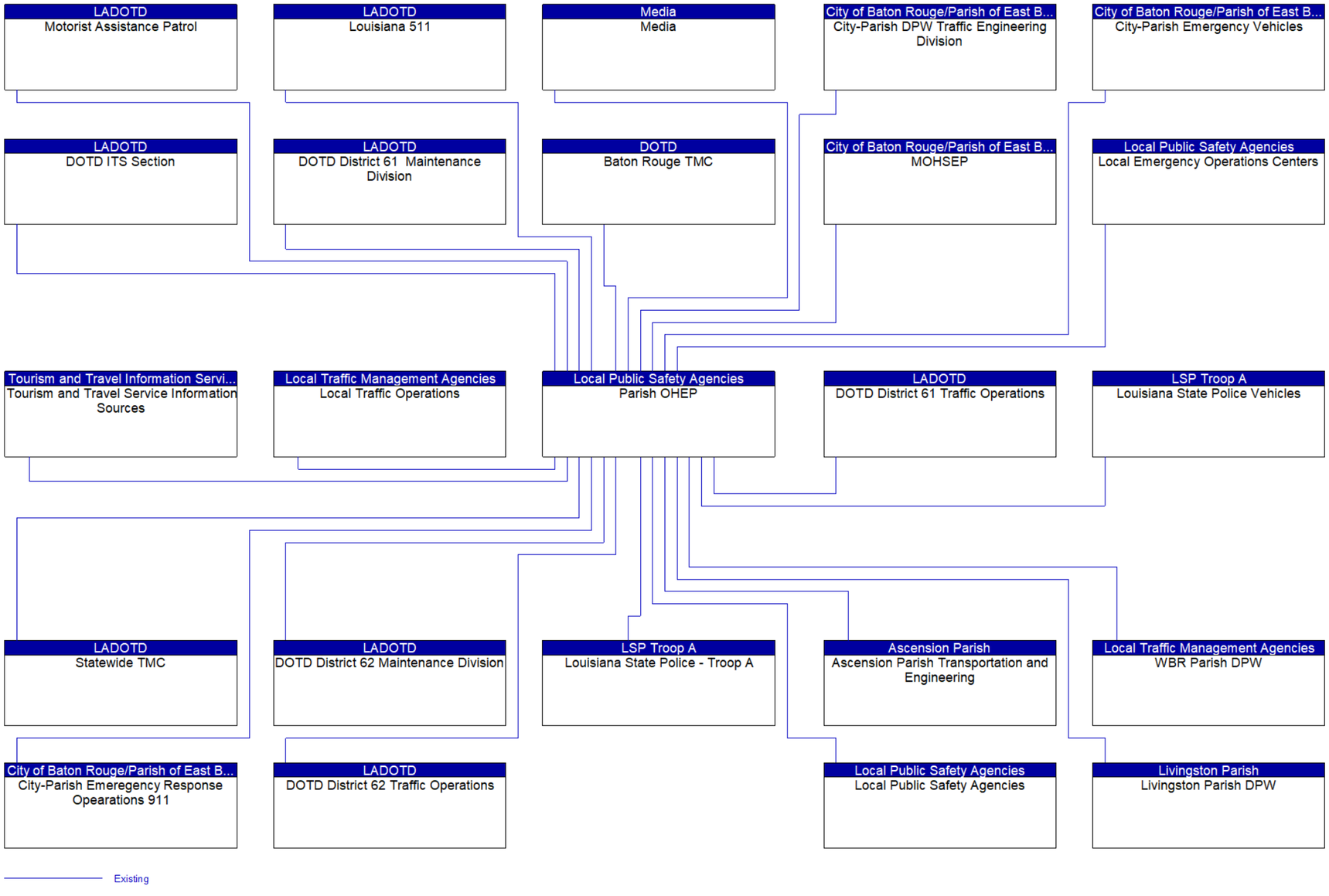

Figure 35: Parish OHEP Context Diagram

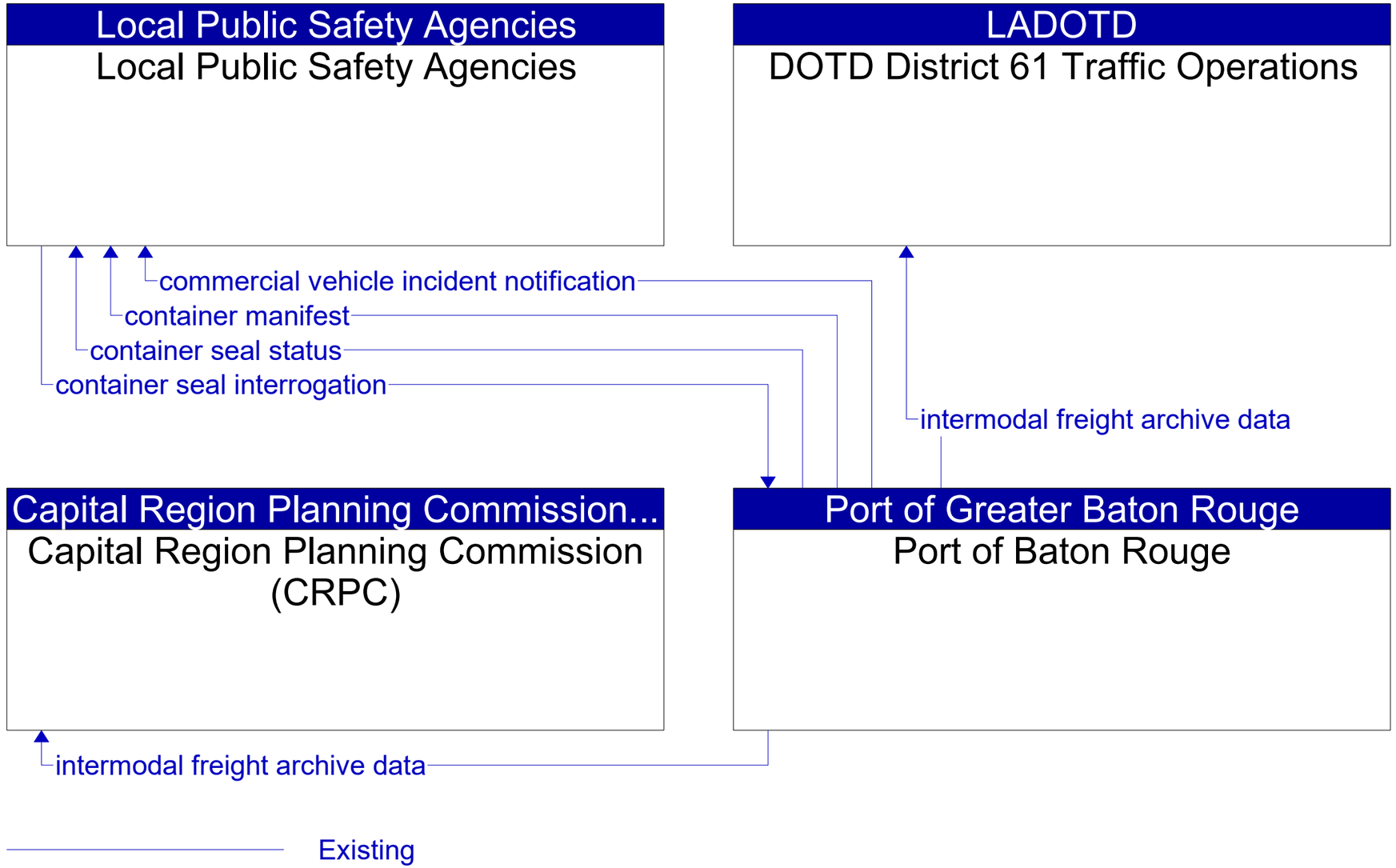

Figure 36: Port of Baton Rouge Context Diagram

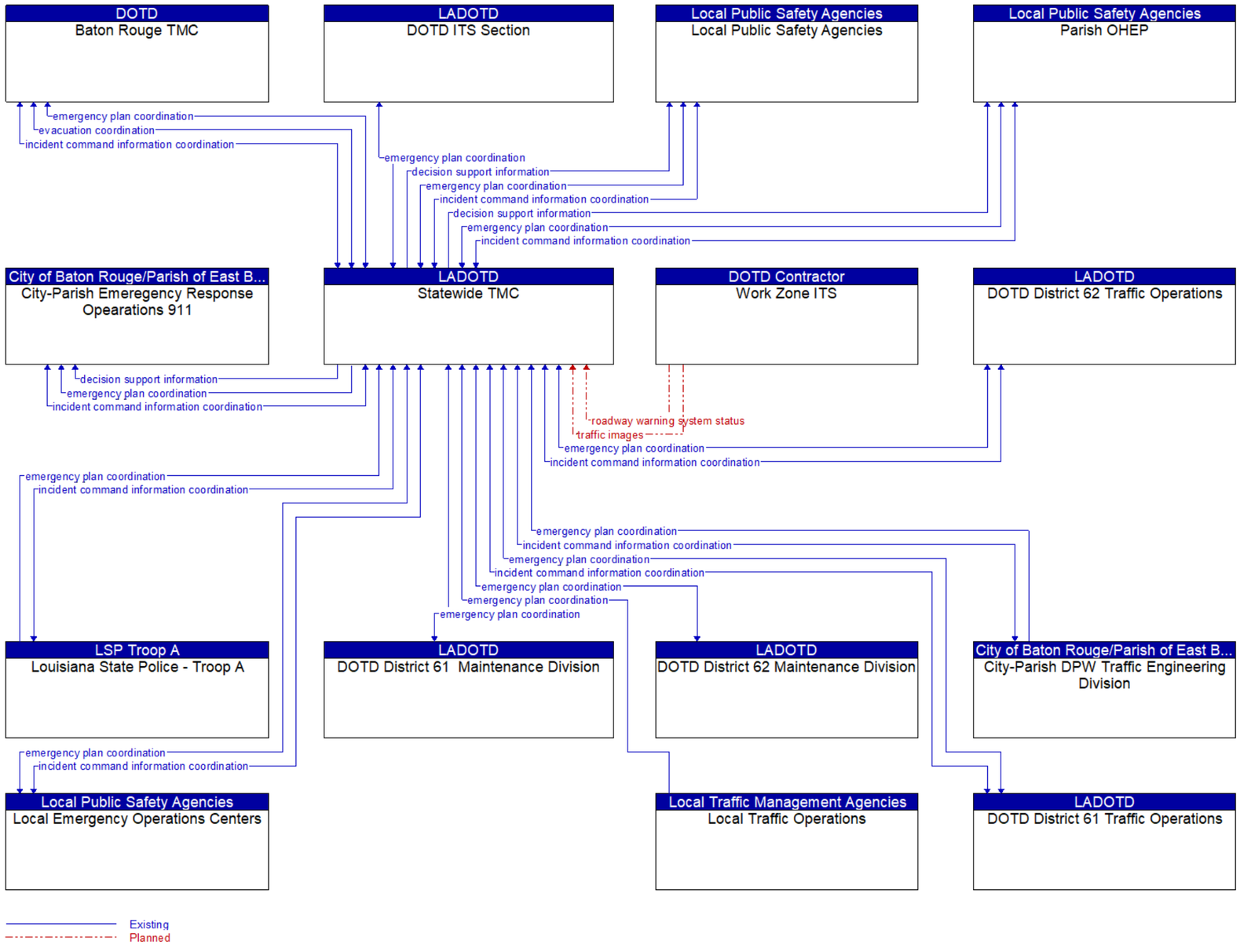

Figure 37: Statewide TMC Context Diagram

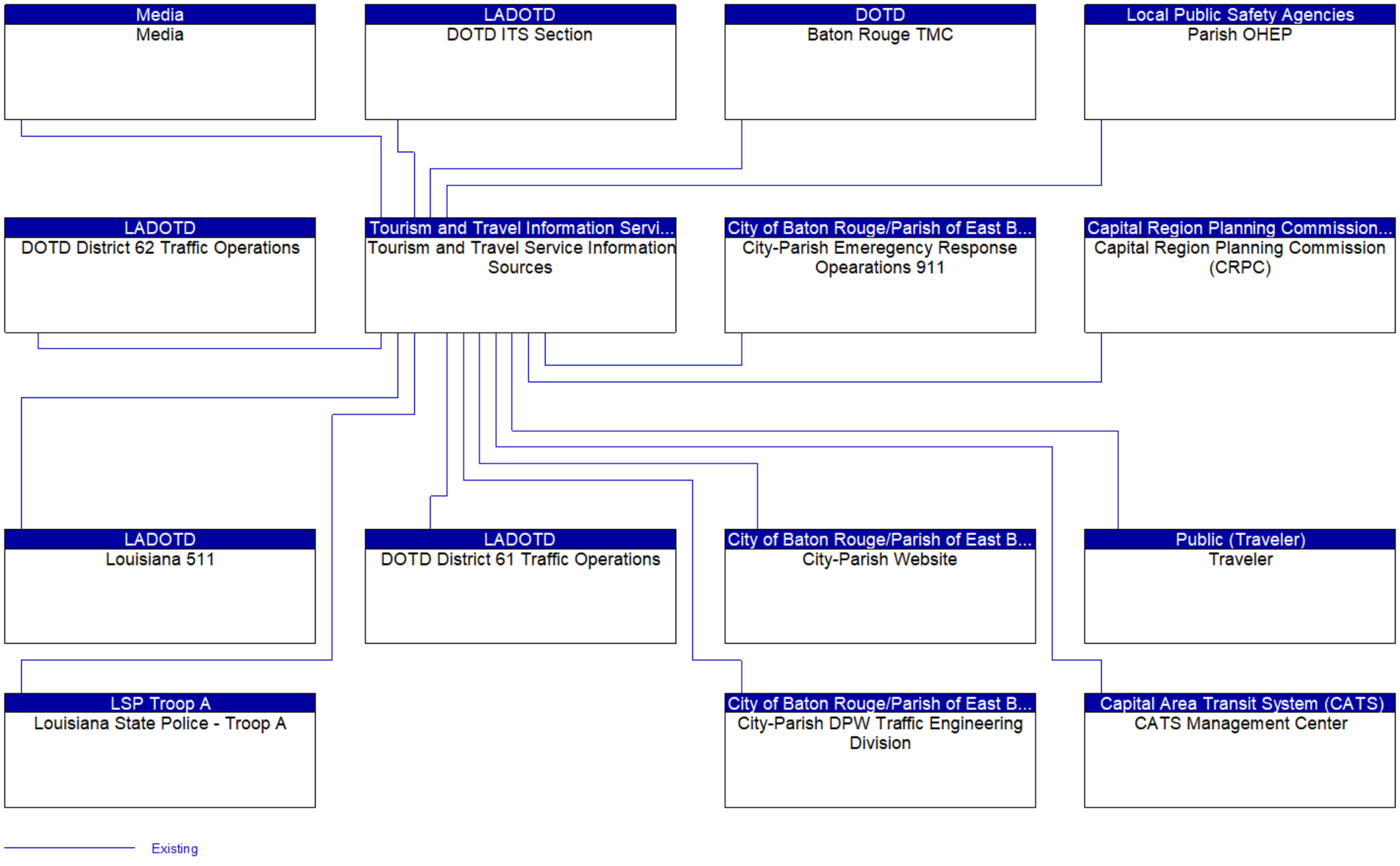

Figure 38: Tourism and Travel Service Information Sources Context Diagram

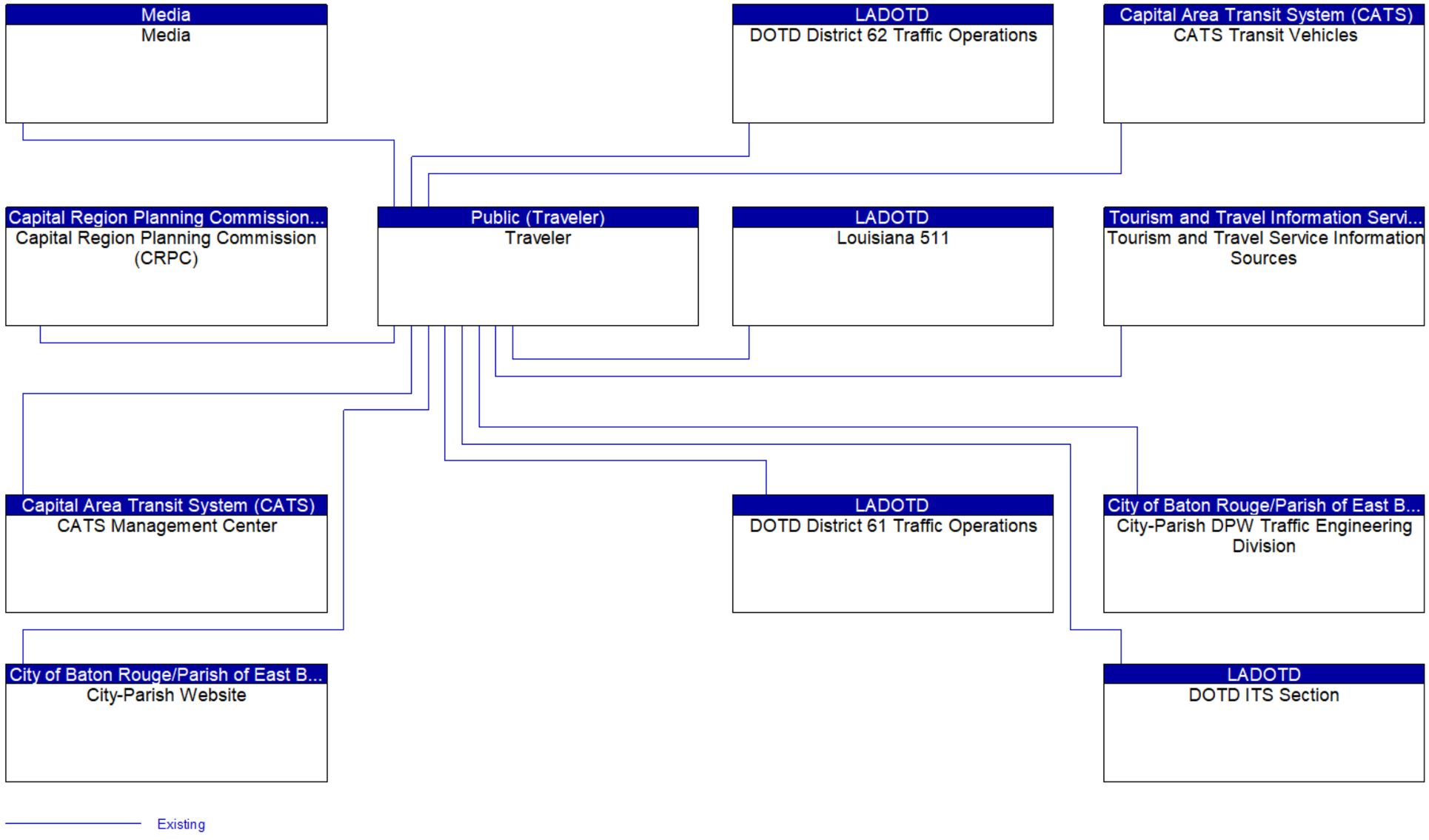

Figure 39: Traveler Context Diagram

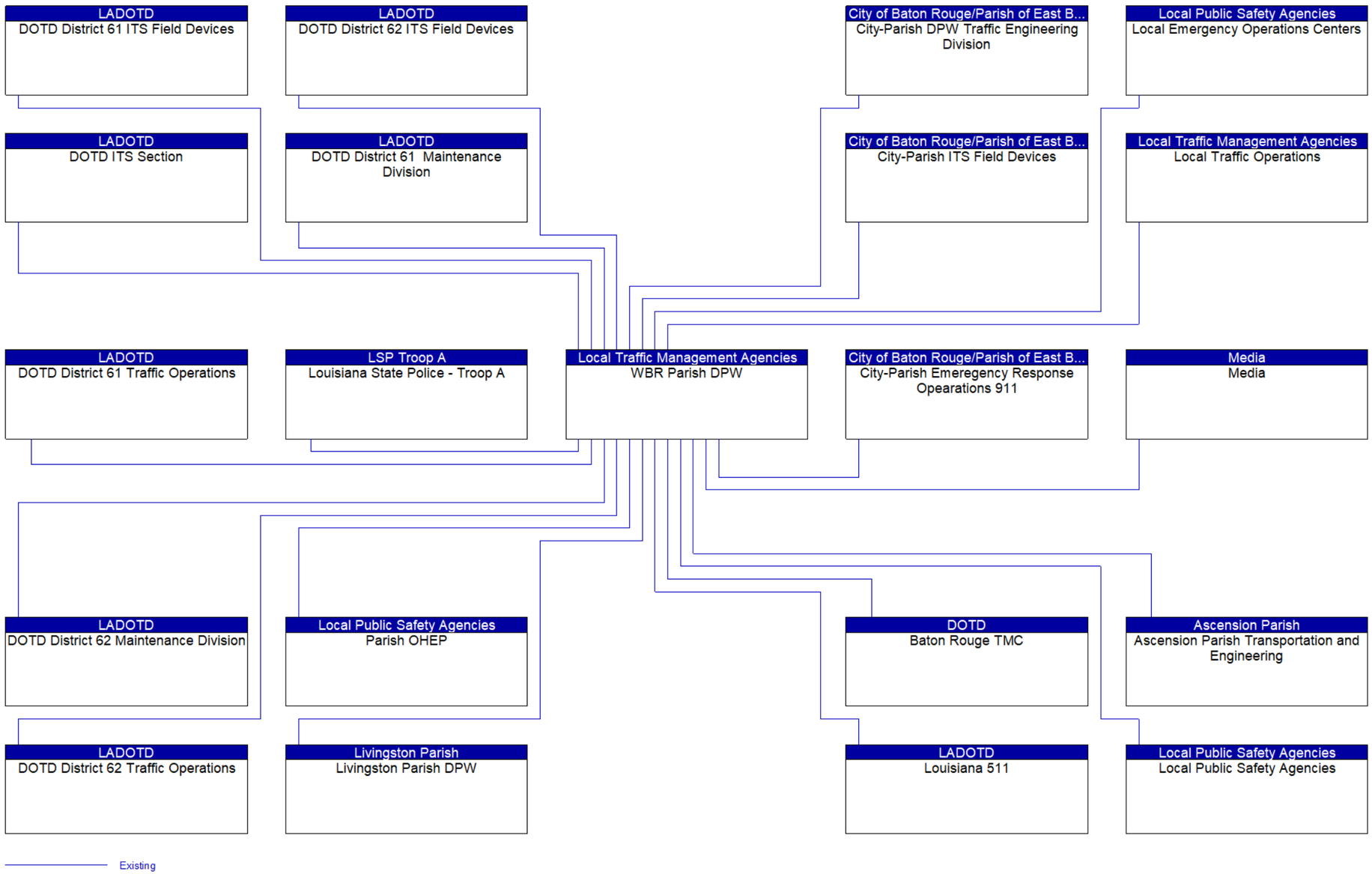

Figure 40: WBR Parish DPW Context Diagram

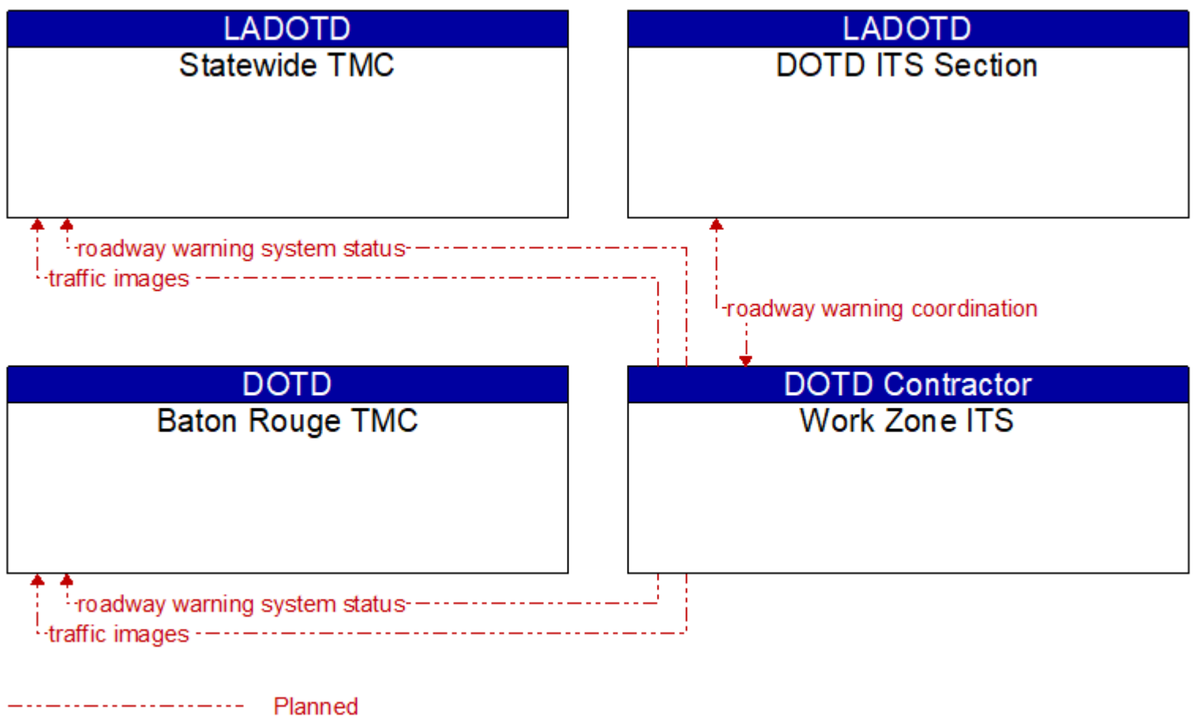

Figure 41: Work Zone ITS Flow Context Diagram

Table 44: Information Flow Definitions

Flow Name	Flow Description	Flow Type
advisory radio coordination	The direct flow of information between field equipment. This includes information used to initialize, configure, and control roadside highway advisory radio including message content and delivery attributes, local message store maintenance requests, control mode commands, status queries, and all other commands and associated parameters that support local monitoring and management of these systems.	Information
alarm acknowledge	Confirmation that alarm was received, instructions and additional information for the alarm initiator, and requests for additional information.	Information
alarm notification	Notification of activation of an audible or silent alarm by a traveler in a public area or by a transit vehicle operator using an on-board device.	Information
alert notification	Notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The flow identifies the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This flow may also identify specific information that should not be released to the public.	Information
alert notification coordination	Coordination of emergency alerts to be distributed to the public. This includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public and status of the public notification.	Information
alternate mode information	Schedule information for alternate mode transportation providers such as air, ferry, and passenger-carrying heavy rail. This also includes details of incidents and other service disruptions that have occurred in the alternative mode. This also includes measures of service demand that supports assessment of their impact on the road network.	Information
archive coordination	Catalog data, meta data, published data, and other information exchanged between archives to support data synchronization and satisfy user data requests.	Information
archive status	Notification that data provided to an archive contains erroneous, missing, or suspicious data or verification that the data provided appears valid. If an error has been detected, the offending data and the nature of the potential problem are identified.	Information
archived data product requests	A user-specified request for archived data products (i.e., data, meta data, or data catalogs). The request also includes information that is used to identify and authenticate the user and support electronic payment requirements, if any.	Request
archived data products	Raw or processed data, meta data, data catalogs and other data products provided to a user system upon request. The response may also include any associated transaction information.	Information
asset archive data	Information describing transportation assets including pavements, bridges, and all other infrastructure included in the transportation network. In addition, information can cover support assets (support equipment and systems, software, etc.). Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	Information
barrier system control	Information used to configure and control barrier systems that are represented by gates, barriers and other automated or remotely controlled systems used to manage entry to roadways.	Information
barrier system status	Current operating status of barrier systems. Barrier systems represent gates, barriers and other automated or remotely controlled systems used to manage entry to roadways. Status of the systems includes operating condition and current operational state.	Information
broadcast traveler information	General traveler information that contains traffic and road conditions, link travel times, incidents, advisories, restrictions, work zones, transit service information, weather information, parking information, and other related traveler information.	Information
care facility general status	General information about a care facility identifying the type, services available, service hours, and current general status (e.g., open or closed, accepting patients, accepting visitors) intended for public dissemination.	Information
commercial vehicle archive data	Information describing commercial vehicle travel and commodity flow characteristics. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	Information

Flow Name	Flow Description	Flow Type
commercial vehicle incident notification	Information about a Commercial Vehicle or Freight Equipment breach, non-permitted security sensitive hazmat detected at the roadside, route deviation, or Commercial Vehicle Driver / Commercial Vehicle / Freight Equipment assignment mismatches which includes the location of the Commercial Vehicle and appropriate identities. May carry information that enables incident reporting to responders, and also includes the type of vehicle and cargo concerned.	Information
container manifest	Official statement of the cargo held in a container.	Information
container seal interrogation	Customs inspection of the electronic seal on a container to verify the container has not been opened or tampered with; requires proper authentication.	Information
container seal status	The status of an electronic seal on a container, indicating sealing time, location, and authority, and any openings or tampering.	Information
current infrastructure restrictions	Restrictions levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions, and temporary facility restrictions that are imposed during maintenance and construction.	Information
data collection and monitoring control	Information used to configure and control data collection and monitoring systems.	Information
decision support information	Information provided to support effective and safe incident response, including local traffic, road, and weather conditions, hazardous material information, and the current status of resources (including vehicles, other equipment, supplies) that have been allocated to an incident.	Information
demand response passenger and use data	Data collected on board a demand response vehicle relating to the picking up and discharging of passengers.	Information
device control request	Request for device control action	Information
device data	Data from detectors, environmental sensor stations, roadside equipment, and traffic control devices, including device inventory information.	Information
device identification	An identifier and device type designation that is used to uniquely identify a device in the Connected Vehicle Environment.	Information
device status	Status information from devices	Information
dynamic bus lane request	Request for a restricted bus lane. May also describe affected services and include schedules with specific vehicle arrival times.	Request
dynamic bus lane status	Status of dynamic lane request, identifying if the request can be met, and the specific lane, start, end location, and time period where priority or exclusive access is to be granted.	Information
dynamic sign coordination	The direct flow of information between field equipment. This includes information used to initialize, configure, and control dynamic message signs. This flow can provide message content and delivery attributes, local message store maintenance requests, control mode commands, status queries, and all other commands and associated parameters that support local management of these devices. Current operating status of dynamic message signs is returned.	Information
emergency archive data	Logged emergency information including information that characterizes identified incidents (routine highway incidents through disasters), corresponding incident response information, evacuation information, surveillance data, threat data, and resource information. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	Information
emergency dispatch requests	Emergency vehicle dispatch instructions including incident location and available information concerning the incident.	Request
emergency dispatch response	Request for additional emergency dispatch information and provision of en route status.	Information
emergency plan coordination	Information that supports coordination of emergency management plans, continuity of operations plans, emergency response and recovery plans, evacuation plans, and other emergency plans between agencies. This includes general plans that are coordinated prior to an incident and shorter duration tactical plans that are prepared during an incident.	Information

Flow Name	Flow Description	Flow Type
emergency route request	Request for access routes for emergency response vehicles and equipment. This may be a request for ingress or egress routes or other emergency routes. It may also include a request for preemption/priority for the identified vehicle at all signalized intersections along the route.	Request
emergency routes	Suggested ingress and egress routes for access to and between the scene and staging areas or other specialized emergency access routes.	Information
emergency traffic coordination	Coordination supporting disaster response including evacuation and reentry. Includes coordination of special traffic control strategies that support efficient evacuation and reentry while protecting and optimizing movement of response vehicles and other resources responding to the emergency.	Information
emergency transit schedule information	Information on transit schedule and service changes that adapt the service to better meet needs of responders and the general public in an emergency situation, including special service schedules supporting evacuation.	Information
emergency transit service request	Request to modify transit service and fare schedules to address emergencies, including requests for transit services to evacuate people from and/or deploy response agency personnel to an emergency scene. The request may poll for resource availability or request pre-staging, staging, or immediate dispatch of transit resources.	Request
emergency transit service response	Response indicating changes to transit service, fares, and/or restrictions that will be made and status of transit resources to be deployed to support emergency response and/or evacuation.	Information
emergency traveler information	Public notification of an emergency such as a natural or man-made disaster, civil emergency, or child abduction. This flow also includes evacuation information including evacuation instructions, evacuation zones, recommended evacuation times, tailored evacuation routes and destinations, traffic and road conditions along the evacuation routes, traveler services and shelter information, and reentry times and instructions.	Information
emergency traveler information request	Request for alerts, evacuation information, and other emergency information provided to the traveling public.	Request
emergency vehicle tracking data	The current location and operating status of the emergency vehicle.	Information
environmental conditions data	Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) as measured and reported by fixed and/or mobile environmental sensors and aggregated by the data collector. Attributes relating to the data collection (and aggregation) are also included.	Information
environmental monitoring application info	Environmental monitoring application parameters and thresholds that control the filtering, aggregation, and range of measures that are collected, derived, and reported. This flow also supports remote control of the application so the application can be taken offline, reset, or restarted.	Information
environmental monitoring application status	Environmental monitoring application status reported by the RSE. This includes current operational state and status of the RSE and a record of system operation.	Information
environmental sensor data	Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) as measured and reported by fixed and/or mobile environmental sensors. Operational status of the sensors is also included.	Information
environmental sensors control	Data used to configure and control environmental sensors.	Information
environmental situation data	Aggregated and filtered vehicle environmental data collected from vehicle safety and convenience systems including measured air temperature, exterior light status, wiper status, sun sensor status, rain sensor status, traction control status, anti-lock brake status, and other collected vehicle system status and sensor information. This information flow represents the aggregated and filtered environmental data sets that are provided by the RSE to the back office center. Depending on the RSE configuration and implementation, the data set may also include environmental sensor station data collected by the RSE.	Information
equipment maintenance request	Identification of field equipment requiring repair and known information about the associated faults.	Information

Flow Name	Flow Description	Flow Type
equipment maintenance status	Current status of field equipment maintenance actions.	Information
evacuation assistance information	Information on evacuation resources including self-evacuation options, anticipated pickup time and location if a transportation asset is to be deployed, destination shelter, and supporting information on what to bring, estimated reentry date/time.	Information
evacuation assistance request	A request for evacuation assistance, which may be registered in advance or issued during an evacuation. It specifies the location, number of people that need to be evacuated, and any special needs/requirements.	Request
evacuation coordination	Coordination of information regarding a pending or in-process evacuation. Includes evacuation zones, evacuation times, evacuation routes, forecast network conditions, and reentry times.	Information
event information	Special event information for travelers. This would include a broader array of information than the similar "event plans" that conveys only information necessary to support traffic management for the event.	Information
external reports	Traffic and incident information that is collected by the media through a variety of mechanisms (e.g., radio station call-in programs, air surveillance).	Information
field equipment status	Reports from field equipment (sensors, signals, signs, controllers, etc.) which indicate current operational status.	Information
incident command information coordination	Information that supports local management of an incident. It includes resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response.	Information
incident information	Notification of existence of incident and expected severity, location, time and nature of incident. As additional information is gathered and the incident evolves, updated incident information is provided. Incidents include any event that impacts transportation system operation ranging from routine incidents (e.g., disabled vehicle at the side of the road) through large-scale natural or human-caused disasters that involve loss of life, injuries, extensive property damage, and multi-jurisdictional response. This also includes special events, closures, and other planned events that may impact the transportation system.	Information
incident information for public	Report of current desensitized incident information prepared for public dissemination.	Information
incident response coordination	Incident response procedures and current incident response status that are shared between allied response agencies to support a coordinated response to incidents. This flow provides current situation information, including a summary of incident status and its impact on the transportation system and other infrastructure, and current and planned response activities. This flow also coordinates a positive hand off of responsibility for all or part of an incident response between agencies.	Information
incident scene images	Real time images or video of an incident scene. This flow includes the images or video and meta data that describes the images.	Information
incident scene status	Information gathered at the incident site that more completely characterizes the incident and provides current incident response status.	Information
infrastructure conditions data	Current condition of pavement, bridges, culverts, signs, and other roadway infrastructure as measured by on-board sensors or read from infrastructure-based sensors. The data may include raw data or images (e.g., photo logs) that indicate the current status of the infrastructure.	Information
interactive traveler information	Traveler information provided in response to a traveler request. The provided information includes traffic and road conditions, advisories, incidents, restrictions, payment information, transit services, parking information, weather information, and other travel-related data updates and confirmations.	Information
intermodal freight archive data	Information describing demand at intermodal freight terminals including loading/unloading activities of trailers and containers. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	Information
intersection control status	Status data provided by the traffic signal controller including phase information, alarm status, and priority/preempt status.	Information

Flow Name	Flow Description	Flow Type
intersection geometry	The physical geometry of an intersection covering the location and width of each approaching lane, egress lane, and valid paths between approaches and egresses. This flow also defines the location of stop lines, cross walks, specific traffic law restrictions for the intersection (e.g., turning movement restrictions), and other elements that support calculation of a safe and legal vehicle path through the intersection.	Information
intersection management application info	Intersection and device configuration data, including intersection geometry, and warning parameters and thresholds. This flow also supports remote control of the application so the application can be taken offline, reset, or restarted.	Information
intersection management application status	Infrastructure application status reported by the RSE. This includes current operational state and status of the RSE and a log of operations.	Information
intersection status	Current signal phase and timing information for all lanes at a signalized intersection. This flow identifies active lanes and lanes that are being stopped and specifies the length of time that the current state will persist for each lane. It also identifies signal priority and preemption status and pedestrian crossing status information where applicable.	Information
lane management control	Information used to configure and control dynamic lane management systems.	Information
lane management coordination	The direct flow of information between field equipment. This includes information used to configure and control dynamic lane management systems and the status of managed lanes including current operational state, violations, and logged information. This also includes lane usage information including both traditional traffic flow measures and special information associated with managed lanes such as measured passenger occupancies. It also includes the operational status of the lane management equipment.	Information
lane management information	System status of managed lanes including current operational state, violations, and logged information. This includes lane usage information including both traditional traffic flow measures and special information associated with managed lanes such as measured passenger occupancies. It also includes the operational status of the lane management equipment.	Information
local priority request coordination	The direct flow of information between field equipment. This includes notification of crossing calls from pedestrians and other vulnerable road users and requests for signal prioritization or preemption, and any other request for right-of-way at an intersection. The status of the priority request is also shared. For vulnerable road users, this includes information provided to guide and warn vulnerable road users at crossings including crossing permission status and crossing time remaining.	Information
local signal priority request	Request from a vehicle to a signalized intersection for priority at that intersection. This flow also allows the vehicle to cancel a priority request (for example, when the vehicle clears the intersection).	Information
local traveler information	Traveler information including traffic, road, and weather conditions for a particular locality. This flow includes the location-specific traveler information and time effectivity of the information.	Information
maint and constr resource coordination	Request for road maintenance and construction resources that can be used in the diversion of traffic (cones, portable signs), clearance of a road hazard, repair of ancillary damage, or any other incident response.	Information
maint and constr work plans	Future construction and maintenance work schedules and activities including anticipated closures with anticipated impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	Information
parking information	General parking information and status, including current parking availability, parking pricing, and parking space availability information.	Information
passive vehicle monitoring control	Control commands used to control detection systems that rely on infrastructure-based identification of individual vehicles to measure travel times and other related measures by identifying the same vehicle at different points in the network. Related technologies include Bluetooth readers and license plate recognition systems.	Information

Flow Name	Flow Description	Flow Type
passive vehicle monitoring coordination	The direct flow of information between field equipment. This includes control commands used to control detection systems that rely on infrastructure-based identification of individual vehicles to measure travel times and other related measures by identifying the same vehicle at different points in the network. Related technologies include Bluetooth readers and license plate recognition systems. The coordination also includes sharing of time stamped identifiers that identify the vehicles that have passed through a detection zone.	Information
passive vehicle monitoring data	Time stamped identifiers that identify the vehicles that have passed through a detection zone.	Information
patient transport status	Notification of medical facility transport that identifies the care facility, basic information about the patient(s) being transported, and enroute status.	Information
permission application	A request for permission to access a Connected Vehicle service by an end-user that requires enrollment. This may include services granted to drivers of low emissions vehicles or pedestrians with special needs that require extended crossing times for example.	Information
permission application receipt	An acknowledgment that an end-user application for a Connected Vehicle service was received and processed.	Information
personal location	The current location (latitude, longitude, and elevation) reported by the personal information device	Information
personal transit information	General and personalized transit information for a particular fixed route, flexible route, or paratransit system.	Information
personnel location	The current location (latitude, longitude, and elevation) reported by the personnel device.	Information
rail crossing control data	Data required for HRI information transmitted at railroad grade crossings and within railroad operations.	Information
rail crossing request	A request for highway-rail intersection status or a specific control request intended to modify HRI operation.	Request
rail crossing status	Status of the highway-rail intersection equipment including both the current state or mode of operation and the current equipment condition.	Information
registered secureIDs	Cryptographically protected identifier indicating that the user associated with the identifier is entitled to use a particular service.	Information
remote surveillance control	The control commands used to remotely operate another center's sensors or surveillance equipment so that roadside surveillance assets can be shared by more than one agency.	Information
resource coordination	Coordination of resource inventory information, specific resource status information, resource prioritization and reallocation between jurisdictions, and specific requests for resources and responses that service those requests.	Information
restricted lanes application info	Restricted lane application configuration data and messaging parameters. This flow defines the location, duration, and operating parameters for lanes that are reserved for the exclusive use of certain types of vehicles (e.g., transit vehicles) or vehicles that meet other qualifications (e.g., number of occupants, low emissions criteria). It may also identify additional vehicles that may be allowed in the lanes as exceptions, though they don't meet specified criteria. It identifies the lane(s), the start and stop locations, start and end times, vehicle restrictions, speed limits and platooning parameters. This flow also supports remote control of the application so the application can be taken offline, reset, or restarted.	Information
restricted lanes application status	Current RSE application status that is monitored by the back office center including the operational state of the RSE, current configuration parameters, and a log of lane use (aggregate profiles of vehicles that checked in to the lane and reported vehicle speeds in the lanes) and RSE communications activity.	Information
restricted lanes information	This flow defines the location, duration, and operating parameters for lanes that are reserved for the exclusive use of certain types of vehicles (e.g., transit vehicles) or vehicles that meet other qualifications (e.g., number of occupants, low emissions criteria). It identifies the lane(s), the start and stop locations, start and end times, vehicle restrictions, speed limits and platooning parameters.	Information
reversible lane control	Control of automated reversible lane configuration and driver information systems.	Information

Flow Name	Flow Description	Flow Type
reversible lane coordination	The direct flow of information between field equipment. This includes control of automated reversible lane configuration and driver information systems and current reversible lane status including the operational status and mode of the reversible lane control equipment.	Information
reversible lane status	Current reversible lane status including traffic sensor and surveillance data and the operational status and mode of the reversible lane control equipment.	Information
right-of-way request notification	Notice that a request has occurred for signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other source for right-of-way.	Information
road closure application info	Road closure signing application configuration data and messaging parameters. This flow identifies the vehicles that may initiate the road closure. This flow also provides access lists, groups, or classifications where selected vehicles are to be allowed access to the closed area.	Information
road closure application status	Road closure application status reported by the RSE. This includes current operational state and status of the RSE, closure status, and a log of closure commands received and issued. For closures that allow entry by selected vehicles, this flow provides an access log identifying vehicles that have requested access with access status.	Information
road network conditions	Current and forecasted traffic information, road and weather conditions, and other road network status. Either raw data, processed data, or some combination of both may be provided by this flow. Information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements) in effect is included.	Information
road network environmental situation data	Aggregated environmental situation data collected from vehicles and other sources for the road network. Aggregated information would include measured air temperature, exterior light status, wiper status, sun sensor status, rain sensor status, traction control status, ALB status, and other collected vehicle system status and sensor information for the region.	Information
road network status assessment	Assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Information
road network traffic situation data	Aggregated route usage, travel times, and other aggregated data collected from probe vehicles that can be used to estimate current traffic conditions.	Information
road weather advisories for emergency response	Segment-specific weather and road conditions including real-time advisories of deteriorating road and weather conditions, medium-term advisories for the next 2-12 hours, and long-term advisories more than 12 hours into the future. This flow is filtered, tailored, and augmented to support emergency responders.	Information
road weather information	Road conditions and weather information that are made available by road maintenance operations to other transportation system operators.	Information
roadside archive data	A broad set of data derived from roadside sensors that includes current traffic conditions, environmental conditions, and any other data that can be directly collected by roadside sensors. This data also indicates the status of the sensors and reports of any identified sensor faults.	Information
roadway advisory radio data	Information used to initialize, configure, and control roadside highway advisory radio. This flow can provide message content and delivery attributes, local message store maintenance requests, control mode commands, status queries, and all other commands and associated parameters that support remote management of these systems.	Information
roadway advisory radio status	Current operating status of highway advisory radios.	Information
roadway dynamic signage data	Information used to initialize, configure, and control dynamic message signs. This flow can provide message content and delivery attributes, local message store maintenance requests, control mode commands, status queries, and all other commands and associated parameters that support remote management of these devices.	Information
roadway dynamic signage status	Current operating status of dynamic message signs.	Information
roadway maintenance status	Summary of maintenance fleet operations affecting the road network. This includes the status of winter maintenance (snow plow schedule and current status).	Information

Flow Name	Flow Description	Flow Type
roadway warning coordination	The direct flow of information between field equipment. This includes information used to configure and control roadway warning systems and the current operating status of roadway warning systems.	Information
roadway warning system control	Information used to configure and control roadway warning systems.	Information
roadway warning system status	Current operating status of roadway warning systems.	Information
route restrictions	Information about routes, road segments, and areas that do not allow the transport of security sensitive hazmat cargoes or include other restrictions (such as height or weight limits).	Information
safeguard system control	Data that controls safeguard systems (remotely controlled equipment used to mitigate the impact of incidents on transportation infrastructure, such as blast shields, exhaust systems, etc.).	Information
safeguard system status	Current operating status of safeguard systems (remotely controlled equipment used to mitigate the impact of incidents on transportation infrastructure, such as blast shields, exhaust systems, etc.). Status of the systems includes operating condition and current operational state.	Information
service patrol dispatch request	Service patrol dispatch instructions including incident location and available information concerning the incident.	Request
service patrol dispatch response	Request for additional dispatch information and provision of en route status.	Information
service patrol incident status	Information gathered at the incident site by a service patrol vehicle that more completely characterizes the incident, the services provided, and clearance status.	Information
shelter recommendations	Recommendation identifying the shelter or shelters best suited to the requestor. Hotels/motels may also be included as potential sheltering options. This flow may also include shelter assignments/reservations.	Information
shelter request	A request for shelter information, recommendations, or assignment/reservation. Information provided my include name, current location, number of people in the group, additional requirements (e.g., evacuating with pets, needed medical support).	Request
shoulder management control	Information used to configure and control systems that allow use of a shoulder as a lane for vehicular traffic.	Information
shoulder management information	System status including current operational state, violations and logged information.	Information
signal control commands	Control of traffic signal controllers or field masters including clock synchronization.	Request
signal control coordination	The direct flow of information between field equipment. This includes configuration and control of traffic signal controllers or field masters. Configuration data and operational status of traffic signal control equipment including operating condition and current indications are returned.	Information
signal control device configuration	Data used to configure traffic signal control equipment including local controllers and system masters.	Information
signal control plans	Traffic signal timing parameters including minimum green time and interval durations for basic operation and cycle length, splits, offset, phase sequence, etc. for coordinated systems.	Information
signal control status	Operational and status data of traffic signal control equipment including operating condition and current indications.	Information
signal enforcement device control	Information used to configure and control automated signal monitoring and enforcement systems.	Information
signal enforcement device status	System status including current operational state and logged information including date and time records of illegal intersection entry.	Information
signal fault data	Faults reported by traffic signal control equipment.	Information

Flow Name	Flow Description	Flow Type
signal priority service request	A service request for vehicle priority issued to a traffic signal controller that results in green extension or other accommodation for the priority vehicle, within the current signal timing plan. The request includes the priority level, the desired time and duration of service, and the intended travel path through the intersection. This flow also allows the RSE to cancel a previously issued request for priority.	Information
signal priority status	In response to a request for signal priority, this flow indicates the status of the priority or preemption request.	Information
signal system configuration	Data used to configure traffic signal systems including configuring control sections and mode of operation (time based or traffic responsive).	Information
situation data collection parameters	The parameters that are used to control the flow of situation data from the RSE. This flow identifies the type of data/snapshots that are requested from passing vehicles and reporting parameters such as snapshot frequency, filtering criteria (data thresholds for reporting), and reporting interval that control the type and volume of data reported to the back office center.	Information
special vehicle restricted use information	Parameters necessary for implementing unrestricted access to controlled access or toll facilities by special vehicles; e.g., maintenance vehicles, emergency vehicles, etc.	Information
suggested route	Suggested route for a dispatched emergency or maintenance vehicle that may reflect current network conditions and the additional routing options available to en route emergency or maintenance vehicles that are not available to the general public.	Information
threat information coordination	Sensor, surveillance, and threat data including raw and processed data that is collected by sensor and surveillance equipment located in secure areas.	Information
traffic control information	Represents the flow of traffic control and status information between centers. This is reporting only, not actual control. This specifically includes the current state of any demand management strategies that have been implemented.	Information
traffic control priority request	Request for signal priority at one or more intersections along a particular route.	Request
traffic control priority status	Status of signal priority request functions at the roadside (e.g., enabled or disabled).	Information
traffic detector control	Information used to configure and control traffic detector systems such as inductive loop detectors and machine vision sensors.	Information
traffic detector coordination	The direct flow of information between field equipment. This includes information used to configure and control traffic detector systems such as inductive loop detectors and machine vision sensors Raw and/or processed traffic detector data is returned that allows derivation of traffic flow variables (e.g., speed, volume, and density measures) and associated information (e.g., congestion, potential incidents). This flow includes the traffic data and the operational status of the traffic detectors	Information
traffic detector data	Raw and/or processed traffic detector data which allows derivation of traffic flow variables (e.g., speed, volume, and density measures) and associated information (e.g., congestion, potential incidents). This flow includes the traffic data and the operational status of the traffic detectors	Information
traffic image meta data	Meta data that describes traffic images. Traffic images (video) are in another flow.	Information
traffic images	High fidelity, real-time traffic images suitable for surveillance monitoring by the operator or for use in machine vision applications. This flow includes the images. Meta data that describes the images is contained in another flow.	Information
traffic information for media	Report of traffic conditions including traffic incident reports for public dissemination through the media. The reports may also include information on diversions and alternate routes, closures, and special traffic restrictions in effect.	Information
traffic metering control	Control commands and operating parameters for ramp meters, interchange meters, mainline meters, and other systems equipment associated with roadway metering operations.	Information
traffic metering coordination	The direct flow of information between field equipment. This includes control commands and operating parameters for ramp meters, interchange meters, mainline meters, and other systems equipment associated with roadway metering operations. Current operational status of the traffic metering status is also provided.	Information

Flow Name	Flow Description	Flow Type
traffic metering status	Current operational status and operating parameters for ramp meters, interchange meters, mainline meters and other control equipment associated with roadway metering operations.	Information
traffic monitoring application info	Traffic monitoring application parameters and thresholds that control the filtering, aggregation, and range of measures that are collected, derived, and reported. This flow also supports remote control of the application so the application can be taken offline, reset, or restarted.	Information
traffic monitoring application status	Traffic monitoring application status reported by the RSE. This includes current operational state and status of the RSE and a record of system operation.	Information
traffic situation data	Current, aggregate traffic data collected from connected vehicles that can be used to supplement or replace information collected by roadside traffic detectors. It includes raw and/or processed reported vehicle speeds, counts, and other derived measures. Raw and/or filtered vehicle control events may also be included to support incident detection.	Information
transit and fare schedules	Transit service information including routes, schedules, and fare information. This also includes on-demand service information.	Information
transit archive data	Data used to describe and monitor transit demand, fares, operations, and system performance. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	Information
transit emergency data	Initial notification of transit emergency at a transit stop or on transit vehicles and further coordination as additional details become available and the response is coordinated.	Information
transit incident information	Information on transit incidents that impact transit services for public dissemination.	Information
transit information for media	Report of transit schedule deviations for public dissemination through the media.	Information
transit information user request	Request for special transit routing, real-time schedule information, and availability information.	Request
transit schedule adherence information	Dynamic transit schedule adherence and transit vehicle location information.	Information
transit schedule information	Current and projected transit schedule information used to initialize the transit vehicle with a vehicle assignment, monitor schedule performance, and develop corrective actions on-board.	Information
transit service information	Transit service information including routes, schedules, and fare information as well as dynamic transit schedule adherence and transit vehicle location information.	Information
transit stop locations	The current geographic location and dimensions of transit stops. This flow may also include the road geometry in the vicinity of the stops as needed to support transit vehicle safety applications when arriving at or departing from stops.	Information
transit stop request	Notification that a transit stop has been requested by a transit user at a roadside stop. This flow identifies the route, stop, and the time of the request.	Information
transit traveler information	Transit information prepared to support transit users and other travelers. It contains transit schedules, real-time arrival information, fare schedules, alerts and advisories, and general transit service information.	Information
transit user information	Information about individual transit users boarding a transit vehicle, used to track a user's progress on a scheduled transit trip.	Information
transit vehicle conditions	Operating conditions of transit vehicle (e.g., engine running, oil pressure, fuel level and usage). It includes status of other on-board systems including user displays, passenger counters, and security systems. This overall status information is also collected from unused (out of service) vehicles.	Information
transit vehicle information	Information about the transit vehicle route and stops, including current location along the route and next stop.	Information
transit vehicle location data	Current transit vehicle location and related operational conditions data provided by a transit vehicle.	Information
transit vehicle operator information	Transit service instructions, wide area alerts, traffic information, road conditions, and other information for both transit and paratransit operators.	Information

Flow Name	Flow Description	Flow Type
transit vehicle schedule performance	Estimated times of arrival and anticipated schedule deviations reported by a transit vehicle.	Information
transportation operational strategies	Operational strategies for each operating agency in a transportation corridor, downtown area, or other travel-impacted area, providing an integrated operations strategy for the freeways, tollways, arterials, transit services, parking facilities, and other transportation-related facilities in the area. These strategies can include dynamic adjustments to transit fares and tolls, parking fees and restrictions, dynamic lane restriction changes, and other active demand management strategies.	Information
transportation system status	Current status and condition of transportation infrastructure (e.g., tunnels, bridges, interchanges, TMC offices, maintenance facilities). In case of disaster or major incident, this flow provides an assessment of damage sustained by the surface transportation system including location and extent of the damage, estimate of remaining capacity and necessary restrictions, and time frame for repair and recovery.	Information
travel service information	Information supplied by a service provider (e.g., a hotel or restaurant) that identifies the service provider and provides details of the service offering. This flow covers initial registration of a service provider and subsequent submittal of new information and status updates so that data currency is maintained.	Information
travel service information request	Requests for travel service information. This flow supports initial registration of service providers and requests for additional traveler service information from registered providers.	Request
travel service reservation request	Reservation request for traveler services (e.g., for a hotel or restaurant) including billing information when applicable.	Request
travel service reservations	Traveler service (e.g., for a hotel or restaurant) reservation information and status, including information on associated billing transactions, when applicable.	Information
travel services information	Travel service information and reservations for tourist attractions, lodging, dining, service stations, emergency services, and other services and businesses of interest to the traveler.	Information
travel services request	Request for travel service information including tourist attractions, lodging, restaurants, service stations, and emergency services. The request identifies the type of service, the area of interest, optional reservation request information, parameters that are used to prioritize or filter the returned information, and sorting preferences.	Request
traveler alerts	Traveler information alerts reporting congestion, incidents, adverse road or weather conditions, parking availability, transit service delays or interruptions, and other information that may impact the traveler. Relevant alerts are provided based on traveler-supplied profile information including trip characteristics and preferences.	Information
traveler archive data	Data associated with traveler information services including service requests, facility usage, rideshare, routing, and traveler payment transaction data. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	Information
traveler information application info	Traveler information and associated parameters, filters, and thresholds that control the RSE's distribution of the traveler information to passing vehicles. This flow also supports remote control of the application so the application can be taken offline, reset, or restarted.	Information
traveler information application status	Application status reported by the RSE. This includes current operational state and status of the RSE and a record of traveler information distribution.	Information
traveler information for media	General traveler information regarding incidents, unusual traffic conditions, transit issues, or other advisory information that has been desensitized and provided to the media.	Information
traveler request	A request for traveler information including traffic, transit, toll, parking, road weather conditions, event, and passenger rail information. The request identifies the type of information, the area of interest, parameters that are used to prioritize or filter the returned information, and sorting preferences.	Request
traveler sourced updates	Traveler posts on traffic and road conditions, parking availability, transit services, traveler services, shelter information and other real-time crowd-sourced data that may be shared with other travelers.	Information
user account setup	Billing information, vehicle information (or registration information), and requests for reports. Also includes subsequent account changes.	Information

Flow Name	Flow Description	Flow Type
user profile	Information provided to register for a travel service and create a user account. The provided information includes personal identification, traveler preferences (e.g., maximum transfer wait time, maximum walking distance, mode preferences, special needs), device information, a user ID and password, and information to support payment transactions, if applicable.	Information
variable speed limit control	Information used to configure and control variable speed limit systems including the equipment used to provide current speed limits and other information to drivers.	Information
variable speed limit status	Current operating status of the variable speed limit systems including the state of the equipment.	Information
vehicle location and motion	Data describing the vehicle's location in three dimensions, heading, speed, acceleration, braking status, and size.	Information
vehicle path prediction	The predicted future vehicle path of travel. This flow includes an indication of the future positions of the transmitting vehicle that can be used by receiving vehicles to support coordinated driving maneuvers and enhance in-lane and out-of-lane threat classification.	Information
vehicle profile	Information about a vehicle such as vehicle make and model, fuel type, engine type, size and weight, vehicle performance and level of control automation, average emissions, average fuel consumption, passenger occupancy, or other data that can be used to classify vehicle eligibility for access to specific lanes, road segments, or regions or participation in cooperative vehicle control applications.	Information
vehicle signage application info	In-vehicle signing application configuration data and messaging parameters. This flow provides a list of regulatory, warning, and information messages to be displayed and parameters that support scheduling and prioritizing messages to be issued to passing vehicles. This flow also supports remote control of the application so the application can be taken offline, reset, or restarted.	Information
vehicle signage application status	In-vehicle signing application status reported by the RSE. This includes current operational state and status of the RSE and a log of messages sent to passing vehicles.	Information
vehicle signage data	In-vehicle signing data that augments regulatory, warning, and informational road signs and signals. The information provided would include static sign information (e.g., stop, curve warning, guide signs, service signs, and directional signs) and dynamic information (e.g., local traffic and road conditions, lane restrictions, work zones, detours, closures, advisories, and warnings).	Information
vehicle signage local data	Information provided by adjacent field equipment to support in-vehicle signing of dynamic information that is currently being displayed to passing drivers. This includes the dynamic information (e.g., local traffic and road conditions, work zone information, lane restrictions, detours, closures, advisories, parking availability, etc.) and control parameters that identify the desired timing, duration, and priority of the signage data.	Information
video surveillance control	Information used to configure and control video surveillance systems.	Information
video surveillance coordination	The direct flow of information between field equipment. This includes information used to configure and control video surveillance systems and the high fidelity, real-time traffic images and associated meta data that are returned.	Information
work plan coordination	Coordination of work plan schedules and activities between maintenance and construction organizations or systems. This information includes the work plan schedules and comments and suggested changes that are exchanged as work plans are coordinated and finalized.	Information
work plan feedback	Comments and suggested changes to proposed construction and maintenance work schedules and activities. This information influences work plan schedules so that they minimize impact to other system operations and the overall transportation system.	Information
work zone information	Summary of maintenance and construction work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Information
work zone warning device control	Data used to configure and control work zone safety monitoring and warning devices.	Information

Flow Name	Flow Description	Flow Type
work zone warning notification	Notification of a work zone emergency or safety issue. This flow identifies that a work zone emergency or safety issue has occurred so that warnings may be generated by more than one system in the work zone.	Information
work zone warning status	Status of a work zone safety monitoring and warning devices. This flow documents system activations and includes additional supporting information (e.g., an image) that allows verification of the alarm.	Information

Appendix C FUNCTIONAL OBJECTS

Table 45 – Functional Objects

Element Name	Physical Object	Functional Object	Functional Object Description
Archived Data Users, Baton Rouge TMC, Capital Region Planning Commission (CRPC), City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana Transportation Research Center (LTRC), DOTD ITS Section, DOTD Planning and Programming Division, Local Emergency Operations Centers, Louisiana State Police - Troop A	Archived Data System	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.
Archived Data Users, Baton Rouge TMC, Capital Region Planning Commission (CRPC), City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana State Police - Troop A, DOTD ITS Section, DOTD Planning and Programming Division, Local Emergency Operations Centers, Louisiana Transportation Research Center (LTRC)	Archived Data System	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.
Archived Data Users, Capital Region Planning Commission (CRPC), DOTD Planning and Programming Division, Louisiana Transportation Research Center (LTRC)	Archived Data System	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 measures that are derived from multiple data sources may also be produced.
Archived Data Users, Capital Region Planning Commission (CRPC), Louisiana Transportation Research Center (LTRC), DOTD ITS Section, DOTD Planning and Programming Division	Archived Data System	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.

Element Name	Physical Object	Functional Object	Functional Object Description
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations	Center	Center Data Collection	'Center Data Collection' collects and stores information that is created in the course of 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.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section	Traffic Management Center	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.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, Statewide TMC, WBR Parish DPW	Traffic Management Center	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.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, Statewide TMC, WBR Parish DPW	Traffic Management Center	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.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, WBR Parish DPW	Traffic Management Center	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.

Element Name	Physical Object	Functional Object	Functional Object Description
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, WBR Parish DPW	Traffic Management Center	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.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Local Traffic Operations	Traffic Management Center	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.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD ITS Section, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, WBR Parish DPW	Traffic Management Center	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
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD ITS Section, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Local Traffic Operations, Statewide TMC	Traffic Management Center	TMC In-Vehicle Signing Management	'TMC In-Vehicle Signing Management' controls and monitors RSEs that support in-vehicle signing. Sign information that may include static regulatory, service, and directional sign information as well as variable information such as traffic and road conditions can be provided to the RSE, which uses short range communications to send the information to in-vehicle equipment. Information that is currently being communicated to passing vehicles and the operational status of the field equipment is monitored by this application. The operational status of the field equipment is reported to operations personnel.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD ITS Section, Livingston Parish DPW, Local Traffic Operations, WBR Parish DPW	Traffic Management Center	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 centers to allow monitoring and control of the barriers from other centers (e.g., public safety or emergency operations centers).

Element Name	Physical Object	Functional Object	Functional Object Description
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD ITS Section, WBR Parish DPW, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations	Traffic Management Center	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.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD ITS Section, WBR Parish DPW, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, Statewide TMC	Traffic Management Center	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.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD ITS Section, WBR Parish DPW, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations	Traffic Management Center	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.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, Louisiana State Police - Troop A, Livingston Parish DPW, Local Public Safety Agencies, MOHSEP, Parish OHEP, Port of Baton Rouge, WBR Parish DPW	ITS Object	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 communications information, billing management, fault management, service level and performance monitoring.

Element Name	Physical Object	Functional Object	Functional Object Description
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, Statewide TMC, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Traffic Operations, WBR Parish DPW	Traffic Management Center	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.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, WBR Parish DPW, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations, Statewide TMC	Traffic Management Center	TMC Roadway Warning	'TMC Roadway Warning' remotely monitors and controls the systems used to warn drivers approaching hazards on a roadway. It monitors data on roadway conditions from sensors in the field and generates warnings 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.
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, WBR Parish DPW, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Traffic Operations	Traffic Management Center	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.).
Ascension Parish Transportation and Engineering, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, WBR Parish DPW, DOTD ITS Section, Livingston Parish DPW, Local Traffic Operations	Traffic Management Center	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.

Element Name	Physical Object	Functional Object	Functional Object Description
Ascension Parish Transportation and Engineering, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section	Maint and Constr Management Center	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.
Ascension Parish Transportation and Engineering, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, WBR Parish DPW	Maint and Constr Management Center	MCM Field Equipment Maintenance	'MCM Field Equipment Maintenance' provides overall management and support for maintenance of field equipment on a roadway system, right-of-way, parking area, transit stop, or other areas where field equipment exists. Services include repair and maintenance of ITS field equipment in these areas (e.g., detectors and other sensors, cameras, dynamic message signs, electronic toll collection equipment, electronic clearance equipment, weigh-in-motion sensors, etc.).
Ascension Parish Transportation and Engineering, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, WBR Parish DPW	Maint and Constr Management Center	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.
Ascension Parish Transportation and Engineering, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, WBR Parish DPW	Maint and Constr Management Center	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.

Element Name	Physical Object	Functional Object	Functional Object Description
Ascension Parish Transportation and Engineering, DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, WBR Parish DPW	Maint and Constr Management Center	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.
Ascension Parish Transportation and Engineering, Livingston Parish DPW, Port of Baton Rouge, WBR Parish DPW	ITS Object	ITS Security Support	'ITS Security Support' provides communications and system security functions to the ITS Object, including privacy protection functions. It may include firewall, intrusion management, authentication, authorization, profile management, identity management, cryptographic key management. It may include a hardware security module and security management information base.
Ascension Parish Transportation and Engineering, Livingston Parish DPW, WBR Parish DPW	Parking Area Equipment	Loading Zone Management	'Loading Zone Management' manages loading zones. It monitors loading zone space occupancy and makes this information available to arriving vehicles and other applications. It monitors the time each vehicle spends in the loading zone and provides this information to drivers in the zone and other applications. Day and time specific management is supported for loading zones that revert to normal vehicle parking spaces in off hours and other day/time specific management strategies. In advanced implementations, reservations are accepted so that a loading zone spot can be reserved with an optional accompanying payment. Vehicles associated with the reservation are identified on arrival and directed to the reserved spot.
Ascension Parish Transportation and Engineering, Livingston Parish DPW, WBR Parish DPW	Parking Area Equipment	Parking Area Electronic Payment	'Parking Area Electronic Payment' supports electronic payment of parking fees using in-vehicle equipment (e.g., tags) or contact or proximity cards. It includes the field elements that provide the interface to the in-vehicle or card payment device and the back-office functionality that performs the transaction.

Element Name	Physical Object	Functional Object	Functional Object Description
Ascension Parish Transportation and Engineering, Livingston Parish DPW, WBR Parish DPW	Parking Area Equipment	Parking Area Management	'Parking Area Management' detects and classifies vehicles at parking facility entrances, exits, and other designated locations within the facility. Current parking availability is monitored and used to inform drivers through dynamic message signs/displays so that vehicles are efficiently routed to available spaces. Parking facility information, including current parking rates and directions to entrances and available exits, is also provided to drivers.
Ascension Parish Transportation and Engineering, Livingston Parish DPW, WBR Parish DPW	Parking Management Center	Parking Account and Fee Management	'Parking Account and Fee Management' manages parking fare collection at the Parking Management Center. It provides the back office functions that support control of field parking management systems, supporting payment reconciliation with links to financial institutions. It loads fee data into field systems when those systems are initialized or whenever such information is modified.
Ascension Parish Transportation and Engineering, Livingston Parish DPW, WBR Parish DPW	Parking Management Center	Parking Coordination	'Parking Coordination' supports communication and coordination between equipped parking facilities and also supports regional coordination between parking facilities and traffic management systems. Coordination with traffic management supports local traffic control coordination in and around the parking facility and broader regional coordination. It also shares information with transit management systems and information providers to support multimodal travel planning, including parking reservations capabilities. Information including current parking availability, system status, and operating strategies are shared to enable local parking facility management that supports regional transportation strategies.
Ascension Parish Transportation and Engineering, WBR Parish DPW, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Traffic Operations	Traffic Management Center	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.
Ascension Parish Transportation and Engineering, WBR Parish DPW, Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, Statewide TMC, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations	Traffic Management Center	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.

Element Name	Physical Object	Functional Object	Functional Object Description
Baton Rouge TMC, CATS Management Center, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section	Center	Center Field Equipment Management	'Center Field Equipment Management' is the back office application that supports monitoring and maintenance of field equipment. It monitors the performance and configuration of the field equipment. This includes management of the infrastructure configuration as well as detection, isolation, and correction of field equipment problems. The application also includes monitoring of performance of the field equipment, including communications links.
Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana State Police - Troop A	Emergency Management Center	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.
Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana State Police - Troop A, Local Public Safety Agencies, MOHSEP, Parish OHEP	Emergency Management Center	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.
Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, Louisiana State Police - Troop A, Local Public Safety Agencies, MOHSEP, Parish OHEP	Emergency Management Center	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	Physical Object	Functional Object	Functional Object Description
Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, Louisiana State Police - Troop A, Local Public Safety Agencies, MOHSEP, Parish OHEP	Emergency Management Center	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.
Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Local Traffic Operations, Statewide TMC	Traffic Management Center	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.
Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Local Traffic Operations, Statewide TMC	Traffic Management Center	TMC Restricted Lanes CV Application	'TMC Restricted Lanes CV Application' manages dynamic lanes for connected vehicles. The application provides the back office functions and supports the TMC operator in establishing and managing dynamic lanes using communications to manage lane use for connected vehicles.
Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, DOTD ITS Section, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Local Traffic Operations	Traffic Management Center	TMC Passive Surveillance	'TMC Passive Surveillance' collects time stamped vehicle identities from different detection zones, correlates the identities, and calculates link travel times and derives other traffic measures.
Baton Rouge TMC, City-Parish DPW Traffic Engineering Division, WBR Parish DPW, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, Livingston Parish DPW, Local Public Safety Agencies, Local Traffic Operations	Traffic Management Center	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.
Baton Rouge TMC, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, Louisiana State Police - Troop A, Local Public Safety Agencies, MOHSEP, Parish OHEP	Emergency Management Center	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	Physical Object	Functional Object	Functional Object Description
Baton Rouge TMC, City-Parish Emergency Response Operations 911, Local Public Safety Agencies, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana State Police - Troop A, Local Emergency Operations Centers, MOHSEP, Parish OHEP, Statewide TMC	Emergency Management Center	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 concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Baton Rouge TMC, DOTD District 61 Traffic Operations, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, DOTD District 62 Traffic Operations, Louisiana State Police - Troop A, Local Public Safety Agencies, MOHSEP, Parish OHEP	Emergency Management Center	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.
Baton Rouge TMC, DOTD District 61 Traffic Operations, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, DOTD District 62 Traffic Operations, Louisiana State Police - Troop A, Local Public Safety Agencies, Parish OHEP	Emergency Management Center	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.

Element Name	Physical Object	Functional Object	Functional Object Description
Baton Rouge TMC, DOTD District 61 Traffic Operations, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, DOTD District 62 Traffic Operations, Louisiana State Police - Troop A, Local Public Safety Agencies, MOHSEP, Parish OHEP	Emergency Management Center	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.
Baton Rouge TMC, DOTD District 61 Traffic Operations, City-Parish DPW Traffic Engineering Division, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, DOTD District 62 Traffic Operations, Louisiana State Police - Troop A, Local Public Safety Agencies, MOHSEP, Parish OHEP	Emergency Management Center	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.

Element Name	Physical Object	Functional Object	Functional Object Description
Baton Rouge TMC, DOTD District 61 Traffic Operations, City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, DOTD District 62 Traffic Operations, Louisiana State Police - Troop A, Local Public Safety Agencies, MOHSEP, Parish OHEP	Emergency Management Center	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.
Baton Rouge TMC, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section	Traffic Management Center	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.
Baton Rouge TMC, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section	Traffic Management Center	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.
Baton Rouge TMC, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section	Traffic Management Center	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.

Element Name	Physical Object	Functional Object	Functional Object Description
Baton Rouge TMC, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section	Traffic Management Center	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.
Baton Rouge TMC, DOTD District 61 Traffic Operations, DOTD ITS Section, Statewide TMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	'TMC Dynamic Lane Management and Shoulder Use' remotely monitors and controls the system that is used to dynamically manage travel lanes, including temporary use of shoulders as travel lanes. It monitors traffic conditions and demand measured in the field and determines when the lane configuration of the roadway should be changed, when intersections and/or interchanges should be reconfigured, when the shoulders should be used for travel (as a lane), when lanes should be designated for use by special vehicles only, such as buses, high occupancy vehicles (HOVs), vehicles attending a special event, etc. and/or when types of vehicles should be prohibited or restricted from using particular lanes. It controls the field equipment used to manage and control specific lanes and the shoulders. It also can automatically notify the enforcement agency of lane control violations.
Baton Rouge TMC, Statewide TMC, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section, WBR Parish DPW	Traffic Management Center	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.
Capital Region Planning Commission (CRPC), CATS Management Center, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations	Transportation Information Center	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.

Element Name	Physical Object	Functional Object	Functional Object Description
Capital Region Planning Commission (CRPC), CATS Management Center, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511, Tourism and Travel Service Information Sources	Transportation 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 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.
Capital Region Planning Commission (CRPC), CATS Management Center, City-Parish DPW Traffic Engineering Division, Tourism and Travel Service Information Sources, City-Parish Website, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511, Media	Transportation 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.
Capital Region Planning Commission (CRPC), CATS Management Center, City-Parish DPW Traffic Engineering Division, Tourism and Travel Service Information Sources, City-Parish Website, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511, Media	Transportation Information Center	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 information. Tailored information is provided based on the traveler's request in this interactive service.
Capital Region Planning Commission (CRPC), CATS Management Center, City-Parish DPW Traffic Engineering Division, Tourism and Travel Service Information Sources, City-Parish Website, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511, Media	Transportation Information Center	TIC Travel Services Information and Reservation	'TIC Travel Services Information' disseminates information about traveler services such as lodging, restaurants, and service stations. Tailored traveler service information is provided on request that meets the constraints and preferences specified by the traveler. This application also supports reservations and advanced payment for traveler services including parking and loading zone use.
Capital Region Planning Commission (CRPC), City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511	Transportation Information Center	TIC Freight-Specific Travel Planning	'TIC Freight-Specific Travel Planning' provides traveler information and trip planning services for freight routes from source to destination, customized for freight users to indicate truck routes, truck stops, inspection stations, steep grades, etc.

Element Name	Physical Object	Functional Object	Functional Object Description
CATS Management Center	Transit Management Center	Transit Center Data Collection	'Transit Center Data Collection' collects and stores transit information that is collected in the course of transit operations performed by the Transit 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.
CATS Management Center	Transit Management Center	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.
CATS Management Center	Transit Management Center	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.
CATS Management Center	Transit Management Center	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.

Element Name	Physical Object	Functional Object	Functional Object Description
CATS Management Center	Transit Management Center	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.
CATS Management Center	Transit Management Center	Transit Center Operator Assignment	'Transit Center Operator Assignment' automates and supports the assignment of transit vehicle operators to runs. It assigns operators to runs in a fair manner while minimizing labor and overtime services, considering operator preferences and qualifications, and automatically tracking and validating the number of work hours performed by each individual operator. It also provides an exception handling process for the operator assignment function to generate supplemental operator assignments when required by changes during the operating day.
CATS Management Center	Transit Management Center	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.
CATS Management Center	Transit Management Center	Transit Center Park and Ride Operations	'Transit Park and Ride Operations' supports additional coordination required for park and ride operations. It monitors park and ride customer arrivals in the parking facility and manages the transit services for those park and ride customers.
CATS Management Center	Transit Management Center	Transit Center Passenger Counting	'Transit Center Passenger Counting' receives and processes transit vehicle loading data using two-way communications from equipped transit vehicles.

Element Name	Physical Object	Functional Object	Functional Object Description
CATS Management Center	Transit Management Center	Transit Center Priority Management	'Transit Center Priority Management' monitors transit schedule performance and generates requests for transit priority on routes and at certain intersections. It may coordinate with the Traffic Management Center to provide transit priority along the selected route, including allocation of dynamic lanes and granting signal priority. It also coordinates with the Transit Vehicle OBE to monitor and manage local transit signal priority requests at individual intersections.
CATS Management Center	Transit Management Center	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.
CATS Management Center	Transit Management Center	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 on suitability for the types of service required by the particular routes.
CATS Management Center	Transit Management Center	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.

Element Name	Physical Object	Functional Object	Functional Object Description
CATS Management Center	Transit Management Center	Transit Evacuation Support	'Transit Evacuation Support' manages transit resources to support evacuation and subsequent reentry of a population in the vicinity of a disaster or other emergency. It supports coordination of regional evacuation plans, identifying the transit role in a regional evacuation and identifying transit resources that would be used. During an evacuation, it coordinates the use of transit and school bus fleets, supporting evacuation of those with special needs and the general population. Transit service and fare schedules are adjusted and updated service and fare information is made available through traveler information systems.
CATS Management Center	Transit Management Center	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.
CATS Management Center, City-Parish DPW Traffic Engineering Division, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511, Media	Transportation Information Center	TIC Traffic Control Dissemination	'TIC Traffic Control Dissemination' disseminates intersection status, lane control information, and other traffic control related information that is real-time or near real-time in nature and relevant to vehicles in a relatively local area on the road network. It collects traffic control information from Traffic Management Center(s) and disseminates the relevant information to vehicles and other mobile devices.
CATS Management Center, City-Parish DPW Traffic Engineering Division, Tourism and Travel Service Information Sources, City-Parish Website, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511, Media	Transportation Information Center	TIC Connected Vehicle Traveler Info Distribution	In support of connected vehicle applications, 'TIC Connected Vehicle Traveler Info Distribution' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. Location-specific or situation-relevant traveler information is sent to short range communications transceivers at the roadside.
CATS Management Center, City-Parish DPW Traffic Engineering Division, Tourism and Travel Service Information Sources, City-Parish Website, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511, Media	Transportation 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.

Element Name	Physical Object	Functional Object	Functional Object Description
CATS Management Center, City-Parish DPW Traffic Engineering Division, Tourism and Travel Service Information Sources, City-Parish Website, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511, Media	Transportation 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.
CATS Transit Vehicles	Transit Vehicle OBE	Transit Vehicle On-Board Fare Management	'Transit Vehicle On-board Fare Management' supports fare collection using a standard fare card or other non-monetary fare medium and detects payment violations. Collected fare data are made available to the center.
CATS Transit Vehicles	Transit Vehicle OBE	Transit Vehicle On-Board Information Services	'Transit Vehicle On-board Information Services' furnishes en route transit users with real-time travel-related information on-board a transit vehicle. Current information that can be provided to transit users includes transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, non-motorized transportation services, and special events are provided. In addition to tailored information for individual transit users, it also supports general annunciation and/or display of general schedule information, imminent arrival information, and other information of general interest to transit users.
CATS Transit Vehicles	Transit Vehicle OBE	Transit Vehicle On-Board Maintenance	'Transit Vehicle On-Board Maintenance' collects and processes transit vehicle maintenance data on-board the vehicle, including mileage and vehicle operating conditions. This maintenance information is provided to the management center and used to schedule future vehicle maintenance and repair.
CATS Transit Vehicles	Transit Vehicle OBE	Transit Vehicle On-Board Paratransit Operations	'Transit Vehicle On-board Paratransit Operations' forwards paratransit and flexible-route dispatch requests to the operator and forwards acknowledgements to the center. It coordinates with, and assists the operator in managing multi-stop runs associated with demand responsive transit services including paratransit. It collects transit vehicle passenger data and makes it available to the center.
CATS Transit Vehicles	Transit Vehicle OBE	Transit Vehicle On-Board Trip Monitoring	'Transit Vehicle On-Board Trip Monitoring' tracks vehicle location, monitors fuel usage, collects operational status (doors opened/closed, running times, etc.) and sends the collected, time stamped data to the Transit Management Center.

Element Name	Physical Object	Functional Object	Functional Object Description
CATS Transit Vehicles	Transit Vehicle OBE	Transit Vehicle Passenger Counting	'Transit Vehicle Passenger Counting' collects transit vehicle loading data and makes it available to the center.
CATS Transit Vehicles	Transit Vehicle OBE	Transit Vehicle Pedestrian Safety	'Transit Vehicle Pedestrian Safety' exchanges current location and motion information with pedestrian-carried devices in the vicinity and uses that information to warn the driver of pedestrians in the vehicle's path. Information from on-board sensors (e.g., radars and image processing) are used to augment the short range communications, if available. In addition to notifying the driver, control information can also be provided to support automated control functions that can avoid the collision.
CATS Transit Vehicles	Transit Vehicle OBE	Transit Vehicle Schedule Management	'Transit Vehicle Schedule Management' monitors schedule performance and identifies corrective actions when a deviation is detected. It provides two-way communication between the transit vehicle and center, enabling the center to communicate with the vehicle operator and monitor on-board systems.
CATS Transit Vehicles	Transit Vehicle OBE	Transit Vehicle Security	'Transit Vehicle Security' provides security and safety functions on-board the transit vehicle. It includes surveillance and sensor systems that monitor the on-board environment, silent alarms that can be activated by transit user or vehicle operator, operator authentication, and a remote vehicle disable function. The surveillance equipment includes video (e.g. CCTV cameras), audio systems and/or event recorder systems. The sensor equipment includes threat sensors (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors (e.g. metal detectors).
CATS Transit Vehicles	Transit Vehicle OBE	Transit Vehicle Signal Priority	'Transit Vehicle Signal Priority' provides the capability for transit vehicles to determine eligibility for priority and request signal priority at signalized intersections, ramps, and interchanges through short range communication with traffic control equipment at the roadside.

Element Name	Physical Object	Functional Object	Functional Object Description
CATS Transit Vehicles	Transit Vehicle OBE	Transit Vehicle V2V Safety	'Transit Vehicle V2V Safety' exchanges current vehicle location and motion information with other vehicles in the vicinity, uses that information to predict vehicle paths, and notifies the driver when the potential for an impending collision is detected. Information from on-board sensors (e.g., radars and image processing) are used to augment the V2V communications, if available. In addition to notifying the driver, control information can also be provided to support automated control functions that can avoid the collision. This object is similar to the 'Vehicle Basic V2V Safety', but it accounts for crash scenarios that are unique to transit vehicles (e.g., Vehicle Turning Right in Front of Bus). It is also stop-aware since stop locations pose specific crash threats for transit vehicles. Finally, the detection and control algorithms, filters, and timing account for bus performance and risk profiles associated with remote vehicles that are unique to transit.
City-Parish DPW Traffic Engineering Division, Tourism and Travel Service Information Sources, City-Parish Website, DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511, Media	Transportation 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.
City-Parish Emergency Response Operations 911, City-Parish Emergency Vehicles, Louisiana State Police Vehicles, Local Public Safety Agencies, Motorist Assistance Patrol, Parish OHEP	Personnel Device	Personnel Incident Scene Communications	'Personnel Incident Scene Communications' provides images, video and information from an incident scene captured by or input to an emergency personnel device. The information provided and the user interface delivery mechanism (visual, audible, or haptic) can also be tailored to the needs of the user that is carrying or wearing the device that generates the information.

Element Name	Physical Object	Functional Object	Functional Object Description
City-Parish Emergency Response Operations 911, Local Emergency Operations Centers, Louisiana State Police - Troop A, Local Public Safety Agencies	Emergency Management Center	Emergency Secure Area Alarm Support	'Emergency Secure Area Alarm Support' receives traveler or transit vehicle operator alarm messages, notifies the system operator, and provides acknowledgement of alarm receipt back to the originator of the alarm. The alarms received can be generated by silent or audible alarm systems and may originate from public areas (e.g. transit stops, park and ride lots, transit stations, rest areas) or transit vehicles. The nature of the emergency may be determined based on the information in the alarm message as well as other inputs.
City-Parish Emergency Response Operations 911, Louisiana State Police - Troop A, Local Emergency Operations Centers	Emergency Management Center	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.
City-Parish Emergency Vehicles, Louisiana State Police Vehicles, Local Public Safety Agencies, Motorist Assistance Patrol	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
City-Parish Emergency Vehicles, Louisiana State Police Vehicles, Local Public Safety Agencies, Motorist Assistance Patrol	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.
City-Parish Emergency Vehicles, Louisiana State Police Vehicles, Motorist Assistance Patrol	Emergency Vehicle OBE	EV Service Patrol Vehicle Operations	'EV Service Patrol Vehicle Operations' provides on-board processing and communications to service patrol vehicles that reduce response times and improve safety of responding personnel. It supports service patrol vehicle dispatch and provides incident information back to the dispatching center.

Element Name	Physical Object	Functional Object	Functional Object Description
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices	ITS Roadway Equipment	Roadway Signal Preemption	'Roadway Signal Preemption' includes the field elements that receive signal preemption requests from emergency vehicles approaching a signalized intersection and overrides the current operation of the traffic signals to stop conflicting traffic and grant right-of-way to the approaching vehicle.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	Connected Vehicle Roadside Equipment	RSE Environmental Monitoring	'RSE Environmental Monitoring' collects environmental situation (probe) data from passing vehicles that are equipped with short range communications capability. The collected data includes current environmental conditions as measured by on-board sensors (e.g., ambient temperature and precipitation measures), current status of vehicle systems that can be used to infer environmental conditions (e.g., status of lights, wipers, ABS, and traction control systems), and emissions measures reported by the vehicle. The functional object collects the provided data, aggregates and filters the data based on provided configuration parameters, and sends the collected information back to a center for processing and distribution. This functional object may also process the collected data locally and issue short-term road weather advisories for the road segment using short range communications.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	Connected Vehicle Roadside Equipment	RSE Intersection Management	'RSE Intersection Management' uses short range communications to support connected vehicle applications that manage signalized intersections. It communicates with approaching vehicles and ITS infrastructure (e.g., the traffic signal controller) to enhance traffic signal operations. Coordination with the ITS infrastructure also supports conflict monitoring to ensure the RSE output and traffic signal control output are consistent and degrade in a fail safe manner.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	Connected Vehicle Roadside Equipment	RSE Parking Management	'RSE Parking Management' monitors the basic safety messages generated by connected vehicles to detect vehicles parking and maintain and report spaces that are occupied by connected vehicles. It also uses short range communications to provide parking information to vehicles.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	Connected Vehicle Roadside Equipment	RSE Restricted Lanes Application	The 'RSE Restricted Lanes Application' uses short range communications to monitor and manage dynamic and static restricted lanes. It collects vehicle profile information from vehicles entering the lanes and monitors vehicles within the lanes, providing aggregate data to the back office center. It provides lane restriction information and signage data to the vehicles and optionally identifies vehicles that violate the current lane restrictions. These functions are performed based on operating parameters provided by the back office managing center(s).

Element Name	Physical Object	Functional Object	Functional Object Description
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	Connected Vehicle Roadside Equipment	RSE Road Closure Management	'RSE Road Closure Management' communicates with qualified Connected Vehicles and barrier control systems to support local road closure management. It validates and requests implementation of road closure requests. During a closure, it can also support selective access to the closed area, only granting entry permission to allowed vehicles.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	Connected Vehicle Roadside Equipment	RSE Traveler Information Communications	'RSE Traveler Information Communications' includes field elements that distribute information to vehicles for in-vehicle display. The information may be provided by a center (e.g., variable information on traffic and road conditions in the vicinity of the field equipment) or it may be determined and output locally (e.g., static sign information and signal phase and timing information). This includes the interface to the center or field equipment that controls the information distribution and the short range communications equipment that provides information to passing vehicles.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway Equipment	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.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway Equipment	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.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway Equipment	Roadway Field Device Support	'Roadway Field Device Support' monitors the operational status of field devices and detects and reports fault conditions. Consolidated operational status (device status, configuration, and fault information) are reported for resolution and repair. A local interface is provided to field personnel for local monitoring and diagnostics, supporting field maintenance, upgrade, repair, and replacement of field devices.

Element Name	Physical Object	Functional Object	Functional Object Description
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway Equipment	Roadway HOV Control	'Roadway HOV Control' monitors and controls high occupancy vehicle (HOV) and high occupancy toll (HOT) lanes. It includes traffic sensors that monitor HOV lane usage and display equipment such as lane control signals that provide lane status to drivers.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway 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.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway Equipment	Roadway Passive Monitoring	'Roadway Passive Monitoring' monitors passing vehicles for a signature that can be used to recognize the same vehicle at different points in the network and measure travel times. Depending on the implementation and the penetration rate of the technology that is monitored, other point traffic measures may also be inferred by monitoring the number of vehicles within range over time. Today this approach is implemented most commonly using a Bluetooth receiver that passively monitors Bluetooth devices on-board passing vehicles and license plate readers that record the vehicle license plate number, but any widely deployed vehicle communications technology or feature that can be passively monitored to uniquely identify a vehicle could be used.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway Equipment	Roadway Reversible Lanes	'Roadway Reversible Lanes' includes field elements that monitor and control reversible lane facilities. It includes the traffic sensors, surveillance equipment, lane control signals, physical lane access controls, and other field elements that manage traffic on these facilities. It provides current reversible lane facility status information and accepts requests and control commands from the controlling center.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway Equipment	Roadway Safeguard System Control	'Roadway Safeguard System Control' includes field equipment that controls safeguard systems for transportation facilities and infrastructure. Safeguard systems include blast shields, exhaust systems and other automatic or remotely controlled systems intended to mitigate the impact of an incident.

Element Name	Physical Object	Functional Object	Functional Object Description
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway Equipment	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.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway 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.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway 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.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway 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.

Element Name	Physical Object	Functional Object	Functional Object Description
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway 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 warning should be issued, the equipment is used to alert approaching drivers via dynamic warning signs, flashing lights, in-vehicle messages, etc.
City-Parish ITS Field Devices, DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	ITS Roadway 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.
DOTD District 61 Maintenance Division	Maint and Constr Management Center	MCM Vehicle Tracking	'MCM Vehicle Tracking' tracks the location of maintenance and construction vehicles and other equipment. Vehicle/equipment location and associated information is presented to the operator.
DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section	Maint and Constr Management Center	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.
DOTD District 61 Maintenance Division, DOTD District 61 Traffic Operations, DOTD District 62 Maintenance Division, DOTD District 62 Traffic Operations, DOTD ITS Section	Maint and Constr Management Center	MCM Work Activity Coordination	'MCM Work Activity Coordination' disseminates work activity schedules and current asset restrictions to other agencies. Work schedules are coordinated with operating agencies, factoring in the needs and activities of other agencies and adjacent jurisdictions. Work schedules are also distributed to Transportation Information Centers for dissemination to the traveling public.
DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices	Connected Vehicle Roadside Equipment	RSE Work Zone Safety	'RSE Work Zone Safety' communicates with Connected Vehicles and Personal Information Devices carried or worn by the work crew to detect vehicle intrusions in work zones and warn crew workers and drivers of imminent encroachment. Crew movements are also monitored so that the crew can be warned of movement beyond the designated safe zone.

Element Name	Physical Object	Functional Object	Functional Object Description
DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices	ITS Roadway Equipment	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 61 ITS Field Devices, DOTD District 62 ITS Field Devices	ITS Roadway Equipment	Roadway Work Zone Safety	'Roadway Work Zone Safety' includes field elements that detect vehicle intrusions in work zones and warns crew workers and drivers of imminent encroachment. Crew movements are also monitored so that the crew can be warned of movement beyond the designated safe zone.
DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	Connected Vehicle Roadside Equipment	RSE Situation Monitoring	'RSE Situation Monitoring' is a general functional object that supports collection of traffic, environmental, and emissions data from passing vehicles. The data is collected, filtered, and forwarded based on parameters provided by the back office. Parameters are provided to passing vehicles that are equipped to collect and send situation data to the infrastructure in snapshots. In addition, this object collects current status information from local field devices including intersection status, sensor data, and signage data, providing complete, configurable monitoring of the situation for the local transportation system in the vicinity of the RSE.
DOTD District 61 ITS Field Devices, DOTD District 62 ITS Field Devices, DOTD ITS Section	Connected Vehicle Roadside 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.
DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, DOTD ITS Section	Maint and Constr Management Center	MCM Environmental Information Collection	'MCM Environmental Information Collection' collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed sensor stations at the roadside, this functional object also collects environmental information from sensor systems located on Maintenance and Construction Vehicles. It also collects current and forecast environmental conditions information that is made available by other systems. The functional object aggregates the sensor system data and provides it, along with data attributes to other applications.

Element Name	Physical Object	Functional Object	Functional Object Description
DOTD District 61 Traffic Operations, DOTD District 62 Traffic Operations, Louisiana 511, Media	Transportation Information Center	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.
DOTD ITS Division Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle Location Tracking	'MCV Vehicle Location Tracking' monitors vehicle location and reports the position and timestamp information to the dispatch center.
DOTD ITS Division Maintenance Vehicles, DOTD ITS Section	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	'MCV Roadway Maintenance and Construction' includes the on-board systems that support routine non-winter maintenance on a roadway system or right-of-way. Routine maintenance includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, etc.).
DOTD ITS Division Maintenance Vehicles, DOTD ITS Section	Maint and Constr Vehicle OBE	MCV Work Zone Support	'MCV Work Zone Support' provides communications and support for local management of a work zone. It supports communications between field personnel and the managing center to keep the center appraised of current work zone status. It controls vehicle-mounted driver information systems (e.g., dynamic message signs) and uses short range communications to monitor and control other fixed or portable driver information systems in the work zone.
DOTD ITS Section	ITS Roadway Equipment	Roadway Data Collection	'Roadway Data Collection' collects traffic, road, and environmental conditions information for use in transportation planning, research, and other off-line applications where data quality and completeness take precedence over real-time performance. It includes the sensors, supporting roadside infrastructure, and communications equipment that collects and transfers information to a center for archival.

Element Name	Physical Object	Functional Object	Functional Object Description
DOTD ITS Section	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	'Roadway Dynamic Lane Management and Shoulder Use' includes the field equipment, physical overhead lane signs and associated control electronics that are used to manage and control specific lanes and/or the shoulders. This equipment can be centrally controlled by a Traffic Management Center or it can be autonomous and monitor traffic conditions and demand along the roadway and determine how to change the lane controls to respond to current conditions. Lane controls can be used to change the lane configuration of the roadway, reconfigure intersections and/or interchanges, allow use of shoulders as temporary travel lanes, designate lanes for use by special vehicles only, such as buses, high occupancy vehicles (HOVs), vehicles attending a special event, etc. and/or prohibit or restrict types of vehicles from using particular lanes. Guidance and information for drivers can be posted on dynamic message signs.
DOTD ITS Section	Maint and Constr Vehicle OBE	MCV Environmental Monitoring	'MCV Environmental Monitoring' collects current road and surface weather conditions from sensors on-board the maintenance and construction vehicle or by querying fixed sensors on or near the roadway. Environmental information including road surface temperature, air temperature, and wind speed is measured and spatially located and time stamped, and reported back to a center.
DOTD Weights and Standards Division	Commercial Vehicle Administration Center	CVAC Credentials and Taxes Administration	'CVAC Credentials and Taxes Administration' issues credentials, collects fees and taxes, and supports enforcement of credential requirements. It manages driver licensing and enrolls carriers in additional CVO programs such as wireless roadside inspection programs. It communicates with the Fleet and Freight Management Centers associated with the motor carriers to process applications and collect fuel taxes, weight/distance taxes, and other taxes and fees associated with commercial vehicle operations. It also receives applications for, and issues special Oversize/Overweight and HAZMAT permits in coordination with other cognizant authorities. It supports user account management and receives and processes requests for review of carrier and driver status. It communicates with peer functional objects in other jurisdictions to exchange credentials database information.

Element Name	Physical Object	Functional Object	Functional Object Description
DOTD Weights and Standards Division	Commercial Vehicle Administration Center	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, 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 and Standards Division	Commercial Vehicle Administration Center	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 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 and Standards Division	Commercial Vehicle Check Equipment	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.
DOTD Weights and Standards Division	Commercial Vehicle Check Equipment	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.

Element Name	Physical Object	Functional Object	Functional Object Description
DOTD Weights and Standards Division	Commercial Vehicle Check Equipment	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 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. 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.
DOTD Weights and Standards Division	Commercial Vehicle Check Equipment	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.
Louisiana 511, Media	Transportation Information Center	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.
Motorist Assistance Patrol	Emergency Vehicle OBE	EV Barrier System Control	'EV Barrier System Control' provides local control of automatic or remotely controlled gates and other barrier systems from an emergency vehicle. Using this capability, emergency personnel can open and close barriers without leaving the vehicle, using V2I Communications to control the barriers.

Element Name	Physical Object	Functional Object	Functional Object Description
Port of Baton Rouge	Fleet and Freight Management Center	Fleet Administration	'Fleet Administration' provides vehicle tracking, dispatch, and reporting capabilities to fleet management personnel. It gathers current road conditions, commercial vehicle-specific traffic and parking information, prepares vehicle routes, and provides a fleet interface for toll collection. It also provides route plan information for network performance evaluation. As part of the tracking function, it monitors commercial vehicle location, compares it against the known route and notifies the Emergency Management Center and Fleet-Freight Manager of any deviations, including HAZMAT route restriction violations. It supports carrier participation in wireless roadside inspection programs, monitoring geographic trigger areas and providing current safety data on behalf of the commercial vehicles it manages. It supports pre-hiring checks for potential drivers and monitors the performance of each driver who is hired. It also supports ongoing monitoring of the company's safety performance.
Port of Baton Rouge	Fleet and Freight Management Center	Fleet Driver Authentication	'Fleet Driver Authentication' collects and stores driver identification records including driver issued PINS and/or individual driver biometric measurements. It manages the storage of driver PINs, data from a driver identification card, and/or biometric measurements for authorized drivers on individual commercial vehicles. Based on information reported by the commercial vehicle, it will determine if the driver is authorized, and notify the Commercial Vehicle Manager when an unauthorized driver is detected. The Commercial Vehicle Manager may override the disable vehicle action. When an unauthorized driver is detected and the system is not overridden, it will issue a message to the commercial vehicle to safely disable the vehicle. If an unauthorized driver is detected, it will send the Emergency Management Center an alert that includes: incident location, current location of the CV, Vehicle ID, Carrier ID, Driver ID, CV Credentials information, and cargo manifest (if known).
Port of Baton Rouge	Fleet and Freight Management Center	Fleet Maintenance Management	'Fleet Maintenance Management' tracks and monitors diagnostic results, vehicle mileage, inspection records, driver logs, and repair and service records collected from a commercial vehicle fleet equipped with on-board monitoring equipment. The data is used to develop preventative maintenance and repair schedules and repair and service records are maintained.

Element Name	Physical Object	Functional Object	Functional Object Description
Port of Baton Rouge	Fleet and Freight Management Center	Freight Administration and Management	'Freight Administration and Management' manages the movement of freight from source to destination. It interfaces to intermodal customers to setup and schedule transportation and coordinates with intermodal terminals and freight consolidation stations to coordinate the shipment. It coordinates with the appropriate government agencies to expedite the movement of trucks, their drivers, and their cargo across international borders. The application monitors the status of the freight and freight equipment (container, trailer, or chassis) and monitors freight location and compares it against the planned route.
Port of Baton Rouge	Freight Equipment	Freight Equipment Monitoring	'Freight Equipment Monitoring' includes the on-board devices used to monitor intermodal freight equipment. These devices provide freight equipment location and status of the freight, container, or chassis equipment.
Port of Baton Rouge	Intermodal Terminal	Terminal Management	'Terminal Management' supports the operation of the roadway aspects of an intermodal terminal. The key capabilities include the ability to identify and control vehicle traffic entering and departing the facility, guide vehicles to loading and unloading points, maintain site security and monitor container integrity, provide an interface to Customs as appropriate, and acknowledge container pickup and drop-off. Other capabilities include the ability to track container locations within the facility, manage any other required assets, like truck chassis, and provide reservation services to manage congestion at busy terminals. This application also provides information to support load matching services for drayage operators.
Port of Baton Rouge	Security Monitoring Equipment	Field Secure Area Surveillance	'Field Secure Area Surveillance' includes video and audio surveillance equipment that monitors conditions of secure areas including facilities (e.g. transit yards), transportation infrastructure (e.g. as bridges, tunnels, interchanges, and transit railways or guideways), and public areas (e.g., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities). It provides the surveillance information to the Emergency Management Center for possible threat detection. It also provides local processing of the video or audio information, providing processed or analyzed results to the Emergency Management Center.

Element Name	Physical Object	Functional Object	Functional Object Description
Traveler	Personal Information Device	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.
Traveler	Personal Information Device	Personal Location Determination	'Personal Location Determination' receives current location information and provides this information to other applications that use the location information to provide guidance and emergency notification services. It interfaces with and encapsulates positioning technology such as a GPS receiver that is embedded in the user's device.
Traveler	Personal Information Device	Personal Pedestrian Safety	'Personal Pedestrian Safety' improves pedestrian, cyclist, and other non-motorized user safety by providing personal location information to the infrastructure that can be used to avoid collisions involving non-motorized travelers. It may also alert the non-motorized user of unsafe conditions, augmenting or extending information provided by signals and signs. The information provided and the user interface delivery mechanism (visual, audible, or haptic) can also be tailored to the needs of the user that is carrying or wearing the device that hosts the application.
Traveler	Personal Information Device	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.

Element Name	Physical Object	Functional Object	Functional Object Description
Traveler	Personal Information Device	Personal Trip Planning and Route Guidance	'Personal Trip Planning and Route Guidance' provides a personalized trip plan to the traveler. The trip plan is calculated based on preferences and constraints supplied by the traveler and provided to the traveler for confirmation. Coordination may continue during the trip so that the route plan can be modified to account for new information. Many equipment configurations are possible including systems that provide a basic trip plan to the traveler as well as more sophisticated systems that can provide transition by transition guidance to the traveler along a multi-modal route with transfers. Devices represented by this functional object include desktop computers at home, work, or at major trip generation sites, plus personal devices such as tablets and smart phones.