

SYSTEMS ENGINEERING ANALYSIS

BR to NO ITS - TIM

Phase 1

Design-Build Project

September 2007

Presented to:

Louisiana Department of Transportation
And Development



**Baton Rouge to New Orleans
Intelligent Transportation Systems –
Traffic Incident Management
Phase 1 Design-Build Project**

Systems Engineering Analysis

Presented to:

**Louisiana Department
Of Transportation
And Development**

Prepared by:



September 2007

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1 Introduction

To assure interoperability of physical systems and a coherent traffic management program, the implementation of an Intelligent Transportation System (ITS) project requires consideration as to how the project will fit into the National, State and Regional ITS Architectures (specifically the Louisiana State ITS Implementation and Telecommunication Plan, 2002) . The Federal Highway Administration (FHWA) has developed and mandated that a “Systems Engineering” process be used whenever ITS technologies are to be deployed. This process will give the implementing agency confidence that resources are being used optimally, returning the maximum value for transportation dollars spent.

LADOTD, supported by the Federal Highway Administration, has requested the implementation of the Baton Rouge to New Orleans ITS Traffic Incident Management (TIM) Phase I project. This project is 17 miles in length and the first of three (3) project phases to deploy ITS technologies along the Interstate 10 (I-10) corridor from Baton Rouge to New Orleans. The goal of Phase I is to deploy an ITS system that will provide LADOTD and the Louisiana State Police (LSP) with traffic surveillance and management tools to more effectively facilitate traffic and incident management activities on I-10 across the Bonnet Carre Spillway and its designated alternative route, US 61 (Airline Highway). ITS equipment will provide LADOTD and LSP with the ability to detect, verify, advise affected motorists, respond, manage traffic, and clear traffic incidents within the project limits. The project will result in improved mobility and safety for all motorists.

A unique aspect of this project is that the Design-Build (DB) contracting method will be used for the first time by LADOTD to implement a fully operational ITS project. LADOTD has prepared a functional specification that will be used by the Design-Builder in order to develop their specific system design and build it. There are a number of advantages for LADOTD using this contracting technique. First, it allows the design-builder the flexibility of implementing an ITS system with the most recently tested and effective technologies. Second, the overall responsibility for designing, constructing, testing and implementing the ITS system falls to the Design-Builder. Third, this process should reduce project implementation time.

Section 6 of this document contains the project requirements. Both the Design-Builder and the stakeholders are required to implement/fulfill these requirements. The Design-Builder will be responsible for the requirements only contained in the contract documents.

The centers operating the ITS equipment will be the LADOTD ITS Statewide TMC in Baton Rouge, the LADOTD District 02 (Bridge City). The LSP Troop B office in Kenner will only have monitoring capability. LADOTD is currently constructing the New Orleans Transportation Management Center (RTMC) at the corner of West End Blvd and Veteran’s Blvd. For the purposes of this analysis, the RTMC has been included with the District 02 (Bridge City) office as the role of the ITS operator will be the same whether at the Bridge City site or the RTMC facility.

Figure 1 shows the project area and physical limits of the ITS project implementation along the I-10 corridor.

Figure 1: Project Area and Physical Limits



Included within the projects limits of the Baton Rouge to New Orleans ITS TIM Phase I project:

- I-10: LA 3188, Belle Terre Blvd. (Exit 206) to LA 49, Williams Blvd. (Exit 223);
- US Highway 61, Airline Highway: US 51 to I-310;
- I-310: I-10 (Exit 1) to US Highway 61, Airline Highway (Exit 2);
- US 51: I-10 to US Highway 61, Airline Highway; and
- Traffic Management Centers: LADOTD District 02 (Bridge City)/RTMC, LADOTD ITS Statewide TMC and LSP Troop B.

2 Acronyms and Abbreviations

Wherever the following abbreviations or acronyms are used in this SE document, they are interpreted as follows:

| | |
|-----------|--------------------------------------------------------------------|
| AASHTO | American Association of State Highway and Transportation Officials |
| ADC | Analog-to-Digital Conversion |
| ADSL | Asymmetric Digital Subscriber |
| ARN | Area Radio Network |
| ATIS | Advanced Traveler Information Systems |
| ATMS | Advanced Traffic Management System |
| C2C | Center-to-center |
| C2F | Center-to-field |
| CAD | Computer Aided Dispatch |
| CCTV | Closed Circuit TV |
| CDMA | Code Division Multiple Access |
| CDPD | Cellular Digital Packet Data |
| CONOPS | Concept of Operations |
| DARC | Data Radio Channel System |
| DATEX-ASN | Data Exchange ASN.1 |
| DB | Design Build |
| DCM | Data Collection and Monitoring |
| DMS | Dynamic Message Sign |
| E9-1-1 | Enhanced 9-1-1 |
| EDGE | Enhanced Data for Global Evolution |
| EM | Emergency Management |
| EMC | Emergency Management Center |
| EMS | Emergency Medical Services |
| EOC | Emergency Operations Center |
| FDM | Frequency Division Multiplexing |
| FCC | Federal Communications Commission |
| FHWA | Federal Highway Administration |
| FR | Functional Requirement |
| GHz | Gigahertz |
| GIS | Geographic Information System |
| GSM | Global System for Mobile Communication |
| IEEE | Institute of Electrical and Electronic Engineers |
| IM | Incident Management |
| ISO | International Standards Organization |
| ITE | Institute of Transportation Engineers |
| ITS | Intelligent Transportation Systems |
| Kbps | Kilobits per Second |
| LADOTD | Louisiana Department of Transportation and Development |
| LCS | Lane Control Signals |
| LONI | Louisiana Optical Network Initiative |
| LSP | Louisiana State Police |
| MHz | Megahertz |
| MPH | Miles per Hour |
| MPO | Metropolitan Planning Organization |

| | |
|--------|---------------------------------------------------------|
| NEC | National Electric Code |
| NEMA | National Electrical Manufactures Association |
| NTCIP | National Communications for ITS Protocol |
| NS | Network Surveillance |
| O&M | Operations and Maintenance |
| OER | Octet Encoding Rules |
| OFDM | Orthogonal Frequency Division Multiplexing |
| PAR | Peak-to-Average Ratio |
| PC | Personal Computer |
| PCS | Personal Communications Services |
| POTS | Plain Old Telephone Service |
| PR | Performance Requirement |
| RS | Roadway Subsystem |
| RTMC | Regional Transportation Management Center (New Orleans) |
| RVD | Radar Vehicle Detector |
| SCP | Signal Control and Prioritization |
| SDO | Standard Development Organizations |
| SE | Systems Engineering |
| SI | Systeme Internationale or International System of Units |
| SNMP | Simple Network Management Protocol |
| STIC | Sub carrier Traffic Information Channel System |
| STMF | Simple Transportation Management Framework |
| STMP | Simple Transportation Management Protocol |
| SOSP | Scope of Services Package |
| SSC | Surface Street Control |
| TCP/IP | Transmission Control Protocol/Internet Protocol |
| TD | Traffic Detector |
| TIS | Traveler Information System |
| TIM | Traffic Incident Management |
| TMC | Traffic Management Center |
| TMP | Transportation Management Protocols |
| TMS | Traffic Management Subsystem |
| TOC | Traffic Operations Center |
| TSS | Transportation Sensor Systems |
| US | United States |
| USDOT | United States Department of Transportation |
| WAN | Wide Area Network |
| WLAN | Wireless Local Area Network |

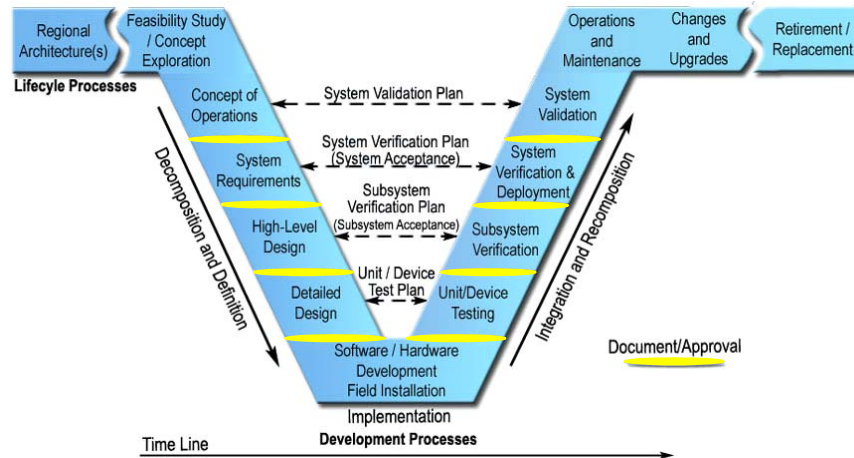
3 Systems Engineering Approach

The Systems Engineering approach offers a structured way of thinking to achieve project goals and objectives. This approach combines skills associated with engineering, project management and soft sciences (economic, social and legal). It helps to address all project issues and provide completeness to the system. Systems Engineering also provides for “traceability”, which is important when considering future changes to the system design, operation, verification and testing. Traceability is the capacity to track every requirement in the system to the system component that satisfies it. Through the Systems Engineering approach, a traceability matrix is deployed. This matrix provides the basis for construction testing and acceptance by the Project

Engineer, as well as the link between completion of individual pay items and implementation of the basic purpose and scope of the project.

Figure 2, the “V” Diagram or Model¹, is a visual illustration of the Systems Engineering process used for ITS, with each step involved as the project progresses through development.

Figure 2: “V” Diagram Illustrating Systems Engineering Process



The left side of the “V” Diagram provides a ‘top-down’ approach for system planning and design development while the right side provides ‘bottom-up’ implementation approach for systems testing and verification. The left side of the “V” must take into account the corresponding processes across on the right side of the “V”. The “V” diagram is a composition of three different perspectives, namely user’s perspective, engineer’s perspective and contractor’s perspective.

The Stakeholder’s (user’s) perspective helps to present the list of requirements. These requirements provide detailed definitions need to support system design. The perspective of a systems engineer is focused on detailed subsystem components design to achieve stated requirements. The perspective of a contractor is focused on the actual deployment of the system components, which ensures compliance with the design specifications.

4 Project Physical Architecture

It is essential that a project physical architecture be developed to illustrate the important ITS interfaces and the major system components. The physical architecture assigns processes from the logical architecture to subsystems, and it groups data flows from the logical architecture into architecture flows. These flows and corresponding communication requirements define the

¹ Source: *Systems Engineering ITS Guide*, FHWA, 2005
<http://ops.fhwa.dot.gov/publications/seitsguide/images/image021.jpg>

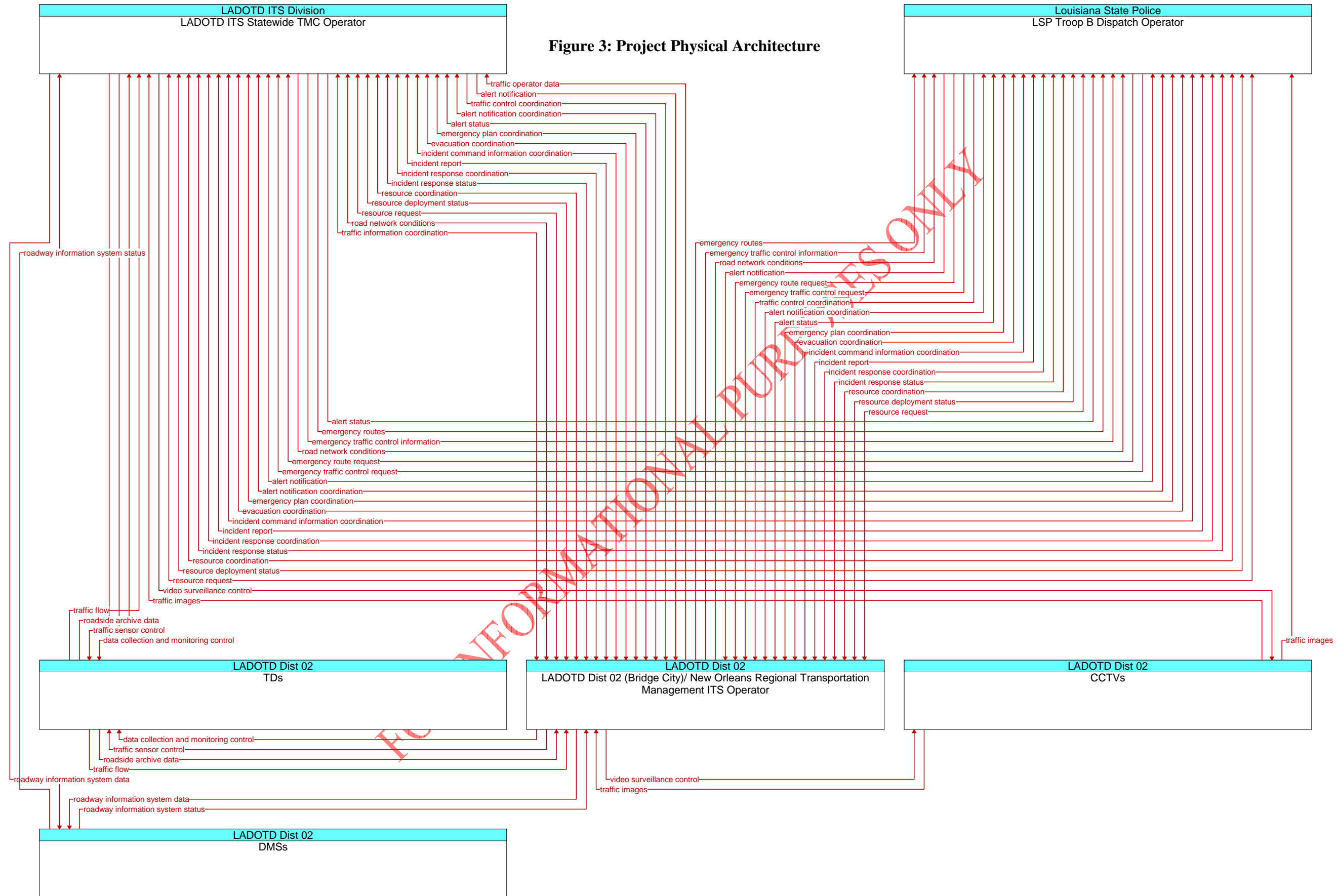
interfaces which are a main focus of the project ITS standards. The subsystems identified for this project are the following:

- LADOTD ITS Statewide TMC Operator;
- LADOTD District 02 (Bridge City)/RTMC ITS Operator;
- LSP Troop B Dispatch Operator;
- DMSs;
- TDs; and
- CCTVs

Figure 3 illustrates the project physical architecture under consideration. It depicts the overall understanding of the physical architecture components associated with the project.

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Figure 3: Project Physical Architecture



5 Concept of Operations

Concept of Operations (ConOps) describes how the proposed system will function, the environment in which it will operate, and the people who will use and support the system. ConOps identifies the stakeholders involved in the project and their responsibilities. It also describes the roles and responsibilities for operations and maintenance of the various system users.

The ConOps is a non-technical discussion of the ITS system that should be understood by everyone involved in the project. The ConOps presents a view of the operational system once the project is completed, the intended benefits of the system and the impact the region in which it is deployed. This ConOps is a general description of how the Baton Rouge to New Orleans ITS TIM Phase I will function and the operational responsibilities of each agency involved. The system, which cannot be used to transfer liability related to operating specific facilities, identifies operational roles to each agency.

5.1 Purpose

The purpose of the Baton Rouge to New Orleans ITS TIM Phase I project is to reduce the negative impacts of traffic congestion and incidents along I-10 between LA 3188, (Belle Terre Blvd., Exit 206) to LA 49, (Williams Blvd., Exit 223). Also, this project will enhance traffic operations and multi-agency coordination for normal and abnormal traffic conditions, evacuation operations, and further enhance the response to and command of incidents for EM and TIM purposes.

With the accomplishment of the system objectives, the system is able:

- To detect, verify and assess traffic congestion and incidents;
- To distribute information to motorists in a timely manner;
- To provide system monitoring and coordinated operations between the LADOTD ITS Statewide TMC, LADOTD District 02 (Bridge City)/RTMC and the LSP Troop B office; and
- Allow for a more reliable power source for existing I-10 – 12 mile bridge (between LaPlace and Kenner) emergency cross-overs.

5.2 Scope

The Baton Rouge to New Orleans ITS TIM Phase I project provides for the interaction of six (6) primary subsystems as previously identified in the Project Physical Architecture. The implementation of this project will provide capabilities to address improvements to the overall operations of traffic, provide information to motorists, and enhance coordination of agencies involved in transportation and incident management. The scope of this project includes the deployment of the ITS equipment components, communications, and integration as previously identified to assist the responsible stakeholders in providing services requiring the indicated architecture flow.

5.3 Justification for the ITS Project

I-10 is the major east-west controlled access freeway facility connecting major population centers across southern Louisiana. It is a major transportation route that enhances commerce and economic development not only within the state of Louisiana, but also other states along the Gulf Coast. During emergencies, it also serves as a major hurricane evacuation route for all of southern Louisiana. The Baton Rouge to New Orleans ITS Traffic Incident Management Phase I project is located along the I-10 Freeway corridor between Baton Rouge and New Orleans.

The importance of this project has significantly increased with the event of Hurricane Katrina in 2005. This hurricane inundated parts of the greater New Orleans area causing massive flooding, destroying thousands of homes and business and severely impacting the State's economy. The hurricane caused a massive evacuation and relocation of Louisiana citizens working in the Greater New Orleans area. With the destruction of so much residential housing, the affected population relocated to other areas in the state, specifically the River Parishes along the I-10 corridor identified herein. The relocation of these people caused an increase travel demand into and out of the greater New Orleans area on a daily basis. Since Hurricane Katrina daily traffic volumes for I-10 within the project area has increased 29 percent, from 42,000 to 53,000 vehicles per day (as seen in August and December 2005, respectfully). The increase in daily traffic volume resulted in more congestion, traffic incidents and lost mobility.

5.4 Existing Operations

Existing operations of the ITS equipment within the project limits are as identified in the following sections based on the operational role the equipment helps facilitate (i.e., Traffic/Roadway Management, Incident Management, and Emergency Management). **Figure 4a** and **Figure 4b** show the existing ITS equipment within the project limits.

Figure 4a: Existing LADOTD ITS Equipment Within Project Limits



Figure 4b: Existing LADOTD ITS Equipment Within Project Limits



5.4.1 Traffic/Roadway Management

LADOTD District 02 (Bridge City)/RTMC and District 62 currently operate and maintain eleven (11) traffic signalized intersections (7 and 4, respectfully) in the project limits along US 51 and US 61. None of the existing traffic signals have remote communications with the District 02 or District 62 offices. All timing changes are performed by District 02 or District 62 personnel in the field.

Currently there are two (2) DMS boards within the project limits operated by the District 02 Traffic Engineer's office. These DMSs use fiber optic hybrid flip disk technology to display a message. This technology is no longer being manufactured and it limited in support. The first location is on I-10 east of the I-310 interchange within the City of Kenner which provides information to motorists traveling west on I-10. The second location is on I-10 west of US 51, located in the City of LaPlace which provides information to motorists traveling west on US 61 and north on US 51. LADOTD personnel can communicate with the DMS boards via POTS lines using dial-up modems.

In addition to the DMS, there is one CCTV site at US 51 that is used for roadway surveillance. The 11 RVD sites and dynamic speed limit signs are currently not operational.

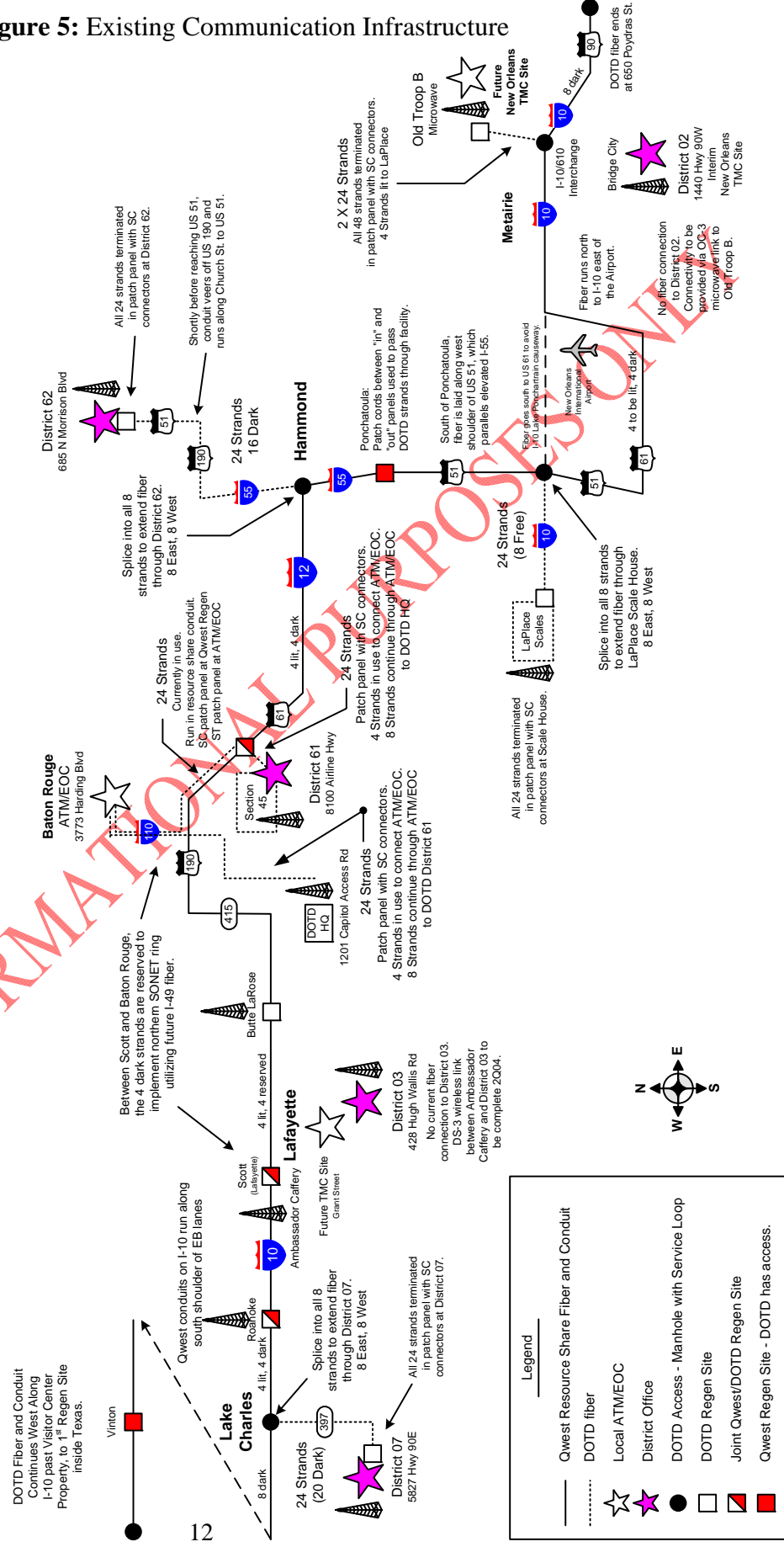
LADOTD's current communication infrastructure uses fiber optic cable and microwave technology. Within the project limits, LADOTD currently has eight fibers (four are currently in use and four are non-active) installed in a duct bank coming from the north along I-55 to I-10. Then it continues running south along US 51 then turning east at US 61. This duct continues just east of the airport where it turns north along the Airport Access Rd. till it reaches Veteran Blvd. From Veteran's Blvd. it runs east to Illinois Ave (east of Williams Blvd.) then north until it reaches I-10. From there it turns east towards New Orleans. LADOTD maintains three microwave towers in the New Orleans area. One located at the LaPlace scale facility, one at the RTMC site, and the other at the District 02 facility. Additionally, the LSP Troop B located in Kenner has an existing microwave tower. **Figure 5** shows the existing communication infrastructure.

LADOTD has ITS Operators monitoring traffic operations at the ITS Statewide TMC. The staff consists of one Statewide Operation Supervisor and two full-time ITS Operators. The LADOTD ITS Statewide TMC center is staffed from 6:00 A.M. to 10:00 P.M. Monday through Friday. LADOTD District 02 (Bridge City)/RTMC will be staffed seven days a week, from 5:30 A.M. until 10:00 P.M. by two full time operators, two part time operators and one full time supervisor.

Figure 5: Existing Communication Infrastructure

Fiber Map - Qwest Resource Share Fiber Along I-10 Corridor

- 8 Strands and 1 Conduit (Non-Multiducted)
- 4 Strands Currently Lit Between Lake Charles and LaPlace (as of February 2004)



5.4.2 Incident Management

LADOTD ITS Statewide TMC and District 02 operators provide incident detection and coordination where surveillance is available in the region.

On the 12 mile bridge there are two “cross-over” locations with barrier gates for access control. The cross-overs are 50 feet wide by 130 feet long areas of refuge that can be accessed by means of electronic card readers on both right hand shoulders across from each cross-over. The cross-overs are used by emergency managers as helipads, storage for inoperable vehicles, emergency vehicle marshalling and access to the opposite direction of travel. Currently the gates are powered by a solar power system. Access to the cross-overs requires emergency vehicles to negotiate across high volume, high speed lanes of traffic to utilize the cross-over.

5.4.3 Emergency Management

The EOC facilities include the LADOTD ITS Statewide TMC, LADOTD District 02 (Bridge City)/RTMC and LSP are responsible for coordinating the emergency management operations for events such as hurricanes, fuel and chemical spills from trucks and tankers, chemical discharges from plants and radiological discharges from the nearby nuclear power plant. There are several independent emergency operation centers tasked with responding to the above mentioned emergency situations. The ITS equipment available for traffic/roadway management and incident management is used for emergency management as needed.

5.5 System Overview

The Baton Rouge to New Orleans ITS TIM Phase I ITS proposed architecture is based on a distributive system design with a centralized TMC computer server located at the LADOTD ITS Statewide TMC in Baton Rouge. The system shall bring all data and video communication together on one backbone network making all data and video available to any system that also has access to the same backbone network. Using standard network communications can provide a common format for all emergency management dispatchers and operations personnel to effectively coordinate operations.

Table 1 shows the agencies that are to be connected to the fiber backbone. **Table 2** identifies the agencies responsible for operating and maintaining elements of the various systems affected by this project. It should be noted that this project will not provide architectural flows with some centers listed in Table 2. However, these have been included to indicate their relationship with the project being implemented.

Table 1: Agencies to be Connected to Backbone

| Center | Address |
|--------------------------|-------------------------------------------|
| LADOTD ITS Statewide TMC | 1201 Capitol Access Road, Baton Rouge, LA |
| LADOTD District 02 | 1440 US Highway 90, Bridge City, LA |
| RTMC (Future) | New Orleans, LA |

Table 2: Agency Responsibility

| System | Agency |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Traffic Management System ² Development | LADOTD ITS Statewide TMC |
| Traffic Management System ² Operations | LADOTD ITS Statewide TMC/LADOTD District 02 (Bridge City)/RTMC /LSP/ St Charles and St. John the Baptist Parishes E-911s |
| Traffic Management System ² Maintenance | LADOTD ITS Statewide TMC |
| Incident Management Development | LADOTD ITS Statewide TMC/ St. Charles and St. John the Baptist Parishes E-911s |
| Incident Management/Incident Operation | LADOTD ITS Statewide TMC/LADOTD District 02 (Bridge City)/RTMC /LSP/St. Charles and St John the Baptist Parishes 911s and EOCs |
| Incident Management System ² Maintenance | LADOTD ITS Statewide TMC/ St. Charles Parish and St. Johns the Baptist Parishes E-911s |
| Emergency Management System ² Development | LADOTD Emergency Operations Section /LSP/St. Charles and St John's Parishes 911s and EOCs |
| Emergency Management System ² Operation | LADOTD Emergency Operations Section/LSP/St. Charles and St John the Baptist Parishes 911s and EOCs |
| Emergency Management System ² Maintenance | LADOTD ITS Statewide TMC/LSP/St. Charles and St John the Baptist Parishes 911s and EOCs |

A distributed traffic, incident and emergency management system requires a highly reliable and robust communications network. As previously stated, a fiber optic communications backbone along I-55, US 51, US 61 and I-10 is available to supplement the communication needs for the project limits. **Table 3** shows agency accessibility to the communications network:

² Traffic Management, Incident Management, and Emergency Management Systems are made up of various physical systems as well process and procedures. These may include systems such as the ITS system deployed, 511, 911, CAD, 700/800MHz radio, etc.

Table 3: Agency Accessibility

| Agency | ITS Access |
|-----------------------------------------------|------------------|
| LADOTD Headquarters Annex (ITS Statewide EOC) | NS, TIS, IM, |
| LADOTD District 02 (Bridge City)/RTMC | SSC, NS, TIS, IM |
| Louisiana State Police, Troop B | NS, TIS, IM |

SSC-Surface Street Control, NS-Network Surveillance, TIS-Traveler Information System, and IM-Incident Management

It is anticipated that stakeholders will continue to provide oversight and direction for this project as it is designed and implemented. For further information regarding stakeholders please refer to section 5.6. The following section outlines the proposed operations of the agencies with regard to the deployment of this project. Operations and maintenance outside of this section are anticipated to remain as currently performed.

5.5.1 ITS Equipment Operations

The operations of the ITS Equipment are provided through the existing traffic management software, Cameleon ITS. Interface with the Cameleon will be constrained or prioritized for those agencies. Primary control of all devices will be held by LADOTD ITS Statewide TMC. LADOTD District 02 (Bridge City)/RTMC will have secondary control.

5.5.2 Center-to-Center Operations

Implementation of a communication backbone between centers permits direct center-to-center communication and allows multiple agencies to access the ITS equipment. This connection will allow for the transfer of data and images. This will result in a more effective and efficient use of resources. The intent of this connection is to better facilitate coordination between the agencies involved in Traffic Management, Incident Management, and Emergency Management.

5.6 Stakeholders

As can be seen from **Table 3**, the resulting envisioned system may involve the interaction of numerous individual agencies located within the region. It is anticipated that project deployment will provide the tools that will allow these stakeholders to facilitate their traffic and transportation management roles.

Currently, no written agreements have been developed on the interaction of the agencies involved in Traffic Management, Incident Management and Emergency Management. All agencies have representatives known as stakeholders. The operations and utilization of the system by the agencies shall be as directed and agreed upon in the Memorandum of Understanding developed for this project.

5.7 Operational Environment

The operational environment for the Baton Rouge to New Orleans ITS Traffic Incident Management Phase I project includes a description of operational procedures, skills and experience of personnel, security issues and processes, communications, data management and ownership. The project has a distributed architecture, as mentioned before, that does not require permanent co-location of agency operations staff.

5.8 Operational Scenarios

The Operational Scenarios describes a sequence of events and activities that are carried out by the user, system and environment. Operational Scenarios identify what event or action initiates the sequence, who or what performs each step, when communications occur and to whom or what. For this project, each function consists of a process used to respond to traffic incidents and access ITS equipment components.

5.8.1 Traffic Incident Management Operations (TIM)

TIM operations within the project limit area are generally a multi-staged approach. **Figure 6** summarizes the primary process for traffic incident management operation.

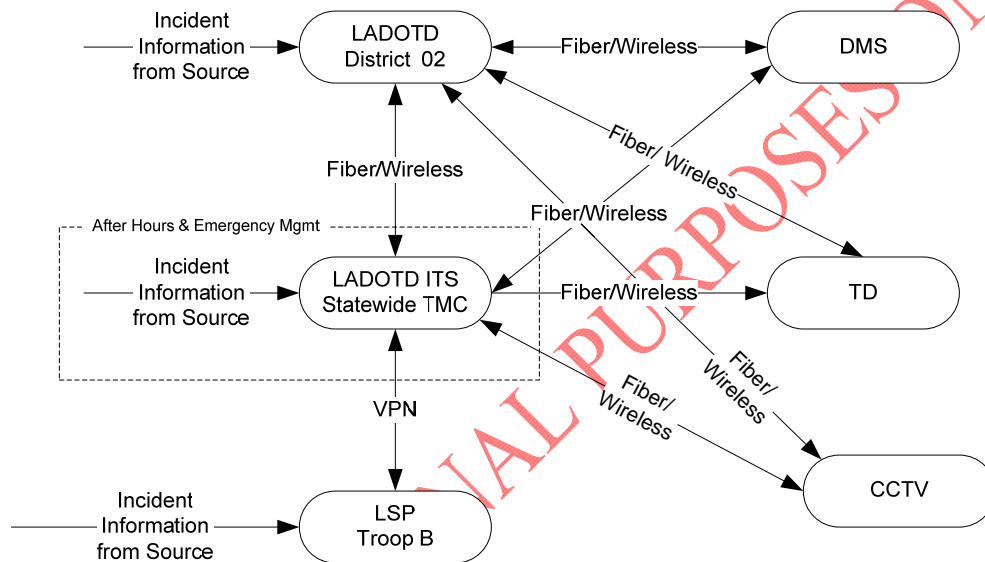
Since LADOTD ITS Statewide TMC and LADOTD District 02 (Bridge City)/RTMC are connected to the communications backbone, benefits of the system will be gained. In the occurrence of an incident, if the given location is near a CCTV camera, the operator will have the ability to detect and verify the incident without having to visit the field. LSP operators can monitor CCTV cameras in the system through its remote virtual private network (VPN) connection with LADOTD's network. CCTV cameras that are located along the 12 mile bridge on I-10 east and west are used for incident detection and vehicle detection. This also applies for alternate routes on US 61, US 51 and I-310. However, cameras at alternate routes are located at major signalized intersections.

The ITS operators at LADOTD ITS Statewide TMC and LADOTD District 02 (Bridge City)/RTMC will have the ability to post messages on DMS boards. DMS boards shall be located at decision points, which are defined as points where motorists can make a decision whether or not to take an alternate route or remain on the bridge. Alternate routing will be provided in the occurrence of an incident and/or emergency.

The ITS operators at LADOTD ITS Statewide TMC, LADOTD District 02 (Bridge City)/RTMC and LSP will have the ability to use traffic detectors (TDs) for their operations. Traffic detectors will be located along the 12 mile bridge. These detectors, along with other existing detectors outside of the project, will be used to determine travel times, gather traffic data and detect traffic incidents. LADOTD ITS Statewide TMC, LADOTD District 02 (Bridge City)/RTMC and LSP shall have the ability to view data from the TDs via compiled reports and the graphical user interface that is part of the existing traffic management software. Data gathered from the TDs shall be collected at the LADOTD ITS Statewide TMC and accessed by LADOTD District 02 (Bridge City)/RTMC and LSP.

A future ITS deployment may consist of Lane Control Signals (LCS) along the 12 mile bridge. These special overhead signals will permit or prohibit the use of a specific travel lane(s). The future implementation, will allow the 12 mile bridge to have three operational lanes of traffic. The third lane is anticipated to be used during peak hours and emergencies only. The specific operations and implementation of the LCS shall be determined by LADOTD prior to its implementation.

Figure 6: Concept of Operations Functions – Traffic Incident Management



5.8.2 Emergency Management Operations

During emergency situations automated messages being posted to DMS will be discontinued, and the ITS operator will post emergency specific messages on DMSs. For smaller emergencies the LADOTD District 02 (Bridge City)/ RTMC ITS Operator will operate the system from the District 02 office/RTMC. For regional based emergencies (i.e., hurricane evacuation), the LADOTD ITS Statewide TMC will assume control and operate the CCTVs, TDs and DMS boards.

5.9 Summary of Impacts

Table 4 shows the project impacts of deployment resulting from this study document for each agency below. This table includes the local agency connections, regional to statewide connections and the connections that will be established as a part of this project. It should be noted that additional operations and maintenance will vary for each agency based on the level of use chosen. If connections are made to the local and statewide backbone, the regional ITS architecture will need to be updated to show the connection.

Table 4: Summary of Impacts

| Center | Impact | | | | |
|---------------------------------------|---------------------------------------------------------|---------------------------------------------|---------------------------------------------|----------------------|---------------------------|
| Connected Centers | Access to other centers on local and statewide backbone | Network surveillance (Monitor CCTV cameras) | Network surveillance (Control CCTV cameras) | Post messages to DMS | Monitor Traffic Detectors |
| LADOTD ITS Statewide TMC | • | • | • | • | • |
| LADOTD District 02 (Bridge City)/RTMC | • | • | • | • | • |
| Louisiana State Police, Troop B | • | • | | | • |

6 Requirements

Requirements provide a foundation of information needed to move from the conceptual view presented in the ConOps to the concrete view which defines what must be done and included in the project design. These requirements form the basis for design, implementation, testing and operations.

6.1 Traffic Management/Traffic Incident Management

Traffic Incident Management monitors and controls traffic in case of an incident (please refer to the ConOps for further details and definitions). LADOTD ITS Statewide TMC (ITS Division) and the LADOTD District 02 (Bridge City)/RTMC serve as traffic management centers that exchange incident management information. To facilitate efficient flow of information, all requirements have been identified as being either performance (PR) or functional (FR).

FR1 LADOTD District 02 (Bridge City)/RTMC shall communicate with LADOTD ITS Statewide TMC.

FR1.1 LADOTD District 02 (Bridge City)/RTMC shall exchange traffic operator data with LADOTD ITS Statewide TMC for traffic management purposes

FR1.1.1 LADOTD District 02 (Bridge City)/RTMC shall provide traffic conditions to the LADOTD ITS Statewide TMC Operator.

FR1.1.2 LADOTD District 02 (Bridge City)/RTMC shall provide operating status of field equipment to the LADOTD ITS Statewide TMC Operator.

FR1.1.3 LADOTD District 02 (Bridge City)/RTMC shall provide maintenance activity status to the LADOTD ITS Statewide TMC Operator.

FR1.1.4 LADOTD District 02 (Bridge City)/RTMC shall provide incident status to the LADOTD ITS Statewide TMC Operator.

- FR1.2 LADOTD District 02 (Bridge City)/RTMC shall coordinate traffic information with LADOTD ITS Statewide TMC for traffic management purposes.
- FR1.2.1 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with incident information.
- FR1.3 LADOTD District 02 (Bridge City)/RTMC shall exchange road network conditions with LADOTD ITS Statewide TMC for traffic management purposes.
- FR1.3.1 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with current traffic information.
 - FR1.3.2 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with forecasted traffic information.
 - FR1.3.3 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with road conditions.
 - FR1.3.4 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with weather conditions.
 - FR1.3.5 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with traffic incident information.
- FR1.4 LADOTD District 02 (Bridge City)/RTMC shall exchange resource request information with LADOTD ITS Statewide TMC for traffic incident management purposes.
- FR1.4.1 LADOTD District 02 (Bridge City)/RTMC shall request LADOTD ITS Statewide TMC resources to implement special traffic control measures.
 - FR1.4.2 LADOTD District 02 (Bridge City)/RTMC shall request LADOTD ITS Statewide TMC resources to verify an incident.
- FR1.5 LADOTD District 02 (Bridge City)/RTMC shall exchange resource deployment status information with LADOTD ITS Statewide TMC for traffic incident management purposes.
- FR1.5.1 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of individual resource deployment.
 - FR1.5.1.1 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of vehicles used in the occurrence of an incident.
 - FR1.5.1.2 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of equipment used in the occurrence of an incident.
 - FR1.5.1.3 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of materials used in the occurrence of an incident.
 - FR1.5.1.4 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of personnel used in the occurrence of an incident.

- FR1.5.2 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the availability of individual resources.
- FR1.5.2.1 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the vehicles available for usage in the occurrence of an incident.
 - FR1.5.2.2 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the equipment available for usage in the occurrence of an incident.
 - FR1.5.2.3 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the materials available for usage in the occurrence of an incident.
 - FR1.5.2.4 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the personnel available for usage in the occurrence of an incident.
- FR1.6 LADOTD District 02 (Bridge City)/RTMC shall exchange incident response status information with LADOTD ITS Statewide TMC for traffic incident management purposes.
- FR1.6.1 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of current incident response.
 - FR1.6.1.1 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC a summary of the incident status.
 - FR1.6.1.2 LADOTD District 02 (Bridge City)/RTMC shall report LADOTD ITS Statewide TMC the impact of the incident on the transportation system.
 - FR1.6.1.3 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC traffic management strategies for the site.
 - FR1.6.1.4 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC current response activities.
 - FR1.6.1.5 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC planned response activities.
- FR1.7 LADOTD District 02 (Bridge City)/RTMC shall coordinate emergency plans with LADOTD ITS Statewide TMC for traffic management purposes.
- FR1.7.1 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC emergency management plans.
 - FR1.7.2 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC the continuity of operations plans.
 - FR1.7.3 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC emergency response plans.
 - FR1.7.4 LADOTD District 02 (Bridge City)/RTMC shall coordinate recovery plans with LADOTD ITS Statewide TMC.

- FR1.7.5 LADOTD District 02 (Bridge City)/RTMC shall coordinate evacuation plans with LADOTD ITS Statewide TMC.
- FR1.8 LADOTD District 02 (Bridge City)/RTMC shall provide an alert status to LADOTD ITS Statewide TMC for traffic management purposes.
- FR1.8.1 LADOTD District 02 (Bridge City)/RTMC shall provide information to LADOTD ITS Statewide TMC indicating the current status of the emergency alert.
- FR1.8.2 LADOTD District 02 (Bridge City)/RTMC shall identify to LADOTD ITS Statewide TMC the driver information systems used to provide the alert.
- FR2 LADOTD ITS Statewide TMC shall communicate with LADOTD District 02 (Bridge City)/RTMC.
- FR2.1 LADOTD ITS Statewide TMC shall coordinate traffic control with LADOTD District 02 (Bridge City)/RTMC for traffic management purposes
- FR2.1.1 LADOTD ITS Statewide TMC shall provide to LADOTD District 02 (Bridge City)/RTMC information transfers that enable remote monitoring of traffic management devices.
- FR2.1.2 LADOTD ITS Statewide TMC shall provide to LADOTD District 02 (Bridge City)/RTMC information transfers that enable control of traffic management devices.
- FR2.2 LADOTD ITS Statewide TMC shall provide an alert notification to LADOTD District 02 (Bridge City)/RTMC for traffic management purposes.
- FR2.2.1 LADOTD ITS Statewide TMC shall provide notification to LADOTD District 02 (Bridge City)/RTMC of a major emergency.
- FR2.2.1.1 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a natural disaster to the public.
- FR2.2.1.1.1 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
- FR2.2.1.1.2 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
- FR2.2.1.1.3 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR2.2.1.1.4 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instructions on how to respond to the alert.

- FR2.2.1.2 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a man-made disaster to the public.
- FR2.2.1.2.1 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
 - FR2.2.1.2.2 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
 - FR2.2.1.2.3 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
 - FR2.2.1.2.4 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instructions on how to respond to the alert.
- FR2.2.1.3 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a civil emergency to the public.
- FR2.2.1.3.1 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
 - FR2.2.1.3.2 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
 - FR2.2.1.3.3 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
 - FR2.2.1.3.4 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instructions on how to respond to the alert.
- FR2.2.1.4 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a child abduction to the public.
- FR2.2.1.4.1 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
 - FR2.2.1.4.2 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.

- FR2.2.1.4.3 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR2.2.1.4.4 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instructions on how to respond to the alert.
- FR3 LADOTD District 02 (Bridge City)/RTMC shall communicate with LSP Troop B Dispatch Operator
 - FR3.1 LADOTD District 02 (Bridge City)/RTMC shall exchange resource request information with LSP for traffic incident management purposes.
 - FR3.1.1 LADOTD District 02 (Bridge City)/RTMC shall request LSP resources to implement special traffic control measures.
 - FR3.1.2 LADOTD District 02 (Bridge City)/RTMC shall request LSP resources to verify an incident.
 - FR3.2 LADOTD District 02 (Bridge City)/RTMC shall exchange resource deployment status information with LSP for traffic incident management purposes.
 - FR3.2.1 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of individual resource deployment.
 - FR3.2.1.1 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of vehicles used in the occurrence of an incident.
 - FR3.2.1.2 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of equipment used in the occurrence of an incident.
 - FR3.2.1.3 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of materials used in the occurrence of an incident.
 - FR3.2.1.4 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of personnel used in the occurrence of an incident.
 - FR3.2.2 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the availability of individual resources.
 - FR3.2.2.1 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the vehicles available for use in the occurrence of an incident.
 - FR3.2.2.2 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the equipment available for use in the occurrence of an incident.
 - FR3.2.2.3 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the materials available for use in the occurrence of an incident.
 - FR3.2.2.4 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the personnel available for use in the occurrence of an incident.
 - FR3.3 LADOTD District 02 (Bridge City)/RTMC shall exchange incident response status information with LSP for traffic incident management purposes.

- FR3.3.1 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of current incident response.
- FR3.3.1.1 LADOTD District 02 (Bridge City)/RTMC shall provide LSP a summary of incident status.
 - FR3.3.1.2 LADOTD District 02 (Bridge City)/RTMC shall report to LSP the impact of the incident on the transportation system.
 - FR3.3.1.3 LADOTD District 02 (Bridge City)/RTMC shall provide LSP traffic management strategies for the site.
 - FR3.3.1.4 LADOTD District 02 (Bridge City)/RTMC shall provide LSP current response activities
 - FR3.3.1.5 LADOTD District 02 (Bridge City)/RTMC shall provide LSP planned response activities.
- FR3.4 LADOTD District 02 (Bridge City)/RTMC shall coordinate emergency plans with LSP for traffic management purposes.
- FR3.4.1 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP emergency management plans.
 - FR3.4.2 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP the continuity of operations plans.
 - FR3.4.3 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP emergency response plans.
 - FR3.4.4 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP recovery plans.
 - FR3.4.5 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP evacuation plans.
- FR3.5 LADOTD District 02 (Bridge City)/RTMC shall provide an alert status to LSP for traffic management purposes.
- FR3.5.1 LADOTD District 02 (Bridge City)/RTMC shall provide information to LSP indicating the current status of the emergency alert.
 - FR3.5.1.1 LADOTD District 02 (Bridge City)/RTMC shall identify to LSP the driver information systems that are being used to provide the alert.
- FR3.6 LADOTD District 02 (Bridge City)/RTMC shall provide road network conditions with LSP for traffic management purposes.
- FR3.6.1 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD LSP with current traffic information.
 - FR3.6.2 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with forecasted traffic information.
 - FR3.6.3 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with road conditions.

- FR3.6.4 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with weather conditions.
- FR3.6.5 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with traffic incident information.
- FR3.7 LADOTD District 02 (Bridge City)/RTMC (Bridge City)/RTMC shall provide emergency traffic control information to LSP for traffic management purposes.
- FR3.7.1 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with the status of a system activation implemented in response to an emergency traffic control request.
- FR3.7.2 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with the status of a system activation implemented in response to a request for emergency access routes.
- FR3.7.3 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with the status of a system activation implemented in response to a request for evacuation.
- FR3.8 LADOTD District 02 (Bridge City)/RTMC shall provide emergency routes to LSP for traffic management purposes.
- FR3.8.1 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested ingress routes for access to the scenes.
- FR3.8.2 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested ingress routes for access between the scenes.
- FR3.8.3 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested ingress routes for access to staging areas.
- FR3.8.4 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested egress routes for access to the scenes.
- FR3.8.5 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested egress routes for access between the scenes.
- FR3.8.6 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested egress routes for access to staging areas.
- FR4 Louisiana State Police Troop B (LSP) shall communicate with LADOTD District 02 (Bridge City)/RTMC.
- FR4.1 LSP shall provide an alert notification to LADOTD District 02 (Bridge City)/RTMC for traffic management purposes.
- FR4.1.1 LSP shall provide notification to LADOTD District 02 (Bridge City)/RTMC of a major emergency.
- FR4.1.1.1 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a natural disaster to the public.
- FR4.1.1.1.1 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.

- FR4.1.1.1.2 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
- FR4.1.1.1.3 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR4.1.1.1.4 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instructions on how to respond to the alert.
- FR4.1.1.2 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a man-made disaster to the public.
- FR4.1.1.2.1 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
- FR4.1.1.2.2 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
- FR4.1.1.2.3 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR4.1.1.2.4 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instructions on how to respond to the alert.
- FR4.1.1.3 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a civil emergency to the public.
- FR4.1.1.3.1 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
- FR4.1.1.3.2 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
- FR4.1.1.3.3 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR4.1.1.3.4 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instructions on how to respond to the alert.
- FR4.1.1.4 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a child abduction to the public.
- FR4.1.1.4.1 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
- FR4.1.1.4.2 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.

- FR4.1.1.4.3 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR4.1.1.4.4 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instructions on how to respond to the alert.
- FR4.2 LSP shall request an emergency route from District 02 in the occurrence of an emergency for traffic management purposes.
- FR4.2.1 LSP shall request LADOTD District 02 (Bridge City)/RTMC for ingress access routes for emergency response vehicles.
- FR4.2.2 LSP shall request LADOTD District 02 (Bridge City)/RTMC for ingress access routes for emergency response equipment.
- FR4.2.3 LSP shall request LADOTD District 02 (Bridge City)/RTMC for egress access routes for emergency response vehicles.
- FR4.2.4 LSP shall request LADOTD District 02 (Bridge City)/RTMC for egress access routes for emergency response equipment.
- FR4.3 LSP shall request emergency traffic control from District 02 for traffic management purposes.
- FR4.3.1 LSP shall request LADOTD District 02 (Bridge City)/RTMC to place a public safety message on a dynamic message sign.
- FR4.3.2 LSP shall request LADOTD District 02 (Bridge City)/RTMC to place an emergency message on a dynamic message sign.
- FR4.4 LSP shall coordinate traffic control with LADOTD District 02 (Bridge City)/RTMC for traffic management purposes.
- FR4.4.1 LSP shall provide to the LADOTD District 02 (Bridge City)/RTMC information transfers that enable remote monitoring of traffic management devices.
- FR4.4.2 LSP shall provide to the LADOTD District 02 (Bridge City)/RTMC information transfers that enable control of traffic management devices.
- FR5 LSP shall communicate with LADOTD ITS Statewide TMC
- FR5.1 LSP shall provide an alert notification to LADOTD ITS Statewide TMC for traffic management purposes.
- FR5.1.1 LSP shall provide notification to LADOTD ITS Statewide TMC of a major emergency.
- FR5.1.1.1 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a natural disaster to the public.
- FR5.1.1.1.1 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the alert originator.

- FR5.1.1.1.2 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the nature of the emergency.
- FR5.1.1.1.3 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the effective time period of the alert.
- FR5.1.1.1.4 LSP shall coordinate with LADOTD ITS Statewide TMC the information provided to the public with instructions on how to respond to the alert.
- FR5.1.1.2 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a man-made disaster to the public.
- FR5.1.1.2.1 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the alert originator.
- FR5.1.1.2.2 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the nature of the emergency.
- FR5.1.1.2.3 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the effective time period of the alert.
- FR5.1.1.2.4 LSP shall coordinate with LADOTD ITS Statewide TMC the information provided to the public with instructions on how to respond to the alert.
- FR5.1.1.3 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a civil emergency to the public.
- FR5.1.1.3.1 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the alert originator.
- FR5.1.1.3.2 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the nature of the emergency.
- FR5.1.1.3.3 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the effective time period of the alert.
- FR5.1.1.3.4 LSP shall coordinate with LADOTD ITS Statewide TMC the information provided to the public with instructions on how to respond to the alert.
- FR5.1.1.4 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a child abduction to the public.
- FR5.1.1.5 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the alert originator.
- FR5.1.1.6 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the nature of the emergency.
- FR5.1.1.7 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the effective time period of the alert.

- FR5.1.1.8 LSP shall coordinate with LADOTD ITS Statewide TMC the information provided to the public with instructions on how to respond to the alert.
- FR5.2 LSP shall exchange resource request information with LADOTD ITS Statewide TMC for traffic incident management purposes.
- FR5.2.1 LSP shall request LADOTD ITS Statewide TMC resources to implement special traffic control measures.
- FR5.2.2 LSP shall request LADOTD ITS Statewide TMC resources to verify an incident.
- FR5.3 LSP shall exchange resource deployment status information with LADOTD ITS Statewide TMC for traffic incident management purposes.
- FR5.3.1 LSP shall inform LADOTD ITS Statewide TMC of the status of individual resource deployment.
- FR5.3.1.1 LSP shall inform LADOTD ITS Statewide TMC of the status of vehicles used in the occurrence of an incident.
- FR5.3.1.2 LSP shall inform LADOTD ITS Statewide TMC of the status of equipment used in the occurrence of an incident.
- FR5.3.1.3 LSP shall inform LADOTD ITS Statewide TMC of the status of materials used in the occurrence of an incident.
- FR5.3.1.4 LSP shall inform LADOTD ITS Statewide TMC of the status of personnel used in the occurrence of an incident.
- FR5.3.2 LSP shall inform LADOTD ITS Statewide TMC of the availability of individual resources.
- FR5.3.2.1 LSP shall inform LADOTD ITS Statewide TMC of the vehicles available for usage in the occurrence of an incident.
- FR5.3.2.2 LSP shall inform LADOTD ITS Statewide TMC of the equipment available for usage in the occurrence of an incident.
- FR5.3.2.3 LSP shall inform LADOTD ITS Statewide TMC of the materials available for usage in the occurrence of an incident.
- FR5.3.2.4 LSP shall inform LADOTD ITS Statewide TMC of the personnel available for usage in the occurrence of an incident.
- FR5.4 LSP shall exchange incident response status information with LADOTD ITS Statewide TMC for traffic incident management purposes.
- FR5.4.1 LSP shall inform LADOTD ITS Statewide TMC of the status of current incident response.
- FR5.4.1.1 LSP shall provide LADOTD ITS Statewide TMC a summary of incident status.
- FR5.4.1.2 LSP shall report to LADOTD ITS Statewide TMC the impact of the incident on the transportation system.

- FR5.4.1.3 LSP shall provide LADOTD ITS Statewide TMC traffic management strategies for the site.
- FR5.4.1.4 LSP shall provide LADOTD ITS Statewide TMC current response activities
- FR5.4.1.5 LSP shall provide LADOTD ITS Statewide TMC planned response activities.
- FR5.5 LSP shall coordinate emergency plans with LADOTD ITS Statewide TMC for traffic management purposes.
- FR5.5.1 LSP shall coordinate with LADOTD ITS Statewide TMC emergency management plans.
- FR5.5.2 LSP shall coordinate with LADOTD ITS Statewide TMC the continuity of operations plans.
- FR5.5.3 LSP shall coordinate with LADOTD ITS Statewide TMC emergency response plans.
- FR5.5.4 LSP shall coordinate with LADOTD ITS Statewide TMC recovery plans.
- FR5.5.5 LSP shall coordinate with LADOTD ITS Statewide TMC evacuation plans.
- FR5.6 LSP shall request an emergency route from LADOTD ITS Statewide TMC in the occurrence of an emergency for traffic management purposes.
- FR5.6.1 LSP shall request LADOTD ITS Statewide TMC for ingress access routes for emergency response vehicles.
- FR5.6.2 LSP shall request LADOTD ITS Statewide TMC for ingress access routes for emergency response equipment.
- FR5.6.3 LSP shall request LADOTD ITS Statewide TMC for egress access routes for emergency response vehicles.
- FR5.6.4 LSP shall request LADOTD ITS Statewide TMC for egress access routes for emergency response equipment.
- FR5.7 LSP shall request emergency traffic control from LADOTD ITS Statewide TMC for traffic management purposes.
- FR5.7.1 LSP shall request LADOTD ITS Statewide TMC to place a public safety message on a dynamic message sign.
- FR5.7.2 LSP shall request LADOTD ITS Statewide TMC to place an emergency message on a dynamic message sign.
- FR6 LADOTD ITS Statewide TMC shall communicate with Louisiana State Police (LSP).
- FR6.1 LADOTD ITS Statewide TMC shall provide an alert status to LSP for traffic management purposes.
- FR6.1.1 LADOTD ITS Statewide TMC shall provide information to LSP indicating the current status of the emergency alert.

- FR6.1.1.1 LADOTD ITS Statewide TMC shall identify to LSP the driver information systems that are being used to provide the alert.
- FR6.2 LADOTD ITS Statewide TMC shall exchange road network conditions with LSP for traffic management purposes.
- FR6.2.1 LADOTD ITS Statewide TMC shall provide LSP with road conditions.
- FR6.2.2 LADOTD ITS Statewide TMC shall provide LSP with weather conditions.
- FR6.2.3 LADOTD ITS Statewide TMC shall provide LSP with traffic incident information.
- FR6.3 LADOTD ITS Statewide TMC shall provide emergency traffic control information to LSP for traffic management purposes.
- FR6.3.1 LADOTD ITS Statewide TMC shall provide LSP with the status of a system activation implemented in response to an emergency traffic control request.
- FR6.3.2 LADOTD ITS Statewide TMC shall provide LSP with the status of a system activation implemented in response to a request for emergency access routes.
- FR6.3.3 LADOTD ITS Statewide TMC shall provide LSP with the status of a system activation implemented in response to a request for evacuation.
- FR6.4 LADOTD ITS Statewide TMC shall provide emergency routes to LSP for traffic management purposes.
- FR6.4.1 LADOTD ITS Statewide TMC shall provide LSP with suggested ingress routes for access to the scenes.
- FR6.4.2 LADOTD ITS Statewide TMC shall provide LSP with suggested ingress routes for access between the scenes.
- FR6.4.3 LADOTD ITS Statewide TMC shall provide LSP with suggested ingress routes for access to staging areas.
- FR6.4.4 LADOTD ITS Statewide TMC shall provide LSP with suggested egress routes for access to the scenes.
- FR6.4.5 LADOTD ITS Statewide TMC shall provide LSP with suggested egress routes for access between the scenes.
- FR6.4.6 LADOTD ITS Statewide TMC shall provide LSP with suggested egress routes for access to staging areas.
- FR7 TDs shall communicate with LADOTD ITS Statewide TMC.
- FR7.1 TDs shall provide traffic flow information to LADOTD ITS Statewide TMC.
- FR7.1.1 TDs shall provide raw traffic detector data which allows the derivation of traffic flow variables
- FR7.1.2 TDs shall provide processed traffic detector data which allows the derivation of traffic flow variables
- FR7.2 TDs shall provide roadside archive data to LADOTD ITS Statewide TMC.

- FR7.2.1 TDs shall provide current traffic conditions derived from roadside sensors to LADOTD ITS Statewide TMC.
- FR7.2.2 TDs shall provide environmental conditions derived from roadside sensors to LADOTD ITS Statewide TMC
- FR8 LADOTD ITS Statewide TMC shall communicate with TDs.
- FR8.1 LADOTD ITS Statewide TMC shall provide traffic sensor control information to TDs.
- FR8.1.1 LADOTD ITS Statewide TMC shall provide information used to configure traffic sensor systems
- FR8.1.2 LADOTD ITS Statewide TMC shall provide shall provide information used to control traffic sensor systems
- FR8.2 LADOTD ITS Statewide TMC shall control data collection and monitoring to TDs.
- FR8.2.1 LADOTD ITS Statewide TMC shall provide to TDs information used to configure data collection.
- FR8.2.2 LADOTD ITS Statewide TMC shall provide to TDs information used to control data collection.
- FR8.2.3 LADOTD ITS Statewide TMC shall provide to TDs information used to configure monitoring systems.
- FR8.2.4 LADOTD ITS Statewide TMC shall provide to TDs information used to control monitoring systems.
- FR9 LADOTD ITS Statewide TMC shall communicate with CCTVs.
- FR9.1 LADOTD ITS Statewide TMC shall control video surveillance of CCTVs
- FR10 CCTVs shall communicate with LADOTD ITS Statewide TMC.
- FR10.1 LADOTD ITS Statewide TMC shall receive traffic images supplied by CCTVs.
- FR11 LADOTD ITS Statewide TMC shall communicate with DMSs.
- FR11.1 LADOTD ITS Statewide TMC shall provide roadway information system data to DMSs for traffic management purposes.
- FR11.1.1 LADOTD ITS Statewide TMC shall provide information to DMSs used to initialize roadside systems that provide driver information.
- FR11.1.2 LADOTD ITS Statewide TMC shall provide information to DMSs used to configure roadside systems that provide driver information.
- FR11.1.3 LADOTD ITS Statewide TMC shall provide information to DMSs used to control roadside systems that provide driver information.
- FR12 LADOTD District 02 (Bridge City)/RTMC shall communicate with DMSs.
- FR12.1 LADOTD District 02 (Bridge City)/RTMC shall provide roadway information system data to DMSs for traffic management purposes.

- FR12.1.1 LADOTD District 02 (Bridge City)/RTMC shall provide information to DMSs used to initialize roadside systems that provide driver information.
- FR12.1.2 LADOTD District 02 (Bridge City)/RTMC shall provide information to DMSs used to configure roadside systems that provide driver information.
- FR12.1.3 LADOTD District 02 (Bridge City)/RTMC shall provide information to DMSs used to control roadside systems that provide driver information.
- FR13 DMSs shall communicate with LADOTD ITS Statewide TMC.
- FR13.1 DMSs shall provide status of the roadway information system to LADOTD ITS Statewide TMC for traffic management purposes.
- FR13.1.1 DMSs shall provide information to LADOTD ITS Statewide TMC indicating the current operating status of the dynamic message signs.
- FR14 DMSs shall communicate with LADOTD District 02 (Bridge City)/RTMC.
- FR14.1 DMSs shall provide status of the roadway information system to LADOTD District 02 (Bridge City)/RTMC for traffic management purposes.
- FR14.1.1 DMSs shall provide information to LADOTD District 02 (Bridge City)/RTMC indicating the current operating status of the dynamic message signs.
- FR15 TDs shall communicate with LADOTD District 02 (Bridge City)/RTMC.
- FR15.1 TDs shall provide traffic flow information to LADOTD District 02 (Bridge City)/RTMC.
- FR15.1.1 TDs shall provide raw traffic detector data which allows the derivation of traffic flow variables.
- FR15.1.2 TDs shall provide processed traffic detector data which allows the derivation of traffic flow variables.
- FR15.2 TDs shall provide roadside archive data to LADOTD District 02 (Bridge City)/RTMC.
- FR15.2.1 TDs shall provide current traffic conditions derived from roadside sensors to LADOTD District 02 (Bridge City)/RTMC.
- FR15.2.2 TDs shall provide environmental conditions derived from roadside sensors to LADOTD District 02 (Bridge City)/RTMC.
- FR16 LADOTD District 02 (Bridge City)/RTMC shall communicate with TDs.
- FR16.1 LADOTD District 02 (Bridge City)/RTMC shall control data collection and monitoring to TDs.
- FR16.1.1 LADOTD District 02 (Bridge City)/RTMC shall provide to TDs information used to configure data collection.
- FR16.1.2 LADOTD District 02 (Bridge City)/RTMC shall provide to TDs information used to control data collection.

- FR16.1.3 LADOTD District 02 (Bridge City)/RTMC shall provide to TDs information used to configure monitoring systems.
- FR16.1.4 LADOTD District 02 (Bridge City)/RTMC shall provide to TDs information used to control monitoring systems.
- FR16.2 LADOTD District 02 (Bridge City)/RTMC shall provide traffic sensor control information to TDs.
- FR16.2.1 LADOTD District 02 (Bridge City)/RTMC shall provide information used to configure traffic sensor systems.
- FR16.2.2 LADOTD District 02 (Bridge City)/RTMC shall provide shall provide information used to control traffic sensor systems.
- FR17 LADOTD District 02 (Bridge City)/RTMC shall communicate with CCTVs.
- FR17.1 LADOTD District 02 (Bridge City)/RTMC shall control video surveillance of CCTVs.
- FR18 CCTVs shall communicate with LADOTD District 02 (Bridge City)/RTMC.
- FR18.1 LADOTD District 02 (Bridge City)/RTMC shall receive traffic images supplied by CCTVs.
- FR19 CCTVs shall communicate with LSP Troop B.
- FR19.1 LSP Troop B shall receive traffic images supplied by CCTVs.
- FR20 LADOTD ITS Statewide TMC shall develop operation guidelines prior to project development.
- FR20.1 LADOTD District 02 (Bridge City)/RTMC shall have control of LCS operations.
- FR20.1.1 The bottom of the signal housing of any lane control signal face shall be at least 4.6m (15 ft) but no more than 5.8m (19 ft) above the pavement grade.
- FR20.1.2 LCS faces shall be located over each controlled lane at frequent intervals if the area to be controlled is more than 700 m (2300 ft) in length, or if the vertical or horizontal alignment is curved.
- PR1 The color of LCS indications shall be clearly visible for 700 m (2300 ft) at all times under normal atmospheric conditions, unless otherwise physically obstructed.

6.2 Emergency Management System

The Emergency Management represents public safety and other allied agency systems that support incident management, disaster response and evacuation, security monitoring, and other security and public safety-oriented ITS applications. This system does not operate from a specific center; rather, all of the emergency response centers that are connected to the fiber backbone communicate in order to make efficient decisions and allow operability within different organizations.

FR21 System shall provide access of high speed communication transmission for emergency coordination between connected agencies.

FR22 LADOTD District 02 (Bridge City)/RTMC shall communicate with LADOTD ITS Statewide TMC

FR22.1 LADOTD District 02 (Bridge City)/RTMC shall exchange traffic operator data with LADOTD ITS Statewide TMC for emergency management purposes

FR22.2 LADOTD District 02 (Bridge City)/RTMC shall exchange road network conditions with LADOTD ITS Statewide TMC for emergency management purposes.

FR22.2.1 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with road conditions.

FR22.2.2 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with weather conditions.

FR22.2.3 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with traffic incident information for emergency management purposes.

FR22.3 LADOTD District 02 (Bridge City)/RTMC shall exchange resource request information with LADOTD ITS Statewide TMC for emergency management purposes.

FR22.3.1 LADOTD District 02 (Bridge City)/RTMC shall request LADOTD ITS Statewide TMC resources to implement special traffic control measures in the occurrence of an emergency.

FR22.3.2 LADOTD District 02 (Bridge City)/RTMC shall request LADOTD ITS Statewide TMC resources to verify an incident for emergency management purposes.

FR22.4 LADOTD District 02 (Bridge City)/RTMC shall exchange resource deployment status information with LADOTD ITS Statewide TMC for emergency management purposes.

FR22.4.1 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of individual resource deployment.

FR22.4.1.1 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of vehicles used in the occurrence of an emergency.

- FR22.4.1.2 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of equipment used in the occurrence of an emergency.
- FR22.4.1.3 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of materials used in the occurrence of an emergency.
- FR22.4.1.4 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of personnel used in the occurrence of an emergency.
- FR22.4.2 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the availability of individual resources.
- FR22.4.2.1 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the vehicles available for usage in emergency management purposes.
- FR22.4.2.2 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the equipment available for usage in the occurrence of an emergency
- FR22.4.2.3 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the materials available for usage in the occurrence of an emergency.
- FR22.4.2.4 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the personnel available for usage in the occurrence of an emergency.
- FR22.5 LADOTD District 02 (Bridge City)/RTMC shall exchange resource coordination information with LADOTD ITS Statewide TMC for emergency management purposes.
- FR22.5.1 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the coordination of resource inventory information.
- FR22.5.2 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the specific resource status information.
- FR22.5.3 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the coordination of resource prioritization.
- FR22.5.4 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the specific requests for resources
- FR22.5.5 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the responses that service requests.
- FR22.6 LADOTD District 02 (Bridge City)/RTMC shall exchange incident reports with LADOTD ITS Statewide TMC for emergency management purposes.
- FR22.6.1 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC an identified incident.

- FR22.6.2 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC the incident location.
- FR22.6.3 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC the incident type.
- FR22.6.4 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC the incident severity.
- FR22.6.5 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC all information necessary to initiate an appropriate incident response.
- FR22.7 LADOTD District 02 (Bridge City)/RTMC shall coordinate incident response with LADOTD ITS Statewide TMC for emergency management purposes.
- FR22.7.1 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC the incident response procedures that are shared between allied response agencies to support a coordinated response to incidents.
- FR22.7.1.1 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC a summary of incident status.
- FR22.7.1.2 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC the impact of the incident on the transportation system.
- FR22.7.1.3 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC the impact of the incident on infrastructure.
- FR22.7.1.4 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC current response activities.
- FR22.7.1.5 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC planned response activities.
- FR22.8 LADOTD District 02 (Bridge City)/RTMC shall exchange incident response status information with LADOTD ITS Statewide TMC for emergency management purposes.
- FR22.8.1 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of the status of current incident response.
- FR22.8.1.1 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC a summary of incident status.
- FR22.8.1.2 LADOTD District 02 (Bridge City)/RTMC shall report LADOTD ITS Statewide TMC the impact of the incident on the transportation system.
- FR22.8.1.3 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC traffic management strategies for the site.
- FR22.8.1.4 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC current response activities
- FR22.8.1.5 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC planned response activities.

FR22.9 LADOTD District 02 (Bridge City)/RTMC shall coordinate incident command information with LADOTD ITS Statewide TMC for emergency management purposes.

FR22.9.1 LADOTD District 02 (Bridge City)/RTMC shall provide to LADOTD ITS Statewide TMC information that supports local management of an incident.

FR22.9.1.1 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC resource deployment status.

FR22.9.1.2 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC traffic conditions.

FR22.9.1.3 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC road conditions.

FR22.9.1.4 LADOTD District 02 (Bridge City)/RTMC shall report to LADOTD ITS Statewide TMC weather conditions.

FR22.9.1.5 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with evacuation advice.

FR22.9.1.6 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with all information that enables emergency personnel in the field to implement a safe incident response.

FR22.9.1.7 LADOTD District 02 (Bridge City)/RTMC shall provide LADOTD ITS Statewide TMC with all information that enables emergency personnel in the field to implement an efficient incident response.

FR22.10 LADOTD District 02 (Bridge City)/RTMC shall coordinate evacuations with LADOTD ITS Statewide TMC for emergency management purposes.

FR22.10.1 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC information regarding a pending evacuation.

FR22.10.1.1 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of evacuation zones.

FR22.10.1.2 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of evacuation times.

FR22.10.1.3 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of evacuation routes.

FR22.10.1.4 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of forecast network conditions.

FR22.10.1.5 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of reentry times.

FR22.10.2 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC information regarding an in-process evacuation.

FR22.10.2.1 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of evacuation zones.

- FR22.10.2.2 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of evacuation times.
- FR22.10.2.3 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of evacuation routes.
- FR22.10.2.4 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of forecast network conditions.
- FR22.10.2.5 LADOTD District 02 (Bridge City)/RTMC shall inform LADOTD ITS Statewide TMC of reentry times.
- FR22.11 LADOTD District 02 (Bridge City)/RTMC shall coordinate emergency plans with LADOTD ITS Statewide TMC for emergency management purposes.
- FR22.11.1 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC emergency management plans.
- FR22.11.2 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC the continuity of operations plans.
- FR22.11.3 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC emergency response plans.
- FR22.11.4 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC recovery plans, evacuation plans.
- FR22.12 LADOTD District 02 (Bridge City)/RTMC shall coordinate alert notifications with LADOTD ITS Statewide TMC for emergency management purposes.
- FR22.12.1 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC emergency alerts to be distributed to the public.
- FR22.12.1.1 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC the notification of a natural disaster to the public.
- FR22.12.1.2 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC the notification of a man-made disaster to the public.
- FR22.12.1.3 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC the notification of a civil emergency to the public.
- FR22.12.1.4 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LADOTD ITS Statewide TMC the notification of a child abduction to the public.
- FR22.13 LADOTD District 02 (Bridge City)/RTMC shall provide an alert status to LADOTD ITS Statewide TMC for emergency management purposes.
- FR22.13.1 LADOTD District 02 (Bridge City)/RTMC shall provide information to LADOTD ITS Statewide TMC indicating the current status of the emergency alert.

- FR22.13.2 LADOTD District 02 (Bridge City)/RTMC shall identify to LADOTD ITS Statewide TMC the driver information systems that are being used to provide the alert.
- FR23 LADOTD ITS Statewide TMC shall communicate with LADOTD District 02 (Bridge City)/RTMC.
- FR23.1 LADOTD ITS Statewide TMC shall provide an alert notification to LADOTD District 02 (Bridge City)/RTMC for emergency management purposes.
- FR23.1.1 LADOTD ITS Statewide TMC shall provide notification to LADOTD District 02 (Bridge City)/RTMC of a major emergency.
- FR23.1.1.1 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a natural disaster to the public.
- FR23.1.1.1.1 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
- FR23.1.1.1.2 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
- FR23.1.1.1.3 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR23.1.1.1.4 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instruction on how to respond to the alert.
- FR23.1.1.2 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a man-made disaster to the public.
- FR23.1.1.2.1 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
- FR23.1.1.2.2 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
- FR23.1.1.2.3 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR23.1.1.2.4 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instruction on how to respond to the alert.

- FR23.1.1.3 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a civil emergency to the public.
- FR23.1.1.3.1 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
 - FR23.1.1.3.2 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
 - FR23.1.1.3.3 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
 - FR23.1.1.3.4 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instruction on how to respond to the alert.
- FR23.2 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a child abduction to the public.
- FR23.2.1 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
 - FR23.2.2 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
 - FR23.2.3 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
 - FR23.2.4 LADOTD ITS Statewide TMC shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instruction on how to respond to the alert.
- FR24 LADOTD District 02 (Bridge City)/RTMC shall communicate with Louisiana State Police (LSP).
- FR24.1 LADOTD District 02 (Bridge City)/RTMC shall exchange resource request information with LSP for emergency management purposes.
 - FR24.1.1 LADOTD District 02 (Bridge City)/RTMC shall request LSP resources to implement special traffic control measures in the occurrence of an emergency.
 - FR24.1.2 LADOTD District 02 (Bridge City)/RTMC shall request LSP resources to verify an incident for emergency management purposes.
 - FR24.2 LADOTD District 02 (Bridge City)/RTMC shall exchange resource deployment status information with LSP for emergency management purposes.
 - FR24.2.1 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of individual resource deployment.
 - FR24.2.1.1 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of vehicles used in the occurrence of an emergency.

- FR24.2.1.2 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of equipment used in the occurrence of an emergency.
- FR24.2.1.3 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of materials used in the occurrence of an emergency.
- FR24.2.1.4 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of personnel used in the occurrence of an emergency.
- FR24.2.2 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the availability of individual resources.
- FR24.2.2.1 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the vehicles available for usage in emergency management purposes.
- FR24.2.2.2 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the equipment available for usage in the occurrence of an emergency.
- FR24.2.2.3 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the materials available for usage in the occurrence of an emergency.
- FR24.2.2.4 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the personnel available for usage in the occurrence of an emergency.
- FR24.3 LADOTD District 02 (Bridge City)/RTMC shall exchange resource coordination information with LSP for emergency management purposes.
- FR24.3.1 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the coordination of resource inventory information.
- FR24.3.2 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the specific resource status information.
- FR24.3.3 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the coordination of resource prioritization.
- FR24.3.4 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the specific requests for resources.
- FR24.4 LADOTD District 02 (Bridge City)/RTMC shall exchange incident response status information with LSP for emergency management purposes.
- FR24.4.1 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of the status of current incident response.
- FR24.4.1.1 LADOTD District 02 (Bridge City)/RTMC shall provide LSP a summary of incident status.
- FR24.4.1.2 LADOTD District 02 (Bridge City)/RTMC shall report LSP the impact of the incident on the transportation system.
- FR24.4.1.3 LADOTD District 02 (Bridge City)/RTMC shall provide LSP traffic management strategies for the site.
- FR24.4.1.4 LADOTD District 02 (Bridge City)/RTMC shall provide LSP current response activities

- FR24.4.1.5 LADOTD District 02 (Bridge City)/RTMC shall provide LSP planned response activities.
- FR24.5 LADOTD District 02 (Bridge City)/RTMC shall coordinate incident response with LSP for emergency management purposes.
- FR24.5.1 LADOTD District 02 (Bridge City)/RTMC shall report to LSP the incident response procedures that are shared between allied response agencies to support a coordinated response to incidents.
- FR24.5.1.1 LADOTD District 02 (Bridge City)/RTMC shall report to LSP a summary of incident status.
- FR24.5.1.2 LADOTD District 02 (Bridge City)/RTMC shall report to LSP the impact of the incident on the transportation system.
- FR24.5.1.3 LADOTD District 02 (Bridge City)/RTMC shall report to LSP the impact of the incident on infrastructure.
- FR24.5.1.4 LADOTD District 02 (Bridge City)/RTMC shall report to LSP current response activities.
- FR24.5.1.5 LADOTD District 02 (Bridge City)/RTMC shall report to LSP planned response activities.
- FR24.6 LADOTD District 02 (Bridge City)/RTMC shall exchange incident reports with LSP for emergency management purposes.
- FR24.6.1 LADOTD District 02 (Bridge City)/RTMC shall report to LSP an identified incident.
- FR24.6.2 LADOTD District 02 (Bridge City)/RTMC shall report to LSP the incident location.
- FR24.6.3 LADOTD District 02 (Bridge City)/RTMC shall report to LSP the incident type.
- FR24.6.4 LADOTD District 02 (Bridge City)/RTMC shall report to LSP the incident severity.
- FR24.6.5 LADOTD District 02 (Bridge City)/RTMC shall report to LSP all information necessary to initiate an appropriate incident response.
- FR24.7 LADOTD District 02 (Bridge City)/RTMC shall coordinate incident command information with LSP for emergency management purposes.
- FR24.7.1 LADOTD District 02 (Bridge City)/RTMC shall provide to LSP information that supports local management of an incident.
- FR24.7.1.1 LADOTD District 02 (Bridge City)/RTMC shall report to LSP resource deployment status.
- FR24.7.1.2 LADOTD District 02 (Bridge City)/RTMC shall report to LSP traffic conditions.
- FR24.7.1.3 LADOTD District 02 (Bridge City)/RTMC shall report to LSP road conditions.

- FR24.7.1.4 LADOTD District 02 (Bridge City)/RTMC shall report to LSP weather conditions.
- FR24.7.1.5 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with evacuation advice.
- FR24.7.1.6 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with all information that enables emergency personnel in the field to implement a safe incident response.
- FR24.7.1.7 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with all information that enables emergency personnel in the field to implement an efficient incident response.
- FR24.8 LADOTD District 02 (Bridge City)/RTMC shall coordinate evacuations with LSP for emergency management purposes.
- FR24.8.1 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP information regarding a pending evacuation.
- FR24.8.1.1 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of evacuation zones.
- FR24.8.1.2 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of evacuation times.
- FR24.8.1.3 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of evacuation routes.
- FR24.8.1.4 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of forecast network conditions.
- FR24.8.1.5 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of reentry times.
- FR24.8.2 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP information regarding an in-process evacuation.
- FR24.8.2.1 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of evacuation zones.
- FR24.8.2.2 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of evacuation times.
- FR24.8.2.3 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of evacuation routes.
- FR24.8.2.4 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of forecast network conditions.
- FR24.8.2.5 LADOTD District 02 (Bridge City)/RTMC shall inform LSP of reentry times.
- FR24.9 LADOTD District 02 (Bridge City)/RTMC shall coordinate emergency plans with LSP for emergency management purposes.

- FR24.9.1 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP emergency management plans.
- FR24.9.2 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP the continuity of operations plans.
- FR24.9.3 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP emergency response plans.
- FR24.9.4 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP recovery plans, evacuation plans.
- FR24.10 LADOTD District 02 (Bridge City)/RTMC shall coordinate alert notifications with LSP for emergency management purposes.
- FR24.10.1 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP emergency alerts to be distributed to the public.
- FR24.10.1.1 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP the notification of a natural disaster to the public.
- FR24.10.1.2 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP the notification of a man-made disaster to the public.
- FR24.10.1.3 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP the notification of a civil emergency to the public.
- FR24.10.1.4 LADOTD District 02 (Bridge City)/RTMC shall coordinate with LSP the notification of a child abduction to the public.
- FR24.11 LADOTD District 02 (Bridge City)/RTMC shall provide an alert status to LSP for emergency management purposes.
- FR24.11.1 LADOTD District 02 (Bridge City)/RTMC shall provide information to LSP indicating the current status of the emergency alert.
- FR24.11.1.1 LADOTD District 02 (Bridge City)/RTMC shall identify to LSP the driver information systems that are being used to provide the alert.
- FR24.12 LADOTD District 02 (Bridge City)/RTMC shall exchange road network conditions with LSP for emergency management purposes.
- FR24.12.1 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with road conditions.
- FR24.12.2 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with weather conditions.
- FR24.12.3 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with traffic incident information for emergency management purposes.
- FR24.13 LADOTD District 02 (Bridge City)/RTMC shall provide emergency traffic control information to LSP for emergency management purposes.
- FR24.13.1 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with the status of a system activation implemented in response to an emergency traffic control request.

- FR24.13.2 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with the status of a system activation implemented in response to a request for emergency access routes.
- FR24.13.3 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with the status of a system activation implemented in response to a request for evacuation.
- FR24.14 LADOTD District 02 (Bridge City)/RTMC shall provide emergency routes to LSP for emergency management purposes.
- FR24.14.1 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested ingress routes for access to the scenes.
- FR24.14.2 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested ingress routes for access between the scenes.
- FR24.14.3 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested ingress routes for access to staging areas.
- FR24.14.4 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested egress routes for access to the scenes.
- FR24.14.5 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested egress routes for access between the scenes.
- FR24.14.6 LADOTD District 02 (Bridge City)/RTMC shall provide LSP with suggested egress routes for access to staging areas.
- FR25 Louisiana State Police (LSP) shall communicate with LADOTD District 02 (Bridge City)/RTMC.
- FR25.1 LSP shall provide an alert notification to LADOTD District 02 (Bridge City)/RTMC for emergency management purposes.
- FR25.1.1 LSP shall provide notification to LADOTD District 02 (Bridge City)/RTMC of a major emergency.
- FR25.1.1.1 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a natural disaster to the public.
- FR25.1.1.1.1 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
- FR25.1.1.1.2 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
- FR25.1.1.1.3 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR25.1.1.1.4 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instruction on how to respond to the alert.
- FR25.1.1.2 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a man-made disaster to the public.

- FR25.1.1.2.1 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
- FR25.1.1.2.2 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
- FR25.1.1.2.3 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR25.1.1.2.4 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instruction on how to respond to the alert.
- FR25.1.1.3 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a civil emergency to the public.
- FR25.1.1.3.1 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
- FR25.1.1.3.2 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
- FR25.1.1.3.3 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR25.1.1.3.4 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instruction on how to respond to the alert.
- FR25.1.1.4 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the notification of a child abduction to the public.
- FR25.1.1.4.1 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the alert originator.
- FR25.1.1.4.2 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the nature of the emergency.
- FR25.1.1.4.3 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the identification of the effective time period of the alert.
- FR25.1.1.4.4 LSP shall coordinate with LADOTD District 02 (Bridge City)/RTMC the information provided to the public with instruction on how to respond to the alert.
- FR25.2 LSP shall request an emergency route from District 02 in the occurrence of an emergency.
- FR25.2.1 LSP shall request LADOTD District 02 (Bridge City)/RTMC for ingress access routes for emergency response vehicles.
- FR25.2.2 LSP shall request LADOTD District 02 (Bridge City)/RTMC for ingress access routes for emergency response equipment.

- FR25.2.3 LSP shall request LADOTD District 02 (Bridge City)/RTMC for egress access routes for emergency response vehicles.
- FR25.2.4 LSP shall request LADOTD District 02 (Bridge City)/RTMC for egress access routes for emergency response equipment.
- FR25.3 LSP shall request emergency traffic control from District 02 for emergency management purposes.
- FR25.3.1 LSP shall request LADOTD District 02 (Bridge City)/RTMC to place a public safety message on a dynamic message sign.
- FR25.3.2 LSP shall request LADOTD District 02 (Bridge City)/RTMC to place an emergency message on a dynamic message sign.
- FR26 LSP shall communicate with LADOTD ITS Statewide TMC.
- FR26.1 LSP shall provide an alert notification to LADOTD ITS Statewide TMC for emergency management purposes.
- FR26.1.1 LSP shall provide notification to LADOTD ITS Statewide TMC of a major emergency.
- FR26.1.1.1 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a natural disaster to the public.
- FR26.1.1.1.1 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the alert originator.
- FR26.1.1.1.2 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the nature of the emergency.
- FR26.1.1.1.3 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the effective time period of the alert.
- FR26.1.1.1.4 LSP shall coordinate with LADOTD ITS Statewide TMC the information provided to the public with instruction on how to respond to the alert.
- FR26.1.1.2 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a man-made disaster to the public.
- FR26.1.1.2.1 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the alert originator.
- FR26.1.1.2.2 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the nature of the emergency.
- FR26.1.1.2.3 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the effective time period of the alert.
- FR26.1.1.2.4 LSP shall coordinate with LADOTD ITS Statewide TMC the information provided to the public with instruction on how to respond to the alert.
- FR26.1.1.3 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a civil emergency to the public.

- FR26.1.1.3.1 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the alert originator.
- FR26.1.1.3.2 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the nature of the emergency.
- FR26.1.1.3.3 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the effective time period of the alert.
- FR26.1.1.3.4 LSP shall coordinate with LADOTD ITS Statewide TMC the information provided to the public with instruction on how to respond to the alert.
- FR26.1.1.4 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a child abduction to the public.
- FR26.1.1.4.1 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the alert originator.
- FR26.1.1.4.2 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the nature of the emergency.
- FR26.1.1.4.3 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the effective time period of the alert.
- FR26.1.1.4.4 LSP shall coordinate with LADOTD ITS Statewide TMC the information provided to the public with instruction on how to respond to the alert.
- FR26.2 LSP shall coordinate alert notifications with LADOTD ITS Statewide TMC for emergency management purposes.
- FR26.2.1 LSP shall coordinate with LADOTD ITS Statewide TMC emergency alerts to be distributed to the public.
- FR26.2.1.1 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a natural disaster to the public.
- FR26.2.1.2 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a man-made disaster to the public.
- FR26.2.1.3 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a civil emergency to the public.
- FR26.2.1.4 LSP shall coordinate with LADOTD ITS Statewide TMC the notification of a child abduction to the public.
- FR26.3 LSP shall exchange resource request information with LADOTD ITS Statewide TMC for emergency management purposes.
- FR26.3.1 LSP shall request LADOTD ITS Statewide TMC resources to implement special traffic control measures in the occurrence of an emergency.
- FR26.3.2 LSP shall request LADOTD ITS Statewide TMC resources to verify an incident for emergency management purposes.

FR26.4 LSP shall exchange resource deployment status information with LADOTD ITS Statewide TMC for emergency management purposes.

FR26.4.1 LSP shall inform LADOTD ITS Statewide TMC of the status of individual resource deployment.

FR26.4.1.1 LSP shall inform LADOTD ITS Statewide TMC of the status of vehicles used in the occurrence of an emergency.

FR26.4.1.2 LSP shall inform LADOTD ITS Statewide TMC of the status of equipment used in the occurrence of an emergency.

FR26.4.1.3 LSP shall inform LADOTD ITS Statewide TMC of the status of materials used in the occurrence of an emergency.

FR26.4.1.4 LSP shall inform LADOTD ITS Statewide TMC of the status of personnel used in the occurrence of an emergency.

FR26.4.2 LSP shall inform LADOTD ITS Statewide TMC of the availability of individual resources.

FR26.4.2.1 LSP shall inform LADOTD ITS Statewide TMC of the vehicles available for usage in emergency management purposes.

FR26.4.2.2 LSP shall inform LADOTD ITS Statewide TMC of the equipment available for usage in the occurrence of an emergency

FR26.4.2.3 LSP shall inform LADOTD ITS Statewide TMC of the materials available for usage in the occurrence of an emergency.

FR26.4.2.4 LSP shall inform LADOTD ITS Statewide TMC of the personnel available for usage in the occurrence of an emergency.

FR26.5 LSP shall exchange resource coordination information with LSP for emergency management purposes.

FR26.5.1 LSP shall inform LADOTD ITS Statewide TMC of the coordination of resource inventory information.

FR26.5.2 LSP shall inform LADOTD ITS Statewide TMC of the specific resource status information.

FR26.5.3 LSP shall inform LADOTD ITS Statewide TMC of the coordination of resource prioritization.

FR26.5.4 LSP shall inform LADOTD ITS Statewide TMC of the specific requests for resources.

FR26.6 LSP shall exchange incident response status information with LADOTD ITS Statewide TMC for emergency management purposes.

FR26.6.1 LSP shall inform LADOTD ITS Statewide TMC of the status of current incident response.

FR26.6.1.1 LSP shall provide LADOTD ITS Statewide TMC a summary of incident status.

- FR26.6.1.2 LSP shall report LADOTD ITS Statewide TMC the impact of the incident on the transportation system.
- FR26.6.1.3 LSP shall provide LADOTD ITS Statewide TMC traffic management strategies for the site.
- FR26.6.1.4 LSP shall provide LADOTD ITS Statewide TMC current response activities
- FR26.6.1.5 LSP shall provide LADOTD ITS Statewide TMC planned response activities.
- FR26.7 LSP shall coordinate incident response with LADOTD ITS Statewide TMC for emergency management purposes.
- FR26.7.1 LSP shall report to LADOTD ITS Statewide TMC the incident response procedures that are shared between allied response agencies to support a coordinated response to incidents.
- FR26.7.1.1 LSP shall report to LADOTD ITS Statewide TMC a summary of incident status.
- FR26.7.1.2 LSP shall report to LADOTD ITS Statewide TMC the impact of the incident on the transportation system.
- FR26.7.1.3 LSP shall report to LADOTD ITS Statewide TMC the impact of the incident on infrastructure.
- FR26.7.1.4 LSP shall report to LADOTD ITS Statewide TMC current response activities.
- FR26.7.1.5 LSP shall report to LADOTD ITS Statewide TMC planned response activities.
- FR26.8 LSP shall exchange incident reports with LADOTD ITS Statewide TMC for emergency management purposes.
- FR26.8.1 LSP shall report to LADOTD ITS Statewide TMC an identified incident.
- FR26.8.2 LSP shall report to LADOTD ITS Statewide TMC the incident location.
- FR26.8.3 LSP shall report to LADOTD ITS Statewide TMC the incident type.
- FR26.8.4 LSP shall report to LADOTD ITS Statewide TMC the incident severity.
- FR26.8.5 LSP shall report to LADOTD ITS Statewide TMC all information necessary to initiate an appropriate incident response.
- FR26.9 LSP shall coordinate incident command information with LADOTD ITS Statewide TMC for emergency management purposes.
- FR26.9.1 LSP shall provide to LADOTD ITS Statewide TMC information that supports local management of an incident.
- FR26.9.1.1 LSP shall report to LADOTD ITS Statewide TMC resource deployment status.
- FR26.9.1.2 LSP shall report to LADOTD ITS Statewide TMC traffic conditions.

- FR26.9.1.3 LSP shall report to LADOTD ITS Statewide TMC road conditions.
- FR26.9.1.4 LSP shall report to LADOTD ITS Statewide TMC weather conditions.
- FR26.9.1.5 LSP shall provide LADOTD ITS Statewide TMC with evacuation advice.
- FR26.9.1.6 LSP shall provide LADOTD ITS Statewide TMC with all information that enables emergency personnel in the field to implement a safe incident response.
- FR26.9.1.7 LSP shall provide LADOTD ITS Statewide TMC with all information that enables emergency personnel in the field to implement an efficient incident response.
- FR26.10 LSP shall coordinate evacuations with LADOTD ITS Statewide TMC for emergency management purposes.
- FR26.10.1 LSP shall coordinate with LADOTD ITS Statewide TMC information regarding a pending evacuation.
- FR26.10.1.1 LSP shall inform LADOTD ITS Statewide TMC of evacuation zones.
- FR26.10.1.2 LSP shall inform LADOTD ITS Statewide TMC of evacuation times.
- FR26.10.1.3 LSP shall inform LADOTD ITS Statewide TMC of evacuation routes.
- FR26.10.1.4 LSP shall inform LADOTD ITS Statewide TMC of forecast network conditions.
- FR26.10.1.5 LSP shall inform LADOTD ITS Statewide TMC of reentry times.
- FR26.10.2 LSP shall coordinate with LADOTD ITS Statewide TMC information regarding an in-process evacuation.
- FR26.10.2.1 LSP shall inform LADOTD ITS Statewide TMC of evacuation zones.
- FR26.10.2.2 LSP shall inform LADOTD ITS Statewide TMC of evacuation times.
- FR26.10.2.3 LSP shall inform LADOTD ITS Statewide TMC of evacuation routes.
- FR26.10.2.4 LSP shall inform LADOTD ITS Statewide TMC of forecast network conditions.
- FR26.10.2.5 LSP shall inform LADOTD ITS Statewide TMC of reentry times.
- FR26.11 LSP shall coordinate emergency plans with LADOTD ITS Statewide TMC for emergency management purposes.
- FR26.11.1 LSP shall coordinate with LADOTD ITS Statewide TMC emergency management plans.
- FR26.11.2 LSP shall coordinate with LADOTD ITS Statewide TMC the continuity of operations plans.
- FR26.11.3 LSP shall coordinate with LADOTD ITS Statewide TMC emergency response plans.

- FR26.11.4 LSP shall coordinate with LADOTD ITS Statewide TMC recovery plans, evacuation plans.
- FR26.12 LSP shall request an emergency route from LADOTD ITS Statewide TMC in the occurrence of an emergency.
- FR26.12.1 LSP shall request LADOTD ITS Statewide TMC for ingress access routes for emergency response vehicles.
- FR26.12.2 LSP shall request LADOTD ITS Statewide TMC for ingress access routes for emergency response equipment.
- FR26.12.3 LSP shall request LADOTD ITS Statewide TMC for egress access routes for emergency response vehicles.
- FR26.12.4 LSP shall request LADOTD ITS Statewide TMC for egress access routes for emergency response equipment.
- FR26.13 LSP shall request emergency traffic control from LADOTD ITS Statewide TMC for emergency management purposes.
- FR26.13.1 LSP shall request LADOTD ITS Statewide TMC to place a public safety message on a dynamic message sign.
- FR26.13.2 LSP shall request LADOTD ITS Statewide TMC to place an emergency message on a dynamic message sign.
- FR27 LADOTD ITS Statewide TMC shall communicate with Louisiana State Police (LSP).
- FR27.1 LADOTD ITS Statewide TMC shall provide an alert status to LSP for emergency management purposes.
- FR27.1.1 LADOTD ITS Statewide TMC shall provide information to LSP indicating the current status of the emergency alert.
- FR27.1.2 LADOTD ITS Statewide TMC shall identify to LSP the driver information systems that are being used to provide the alert.
- FR27.2 LADOTD ITS Statewide TMC shall exchange road network conditions with LSP for emergency management purposes.
- FR27.2.1 LADOTD ITS Statewide TMC shall provide LSP with road conditions.
- FR27.2.2 LADOTD ITS Statewide TMC shall provide LSP with weather conditions.
- FR27.2.3 LADOTD ITS Statewide TMC shall provide LSP with traffic incident information for emergency management purposes.
- FR27.3 LADOTD ITS Statewide TMC shall provide emergency traffic control information to LSP for emergency management purposes.
- FR27.3.1 LADOTD ITS Statewide TMC shall provide LSP with the status of a system activation implemented in response to an emergency traffic control request.
- FR27.3.2 LADOTD ITS Statewide TMC shall provide LSP with the status of a system activation implemented in response to a request for emergency access routes.

- FR27.3.3 LADOTD ITS Statewide TMC shall provide LSP with the status of a system activation implemented in response to a request for evacuation.
- FR27.4 LADOTD ITS Statewide TMC shall provide emergency routes to LSP for emergency management purposes.
- FR27.4.1 LADOTD ITS Statewide TMC shall provide LSP with suggested ingress routes for access to the scenes.
- FR27.4.2 LADOTD ITS Statewide TMC shall provide LSP with suggested ingress routes for access between the scenes.
- FR27.4.3 LADOTD ITS Statewide TMC shall provide LSP with suggested ingress routes for access to staging areas.
- FR27.4.4 LADOTD ITS Statewide TMC shall provide LSP with suggested egress routes for access to the scenes.
- FR27.4.5 LADOTD ITS Statewide TMC shall provide LSP with suggested egress routes for access between the scenes.
- FR27.4.6 LADOTD ITS Statewide TMC shall provide LSP with suggested egress routes for access to staging areas.
- FR28 LADOTD ITS Statewide TMC shall communicate with DMSs for emergency management purposes.
- FR29 LADOTD ITS Statewide TMC shall communicate with CCTVs for emergency management purposes.
- FR29.1 LADOTD ITS Statewide TMC shall control video surveillance of CCTVs for emergency management purposes.
- FR30 CCTVs shall communicate with LADOTD ITS Statewide TMC for emergency management purposes.
- FR30.1 LADOTD ITS Statewide TMC shall receive traffic images supplied by CCTVs.
- FR31 CCTVs shall communicate with LADOTD District 02 (Bridge City)/RTMC for emergency management purposes.
- FR31.1 LADOTD District 02 (Bridge City)/RTMC shall receive traffic images supplied by CCTVs.
- FR32 CCTVs shall communicate with LSP Troop B for emergency management purposes.
- FR32.1 LSP Troop B shall receive traffic images supplied by CCTVs.

6.3 Requirements Traceability Matrix

The purpose of the requirements traceability matrix is to identify the section of the Concept of Operations document from which the requirement is derived, as well as the high level and associated detailed requirements. As design and implementation are completed, the matrix contains the linking information to the design specifications and implementation information that addresses requirements. The Requirements Traceability Matrix is provided in **Appendix A, Table A-1**.

7 System Design

As part of a Systems Engineering process, a system design is required for an ITS project. The system design process defines how a system will be built. The design activities supported in a LADOTD ITS project result in a design document that contains both high-level and detailed design specifications as well as any supporting information needed to implement and integrate ITS facilities.

A system design is developed from the system requirements. For the Baton Rouge to New Orleans Phase 1 project, these requirements have been previously defined (please refer to Section 6). Since the previous requirements section has defined what the system will do, the requirements will be translated into a hardware and software design that can be deployed.

The system design process has two phases. The first phase is High-Level Design where High Level requirements are translated into decisions about how the system will be built, how subsystems are organized and how verification should be handled at a high level. In the High-Level Design process, design concepts are developed. During the second phase of design, plan sets and top-level specifications are defined in detail, at a level where implementation is supported. As part of this project, design concepts are satisfied and detailed design specifications are developed.

7.1 High-Level Design

The high level design process will give way to the development of an overall system design prior to working out the details of an individual system. The Concept of Operations and System Requirements of the project have defined the purpose and the need for the ITS project (sections 5 and 6, respectively). Please refer to these sections for clarifications on the purpose of the system, system development, operation and maintenance, identification of stakeholders and the current and planned operating sites.

7.1.1 Project Organization

This section will describe how the project is divided into subsystems. Each subsystem has its purpose, functionality, and interface with other sub-systems and component parts. As previously stated, subsystem organization can be seen in the Project Physical Architecture.

The Baton Rouge to New Orleans Phase 1 project will provide communication connection and data flow between subsystems. From the Project Physical Architecture, the following have been defined as subsystems:

1. LADOTD ITS Statewide TMC Operator
2. LADOTD District 02 (Bridge City)/RTMC ITS Operator
3. LSP Troop B Dispatch Operator
4. TDs
5. DMSs
6. CCTVs

All of these subsystems communicate through the communications backbone or by remote connection. These subsystems exchange information ranging from traffic operations and incident detection to incident reports. The information that these centers exchange has been previously defined in the Concept of Operations and Requirements section of this document. Please refer to these documents and the Project Physical Architecture for further information.

7.1.1.1 Hardware and Software Components

The hardware and software component of each subsystem is either directly or remotely connected to the communication backbone. These components have been defined in the Functional Specification section of the Scope of Services Package (i.e., the request for proposal).

A communications alternative section has been developed as part of this System Engineering analysis. Please refer to Alternative Communications Configurations section for information regarding connections between subsystems, hardware components and software implementation. Please note that different types of communication connectivity were explored.

7.2 Detailed Design

As previously stated, the detailed design provides the detailed plans and configuration needed for system implementation. For the Baton Rouge to New Orleans Phase 1 project, please refer to section 8 for the Alternative Communications Configurations section, Functional Specifications, and to the resulting detail design plans.

8 Alternative Communication Configurations

An important component of the SE analysis for the Baton Rouge to New Orleans Phase 1 project is the communication and alternative analysis. This analysis evaluates a number of communication technologies to determine their application to this project. Satisfaction of the project communication needs requires the identification of a transmission media that accommodates the current information demand and provides capacity to meet future system demand. The selected transmission media must be capable of handling system communication needs at a high operational performance level.

8.1 Communication Technologies

There are a number of different types of communication technologies available for ITS network applications that LADOTD should be aware of. Some of the technologies cited below are not applicable for this project. However it is important that LADOTD be aware of the variety of technologies currently being used throughout the communication industry. They are:

- Fiber optic cable (Single Mode);
- Cellular Digital Packet Data (CDPD);
- Global System for Mobile Communication (GSM/EDGE) Enhanced Data for Global Evolution;
- Radio Frequency (Spread Spectrum);
- Terrestrial Microwave Links;
- Area Radio Network (ARN);
- Telephone Lease Lines;
- Code-Division Multiple Access (CDMA); and
- Orthogonal Frequency Division Multiplexing (OFDM)

The critical factors in the selection of a preferred alternative are the following:

- High reliability and availability;
- Low capital and operating (i.e., maintenance) costs;
- Provisions for high bandwidth capacity and transmission speed with flexibility to accommodate future expansion; and
- Protection of the interconnected server, workstations and controllers from unauthorized access and malicious intent.

General advantages of direct wire connection versus a wireless connection:

- Bandwidth is limited only by the edge devices;
- Life span of 15 years+;
- Connection can only be interrupted by invasive measures (e.g., break in the fiber); and
- Maintenance is generally less than that of wireless.

General disadvantages of direct wire connection versus a wireless connection:

- Susceptible to being broken during construction;
- Requires costly conduit/duct (e.g., structure mounted bullet resistant conduit); and
- Installation cost is higher than that of wireless.

8.1.1 Fiber Optic Cable (Single Mode)

The advantages of single mode fiber optic cable are the following:

- Allowable distance between transmission equipment, transmission rate and bandwidth capacity is significantly greater than any other communication method, thereby providing nearly unlimited future System expansion;
- Lightning protection devices are not required;

- Ratio of cable diameter to bandwidth capacity is very small;
- Provides highest level of security when properly monitored;
- Not susceptible to electro-magnetic and radio frequency interference;
- Not susceptible to corrosion; and
- Provides high transmission reliability if quality materials are specified and testing is performed to verify compliance.

The disadvantages of single mode fiber optic cable are the following:

- Splicing and connector termination requires specialized equipment and skilled technician;
- Technician training required repairing, replacing and testing fiber cable;
- Test equipment is more complex and expensive relative to copper test equipment;
- Susceptible to breaking if the fiber bends are smaller than the recommended bending radius or excessive load is applied;
- Requires devices to convert from optical to electrical end user equipment; and
- Substantial capital cost of installation.

8.1.2 Cellular Digital Packet Data (CDPD)

CDPD is a packet-switched, full duplex data communication system that cellular carriers use specifically for data transmission and as a means of filling unused voice channel capacity. The advantages of CDPD are the following:

- Eliminates need for incurring underground cable installation costs;
- Not susceptible to electro-magnetic interference and limited susceptibility to radio frequency interference; and
- Maximum flexibility in locating and moving the required modem (assuming adequate cell coverage).

The disadvantages of CDPD are the following:

- Requires payment of a recurring service fee (payment is only for data sent and received in packets, not minutes);
- Major carriers plan to discontinue CDPD service with the migration to 3G technologies;
- Transmission Speed limited to 28.8 Kbps;
- Dependent on cellular coverage provided by existing infrastructure. Connection likely to be lost if signal strength falls below -105 dBm;
- Requires separate modem for each controller; and
- Unencrypted data is susceptible to eavesdropping.

8.1.3 Global System for Mobile Communication (GSM)

CDMA is the dominant technology for cellular and/or PCS networks in North America (see section 8.1.8 for CDMA). GSM is the dominant technology for cellular and/or PCS networks in

Europe. Cellular and PCS differ primarily in their respective operational frequency bands: 800 MHz for cellular and 1900 MHz for PCS. The advantages of GSM are the following:

- Lower cost of data rate plans for wireless WANs Prices for these plans have fallen significantly, creating a more compelling reason to switch to wireless data networks for remote device communications;
- New technology gives wireless gateways the ability to maintain an “always on” connection without being charged for total airtime, so users pay only for the data they actually send over the wireless connection;
- Maximum flexibility in locating and moving the required gateway (assuming adequate cell coverage); and
- Transmission speeds of 3.0 Mbps can be achieved with EDGE technology where service is available.

The disadvantages of GSM are the following:

- Airtime cost excessive for continuous communication service;
- Only two providers in one area;
- Actual data throughput reduced due to protocol overhead; and
- Remote areas may not have service.

8.1.4 Radio Frequency (Spread Spectrum)

Spread spectrum uses wideband modulation to impart noise-like characteristics to an RF signal. The bandwidth is spread by means of a code which is independent of the data. The independence of the code distinguishes this from standard modulation schemes in which the data modulation will always spread the spectrum. The receiver synchronizes to the transmitter code to recover the data. The use of an independent code and synchronous reception allows multiple users to access the same frequency band at the same time without interference. Frequency hopping and direct sequence systems are the most widely used implementations of this technology and the associated equipment is commercially available. The advantages of radio frequency transmission are the following:

- Eliminates need for incurring underground cable installation costs;
- Not susceptible to electro-magnetic interference;
- Provides a low probability of intercept and includes anti-jam features;
- Radio frequency interference with narrowband communications is minimized by use of lower spectral power density and for a frequency hopping implementation, an ability to reconstruct the data when some frequencies are blocked; and
- Does not require a FCC license to operate.

The disadvantages of radio frequency transmission are the following:

- Requires overhead locations to mount antennas that maintain line of sight;
- Requires routing cable and conduit from antenna to modem installed in cabinet;

- Requires separate modem for each controller;
- Limited susceptibility to radio frequency interference;
- Requires the highest equipment expenditure that includes sufficient spares. (Also expected to have the highest total cost consisting of initial capital cost and net present value of operating/maintenance cost);
- Antenna is susceptible to vandalism;
- Requires special skills and equipment to maintain; and
- Requires the most training to maintain.

8.1.5 Terrestrial Microwave Links

Terrestrial microwave is a line-of-sight technology that cannot extend beyond the earth's horizon. Long distance terrestrial transmission of data is accomplished using relay points known as "hops). Typically each hop consists of a tower with one antenna for receiving and another for transmitting. Terrestrial microwave systems operate in the low-gigahertz range, typically at 4-6 GHz and 21- 23 GHz.

The advantages of terrestrial microwave links are as follows:

- Useful as a point-to-point trunk;
- Can transmit data and a limited number of full motion video channels;
- Can control groups of traffic control devices;
- Can use both analog and digital transmission; and
- Offers the highest data throughput rates of any wireless technology.

The disadvantages of terrestrial microwave links are as follows:

- Line-of-sight may be required based on the frequency ;
- In most cases, requires FCC license;
- Channel availability limited;
- May have little choice in operating frequency;
- Possible interference due to rain, snow and atmospheric effects;
- May require antenna tower;
- Available bandwidth usually limited; and
- Typically most expensive wireless technology to implement.

8.1.6 Area Radio Network (ARN)

Area Radio Network (ARN) is representative of a radio network usually operating in the UHF/VHF frequency bands. These networks are normally used for in-house communications of equipment devices and maintenance staff and personnel.

The advantages of ARN are as follows:

- Can operate traffic controllers or other devices;
- Can provide voice communications to highway maintenance vehicles;

- Can support 9600 baud data rate; and
- Can prove cost effective depending on application.

The disadvantages of ARN are as follows:

- Terrain may be limited;
- Limited channel availability in urban area;
- Requires antenna at each site;
- Turnaround time excessive for some applications; and
- Service reliability may limit use for some applications (Example, CTV video).

8.1.7 Telephone Lease Lines Line

The advantages of telephone line are as follows:

- Can operate traffic controllers or other devices;
- Can provide video transmission at low fps; and
- Asymmetric Digital Subscriber (ADSL) can support full motion video.

The disadvantages of telephone are as follows:

- ADSL leasing cost; and
- Limited video availability.

8.1.8 Code-Division Multiple Access (CDMA)

CDMA (Code-Division Multiple Access) refers to any of several protocols used in so-called second-generation (2G) and third-generation (3G) wireless communications. As the term implies, CDMA is a form of multiplexing, which allows numerous signals to occupy a single transmission channel, optimizing the use of available bandwidth. The technology is used in ultra-high-frequency (UHF) cellular telephone systems in the 800-MHz and 1.9-GHz bands. CDMA employs analog-to-digital conversion (ADC) in combination with spread spectrum technology. Audio input is first digitized into binary elements. The frequency of the transmitted signal is then made to vary according to a defined pattern (code), so it can be intercepted only by a receiver whose frequency response is programmed with the same code, so it follows exactly along with the transmitter frequency. There are trillions of possible frequency-sequencing codes which enhance privacy and makes cloning difficult.

The CDMA channel is nominally 1.23 MHz wide. CDMA networks use a scheme called soft handoff, which minimizes signal breakup as a handset passes from one cell to another. The combination of digital and spread-spectrum modes supports several times as many signals per unit bandwidth as analog modes. CDMA is compatible with other cellular technologies; this allows for nationwide roaming.

The original CDMA standard, also known as CDMA One and still common in cellular telephones in the U.S., offers a transmission speed of only up to 14.4 Kbps in its single channel form and up to 115 Kbps in an eight-channel form. CDMA2000 and wideband CDMA deliver data many times faster.

The advantages of CDMA are as follows:

- Frequency diversity;
- Multi-path resistance;
- Privacy/security; and
- Graceful degradation.

The disadvantages of CDMA are as follows:

- Self jamming³ ;
- Near-far problem;
- Soft hand-off; and
- Not suitable for very high bit rate (like in WLAN); and
- Monthly service subscription.

8.1.9 Orthogonal Frequency Division Multiplexing (OFDM)

OFDM is an FDM modulation technique for transmitting large amounts of digital data over a radio wave. OFDM works by splitting the radio signal into multiple smaller sub-signals that are then transmitted simultaneously at different frequencies to the receiver. This spacing provides the "orthogonality" technique which prevents the demodulators from seeing frequencies other than their own. OFDM reduces the amount of crosstalk in signal transmissions. 802.11a WLAN, 802.16 and WiMAX technologies use OFDM. OFDM is best used in high dense area where multipath effect is severe; (in a building or in a city where multipath is severe). OFDM should not be implemented in areas where multipath is not an issue, such as open space rural areas/LOS.

The advantages of OFDM are as follows:

- High bandwidth efficiency;
- Robust in multipath environments (typically urban);
- Suitable for very high bit rate systems like (WLANS); and
- Offers flexibility in modulation and multiple accesses.

The disadvantages of OFDM are as follows:

- Sensitive to carrier frequency offset causing incorrect carrier frequency ;
- Large Peak-to-Average ratio (PAR) which causes amplifier non-linearity; and
- Sensitive to channel fade (flat fade).

³ Self-jamming is a phenomena that arises because the sequence in which multiple user signals received are not exactly orthogonal, which results in an elevated noise floor, and a higher bit error rate in regards to the receiving end, otherwise known as the up-link.

8.2 Project Communications

Implementation of the Baton Rouge to New Orleans ITS TIM Phase 1 project directly connects ITS field equipment to LADOTD ITS Statewide TMC, the District 02 TMC and remotely connects the LSP Troop B office.

The connection of the centers and ITS field equipment is in compliance with the requirements for the LADOTD Statewide ITS Plan, which promotes maximizing interoperability for the statewide ITS network. For this project LADOTD is using a design-build contracting process. The DB contracting process provides a proposing firm with a functional specification of the project. The proposing firm develops a specific design approach to the project along with a cost estimate.

This project SE analysis offers three viable communications technologies for consideration. They are: fiber optics, radio frequency wireless, and microwave. Each one (or a combination) can provide the data transmission capacity, reliability and scalability to address the communications needs per the different applications identified for the project. The primary element of differentiation for these technologies is the cost and reliability associated with their implementation.

The existing fiber backbone described in section 5.4 of this document was provided to LADOTD as part of a permit filed by Enron Communications, Inc. in 1999. LADOTD received 1 - 1.25" vacant conduit and 8 dark strands of long haul fiber in the Enron duct. LADOTD envisions the use of the vacant conduit as a feasible means of expand its communication infrastructure to ITS field equipment. Existing pull boxes (access points) to the conduit are limited. The use of this conduit requires installation of additional access points and coordination with Qwest Communications International, Inc. (the current owner of the Enron duct). Also, LADOTD and LSP currently own towers within the project limits that may allow for wireless expansion to cover communications to field devices as well. These communication options are presented in the Scope of Services Package (i.e., request for proposal) for the plan design and construction of the project.

Table 6 presents a brief description of the three communication alternatives for connecting the project with the statewide communication backbone with corresponding cost estimates. Please note that since this is a design-build project the cost of the design as well as construction is typically presented in the proposal documents and may not necessarily reflect the typical cost associated with the design-bid-build type projects. Also, it should be noted that there may be an unforeseen cost increase due to the current demand on contractors/engineers as well as the limited local contractors who specialize in ITS construction.

Life Cycle Cost analyses has been provided for this project. See section 14.1 of this document for information pertaining to the Life Cycle Cost analysis.

9 Power Configuration

Electrical power for the Baton Rouge to New Orleans Phase 1 project is a significant component in its implementation. The criteria for power design is primarily determined by the power needs of the overall ITS field equipment (DMS, CCTV, vehicle detections, cross-over gates, and future LCS devices.) required for the project and the ease of accessing commercial power. This project is unique in that the I-10 roadway spans the Bonnet Carre Spillway, a distance of approximately 12 miles. Consequently the cost of supplying commercial power to ITS field components is substantial. LADOTD has deemed that in order to obtain the reliability required to operate the ITS equipment, accommodate the cross-overs, and deploy future LCS, commercial power is required along the 12 mile bridge. **Table 6** includes the estimated cost for power along the 12 mile bridge section. It should be noted that the conduit for the 12 mile bridge is included in just the cost shown for the power. Also, the actual cost associated with the power may vary based on the number of devices immediately connecting to each power source.

Table 6: Communications and Power Design Options

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10 Software Alternative Configurations

An important component of the Baton Rouge to New Orleans Phase 1 project is the system software necessary to communicate with and manage the different ITS field components associated with the project. LADOTD first deployment of integrated system software for TMCs was a software packaged developed by PB Faradyne titled Management Information System for Transportation (MIST). This software allowed operators to manage and monitor ITS field devices located within the Baton Rouge metropolitan area.

More recently LADOTD began implementing traffic management software product by 360 Surveillance 360 titled Cameleon ITS v4 at the LADOTD ITS Statewide TMC and District 02 TMC. Cameleon is a systems integration software that allows operators to monitor and manage ITS field devices from a central (or multiple) TMC. LADOTD envisions Cameleon as an interim solution as they better define their statewide ITS software integration needs.

Software alternative configuration information is presented in the SOSP for design and construction of the project. It is a requirement of this project that the system to be deployed be integrated with the Cameleon traffic management software operating at the LADOTD ITS Statewide TMC. This would also require the installation of this software at the LSP Troop B and District 02 TMC locations. In addition, LADOTD requires the installation of all vendor supplied software for remote access as well as device diagnostics.

11 Procurement Options

The implementation of the Baton Rouge to New Orleans Phase 1 project will include the deployment of numerous ITS technologies. These technologies will be used by LADOTD to monitor traffic operations within the project limits (**Figure 1**), detect and evaluate incidents to determine the need for traffic diversion, and communicate roadway conditions to the motoring public. Once the traffic incident is resolved, the roadway facility can return to its normal operating conditions. This section identifies the procurement options for the ITS hardware, software, and communication technologies that are available to LADOTD to satisfy previously identified requirements.

11.1 Procurement Options of ITS Technologies

Based on review of the LADOTD procurement regulations, ITS technologies are procured under the Louisiana Administrative Code Title 70: XXIII Chapter 3. Commodities purchased by the LADOTD Procurement Section fall into two categories, either non-exempt commodities or exempt commodities.

11.1.1 Non-Exempt Commodities

Non-exempt commodities are defined as materials and supplies that will **not** become a component part of any road, highway, bridge, or appurtenance thereto. These commodities are subject to the requirements of the Louisiana Procurement Code and such regulations promulgated by the Commissioner of Administration and are governed by the rules and regulations adopted by the Director of State Purchasing.

Purchases of less than \$500.00 (or the amount set in the latest Governor's Executive Order, whichever is higher) **do not** require competitive bids.

All Request for Quotations covering non-exempt commodities that exceed the non-competitive dollar limit but do not exceed \$5,000.00 (or the dollar limits listed in the latest Governor's Executive Order, whichever is higher) are awarded on the basis of the lowest responsive price

quotation solicited from at least three bona fide, qualified bidders. All Request for Quotations covering non-exempt commodities having an estimated cost which exceeds \$5,000.00 but which do not exceed \$20,000.00, (or the dollar limits listed in the latest Governor's Executive Order, whichever is higher) are awarded on the basis of the lowest responsive price quotation solicited from at least five bona fide, qualified bidders.

Purchases of non-exempt commodities having an estimated cost which exceeds \$20,000.00 (or the latest delegated purchasing authority, whichever is higher) are prepared and forwarded to the Office of State Purchasing for bid solicitation.

11.1.2 Exempt Commodities

Exempt commodities are defined in R.S.39:1572 as materials and supplies that will become a component part of any road, highway, bridge, or appurtenance as defined in R.S. 39:1572.

Purchases of exempt commodities having an estimated cost which exceeds the non-competitive dollar limit of \$500 (or the amount set in the latest Governor's Executive Order, whichever is higher) but which do not exceed \$25,000.00 (or the latest revision to R.S. 48:205, whichever is higher) are also referred to as Request for Quotations. All Request for Quotations covering exempt commodities which exceed the non-competitive dollar limit but which do not exceed \$5,000.00 (or the dollar limits listed in the latest Governor's Executive Order, whichever is higher) are awarded on the basis of the lowest responsive price quotation from at least three bona fide, qualified bidders.

All Request for Quotations covering exempt commodities having an estimated cost which exceeds \$5,000.00 (or the dollar limit listed in the latest Governor's Executive Order, whichever is higher) but which do not exceed \$25,000.00 (or the latest revision to R.S. 48:205, whichever is higher) are awarded on the basis of the lowest responsive price quotation solicited from at least five bona fide, qualified bidders. Purchase of exempt commodities having an estimated cost which exceeds \$25,000.00 (or the latest revision to R.S. 48:205, whichever is higher) will be processed as Sealed Bids and shall be advertised in accordance with R.S. 48:205.

11.2 ITS Hardware Technologies

ITS hardware technologies can be segmented into three categories: traffic monitoring, incident evaluation, and communications with the traveling public. ITS technologies used by transportation agencies for monitoring traffic operations are primarily achieved with remote sensory devices, TDs. These devices employ radar, video imaging, and magnetic inductance to "sense" the presence and movement of vehicles traveling along the roadway facility. These devices are located at strategic points and at specific distances along the roadway. They can be non-intrusively mounted on existing light and sign structures (radar and video) or placed inside the roadway service (wire loops). CCTV technologies are primarily used by operators to locate and evaluate traffic incidents and traffic monitoring. This technology allows traffic management personnel to visually observe traffic operations on a roadway facility and determine how traffic is moving. There are many more product options with CCTV, as there are many other applications than highway transportation. DMS are an effective way of disseminating real-time

traffic conditions to the traveling public. A DMS is an electronically controlled message board located at a strategic location near or over the travel lanes of the roadway.

11.3 Software

All of these ITS technology system components typically come with software as part of the hardware purchase (vendor software). This software allows operators to control, manage and diagnose the hardware components located along the roadway. Typically these component systems can be integrated with existing traffic management system operating software. For this project LADOTD has specified the use of 360 Surveillance's Cameleon ITS v4. The deployment of this project will require the integration of the equipment with the existing software. Since the component software is considered a component of the hardware system, it would be typically purchased as an exempt commodity. However, the system integration software could be considered a non-exempt commodity since it is not part of the roadway.

11.4 Communications

The communications network (or plant) used to integrate the ITS technology hardware, manage data flows and receive video images is comprised of land-lines (fiber optic, cable, and twisted wire pairs), spread spectrum radio, and microwave or wireless technology. The communications plant connects the TOC to the various ITS components located along the roadway facility. This allows operators to receive information from the field and display it numerically, graphically, and visually. The information can be used by operators to determine roadway congestion, vehicle travel speeds, lane capacity, and to evaluate incidents. Additionally, operators can use the communication network to send information and communicate with motorists about driving conditions, lane closures and roadway detours.

The communication network, built as a component of the ITS network for traffic management is typically purchased as an exempt commodity. The physical communication plant is placed in conduits and equipment cabinets in the roadway right-of-way. However this may not be the case for microwave towers and equipment that are constructed outside of roadway right-of-way, but on other LADOTD properties.

Another method used by LADOTD to procure communications is that of leasing communications services from private communications companies. The procurement of communication services would be done in the same manner as the purchase of telephone services for LADOTD. Prices for these services are typically negotiated on a per connection per month basis.

11.5 Project Procurement Methods Available for Use by LADOTD

The procurement of ITS technologies and services associated with this project can be acquired by LADOTD using one of or a combination of four different procurement methods. They are:

- Sealed Bid (or Design-Bid-Build) – LADOTD prepares a detailed project design and advertises for interested parties to submit a sealed bid to build the project. The lowest bidder offering a fixed price (all else being equal) is awarded the project. Any changes to

the project made by LADOTD that result in additional work is subject to a negotiated change order. Time value may be considered in the project.

- Design–Build – LADOTD advertises a Notice of Intent and short list teams (maximum of 5) based on their interest and qualifications. LADOTD prepares a Scope of Services Package which includes a functional specification for the short listed teams to submit proposals for the detail design and implementation of the project. The team with the lowest calculated adjusted score based on their bid price plus time value divided by the technical score is awarded the project. Time value may be considered in the project. Any changes to the project made by LADOTD that result in additional work is subject to a negotiated change order.
- Request for Quotation – This is used primarily in the procurement of different types of ITS hardware. The LADOTD prepares a specification and solicits bids from three or five bona fide bidders (depending on the purchase amount). The bidder with the lowest price (all else being equal) is the successful bidder.
- Lease – Leasing is used by LADOTD for ITS projects primarily to secure communication services such as an existing privately owned communications provider that can provide the necessary bandwidth for the ITS network. Where there is only one provider, sole sourcing is used.

The selection of a contracting method(s) for use in this project is influenced by a number of factors including: legal and administrative constraints, quality control, liability and responsibility of the contractor, procurement schedule, familiarity of the LADOTD project manager, and past experience. An evaluation of the positive and negative attributes for each method previously identified provides a basis for determining which method(s) should be used for this project.

11.6 Procurement Method for Project

LADOTD has elected to use the Design-Build Contracting method for this project. This project will be the first ITS project (and the second for any LADOTD project) to use the design-build method of contracting.

12 ITS Standards

Standards are specifications that define how the different ITS sub-components interconnect and interact within the established parameters of the National ITS Architecture. Specifically, they stipulate how the different technologies interoperate to automatically share information. LADOTD benefits from ITS standards for this project in several ways including:

- Reducing the risk of equipment obsolescence;
- Reducing the risk of a single point of supply and proprietary products;
- Lowering prices for equipment;
- Minimizing design and implementation confusion; and
- Assuring quality.

Additionally, federal regulations require that ITS projects must conform to the National ITS Architecture and the standards if they are financed using funds from the Highway Trust Fund. The architecture currently identifies 13 key standards areas that can be found in the ITS Standards Requirements Document (SRD).

ITS projects that are currently deployed by LADOTD incorporate standards developed by a number of standards developing bodies. The American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) have taken the lead in developing standards for traffic management devices and their interoperability. These devices include DMS, traffic signals, traffic sensors, etc. The Institute of Electrical and Electronic Engineers (IEEE) and the International Standards Organization (ISO) primarily provide the standards for communication infrastructure. This includes communication cables, switches, nodes, etc. Finally, the National Electric Code (NEC) provides standards to all related electrical and power requirements associated with ITS projects. It should be noted that the development of standards is an ongoing and evolving process. Therefore standards will need to be continually reviewed as LADOTD implements future projects.

The purpose of this chapter is to identify the standards that will be used in developing design concepts, detail design, and operational procedures associated with this project.

12.1 Project Standards

The most significant set of standards for ITS projects is the National Transportation Communications for ITS Protocol (NTCIP). This family of standards will establish the parameters for the development, design, and implementation of the ITS component of the project. AASHTO, ITE and NEMA have taken the lead in developing NTCIP standards. NTCIP is a family of communication protocols (protocol is a system of rules and procedures governing communications between two devices) and data definition standards that serve and address the diverse needs of the various subsystems and user services presented in the national, state, and regional ITS architectures. NTCIP consists of a whole family of protocols covering the spectrum from point-to-point command/response to sophisticated object oriented techniques. NTCIP provides standards for two different ITS applications: center-to-field (C2F) and center-to-center (C2C), both of which are applicable to this project.

12.1.1 Center-to-Field Standards

There are two existing application protocols (and one protocol under development) for C2F communications: the Internet's Simple Network Management Protocol (SNMP) and the Simple Transportation Management Protocol (STMP). These protocols use the get/set-messaging model. Each protocol has its advantages. SNMP is the simplest to implement. The STMP is the most flexible and band width efficient. **Table 7** presents the comparison of the two protocols.

Table 7: SNMP and STMP Comparisons

| Characteristic | SNMP | STMP |
|--------------------------------|-----------|-------------------------------|
| Can send any base data element | Yes | Yes |
| Bandwidth Efficiency | Worse | Better (uses dynamic objects) |
| Supports routing and dial-up | Options | Options |
| Message Set | Supported | Limited to 13 |
| Ease of Implementation | Easy | Hard |

Devices with either of the two protocols can use the same communications line with other devices using the same protocols. The manufacturer or type of device (traffic signals, DMS, etc.) is not important. Each device is assigned an address that is unique on that line or channel which allows the management system to communicate with that device.

The communication link for C2F can be any type of medium; fiber optics, cable, spread spectrum, radio, etc. It does not matter whether the communications medium is owned or leased by LADOTD. The only requirement assumes that communication is a half-duplex poll and response, and the time for transmission and the response time for the end device are within the tolerances the devices need to communicate.

Although STMP is designed to use communication channels with slow transmission rates, it is not as bandwidth efficient as proprietary protocols used in the past.

12.2 Standards Applicable to the Project

A number of technical standards must be considered in the development of this project. There are over 80 ITS standards now being developed by different standards development organizations (SDOs). ITS designers are encouraged by United States Department of Transportation (U.S. DOT) to use SDO approved standards when developing ITS projects.

Mapping the applicable ITS standards to the project architecture provides a clearer understanding as to how each standard should be considered in design of the project. There are three architectural components to which the standards must be applied for this project: Center to Field, Center-to-Center and Center-to-Vehicle/Traveler. Adhering to these standards will assure interoperability and interchangeability of the project's components and its overall integration with current ITS operations. **Table 8** presents the relevant standards for each architectural component that may be used in the implementation of this project.

Table 8: ITS Standards Applicable to Project

| Standard Number | Standard Name | C2F | C2C | Center to Veh/Traveler |
|-----------------|----------------------------------------------------------------------------------|-----|-----|------------------------|
| NTCIP 1101 | Simple Transportation Management Framework (STMF) | • | | |
| NTCIP 1102 | Octet Encoding Rules (OER) | • | • | |
| NTCIP 1103 | Transportation Management Protocols (TMP) | • | • | |
| NTCIP 1104 | Center-to-Center Having Convention Specification | | • | |
| NTCIP 1201 | Global Object Definitions | • | | |
| NTCIP 1202 | Object Definitions for Actuated Traffic Signal Controller | • | | |
| NTCIP 1203 | Object Definitions for Dynamic Message Signs | • | | |
| NTCIP 1205 | Object Definitions for CCTV Camera Control | • | | |
| NTCIP 1206 | Object Definitions for Data Collection and Monitoring (DCM) Devices | • | | |
| NTCIP 1208 | Object Definitions for CCTV Switching | • | | |
| NTCIP 1209 | Object Definitions for Transportation Sensor Systems (TSS) | • | | |
| NTCIP 1210 | Field Management Stations - Part 1: Object Definitions for Signal System Masters | • | | |
| NTCIP 1211 | Object Definitions for Signal Control and Prioritization (SCP) | • | | |
| NTCIP 1400 | TCIP Framework Standard | • | • | |
| NTCIP 1402 | TCIP Incident Management Objects | • | • | |
| NTCIP 2101 | Point-to-Point Using RS-232 Subnetwork Profile | | • | |
| NTCIP 2102 | Point-to-Multi-Point Protocol Using FSK Modem Subnetwork Profile | | • | |
| NTCIP 2103 | Subnet Profile for Point-to-Point Over RS-232 | | • | |
| NTCIP 2104 | Ethernet Subnetwork Profile | | • | |
| NTCIP 2202 | Internet (TCP/IP and UDP/IP) Transport Profile | • | • | |
| NTCIP 2301 | Application Profile for Simple Transportation Management Framework (STMF) | • | | |
| NTCIP 2302 | Application Profile for Trivial File Transfer Protocol | • | | |
| NTCIP 2303 | Application Profile for File Transfer Protocol | • | • | |

| Standard Number | Standard Name | C2F | C2C | Center to Veh/Traveler |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------------------------|
| NTCIP 2304 | Application Profile for Data Exchange ASN.1 (DATEX-ASN) | • | | |
| NTCIP 8003 | Profile Frame Work | • | • | |
| NTCIP 9001 | NTCIP Guide | • | • | • |
| EIA-794 | Data Radio Channel (DARC) System | | | • |
| EIA-795 | Sub carrier Traffic Information Channel (STIC) System | | | • |
| IEEE Std 1404 | | • | • | |
| IEEE Std 1488, 2000 | Trail-Use Standard for Message Set Template for ITS | • | • | • |
| IEEE Std 1489, 1999 | Data Dictionaries for ITS | • | • | • |
| IEEE Std 1512, 2000 | Common Incident Management Sets for Use by Emergency Management Centers | • | | • |
| IEEE SH 94633-94638 | Analysis of Existing Standards and Those Under Development Applicable to the needs of ITS Short Range and Wide Area Wireless Communications | • | • | • |
| ITE-AASHTO TM 1.03 | Traffic Management Data Dictionary | • | • | |
| ITE-AASHTO TM 2.01 | Message Sets for External Traffic Management Center Communications | • | • | |
| SAE J1763 | General Reference Model | • | • | • |
| SAE J2353 | Advance Traveler Information Systems (ATIS) Data Dictionary | • | | • |
| SAE J2354 | Advanced Traveler Information Systems (ATIS) Message Sets | • | | • |
| SAE J2369 | ATIS Message Sets Delivered Over Bandwidth Restricted Media | | | • |

13. Testing

Testing fulfills the system engineering requirements of verification and validation. Verification can be simple described as “was the system built correctly”? While validation may be described as “was the correct system built”? Testing through the project development until the completion of the project provides for a successful project. The use of traceability matrices allows for the stakeholders to ensure the envision system described in the ConOps is the actual functional system deployed. During the construction of the project, equipment must be tested at various stages to ensure its operability, function and performance. These tests are detailed in the

specification document developed to accompany the detail design plans. Also, once the system is constructed, tests on integrating the equipment into the existing system shall be required. These tests are also as defined and required by the specifications.

It is envisioned that during the detail design of this project an advanced traceability matrix will be provided to trace the conception of the project through the testing phase. This matrix will allow for LADOTD personnel to check off the project deployment requirement and ensure ultimately, a successful final system.

14 Maintenance

LADOTD shall be the agency responsible for maintaining the equipment deployed as part of this project. Currently, LADOTD uses contract and agency personnel to provide maintenance on ITS equipment through LADOTD's ITS Division. The LADOTD Maintenance Supervisor has been tasked with approximately 30 staff members to ensure the continued function of the various ITS systems statewide. LADOTD currently has an anticipated annual budget of \$2.5 million dollars for maintenance for the state. It is expected that the maintenance budget will be divided to facilitate each region. If any region doesn't use its total amount allocated, the money may be shifted to another region for maintenance.

Also, for each project deployment, an extended maintenance agreement accompanies the construction contract documents. This extended maintenance agreement (contract) requires 1 year of warranty and maintenance service on the system. Thereafter that required 1 year, LADOTD has the option to extend the warranty through the contractor for an additional 3 years. This project is anticipated to include the extended maintenance requirement agreement.

14.1 Life-Cycle Funding

Life-cycle funding from the systems engineering prospective is a total project process. In other words, the total costs (i.e., need for funding in constant of inflated dollars) associated with the successful development, implementation, operation, and maintenance for the "life" of an ITS project must be determined. A life-cycle analysis provides LADOTD with a realistic perspective of funding needs for their ITS projects and programs. This information is used to develop future funding requests and in developing benefit/cost analysis for their ITS program and individual projects.

A life-cycle funding analysis for this comprised of three components: equipment installation, operations, and maintenance.

Equipment installation refers to the actual procurement and installation of ITS equipments. For example, the purchase and installation for a pedestal mounted DMS is approximately \$200,000 per sign. Additionally, estimating the life-cycle funding for ITS equipment must take into account the useful life expectancy of each component. For example, the useful life-expectancy of a DMS is 8 to 10 years. The useful life of fiber optic cable is 20 years, and the life expectancy for conduit and structures is 20 years plus. One way to estimate equipment cost is to use the component that has the longest life expectancy as a base line. Then estimate the replacement

cycle of other components with shorter life expectancies. An example would be if the conduit system lasts 20 years and the DMS only last 5 years, then DMS replacement costs will occur 4 times during the project life cycle.

Estimating cost of operations is straight forward. If the project is estimated to last 20 years (before replacement or decommissioning), then LADOTD will need to determine how many staff persons (or contracted maintenance) will be required over that period of time. Presented in **Appendix B** are life cycle cost analyses for this project. It should be noted that the quantity of equipment and locations in the life cycle cost analyses are approximated based on conceptual designs. The exact quantity and locations of ITS field equipment devices will be further defined in the SOSOP and by the Design-Builders actual design.

Three life cycle cost analyses have been provided in Appendix B. The life cycle cost analyses presents the deployed system in 3 scenarios; **Table B-1**: Fully Fiber, **Table B-2**: Fully Wireless, and **Table B-3**: Hybrid Wireless and Fiber. Also, each scenario uses operations and maintenance (O&M) cost based on the data obtained from the USDOT ITS Unit Cost Database when available. The costs are in terms of 2005 dollars. The price per unit is based on current LADOTD project estimates. The cells are highlighted in yellow where USDOT numbers are used. Although some equipment presented has a longer life cycle then 10 years, only the first 10 years have been presented. It should be noted, any replacement cost for equipment that has a life cycle less than 10 years, is covered under the cost of O&M. Also, it is assumed that there is no salvage value at the end of the equipment's life.

Maintenance funding for an ITS project is determined by the complexity (i.e. the type and quantity of devices) and the operational life of the project. The longer the system operations, the greater the maintenance costs. Additionally, maintenance costs will be skewed as the equipment ages. The older the equipment, the more maintenance (staff time and replacement parts) will be required to keep it functioning within specified limits. For planning purposes a general rule-of-thumb for estimating overall annual maintenance costs for an ITS system is 5 percent of the total capital costs. Also, the 10 year total life cycle cost has been provided in 2 ways. First is linear where the annual O&M is continuous for the 10 year period. In the second O&M is inflated at an exponential rate of 2% per year.

APPENDIX A
TRACEABILITY MATRIX

FOR INFORMATIONAL PURPOSES ONLY

Table A-1: Traceability Matrix

| LADOTD District 02 (Bridge City)/RTMC - LADOTD ITS Statewide TMC Communications | |
|---------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Concept of Operations | Traffic Management/TIM Requirements |
| 6.1 Traffic Management/Traffic Incident Management | FR1 Center communication |
| 6.1 Traffic Management/Traffic Incident Management | FR1.1 Exchange of traffic operator data |
| 5.8.1 Traffic Incident Management Operations (TIM) | FR1.1.1 Traffic conditions |
| 5.8.1 Traffic Incident Management Operations (TIM) | FR1.1.2 Operating status of field equipments |
| 5.8.1 Traffic Incident Management Operations (TIM) | FR1.1.3 Maintenance activity status |
| 5.8.1 Traffic Incident Management Operations (TIM) | FR1.1.4 Incident status |
| 5.5.2 Center-to-Center Operations | FR1.2 Traffic information |
| 5.5.2 Center-to-Center Operations | FR1.2.1 Incident information |
| 5.5.2 Center-to-Center Operations | FR1.3 Road network conditions for traffic management purposes |
| 5.5.2 Center-to-Center Operations | FR1.3.1 Current traffic information |
| 5.5.2 Center-to-Center Operations | FR1.3.2 Forecasted traffic information |
| 5.5.2 Center-to-Center Operations | FR1.3.3 Road conditions |
| 5.5.2 Center-to-Center Operations | FR1.3.4 Weather conditions |
| 5.5.2 Center-to-Center Operations | FR1.3.5 Traffic incident information |
| 5.5.2 Center-to-Center Operations | FR1.4 Exchange of resource request information |
| 5.5.2 Center-to-Center Operations | FR1.4.1 Request of resources to implement special traffic control measures |
| 5.5.2 Center-to-Center Operations | FR1.4.2 Request of resources to verify an incident |
| 5.5.2 Center-to-Center Operations | FR1.5 Exchange of resource deployment status information |
| 5.5.2 Center-to-Center Operations | FR1.5.1 Status of individual resource deployment |
| 5.5.2 Center-to-Center Operations | FR1.5.1.1 Status of vehicles |
| 5.5.2 Center-to-Center Operations | FR1.5.1.2 Status of equipment |
| 5.5.2 Center-to-Center Operations | FR1.5.1.3 Status of materials |
| 5.5.2 Center-to-Center Operations | FR1.5.1.4 Status of personnel |
| 5.5.2 Center-to-Center Operations | FR1.5.2 Availability of individual resources. |
| 5.5.2 Center-to-Center Operations | FR1.5.2.1 Vehicles available |
| 5.5.2 Center-to-Center Operations | FR1.5.2.2 Equipment available |
| 5.5.2 Center-to-Center Operations | FR1.5.2.3 Materials available |
| 5.5.2 Center-to-Center Operations | FR1.5.2.4 Personnel available |
| 5.5.2 Center-to-Center Operations | FR1.6 Exchange of incident response status information |
| 5.5.2 Center-to-Center Operations | FR1.6.1 Status of current incident response |
| 5.5.2 Center-to-Center Operations | FR1.6.1.1 Summary of the incident status |
| 5.5.2 Center-to-Center Operations | FR1.6.1.2 Impact of the incident on the transportation system |
| 5.5.2 Center-to-Center Operations | FR1.6.1.3 Traffic management strategies |
| 5.5.2 Center-to-Center Operations | FR1.6.1.4 Current response activities |
| 5.5.2 Center-to-Center Operations | FR1.6.1.5 Planned response activities |
| 5.5.2 Center-to-Center Operations | FR1.7 Coordination emergency plans |
| 5.5.2 Center-to-Center Operations | FR1.7.1 Coordination of emergency management plans |
| 5.5.2 Center-to-Center Operations | FR1.7.2 Continuity of operations plans |
| 5.5.2 Center-to-Center Operations | FR1.7.3 Emergency response plans. |
| 5.5.2 Center-to-Center Operations | FR1.7.4 Recovery plans |
| 5.5.2 Center-to-Center Operations | FR1.7.5 Evacuation plans with LADOTD ITS Statewide TMC. |
| 5.5.2 Center-to-Center Operations | FR1.8 Provide an alert status |
| 5.5.2 Center-to-Center Operations | FR1.8.1 Current status of the emergency alert |

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| 5.5.2 Center-to-Center Operations | FR1.8.2 Driver information systems used to provide the alert |
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| LADOTD ITS Statewide TMC - LADOTD District 02 (Bridge City)/RTMC Communications | |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Concept of Operations | Traffic Management/TIM Requirements |
| 5.5 System Overview | FR2 Center communication |
| 5.5.2 Center-to-Center Operations | FR2.1 Traffic control |
| 5.5.1 ITS Equipment Operations | FR2.1.1 Information transfers that enable remote monitoring of traffic management devices |
| 5.5.1 ITS Equipment Operations | FR2.1.2 Information transfers that enable control of traffic management devices |
| 5.5.2 Center-to-Center Operations | FR2.2 Alert notification. |
| 5.5.2 Center-to-Center Operations | FR2.2.1 Notification of a major emergency |
| 5.5.2 Center-to-Center Operations | FR2.2.1.1 Notification of a natural disaster to the public |
| 5.5.2 Center-to-Center Operations | FR2.2.1.1.1 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR2.2.1.1.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR2.2.1.1.3 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR2.2.1.1.4 Information provided to the public with instructions on how to respond to the alert. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.2 Notification of a man-made disaster to the public. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.2.1 Identification of the alert originator. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.2.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR2.2.1.2.3 Effective time period of the alert. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.2.4 Information provided to the public with instructions on how to respond to the alert. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.3 Notification of a civil emergency to the public |
| 5.5.2 Center-to-Center Operations | FR2.2.1.3.1 Identification of the alert originator. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.3.2 Identification of the nature of the emergency. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.3.3 Identification of the effective time period of the alert. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.3.4 Information provided to the public with instructions on how to respond to the alert. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.4 Notification of a child abduction to the public. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.4.1 Identification of the alert originator. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.4.2 Identification of the nature of the emergency. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.4.3 Identification of the effective time period of the alert. |
| 5.5.2 Center-to-Center Operations | FR2.2.1.4.4 Information provided to the public with instructions on how to respond to the alert. |

| LADOTD District 02 (Bridge City)/RTMC - LSP Troop B Communications | |
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| Concept of Operations | Traffic Management/TIM Requirements |
| 5.5 System Overview | FR3 Center communication |
| 5.4.2 Incident Management | FR3.1 Exchange resource request information |
| 5.4.2 Incident Management | FR3.1.1 Request of resources to implement special traffic control measures |
| 5.4.2 Incident Management | FR3.1.2 Request of resources to verify an incident |
| 5.4.2 Incident Management | FR3.2 Exchange resource deployment status information |
| 5.4.2 Incident Management | FR3.2.1 Status of individual resource deployment |
| 5.4.2 Incident Management | FR3.2.1.1 Status of vehicles |
| 5.4.2 Incident Management | FR3.2.1.2 Status of equipment |
| 5.4.2 Incident Management | FR3.2.1.3 Status of materials |
| 5.4.2 Incident Management | FR3.2.1.4 Status of personnel |
| 5.4.2 Incident Management | FR3.2.2 Availability of individual resources |
| 5.4.2 Incident Management | FR3.2.2.1 Vehicles available |

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| 5.4.2 Incident Management | FR3.2.2.2 Equipment available |
| 5.4.2 Incident Management | FR3.2.2.3 Materials available |
| 5.4.2 Incident Management | FR3.2.2.4 Personnel available |
| 5.4.2 Incident Management | FR3.3 Incident response status information |
| 5.4.2 Incident Management | FR3.3.1 Status of current incident response |
| 5.4.2 Incident Management | FR3.3.1.1 Summary of incident status |
| 5.4.2 Incident Management | FR3.3.1.2 Impact of the incident on the transportation system |
| 5.4.2 Incident Management | FR3.3.1.3 Traffic management strategies |
| 5.4.2 Incident Management | FR3.3.1.4 Current response activities |
| 5.4.2 Incident Management | FR3.3.1.5 Response activities |
| 5.4.3 Emergency Management System | FR3.4 Emergency plans |
| 5.4.3 Emergency Management System | FR3.4.1 Emergency management plans |
| 5.4.3 Emergency Management System | FR3.4.2 Continuity of operations plans |
| 5.4.3 Emergency Management System | FR3.4.3 Emergency response plans |
| 5.4.3 Emergency Management System | FR3.4.4 Recovery plans |
| 5.4.3 Emergency Management System | FR3.4.5 Evacuation plans |
| 5.5.2 Center-to-Center Operations | FR3.5 Alert status |
| 5.5.2 Center-to-Center Operations | FR3.5.1 Current status of the emergency alert |
| 5.5.2 Center-to-Center Operations | FR3.5.1.1 Driver information systems |
| 5.5.2 Center-to-Center Operations | FR3.6 Road network conditions |
| 5.5.2 Center-to-Center Operations | FR3.6.1 Current traffic information |
| 5.5.2 Center-to-Center Operations | FR3.6.2 Forecasted traffic information |
| 5.5.2 Center-to-Center Operations | FR3.6.3 Road conditions |
| 5.5.2 Center-to-Center Operations | FR3.6.4 Weather conditions |
| 5.4.2 Incident Management | FR3.6.5 Traffic incident information |
| 5.5.2 Center-to-Center Operations | FR3.7 Emergency traffic control information |
| 5.5.2 Center-to-Center Operations | FR3.7.1 Status of a system activation implemented in response to an emergency traffic control request |
| 5.5.2 Center-to-Center Operations | FR3.7.2 Status of a system activation implemented in response to a request for emergency access routes |
| 5.5.2 Center-to-Center Operations | FR3.7.3 Status of a system activation implemented in response to a request for evacuation |
| 5.5.2 Center-to-Center Operations | FR3.8 Emergency routes |
| 5.5.2 Center-to-Center Operations | FR3.8.1 Ingress routes for access to the scenes |
| 5.5.2 Center-to-Center Operations | FR3.8.2 Ingress routes for access between the scenes |
| 5.5.2 Center-to-Center Operations | FR3.8.3 Ingress routes for access to staging areas |
| 5.5.2 Center-to-Center Operations | FR3.8.4 Egress routes for access to the scenes |
| 5.5.2 Center-to-Center Operations | FR3.8.5 Egress routes for access between the scenes |
| 5.5.2 Center-to-Center Operations | FR3.8.6 Egress routes for access to staging areas |

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| LSP Troop B - LADOTD District 02 (Bridge City)/RTMC Communications | |
| Concept of Operations | Traffic Management/TIM Requirements |
| 5.5 System Overview | FR4 Center communication |
| 5.5.2 Center-to-Center Operations | FR4.1 LSP shall provide an alert notification to LADOTD District 02 for traffic management purposes. |
| 5.5.2 Center-to-Center Operations | FR4.1.1 Notification of a major emergency |
| 5.5.2 Center-to-Center Operations | FR4.1.1.1 Notification of a natural disaster to the public |

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| 5.5.2 Center-to-Center Operations | FR4.1.1.1.1 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR4.1.1.1.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR4.1.1.1.3 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR4.1.1.1.4 Information provided to the public with instructions on how to respond to the alert |
| 5.5.2 Center-to-Center Operations | FR4.1.1.2 Notification of a man-made disaster to the public |
| 5.5.2 Center-to-Center Operations | FR4.1.1.2.1 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR4.1.1.2.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR4.1.1.2.3 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR4.1.1.2.4 Information provided to the public with instructions on how to respond to the alert. |
| 5.5.2 Center-to-Center Operations | FR4.1.1.3 Notification of a civil emergency to the public |
| 5.5.2 Center-to-Center Operations | FR4.1.1.3.1 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR4.1.1.3.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR4.1.1.3.3 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR4.1.1.3.4 Information provided to the public with instructions on how to respond to the alert |
| 5.5.2 Center-to-Center Operations | FR4.1.1.4 Notification of a child abduction to the public |
| 5.5.2 Center-to-Center Operations | FR4.1.1.4.1 Identification of the alert originator. |
| 5.5.2 Center-to-Center Operations | FR4.1.1.4.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR4.1.1.4.3 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR4.1.1.4.4 Information provided to the public with instructions on how to respond to the alert |
| 5.5.2 Center-to-Center Operations | FR4.2 Request of an emergency route |
| 5.5.2 Center-to-Center Operations | FR4.2.1 Ingress access routes for emergency response vehicles |
| 5.5.2 Center-to-Center Operations | FR4.2.2 Ingress access routes for emergency response equipment |
| 5.5.2 Center-to-Center Operations | FR4.2.3 Egress access routes for emergency response vehicles |
| 5.5.2 Center-to-Center Operations | FR4.2.4 Egress access routes for emergency response equipment |
| 5.5.2 Center-to-Center Operations | FR4.3 Request emergency traffic control |
| 5.5.2 Center-to-Center Operations | FR4.3.1 Public safety message on a dynamic message sign |
| 5.5.2 Center-to-Center Operations | FR4.3.2 Place an emergency message on a dynamic message sign |
| 5.5.2 Center-to-Center Operations | FR4.4 Coordination of traffic control |
| 5.5.2 Center-to-Center Operations | FR4.4.1 Information transfers that enable remote monitoring of traffic management devices |
| 5.5.2 Center-to-Center Operations | FR4.4.2 Information transfers that enable control of traffic management devices |

| LSP Troop B - LADOTD ITS Statewide TMC Communications | |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Concept of Operations | Traffic Management/ TIM Requirements |
| 5.5 System Overview | FR5 Center communication |
| 5.5.2 Center-to-Center Operations | FR5.1 Alert notification |
| 5.5.2 Center-to-Center Operations | FR5.1.1 Notification of a major emergency |
| 5.5.2 Center-to-Center Operations | FR5.1.1.1 Notification of a natural disaster to the public |
| 5.5.2 Center-to-Center Operations | FR5.1.1.1.1 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR5.1.1.1.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR5.1.1.1.3 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR5.1.1.1.4 Information provided to the public with instructions on how to respond to the alert |
| 5.5.2 Center-to-Center Operations | FR5.1.1.2 Notification of a man-made disaster to the public |
| 5.5.2 Center-to-Center Operations | FR5.1.1.2.1 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR5.1.1.2.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR5.1.1.2.3 Identification of the effective time period of the alert |

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| 5.5.2 Center-to-Center Operations | FR5.1.1.2.4 Information provided to the public with instructions on how to respond to the alert |
| 5.5.2 Center-to-Center Operations | FR5.1.1.3 Notification of a civil emergency to the public |
| 5.5.2 Center-to-Center Operations | FR5.1.1.3.1 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR5.1.1.3.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR5.1.1.3.3 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR5.1.1.3.4 Information provided to the public with instructions on how to respond to the alert |
| 5.5.2 Center-to-Center Operations | FR5.1.1.4 Notification of a child abduction to the public |
| 5.5.2 Center-to-Center Operations | FR5.1.1.5 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR5.1.1.6 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR5.1.1.7 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR5.1.1.8 Information provided to the public with instructions on how to respond to the alert. |
| 5.4.2 Incident Management | FR5.2 Exchange resource request information |
| 5.4.2 Incident Management | FR5.2.1 Request resources to implement special traffic control measures |
| 5.8.1 Traffic Incident Management Operations (TIM) | FR5.2.2 Request resources to verify an incident |
| 5.4.2 Incident Management | FR5.3 Exchange resource deployment status information |
| 5.4.2 Incident Management | FR5.3.1 Status of individual resource deployment |
| 5.4.2 Incident Management | FR5.3.1.1 Status of vehicles |
| 5.4.2 Incident Management | FR5.3.1.2 Status of equipment |
| 5.4.2 Incident Management | FR5.3.1.3 Status of materials |
| 5.4.2 Incident Management | FR5.3.1.4 Status of personnel |
| 5.4.2 Incident Management | FR5.3.2 Availability of individual resources |
| 5.4.2 Incident Management | FR5.3.2.1 Vehicles available |
| 5.4.2 Incident Management | FR5.3.2.2 Equipment available |
| 5.4.2 Incident Management | FR5.3.2.3 Materials available |
| 5.4.2 Incident Management | FR5.3.2.4 Personnel available |
| 5.4.2 Incident Management | FR5.4 Incident response status information |
| 5.4.2 Incident Management | FR5.4.1 Status of current incident response |
| 5.4.2 Incident Management | FR5.4.1.1 Summary of incident status |
| 5.4.2 Incident Management | FR5.4.1.2 Impact of the incident on the transportation system |
| 5.4.2 Incident Management | FR5.4.1.3 Traffic management strategies |
| 5.4.2 Incident Management | FR5.4.1.4 Current response activities |
| 5.4.2 Incident Management | FR5.4.1.5 Planned response activities |
| 5.5.2 Center-to-Center Operations | FR5.5 Emergency plans |
| 5.5.2 Center-to-Center Operations | FR5.5.1 Emergency management plans |
| 5.5.2 Center-to-Center Operations | FR5.5.2 Continuity of operations plans |
| 5.5.2 Center-to-Center Operations | FR5.5.3 Emergency response plans |
| 5.5.2 Center-to-Center Operations | FR5.5.4 Recovery plans |
| 5.5.2 Center-to-Center Operations | FR5.5.5 Evacuation plans |
| 5.5.2 Center-to-Center Operations | FR5.6 Request an emergency route |
| 5.5.2 Center-to-Center Operations | FR5.6.1 Ingress access routes for emergency response vehicles |
| 5.5.2 Center-to-Center Operations | FR5.6.2 Ingress access routes for emergency response equipment |
| 5.5.2 Center-to-Center Operations | FR5.6.3 Egress access routes for emergency response vehicles |
| 5.5.2 Center-to-Center Operations | FR5.6.4 Egress access routes for emergency response equipment |
| 5.5.2 Center-to-Center Operations | FR5.7 Request emergency traffic control |
| 5.5.2 Center-to-Center Operations | FR5.7.1 Request to place a public safety message on a dynamic message sign |
| 5.5.2 Center-to-Center Operations | FR5.7.2 Request to place an emergency message on a dynamic message sign. |

| LADOTD ITS Statewide TMC - LSP Troop B Communications | |
|-------------------------------------------------------|-------------------------------------------------------------------------------|
| Concept of Operations | Traffic Management/TIM Requirements |
| 5.5 System Overview | FR6 Center communication |
| 5.5.2 Center-to-Center Operations | FR6.1 Alert status |
| 5.5.2 Center-to-Center Operations | FR6.1.1 Current status of the emergency alert |
| 5.5.2 Center-to-Center Operations | FR6.1.1.1 Driver information systems that are being used to provide the alert |
| 5.5.2 Center-to-Center Operations | FR6.2 Exchange road network conditions |
| 5.5.2 Center-to-Center Operations | FR6.2.1 Road conditions |
| 5.5.2 Center-to-Center Operations | FR6.2.2 Weather conditions |
| 5.5.2 Center-to-Center Operations | FR6.2.3 Traffic incident information |
| 5.5.2 Center-to-Center Operations | FR6.3 Emergency traffic control information |
| 5.5.2 Center-to-Center Operations | FR6.3.1 Status of a system activation |
| 5.5.2 Center-to-Center Operations | FR6.3.2 Status of a system activation |
| 5.5.2 Center-to-Center Operations | FR6.3.3 Status of a system activation |
| 5.5.2 Center-to-Center Operations | FR6.4 Emergency routes |
| 5.5.2 Center-to-Center Operations | FR6.4.1 Ingress routes for access to the scenes |
| 5.5.2 Center-to-Center Operations | FR6.4.2 Ingress routes for access between the scenes |
| 5.5.2 Center-to-Center Operations | FR6.4.3 Ingress routes for access to staging areas |
| 5.5.2 Center-to-Center Operations | FR6.4.4 Egress routes for access to the scenes |
| 5.5.2 Center-to-Center Operations | FR6.4.5 Egress routes for access between the scenes |
| 5.5.2 Center-to-Center Operations | FR6.4.6 Egress routes for access to staging areas |

| Center - ITS Equipment Communications | |
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| Concept of Operations | Traffic Management/TIM Requirements |
| 5.5.1 ITS Equipment Operations | FR7 TDs communication with center |
| 5.5.1 ITS Equipment Operations | FR7.1 Traffic flow information |
| 5.5.1 ITS Equipment Operations | FR7.1.1 Raw traffic detector data |
| 5.5.1 ITS Equipment Operations | FR7.1.2 Processed traffic detector data |
| 5.5.1 ITS Equipment Operations | FR7.2 Roadside archive data |
| 5.5.1 ITS Equipment Operations | FR7.2.1 Current traffic conditions |
| 5.5.1 ITS Equipment Operations | FR7.2.2 Environmental conditions derived from roadside sensors |
| 5.5.1 ITS Equipment Operations | FR8 Center communication TDs |
| 5.5.1 ITS Equipment Operations | FR8.1 Traffic sensor control information |
| 5.5.1 ITS Equipment Operations | FR8.1.1 Configuration of traffic sensor systems |
| 5.5.1 ITS Equipment Operations | FR8.1.2 Control traffic sensor systems |
| 5.5.1 ITS Equipment Operations | FR8.2 Control data collection and monitoring |
| 5.5.1 ITS Equipment Operations | FR8.2.1 Information used to configure data collection |
| 5.5.1 ITS Equipment Operations | FR8.2.2 Information used to control data collection |
| 5.5.1 ITS Equipment Operations | FR8.2.3 Information used to configure monitoring systems |
| 5.5.1 ITS Equipment Operations | FR8.2.4 Information used to control monitoring systems |
| 5.5.1 ITS Equipment Operations | FR9 Center communication to CCTVs. |
| 5.5.1 ITS Equipment Operations | FR9.1 Control video surveillance |
| 5.5.1 ITS Equipment Operations | FR10 CCTVs communication with center |
| 5.5.1 ITS Equipment Operations | FR10.1 Traffic images supplied |
| 5.5.1 ITS Equipment Operations | FR11 Center communication to DMSs |
| 5.5.1 ITS Equipment Operations | FR11.1 Roadway information system data |
| 5.5.1 ITS Equipment Operations | FR11.1.1 Roadside systems that provide driver information |
| 5.5.1 ITS Equipment Operations | FR11.1.2 Roadside systems that provide driver information |
| 5.5.1 ITS Equipment Operations | FR11.1.3 Roadside systems that provide driver information. |
| 5.5.1 ITS Equipment Operations | FR12 Center communication with DMSs |
| 5.5.1 ITS Equipment Operations | FR12.1 Roadway information system data |
| 5.5.1 ITS Equipment Operations | FR12.1.1 Roadside systems that provide driver information |

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| 5.5.1 ITS Equipment Operations | FR12.1.2 Roadside systems that provide driver information |
| 5.5.1 ITS Equipment Operations | FR12.1.3 Roadside systems that provide driver information |
| 5.5.1 ITS Equipment Operations | FR13 DMSs communication with center |
| 5.5.1 ITS Equipment Operations | FR13.1 Status of the roadway information system |
| 5.5.1 ITS Equipment Operations | FR13.1.1 Current operating status of the dynamic message signs |
| 5.5.1 ITS Equipment Operations | FR14 DMSs communication with center |
| 5.5.1 ITS Equipment Operations | FR14.1 Status of the roadway information system |
| 5.5.1 ITS Equipment Operations | FR14.1.1 Current operating status of the dynamic message signs |
| 5.5.1 ITS Equipment Operations | FR15 TDs shall communicate with LADOTD District 02. |
| 5.5.1 ITS Equipment Operations | FR15.1 Traffic flow information |
| 5.5.1 ITS Equipment Operations | FR15.1.1 Raw traffic detector data |
| 5.5.1 ITS Equipment Operations | FR15.1.2 Processed traffic detector data |
| 5.5.1 ITS Equipment Operations | FR15.2 Roadside archive data |
| 5.5.1 ITS Equipment Operations | FR15.2.1 Current traffic conditions derived from roadside sensors |
| 5.5.1 ITS Equipment Operations | FR15.2.2 Environmental conditions derived from roadside sensors |
| 5.5.1 ITS Equipment Operations | FR16 Center communication with TDs. |
| 5.5.1 ITS Equipment Operations | FR16.1 Control data collection and monitoring |
| 5.5.1 ITS Equipment Operations | FR16.1.1 Data collection |
| 5.5.1 ITS Equipment Operations | FR16.1.2 Control data collection |
| 5.5.1 ITS Equipment Operations | FR16.1.3 Configuration of monitoring systems |
| 5.5.1 ITS Equipment Operations | FR16.1.4 Control monitoring systems |
| 5.5.1 ITS Equipment Operations | FR16.2 Traffic sensor control information |
| 5.5.1 ITS Equipment Operations | FR16.2.1 Configuration of traffic sensor systems |
| 5.5.1 ITS Equipment Operations | FR16.2.2 Control traffic sensor systems |
| 5.5.1 ITS Equipment Operations | FR17 Center communication with CCTVs |
| 5.5.1 ITS Equipment Operations | FR17.1 Video surveillance |
| 5.5.1 ITS Equipment Operations | FR18 CCTVs communication with center |
| 5.5.1 ITS Equipment Operations | FR18.1 Traffic images supplied |
| 5.5.1 ITS Equipment Operations | FR19 CCTVs communication with center |
| 5.5.1 ITS Equipment Operations | FR19.1 Traffic images supplied |
| 5.5.1 ITS Equipment Operations | FR20 Develop operation guidelines prior to project development |
| 5.5.1 ITS Equipment Operations | FR20.1 Center control of LCS operations |
| 5.5.1 ITS Equipment Operations | FR20.1.1 Signal housing location |
| 5.5.1 ITS Equipment Operations | FR20.1.2 LCS faces interval |

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| Center - ITS Equipment Communications | |
| Concept of Operations | Traffic Management/TIM Requirements |
| 5.5.1 ITS Equipment Operations | PR 1 LCS indication visibility |

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| LADOTD District 02 (Bridge City)/RTMC - LADOTD ITS Statewide TMC Communications | |
| Concept of Operations | Emergency Management Requirements |
| 5.5 System Overview | FR21 High speed communication |
| 5.5 System Overview | FR22 Center communication |
| 5.4.3 Emergency Management System | FR22.1 Traffic operator data |
| 5.4.3 Emergency Management System | FR22.2 Road network conditions |
| 5.4.3 Emergency Management System | FR22.2.1 Road conditions |
| 5.4.3 Emergency Management System | FR22.2.2 Weather conditions |

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| 5.4.3 Emergency Management System | FR22.2.3 Traffic incident information |
| 5.4.3 Emergency Management System | FR22.3 Exchange resource request information |
| 5.4.3 Emergency Management System | FR22.3.1 Request of resources to implement special traffic control measures |
| 5.4.3 Emergency Management System | FR22.3.2 Request of resources to verify an incident |
| 5.4.3 Emergency Management System | FR22.4 Resource deployment status information |
| 5.4.3 Emergency Management System | FR22.4.1 Status of individual resource deployment |
| 5.4.3 Emergency Management System | FR22.4.1.1 Status of vehicles |
| 5.4.3 Emergency Management System | FR22.4.1.2 Status of equipment |
| 5.4.3 Emergency Management System | FR22.4.1.3 Status of materials |
| 5.4.3 Emergency Management System | FR22.4.1.4 Status of personnel |
| 5.4.3 Emergency Management System | FR22.4.2 Availability of individual resources |
| 5.4.3 Emergency Management System | FR22.4.2.1 Vehicles available |
| 5.4.3 Emergency Management System | FR22.4.2.2 Equipment available |
| 5.4.3 Emergency Management System | FR22.4.2.3 Materials available |
| 5.4.3 Emergency Management System | FR22.4.2.4 Personnel available |
| 5.4.3 Emergency Management System | FR22.5 Exchange resource coordination information |
| 5.4.3 Emergency Management System | FR22.5.1 Resource inventory information |
| 5.4.3 Emergency Management System | FR22.5.2 Specific resource status information |
| 5.4.3 Emergency Management System | FR22.5.3 Coordination of resource prioritization |
| 5.4.3 Emergency Management System | FR22.5.4 Specific requests for resources |
| 5.4.3 Emergency Management System | FR22.5.5 Responses that service request |
| 5.4.3 Emergency Management System | FR22.6 Exchange incident reports |
| 5.4.3 Emergency Management System | FR22.6.1 Identified incident |
| 5.4.3 Emergency Management System | FR22.6.2 Incident location |
| 5.4.3 Emergency Management System | FR22.6.3 Incident type |
| 5.4.3 Emergency Management System | FR22.6.4 Incident severity |
| 5.4.3 Emergency Management System | FR22.6.5 Appropriate incident response |
| 5.5.2 Center-to-Center Operations | FR22.7 Coordination of incident response |

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| 5.5.2 Center-to-Center Operations | FR22.7.1 Coordinated response to incidents |
| 5.5.2 Center-to-Center Operations | FR22.7.1.1 Summary of incident status |
| 5.5.2 Center-to-Center Operations | FR22.7.1.2 Impact of the incident on the transportation system |
| 5.5.2 Center-to-Center Operations | FR22.7.1.3 Impact of the incident on infrastructure |
| 5.5.2 Center-to-Center Operations | FR22.7.1.4 Current response activities |
| 5.5.2 Center-to-Center Operations | FR22.7.1.5 Planned response activities |
| 5.5.2 Center-to-Center Operations | FR22.8 Exchange incident response status information |
| 5.5.2 Center-to-Center Operations | FR22.8.1 Status of current incident response |
| 5.5.2 Center-to-Center Operations | FR22.8.1.1 Summary of incident status |
| 5.5.2 Center-to-Center Operations | FR22.8.1.2 Impact of the incident on the transportation system |
| 5.5.2 Center-to-Center Operations | FR22.8.1.3 Traffic management strategies for the site |
| 5.5.2 Center-to-Center Operations | FR22.8.1.4 Current response activities |
| 5.5.2 Center-to-Center Operations | FR22.8.1.5 Planned response activities |
| 5.5.2 Center-to-Center Operations | FR22.9 Incident command information |
| 5.5.2 Center-to-Center Operations | FR22.9.1 Information that supports local management of an incident |
| 5.5.2 Center-to-Center Operations | FR22.9.1.1 Resource deployment status |
| 5.5.2 Center-to-Center Operations | FR22.9.1.2 Traffic conditions |
| 5.5.2 Center-to-Center Operations | FR22.9.1.3 Road conditions |
| 5.5.2 Center-to-Center Operations | FR22.9.1.4 Weather conditions |
| 5.5.2 Center-to-Center Operations | FR22.9.1.5 Evacuation advice |
| 5.5.2 Center-to-Center Operations | FR22.9.1.6 Safe incident response |
| 5.5.2 Center-to-Center Operations | FR22.9.1.7 Efficient incident response. |
| 5.4.3 Emergency Management System | FR22.10 Evacuations |
| 5.4.3 Emergency Management System | FR22.10.1 Information regarding a pending evacuation |
| 5.4.3 Emergency Management System | FR22.10.1.1 Evacuation zones |
| 5.4.3 Emergency Management System | FR22.10.1.2 Evacuation times |
| 5.4.3 Emergency Management System | FR22.10.1.3 Evacuation routes |
| 5.4.3 Emergency Management System | FR22.10.1.4 Forecast network conditions |
| 5.4.3 Emergency Management System | FR22.10.1.5 Reentry times |
| 5.4.3 Emergency Management System | FR22.10.2 In-process evacuation |
| 5.4.3 Emergency Management System | FR22.10.2.1 Evacuation zones |
| 5.4.3 Emergency Management System | FR22.10.2.2 Evacuation times |
| 5.4.3 Emergency Management System | FR22.10.2.3 Evacuation routes |
| 5.4.3 Emergency Management System | FR22.10.2.4 Forecast network conditions |
| 5.4.3 Emergency Management System | FR22.10.2.5 Reentry times |
| 5.4.3 Emergency Management System | FR22.11 Emergency plans |
| 5.4.3 Emergency Management System | FR22.11.1 Emergency management plans |
| 5.4.3 Emergency Management System | FR22.11.2 Continuity of operations plans |

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| 5.4.3 Emergency Management System | FR22.11.3 Emergency response plans |
| 5.4.3 Emergency Management System | FR22.11.4 Recovery plans |
| 5.5.2 Center-to-Center Operations | FR22.12 Alert notifications |
| 5.5.2 Center-to-Center Operations | FR22.12.1 Emergency alerts to be distributed to the public. |
| 5.5.2 Center-to-Center Operations | FR22.12.1.1 Natural disaster to the public |
| 5.5.2 Center-to-Center Operations | FR22.12.1.2 Man-made disaster to the public |
| 5.5.2 Center-to-Center Operations | FR22.12.1.3 Civil emergency to the public |
| 5.5.2 Center-to-Center Operations | FR22.12.1.4 Child abduction to the public |
| 5.5.2 Center-to-Center Operations | FR22.13 Alert status |
| 5.5.2 Center-to-Center Operations | FR22.13.1 Current status of the emergency alert |
| 5.5.2 Center-to-Center Operations | FR22.13.2 Driver information systems |

| LADOTD ITS Statewide TMC - LADOTD District 02 Communications | |
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| Concept of Operations | Emergency Management Requirements |
| 5.5 System Overview | FR23 Center communication |
| 5.5.2 Center-to-Center Operations | FR23.1 Alert notification |
| 5.5.2 Center-to-Center Operations | FR23.1.1 Notification of a major emergency |
| 5.5.2 Center-to-Center Operations | FR23.1.1.1 Notification of a natural disaster to the public |
| 5.5.2 Center-to-Center Operations | FR23.1.1.1.1 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR23.1.1.1.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR23.1.1.1.3 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR23.1.1.1.4 Information provided to the public with instruction on how to respond to the alert |
| 5.5.2 Center-to-Center Operations | FR23.1.1.2 Notification of a man-made disaster to the public |
| 5.5.2 Center-to-Center Operations | FR23.1.1.2.1 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR23.1.1.2.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR23.1.1.2.3 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR23.1.1.2.4 Information provided to the public with instruction on how to respond to the alert |
| 5.5.2 Center-to-Center Operations | FR23.1.1.3 Civil emergency to the public |
| 5.5.2 Center-to-Center Operations | FR23.1.1.3.1 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR23.1.1.3.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR23.1.1.3.3 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR23.1.1.3.4 Information provided to the public with instruction on how to respond to the alert. |
| 5.5.2 Center-to-Center Operations | FR23.2 Notification of a child abduction to the public |
| 5.5.2 Center-to-Center Operations | FR23.2.1 Identification of the alert originator |
| 5.5.2 Center-to-Center Operations | FR23.2.2 Identification of the nature of the emergency |
| 5.5.2 Center-to-Center Operations | FR23.2.3 Identification of the effective time period of the alert |
| 5.5.2 Center-to-Center Operations | FR23.2.4 Information provided to the public with instruction on how to respond to the alert. |

| LADOTD District02 (Bridge City)/RTMC - LSP Troop B Communications | |
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| Concept of Operations | Emergency Management Requirements |
| 5.5 System Overview | FR24 Center communication |
| 5.4.3 Emergency Management System | FR24.1 Exchange resource request information |
| 5.4.3 Emergency Management System | FR24.1.1 Request resources to implement special traffic control measures |

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| 5.4.3 Emergency Management System | FR24.1.2 Request resources to verify an incident |
| 5.4.3 Emergency Management System | FR24.2 Exchange resource deployment status information |
| 5.4.3 Emergency Management System | FR24.2.1 Status of individual resource deployment |
| 5.4.3 Emergency Management System | FR24.2.1.1 Status of vehicles |
| 5.4.3 Emergency Management System | FR24.2.1.2 Status of equipment |
| 5.4.3 Emergency Management System | FR24.2.1.3 Status of materials |
| 5.4.3 Emergency Management System | FR24.2.1.4 Status of personnel |
| 5.4.3 Emergency Management System | FR24.2.2 Availability of individual resource |
| 5.4.3 Emergency Management System | FR24.2.2.1 Vehicles available |
| 5.4.3 Emergency Management System | FR24.2.2.2 Equipment available |
| 5.4.3 Emergency Management System | FR24.2.2.3 Materials available |
| 5.4.3 Emergency Management System | FR24.2.2.4 Personnel available |
| 5.4.3 Emergency Management System | FR24.3 Exchange resource coordination information |
| 5.4.3 Emergency Management System | FR24.3.1 Coordination of resource inventory information |
| 5.4.3 Emergency Management System | FR24.3.2 Resource status information |
| 5.4.3 Emergency Management System | FR24.3.3 Resource prioritization |
| 5.4.3 Emergency Management System | FR24.3.4 Specific requests for resources |
| 5.4.3 Emergency Management System | FR24.4 Exchange incident response status information |
| 5.4.3 Emergency Management System | FR24.4.1 Status of current incident response |
| 5.4.3 Emergency Management System | FR24.4.1.1 Summary of incident status |
| 5.4.3 Emergency Management System | FR24.4.1.2 Impact of the incident on the transportation system |
| 5.4.3 Emergency Management System | FR24.4.1.3 Traffic management strategies |
| 5.4.3 Emergency Management System | FR24.4.1.4 Current response activities |
| 5.4.3 Emergency Management System | FR24.4.1.5 Planned response activities |
| 5.4.3 Emergency Management System | FR24.5 Incident response |
| 5.4.3 Emergency Management System | FR24.5.1 Incident response procedures |
| 5.4.3 Emergency Management System | FR24.5.1.1 Summary of incident status |

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| 5.4.3 Emergency Management System | FR24.5.1.2 Impact of the incident on the transportation system |
| 5.4.3 Emergency Management System | FR24.5.1.3 Impact of the incident on infrastructure |
| 5.4.3 Emergency Management System | FR24.5.1.4 Current response activities |
| 5.4.3 Emergency Management System | FR24.5.1.5 Planned response activities |
| 5.4.3 Emergency Management System | FR24.6 Exchange incident reports |
| 5.4.3 Emergency Management System | FR24.6.1 Identified incident |
| 5.4.3 Emergency Management System | FR24.6.2 Incident location |
| 5.4.3 Emergency Management System | FR24.6.3 Incident type |
| 5.4.3 Emergency Management System | FR24.6.4 Incident severity |
| 5.4.3 Emergency Management System | FR24.6.5 Appropriate incident response |
| 5.4.3 Emergency Management System | FR24.7 Incident command information |
| 5.4.3 Emergency Management System | FR24.7.1 Local management of an incident |
| 5.4.3 Emergency Management System | FR24.7.1.1 Resource deployment status |
| 5.4.3 Emergency Management System | FR24.7.1.2 Traffic conditions |
| 5.4.3 Emergency Management System | FR24.7.1.3 Road conditions |
| 5.4.3 Emergency Management System | FR24.7.1.4 Weather conditions |
| 5.4.3 Emergency Management System | FR24.7.1.5 Evacuation advice |
| 5.4.3 Emergency Management System | FR24.7.1.6 Safe incident response |
| 5.4.3 Emergency Management System | FR24.7.1.7 Efficient incident response |
| 5.4.3 Emergency Management System | FR24.8 Evacuations |
| 5.4.3 Emergency Management System | FR24.8.1 Pending evacuation |
| 5.4.3 Emergency Management System | FR24.8.1.1 Evacuation zones |
| 5.4.3 Emergency Management System | FR24.8.1.2 Evacuation times |
| 5.4.3 Emergency Management System | FR24.8.1.3 Evacuation routes |
| 5.4.3 Emergency Management System | FR24.8.1.4 Forecast network conditions |
| 5.4.3 Emergency Management System | FR24.8.1.5 Reentry times |
| 5.4.3 Emergency Management System | FR24.8.2 In-process evacuation |

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| 5.4.3 Emergency Management System | FR24.8.2.1 Evacuation zones |
| 5.4.3 Emergency Management System | FR24.8.2.2 Evacuation times |
| 5.4.3 Emergency Management System | FR24.8.2.3 Evacuation routes |
| 5.4.3 Emergency Management System | FR24.8.2.4 Forecast network conditions |
| 5.4.3 Emergency Management System | FR24.8.2.5 Reentry times |
| 5.4.3 Emergency Management System | FR24.9 Emergency plans |
| 5.4.3 Emergency Management System | FR24.9.1 Emergency management plans |
| 5.4.3 Emergency Management System | FR24.9.2 Continuity of operations plans |
| 5.4.3 Emergency Management System | FR24.9.3 Emergency response plans |
| 5.4.3 Emergency Management System | FR24.9.4 Recovery plans |
| 5.5.2 Center-to-Center Operations | FR24.10 Alert notifications |
| 5.5.2 Center-to-Center Operations | FR24.10.1 Emergency alerts to be distributed to the public |
| 5.5.2 Center-to-Center Operations | FR24.10.1.1 Notification of a natural disaster to the public |
| 5.5.2 Center-to-Center Operations | FR24.10.1.2 Notification of a man-made disaster to the public |
| 5.5.2 Center-to-Center Operations | FR24.10.1.3 Civil emergency to the public |
| 5.5.2 Center-to-Center Operations | FR24.10.1.4 Child abduction |
| 5.5.2 Center-to-Center Operations | FR24.11 Alert status |
| 5.5.2 Center-to-Center Operations | FR24.11.1 Current status of the emergency alert |
| 5.5.2 Center-to-Center Operations | FR24.11.1.1 Driver information systems |
| 5.4.3 Emergency Management System | FR24.12 Road network conditions |
| 5.4.3 Emergency Management System | FR24.12.1 Road conditions. |
| 5.4.3 Emergency Management System | FR24.12.2 Weather conditions. |
| 5.4.3 Emergency Management System | FR24.12.3 Traffic incident information |
| 5.4.3 Emergency Management System | FR24.13 Emergency traffic control information |
| 5.4.3 Emergency Management System | FR24.13.1 Status of a system activation |
| 5.4.3 Emergency Management System | FR24.13.2 Status of a system activation |
| 5.4.3 Emergency Management System | FR24.13.3 Status of a system activation |
| 5.4.3 Emergency Management System | FR24.14 Emergency routes |
| 5.4.3 Emergency Management System | FR24.14.1 Ingress routes for access to the scenes |
| 5.4.3 Emergency Management System | FR24.14.2 Ingress routes for access between the scenes |
| 5.4.3 Emergency Management System | FR24.14.3 Ingress routes for access to staging areas |

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| 5.4.3 Emergency Management System | FR24.14.4 Egress routes for access to the scenes |
| 5.4.3 Emergency Management System | FR24.14.5 Egress routes for access between the scenes |
| 5.4.3 Emergency Management System | FR24.14.6 Egress routes for access to staging areas |

| LSP Troop B - LADOTD District 02 (Bridge City)/RTMC Communications | |
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| Concept of Operations | Emergency Management Requirements |
| 5.5 System Overview | FR25 Center communication |
| 5.4.3 Emergency Management System | FR25.1 Alert notification |
| 5.4.3 Emergency Management System | FR25.1.1 Notification of a major emergency |
| 5.4.3 Emergency Management System | FR25.1.1.1 Notification of a natural disaster to the public |
| 5.4.3 Emergency Management System | FR25.1.1.1.1 Identification of the alert originator |
| 5.4.3 Emergency Management System | FR25.1.1.1.2 Identification of the nature of the emergency |
| 5.4.3 Emergency Management System | FR25.1.1.1.3 Identification of the effective time period of the alert |
| 5.4.3 Emergency Management System | FR25.1.1.1.4 Information provided to the public with instruction on how to respond to the alert |
| 5.4.3 Emergency Management System | FR25.1.1.2 Notification of a man-made disaster to the public |
| 5.4.3 Emergency Management System | FR25.1.1.2.1 Identification of the alert originator |
| 5.4.3 Emergency Management System | FR25.1.1.2.2 Identification of the nature of the emergency |
| 5.4.3 Emergency Management System | FR25.1.1.2.3 Identification of the effective time period of the alert |
| 5.4.3 Emergency Management System | FR25.1.1.2.4 Information provided to the public with instruction on how to respond to the alert |
| 5.4.3 Emergency Management System | FR25.1.1.3 Notification of a civil emergency to the public |
| 5.4.3 Emergency Management System | FR25.1.1.3.1 Identification of the alert originator |
| 5.4.3 Emergency Management System | FR25.1.1.3.2 Identification of the nature of the emergency |
| 5.4.3 Emergency Management System | FR25.1.1.3.3 Identification of the effective time period of the alert |
| 5.4.3 Emergency Management System | FR25.1.1.3.4 Information provided to the public with instruction on how to respond to the alert |
| 5.4.3 Emergency Management System | FR25.1.1.4 Notification of a child abduction to the public |
| 5.4.3 Emergency Management System | FR25.1.1.4.1 Identification of the alert originator |
| 5.4.3 Emergency Management System | FR25.1.1.4.2 Identification of the nature of the emergency |
| 5.4.3 Emergency Management System | FR25.1.1.4.3 Identification of the effective time period of the alert |
| 5.4.3 Emergency Management System | FR25.1.1.4.4 Information provided to the public with instruction on how to respond to the alert. |

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| 5.4.3 Emergency Management System | FR25.2 Request an emergency route |
| 5.4.3 Emergency Management System | FR25.2.1 Ingress access routes for emergency response vehicles |
| 5.4.3 Emergency Management System | FR25.2.2 Ingress access routes for emergency response equipment |
| 5.4.3 Emergency Management System | FR25.2.3 Egress access routes for emergency response vehicles |
| 5.4.3 Emergency Management System | FR25.2.4 Egress access routes for emergency response equipment |
| 5.4.3 Emergency Management System | FR25.3 Request emergency traffic control |
| 5.4.3 Emergency Management System | FR25.3.1 Request to place a public safety message on a dynamic message sign |
| 5.4.3 Emergency Management System | FR25.3.2 Request to place an emergency message on a dynamic message sign |

| LSP Troop B - LADOTD ITS Statewide TMC Communications | |
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| Concept of Operations | Emergency Management Requirements |
| 5.5 System Overview | FR26 Center communication |
| 5.4.3 Emergency Management System | FR26.1 Alert notification |
| 5.4.3 Emergency Management System | FR26.1.1 Notification of a major emergency |
| 5.4.3 Emergency Management System | FR26.1.1.1 Notification of a natural disaster to the public |
| 5.4.3 Emergency Management System | FR26.1.1.1.1 Identification of the alert originator |
| 5.4.3 Emergency Management System | FR26.1.1.1.2 Identification of the nature of the emergency |
| 5.4.3 Emergency Management System | FR26.1.1.1.3 Identification of the effective time period of the alert |
| 5.4.3 Emergency Management System | FR26.1.1.1.4 Information provided to the public with instruction on how to respond to the alert |
| 5.4.3 Emergency Management System | FR26.1.1.2 Notification of a man-made disaster to the public |
| 5.4.3 Emergency Management System | FR26.1.1.2.1 LSP shall coordinate with LADOTD ITS Statewide TMC the identification of the alert originator. |
| 5.4.3 Emergency Management System | FR26.1.1.2.2 Identification of the nature of the emergency |
| 5.4.3 Emergency Management System | FR26.1.1.2.3 Identification of the effective time period of the alert |
| 5.4.3 Emergency Management System | FR26.1.1.2.4 Information provided to the public with instruction on how to respond to the alert |
| 5.4.3 Emergency Management System | FR26.1.1.3 Notification of a civil emergency to the public |
| 5.4.3 Emergency Management System | FR26.1.1.3.1 Identification of the alert originator |
| 5.4.3 Emergency Management System | FR26.1.1.3.2 Identification of the nature of the emergency |
| 5.4.3 Emergency Management System | FR26.1.1.3.3 Identification of the effective time period of the alert |
| 5.4.3 Emergency Management System | FR26.1.1.3.4 Information provided to the public with instruction on how to respond to the alert |

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| 5.4.3 Emergency Management System | FR26.1.1.4 Notification of a child abduction to the public |
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| 5.4.3 Emergency Management System | FR26.1.1.4.4 Information provided to the public with instruction on how to respond to the alert |
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| 5.4.3 Emergency Management System | FR26.5 Resource coordination information |
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