FACILITY ANALYSIS

(Using the System Engineering Process)

New Orleans Regional Transportation Management Center

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Presented to:

Louisiana Department of Transportation
And Development

ABMB ENGINEERS, INC.

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1 Acronyms and Abbreviations

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

AASHTO	American Association of State Highway and Transportation Officials
AC	Alternating Current
ATIS	Advanced Traveler Information Systems
ATMS	Advanced Traffic Management System
ASC	Actuated Traffic Signal Controller
C2C	Center-to-Center
CCTV	Closed Circuit TV
CEA	Cooperative Endeavor Agreement
CVO	Commercial Vehicle Operations
DATEX-ASN	Data Exchange ASN.1
DC	Direct Current
DCM	Data Collection and Monitoring
DOTD	Louisiana Department of Transportation and Development
DMS	Dynamic Message Sign
DVR	Digital Video Recorder
EOC	Emergency Operations Center
ESS	Environmental Sensor Stations
FAP	Federal Aid Project
FHWA	Federal Highway Administration
FSK	Frequency-shift Keying
FMS	Field Management Stations
FTA	Federal Transit Administration
GIS	Geographic Information Systems
HAR	Highway Advisory Radio
HOV	High Occupancy Vehicle
IEEE	Institute of Electrical and Electronic Engineers
ITE	Institute of Transportation Engineers
ITIS	International Traveler Information Systems
ITS	Intelligent Transportation Systems
LA	Louisiana
LRMS	Location Referencing Message Specification
MAP	Motorist Assistance Patrol
MHz	Megahertz
MPO	Metropolitan Planning Organization
MS/ETMCC	Message Sets for External TMC Communication
NEMA	National Electrical Manufactures Association
NTCIP	National Transportation Communications for ITS Protocol
O&M	Operations and Management
OER	Octet Encoding Rules
RDS	Radio Data System
RMC	Ramp Meter Control

RPC	Regional Planning Commission
RTMC	Regional Transportation Management Center (New Orleans)
SCP	Signal Control and Prioritization
SDO	Standard Development Organizations
SOP	Standard Operating Procedures
STMF	Simple Transportation Management Framework
TCP/IP	Transmission Control Protocol/Internet Protocol
TED	Traffic Engineering Department
TFTP	Trivial File Transfer Protocol
TIP	Transportation Improvement Program
TMC	Traffic Management Center
TMDD	Traffic Management Data Dictionary
TMP	Transportation Management Protocols
TO	Task Order
TSS	Transportation Sensor Systems
TV	Television
UDP/IP	User Datagram Protocol/Internet Protocol
UPS	Uninterruptible Power Supply
U.S.	United States
XML	Extensible Markup Language

2 Physical Architecture

2.1 Introduction

The purpose of this section is it to show the New Orleans Regional Transportation Management Center (RTMC) in the broader context of the surface transportation system in New Orleans and the state of Louisiana.

This section defines a *project ITS architecture*[1] for the RTMC that shows the RTMC in the context of surrounding systems. This broad integrated view of the RTMC is intended to encourage stakeholders to think about how the RTMC fits within the overall transportation vision for the region. The project ITS architecture identifies the integration opportunities that should be considered and provides a head start for the systems engineering analysis that is required for ITS projects.

In addition to providing these benefits, this document satisfies the federal requirement to use the regional ITS architecture to support project implementation. Specifically, FHWA Rule 940.11.c.1 and FTA National ITS Architecture Policy Section 6.c.1 require identification of the portion of the regional ITS architecture that is implemented by each ITS project. This requirement is satisfied by this document.

This document is an analysis of the RTMC facility using the system engineering process. The focus of the analysis is facility requirements rather than transportation management requirements. Typical ITS architectures focus on transportation management functions and are almost completely silent on the facilities that house the systems to satisfy these functions. Although they are not the focus of this project, transportation management functions that will be supported by the RTMC are identified since these functions will influence facilities requirements. Where possible, architecture areas that are related to facilities are highlighted and elaborated.

2.2 Architecture Creation Process

The RTMC Project ITS Architecture is primarily based on the architecture elements found in the *New Orleans Regional ITS Preliminary Implementation Plan*, which was developed in 2002. Hereafter, the architecture elements found in the 2002 document will be referenced as the New Orleans Regional ITS Architecture or simply the regional ITS architecture. The U.S. National ITS Architecture, Louisiana Statewide ITS Architecture, and the Baton Rouge Regional ITS Architecture were also used to supplement the project ITS architecture development where necessary. For example, security requirements that may be relevant to the RTMC were collected from the National ITS Architecture since these requirements were not included in the New Orleans Regional ITS Architecture.

2.2.1 Identify the Portion of the Regional ITS Architecture

Turbo Architecture was used to create an initial architecture that includes the portion of the regional ITS architecture that is relevant to the RTMC. As part of this process, the regional ITS architecture was upgraded from version 3.0 of the National ITS Architecture to version 6.0, the most current version of the architecture. Project documents including the Preliminary Implementation Plan were used to determine the portion of the regional ITS architecture that would apply to the RTMC.

[1] See http://www.its.dot.gov/arch/index.htm for more information on ITS architecture terminology and concepts.

2.2.2 Fix, Fill Gaps, and Add Facilities Focus

The subset of the architecture was reviewed and compared with available RTMC documentation. Discrepancies between the RTMC documentation and the way that the RTMC was depicted in the regional ITS architecture were resolved. Suggested changes to the regional ITS architecture were documented.

There were several gaps in the architecture subset that also had to be filled. For example, the regional ITS architecture defined neither roles and responsibilities nor functional requirements. Requirements from the National ITS Architecture were added to make the RTMC Project ITS Architecture more complete.

Finally, the portion of the architecture definition that was most relevant to the RTMC project was reviewed in more detail and elaborated where possible. For example, security requirements from the National ITS Architecture were added since these are particularly relevant to the RTMC facility.

The result of this process was a RTMC Project ITS Architecture that can be used to support the RTMC systems engineering analysis. The architecture is documented here and in a Turbo Architecture database.

2.3 The RTMC Project ITS Architecture

2.3.1 RTMC Inventory Elements

The regional ITS architecture inventory identifies the existing and planned systems in the region as a list of "inventory elements." The inventory element of central interest to this project is the "Regional Transportation Management Center (TransJazz)" element. The "TransJazz" name is no longer used, so it was removed from the RTMC Project ITS Architecture. Two other inventory elements are archives that would also be housed at the RTMC facility. **Table 1** identifies the inventory elements that would be housed in the RTMC facility and are included in the RTMC Project ITS Architecture. It should be noted that the inventory in Table 1 only considers the elements (systems deployed) for the facility used by and between DOTD and RPC.

Table 1: RTMC Project Inventory Elements

Inventory Element	Stakeholder	Description *
Regional Transportation Management Center	DOTD	This element represents the DOTD ITS Section systems and personnel at the RTMC that are responsible for the operations and maintenance of all DOTD District 02 ITS field devices. For this project, this element will collect and process archive data.
Regional TMC Archive	DOTD	This element represents the DOTD ITS Section systems at the RTMC that are responsible for managing and collecting archive data.
RPC Archives	RPC	This element represents the data collection system(s) that the Regional Planning Commission (RPC) uses to collect transportation data for transportation planning purposes.

* Note descriptions of the inventory elements were derived from the *New Orleans Regional ITS Preliminary Implementation Plan*.

In addition to these three elements, the regional ITS architecture also includes a "District 02 Traffic Operations Center" that represents the District 02 Traffic Engineering Division System that will operate within the RTMC. The transportation functions and interfaces that are supported by the three inventory elements identified in Table 1 are further explored in the following sections.

2.3.2 RTMC Transportation Services (Market Packages)

The regional ITS architecture identifies traffic management, transit, traveler information, and maintenance services for the RTMC. The list of services in Table 2 includes services that are identified in the regional ITS architecture as well as a few additional services that are also relevant to the RTMC. In most cases, the additional services are newer services that were not defined when the New Orleans Regional ITS Architecture was developed. Services that are not identified in the *New Orleans Regional ITS Preliminary Implementation Plan* are highlighted with an asterisk (*).

Table 2: RTMC Transportation Services

MP	Market Package Name
AD1	ITS Data Mart
AD2	ITS Data Warehouse
APTS02	Transit Fixed-Route Operations
APTS03	Demand Response Transit Operations
APTS07	Multi-modal Coordination
ATIS01	Broadcast Traveler Information
ATIS02	Interactive Traveler Information
ATMS01	Network Surveillance
ATMS02	Traffic Probe Surveillance
ATMS03	Surface Street Control
ATMS04	Freeway Control
ATMS05	HOV Lane Management
ATMS06	Traffic Information Dissemination
ATMS07	Regional Traffic Management
ATMS08	Traffic Incident Management System
ATMS18	Reversible Lane Management
ATMS21	Roadway Closure Management *
EM04	Roadway Service Patrols
EM05	Transportation Infrastructure Protection *
EM06	Wide-Area Alert *
EM07	Early Warning System *
EM08	Disaster Response and Recovery *
EM09	Evacuation and Reentry Management *
EM10	Disaster Traveler Information *
MC08	Work Zone Management

2.3.3 Interfaces

At the heart of the RTMC Project ITS Architecture are the three inventory elements that are housed in the RTMC facility. These three elements are interfaced to support sharing and archiving of operational data as shown in **Appendix A,** Figure 1**.** The regional ITS architecture shows the DOTD Regional TMC Archive collecting operational data for archiving and analysis and sharing this data with the RPC archive. This is an efficient approach where one system archives the data that is then shared with other archives/data users within the center.

The three inventory elements previously discussed interface with more than 60 other inventory elements based on the regional ITS architecture. This large number of interfaces should be carefully reviewed and revised as necessary so that the regional ITS architecture accurately reflects the potential integration and transportation operations of the RTMC with the rest of the surface transportation system. The RTMC interfaces envisioned to fulfill the transportation management functions identified in the regional ITS architecture are shown in the series of figures in **Appendix A**.

2.3.4 ITS Standards

The Turbo Architecture database that was created for the RTMC Project ITS Architecture identifies the ITS standards that support the RTMC's planned system interfaces. The following table lists all the ITS standards that are associated with one or more RTMC interfaces. Use the database to generate more detailed reports that associate specific standards with each of the RTMC interfaces.

Table 3: ITS Standards Supporting Future RTMC Interfaces

SDO	Doc ID	Standard Title
AASHTO/ITE	ITE TMDD 2.1	Traffic Management Data Dictionary and Message Sets for External TMC Communication (TMDD and MS/ETMCC)
AASHTO/ITE/NEMA	NTCIP 1102	Octet Encoding Rules (OER) Base Protocol
AASHTO/ITE/NEMA	NTCIP 1103	Transportation Management Protocols (TMP)
AASHTO/ITE/NEMA	NTCIP 1104	Center-to-Center Naming Convention Specification
AASHTO/ITE/NEMA	NTCIP 1201	Global Object Definitions
AASHTO/ITE/NEMA	NTCIP 1202	Object Definitions for Actuated Traffic Signal Controller (ASC) Units
AASHTO/ITE/NEMA	NTCIP 1203	Object Definitions for Dynamic Message Signs (DMS)
AASHTO/ITE/NEMA	NTCIP 1204	Object Definitions for Environmental Sensor Stations (ESS)
AASHTO/ITE/NEMA	NTCIP 1205	Object Definitions for Closed Circuit Television (CCTV) Camera Control
AASHTO/ITE/NEMA	NTCIP 1206	Object Definitions for Data Collection and Monitoring (DCM) Devices
AASHTO/ITE/NEMA	NTCIP 1207	Object Definitions for Ramp Meter Control (RMC) Units
AASHTO/ITE/NEMA	NTCIP 1208	Object Definitions for Closed Circuit Television (CCTV) Switching
AASHTO/ITE/NEMA	NTCIP 1209	Data Element Definitions for Transportation Sensor Systems (TSS)
AASHTO/ITE/NEMA	NTCIP 1210	Field Management Stations (FMS) - Part 1: Object Definitions for Signal System Masters
AASHTO/ITE/NEMA	NTCIP 1211	Object Definitions for Signal Control and Prioritization (SCP)
AASHTO/ITE/NEMA	NTCIP 2101	Point to Multi-Point Protocol Using RS-232 Subnetwork Profile
AASHTO/ITE/NEMA	NTCIP 2102	Point to Multi-Point Protocol Using FSK Modem Subnetwork Profile
AASHTO/ITE/NEMA	NTCIP 2103	Point-to-Point Protocol Over RS-232 Subnetwork Profile
AASHTO/ITE/NEMA	NTCIP 2104	Ethernet Subnetwork Profile
AASHTO/ITE/NEMA	NTCIP 2201	Transportation Transport Profile
AASHTO/ITE/NEMA	NTCIP 2202	Internet (TCP/IP and UDP/IP) Transport Profile
AASHTO/ITE/NEMA	NTCIP 2301	Simple Transportation Management Framework (STMF)

SDO	Doc ID	Standard Title
		Application Profile
AASHTO/ITE/NEMA	NTCIP 2302	Trivial File Transfer Protocol (TFTP) Application Profile
AASHTO/ITE/NEMA	NTCIP 2303	File Transfer Protocol (FTP) Application Profile
AASHTO/ITE/NEMA	NTCIP 2304	Application Profile for DATEX-ASN (AP-DATEX)
AASHTO/ITE/NEMA	NTCIP 2306	Application Profile for XML Message Encoding and Transport in ITS Center-to-Center Communications (C2C XML)
ASTM	ASTM E2468-05	Standard Practice for Metadata to Support Archived Data Management Systems
ASTM	ASTM WK7604	Standard Specifications for Archiving ITS-Generated Traffic Monitoring Data
IEEE	IEEE 1512 - 2006	Standard for Common Incident Management Message Sets for Use by Emergency Management Centers
IEEE	IEEE 1512.1-2006	Standard for Traffic Incident Management Message Sets for Use by Emergency Management Centers
IEEE	IEEE 1512.2-2004	Standard for Public Safety Traffic Incident Management Message Sets for Use by Emergency Management Centers
IEEE	IEEE 1512.3-2006	Standard for Hazardous Material Incident Management Message Sets for Use by Emergency Management Centers
IEEE	IEEE P1512.4	Standard for Common Traffic Incident Management Message Sets for Use in Entities External to Centers
SAE	SAE J2266	Location Referencing Message Specification (LRMS)
SAE	SAE J2354	Message Sets for Advanced Traveler Information Systems (ATIS)
SAE	SAE J2540	Messages for Handling Strings and Look-up Tables in ATIS Standards
SAE	SAE J2540/1	RDS (Radio Data System) Phrase Lists
SAE	SAE J2540/2	ITIS (International Traveler Information Systems) Phrase Lists
SAE	SAE J2540/3	National Names Phrase List

2.4 Suggested Changes to New Orleans Regional ITS Architecture

This section identifies potential issues and opportunities for improvement that were identified in the New Orleans Regional ITS Architecture as the RTMC Project ITS Architecture was developed. Many of the identified issues are related to two facts:

1. Most of the work on the New Orleans Regional ITS Architecture appears to have been performed in a short span of time during a Tier 2 workshop in December 2000. There does not appear to have been significant further development of the architecture to include descriptions, tailoring interfaces, defining a maintenance plan, etc. after the 3-day Tier 2 workshop was completed.
2. The architecture has not been updated since January 2001, so it may not reflect the latest strategies for the region.

When the regional ITS architecture is updated, consideration should be given to the suggestions listed in Table 4 for incorporation. These suggestions were identified as part of this systems engineering analysis effort. In some cases, comments were made where something was different from "typical" architectures that have been reviewed and used, but this may be as intended. Please review these comments with stakeholders that are very familiar with the New Orleans region prior to incorporation.

Table 4: New Orleans Regional ITS Architecture Comments

Area	Comment
Stakeholders	DOTD District 02 is identified as a stakeholder, but it is not associated with any inventory in the regional ITS architecture. Clarify the role of this stakeholder either by associating it with inventory or defining roles and responsibilities for it. This stakeholder was included in the RTMC Project ITS Architecture since District 02 is a stakeholder in the RTMC.
Inventory	"TransJazz" is used in the regional ITS architecture, but is not used in later ITS planning/project documentation. Suggest removing this name from the regional ITS architecture if it is no longer used.
Inventory	Normally, a regional TMC will have some associated traveler information capability, either broken out as a separate inventory element or included as part of the regional TMC element. No Information Service Provider capability was associated with the regional TMC. Comparing this with the Baton Rouge Regional ITS Architecture, the DOTD center was mapped to ISP, Maintenance and Construction, and Archived Data Management entities.
Inventory	Review the inventory elements and adopt naming conventions that are consistent with other regional ITS architectures in Louisiana. For example, use standard naming conventions for field equipment elements associated with DOTD. Only minimal naming changes were made to support this project architecture development. For example, a "Variable Message Sign" element was changed to "Dynamic Message Sign" element per local conventions.
Market Packages	Many new market packages have been added in versions 4, 5, and 6 of the National ITS Architecture that will be applicable to New Orleans and should be added to the New Orleans architecture. For example, the Disaster Response and Emergency Traveler Information market packages were added in version 5.0. Several of these new market packages were added to the RTMC Project ITS Architecture. The new market packages should be reviewed for potential applicability to New Orleans. Focusing specifically on the RTMC, the following were added to the project ITS architecture: ATMS21: Road Closure Management; EM05: Transportation Infrastructure Protection; EM06: Wide-Area Alert; EM07: Early Warning System; EM08: Disaster Response and Recovery; EM09: Evacuation and Reentry Management; and EM10: Disaster Traveler Information.
Market Packages	Several other market packages appear to be missing from the list of market packages that would normally be associated with a regional TMC. For

Area	Comment
	example, ATIS02 would normally be included if the regional TMC supports or will support traveler information web pages or a 511 system.
Functional Requirements	Consider identifying high-level functional requirements for the key systems in the architecture. This can be done fairly quickly using Turbo Architecture to select the requirements from the National ITS Architecture that are more relevant to each region. Functional requirements were selected for the RTMC using Turbo Architecture. Section 3.7 identifies the Project Requirements for the RTMC.
Interfaces	The integration that is shown for the RTMC is very ambitious, including planned interfaces to approximately 50 other systems. It would be useful to walk through these interfaces with DOTD and RPC, verify that all the interfaces are valid, and prioritize the many integration opportunities that are shown.
Interfaces	Although the RTMC will certainly be closely integrated with other systems, the regional ITS architecture includes a number of suspect information flows among more than 350 flows that are identified in the regional ITS architecture. Running the "Check Request Flows" tool in Turbo Architecture quickly finds disconnects in the defined information flows.
Interfaces	The regional ITS architecture should be converted to the latest version of the National ITS Architecture (currently Version 6.0) and rebuilt to update the interfaces to the latest information flows and ITS standards mappings. A minimal conversion was performed on the RTMC Project ITS Architecture.
Standards	The ITS standards identified in the regional ITS architecture have not been tailored. Update the architecture to reflect specific strategies for adoption of standards in the region, if any have been identified.

3 Concept of Operations

3.1 SCOPE

3.1.1 Introduction

A concept of operations is defined as "the way a system will operate from multiple stakeholder viewpoints"[2] in its intended environment. This concept of operations section is focused on the RTMC facility and support for the transportation management functions but not the transportation management functions themselves. DOTD has indicated that a separate systems engineering analysis document will be developed to discuss the concept of operations of the transportation management functions of the RTMC.

Currently, there are two identified project stakeholders, DOTD and RPC, but it is envisioned that other agencies will want to operate within the facility as the transportation management functions in the RTMC are realized. The RTMC is being built with consideration of the following planned operations, facilities layout, climate & weather, and security & safety capabilities:

1. Efficient conduct of Highway Traffic Incident, Planned Special Events, and Emergency Management functions
2. Day-to-day usage for RPC and DOTD work activities
3. Flexible and adaptable networking for current and future needs
4. Flexible allocation of operational resources to accommodate partner agencies' requirements
5. Adaptability of multi-use space within the facility
6. Withstand weather and flood-related disasters

3.1.2 Overview

This concept of operations describes the RTMC from the point of view of the four environments identified above; planned operations, facility layout, and climate & weather, and security & safety. The following is a brief overview of each of these as it relates to the RTMC and communications facility. These views will be elaborated in greater detail in the rest of this section.

3.1.2.1 Planned Operations

The RTMC's primary function is to be the command center that will monitor and manage the transportation system for freeway and arterial roadways and intermodal connections as described in the *New Orleans Regional ITS Preliminary Implementation Plan* document, June 2002. The 10-year plan identifies the scope of surveillance coverage, detection, and monitoring for both the freeway management and the arterial signal systems. The RTMC will monitor and operate the surveillance and detection devices as well as provide the transportation management for the New Orleans region. The RTMC will also manage planned special events, incidents, and emergencies related to transportation. The RTMC will provide information on events, incidents, and emergencies to the traveler and public through a number of different media such as Dynamic Message Signs (DMS), Highway Advisory Radio (HAR), Internet, commercial television, and radio.

[2] Systems Engineering Guidebook for ITS, 8.1.1 Glossary, www.fhwa.dot.gov/cadiv/segb

The RTMC will provide work space for a maximum of 119 personnel that could eventually occupy the facility. This includes RPC and DOTD staff throughout the facility as well as future partner agency staff on the control room floor.

RPC staff will carry out their normal daily activities including at a minimum:

- Modeling
- Analysis
- Planning
- Community outreach
- Management functions

DOTD staff will carry out their normal daily activities including at a minimum:

- Operate and maintain the transportation management center
- Management functions
- Traffic engineering related functions
- Interface to the public regarding transportation related issues

Future partner agencies are anticipated to require operational space at the RTMC on the control room floor including connections to their own management systems.

A flexible communication networking strategy will be essential. The following three networking needs have been identified for the RTMC:

- RPC work activities
- DOTD administration functions
- DOTD transportation management functions

Each of these functions has its own set of needs and in some cases will conflict with others. For example, the security and firewall requirements related to the DOTD administrative functions (personal information) are in conflict with the open and standardized interfaces for the following transportation management functions:

- Remote access of control room displays and information to offices
- Bidirectional interfaces to adjacent partner agencies and/or regional systems
- Standard and unrestricted interface to the internet for webcasts and other commercial services

If new partner agencies participate with the DOTD and RPC, they will have their own set of networking requirements. This will require a network that is adaptable to these varied needs. To obtain the maximum flexibility within the facility, a wireless capability as well as a user configurable cable layout is needed.

At times, the RTMC provides transportation information to the public through live network news broadcasts. Media trailers maybe located at the RTMC to broadcast video. Parking spaces and

communication access ports for each trailer will need to be provided in a location that is non intrusive to the facility.

3.1.2.2 Facility Layout

The RTMC facility, particularly the control room, must be configurable internally to accommodate additional regional partners that desire to participate with the RPC and DOTD in the RTMC. The facility will need to be flexible as added functions and staff will increase the equipment needs and impact the work flow of the RTMC staff. Reconfigurable rooms will impact the power and air conditioning requirements. The layout of the RTMC has been documented in the construction plans and specifications for the building. External physical security will be an important issue for both the RTMC and the communications facility. Monitoring of all entry ways with CCTV as well as alarms on all accesses; after hours "key card" access; and well-lit parking areas, surrounding premises, and perimeters will be needed. Internal security will also be needed. Access to computer and communications rooms as well as data storage areas will be controlled.

3.1.2.3 Climate & Weather

The RTMC facility is being built considering the prevailing weather conditions and lessons from Hurricane Katrina. Some considerations that are being integrated into the design of this facility include:

- On-site back-up power generation for critical equipment for both the RTMC as well as the communication facilities
- Back up or alternative units for single-point-of-failure elements (e.g., redundant air conditioning units in the computer room)

3.1.2.4 Security & Safety

In consideration of these issues, a security monitoring system will be needed to manage the safety and security of both facilities. This includes, monitoring and recording of security images and data for internal and exterior entry points 24 hours a day 7 days a week.

3.1.3 Audience for this Concept of Operations

The audience for this concept of operations includes:

- DOTD
- RPC
- Architect
- Builder
- Interior designer and contractor
- Networking designer and contractor
- Air conditioning contractor
- Security and safety designer and contractor
- Landscape designer and contractor
- Facilities designer and contractor

3.2 Existing Operations

Typically, this section would focus on how the existing system operates its interfaces, user environment, procedures, and any other information needed to support adding capabilities to an existing system. However, since the RTMC is a new facility that did not previously exist, there are no existing operations in terms of the facility. Instead, this section will provide a description of the operations in terms of the existing facilities where the RPC and DOTD District 02 Traffic Engineering Division (TED) currently operate and if these facilities meet the needs of this project. **Table 5** contains the needs and the whether the existing facilities accommodate or not. Needs that are unique to the RTMC facility are identified as such. When the existing facility only partially accommodates the need, "Partially" is indicated with a footnote to further explain.

Need_1 is in terms of the RTMC facility. However, in order to understand the existing facilities in terms of operations, Need_1 would be read as, "The existing DOTD facility performs transportation management functions and manages the ITS assets." This example is true, so a "Yes" is indicated. The other needs listed have been determined similarly to the example.

Table 5: Needs and Existing Operations

#	User Need ID	Description	Do the Existing Facilities Satisfy?	
			DOTD	RPC
1.1	Planned Operations			
1.1.1	Need_1	Develop a Regional Transportation Management Center (RTMC) facility to perform transportation management functions and manage the ITS assets.	Partially[3]	
1.1.2	Need_2	RTMC needs to support the following basic transportation management functions:		
		- Event Management	Partially[3]	
		- Emergency Management	Partially[3]	
		- Incident Management	Partially[3]	
		- Advanced Public Transit Systems Management	No	Partially[3]
1.1.3	Need_3	The RTMC needs to provide a facility to broadcast real-time traveler information such that the traveler can make timely mode choices through HAR, Dynamic Message Signs, and commercial television and radio.	Partially[3]	N/A
1.1.4	Need_4	The RTMC needs to provide the infrastructure to gather real-time traveler, event, and emergency information for processing and to provide routing for Commercial Vehicle Operations (CVO).	No	N/A
1.1.5	Need_6	The RTMC needs to be a multi-functional facility that will provide the infrastructure for the Regional Planning Commission staff co-located with DOTD.	No	No
1.1.6	Need_7	RTMC infrastructure provides an integration point for information and the distribution of timely modal information choices to the traveler.	No	No
1.1.7	Need_8	The RTMC needs to provide links among the following systems: transportation planning, database systems, evaluation, deployment of ITS technologies, and Homeland Security preparedness and response.	No	No
1.1.8	Need_9	RTMC to facilitate the following Transportation management functions:		
		- Provide traffic management	Partially[3]	
		- Provide traveler information	Partially[3]	N/A
		- Provide emergency vehicle priority systems	No	N/A
		- Improve commercial vehicle operations	No	N/A
1.1.9	Need_10	The RTMC needs to provide facilities for day to day usage for RPC and DOTD staff work activities	Yes	Yes

[3] Both DOTD District 02 TED and RPC are limited by their existing facility to perform and manage the ITS system envisioned for the New Orleans Region. Limitations include availability of space for Control Room operations, communications infrastructure, limited bandwidth, and expandability to accommodate future agency partnerships.

#	User Need ID	Description	Do the Existing Facilities Satisfy?	
			DOTD	RPC
1.1.10	Need_11	The RTMC needs to provide flexible communications and networking within the facility to accommodate:		
		- RPC work activities	N/A	Partially[3]
		- DOTD administration functions	Yes	N/A
		- Transportation management functions	Partially[3]	
1.2	Facilities Layout (RTMC, Communications, and Parking)			
1.2.1	Need_12	RTMC facility needs to be configurable internally to accommodate partner operations with the RPC and DOTD.	No	No
1.2.2	Need_14	Security access, power, and communications needs to be adaptable with the RTMC to the reconfiguration of rooms, user and utility space.	No	No
1.2.3	Need_13	Space within the control room needs to configurable to accommodate additional functions impacted by additional regional partners.	No	N/A
1.2.4	Need_15	Parking space is needed at the Tower Parking facility for commercial television and radio to park television and radio broadcast vehicles and have data feeds with a standard interface.	No	No
1.3	Climate and Weather			
1.3.1	Need_17	The RTMC needs to provide alternatives and back-up systems (power and air conditioning) to those that are critical for operations.	Partially[4]	
1.3.2	Need_18	[Need is no longer applicable. Please ignore.]		
1.4	Security & Safety			
1.4.1	Need_19	Need for alarm of entry ways into the facility as well as entry ways to critical and secure areas.	Yes	Partially[5]
1.4.2	Need_20	RTMC needs to develop a security procedure manual for the facility.	Yes	Partially[6]
1.4.3	Need_21	The RTMC needs internal alarm systems for environmental conditions such as heat, carbon dioxide, and monoxide gases.	No	No
1.4.4	Need_22	The RTMC needs circuit overload protection as well as computer room fire suppression systems.	Yes/No	Yes/No
1.4.5	Need_23	[Need is no longer applicable. Please ignore.]		

[4] Existing facilities do not have back-up air conditioning
[5] Building has alarm system and access control, but the suite does not have independent system
[6] Building has security procedure manual, but RPC does not for its suite

#	User Need ID	Description	Do the Existing Facilities Satisfy?	
			DOTD	RPC
1.4.6	Need_24	The RTMC needs after hours "key card" access for limited facility entry points as well as internally secure areas such as server rooms, communication hubs, etc.	Partially[7]	Partially[8]
1.4.7	Need_38	Three external doors of the RTMC will need access card control as identified on the building plan sheets.	Partially[7]	Partially[8]
1.4.8	Need_39	Nine (9) doors of the RTMC need sensors on them and access cards for entry into the controlled areas.	No	No
1.4.9	Need_40	Within the RTMC, card controlled doors need to be online and monitored through an access control system.	Yes	Partially[5]
1.4.10	Need_41	RTMC/Tower parking facility video surveillance needs to be viewable throughout the RTMC and the surveillance video needs to be recorded (DVR) for investigations.	No	No
1.5	Network System			
1.5.1	Need_25	Three networks are envisioned for the RTMC, one for the RPC, one for the DOTD, and the third network would gather information from the field devices and bring them back to the TMC.	Yes	Yes
1.5.2	Need_27	Within the RTMC, some applications of the RPC network and DOTD network will be shared between agencies. For example, RPC will need access to the count data collected by DOTD and DOTD will need access to the RPC GIS database.	No	No
1.5.3	Need_26	Within the RTMC there will be a DOTD wireless network, a RPC wireless network, and a public wireless network available in all conference rooms, the reception area, and the library.	Partially[9]	No
1.6	Internet Service			
1.6.1	Need_28	Within the RTMC, two Internet services are envisioned: one, which is distributed through all the centers through the DOTD backbone in Baton Rouge, and two, a public Internet service in all conference rooms and the library.	Partially[10]	
1.7	Telephone System			
1.7.1	Need_29	The RTMC will provide an IP telephone system(s) for both DOTD and RPC.	No	No
1.8	Teleconference System			

[7] Facility has key pad access for entry points with personal codes for each employee for access control
[8] Building has key card access, but the suite does not have any additional means of access control
[9] DOTD wireless network only
[10] Each agency has its own existing Internet access. No public access currently available.

#	User Need ID	Description	Do the Existing Facilities Satisfy?	
			DOTD	RPC
1.8.1	Need_31	The first floor conference room will need to have teleconferencing on both sides that can be linked together.	Unique to RTMC	
1.8.2	Need_30	All conference rooms and the second floor library will need to have teleconferencing capabilities.	Yes	Yes
1.9	Computer Equipment			
1.9.1	Need_35	The following servers need to be installed at the RTMC:		
		- RPC servers: Data and GIS information	N/A	Yes
		- Traffic Operation Servers, traffic information	Yes	No
		- ICX 360 Servers	No	No
		The control room desktop computers need to accommodate the 360 surveillance software (ICX) cameras, and detection.	Partially[11]	N/A
1.10	Audio Visual			
1.10.1	Need_33	Audio/visual in first floor conference room needs to accommodate full assembly as well as when room is divided in two.	Unique to RTMC	
1.10.2	Need_34	Provide digital recording of public meetings in the first floor conference room.	No	No
1.10.3	Need_52	Audio/visual in the first floor conference room should accommodate full assembly in the single room configuration as well as in the divided configuration.	Unique to RTMC	
1.10.4	Need_55	Audio/video should include digital recording of public meetings in the first floor conference room for full assembly in the single room configuration as well as in the divided configuration.	No	No
1.10.5	Need_56	Real-time images should display from the control room in the first floor conference room in both the full and divided configuration.	Unique to RTMC	
1.10.6	Need_57	Television broadcast should display on the video display wall in the first floor conference room (cable & satellite TV) in both the full and divided configuration.	Unique to RTMC	
1.10.7	Need_58	Presentations from a notebook computer should display on the video display wall in the first floor conference room in both the full and divided configuration.	Yes	Yes

[11] Currently District 02 has one workstation with the 360 Surveillance software installed.

#	User Need ID	Description	Do the Existing Facilities Satisfy?	
			DOTD	RPC
1.10.8	Need_59	Video should display from a composite connection in the first floor conference room in both the full and divided configuration.	Unique to RTMC	
1.10.9	Need_63	Two presentations should display concurrently side-by-side in the full configuration in the first floor conference room.	No	Yes
1.10.10	Need_64	The display in the first floor conference room needs to be of such quality to display a presentation to the audience that is bright, sharp, and high-resolution in the full configuration.	No	No
1.10.11	Need_65	The first floor conference room should have a public address system(s) that can be used for the full configuration, or separate and independently for the divided configuration	Unique to RTMC	
1.10.12	Need_66	The first floor conference room should record the output of the public address system(s) in the full configuration, and separate and independently in the divided configuration.	No	No
1.10.13	Need_67	Each microphone used needs to be able to be muted by the user in the first floor conference room.	No	No
1.10.14	Need_68	The selection of microphone for recording needs to be done at the head end in the first floor conference room.	No	No
1.10.15	Need_69	Video needs to be recorded for the first floor conference room in the full configuration, and separate and independently in the divided configuration.	Unique to RTMC	
1.10.16	Need_70	Audio needs to be recorded with the video for the first floor conference room in the full configuration, and separate and independently in the divided configuration.	Partially[12]	No
1.10.17	Need_71	Wireless microphones are needed in the first floor conference room for the full configuration, and separate and independent wireless microphones for the divided configuration.	No	No
1.10.18	Need_72	Conference calls in the first floor conference room need to be able to be connected to the public address system(s) in the full configuration, as well as separate and independently in the divided configuration.	Unique to RTMC	

[12] Existing equipment does not readily accommodate. It requires a video conference connection to a location with recording capability.

#	User Need ID	Description	Do the Existing Facilities Satisfy?	
			DOTD	RPC
1.10.19	Need_73	Conference calls in the first floor conference room need to be able to be connected to the microphone system(s) in the full configuration, and separately and independently for the divided configuration.	No	No
1.10.20	Need_74	The video conference system in the first floor conference room needs to record the displayed presentations as well as the audio from the presenter and audience.	Partially[12]	No
1.10.21	Need_32	Both satellite and cable will be used, as redundant and backup systems (cable during heavy storms, Dish after the storms).	Partially[13]	No
1.10.22	Need_42	Video display wall in the control room should view real-time images of traffic and roadway facilities.	No	No
1.10.23	Need_43	Television broadcast should display on the video display wall (cable & satellite TV) in the control room.	Unique to RTMC	
1.10.24	Need_44	Within the control room, there is a need to configure the video wall from each of the 12 operator consoles.	Unique to RTMC	
1.10.25	Need_45	Within the control room, there is a need to plug in additional video and audio feeds from external sources at the consoles using composite connections (6 locations).	Unique to RTMC	
1.10.26	Need_46	Within the control room, there is a need to configure the video wall's display of real-time images of traffic and roadways from the operator workstations.	Unique to RTMC	
1.10.27	Need_47	Within the control room, there is a need for the video wall to act as a single unit and be able to manipulate the size of the real-time images (e.g. stretch video windows across various display modules).	Unique to RTMC	
1.10.28	Need_48	Within the control room, there is a need to display console desktop(s) on the video display wall.	Unique to RTMC	
1.10.29	Need_49	Within the control room, there is a need to view the facility video surveillance on the video display wall (live and from DVR).	No	No
1.10.30	Need_50	Audio should be broadcast throughout the control room from various sources (cable, satellite TV, CCTV, DOTD 700/800 radio, and local/national/satellite radio).	Unique to RTMC	
1.10.31	Need_61	Presentations should display in the second floor library and conference room.	Unique to RTMC	
1.10.32	Need_62	Specific offices and break rooms should have video access (cable, satellite TV, and video feed from servers).	No	No

[13] Cable TV only

#	User Need ID	Description	Do the Existing Facilities Satisfy?	
			DOTD	RPC
1.10.33	Need_75	Video conference images from the training room should display in the control room.	Unique to RTMC	
1.11	Power Systems			
1.11.1	Need_16	The RTMC needs back-up power for the operation critical equipment during inclement weather.	Yes	Partially[14]
1.11.2	Need_37	Uninterruptible Power Supply (UPS) is needed for all (desirable) computers and displays. At a minimum the computers and displays within computer room need to be on UPS power until the generators take over supplying power.	Yes	Partially[14]
1.11.3	Need_76	Need for an isolated ground bus on the roof of the RTMC for radio antenna and satellite television grounding.	Unique to RTMC	
1.12	Video Teleconferencing			
1.12.1	Need_54	Should be able to video conference separately from both rooms (when in the divided configuration) in the first floor conference room.	Unique to RTMC	
1.12.2	Need_53	Should be able to video conference from the first floor conference room in full assembly in the full configuration.	Unique to RTMC	
1.12.3	Need_51	Should be able to video conference bi-directionally from training room.	Yes	No
1.12.4	Need_60	Should be able to video conference from the second floor library and conference room.	Unique to RTMC	
1.13	Radio Equipment			
1.13.1	Need_36	Within the control room, each operator will need access to a DOTD 700/800 radio unit	Yes	N/A

3.3 System Overview

The RTMC will be comprised of multiple systems to accommodate the envisioned operations. These systems include:

- Communications: Computer/business network
- Communications: Telephone
- Security
- Audio/visual
- Control room display wall

3.4 Stakeholders

The Louisiana Department of Transportation and Development District 02 Traffic Engineering Department (DOTD TED) and the Regional Planning Commission are the stakeholders for the RTMC. It is

[14] Backup on UPS power with limited duration

envisioned that additional stakeholders or partnering agencies may solicit a place on the control room floor in the future.

3.4.1 Roles and Responsibilities

The RTMC facility provides DOTD TED and RPC staff with systems to assist in performing its roles and responsibilities.

3.4.1.1 DOTD Roles and Responsibilities

In general, the DOTD TED is responsible for managing traffic throughout the District 02 area by operating and maintaining traffic control devices, providing traffic analysis, monitoring traffic conditions, and providing notice to traveling public of roadway conditions. The most notable device responsibility of DOTD TED is the traffic signal system.

3.4.1.2 RPC – RTMC

The RPC is one of eight regional planning agencies in Louisiana to fulfill federal and state requirements for regional comprehensive and economical development planning. RPC's mission is to promote the general welfare and prosperity of the entire region by harmonizing the activities of federal, state, parish, municipal, and other governmental agencies in the region. The RPC covers the area within Jefferson, Orleans, Plaquemines, St. Bernard, and St. Tammany Parishes. The RPC houses the quarterly public transportation policy committee meeting as well as maintains the Transportation Improvement Program (TIP).

3.5 Operational Environment

This section describes the physical operational environment in terms of facilities and equipment.

The facility will contain the infrastructure necessary for communications and data sharing required to implement ITS operation including a data network, telephone system, security system, audio/visual systems, and video wall display. The facility will house the RPC and DOTD District 02 traffic engineering personnel. RPC will be provided the following items/usage as part of the agreement with DOTD.

1. The complete second floor comprising approximately 11,900 square feet.
2. Reasonable access to all common areas and meeting rooms.
3. Reasonable access to the DOTD equipment and/or data relating to the operation of the ITS facility.
4. Telecommunications/Internet equipment and service.
5. Access to non-restricted keyed entry areas. Reservations for the library, conference rooms and classrooms must be obtained from the District Administrator or his designee prior to use. Common areas will not be restricted.

3.5.1 Common Areas

The RTMC facility has common areas that both DOTD and RPC will have access. These areas include the following areas:

- First floor
  - Lobby
  - Conference room

- Reception
- Elevator
- Restrooms
- Stairs
- Mechanical room
- Computer Room (controlled access)
- Break rooms/kitchen
- Shower facilities (men's restroom)

- Second floor
  - Library
  - Conference room
  - Mechanical room
  - Break room/kitchen
  - Shower facilities (women's restroom)

The common areas with the exception of the storage, mechanical, stairwells, and computer rooms are accessible to the public during normal business hours. After normal business hours, access to enter the facility will be through dedicated doors with key card access.

The largest common space is the first floor conference room. It is able to be opened for full assembly or divided into two partitioned rooms. The conference room will be used for public metropolitan area meetings, as well as other transportation related gatherings. The audio/visual system in the conference room will allow for recording of public meetings, video conferencing, video presentation display, and video/radio/television broadcast, whether in full or divided configuration. The room will also be equipped for temporary usage as an operations floor during emergency evacuation or reentry.

Both the second floor library and conference room will have similar features to that of the first floor conference room. The main exception will be the recording of public meetings.

3.5.2 RPC Environment

The RPC will be housed on the second floor of the facility for its use in conducting business. The second floor is primarily comprised of office spaces. There is a room dedicated for the creation of maps. Also, the second floor has typical business rooms for receptions, copy production and mailing, file storage, general storage, and break.

3.5.3 DOTD Environment

The prominent feature of the DOTD environment is the control room. The control room will house twelve TMC operator work stations, a video wall display, and training room. The control room will be viewable by the public from a window wall in the first floor lobby as well as both the second floor library and conference room.

Each operator work station will allow access to the DOTD data network, DOTD 700/800 MHz radio system as well as the DOTD phone system. Operators will be able to view video surveillance of the facility for monitoring as well as review of recorded surveillance. The control room will be enhanced

throughout with audio for conference calls, video/radio/television broadcasts, and other audio sources. Also, the training room, which is located withing the control room, will be equipped for video conference through the DOTD network.

The DOTD area outside of the control room is versatile. There are offices for traffic engineers, test and repair rooms for traffic signal equipment, equipment repair rooms for computer/communications equipment, and expansion as well as the typical business office spaces for copying, files, storage, and breaks.

3.5.4 Partner Agencies

It is envisioned that partnering agencies that provide transportation based services (e.g., Traffic.com and Louisiana State Police) may be seated on the control room floor in the future. The environment for operations of these agencies will be similar to that of DOTD's environment on the control room floor.

3.5.5 Non-critical Events

During non-critical events the operational environment of the RTMC is slightly altered from that of the typical day-to-day operations. These events include public meetings, metro planning commission meetings, visitor tours, media broadcast, etc. During these events, the operation of the control room does not change; although, there may be visitors or additional RTMC/DOTD personnel in the control room. Other rooms of the RTMC are affected during non-critical events. The public areas, especially the conference rooms and library, are occupied with people. Both DOTD and RPC staff are required to accommodate the attendees depending on the type of meeting. Typically, RPC staff accommodates the MPO-related meeting; whereas, DOTD staff accommodates traffic and transportation related meetings. When overlap occurs based on the type of meeting, both agencies accommodate the meeting. Generally, accommodations include the arrangement of seating in the conference rooms, adjustment of the audio/visual equipment, and any other meeting preparation arrangements needed.

The facility itself has been designed to accommodate these non-critical events. Adequate area and equipment has been provided to accommodate public meetings, media access, meeting recording, and public tours/viewing.

3.5.6 Emergency Events

Emergency events are typically unplanned events such as severe weather, hurricanes, large scale crashes, reentry, and other events with limited advanced notice. Typical minor and immediate traffic crashes are not considered emergency events and the environment of the RTMC is not affected.

During emergency events the environment of the RTMC is affected for both the RPC and DOTD. While both agencies have experience and are prepared for such events, the environment must adapt to accommodate the instability of the situation. DOTD typically gathers assistance from the DOTD ITS Statewide TMC (located at 1212 E. Highway Rd., Baton Rouge, LA) as well as the Statewide EOC and other New Orleans emergency centers and agencies. RPC coordination includes accommodating the DOTD in determining transit needs. For events requiring evacuation of the RTMC (e.g., hurricanes), DOTD operates the center while prepping for its own staff's evacuation.

RPC is staged to assist as needed. During re-entry, both the RPC and DOTD are staged to accommodate the motorist reentry needs.

The facility itself has been designed to accommodate the environment created during an emergency. Both uninterrupted power supplies (UPS) and a generator has been included in the design to operate the technology-based applications in the control room and computer room during power outages. All equipment connected to the UPS will be operated on the generator. Equipment connected to the UPS includes operator console computers, video wall displays, console equipment, and all equipment in the computer room. The UPS will fully regulate power as an online based system (i.e., distributed AC power from the power meter is converted to DC then converted back AC for internal facility distribution). The UPS will have a minimum operation backup time of 12 minutes at full load. This will allow proper power transfer to the generator as well as allowing for time to shut down in the event of full power loss. Other equipment running on the generator but not through the UPS include the two computer room AC units, egress lighting, computer room and control room fluorescent general lighting, and refrigerators in the break rooms.

3.5.7 Services/Maintenance

The facility is envisioned to operate beyond normal business but not 24/7 operations initially. The operations schedule allows for after-hours maintenance of the various systems. Also, the RTMC was designed with redundant AC and UPS for the computer room, hence, maintenance can be performed during the day if necessary without hindering operations.

3.6 Operational Scenarios

Operational scenarios for the RTMC focus on the RTMC facility in support of daily traffic management, incident management, emergency management, RPC public meetings, and event management. The scenarios are based on the layout of the RTMC as depicted in the plan sheet E3.1. This facility support will be identified in context of these general operational scenarios.

3.6.1 Daily Traffic Management

Daily traffic management activities are performed routinely in the control room. These activities include Advanced Traffic Management System (ATMS) Operations, Traffic Signal System Operations, District Work Zone Operations, and Traveler Information Systems Monitoring. These daily activities would be performed concurrently with the other scenarios described in this document.

Table 6 describes each of these steps and the corresponding RTMC facility support.

Table 6: Operational Scenario – Daily Traffic Management

Daily Traffic Management - Operational Scenario	RTMC Facility Support
ATMS Operations ATMS Operations would include checking status of all field devices remotely at the beginning of each shift, reporting discrepancies, coordinating with field crews on maintenance and repairs, and filling out logs.	• Control Center • Field device network • Servers • Workstations • Radio system • Video wall
Traffic Signal System Operations Traffic Signal System Operations would include reviewing status of all signal systems and communications, reviewing system alarms and other discrepancies to communicate with field crews, and filling out logs.	• Control Center • Field device network • Radio system • Servers • Workstations • Video wall
District Work Zone Operations District Work Zone Operations would include reviewing all active or planned activities at the beginning of the shift; reporting potential conflicts to the RTMC Manager; coordinating the staging of traffic control, MAP, and police assets as needed for the various activities; posting messages on portable and permanent DMSs; and monitoring delay caused by lane closures or traffic diversions.	• Control Center • Field device network • Servers • Workstations • DOTD network • Video wall • Telephone system • Radio system • Internet
Traveler Information Systems Monitoring Traveler Information Systems Monitoring would include publishing and reviewing for accuracy and timeliness of 511, road closure, and other public information notices and websites; informing responsible parties of conflicts or needed revisions; coordinating reports to and from Information Service Providers; and handling other related media inquiries. This is by no means a complete list but the vision is that this center will be the clearinghouse for all activities related to management of traffic in coordination with any agency who works on the transportation system in the metropolitan area.	• Control Center • Field device network • DOTD network • Servers • Workstations • Video wall • Telephone system • Radio system • Internet

3.6.2 Incident Management

In this scenario there is a traffic incident on a freeway that would involve the resources for clearing a multi-vehicle collision, accident investigation, minor medical assistance, towing, and cleaning debris from the roadway. The incident is monitored from the RTMC Control. The duration for the incident time is 1-2 hours.

Incident management is conducted in the following five (5) phases:

1. Detection is when an alert is generated for the TMC operator.
2. Verification is when the operator views the incident through a roadside camera or when viewed by the on-site responder.
3. Response is when resources are sent to the incident site and traveler information is sent to the public.
4. Clearing is when the on-site responders clear the incident from the main line and all investigations are completed.
5. Restoration of traffic to normal flow is when the incident resources are recalled, the public information about the incident is no longer posted, and the flow of traffic is at normal levels again.

Table 7 describes each of these steps and the corresponding RTMC facility support.

Table 7: Operational Scenario – Incident Management

Incident Management - Operational Scenario	RTMC Facility Support
Incident Detection The field device network provides the conduit for information from detectors to the control center; the information is routed to traffic servers and RTMC operator workstations over the TMC network. RTMC operators scan live video feeds from the field CCTV cameras via the field device network and TMC network. Cell phone calls are handled by local parish 911 call centers that dispatch the local law enforcement agency. The local law enforcement agency in-turn notifies the RTMC of a traffic incident. On-location DOTD staff signals an incident and notifies the RTMC Control Room.	• Control Center • Field device network • DOTD network • Telephone system • Servers • Workstations • Radio system • Video wall
Incident Verification Upon receiving location information, the field device network provides the conduit for control of the nearest CCTV camera to the incident for verification purposes. The real-time images of the incident scene are routed through a video switching device and displayed on the workstations and video wall for confirmation. The video switch actions are controlled by the control center workstation over the TMC network.	• Control Center • Field device network • DOTD network • Servers • Workstations • Video wall

Incident Management - Operational Scenario	RTMC Facility Support
Incident Response Operator determines the severity of traffic incident and notifies the appropriate agencies, and services, (via email, fax, and/or voice) and notifies the first responders (if not already completed). The operator monitors the incident; posts appropriate messages on the DMSs, HAR, media, and Internet. The operator then logs key activities along a time line. In coordinating with the on-site responders, the operator provides or notifies additional resources as needed.	• Control Center • Field device network • DOTD network • Servers • Workstations • Video wall • Telephone system • Radio system • Internet
Incident Clearing On-site responders work to clear the incident by moving the involved vehicles or obstacles from the roadway to the shoulder or off to the side. Traffic blocks may be necessary to clean the debris off the road or for the accident investigation staff to complete their activities. The RTMC operator would monitor and log events and coordinate with on-site responders. In addition, the RTMC operator would ensure that the needed resources were obtained, e.g. tow trucks, emergency medical etc.	• Control Center • Field device network • DOTD network • Servers • Workstations • Video wall • Radio system • Telephone system
Restoration of Traffic to Normal-Flow Restoring traffic to normal flow is decommissioning of the traffic incident activities; recalling the on-site resources (portable DMS); removing any incident messages on DMS, HAR, media, and the Internet; and notifying incident termination to the impacted agencies and services.	• Control Center • Field device network • DOTD network • Servers • Workstations • Video wall • Telephone system • Radio system • Internet

3.6.3 Emergency Management

In this scenario, a slow moving category 3 or higher hurricane is watched and emergency response measures are managed. This scenario is divided into the following five (5) phases:

1. Emergency planning – Planning activities for emergency management activities.
2. Phase 0 – Increased level of readiness, construction zones are identified and alternative routes are planned. Assistance is provided to statewide and local resource agencies in the staging and routing of buses for assisted and special needs evacuation.
3. Phase I – 50 hours before onset of tropical storm winds. Includes evacuation of areas of the Intracoastal Waterway. These areas are outside any levee protection system and are

vulnerable to Category 1 and 2 storms. During Phase I there are no route restrictions – monitoring traffic, incidents, and potential hot spots. Staging for Phase II plans.

4. Phase II – 40 hours before onset of tropical storm winds. Evacuation includes areas south of the Mississippi River which are levee protected but remain vulnerable to Category 2 or higher storms. During Phase II there are no route restrictions and staging resources for Phase III evacuation and contraflow of specific routes. Traffic signals on designated routes are re-timed and/or placed in flashing mode to assist with evacuation of affected areas.
5. Phase III – 30 hours before onset of tropical storm winds. Evacuation includes areas on the east bank of the Mississippi River in the New Orleans Metropolitan Area which are within the levee protection system but remain vulnerable to a slow-moving Category 3 or any Category 4 or 5 storm. During Phase III, certain routes will be directed and the contraflow plan implemented. Evacuation of the RTMC facility. At 6 hours before landfall, contraflow is terminated and crews are directed to retrieve devices and return them to their units as the weather allows. The RTMC facility is evacuated.
6. Storm Landfall – Monitor remotely.
7. After the Storm – Enter to the RTMC and the system is brought back online for reentry of traffic as assets become available. Field crews assess and repair damages to field assets.

Table 8 describes each of these steps and the corresponding RTMC facility support:

Table 8: Operational Scenario – Emergency Management

Emergency Management - Operational Scenario	RTMC Facility Support
Emergency Planning Emergency planning is a coordinated effort with cities and parishes. Activities involved are developing contraflow maps for traffic evacuations, designating locations for the staging of resources to support the City Assisted Evacuation, and implementing contraflow – these would be stored on the RPC and DOTD servers. Updated contraflow maps are posted on the emergency preparedness website.	• RPC Network • DOTD Network • RPC Server • DOTD Server • Internet

Emergency Management - Operational Scenario	RTMC Facility Support
Phase 0 – Prior to 60 hours Before Onset of Tropical Storm Winds During Phase 0, heightened alert level resources are marshaled in support of a potential emergency evacuation. Staff has gathered at the RTMC in the first floor conference room as well as the media vehicles in the parking lot of the tower site for live broadcast. Review of the preparedness plans and any staging of resources are deployed. Construction project managers review construction sites and update plans. In the control room the operators monitor the traffic flow situation due to some of the community residents evacuating voluntarily. Messages of the watch are posted via DMS, HAR, and media. Remote stations are set up. Provide assistance with coordination and communication to statewide and local resource agencies in the staging and routing of buses for assisted and special needs evacuation.	• Control Center • First floor conference room • Second floor conference room • Second floor library • Conference calling • Field device network • DOTD network • RPC network • Servers • Workstations • Video wall • Telephone system • Radio system • Internet • Media connections • Cable television • Satellite television • Public Address system
Phase I – 50 Hours Before Onset of Tropical Storm Winds During Phase I, evacuation plans for the Intracoastal Waterway have been initiated. In the control room the operators monitor the traffic flow situation since some of the residents of the community will start to evacuate voluntarily. Staging for Phase II has begun. Messages of the watch are posted via DMS, HAR, and media. Remote stations are set up. Bus routing activities continue. MAP units are alerted to revised schedules and locations per the evacuation scenario.	• Control Center • First floor Conference room • Second floor Conference room • Second floor Library • Conference calling • Field device network • DOTD network • RPC network • Servers • Workstations • Video wall • Telephone system • Radio system • Internet • Media connections • Cable television • Satellite television • Public address system

Emergency Management - Operational Scenario	RTMC Facility Support
Phase II – 40 Hours Before Onset of Tropical Storm Winds The Phase II evacuation plan is now implemented with messages posted via DMS, HAR, media, and the Internet. Resources are conditioning Phase III roadways for contraflow. Once the field responders have completed their work they are moved to locations that may have problems or they are evacuated. TMC operators are monitoring the roadway conditions for any incidents, and coordinating with other agencies via telephone, email, and radio. The DOTD and affected agencies would be monitoring the weather and traffic conditions on the video wall in the second floor conference room and Control Center. Traffic signals are adjusted on key Phase II evacuation routes, designated signals are placed on flash, and nonessential intersections are closed off by coordinating with state police.	• Control Center • Second floor conference room • Second floor Library • Conference calling • Field device network • DOTD network • RPC network • Servers • Workstations • Video wall • Telephone system • Radio system • Internet • Media connections • Cable television • Satellite television • Public address system
Phase III – 30 Hours Before Onset of Tropical Storm Winds The Phase III evacuation plan is now implemented with messages of the evaluation posted via DMS, HAR, media and the Internet. Once the field responders have completed the contraflow routes, they are moved to locations that may have problems or they are evacuated. TMC operators monitor the roadway conditions for any incidents, and coordinate with other agencies via telephone, email, and radio. The DOTD and affected agencies would monitor the weather and traffic conditions on the video wall in the second floor conference room and Control Center. At 6 hours before landfall, contraflow operations are terminated, and crews are directed to retrieve devices and return them to their units as the weather allows. Once all district assets are secured and crews leave the area, the RTMC is evacuated and the remote stations take over monitoring the situation.	• Control Center • Second floor Conference room • Second floor Library • Conference calling • Field device network • DOTD network • RPC network • Servers • Workstations • Video wall • Telephone system • Radio system • Internet • Media connections • Cable television • Satellite television • Public address system

Emergency Management - Operational Scenario	RTMC Facility Support
Storm Llandfall During the landfall of the storm, the roadways are monitored remotely as long as field cameras, networks, back-up power, and communications are available.	• Back-up power generators • Field device network • DOTD network • RPC network • Servers • Computer servers • Communications • Radio system
After the Storm (Reentry) After the storm, the RPC and DOTD staff will reenter the RTMC, maintenance staff will assess the damage in the field, if field devices are available, and the communications can be restored. The RTMC will monitor the field damage from the Control Center and coordinate the restoration of the damaged transportation facilities back to normal operations.	• Control Center • Second floor Conference room • Second floor Library • Conference calling • Field device network • DOTD network • RPC network • Servers • Workstations • Video wall • Telephone system • Radio system • Internet

3.7 Requirements

The following tables describe the system requirements for the RTMC facility. The Tables are broken down by the following groupings.

- **Table 9:** General Requirements
- **Table 10:** Communications and Networking
- Audio/visual
  - **Table 11:** Audio/visual Requirements for the First Floor Conference Room
  - **Table 12:** Audio/visual Requirements for the RTMC Control Room
  - **Table 13:** Audio/visual Requirements for the Other RTMC Locations
- **Table 14:** Telephone
- **Table 15:** Teleconferencing
- **Table 16:** Video Teleconferencing
- **Table 17:** Digital Recording
- **Table 18:** Media
- **Table 19:** Facilities Layout
- **Table 20:** Climate and Weather
- **Table 21:** Security and Safety
- **Table 22:** Computer Equipment
- **Table 23:** Power
- **Table 24:** Radio Equipment

Table 9: General Requirements

#	Sys Rqmt ID	Title	Description
1.1.1	SysReq_11	RPC Facility	The RTMC facility shall provide space for Regional Planning Commission staff.
1.1.1.1	SysReq_17	RPC Staff	The RTMC facility shall contain the infrastructure for the RPC staff's day-to-day work activities.
1.1.2	SysReq_12	DOTD Facility	The RTMC facility shall provide space for Department of Transportation and Development (District 02 Traffic Engineering Division) staff.
1.1.2.1	SysReq_18	DOTD Staff	The RTMC facility shall contain the infrastructure for the DOTD staff's day-to-day work activities.
1.1.3	SysReq_13	HLS - Database Linkage	The RTMC facility shall contain linkages between: transportation planning database systems, evaluation, and deployment of ITS technologies; and the Homeland Security (HLS) preparedness and response.
1.1.4	SysReq_86	RTMC Control Room	The RTMC facility shall contain a traffic management control room.
1.1.4.1	SysReq_14	Traffic Management Function	The RTMC facility shall provide the infrastructure to perform traffic management functions.
1.1.4.1.1	SysReq_1	Incident Management	The RTMC facility shall provide the infrastructure to perform incident management functions.
1.1.4.1.2	SysReq_3	Emergency Management	The RTMC facility shall provide the infrastructure to perform emergency management functions.
1.1.4.1.3	SysReq_2	Event Management	The RTMC facility shall provide the infrastructure to perform event management functions.
1.1.4.1.4	SysReq_15	Traveler Information	The RTMC facility shall provide the infrastructure to generate traveler information.
1.1.4.1.4.1	SysReq_4	Highway Advisory Radio	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through highway advisory radio.
1.1.4.1.4.2	SysReq_5	Dynamic Message Signs	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through dynamic message signs.
1.1.4.1.4.3	SysReq_6	Commercial Television	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial television.
1.1.4.1.4.4	SysReq_7	Commercial Radio	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial radio.
1.1.4.1.5	SysReq_16	Commercial Vehicle Operations	The RTMC facility shall provide the infrastructure to perform Commercial Vehicle Operations (CVO) functions.
1.1.4.1.5.1	SysReq_10	CVO Emergency Event Information	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from emergency information.

#	Sys Rqmt ID	Title	Description
1.1.4.1.5.2	SysReq_9	CVO Event Information	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from event information.
1.1.4.1.5.3	SysReq_8	CVO Alternative Routing	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from traffic information.
1.1.4.2	SysReq_186	Advanced Public Transit Systems Management	The RTMC facility shall provide the infrastructure to perform Advanced Public Transit Systems Management functions.

Table 10: Communications and Networking

#	Sys Rqmt ID	Title	Description
1.2.1	SysReq_19	RPC Network	The RTMC facility shall provide a networking infrastructure that is reconfigurable to accommodate RPC work activities.
1.2.1.1	SysReq_24	RPC Wired Network	The RTMC facility shall provide an independent network for the RPC staff's work activities.
1.2.1.2	SysReq_26	RPC Wireless Network	The RTMC facility shall provide a wireless network for RPC staff's work activities.
1.2.2	SysReq_20	DOTD Network	The RTMC facility shall provide a networking infrastructure that is reconfigurable to accommodate DOTD administration functions.
1.2.2.1	SysReq_22	DOTD Wired Network	The RTMC facility shall provide an independent network for the DOTD staff's work activities.
1.2.2.2	SysReq_25	DOTD Wireless Network	The RTMC facility shall provide a secure wireless network for DOTD staff's work activities.
1.2.3	SysReq_21	Traffic Management Network	The RTMC facility shall provide a networking infrastructure that is reconfigurable to accommodate transportation management functions.
1.2.3.1	SysReq_23	Field Device Network	The RTMC facility shall provide an independent network for the traffic management field devices.
1.2.4	SysReq_29	Sharing Network Information	The RPC and DOTD shall share information across their networks.
1.2.5	SysReq_166	Satellite Television Service	The RTMC facility shall subscribe to satellite television service.
1.2.5.1	SysReq_163	Satellite TV in the First Floor Conference Room	Satellite television shall be provided in the first floor conference room.
1.2.5.1.1	SysReq_35	Satellite TV in the Full/one (1) Room Configuration	Satellite television shall be provided in the first floor conference room linked together in the full/one room configuration.

#	Sys Rqmt ID	Title	Description
1.2.5.1.2	SysReq_34	Satellite TV in the Divided/Two (2) Room Configuration	Satellite television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.
1.2.5.2	SysReq_126	Satellite TV-Specified DOTD Office	Satellite television shall be provided in a specific DOTD office.
1.2.5.3	SysReq_33	Satellite TV Control Room	Satellite television shall be provided in the traffic management control room.
1.2.6	SysReq_167	Cable Television Service	The RTMC facility shall subscribe to cable television service.
1.2.6.1	SysReq_164	Cable TV in the First Floor Conference Room	Cable television shall be provided in the first floor conference room.
1.2.6.1.1	SysReq_38	Cable TV in the Full/one (1) Room Configuration	Cable television shall be provided in the first floor conference room linked together in the full/one room configuration.
1.2.6.1.2	SysReq_37	Cable TV in the Divided/two (2) Room Configuration	Cable television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.
1.2.6.2	SysReq_36	Cable TV Control Room	Cable television shall be provided in the traffic management control room.
1.2.6.3	SysReq_128	Cable TV - Specified Offices	Cable television shall be provided in specified offices.
1.2.7	SysReq_31	Internet Service	The RTMC facility shall provide Internet service.
1.2.7.1	SysReq_27	Wireless Internet - Conference Rooms	The RTMC facility shall provide an independent wireless network for public use in all conference rooms.
1.2.7.2	SysReq_32	Internet - Library	The RTMC facility shall contain Internet service in the library.
1.2.7.2.1	SysReq_28	Wireless Internet - Library	The RTMC facility shall provide a wireless connection to the Internet for public use in the library.
1.2.7.3	SysReq_30	DOTD Internet	The DOTD offices in the RTMC facility shall contain Internet service through the DOTD backbone in Baton Rouge.
1.2.8	SysReq_185	Wireless Internet - Reception Area	The RTMC facility shall provide an independent wireless network for public use in the reception area.

Table 11: Audio/visual Requirements for the First Floor Conference Room

#	Sys Rqmt ID	Title	Description
1.3.1.1	SysReq_168	Computer Generated Presentations	An infrastructure for computer generated presentations shall be provided in the first floor conference room.
1.3.1.1.1	SysReq_42	Display Equipment in the full/one (1) Room Configuration	In the first floor conference room, equipment to display computer generated presentations shall be linked together when in the full/one room configuration.
1.3.1.1.2	SysReq_41	Display Equipment in the Divided/two (2) Room Configuration	In the first floor conference room. equipment to display computer generated presentations shall be independent on both sides in the divided/two room configuration.
1.3.1.1.3	SysReq_132	Side-by-side Screens for Presentations in the Full/one (1) Room Configuration	The first floor conference room shall have adjacent dual independent screens for side-by-side presentations in the full/one room configuration.
1.3.1.1.4	SysReq_133	Side-by-side Projectors for Presentations in the Full/one (1) Room Configuration	The first floor conference room shall have adjacent dual independent projectors for side-by-side presentations in the full/one room configuration.
1.3.1.1.5	SysReq_135	Projector Brightness	The presentation projectors shall provide at a minimum 4000 lumens of projected light.
1.3.1.1.6	SysReq_137	Projector Resolution	The video projectors shall provide a minimum resolution of 1024 x 768.
1.3.1.2	SysReq_169	Real-time Traffic	An infrastructure for real-time traffic information shall be provided in the first floor conference room.
1.3.1.2.1	SysReq_54	Real-time Video in the Full/one (1) Room Configuration	The RTMC facility shall display live real-time traffic images to the first floor conference room linked together in the full/one room configuration.
1.3.1.2.2	SysReq_53	Real-time Video in the Divided/two (2) Room Configuration	The RTMC facility shall display live real-time traffic images to the first floor conference room independently on both sides in the divided/two room configuration.

#	Sys Rqmt ID	Title	Description
1.3.1.2.3	SysReq_56	Real-time Traffic Data in the Full/one (1) Room Configuration	The RTMC facility shall display live real-time traffic data to the first floor conference room linked together in the full/one room configuration.
1.3.1.2.4	SysReq_55	Real-time Traffic Data in the Divided/two (2) Room Configuration	The RTMC facility shall display live real-time traffic data to the first floor conference room independently on both sides in the divided/two room configuration.
1.3.1.3	SysReq_170	Public Address	An infrastructure for public address shall be provided in the first floor conference room.
1.3.1.3.1	SysReq_138	Public Address in the Full/one (1) Room Configuration	The first floor conference room shall have a public address system for the full/one room configuration.
1.3.1.3.2	SysReq_139	Public Address in the Divided/Two (2) Room Configuration	The first floor conference room shall have a dual independent public address system for the divided/two room configuration.
1.3.1.3.3	SysReq_151	PA/conference Call in the Full/ one (1) Room Configuration	When selected, conference calls in the first floor conference room shall be connected to the public address system in the full/one room configuration.
1.3.1.3.4	SysReq_152	PA/conference Call in the Divided/two (2) Room Configuration	When selected, conferences calls in the first floor conference room shall be independently connected to public address systems in each room in the divided/two room configuration.
1.3.1.4	SysReq_171	Microphone	An infrastructure for microphones shall be provided in the first floor conference room.
1.3.1.4.1	SysReq_183	Wired Microphone Connections	A minimum of 15 wired microphones connections shall be provided for in the first floor conference room in the full/one (1) room configuration.
1.3.1.4.1.1	SysReq_184	Wired Microphones	A minimum of fifteen (15) wired microphones with mute control switches shall be provided in the first floor conference room.
1.3.1.4.2	SysReq_142	Microphone Mute Control	In the first floor conference room, muting of each microphone shall be performed with a switch on the microphone unit.

#	Sys Rqmt ID	Title	Description
1.3.1.4.3	SysReq_148	Wireless Microphone in the Full/one (1) Room Configuration	The first floor conference room shall be equipped with a minimum of one (1) wireless microphone in the full/one room configuration.
1.3.1.4.4	SysReq_149	Wireless Microphone in the Divided/two (2) Room Configuration	The first floor conference room shall be equipped with a minimum of two (2) wireless microphones, one (1) per each, in the divided/two room configuration.
1.3.1.4.5	SysReq_150	Wireless Microphone Interference	In the first floor conference room, wireless microphones shall not interfere with each other.
1.3.1.4.6	SysReq_153	Microphone/conference Calls in the Full/one (1) Room Configuration	When selected, conferences calls in the first floor conference room shall be connected to the microphone system in the full/one room configuration.
1.3.1.4.7	SysReq_154	Microphone/conference Calls in the Divided/two (2) Room Configuration	When selected, conferences calls in the first floor conference room shall be independently connected to the microphone systems in each room in the divided/two room configuration.
1.3.1.4.8	SysReq_143	Microphone Recording	When selected, the first floor conference room's audio output from the microphones shall be recorded.
1.3.1.5	SysReq_172	Video	An infrastructure for video recording shall be provided for the first floor conference room.
1.3.1.5.1	SysReq_123	Video Connections	Video connections shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.
1.3.1.5.2	SysReq_144	Video Recording	When selected, video of the first floor conference room shall be recorded in the full/one room configuration.

Table 12: Audio/visual Requirements for the RTMC Control Room

#	Sys Rqmt ID	Title	Description
1.3.2.1	SysReq_40	Computer Generated Presentations	Equipment to display computer generated presentations shall be in the traffic management control center.
1.3.2.2	SysReq_173	Video Display Wall	The RTMC control room shall have a video display wall.
1.3.2.2.1	SysReq_87	Single Image Spans All Displays	The control room shall have a video wall that can display from a single image that spans all displays to up to and including 48 real-time images.

#	Sys Rqmt ID	Title	Description
1.3.2.2.2	SysReq_89	Display Cable Television on Video Wall	The control room video wall shall display cable television broadcast on video display wall.
1.3.2.2.3	SysReq_91	Six (6) Additional Video Sources	The control room video wall display shall have six (6) additional video sources.
1.3.2.2.4	SysReq_92	Configurable from Workstations	The control room video wall shall be configurable to display real-time images from any of the operator workstations.
1.3.2.2.5	SysReq_93	Display of Simultaneous Workstation Real-time Images	The control Room video wall shall be configurable to display real-time images from all of the operator workstations simultaneously.
1.3.2.2.6	SysReq_95	Display Forty-Eight (48) Security Surveillance Images	The control Room video wall shall view up to and including forty-eight (48) live real-time images of the recorded facility video surveillance.
1.3.2.2.7	SysReq_88	Display Forty-Eight (48) Concurrent Real-time Images	The control Room video wall shall view up to and including 48 concurrent real-time traffic images from roadside CCTV cameras.
1.3.2.2.8	SysReq_90	Display Satellite Television	The control room video wall shall display satellite television broadcast on video display wall.
1.3.2.3	SysReq_174	Public Address	An infrastructure for public address in RTMC control room shall be provided.
1.3.2.3.1	SysReq_98	Public Address of Audio Roadside CCTV	Audio shall be broadcast through a public address system within the control room from the roadside CCTV source.
1.3.2.3.2	SysReq_99	Public Address of DOTD Radio	Audio shall be broadcast through a public address system within the control room from the DOTD 700/800 radio source.
1.3.2.3.3	SysReq_100	Public Address of Local Radio	Audio shall be broadcast through a public address system within the control room from the local radio source.
1.3.2.3.4	SysReq_101	Public Address of National Radio	Audio shall be broadcast through a public address system within the control room from the national radio source.
1.3.2.3.5	SysReq_102	Public Address of Satellite Radio	Audio shall be broadcast through a public address system within the control room from the local satellite radio source.
1.3.2.3.6	SysReq_97	Public Address of Satellite Television Audio	Audio shall be broadcast through a public address system within the control room from the satellite television source.

#	Sys Rqmt ID	Title	Description
1.3.2.3.7	SysReq_96	Public Address of Cable Television Audio	Audio shall be broadcast through a public address system within the control room from the cable television source.

Table 13: Audio/visual Requirements for the Other RTMC Locations

#	Sys Rqmt ID	Title	Description
1.3.3.1	SysReq_39	Computer Generated Presentations Second Floor Conference Room	Equipment to display computer generated presentations shall be in the second floor conference room.
1.3.3.2	SysReq_125	Computer Generated Presentations Second Floor Library	Equipment to display computer generated presentations shall be in the second floor library.
1.3.3.3	SysReq_129	Video Feeds in Break Rooms	Feeds from the video server shall be provided in all break rooms.
1.3.3.4	SysReq_130	Video Feeds from Server in Offices	Feeds from the video server shall be provided in specified offices.

Table 14: Telephone

#	Sys Rqmt ID	Title	Description
1.4.1	SysReq_43	IP Telephone System	The RTMC facility shall provide IP telephone service for both DOTD and RPC.
1.4.1.1	SysReq_157	Paging IP Telephone System	The IP phone system shall provide loud speaker paging across selected groups of phones.
1.4.1.2	SysReq_158	Five (5) Digit Dialing IP Telephone System	The IP phone system shall provide five (5) digit dialing.
1.4.1.3	SysReq_159	User Voice Mail IP Telephone System	The IP phone system shall have user voice mail.
1.4.1.4	SysReq_160	Programmable Feature Keys IP Telephone System	The IP phone system shall have programmable feature keys.

#	Sys Rqmt ID	Title	Description
1.4.1.5	SysReq_161	Caller ID IP Telephone System	The IP phone system shall have caller id with display.

Table 15: Teleconferencing

#	Sys Rqmt ID	Title	Description
1.5.1	SysReq_44	Teleconferencing Second Floor Conference Room	The RTMC facility shall provide teleconferencing in the second floor conference room.
1.5.2	SysReq_45	Teleconferencing in Second Floor Library	The RTMC facility shall provide teleconferencing in the second floor library.
1.5.3	SysReq_47	Teleconferencing First Floor Conference Room in the Full/one (1) Room Configuration	The RTMC facility shall provide teleconferencing in the first floor conference room linked together in the full/one room configuration.
1.5.4	SysReq_46	Teleconferencing First Floor Conference Room in the Divided/two (2) Room Configuration	The RTMC facility shall provide teleconferencing in the first floor conference room independently on both sides of the conference room in the divided/two room configuration.

Table 16: Video Teleconferencing

#	Sys Rqmt ID	Title	Description
1.6.1	SysReq_48	Video Teleconferencing Second Floor Conference Room	The RTMC facility shall provide bidirectional audio/video conferencing in the second floor conference room.
1.6.2	SysReq_49	Video Teleconferencing Training Room	The RTMC facility shall provide bidirectional audio/video conferencing in the training room.
1.6.2.1	SysReq_131	Video Teleconferencing Display in Control Room	Training room video conferencing shall be a selectable item to be displayed in the control room.

#	Sys Rqmt ID	Title	Description
1.6.3	SysReq_51	Video Teleconferencing First Floor Conference Room in the Full/one (1) Room Configuration	The RTMC facility shall provide bidirectional audio/video conferencing in the first floor conference room linked together in the full/one room configuration.
1.6.4	SysReq_50	Video Teleconferencing First Floor Conference Room in the Divided/two (2) Room Configuration	The RTMC facility shall provide bidirectional audio/video conferencing in the first floor conference room independently on both sides in the divided/two room configuration.
1.6.5	SysReq_124	Video Teleconferencing Second Floor Library	The RTMC facility shall provide bidirectional audio/video conferencing in the second floor library.
1.6.6	SysReq_155	Video Teleconferencing of Computer Generated Presentations	When selected, the video conference system in the first floor conference room shall display computer generated presentations.

Table 17: Digital Recording

#	Sys Rqmt ID	Title	Description
1.7.1	SysReq_52	Audio Recording First Floor Conference Room Divided/two (2) Room Configuration	The RTMC facility shall have digital recording of audio to the first floor conference room independently on both sides in the divided/two room configuration.
1.7.2	SysReq_140	Digital Recording of Public Address in First Floor Conference Room in the Full/one (1) Room Configuration	When selected, the first floor conference room's audio output from the public address system shall be digitally recorded in the full/one room configuration.

#	Sys Rqmt ID	Title	Description
1.7.3	SysReq_141	Digital Recording of Public Address in First Floor Conference Room in the Divided/two (2) Room Configuration	When selected, the first floor conference room's audio outputs from the dual independent public address systems shall be digitally recorded in the divided/two room configuration.
1.7.4	SysReq_145	Video Recording First Floor Conference Room in the Divided/two (2) Room Configuration	When selected, in the first floor conference room, video of each room shall be recorded in the divided/two room configuration.
1.7.5	SysReq_146	Audio of Video Recording First Floor Conference Room in the Full/one (1) Room Configuration	When selected, audio of the video of the first floor conference room shall be recorded in the full/one room configuration.
1.7.6	SysReq_147	Audio of Video Recording of the First Floor Conference Room in the Divided/two (2) Room Configuration	When selected, the first floor conference room's audio with the video of each room shall be recorded in the divided/two room configuration.

Table 18: Media

#	Sys Rqmt ID	Title	Description
2.8.1	SysReq_57	Media Access To Traffic Information	The tower parking facility shall provide the infrastructure for four (4) interfaces that will transmit real-time media broadcast.

Table 19: Facility Layout

#	Sys Rqmt ID	Title	Description
1.9.1	SysReq_59	RPC reconfigurable floor space	The RTMC facility shall provide reconfigurable floor space to accommodate RPC functions.

#	Sys Rqmt ID	Title	Description
1.9.2	SysReq_60	DOTD Reconfigurable Floor Space	The RTMC facility shall provide reconfigurable floor space to accommodate DOTD functions.
1.9.3	SysReq_61	Control Room Reconfigurable Floor Space	The control room shall provide reconfigurable floor space for additional regional partners.
1.9.3.1	SysReq_63	Control Room Reconfigurable Power	The RTMC facility power shall be reconfigurable to accommodate the reconfiguration of the control room floor space.
1.9.4	SysReq_62	RTMC Reconfigurable Security Access	The RTMC facility security access shall be reconfigurable to accommodate the reconfiguration of the control room floor space for additional regional partners.

Table 20: Climate and Weather

#	Sys Rqmt ID	Title	Description
1.10.1	SysReq_67	Redundancy Of Elements	The RTMC facility shall contain redundancy for elements that are critical for operations in inclement weather.
1.10.2	SysReq_68	RTMC Facility Storm Design	The RTMC facility shall meet storm design specifications for inclement weather.

Table 21: Security and Safety

#	Sys Rqmt ID	Title	Description
1.11.1	SysReq_74	Security Procedure Manual	The RTMC facility shall have a security procedure manual for the facility.
1.11.2	SysReq_85	Safety Alarm Notification	The RTMC facility safety alarm notifications shall be sent to a set of predetermined phone numbers.
1.11.3	SysReq_76	Security Alarm Notification	The RTMC facility security alarm notifications shall be sent to a set of predetermined phone numbers.
1.11.4	SysReq_75	Unmanned Security Monitoring	The RTMC facility shall use a 24 hour, 365 day unmanned security monitoring system that is recordable.
1.11.5	SysReq_69	Entry Way Security	The RTMC facility shall contain entry way security into the facility.
1.11.5.1	SysReq_70	Access Card Readers On Entry Points	The RTMC facility shall contain "access card" readers for limited facility entry points.

#	Sys Rqmt ID	Title	Description
1.11.5.1.1	SysReq_115	Access Card Reader Locations	Access card readers shall be installed on the following 9 doors within the RTMC: 1) Front Door (101A) 2) Rear Door (ST2-1B) 3) First floor DOTD section (102A) 4) Control room (103B) 5) Second floor RPC section (202A) 6) Display access room (b/w computer room/control room) 7) Roof access door (ST1-3A) 8)Computer room (147A) 9) Second floor rear door (ST2-2A)
1.11.5.1.1.1	SysReq_117	Access Card Reader Specific Locations	Access card readers shall be installed in specific locations that are identified on the building plan sheets.
1.11.5.1.2	SysReq_113	External Door Locations	Three external doors shall have access card control as identified on the building plan sheets.
1.11.5.1.3	SysReq_118	Online Monitoring System	Card-controlled doors shall be monitored through an online access control system.
1.11.5.2	SysReq_114	Entry Way Sensors	All internal doors with card access shall have status sensors on them.
1.11.5.3	SysReq_81	Entry Way Lighting	The RTMC facility shall implement adequate lighting systems at all entry points within the facility.
1.11.5.4	SysReq_82	Exit Way Lighting	The RTMC facility shall implement adequate lighting systems at all exit points within the facility.
1.11.5.5	SysReq_72	External Door Video Surveillance	The RTMC facility shall contain dedicated video surveillance of all facility external doors.
1.11.5.6	SysReq_187	Internal Surveillance Second Floor	The second floor shall contain dedicated video surveillance of all 3 points of entry from the first floor.
1.11.6	SysReq_175	Parking Facility Security	Security measures shall be provided for the RTMC parking facility.
1.11.6.1	SysReq_84	Parking Facility Lighting	The RTMC facility shall implement adequate lighting systems around its parking facilities.
1.11.6.2	SysReq_120	Unmanned Security Monitoring	The parking facility shall use a 24 hour, 365 day unmanned monitoring system that is recordable.
1.11.6.3	SysReq_119	Dedicated Surveillance	The parking facility shall have dedicated video surveillance.
1.11.6.4	SysReq_121	Parking Facility Surveillance Remote Viewing	The parking facility surveillance shall be viewable from remote locations.

#	Sys Rqmt ID	Title	Description
1.11.6.5	SysReq_179	Surveillance Viewable In RTMC	The parking facility video shall be viewable in the RTMC.
1.11.7	SysReq_176	Tower Site Security	Security measures shall be provided for the tower site.
1.11.7.1	SysReq_73	Dedicated Surveillance	The RTMC facility shall contain dedicated video surveillance of the tower site.
1.11.8	SysReq_177	RTMC Perimeter Security	Security measures shall be provided for the RTMC facility perimeter.
1.11.8.1	SysReq_83	Perimeter Lighting	The RTMC facility shall implement adequate lighting systems around the building's perimeter.
1.11.9	SysReq_178	Environmental Safety	Environmental safety measures shall be provided for the RTMC.
1.11.9.1	SysReq_77	Overheating	The RTMC facility shall implement a safety alarm system for the room overheating.
1.11.9.2	SysReq_78	Carbon Dioxide Gas	The RTMC facility shall implement a safety alarm system for monitoring carbon dioxide gas.
1.11.9.3	SysReq_122	Carbon Monoxide Gas	The RTMC facility shall implement a safety alarm system for monitoring carbon monoxide gas.
1.11.9.4	SysReq_79	Circuit Overload	The RTMC facility shall implement a safety system for circuit overload protection.
1.11.9.5	SysReq_80	Fire Suppression	The RTMC facility shall implement computer room fire suppression systems.

Table 22: Computer Equipment

#	Sys Rqmt ID	Title	Description
1.12.1	SysReq_104	Rpc Servers	The RTMC facility shall contain RPC dedicated servers.
1.12.2	SysReq_105	DOTD Traffic Servers	The RTMC facility shall contain DOTD dedicated traffic operation servers.
1.12.3	SysReq_106	360 Surveillance Software Workstations	The control room workstations shall be compatible with the 360 surveillance software (ICX) with the ITS package.
1.12.4	SysReq_162	360 Surveillance Software Servers	The RTMC facility shall contain servers for 360 surveillance (ICX) with the ITS package.

Table 23: Power

#	Sys Rqmt ID	Title	Description
1.13.1	SysReq_66	Backup Power Generation	The RTMC facility shall contain backup power generation for the operation of critical equipment in inclement weather.

#	Sys Rqmt ID	Title	Description
1.13.1.1	SysReq_111	Operator Notification - Running On The Backup Generator	Notification shall be given to the operators when the system is running on backup power.
1.13.2	SysReq_109	Uninterruptible Power Supply (UPS)	An Uninterruptible Power Supply (UPS) shall be installed for critical equipment.
1.13.2.1	SysReq_180	Computer Room UPS	At a minimum the computer room shall be on UPS power until the generators take over supplying power.
1.13.2.1.1	SysReq_181	Computers on UPS	At a minimum the computers within the computer room shall be on UPS power until the generators take over supplying power.
1.13.2.1.2	SysReq_182	Displays on UPS	At a minimum the displays associated with the computers shall be on UPS power until the generators take over supplying power.
1.13.3	SysReq_156	Grounding for Satellite and Radio Antennas	Isolated grounding shall be installed on the roof of the RTMC.

Table 24: Radio Equipment

#	Sys Rqmt ID	Title	Description
1.14.1	SysReq_112	Radio Equipment	Each traffic management operator shall have access to a DOTD 700/800 radio unit.

3.8 System Design

The systems necessary for the DOTD TED and RPC to perform their roles and responsibilities have been included as part of this systems engineering analysis. Although the needs and requirements are put into logical groups, these groups do not necessarily make up a system in itself. Rather, the logical groups are covered within these five systems analyzed:

- Communications: Computer/business network
- Communications: Telephone
- Security
- Audio/visual
- Control room display wall

3.8.1 Design Approach, Life Cycle Costs, & Recommendations

A series of tables are provided to evaluate the various systems, alternative designs, life cycle cost, and the recommended solutions for each system.

Items to consider during the review of this evaluation:

- Estimates solicited from various state contracts may have detailed equipment only. When this occurred, labor was estimated as a percentage of the equipment dependent on the type of equipment (e.g., video surveillance, 60% labor).
- When estimates only included one component of a system, the cost gathered from other solicited manufacturers was used to develop the total estimate.
- A 15% contingency has been added to the overall cost to accommodate any irregularities in the estimates obtained and rising cost in materials and labor.
- The recommended solutions and procurement methods take into account the availability of staff for bid package development and available time prior to implementation.

Table 25: Design Analysis

System Component	*Description*	*Analyzed Components*	*Feasibility/Pros*	*Limitations/Cons*	*Procurement Options*	*Procurement Requirements*	*Recommended Procurement*	*Capital Cost*	*5 Year Maint Cost*	*Total 5 Year Cost*	*Capital Cost of Recommended*
Network Data Cable Facility Wiring	This system includes the physical installation of data wiring within the RTMC from wall outlet terminations to the computer room panel termination.	Copper throughout the facility -Cat 5e -Cat 6 -Cat 6A	Copper cable is standard practice for all networks - Cat 5e good up to 1- Gigabit per sec (100 MHz) - Cat 6 good up to 10-Gigabit per sec (250 MHz) - Cat 6a good up to 10-Gigabit per sec (500 MHz)	- OTM requires a minimum of Cat 6 when using copper (OTM typ. installs Cat 6+ which is expected to meet Cat 6a standards) - Cat 6 has lower performance requirements than Cat 6a - Cat 6a has not been fully standardized	-State Contract (inside plant) -State Contract (Materials) -Bidding Process	Communications requires OTM approval	State Contract (inside plant) Cat 6+	$80,000.00		$80,000.00	$80,000.00
		Fiber throughout the facility	Fiber cable has unlimited bandwidth	Connections require a switch at every fiber termination				$150,000.00		$150,000.00	
Network Equipment	Network equipment consists of hardware and software required to communicate between at least two points of access. RPC and DOTD are required to operate and maintain the network equipment required for their agency to function accordingly.	-Core Switches: DOTD/RPC on separate switches (i.e., two networks) DOTD Switches shown across	- Equipment is easier to configure for each agency - Troubleshooting easier - Failure of one switch does not affect other - Physical barrier of security - RPC not affected by DOTD security - Able to patch between networks as needed - Readily accommodates two phone systems	- A physical patch required to bridge between the two switches for sharing data - Latency added between switches - More equipment to maintain - More points of failure - Additional cost of multiple switches	-State Contract -Bid process		State Contract (Global Data)	$132,221.60	$44,772.00	$176,993.60	$132,221.60
		- RPC Switches (Req'd new POE switch to be installed with existing RPC switch)					State Contract (HP)	$3,200.00		$3,200.00	$3,200.00
		-DOTD/RPC on one switch (No switch available to handle both agencies)	- Only one piece of equipment to configure - No patch between agencies required - May be some cost savings on switch	- Higher level of difficulty in configuring firewalls -Switch failure brings down entire system - Confusion and finger pointing on maintenance of switch				N/A			
		-The full build out of the Computer Room will house 17 - 19" 42U server racks	Server racks come in various styles and configuration. Types include 2 or 4 post and caged.	The floor tiles are 2'x2' sections so the racks typicaly will fix over 1 1/2 tiles.			State Contract (various)	$20,400.00		$20,400.00	$20,400.00
Telephone System	The phone system allows users to make both outside calls as well as calls within the facility. DOTD requires a 5-digit quick dial for interagency calls. In addition: voice mail, caller id, call waiting, and speaker phone.	One IP Phone system	- Entire system consistent throughout facility	DOTD would be tasked to maintain all phones with RTMC (not an applicable option)	Three different IP phone systems are readily available on state contract		N/A (ShoreTel)	$65,370.76	$30,031.78	$95,402.54	
		Two IP Phone systems	- Since each agency is tasked with the maintenance of its telephone equipment, the design must accommodate the agency's ability to maintain the phones. -DOTD currently maintains Cisco IP phones - RPC's IT consultant maintains ShoreTel IP phones - OTM supports IP phones - PRI can be shared	- More equipment to maintain - More points of failure - Additional cost for two phone systems - Phone systems potentially would be different systems	- For DOTD Cisco phone systems are readily available on state contract - For RPC ShoreTel phone systems are readily available on state contract		State Contract ShoreTel (DOTD)	$38,607.92	$16,238.83	$54,846.75	$38,607.92
							N/A (Cisco)	- Only cost of items provided. Not total system cost.			
							N/A (NEC)	$33,095.78	$7,200.00	$238,289,616.00	
							State Contract ShoreTel (RPC)	$34,681.52	$13,792.95	$48,474.47	$34,681.52
		Traditional Telephone system	- Would be consistent with DOTD's legacy phone system - Wiring can be on Cat series cable	- Technology is limited - Carriers are moving to IP - DOTD's legacy system cannot be expanded without a software upgrade - Shared wiring limits bandwidth	State Contract for 4 POT lines for backup and field equipment connections		State Contract (BellSouth)	$340.00	$2,400.00	$2,740.00	$340.00

System Component	*Description*	*Analyzed Components*	*Feasibility/Pros*	*Limitations/Cons*	*Procurement Options*	*Procurement Requirements*	*Recommended Procurement*	*Capital Cost*	*5 Year Maint Cost*	*Total 5 Year Cost*	*Capital Cost of Recommended*
Security System	The security system envisioned encompasses access control as well as video surveillance	Online access control system to monitor doors and manage access.	- Allows the administration to manage door access. - Admin assign levels of access to personnel. - Records date/time of access. - Remote access control can be accomplished from other facilities via the extended network - Can be used as offline system	- Requires additional equipment to maintain - Server required - Additional points of failure - Each door panel requires networking (typ. RS 485 or RJ-45 depending on type of system) - Licensing provided via a network client or per workstation - Cost	- Change order for equipment swap out for online system and procurement of control panel and software licensing. - Software licensing not available on state contract -Bid process		Change order for parts swap out and control system/license installation	$63,256.44		$63,256.44	$63,256.44
		Offline access control	- Level of security more flexible than traditional keyed lock - Able to program each lock/card reader with accessibility	- Each lock/card reader must be programmed on site for access control - No record of entry maintained - No flexibility to expand offline system proposed by Shaw to be an online system	No procurement required; included as part of construction project. Would be limited to the original 7 controlled doors.			N/A			
		Video surveillance with digital video recording for the parking lot and all exit doors (10 fixed for parking & 1 PTZ on top of RTMC, 1 PTZ at tower; 9 inside for ext. door entry & 3 for 2nd floor entry)	- CCTV surveillance gives personnel ability to view exit door during after hours - When not actively monitored DVR provides video review in event of incident/crime - CCTVs can be readily mounted to exterior of building	- Additional equipment to maintain	-Readily available under state contract (CCTV not supported by ITS Section)		Letter Bid	$69,000.00		$69,000.00	
					-Get CCTVs supported by ITS Section on existing state contracts -Bid process			$87,000.00		$87,000.00	$87,000.00
Control Room Video Display Wall	The video display wall provides the operators the ability to display video feeds from field devices, 360 data/maps, news, weather, etc.	DLP Rear Projection Cubes	- Industry standard in control room operations - Image doesn't wash out due to overhead lighting -Brightness: norm 800 cd/m2, 560 Lumens (bright 1000 cd/m2, 700 Lumens) - Bulb life 10k/6k-hours (100w/120w) - Mullion 0.2mm-2mm - 30" depth required - 36" rear clearance required for ladder access - Dual bulb option available for auto change over -Typ. sizes 50" & 67" -Resolution: 1024x768 up to 1400x1050	- Bulb replacement based on 16 hr/day operations: approximately 1 bulb per year @ 120w & 1.7 bulbs per year @ 100w -Bulb replacement based on 24 hr day operations (used in 5 year cost): approximately 2.2 bulbs per year @ 100w - Requires large footprint and rear access room	-State contract thru A/V integrator (pending cost) -Bid process		State Contract (Creative Presentation or Interstate Electronics)	$242,362.00	$27,312.00	$269,674.00	$242,362.00

System Component	Description	Analyzed Components	Feasibility/Pros	Limitations/Cons	Procurement Options	Procurement Requirements	Recommended Procurement	Capital Cost	5 Year Maint Cost	Total 5 Year Cost	Capital Cost of Recommended
Control Room Video Display Wall (Continued)	The video display wall provides the operators the ability to display video feeds from field devices, 360 data/maps, news, weather, etc.	LCD commercial grade	- Brightness 500 cd/m2 (*1500 cd/m2) - Bulb life 50k-hours - Typ. sizes 42", 46", 65", *104" - Mullion +1" * indicates 104" diagonal display - 12 units for video wall - Resolution: 1366x768 up to 3840x2160	- Room lighting has to be adjusted to accommodate brightness on standard models - Replacement/maintenance requires full removal of unit off wall from front - Bulb replacement based on 16 hr day operations: approximately once every 8.5 years - Doesn't include bulb swap over - Mullion is rather large for multi unit display of an image/video - Large models (>65") have greater cost then standard models - Large models (>65") relatively new on market	-State contract thru A/V integrator (pending cost) -Bid process			$158,964.00			
		Overhead DLP projection (consumer grade)	- Gives flexibility in design of screen size - Consumer projectors have low cost and are easy to maintain - Brightness 2100 - 3000 Lumens -Mullion 0" -Bulb life 3k hr - 12 units for video wall - Resolution: 1024x768 w/ 1600x1200 max	- Requires overhead mounting on control room floor - Room lighting has to be adjusted on standard models - Maintenance will require ladder on control room floor - Bulb replacement based on 16 hr/day operations: approximately 2 bulbs per year -Low life span ~4years - Requires drop down screen or special reflective paint	-State contract thru A/V integrator (pending cost) -Bid process			$18,000.00	$21,600.00	$39,600.00	
		Overhead DLP projection (commercial)	- Gives flexibility in design of screen size - Consumer grade DLP designed for longer life - Brightness 870 - 10,000 Lumens - Mullion 0" - Bulb life 2.5k-4k hr - 12 units for video wall - Resolution: 1024x768 up to 1920x1080	- Requires overhead mounting on control room floor - Room lighting has to be adjusted on standard models - Maintenance will require ladder on control room floor - Bulb replacement based on 16 hr/day operations: approximately 2 bulbs per year - Requires drop down screen or special reflective paint	-State contract thru A/V integrator (pending cost) -Bid process			$48,000.00	$10,296.00	$58,296.00	

System Component	*Description*	*Analyzed Components*	*Feasibility/Pros*	*Limitations/Cons*	*Procurement Options*	*Procurement Requirements*	*Recommended Procurement*	*Capital Cost*	*5 Year Maint Cost*	*Total 5 Year Cost*	*Capital Cost of Recommended*
Video Wall Processor	Video wall processor allows users to control the configuration on the display wall of video inputs from various sources	Quad splitting images on each display unit	- Allows the user to have 4 images per display unit	-Very limited in flexibility of control - Control depends on the operating system running the display unit - Typically each display is run to a dedicated workstation or video input (CATV or sat TV) - Operators must coordinate with each other to have images switched or the operators have to swap console locations -360 Surveillance is readily accommodated	-State contract thru A/V integrator (pending cost) -Bid process			N/A			
		Low end video wall processor	- Images can be scaled across multiple screens - Entire display acts as a single system - Both data and video are processed	- Not readily able to be integrated with 360 software - Configuration may be problematic - Support tends to be more of an issue	-State contract thru A/V integrator (pending cost) -Bid process			$64,985.25	N/A	$64,985.25	
		High end video wall processor (Software Based)	- Images can be easily scaled across multiple screens. - Entire display acts as a single system - Decodes video from compressed sources - Expandable for additional inputs and outputs - Readily integrates with 360 control software - Service is first rate		Letter Bid			$158,566.18	$93,148.73	$251,714.91	
		High end video wall processor (Hardware Based)		- High cost	-State contract thru A/V integrator (pending cost) -Bid process		State Contract (Creative Presentation or Interstate Electronics)	$196,673.00	$68,115.00	$264,788.00	$196,673.00
Control Room CATV, SATV & Audio	The audio system required in the control room for sound from TV and other sources. Includes OH speakers, mixers, and headphone plug-in at each console	Typical control room configuration	-Allows operators to listen to live news, weather, and other media sources -Allows users to play portable media sources		-State contract thru A/V integrator (pending cost) -Bid process		State Contract (Creative Presentation or Interstate Electronics)	$9,291.08	Included in video wall processor 5 year cost	$9,291.08	$9,291.08
Control Room Install Labor	Design, engineering, programming, survey, installation, and training	Labor	Necessary for an operational system	High cost	-State contract thru A/V integrator (pending cost) -Bid process		State Contract (Creative Presentation or Interstate Electronics)	$119,098.64	-	$119,098.64	$119,098.64

System Component	*Description*	*Analyzed Components*	*Feasibility/Pros*	*Limitations/Cons*	*Procurement Options*	*Procurement Requirements*	*Recommended Procurement*	*Capital Cost*	*5 Year Maint Cost*	*Total 5 Year Cost*	*Capital Cost of Recommended*
A/V & tele-conference equipment for conference rooms	The audio/visual equipment for the conference rooms consists of wall displays, speaker systems, microphones, digital video recorder, and teleconference equipment	Overhead projection(s) w/ screens	- See "Control Room Video Display Wall" for feasibility of overhead projection by type - Uses drop down screens for display - Typically a single image/data/presentation being displayed; suits OH projection - Limited duration of use (10 hours per week)	- See "Control Room Video Display Wall" for limitations of overhead projections	-State contract thru A/V integrator (pending cost) -Bid process		State Contract (Creative Presentation or Interstate Electronics)	$22,300.00	$3,432.00	$25,732.00	$22,300.00
		LCD displays	- See "Control Room Video Display Wall" for feasibility of LCD displays - One large display in front of room to facilitate the full room w/ supplemental displays in 2nd & 3rd rooms - Limited duration of use (10 hours per week)	- See "Control Room Video Display Wall" for limitations of LCD display technology - High cost for required sized LCD to suit full room display - LCDs always in sight even when not in use	-State contract thru A/V integrator (pending cost) -Bid process			$26,494.00		$26,494.00	
		DLP cubes	- See "Control Room Video Display Wall" for feasibility of DLP cube displays - Multiple units for full integration display - Single unit for 2nd conference room - Limited duration of use (10 hours per week)	- See "Control Room Video Display Wall" for limitations of DLP cube technology - Requires permanent space on conference room floor - High cost for limited use	-State contract thru A/V integrator (pending cost) -Bid process			$86,600.80		$86,600.80	
		Audio System	-Allows audience to hear presenter -Allows audience to video conference -Allows users to play portable audio sources -System designed for operations in multi room configurations		-State contract thru A/V integrator (pending cost) -Bid process		State Contract (Creative Presentation or Interstate Electronics)	$9,291.00	Included in video wall processor 5 year cost		$9,291.00
		Microphones	-Allows audience presenter and audience to be heard throughout room -Wireless systems allow flexibility	-Wired systems are constrained to fixed positions or running wiring on floor -Wireless systems require batteries with limited life	-State contract thru A/V integrator (pending cost) -Bid process		State Contract (Creative Presentation or Interstate Electronics)	$28,000.00	$4,000.00	$32,000.00	$28,000.00
Media Access	Provide a wiring bridge so camera crew in the public areas of the RTMC can connect to van in tower parking lot for live broadcast	Required wiring and panels	Required component		-State contract thru A/V integrator (pending cost) -Bid process		State Contract (Creative Presentation or Interstate Electronics)	$34,963.20		$34,963.20	$34,963.20
										Subtotal	$1,121,686.40
										15% contingency	$168,252.96
										Total	$1,289,939.36

3.9 Operations and Management (O&M)

Although operations is discussed in abundance in the previous sections of this document, at no point has it been clearly defined as to whom will be operating the various systems. This may be partially due to this analysis focusing on the systems in terms of the facility rather than on how the systems themselves will be operated.

Since the building occupants are DOTD and RPC, their staff will be operating the systems required for typical business functions (e.g., network, phone systems, access control, audio/visual, etc). Local media personnel will be allowed to operate by connecting to the media connection points in the RTMC and in the tower parking lot. The public and guest will be allowed to use certain systems in the public areas under DOTD and/or RPC staff supervision (e.g., audio/visual during public meetings).

DOTD currently has procured contract staff for TMC operations. As part of this contract, DOTD will standardize the operations of all the TMCs across the state, yet still cater to the needs of the local district operations. The RTMC follows suit with this operations plan and the development of Standard Operating Procedures (SOP). It is envisioned that as part of the SOP, the TMC operators will be responsible for portions of the daily management and maintenance on the systems managing the ITS field devices in the control room (e.g., video wall).

Prior to the beginning of design on the RTMC, DOTD and RPC entered into a Cooperative Endeavor Agreement (CEA). The CEA specifies the financial responsibilities for both entities as well as managing the RTMC. A copy of the CEA has been provided in **Appendix B**.

The management responsibilities of the RTMC systems are summarized below:

- RPC
  - General maintenance of the RTMC building and grounds.
  - All system equipment purchased by RPC to accommodate RPC's roles and responsibilities.
  - Phone system (management & maintenance only for RPC phone system).
- DOTD
  - All systems required for the TMC operations of the ITS field devices.
  - Phone system (management & maintain DOTD phone system and provide service for both DOTD and RPC phone systems).
  - All systems in common areas. However if equipment is added/procured by RPC, the maintenance of that equipment will be held by RPC unless agreed upon otherwise in writing.

Appendix A

RTMC Project ITS Architecture Interface Diagrams

This appendix contains a series of diagrams that together show the information flows that connect the RTMC with other systems in Louisiana. The diagrams were generated from the Turbo Architecture database containing the RTMC Project ITS Architecture, which was based on the New Orleans Regional ITS Architecture. Each diagram shows interfaces between one of the three elements in the RTMC facility (shown as rectangles) with external systems (shown as rounded rectangles). The information flows shown are standard information flows from the National ITS Architecture. Consult the National ITS Architecture (www.iteris.com/itsarch) for more information.

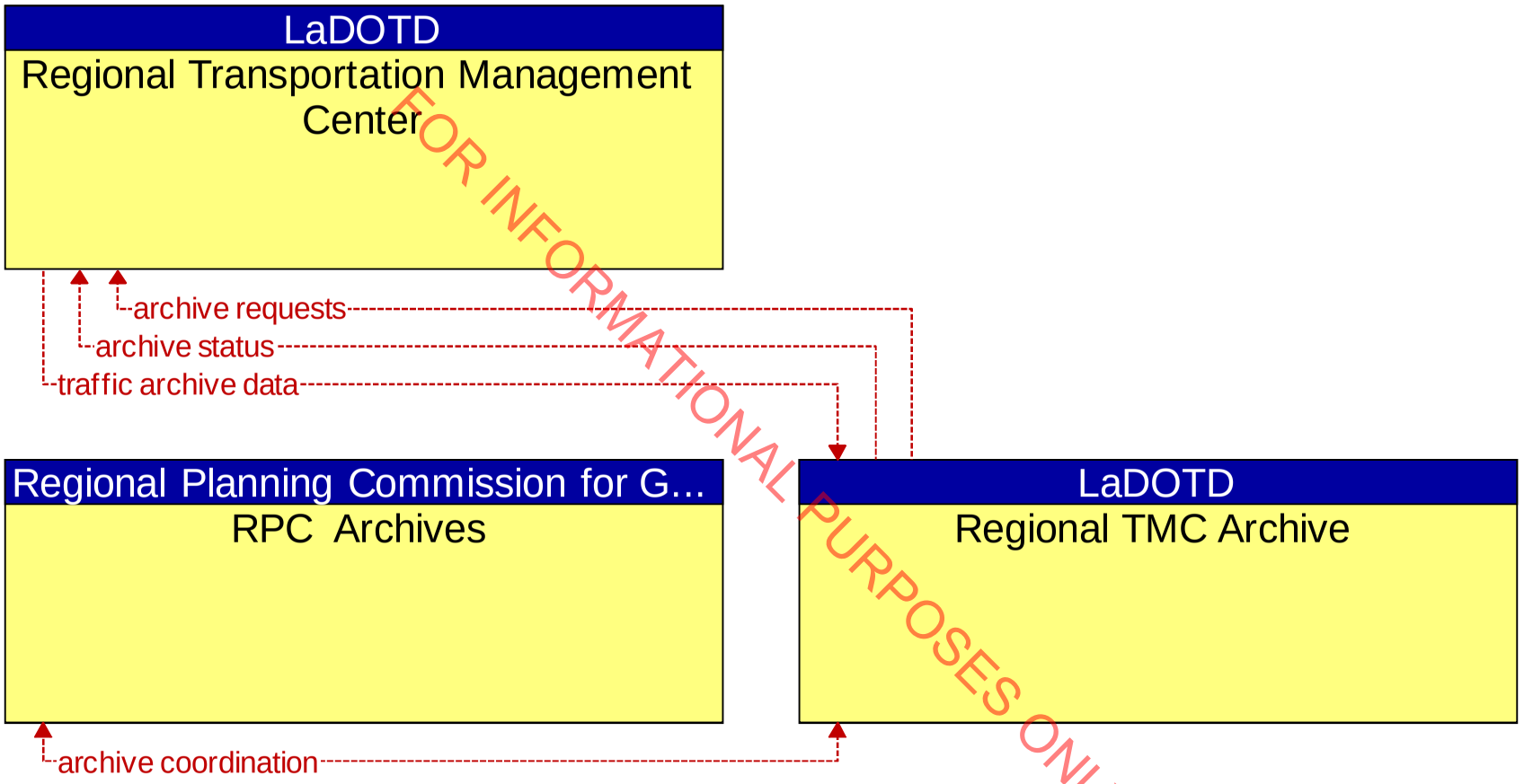

Figure 1: RTMC Facility Internal Interfaces

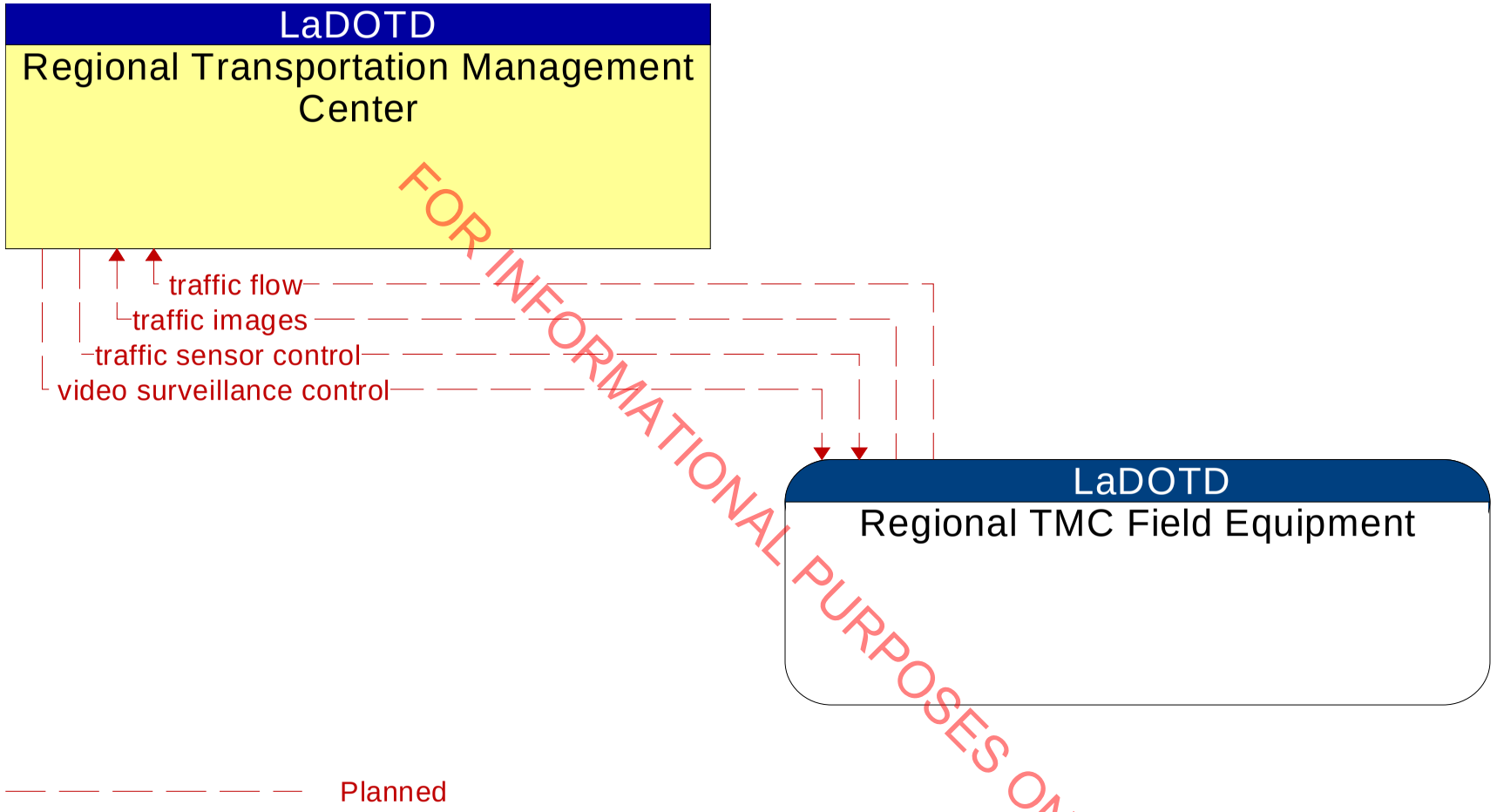

Figure 2: RTMC Interfaces - Network Surveillance

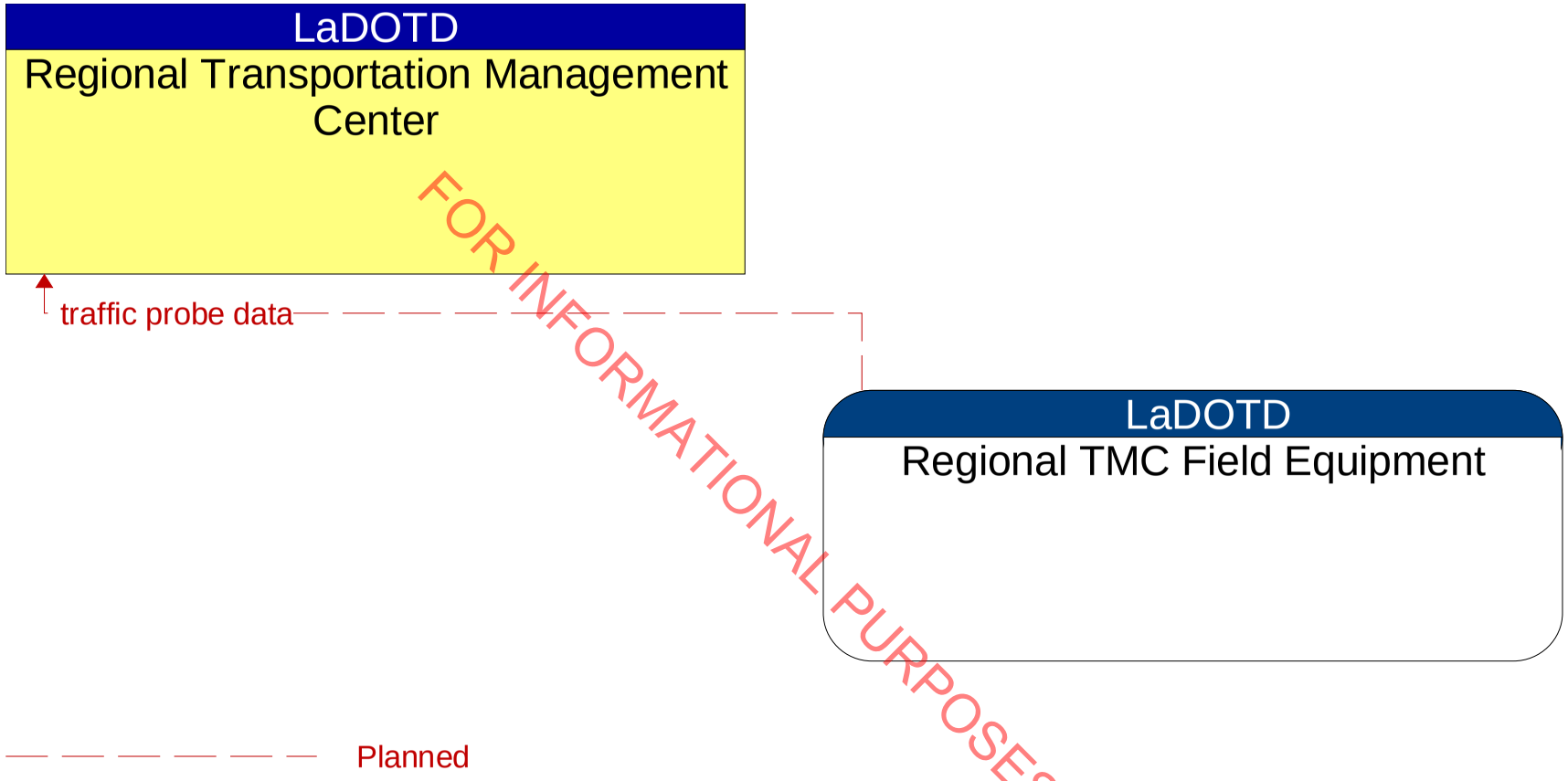

Figure 3: RTMC Interfaces - Probe Surveillance

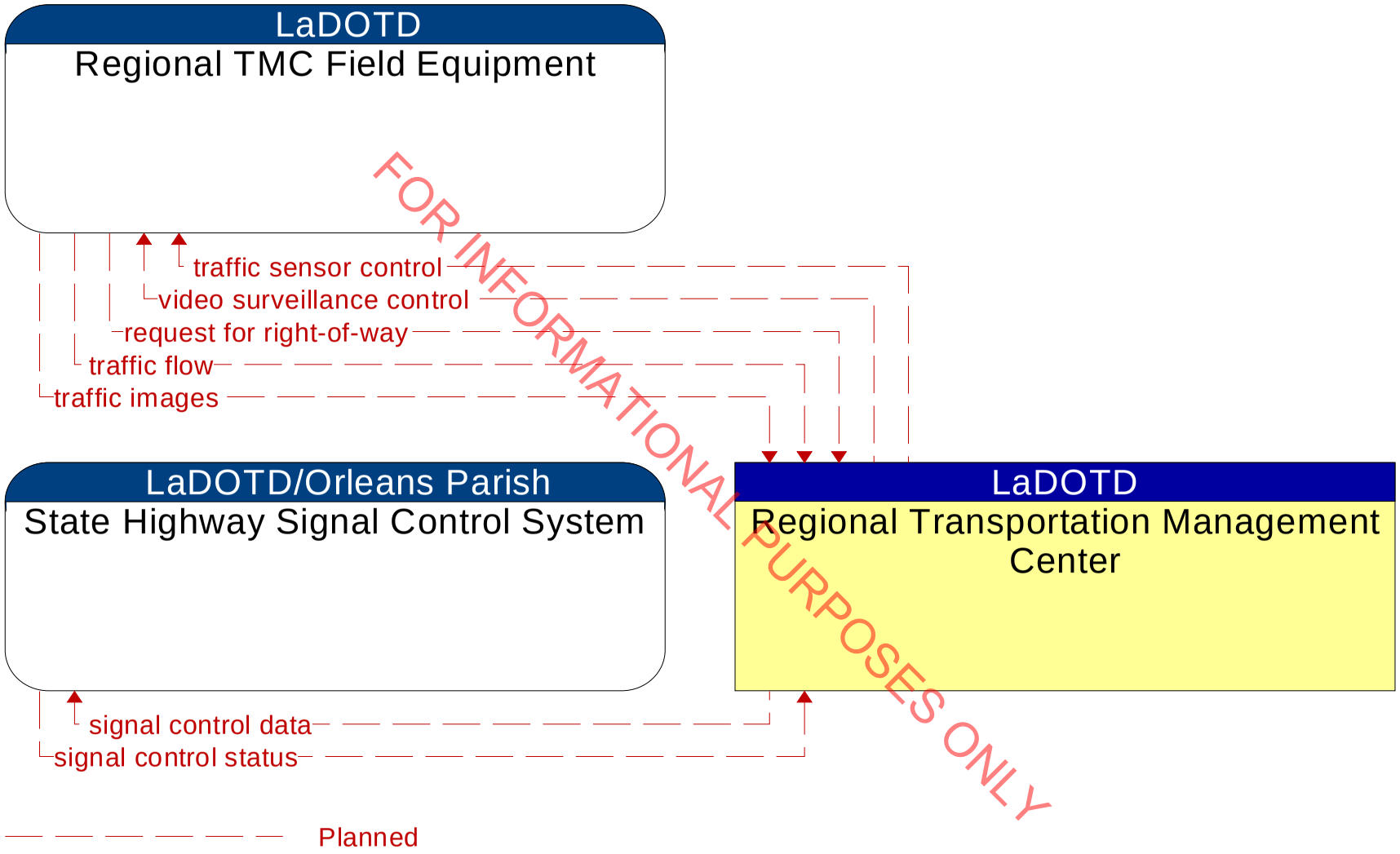

Figure 4: RTMC Interfaces - Traffic Signal Control

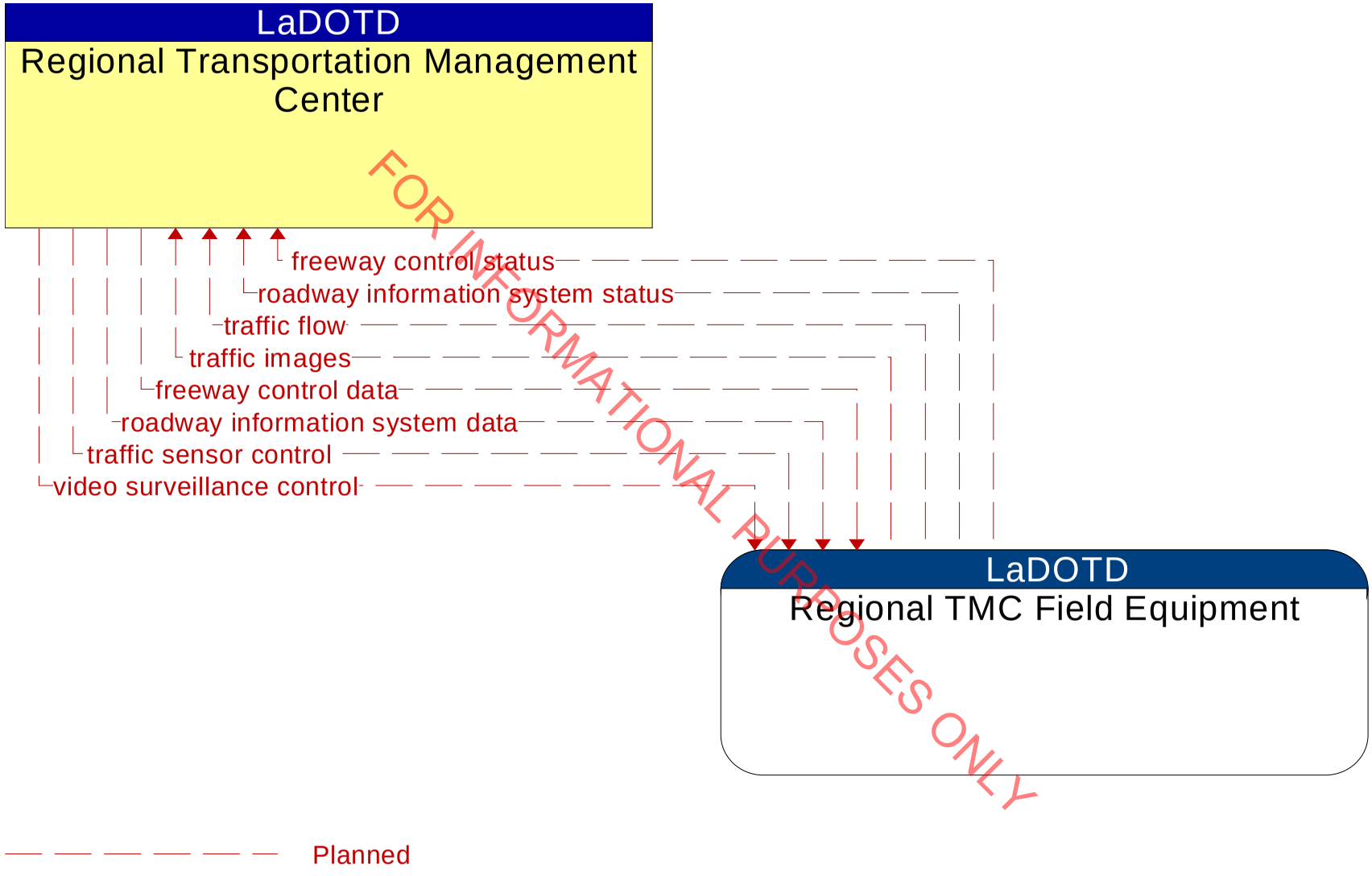

Figure 5: RTMC Interfaces - Freeway Control

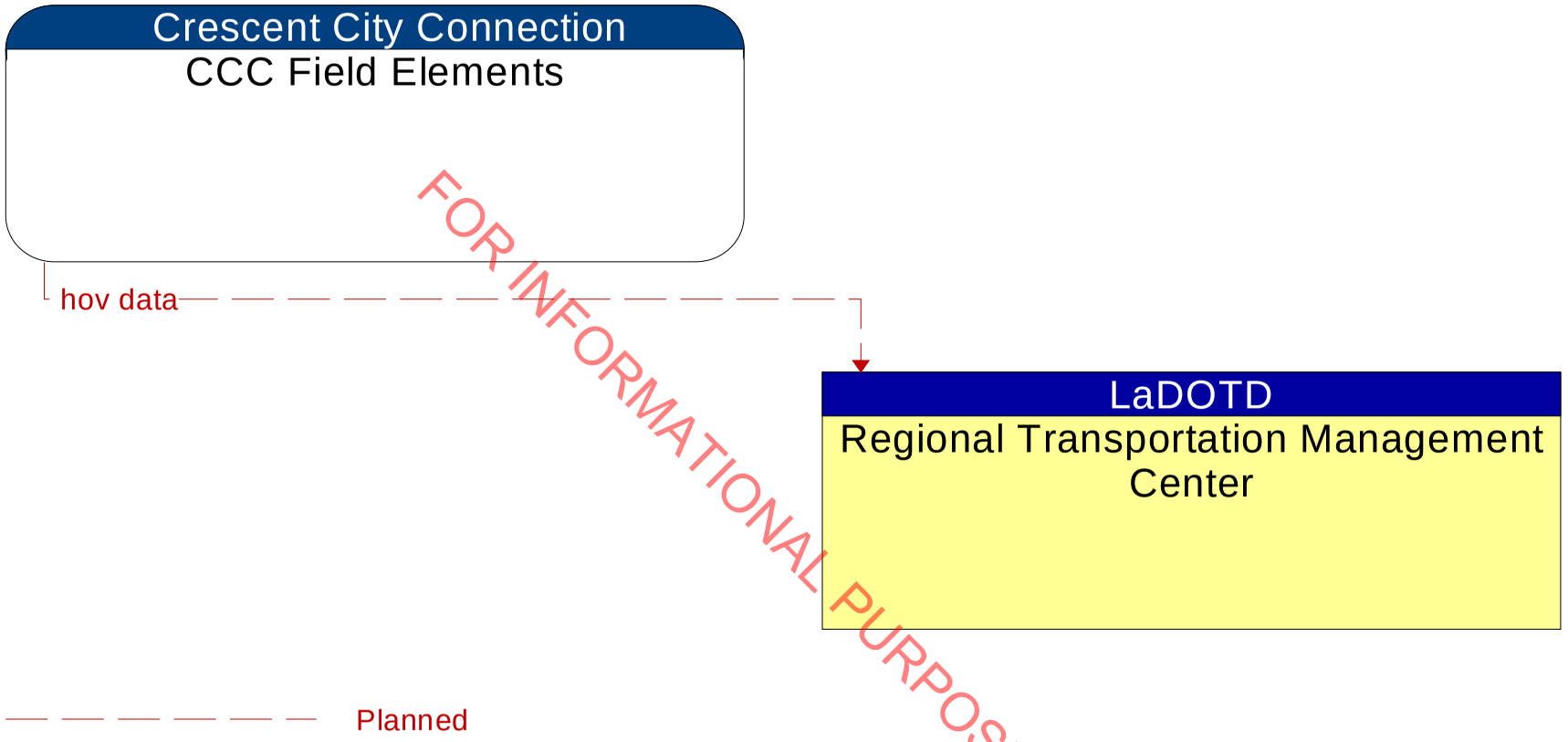

Figure 6: RTMC Interfaces - HOV Lane Management

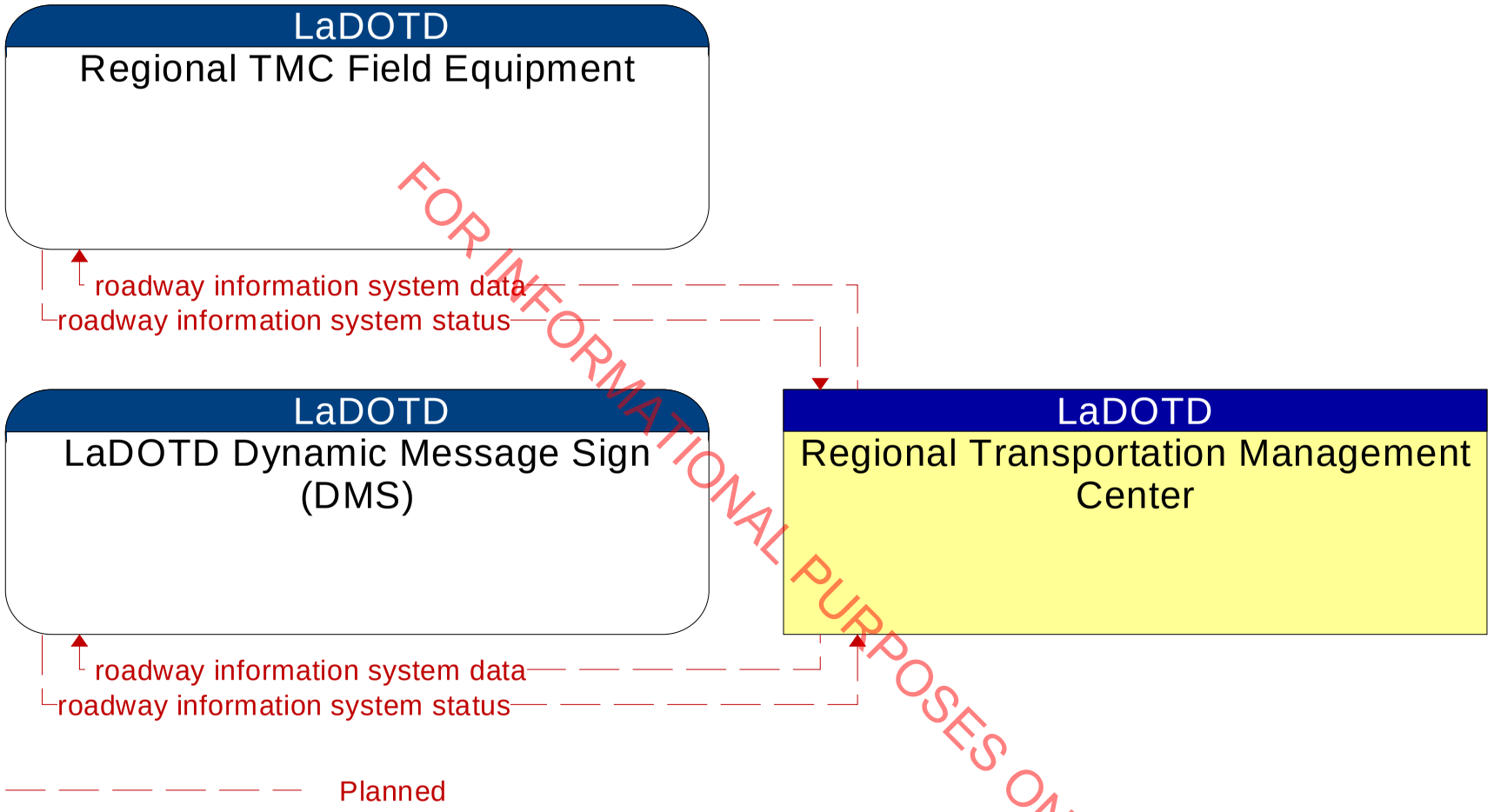

Figure 7: RTMC Interfaces - Traffic Information Dissemination (DMS/HAR)

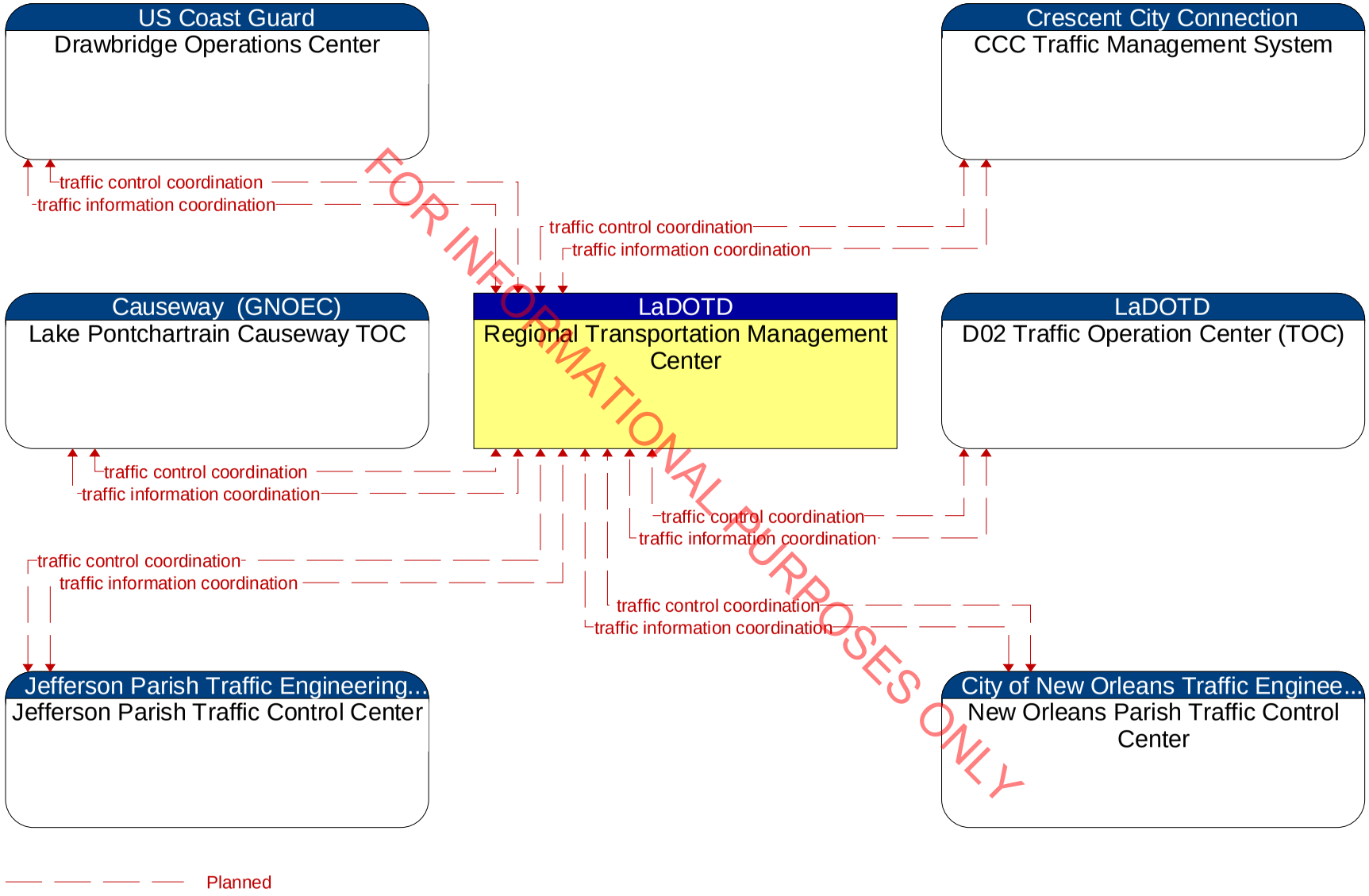

Figure 8: RTMC Interfaces - Regional Traffic Management

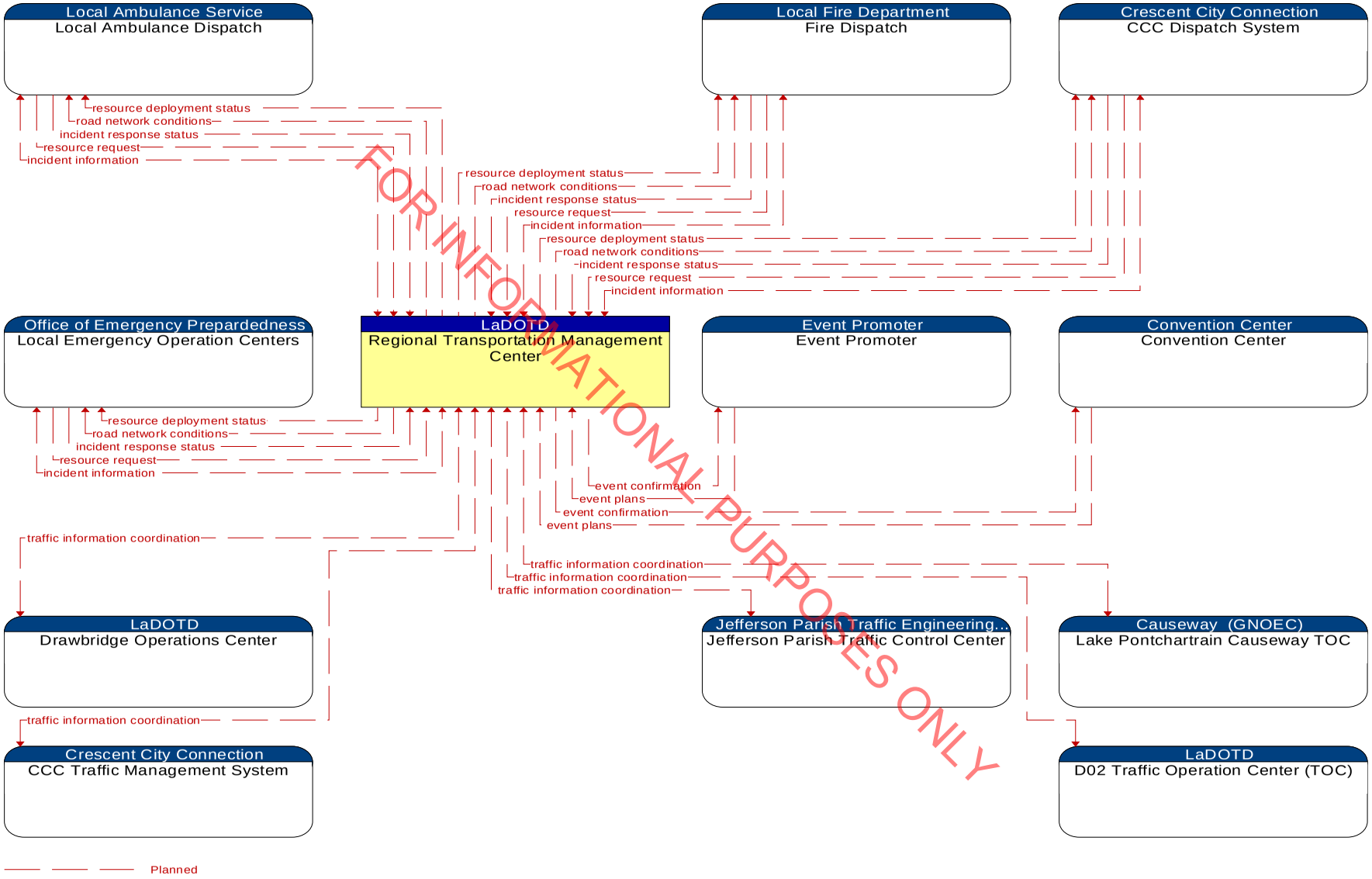

Figure 9: RTMC Interfaces - Incident Management (1 of 2)

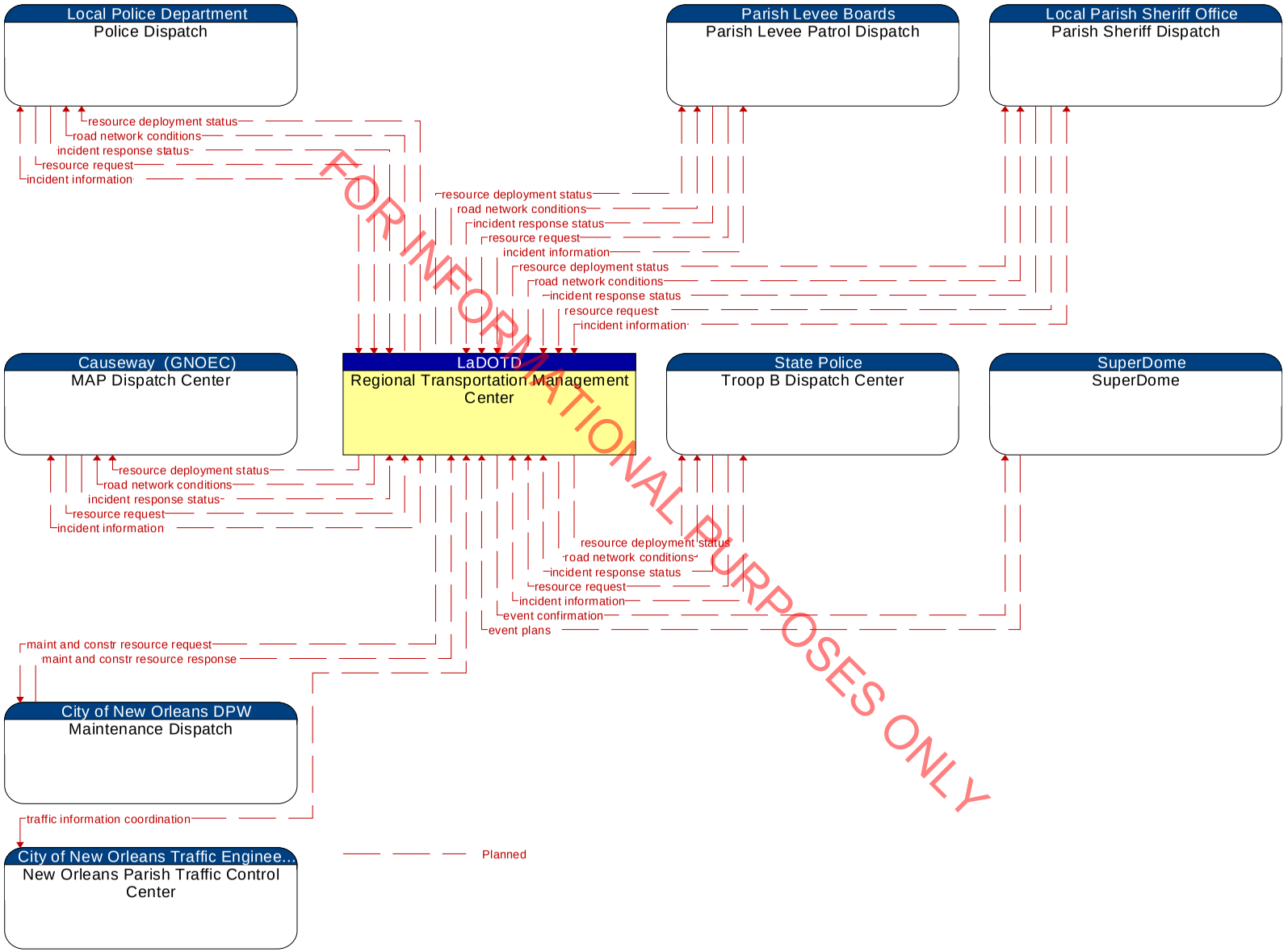

Figure 10: RTMC Interfaces - Incident Management (2 of 2)

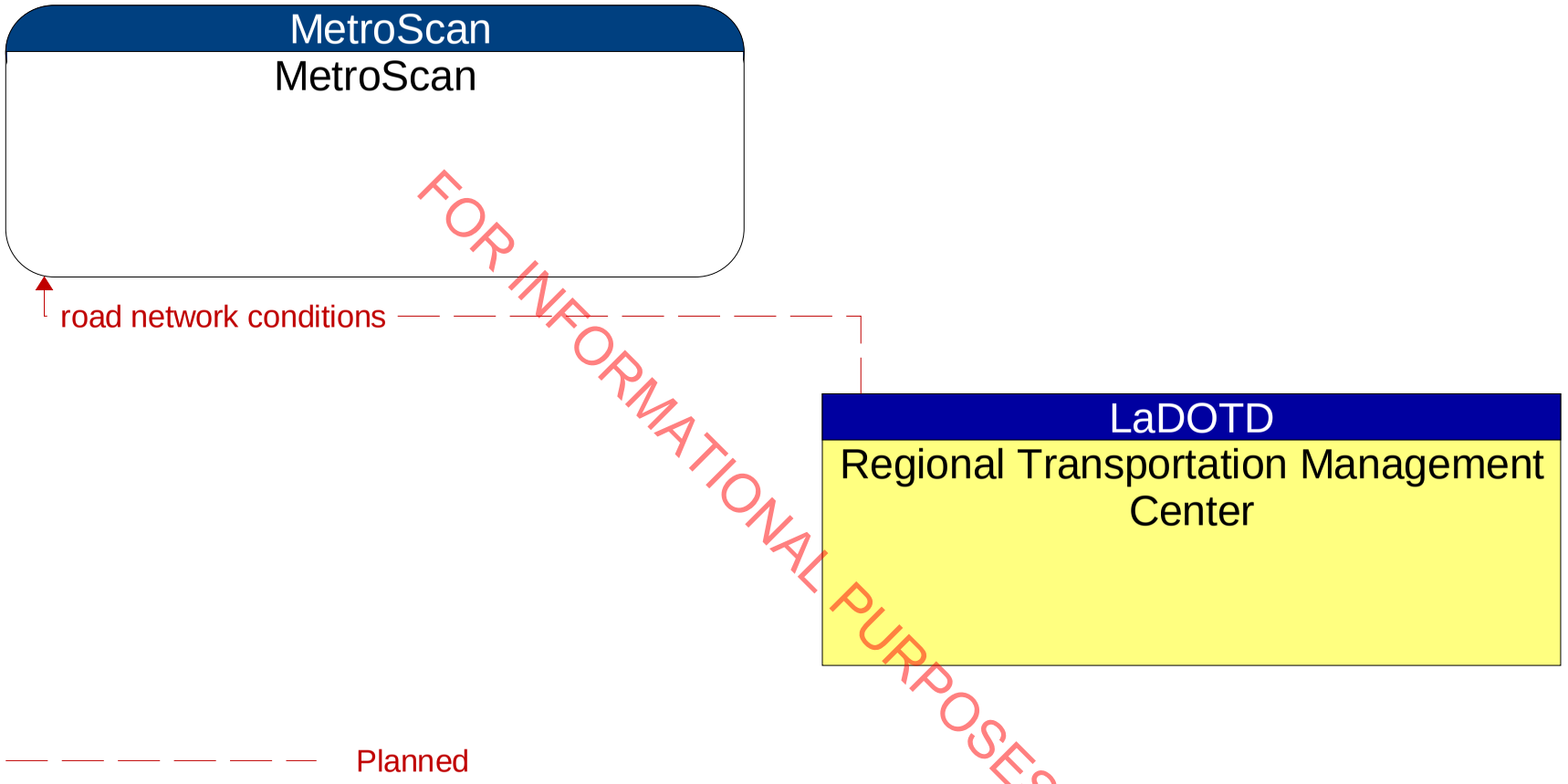

Figure 11: RTMC Interfaces - Broadcast Traveler Information

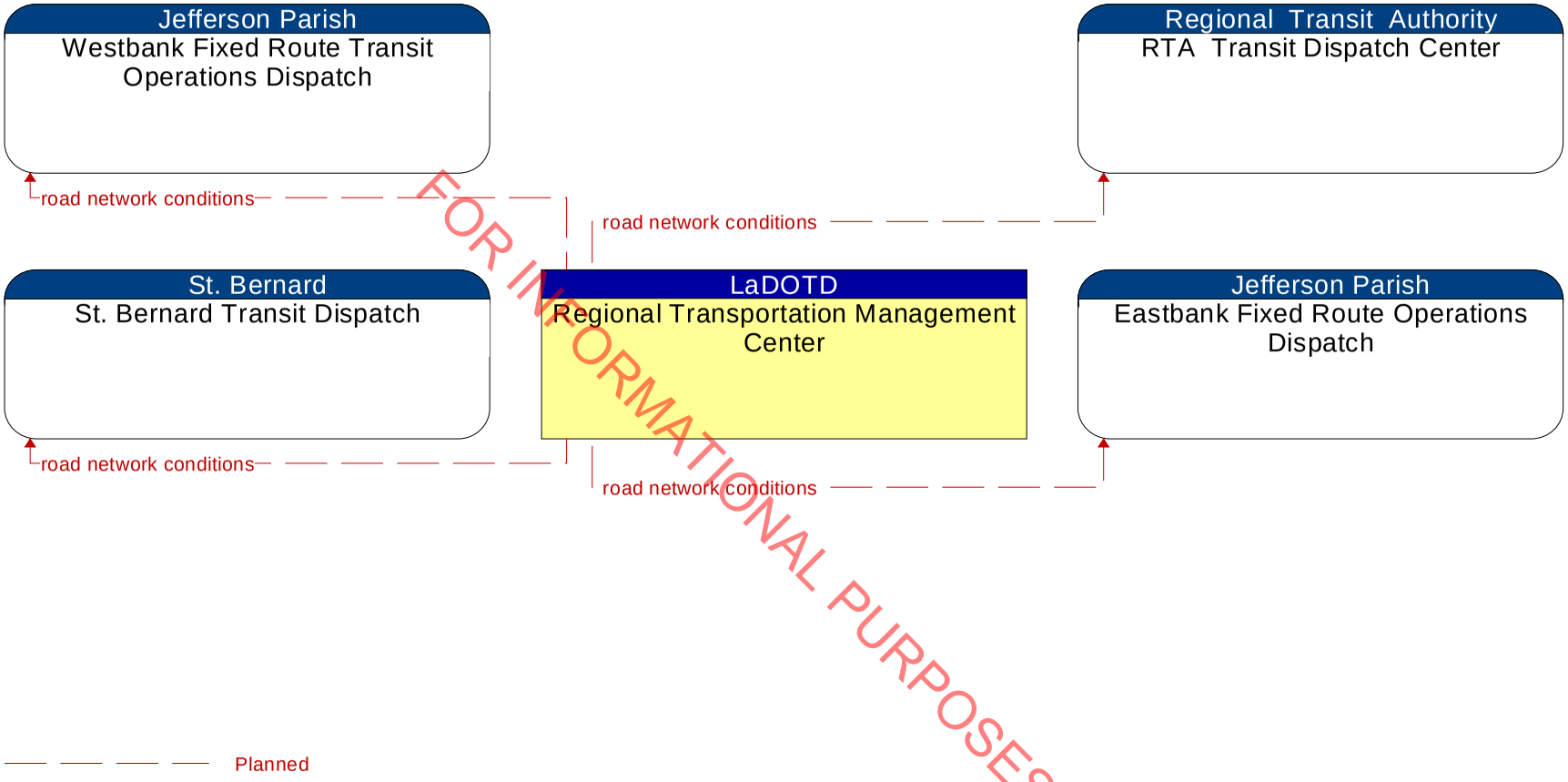

Figure 12: RTMC Interfaces - Transit Fixed Route Operations

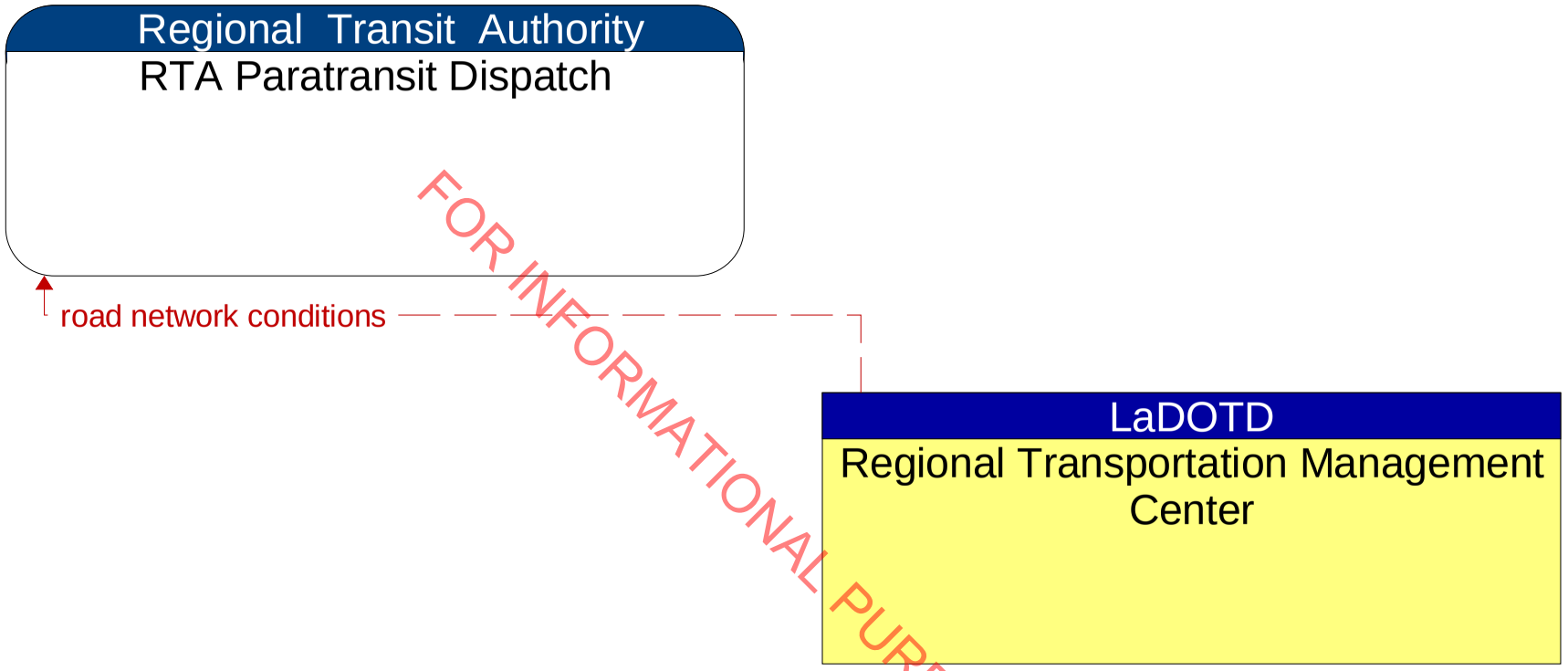

Figure 13: RTMC Interfaces - Demand Response Transit Operations

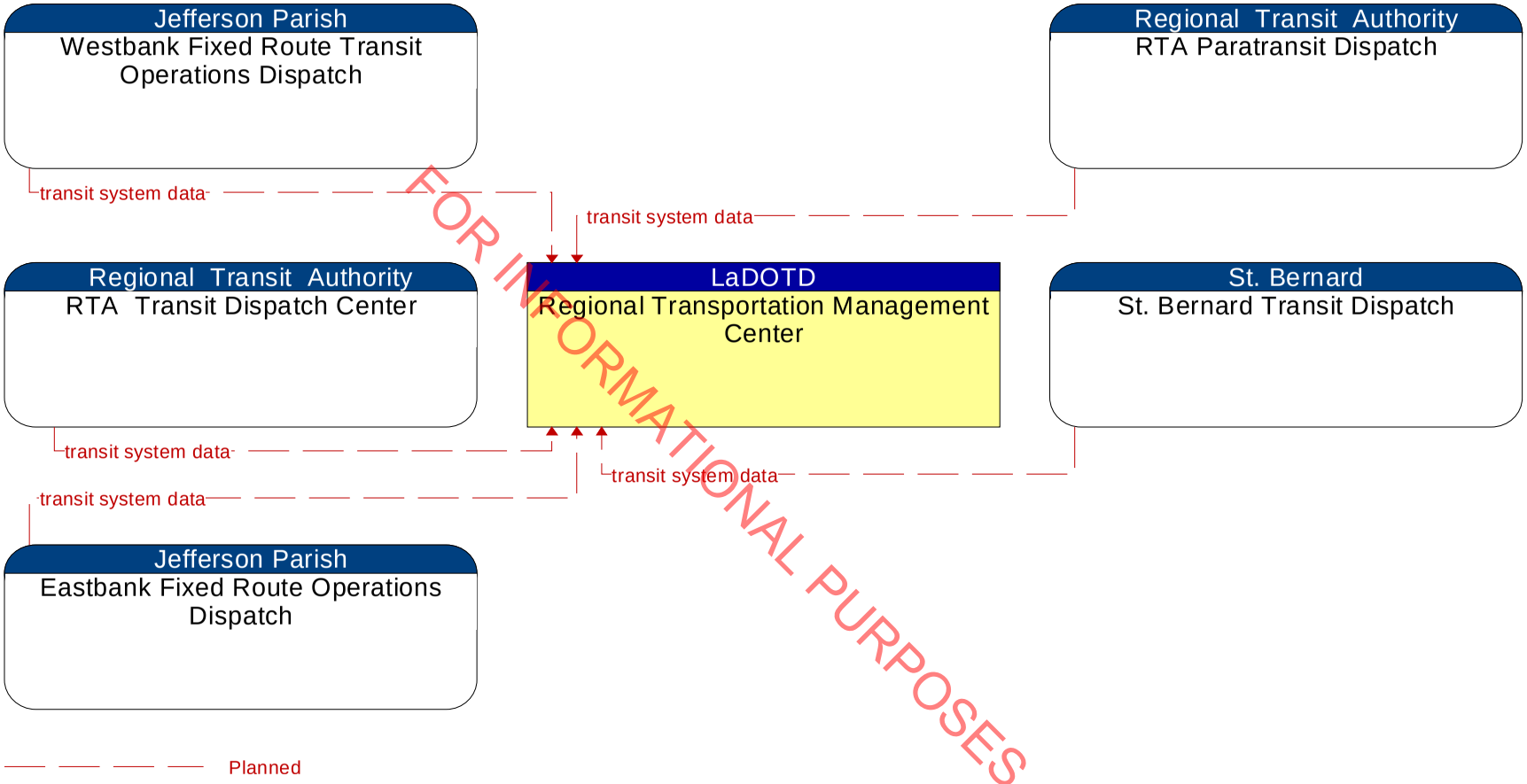

Figure 14: RTMC Interfaces - Multi-modal Coordination

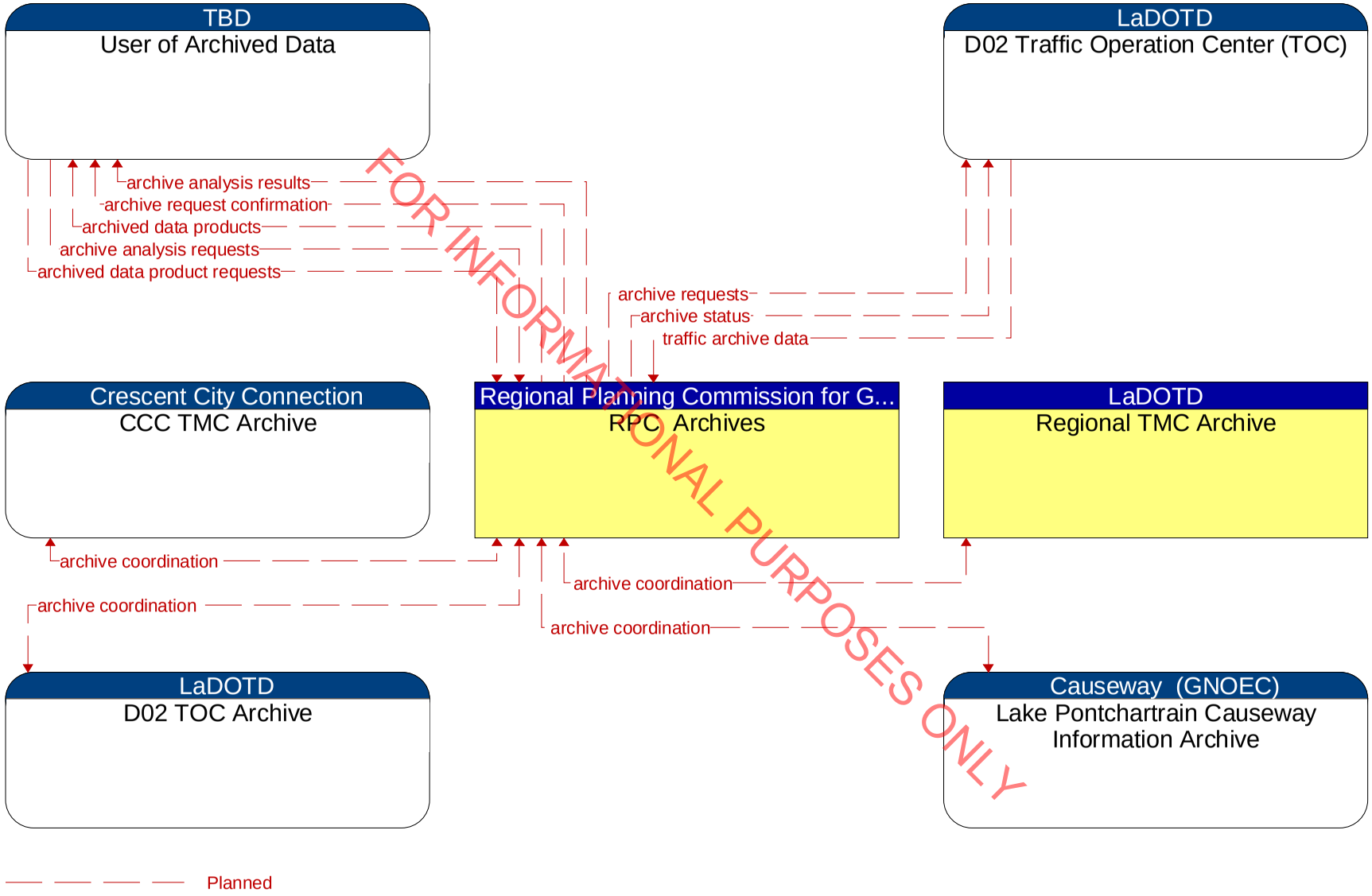

Figure 15: RTMC Interfaces - RPC Archival Interfaces

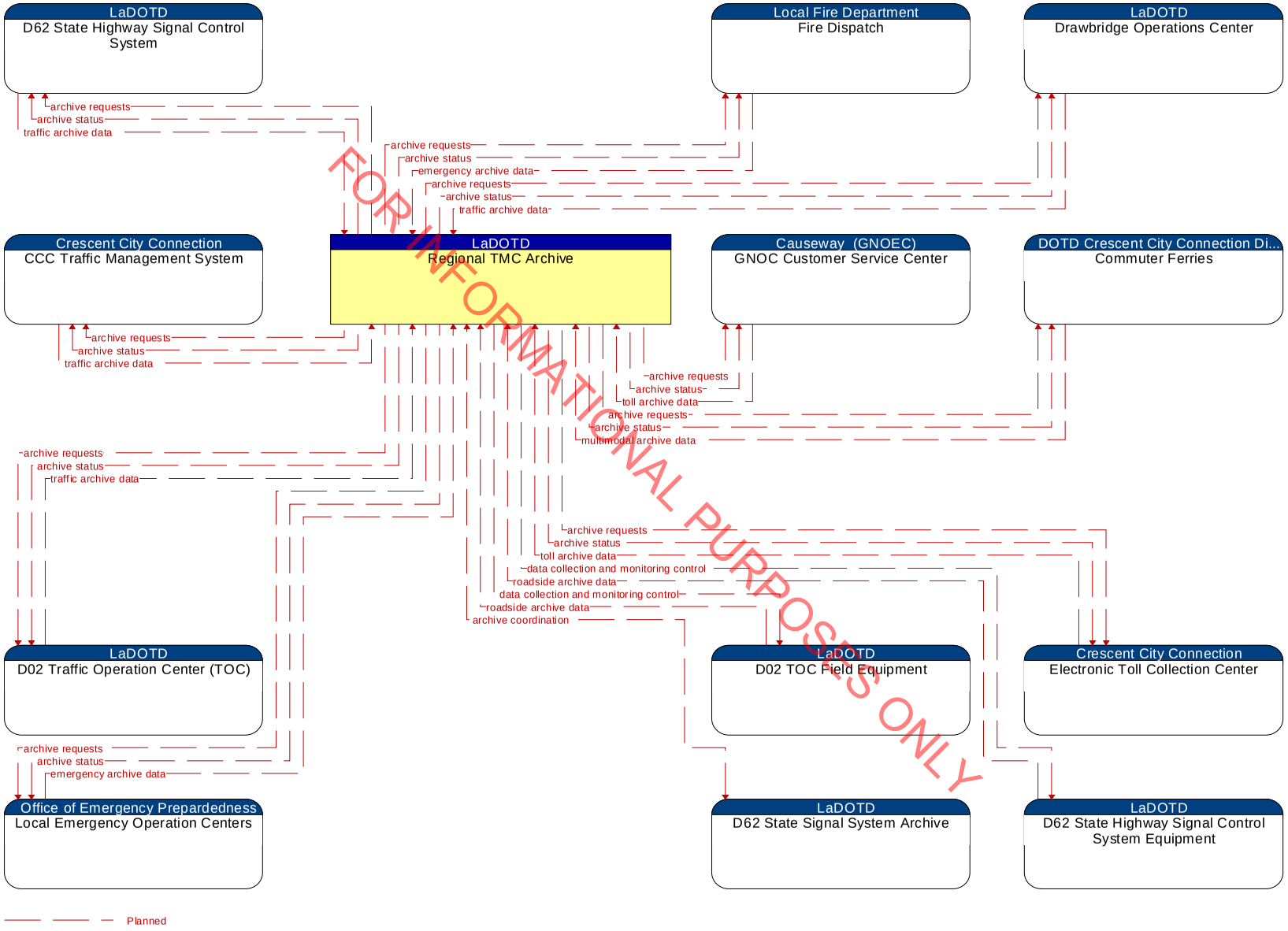

Figure 16: RTMC Interfaces - Regional TMC Archive (1 of 3)

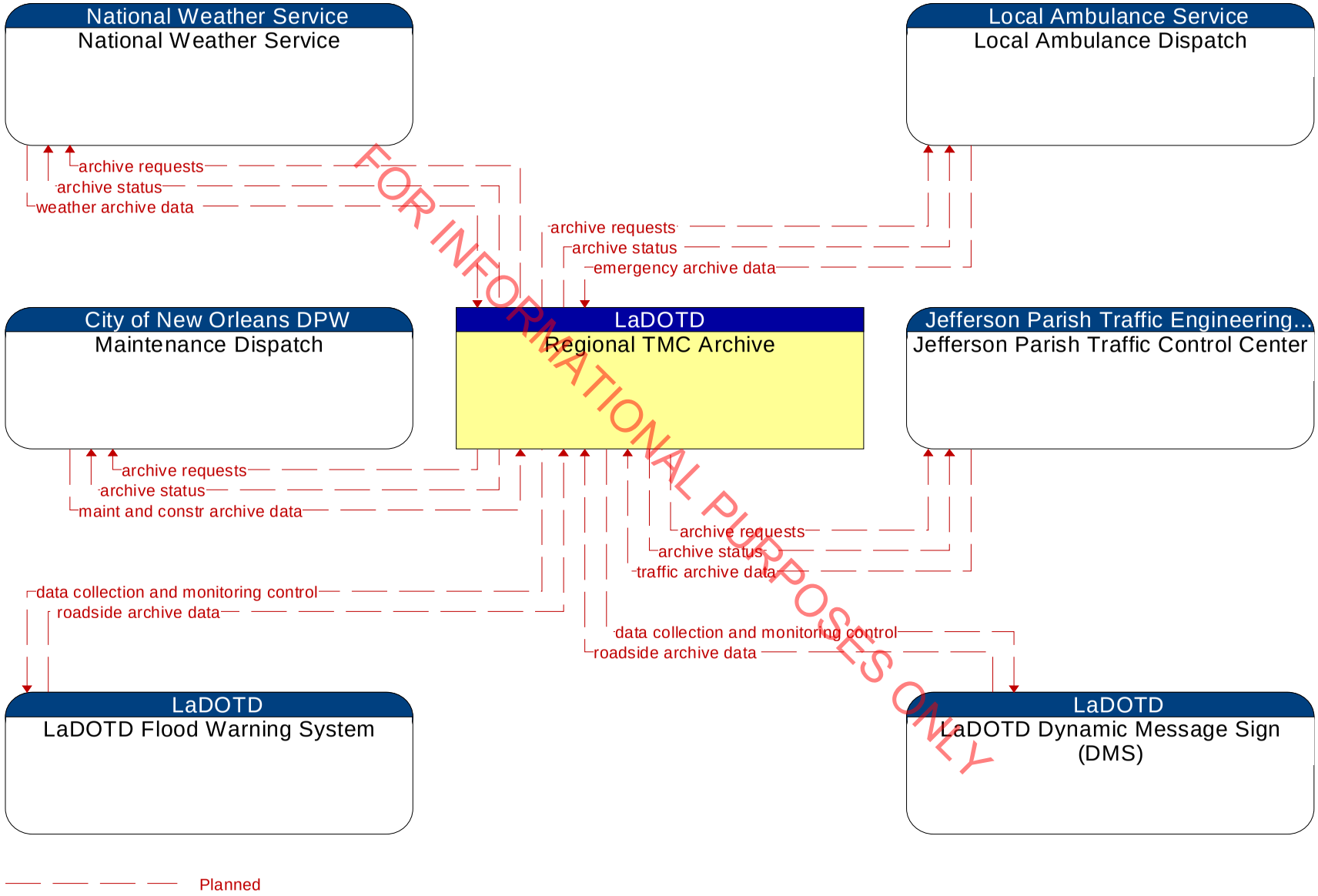

Figure 17: RTMC Interfaces - Regional TMC Archive (2 of 3)

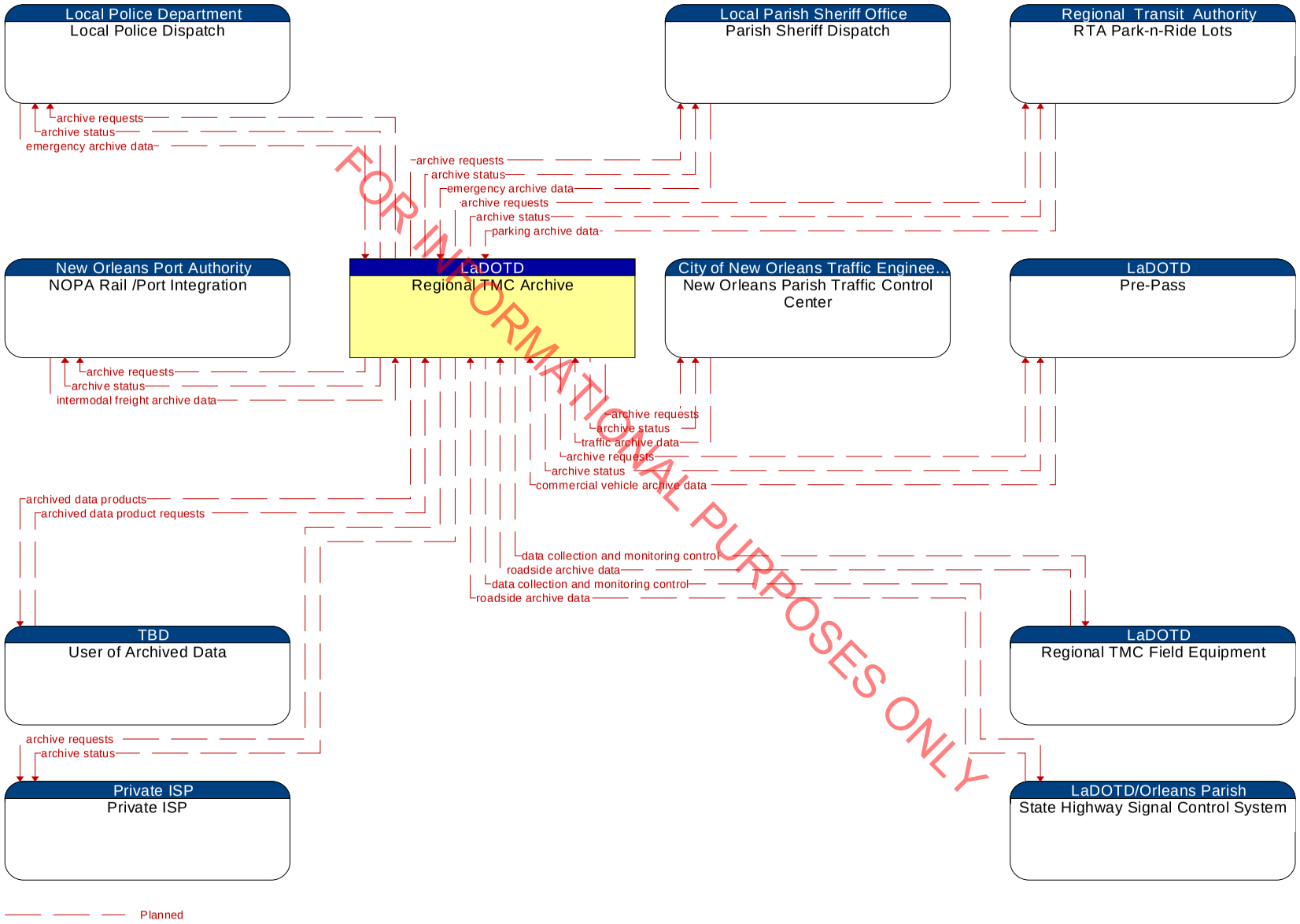

Figure 18: RTMC Interfaces - Regional TMC Archive (3 of 3)

Appendix B

Cooperative Endeavor Agreement (CEA)
This appendix contains a scanned copy of the CEA entered into by DOTD and RPC for the RTMC in May of 2007.

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

COOPERATIVE ENDEAVOR AGREEMENT
REGIONAL TRAFFIC MANAGEMENT CENTER

WITH

REGIONAL PLANNING COMMISSION
Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes

THIS AGREEMENT, made and executed in four (4) original copies on this 16th day of May, 2007, by and among the Department of Transportation and Development, through it's Secretary ("DOTD"), and the Regional Planning Commission ("RPC"), a political subdivision of the State of Louisiana, through its Executive Director, to serve the public as hereinafter provided;

WITNESSETH: That,

WHEREAS, Article VII, Section 14, of the Constitution of the State of Louisiana provides that "for a public purpose, the state and its political subdivisions ... may engage in cooperative endeavors with each other ... ; and ,

WHEREAS, the parties wish to cooperate with each other in the development, implementation, and operation of the Intelligent Transportation Systems (ITS) in the Greater New Orleans Metropolitan Transportation Management Area and the State of Louisiana to benefit the public by means of more effective traffic control, incident management, and improved safety; and,

WHEREAS, it is more economically feasible for agencies responsible for traffic and incident management to co-locate in such a facility to deliver seamless transportation and planning services in a region and state; and.

WHEREAS, the parties are entering into this cooperative endeavor agreement to govern each parties' duties and responsibilities with regard to operation, maintenance, and funding responsibilities for the Regional Traffic Management Center; and

WHEREAS, the RPC has defined federal funding participation for a portion of the communications and information infrastructure system for the RTMC and the DOTD is committed to the matching requirements of these federal funds and the portion of funding in this package not eligible for federal participation; and

WHEREAS, the DOTD and the RPC wish to clarify their responsibilities in funding and managing joint regional/state operations utilizing the above referenced RTMC.

NOW THEREFORE, in consideration of the mutual covenants herein contained, the parties hereto agree as follows:

ARTICLE I – SCOPE OF SERVICES

It is the intent of each of the parties hereto that the RTMC shall be maintained as a preeminent "state-of-the art" ITS facility for the duration of this agreement.

RESPONSIBILITIES OF RPC

The RPC agrees to provide DOTD with the following services as an integral component of the operation of the RTMC:

1. Maintain and update the Regional Intelligent Transportation System (ITS), as needed.

2. Provide annual technical support which includes:

    a. Traffic Surveillance Program

    b. Congestion Management System Process

    c. Intelligent Transportation System Planning

    d. Incident Management Program Development

    e. Transportation Safety and Access Management

    f. Bike and Pedestrian Plan

    g. GIS support for RTMC and related UWP Programs

3. General Maintenance of the RTMC Building and Grounds.

4. An initial capital funding of $2,500,000.

5. An Annual commitment of $250,000/year of RPC Urban Attributable funds for ITS related deployment.

6. Staffing support to include, but not limited to, one (1) traffic engineer, two (2) planning internships, and one (1) qualified information management systems support person.

RESPONSIBILITIES OF DOTD

The DOTD agrees to erect a structure for the RTMC, as well as purchase, the communications and information infrastructure equipment necessary, including a video wall display system, to implement ITS operation and provide the following to RPC:

1. The complete second floor of this structure comprising approximately 11,900 square feet, all as more specifically shown on the attached plan marked as Exhibit "A" to be built out per RPC specifications.

2. Reasonable access to all common areas and meeting rooms.

3. Reasonable access to the DOTD equipment and/or data relating to the operation of the ITS Facility

4. Telecommunication/internet equipment and service

5. Access to non-restricted keyed entry areas. Reservations for the library, conference rooms and classrooms must be obtained from the District Administrator or his designee in advance of use. Common areas will not be restricted.

The DOTD agrees to pay all normal operating expenses (lights, HVAC, water, sewer) of the RTMC.

The office of Facility Planning must review the building plans for code requirements.

ARTICLE II – TERM

This Agreement shall become effective from the date of approval by the Division of Administration, Office of Contractual Review, and shall remain in effect for twenty-five (25) years, with options to renew for two (2) five (5) year periods thereafter if the parties agree.

ARTICLE III – TERMINATION

The DOTD may terminate this Agreement for cause based upon the failure of the RPC to comply with the terms and/or conditions of the Agreement; provided that the DOTD shall give the RPC written notice specifying the failure. If within sixty (60) days after receipt of such notice, the RPC shall not have corrected such failure and thereafter proceeded diligently to complete such correction, then the Agreement shall terminate on the date specified in the notice. The RPC may exercise any rights available to it under Louisiana law to terminate for cause upon the failure of the DOTD to comply with the terms and conditions applicable to it under this Agreement; provided that the RPC shall give the DOTD written notice specifying the failure and a sixty (60) day period within which DOTD may cure the effect.

Either party may terminate this Agreement at any time by giving thirty (30) days written notice to the other party.

Upon termination of the agreement, whether for cause or without cause, DOTD shall have the option to purchase from RPC its share of any of the equipment owned by the parties hereto in indivision. The cost of this equipment shall be based upon the fair market value of the equipment at the time DOTD exercises this option.

ARTICLE IV – OWNERSHIP/MAINTENANCE

All records, reports, documents, equipment and other movable property generated or provided by the DOTD under this Agreement shall remain the property of the DOTD. All records, reports, documents, equipment and other movable property generated or provided by the RPC under this Agreement shall remain the property of the RPC. The DOTD shall install and maintain all ITS communications equipment in the RTMC facility for the duration of this agreement.

It is further understood by both parties hereto that an appropriate process and cost allocation must be established for the replacement, exchange and upgrade of outmoded equipment. The cost allocation and process for replacement, exchange and upgrade will be identified in a Memorandum of Understanding between the parties hereto at a future date.

All future equipment acquired during the term of this agreement shall be owned by the party purchasing the equipment and shall be maintained by said owner, unless otherwise agreed by the parties hereto in writing.

ARTICLE V – ASSIGNMENT

The RPC shall not assign any interest in this Agreement and shall not transfer any interest in same (whether by assignment or novation), without prior written consent of the DOTD.

ARTICLE VI – AUDIT

The RPC agrees that the DOTD Auditors, the Legislative Auditor of the State of Louisiana and/or the Office of the Governor, Division of Administration auditors shall the option of auditing all accounts of the RPC which relate to this Agreement.

ARTICLE VII – DISCRIMINATION

The DOTD and RPC agree to abide by the requirements of the following as applicable: Title VI and VII of the Civil Rights Act of 1964, as amended by the Equal Opportunity Act of 1972, Federal Executive Order 11246, the Federal Rehabilitation Act of 1973, as amended, the Vietnam Era Veteran's Readjustment Assistance Act of 1974, Title IX of the Education Amendments of 1972, the Age Act of 1975, and the Americans with Disabilities Act of 1990.

The DOTD and RPC agree not to discriminate in its employment practices, and will render services under this Agreement without regard to race, color, religion, sex, sexual orientation, national origin, veteran status, political affiliation, or disabilities.

Any act of discrimination committed by the DOTD or RPC, or failure to comply with these statutory obligations when applicable shall be grounds for termination of this Agreement.

ARTICLE VIII- AMENDMENTS

The DOTD and RPC agree that any amendment to this Cooperative Agreement must be in writing and executed by both parties.

ARTICLE IX – FISCAL FUNDING

The continuation of this contract is contingent upon the appropriation of funds to fulfill the requirements of the contract by the legislature. If the legislature fails to appropriate sufficient monies to provide for the continuation of the contract, or if such appropriation is reduced by the veto of the Governor or by any means provided in the appropriations act to prevent the total appropriation for the year from exceeding revenues for that year, or for any other lawful purpose, and the effect of such reduction is to provide insufficient monies for the continuation of the contract, the contract shall terminate on the date of the beginning of the first fiscal year for which funds are not appropriated.

ARTICLE X – IMPLEMENTATION OF APPROVAL

KBB 2005 - 14 hereby orders that unless exempted by written delegation of authority granted by the director of the Office of Contractual Review, Division of Administration, with the approval of the commissioner of administration, each department, commission, board, agency, and/or office in the executive branch of the state of Louisiana (hereinafter "department") shall submit all cooperative endeavor agreements (hereinafter "agreements") which require the expenditure of public funds to the Office of Contractual Review for review and approval.

IN WITNESS THEREOF, the parties have caused these presents to be executed by their respective officers thereunto duly authorized as of the day and year first above written.

WITNESSES:

Witness for First Party

Witness for First Party

REGIONAL PLANNING COMMISSION

BY: Walter Brooks

Walter Brooks
Typed or Printed Name

TITLE: Executive Director

72-0595531
Federal Identification Number

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION
AND DEVELOPMENT

Witness for Second Party

BY:
Johnny B. Bradberry
Secretary

RECOMMENDED FOR APPROVAL:

Witness for Second Party

BY:
Gordon E. Nelson, P.E.
Assistant Secretary for Operations

Number 07-1005

RESOLUTION

REGIONAL PLANNING COMMISSION

JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES

Cooperative Endeavor Agreement
Regional Traffic Management Center
Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes

Introduced by Richard Kelley, seconded by Aaron Broussard on the 8th day of May, 2007.

WHEREAS, Article VII, Section 14 of the Constitution of the state of Louisiana provides that "for a public purpose, the state and its political subdivisions...may engage in cooperative endeavors with each other...; and

WHEREAS, the parties wish to cooperate with each other in the development, implementation, and operation of the Intelligent Transportation Systems (ITS) in the greater New Orleans Metropolitan Transportation Management Area and the state of Louisiana to benefit the public by means of more effective traffic control, incident management, and improved safety; and

WHEREAS, the parties are entering into this cooperative endeavor agreement to govern each parties' duties and responsibilities with regard to operation, maintenance, and funding responsibilities for the Regional Traffic Management Center.

NOW, THEREFORE, BE IT RESOLVED THAT:

The Regional Planning Commission hereby authorizes the Chairman and/or Executive Director to execute on behalf of the Regional Planning Commission the required contractual agreements between the Louisiana Department of Transportation and Development and the Regional Planning Commission for the Regional Traffic Management Center.

Whereupon, after discussion, the question was called and resulted in the following:

AYES: 18 NAYS: 0 ABSTENTIONS: 0

Henry J. Rodriguez, Jr.
HENRY J. RODRIGUEZ, JR.
CHAIRMAN

Billy Nungesser
BILLY NUNGESSER
SECRETARY

Appendix C

Traceability Matrix

This appendix contains a table that allows the reader to trace between the needs and the requirements. It further identifies the "parent-child" relationship of the requirements. The "System Implemented" fields are to be filed in during the construction of the center to show which system/device has been implemented to fulfill the requirement. A "Sign-off" field has also been provided for the agency project engineer to sign that he/she has verified that the system/device has been successfully implemented and has validated that the system/device has completely fulfilled the requirement.

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
Need_1	Develop a Regional Transportation Management Center (RTMC) facility to perform and manage transportation management functions and manage the ITS assets.	RTMC	SysReq_86	The RTMC facility shall contain a traffic management control room.	SysReq_14	The RTMC facility shall provide the infrastructure to perform traffic management functions.	SysReq_1	The RTMC facility shall provide the infrastructure to perform incident management functions.				
							SysReq_2	The RTMC facility shall provide the infrastructure to perform event management functions.				
							SysReq_3	The RTMC facility shall provide the infrastructure to perform emergency management functions.				
							SysReq_15	The RTMC facility shall provide the infrastructure to generate traveler information.	SysReq_4	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through highway advisory radio.		
									SysReq_5	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through dynamic message signs.		
									SysReq_6	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial television.		
									SysReq_7	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial radio.		
							SysReq_16	The RTMC facility shall provide the infrastructure to perform Ccommercial vVehicle oOperations (CVO) functions.	SysReq_8	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from traffic information.		
									SysReq_9	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from event information.		
									SysReq_10	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from emergency information.		
Need_2	RTMC needs to support the following basic transportation management functions: - Incident Management - Event Management - Emergency Management - Advanced Public Transit Systems Management	RTMC	SysReq_1	The RTMC facility shall provide the infrastructure to perform incident management functions.								
			SysReq_2	The RTMC facility shall provide the infrastructure to perform event management functions.								
			SysReq_3	The RTMC facility shall provide the infrastructure to perform emergency management functions.								
			SysReq_86	The RTMC facility shall contain a traffic management control room.	SysReq_14	The RTMC facility shall provide the infrastructure to perform traffic management functions.	SysReq_1	The RTMC facility shall provide the infrastructure to perform incident management functions.				
							SysReq_2	The RTMC facility shall provide the infrastructure to perform event management functions.				
							SysReq_3	The RTMC facility shall provide the infrastructure to perform emergency management functions.				
							SysReq_15	The RTMC facility shall provide the infrastructure to generate traveler information.	SysReq_4	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through highway advisory radio.		
									SysReq_5	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through dynamic message signs.		
									SysReq_6	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial television.		
									SysReq_7	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial radio.		
							SysReq_16	The RTMC facility shall provide the infrastructure to perform Ccommercial vVehicle oOperations (CVO) functions.	SysReq_8	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from traffic information.		

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
									SysReq_9	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from event information		
									SysReq_10	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from emergency information		
			SysReq_186	The RTMC facility shall provide the infrastructure to perform Advanced Public Transit Systems Management functions.								
Need_3	The RTMC needs to provide a facility to broadcast real-time traveler information such that the traveler can make timely mode choices through HAR, Dynamic Message Signs, and commercial television and radio.	RTMC	SysReq_4	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through highway advisory radio.								
			SysReq_5	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through dynamic message signs.								
			SysReq_6	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial television.								
			SysReq_7	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial radio.								
			SysReq_86	The RTMC facility shall contain a traffic management control room.	SysReq_14	The RTMC facility shall provide the infrastructure to perform traffic management functions.	SysReq_1	The RTMC facility shall provide the infrastructure to perform incident management functions.				
							SysReq_2	The RTMC facility shall provide the infrastructure to perform event management functions.				
							SysReq_3	The RTMC facility shall provide the infrastructure to perform emergency management functions.				
							SysReq_15	The RTMC facility shall provide the infrastructure to generate traveler information.	SysReq_4	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through highway advisory radio		
									SysReq_5	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through dynamic message signs		
									SysReq_6	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial television		
									SysReq_7	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial radio		
							SysReq_16	The RTMC facility shall provide the infrastructure to perform Ccommercial vVehicle oOperations (CVO) functions.	SysReq_8	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from traffic information		
									SysReq_9	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from event information		
									SysReq_10	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from emergency information		
Need_4	The RTMC needs to provide the infrastructure to gather real-time traveler, event, and emergency information for processing and provide routing for Commercial Vehicle Operations (CVO).	RTMC	SysReq_8	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from traffic information.								
			SysReq_9	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from event information.								

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
			SysReq_10	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from emergency information								
			SysReq_86	The RTMC facility shall contain a traffic management control room.	SysReq_14	The RTMC facility shall provide the infrastructure to perform traffic management functions.	SysReq_1	The RTMC facility shall provide the infrastructure to perform incident management functions.				
							SysReq_2	The RTMC facility shall provide the infrastructure to perform event management functions.				
							SysReq_3	The RTMC facility shall provide the infrastructure to perform emergency management functions.				
							SysReq_15	The RTMC facility shall provide the infrastructure to generate traveler information.	SysReq_4	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through highway advisory radio		
									SysReq_5	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through dynamic message signs		
									SysReq_6	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial television		
									SysReq_7	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial radio		
							SysReq_16	The RTMC facility shall provide the infrastructure to perform Ccommercial vVehicle oOperations (CVO) functions.	SysReq_8	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from traffic information		
									SysReq_9	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from event information		
									SysReq_10	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from emergency information		
Need_6	The RTMC needs to be a multi-functional facility that will provide the infrastructure for the Regional Planning Commission staff co-located with DOTD.	RTMC	SysReq_11	The RTMC facility shall provide space for Regional Planning Commission staff.	SysReq_17	The RTMC facility shall contain the infrastructure for the RPC staff's day-to-day work activities.						
			SysReq_12	The RTMC facility shall provide space for Department of Transportation and Development (District 02 Traffic Engineering Division) staff.	SysReq_18	The RTMC facility shall contain the infrastructure for the DOTD staff's day-to-day work activities.						
Need_7	RTMC infrastructure provides an integration point for information and the distribution of timely modal information choices to the traveler	RTMC	SysReq_4	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through highway advisory radio								
			SysReq_5	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through dynamic message signs								
			SysReq_6	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial television								
			SysReq_7	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial radio								
			SysReq_8	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from traffic information								
Need_8	The RTMC needs to provide links among the following systems: transportation planning, database systems, and evaluation, and deployment of ITS technologies and Homeland Security preparedness and response	RTMC	SysReq_13	The RTMC facility shall contain linkages between: (transportation planning database systems, evaluation, and deployment of ITS technologies); and the Homeland Security (HLS) preparedness and response.								

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
Need_9	RTMC to facilitate the following Transportation management functions: - Provide traffic management - Provide traveler information - Provide emergency vehicle priority systems* - Improve commercial vehicle operations	RTMC	SysReq_14	The RTMC facility shall provide the infrastructure to perform traffic management functions.	SysReq_1	The RTMC facility shall provide the infrastructure to perform incident management functions.						
					SysReq_2	The RTMC facility shall provide the infrastructure to perform event management functions.						
					SysReq_3	The RTMC facility shall provide the infrastructure to perform emergency management functions.						
					SysReq_15	The RTMC facility shall provide the infrastructure to generate traveler information.	SysReq_4	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through highway advisory radio.				
							SysReq_5	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through dynamic message signs.				
							SysReq_6	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial television.				
							SysReq_7	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial radio.				
					SysReq_16	The RTMC facility shall provide the infrastructure to perform Ccommercial vVehicle oOperations (CVO) functions.	SysReq_8	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from traffic information.				
							SysReq_9	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from event information.				
							SysReq_10	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from emergency information.				
			SysReq_15	The RTMC facility shall provide the infrastructure to generate traveler information.	SysReq_4	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through highway advisory radio.						
					SysReq_5	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through dynamic message signs.						
					SysReq_6	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial television.						
					SysReq_7	The RTMC facility shall provide the infrastructure to broadcast real-time traveler information through commercial radio.						
			SysReq_16	The RTMC facility shall provide the infrastructure to perform Ccommercial vVehicle oOperations (CVO) functions.	SysReq_8	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from traffic information.						
					SysReq_9	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from event information.						
					SysReq_10	The RTMC facility shall provide the infrastructure to generate alterative routing for Commercial Vehicle Operations (CVO) from emergency information.						
Need_10	The RTMC needs to provide facilities for day to day usage for RPC and DOTD staff work activities	RTMC	SysReq_17	The RTMC facility shall contain the infrastructure for the RPC staff's day-to-day work activities.								
			SysReq_18	The RTMC facility shall contain the infrastructure for the DOTD staff's day-to-day work activities.								

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
Need_11	The RTMC needs to provide flexible communications and networking within the facility to accommodate: - RPC work activities - DOTD administration functions - Transportation management functions	RTMC	SysReq_19	The RTMC facility shall provide a networking infrastructure that is reconfigurable to accommodate RPC work activities.	SysReq_24	The RTMC facility shall provide an independent network for the RPC staff's work activities.						
					SysReq_26	The RTMC facility shall provide a wireless network for RPC staff's work activities.						
			SysReq_20	The RTMC facility shall provide a networking infrastructure that is reconfigurable to accommodate DOTD administration functions.	SysReq_25	The RTMC facility shall provide a secure wireless network for DOTD staff's work activities.						
					SysReq_22	The RTMC facility shall provide an independent network for the DOTD staff's work activities.						
			SysReq_21	The RTMC facility shall provide a networking infrastructure that is reconfigurable to accommodate transportation management functions.	SysReq_23	The RTMC facility shall provide an independent network for the traffic management field devices.						
Need_12	RTMC facility needs to be configurable internally to accommodate partner operations with the RPC and DOTD	RTMC	SysReq_61	The control room shall provide reconfigurable floor space for additional regional partners.	SysReq_63	The RTMC facility power shall be reconfigurable to accommodate the reconfiguration of the control room floor space.						
			SysReq_62	The RTMC facility security access shall be reconfigurable to accommodate the reconfiguration of the control room floor space for additional regional partners.								
			SysReq_63	The RTMC facility power shall be reconfigurable to accommodate the reconfiguration of the control room floor space.								
Need_13	Space within the control room needs to configurable to accommodate additional functions impacted by additional regional partners.	Control Room	SysReq_59	The RTMC facility shall provide reconfigurable floor space to accommodate RPC functions.								
			SysReq_60	The RTMC facility shall provide reconfigurable floor space to accommodate DOTD functions.								
			SysReq_61	The control room shall provide reconfigurable floor space for additional regional partners.	SysReq_63	The RTMC facility power shall be reconfigurable to accommodate the reconfiguration of the control room floor space.						
			SysReq_62	The RTMC facility security access shall be reconfigurable to accommodate the reconfiguration of the control room floor space for additional regional partners.								
			SysReq_63	The RTMC facility power shall be reconfigurable to accommodate the reconfiguration of the control room floor space.								
Need_14	Security access, power, and communications needs to be adaptable with the RTMC to the reconfiguration of rooms, user and utility space.	RTMC	SysReq_62	The RTMC facility security access shall be reconfigurable to accommodate the reconfiguration of the control room floor space for additional regional partners.								
			SysReq_63	The RTMC facility power shall be reconfigurable to accommodate the reconfiguration of the control room floor space.								
Need_15	Parking space is needed at the Tower Parking facility for commercial television and radio to park television and radio broadcast vehicles and have data feeds with a standard interface	Tower Parking facility	SysReq_57	The tower parking facility shall provide the infrastructure for four (4) interfaces that will transmit real-time media broadcast.								
			SysReq_175	Security measures shall be provided for the RTMC parking facility.	SysReq_84	The RTMC facility shall implement adequate lighting systems around its parking facilities.						
					SysReq_119	The parking facility shall have dedicated video surveillance.						
					SysReq_120	The parking facility shall use a 24 hour, 365 day unmanned monitoring system that is recordable.						
					SysReq_121	The parking facility surveillance shall be viewable from remote locations.						
					SysReq_179	The parking facility video shall be viewable in the RTMC.						
Need_16	The RTMC needs back-up power for the operation critical equipment during inclement weather.	RTMC	SysReq_66	The RTMC facility shall contain backup power generation for the operation of critical equipment in inclement weather.	SysReq_111	Notification shall be given to the operators when the system is running on backup power.						

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
Need_17	The RTMC needs to provide alternatives and back-up systems (power and air conditioning) to those that are critical for operations.	RTMC	SysReq_67	The RTMC facility shall contain redundancy for elements that are critical for operations in inclement weather.								
Need_19	Need for alarm of entry ways into the facility as well as entry ways to critical and secure areas.	RTMC	SysReq_69	The RTMC facility shall contain entry way security into the facility.	SysReq_70	The RTMC facility shall contain "access card" readers for limited facility entry points.	SysReq_113	Three external doors shall have access card control as identified on the building plan sheets.				
							SysReq_115	Access card readers shall be installed on the following 9 doors within the RTMC: 1) Front Door (101A) 2) Rear Door (ST2-1B) 3) First floor DOTD section (102A) 4) Control room (103B) 5) Second floor RPC section (202A) 6) Display access room (b/w computer room/control room) 7) Roof access door (ST1-3A) 8)Computer room (147A) 9) Second floor rear door (ST2-2A	SysReq_117	Access card readers shall be installed in specific locations that are identified on the building plan sheets.		
							SysReq_118	Card controlled doors shall be monitored through an on-line access control system.				
					SysReq_72	The RTMC facility shall contain dedicated video surveillance of all facility external doors.						
					SysReq_81	The RTMC facility shall implement adequate lighting systems at all entry points within the facility.						
					SysReq_82	The RTMC facility shall implement adequate lighting systems at all exit points within the facility.						
					SysReq_114	All internal doors with card access shall have status sensors on them.						
					SysReq_187	The second floor shall contain dedicated video surveillance of all 3 points of entry from the first floor.						
			SysReq_70	The RTMC facility shall contain "access card" readers for limited facility entry points.	SysReq_113	Three external doors shall have access card control as identified on the building plan sheets.						
					SysReq_115	Access card readers shall be installed on the following 9 doors within the RTMC: 1) Front Door (101A) 2) Rear Door (ST2-1B) 3) First floor DOTD section (102A) 4) Control room (103B) 5) Second floor RPC section (202A) 6) Display access room (b/w computer room/control room) 7) Roof access door (ST1-3A) 8)Computer room (147A) 9) Second floor rear door (ST2-2A	SysReq_117	Access card readers shall be installed in specific locations that are identified on the building plan sheets.				
					SysReq_118	Card controlled doors shall be monitored through an on-line access control system.						
			SysReq_76	The RTMC facility security alarm notifications shall be sent to a set of pre-determined phone numbers.								
			SysReq_85	The RTMC facility safety alarm notifications shall be sent to a set of pre-determined phone numbers.								
Need_20	RTMC needs to develop a security procedure manual for the facility	RTMC	SysReq_74	The RTMC facility shall have a security procedure manual for the facility.								
			SysReq_178	Environmental safety measures shall be provided for the RTMC.	SysReq_77	The RTMC facility shall implement a safety alarm system for the room overheating						
					SysReq_78	The RTMC facility shall implement a safety alarm system for monitoring carbon dioxide gas.						
					SysReq_79	The RTMC facility shall implement a safety system for circuit overload protection						
					SysReq_80	The RTMC facility shall implement computer room fire suppression systems						
					SysReq_122	The RTMC facility shall implement a safety alarm systems for monitoring carbon monoxide gas.						
Need_21	The RTMC needs internal alarm systems for environmental conditions such as heat, carbon dioxide, and monoxide gases	RTMC	SysReq_77	The RTMC facility shall implement a safety alarm system for the room overheating								
			SysReq_78	The RTMC facility shall implement a safety alarm system for monitoring carbon dioxide gas.								

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
			SysReq_122	The RTMC facility shall implement a safety alarm systems for monitoring carbon monoxide gas.								
			SysReq_178	Environmental safety measures shall be provided for the RTMC.	SysReq_77	The RTMC facility shall implement a safety alarm system for the room overheating						
					SysReq_78	The RTMC facility shall implement a safety alarm system for monitoring carbon dioxide gas.						
					SysReq_79	The RTMC facility shall implement a safety system for circuit overload protection						
					SysReq_80	The RTMC facility shall implement computer room fire suppression systems						
					SysReq_122	The RTMC facility shall implement a safety alarm systems for monitoring carbon monoxide gas.						
Need_22	The RTMC needs circuit overload protection as well as computer room fire suppression systems.	RTMC & Computer Rooms	SysReq_79	The RTMC facility shall implement a safety system for circuit overload protection								
			SysReq_80	The RTMC facility shall implement computer room fire suppression systems								
			SysReq_178	Environmental safety measures shall be provided for the RTMC.	SysReq_77	The RTMC facility shall implement a safety alarm system for the room overheating						
					SysReq_78	The RTMC facility shall implement a safety alarm system for monitoring carbon dioxide gas.						
					SysReq_79	The RTMC facility shall implement a safety system for circuit overload protection						
					SysReq_80	The RTMC facility shall implement computer room fire suppression systems						
					SysReq_122	The RTMC facility shall implement a safety alarm systems for monitoring carbon monoxide gas.						
Need_24	The RTMC needs after hours "key card" access for limited facility entry points as well as internally secure areas such as server rooms, communication hubs etc.	RTMC entry, Server Rooms, & Communications Rooms	SysReq_69	The RTMC facility shall contain entry way security into the facility.	SysReq_70	The RTMC facility shall contain "access card" readers for limited facility entry points.	SysReq_113	Three external doors shall have access card control as identified on the building plan sheets.				
							SysReq_116	Access card readers shall be installed on the following 9 doors within the RTMC: 1) Front Door (101A) 2) Rear Door (ST2-1B) 3) First floor DOTD section (102A) 4) Control room (103B) 5) Second floor RPC section (202A) 6) Display access room (b/w computer room/control room) 7) Roof access door (ST1-3A) 8)Computer room (147A) 9) Second floor rear door (ST2-2A	SysReq_117	Access card readers shall be installed in specific locations that are identified on the building plan sheets.		
							SysReq_118	Card controlled doors shall be monitored through an on-line access control system.				
					SysReq_72	The RTMC facility shall contain dedicated video surveillance of all facility external doors.						
					SysReq_81	The RTMC facility shall implement adequate lighting systems at all entry points within the facility.						
					SysReq_82	The RTMC facility shall implement adequate lighting systems at all exit points within the facility.						
					SysReq_114	All internal doors with card access shall have status sensors on them.						
					SysReq_187	The second floor shall contain dedicated video surveillance of all 3 points of entry from the first floor.						
			SysReq_70	The RTMC facility shall contain "access card" readers for limited facility entry points.	SysReq_113	Three external doors shall have access card control as identified on the building plan sheets.						

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
					SysReq_115	Access card readers shall be installed on the following 9 doors within the RTMC: 1) Front Door (101A) 2) Rear Door (ST2-1B) 3) First floor DOTD section (102A) 4) Control room (103B) 5) Second floor RPC section (202A) 6) Display access room (b/w computer room/control room) 7) Roof access door (ST1-3A) 8)Computer room (147A) 9) Second floor rear door (ST2-2A	SysReq_117	Access card readers shall be installed in specific locations that are identified on the building plan sheets.				
					SysReq_118	Card controlled doors shall be monitored through an on-line access control system.						
Need_25	Three networks are envisioned for the RTMC, one for the RPC, one for the DOTD, and the third network that would gather information from the field devices and bring them back to the TMC.	RTMC	SysReq_22	The RTMC facility shall provide an independent network for the DOTD staff's work activities.								
			SysReq_23	The RTMC facility shall provide an independent network for the traffic management field devices.								
			SysReq_24	The RTMC facility shall provide an independent network for the RPC staff's work activities.								
Need_26	Within the RTMC, there will be a DOTD wireless network and a RPC wireless network and a public wireless network available in all conference rooms, reception area and the library.	Conference Rooms, Library, Public Areas	SysReq_25	The RTMC facility shall provide a secure wireless network for DOTD staff's work activities.								
			SysReq_26	The RTMC facility shall provide a wireless network for RPC staff's work activities.								
			SysReq_27	The RTMC facility shall provide an independent wireless network for public use in all conference rooms.								
			SysReq_28	The RTMC facility shall provide a wireless connection to the Internet for public use in the library.								
			SysReq_185	The RTMC facility shall provide an independent wireless network for public use in the reception area.								
Need_27	Within the RTMC, some applications of the RPC network and DOTD network will be shared between agencies. For example, RPC will need access to the count data collected by DOTD and DOTD will need access to the RPC GIS database	RTMC	SysReq_29	The RPC and DOTD shall share information across their networks.								
Need_28	Within the RTMC, two Internet services are envisioned: one, which is distributed through all the centers through the DOTD backbone in Baton Rouge, and two, a public Internet service in all conference rooms and the library.	RTMC	SysReq_30	The DOTD offices in the RTMC facility shall contain Internet service through the DOTD backbone in Baton Rouge.								
			SysReq_31	The RTMC facility shall provide Internet service.	SysReq_27	The RTMC facility shall provide an independent wireless network for public use in all conference rooms.						
					SysReq_30	The DOTD offices in the RTMC facility shall contain Internet service through the DOTD backbone in Baton Rouge.						
					SysReq_32	The RTMC facility shall contain Internet service in the library.	SysReq_28	The RTMC facility shall provide a wireless connection to the Internet for public use in the library.				
			SysReq_32	The RTMC facility shall contain Internet service in the library.	SysReq_28	The RTMC facility shall provide a wireless connection to the Internet for public use in the library.						
Need_29	The RTMC will provide an IP telephone system(s) for both DOTD and RPC.	RTMC	SysReq_43	The RTMC facility shall provide IP telephone service for both DOTD and RPC.	SysReq_157	The IP phone system shall provide loud speaker paging across selected groups of phones.						
					SysReq_158	The IP phone system shall provide five (5) digit dialing.						
					SysReq_159	The IP phone system shall have user voice mail.						
					SysReq_160	The IP phone system shall have programmable feature keys.						
					SysReq_161	The IP phone system shall have caller id with display.						

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
			SysReq_157	The IP phone system shall provide loud speaker paging across selected groups of phones.								
			SysReq_158	The IP phone system shall provide five (5) digit dialing.								
			SysReq_159	The IP phone system shall have user voice mail.								
			SysReq_160	The IP phone system shall have programmable feature keys.								
			SysReq_161	The IP phone system shall have caller id with display.								
Need_30	All conference rooms and the second floor library will need to have teleconferencing capabilities.	Conference Rooms and 2nd floor library	SysReq_44	The RTMC facility shall provide teleconferencing in the second floor conference room.								
			SysReq_45	The RTMC facility shall provide teleconferencing in the second floor library.								
			SysReq_46	The RTMC facility shall provide teleconferencing in the first floor conference room independently on both sides of the conference room in the divided/two room configuration.								
			SysReq_47	The RTMC facility shall provide teleconferencing in the first floor conference room linked together in the full/one room configuration.								
Need_31	The first floor conference room will need to have teleconferencing on both sides that can be linked together.	1st floor conference room	SysReq_46	The RTMC facility shall provide teleconferencing in the first floor conference room independently on both sides of the conference room in the divided/two room configuration.								
			SysReq_47	The RTMC facility shall provide teleconferencing in the first floor conference room linked together in the full/one room configuration.								
Need_32	Both satellite and cable will be used, as redundant and backup systems (cable during heavy storms, Dish after the storms).	Control Room	SysReq_33	Satellite television shall be provided in the traffic management control room.								
			SysReq_34	Satellite television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.								
			SysReq_35	Satellite television shall be provided in the first floor conference room linked together in the full/one room configuration.								
			SysReq_36	Cable television shall be provided in the traffic management control room.								
			SysReq_37	Cable television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.								
			SysReq_38	Cable television shall be provided in the first floor conference room linked together in the full/one room configuration.								
			SysReq_166	The RTMC facility shall subscribe to satellite television service.	SysReq_33	Satellite television shall be provided in the traffic management control room.						
					SysReq_126	Satellite television shall be provided in a specific DOTD office.						
					SysReq_163	Satellite television shall be provided in the first floor conference room.	SysReq_34	Satellite television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.				
							SysReq_35	Satellite television shall be provided in the first floor conference room linked together in the full/one room configuration.				
			SysReq_167	The RTMC facility shall subscribe to cable television service.	SysReq_36	Cable television shall be provided in the traffic management control room.						
					SysReq_128	Cable television shall be provided in specified offices.						
					SysReq_164	Cable television shall be provided in the first floor conference room.	SysReq_37	Cable television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.				
							SysReq_38	Cable television shall be provided in the first floor conference room linked together in the full/one room configuration.				

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
Need_33	Audio/visual in first floor conference room needs to accommodate full assembly as well as when room is divided in two.	1st floor conference room	SysReq_41	In the first floor conference room, equipment to display computer generated presentations shall be independent on both sides in the divided/two room configuration.								
			SysReq_42	In the first floor conference room, equipment to display computer generated presentations shall be linked together when in the full/one room configuration.								
			SysReq_46	The RTMC facility shall provide teleconferencing in the first floor conference room independently on both sides of the conference room in the divided/two room configuration.								
			SysReq_47	The RTMC facility shall provide teleconferencing in the first floor conference room linked together in the full/one room configuration.								
			SysReq_50	The RTMC facility shall provide bidirectional audio/video conferencing in the first floor conference room independently on both sides in the divided/two room configuration.								
			SysReq_51	The RTMC facility shall provide bidirectional audio/video conferencing in the first floor conference room linked together in the full/one room configuration.								
			SysReq_53	The RTMC facility shall display live real-time traffic images to the first floor conference room independently on both sides in the divided/two room configuration.								
			SysReq_54	The RTMC facility shall display live real-time traffic images to the first floor conference room linked together in the full/one room configuration.								
Need_34	Provide digital recording of public meetings in the first floor conference room.	1st floor conference room	SysReq_52	The RTMC facility shall have digital recording of audio to the first floor conference room independently on both sides in the divided/two room configuration.								
			SysReq_172	An infrastructure for video recording shall be provided for the first floor conference room.	SysReq_123	Video connections shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.						
					SysReq_144	When selected, video of the first floor conference room shall be recorded in the full/one room configuration.						
Need_35	The following servers need to be installed at the RTMC. - RPC servers - Data and GIS information - Traffic Operation Servers, traffic information - ICX 360 Servers The control room desktop computers need to accommodate the 360 surveillance software (ICX) cameras, and detection.	RTMC	SysReq_104	The RTMC facility shall contain RPC dedicated servers								
			SysReq_105	The RTMC facility shall contain DOTD dedicated traffic operation servers.								
			SysReq_106	The control room workstations shall be compatible with the 360 surveillance software (ICX) with the ITS package.								
			SysReq_162	The RTMC facility shall contain servers for 360 surveillance (ICX) with the ITS package.								
Need_36	Within the control room, each operator will need access to a DOTD 700/800 radio unit.	Control Room	SysReq_112	Each traffic management operator shall have access to a DOTD 700/800 radio unit.								
Need_37	Uninterruptible Power Supply (UPS) is needed for all (desirable) computers and displays. At a minimum the computers and displays within computer room need to be on UPS power until the generators take over supplying power.	RTMC	SysReq_109	An Uninterruptible Power Supply (UPS) shall be installed for critical equipment.	SysReq_180	At a minimum the computer room shall be on UPS power until the generators take over supplying power.	SysReq_181	At a minimum the computers within the computer room shall be on UPS power until the generators take over supplying power.				

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
							SysReq_182	At a minimum the displays associated with the computers shall be on UPS power until the generators take over supplying power.				
					SysReq_181	At a minimum the computers within the computer room shall be on UPS power until the generators take over supplying power.						
					SysReq_182	At a minimum the displays associated with the computers shall be on UPS power until the generators take over supplying power.						
			SysReq_111	Notification shall be given to the operators when the system is running on backup power.								
			SysReq_180	At a minimum the computer room shall be on UPS power until the generators take over supplying power.	SysReq_181	At a minimum the computers within the computer room shall be on UPS power until the generators take over supplying power.						
					SysReq_182	At a minimum the displays associated with the computers shall be on UPS power until the generators take over supplying power.						
			SysReq_181	At a minimum the computers within the computer room shall be on UPS power until the generators take over supplying power.								
			SysReq_182	At a minimum the displays associated with the computers shall be on UPS power until the generators take over supplying power.								
Need_38	Three external doors of the RTMC will need access card control as identified on the building plan sheets.	Secure Access Areas	SysReq_113	Three external doors shall have access card control as identified on the building plan sheets.								
			SysReq_117	Access card readers shall be installed in specific locations that are identified on the building plan sheets.								
Need_39	Nine (9) doors of the RTMC need sensors on them and access cards for entry into the controlled areas.	Secure Access Areas	SysReq_114	All internal doors with card access shall have status sensors on them.								
			SysReq_115	Access card readers shall be installed on the following 9 doors within the RTMC: 1) Front Door (101A) 2) Rear Door (ST2-1B) 3) First floor DOTD section (102A) 4) Control room (103B) 5) Second floor RPC section (202A) 6) Display access room (b/w computer room/control room) 7) Roof access door (ST1-3A) 8)Computer room (147A) 9) Second floor rear door (ST2-2A	SysReq_117	Access card readers shall be installed in specific locations that are identified on the building plan sheets.						
Need_40	Within the RTMC, card controlled doors need to be online and monitored through an access control system.	Secure Access Areas	SysReq_118	Card controlled doors shall be monitored through an on-line access control system.								
			SysReq_187	The second floor shall contain dedicated video surveillance of all 3 points of entry from the first floor.								
Need_41	RTMC/Tower parking facility video surveillance needs to be viewable throughout the RTMC and the surveillance video needs to be recorded (DVR) for investigations.	Parking Facilities	SysReq_72	The RTMC facility shall contain dedicated video surveillance of all facility external doors.								
			SysReq_73	The RTMC facility shall contain dedicated video surveillance of the tower site.								
			SysReq_75	The RTMC facility shall use a 24 hour, 365 day unmanned security monitoring system that is recordable.								
			SysReq_119	The parking facility shall have dedicated video surveillance.								
			SysReq_120	The parking facility shall use a 24 hour, 365 day unmanned monitoring system that is recordable.								
			SysReq_121	The parking facility surveillance shall be viewable from remote locations.								
			SysReq_175	Security measures shall be provided for the RTMC parking facility.	SysReq_84	The RTMC facility shall implement adequate lighting systems around its parking facilities.						
					SysReq_119	The parking facility shall have dedicated video surveillance.						

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
					SysReq_120	The parking facility shall use a 24 hour, 365 day unmanned monitoring system that is recordable.						
					SysReq_121	The parking facility surveillance shall be viewable from remote locations.						
					SysReq_179	The parking facility video shall be viewable in the RTMC.						
			SysReq_179	The parking facility video shall be viewable in the RTMC.								
Need_42	Video display wall in the control room should view real-time images of traffic and roadway facilities.	Control Room	SysReq_87	The control room shall have a video wall that can display from a single image that spans all displays to up to and including 48 real-time images.								
			SysReq_88	The control room video wall shall view up to and including 48 concurrent real-time traffic images from roadside CCTV cameras.								
			SysReq_173	The RTMC control room shall have a video display wall.	SysReq_87	The control room shall have a video wall that can display from a single image that spans all displays to up to and including 48 real-time images.						
					SysReq_88	The control room video wall shall view up to and including 48 concurrent real-time traffic images from roadside CCTV cameras.						
					SysReq_89	The control room video wall shall display cable television broadcast on video display wall.						
					SysReq_90	The control room video wall shall display satellite television broadcast on video display wall.						
					SysReq_91	The traffic management control room video wall display shall have six (6) additional video sources.						
					SysReq_92	Traffic Management Control Room video wall shall be configurable to display real-time images from any of the operator workstations.						
					SysReq_93	Traffic Management Control Room video wall shall be configurable to display real-time images from all of the operator workstations simultaneously.						
					SysReq_95	Traffic Management Control Room video wall shall view up to and including forty-eight (48) live real-time images of the recorded facility video surveillance.						
Need_43	Television broadcast should display on the video display wall (cable & satellite TV) in the control room.	Control Room	SysReq_89	The control room video wall shall display cable television broadcast on video display wall.								
			SysReq_90	The control room video wall shall display satellite television broadcast on video display wall.								
			SysReq_166	The RTMC facility shall subscribe to satellite television service.	SysReq_33	Satellite television shall be provided in the traffic management control room.						
					SysReq_126	Satellite television shall be provided in a specific DOTD office.						
					SysReq_163	Satellite television shall be provided in the first floor conference room.	SysReq_34	Satellite television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.				
							SysReq_35	Satellite television shall be provided in the first floor conference room linked together in the full/one room configuration.				
			SysReq_167	The RTMC facility shall subscribe to cable television service.	SysReq_36	Cable television shall be provided in the traffic management control room.						
					SysReq_128	Cable television shall be provided in specified offices.						
					SysReq_164	Cable television shall be provided in the first floor conference room.	SysReq_37	Cable television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.				
							SysReq_38	Cable television shall be provided in the first floor conference room linked together in the full/one room configuration.				
			SysReq_173	The RTMC control room shall have a video display wall.	SysReq_87	The control room shall have a video wall that can display from a single image that spans all displays to up to and including 48 real-time images.						

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
					SysReq_88	The control room video wall shall view up to and including 48 concurrent real-time traffic images from roadside CCTV cameras.						
					SysReq_89	The control room video wall shall display cable television broadcast on video display wall.						
					SysReq_90	The control room video wall shall display satellite television broadcast on video display wall.						
					SysReq_91	The traffic management control room video wall display shall have six (6) additional video sources.						
					SysReq_92	Traffic Management Control Room video wall shall be configurable to display real-time images from any of the operator workstations.						
					SysReq_93	Traffic Management Control Room video wall shall be configurable to display real-time images from all of the operator workstations simultaneously.						
					SysReq_95	Traffic Management Control Room video wall shall view up to and including forty-eight (48) live real-time images of the recorded facility video surveillance.						
Need_44	Within the control room, there is a need to configure the video wall from each of the 12 operator consoles.	Control Room	SysReq_173	The RTMC control room shall have a video display wall.	SysReq_87	The control room shall have a video wall that can display from a single image that spans all displays to up to and including 48 real-time images.						
					SysReq_88	The control room video wall shall view up to and including 48 concurrent real-time traffic images from roadside CCTV cameras.						
					SysReq_89	The control room video wall shall display cable television broadcast on video display wall.						
					SysReq_90	The control room video wall shall display satellite television broadcast on video display wall.						
					SysReq_91	The traffic management control room video wall display shall have six (6) additional video sources.						
					SysReq_92	Traffic Management Control Room video wall shall be configurable to display real-time images from any of the operator workstations.						
					SysReq_93	Traffic Management Control Room video wall shall be configurable to display real-time images from all of the operator workstations simultaneously.						
					SysReq_95	Traffic Management Control Room video wall shall view up to and including forty-eight (48) live real-time images of the recorded facility video surveillance.						
Need_45	Within the control room, there is a need to plug in additional video and audio feeds from external sources at the consoles using composite connections (6 locations)	Control Room	SysReq_91	The traffic management control room video wall display shall have six (6) additional video sources.								
Need_46	Within the control room, there is a need to configure the video wall's display of real-time images of traffic and roadways from the operator workstations.	Control Room	SysReq_93	Traffic Management Control Room video wall shall be configurable to display real-time images from all of the operator workstations simultaneously.								
			SysReq_173	The RTMC control room shall have a video display wall.	SysReq_87	The control room shall have a video wall that can display from a single image that spans all displays to up to and including 48 real-time images.						
					SysReq_88	The control room video wall shall view up to and including 48 concurrent real-time traffic images from roadside CCTV cameras.						
					SysReq_89	The control room video wall shall display cable television broadcast on video display wall.						
					SysReq_90	The control room video wall shall display satellite television broadcast on video display wall.						
					SysReq_91	The traffic management control room video wall display shall have six (6) additional video sources.						

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
					SysReq_92	Traffic Management Control Room video wall shall be configurable to display real-time images from any of the operator workstations.						
					SysReq_93	Traffic Management Control Room video wall shall be configurable to display real-time images from all of the operator workstations simultaneously.						
					SysReq_95	Traffic Management Control Room video wall shall view up to and including forty-eight (48) live real-time images of the recorded facility video surveillance.						
Need_47	Within the control room, there is a need for the video wall to act as a single unit and be able to manipulate the size of the real-time images (e.g. stretch video windows across various display modules)	Control Room	SysReq_87	The control room shall have a video wall that can display from a single image that spans all displays to up to and including 48 real-time images.								
			SysReq_173	The RTMC control room shall have a video display wall.	SysReq_87	The control room shall have a video wall that can display from a single image that spans all displays to up to and including 48 real-time images.						
					SysReq_88	The control room video wall shall view up to and including 48 concurrent real-time traffic images from roadside CCTV cameras.						
					SysReq_89	The control room video wall shall display cable television broadcast on video display wall.						
					SysReq_90	The control room video wall shall display satellite television broadcast on video display wall.						
					SysReq_91	The traffic management control room video wall display shall have six (6) additional video sources.						
					SysReq_92	Traffic Management Control Room video wall shall be configurable to display real-time images from any of the operator workstations.						
					SysReq_93	Traffic Management Control Room video wall shall be configurable to display real-time images from all of the operator workstations simultaneously.						
					SysReq_95	Traffic Management Control Room video wall shall view up to and including forty-eight (48) live real-time images of the recorded facility video surveillance.						
Need_48	Within the control room, there is a need to display console desktop(s) on the video display wall.	Control Room	SysReq_40	Equipment to display computer generated presentations shall be in the traffic management control center.								
			SysReq_92	Traffic Management Control Room video wall shall be configurable to display real-time images from any of the operator workstations.								
			SysReq_93	Traffic Management Control Room video wall shall be configurable to display real-time images from all of the operator workstations simultaneously.								
			SysReq_173	The RTMC control room shall have a video display wall.	SysReq_87	The control room shall have a video wall that can display from a single image that spans all displays to up to and including 48 real-time images.						
					SysReq_88	The control room video wall shall view up to and including 48 concurrent real-time traffic images from roadside CCTV cameras.						
					SysReq_89	The control room video wall shall display cable television broadcast on video display wall.						
					SysReq_90	The control room video wall shall display satellite television broadcast on video display wall.						
					SysReq_91	The traffic management control room video wall display shall have six (6) additional video sources.						
					SysReq_92	Traffic Management Control Room video wall shall be configurable to display real-time images from any of the operator workstations.						

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
					SysReq_93	Traffic Management Control Room video wall shall be configurable to display real-time images from all of the operator workstations simultaneously.						
					SysReq_95	Traffic Management Control Room video wall shall view up to and including forty-eight (48) live real-time images of the recorded facility video surveillance.						
Need_49	Within the control room, there is a need to view the facility video surveillance on the video display wall (live and from DVR).	Control Room	SysReq_95	Traffic Management Control Room video wall shall view up to and including forty-eight (48) live real-time images of the recorded facility video surveillance.								
			SysReq_173	The RTMC control room shall have a video display wall.	SysReq_87	The control room shall have a video wall that can display from a single image that spans all displays to up to and including 48 real-time images.						
					SysReq_88	The control room video wall shall view up to and including 48 concurrent real-time traffic images from roadside CCTV cameras.						
					SysReq_89	The control room video wall shall display cable television broadcast on video display wall.						
					SysReq_90	The control room video wall shall display satellite television broadcast on video display wall.						
					SysReq_91	The traffic management control room video wall display shall have six (6) additional video sources.						
					SysReq_92	Traffic Management Control Room video wall shall be configurable to display real-time images from any of the operator workstations.						
					SysReq_93	Traffic Management Control Room video wall shall be configurable to display real-time images from all of the operator workstations simultaneously.						
					SysReq_95	Traffic Management Control Room video wall shall view up to and including forty-eight (48) live real-time images of the recorded facility video surveillance.						
Need_50	Audio should be broadcast throughout the control room from various sources (cable, satellite TV, CCTV, DOTD 700/800 radio, and local/national/satellite radio).	Control Room	SysReq_96	Audio shall be broadcast through a public address system within the control room from the cable television source.								
			SysReq_97	Audio shall be broadcast through a public address system within the control room from the satellite television source.								
			SysReq_98	Audio shall be broadcast through a public address system within the control room from the roadside CCTV source.								
			SysReq_99	Audio shall be broadcast through a public address system within the control room from the DOTD 700/800 radio source.								
			SysReq_100	Audio shall be broadcast through a public address system within the control room from the local radio source.								
			SysReq_101	Audio shall be broadcast through a public address system within the control room from the national radio source.								
			SysReq_102	Audio shall be broadcast through a public address system within the control room from the local satellite radio source.								
			SysReq_166	The RTMC facility shall subscribe to satellite television service.	SysReq_33	Satellite television shall be provided in the traffic management control room.						
					SysReq_126	Satellite television shall be provided in a specific DOTD office.						
					SysReq_163	Satellite television shall be provided in the first floor conference room.	SysReq_34	Satellite television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.				

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
							SysReq_35	Satellite television shall be provided in the first floor conference room linked together in the full/one room configuration.				
			SysReq_167	The RTMC facility shall subscribe to cable television service.	SysReq_36	Cable television shall be provided in the traffic management control room.						
					SysReq_128	Cable television shall be provided in specified offices.						
					SysReq_164	Cable television shall be provided in the first floor conference room.	SysReq_37	Cable television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.				
							SysReq_38	Cable television shall be provided in the first floor conference room linked together in the full/one room configuration.				
			SysReq_174	An infrastructure for public address in RTMC control room shall be provided.	SysReq_96	Audio shall be broadcast through a public address system within the control room from the cable television source.						
					SysReq_97	Audio shall be broadcast through a public address system within the control room from the satellite television source.						
					SysReq_98	Audio shall be broadcast through a public address system within the control room from the roadside CCTV source.						
					SysReq_99	Audio shall be broadcast through a public address system within the control room from the DOTD 700/800 radio source.						
					SysReq_100	Audio shall be broadcast through a public address system within the control room from the local radio source.						
					SysReq_101	Audio shall be broadcast through a public address system within the control room from the national radio source.						
					SysReq_102	Audio shall be broadcast through a public address system within the control room from the local satellite radio source.						
Need_51	Should be able to video conference bi-directionally from training room.	Training Room	SysReq_49	The RTMC facility shall provide bidirectional audio/video conferencing in the training room.	SysReq_131	Training room video conferencing shall be a selectable item to be displayed in the control room.						
Need_52	Audio/visual in the first floor conference room should accommodate full assembly in the single room configuration as well as in the divided configuration.	1st floor conference room	SysReq_50	The RTMC facility shall provide bidirectional audio/video conferencing in the first floor conference room independently on both sides in the divided/two room configuration.								
			SysReq_51	The RTMC facility shall provide bidirectional audio/video conferencing in the first floor conference room linked together in the full/one room configuration.								
Need_53	Should be able to video conference from the first floor conference room in full assembly in the full configuration.	1st floor conference room	SysReq_51	The RTMC facility shall provide bidirectional audio/video conferencing in the first floor conference room linked together in the full/one room configuration.								
Need_54	Should be able to video conference separately from both rooms (when in the divided configuration) in the first floor conference room.	1st floor conference room	SysReq_50	The RTMC facility shall provide bidirectional audio/video conferencing in the first floor conference room independently on both sides in the divided/two room configuration.								
Need_55	Audio/video should include digital recording of public meetings in the first floor conference room for full assembly in the single room configuration as well as in the divided configuration.	1st floor conference room	SysReq_52	The RTMC facility shall have digital recording of audio to the first floor conference room independently on both sides in the divided/two room configuration.								
			SysReq_172	An infrastructure for video recording shall be provided for the first floor conference room.	SysReq_123	Video connections shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.						
					SysReq_144	When selected, video of the first floor conference room shall be recorded in the full/one room configuration.						

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
Need_56	Real-time images should display from the control room in the first floor conference room in both the full and divided configuration.	1st floor conference room	SysReq_55	The RTMC facility shall display live real-time traffic data to the first floor conference room independently on both sides in the divided/two room configuration.								
			SysReq_56	The RTMC facility shall display live real-time traffic data to the first floor conference room linked together in the full/one room configuration.								
			SysReq_169	An infrastructure for real-time traffic information shall be provided in the first floor conference room.	SysReq_53	The RTMC facility shall display live real-time traffic images to the first floor conference room independently on both sides in the divided/two room configuration.						
					SysReq_54	The RTMC facility shall display live real-time traffic images to the first floor conference room linked together in the full/one room configuration.						
					SysReq_55	The RTMC facility shall display live real-time traffic data to the first floor conference room independently on both sides in the divided/two room configuration.						
					SysReq_56	The RTMC facility shall display live real-time traffic data to the first floor conference room linked together in the full/one room configuration.						
Need_57	Television broadcast should display on the video display wall in the first floor conference room (cable & satellite TV) in both the full and divided configuration.	1st floor conference room	SysReq_34	Satellite television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.								
			SysReq_35	Satellite television shall be provided in the first floor conference room linked together in the full/one room configuration.								
			SysReq_163	Satellite television shall be provided in the first floor conference room.	SysReq_34	Satellite television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.						
					SysReq_35	Satellite television shall be provided in the first floor conference room linked together in the full/one room configuration.						
			SysReq_164	Cable television shall be provided in the first floor conference room.	SysReq_37	Cable television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.						
					SysReq_38	Cable television shall be provided in the first floor conference room linked together in the full/one room configuration.						
			SysReq_166	The RTMC facility shall subscribe to satellite television service.	SysReq_33	Satellite television shall be provided in the traffic management control room.						
					SysReq_126	Satellite television shall be provided in a specific DOTD office.						
					SysReq_163	Satellite television shall be provided in the first floor conference room.	SysReq_34	Satellite television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.				
							SysReq_35	Satellite television shall be provided in the first floor conference room linked together in the full/one room configuration.				
			SysReq_167	The RTMC facility shall subscribe to cable television service.	SysReq_36	Cable television shall be provided in the traffic management control room.						
					SysReq_128	Cable television shall be provided in specified offices.						
					SysReq_164	Cable television shall be provided in the first floor conference room.	SysReq_37	Cable television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.				
							SysReq_38	Cable television shall be provided in the first floor conference room linked together in the full/one room configuration.				
Need_58	Presentations from a notebook computer should display on the video display wall in the first floor conference room in both the full and divided configuration.	1st floor conference room	SysReq_41	In the first floor conference room, equipment to display computer generated presentations shall be independent on both sides in the divided/two room configuration.								

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
			SysReq_42	In the first floor conference room, equipment to display computer generated presentations shall be linked together when in the full/one room configuration.								
			SysReq_168	An infrastructure for computer generated presentations shall be provided in the first floor conference room.	SysReq_41	In the first floor conference room, equipment to display computer generated presentations shall be independent on both sides in the divided/two room configuration.						
					SysReq_42	In the first floor conference room, equipment to display computer generated presentations shall be linked together when in the full/one room configuration.						
					SysReq_132	The first floor conference room shall have adjacent dual independent screens for side-by-side presentations in the full/one room configuration.						
					SysReq_133	The first floor conference room shall have adjacent dual independent projectors for side-by-side presentations in the full/one room configuration.						
					SysReq_135	The presentation projectors shall provide at a minimum 4000 lumens of projected light.						
					SysReq_137	The video projectors shall provide a minimum resolution of 1024 x 768.						
Need_59	Video should display from a composite connection in the first floor conference room in both the full and divided configuration.	1st floor conference room	SysReq_123	Video connections shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.								
Need_60	Should be able to video conference from the second floor library and conference room.	2nd Floor Library and Conference Rooms	SysReq_48	The RTMC facility shall provide bidirectional audio/video conferencing in the second floor conference room.								
			SysReq_124	The RTMC facility shall provide bidirectional audio/video conferencing in the second floor library.								
Need_61	Presentations should display in the second floor library and conference room.	2rd Floor Library and Conference Rooms	SysReq_39	Equipment to display computer generated presentations shall be in the second floor conference room.								
			SysReq_125	Equipment to display computer generated presentations shall be in the second floor library.								
Need_62	Specific offices and break rooms should have video access (cable, satellite TV, and video feed from servers).	Specified offices and break rooms	SysReq_36	Cable television shall be provided in the traffic management control room.								
			SysReq_126	Satellite television shall be provided in a specific DOTD office.								
			SysReq_128	Cable television shall be provided in specified offices.								
			SysReq_129	Feeds from the video server shall be provided in all break rooms.								
			SysReq_130	Feeds from the video server shall be provided in specified offices.								
			SysReq_166	The RTMC facility shall subscribe to satellite television service.	SysReq_33	Satellite television shall be provided in the traffic management control room.						
					SysReq_126	Satellite television shall be provided in a specific DOTD office.						
					SysReq_163	Satellite television shall be provided in the first floor conference room.	SysReq_34	Satellite television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.				
							SysReq_35	Satellite television shall be provided in the first floor conference room linked together in the full/one room configuration.				
			SysReq_167	The RTMC facility shall subscribe to cable television service.	SysReq_36	Cable television shall be provided in the traffic management control room.						
					SysReq_128	Cable television shall be provided in specified offices.						
					SysReq_164	Cable television shall be provided in the first floor conference room.	SysReq_37	Cable television shall be provided in the first floor conference room independently on both sides in the divided/two room configuration.				
							SysReq_38	Cable television shall be provided in the first floor conference room linked together in the full/one room configuration.				

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
Need_63	Two presentations should display concurrently side-by-side in the full configuration in the first floor conference room.	1st floor conference room	SysReq_132	The first floor conference room shall have adjacent dual independent screens for side-by-side presentations in the full/one room configuration.								
			SysReq_133	The first floor conference room shall have adjacent dual independent projectors for side-by-side presentations in the full/one room configuration.								
			SysReq_168	An infrastructure for computer generated presentations shall be provided in the first floor conference room.	SysReq_41	In the first floor conference room, equipment to display computer generated presentations shall be independent on both sides in the divided/two room configuration.						
					SysReq_42	In the first floor conference room, equipment to display computer generated presentations shall be linked together when in the full/one room configuration.						
					SysReq_132	The first floor conference room shall have adjacent dual independent screens for side-by-side presentations in the full/one room configuration.						
					SysReq_133	The first floor conference room shall have adjacent dual independent projectors for side-by-side presentations in the full/one room configuration.						
					SysReq_135	The presentation projectors shall provide at a minimum 4000 lumens of projected light.						
					SysReq_137	The video projectors shall provide a minimum resolution of 1024 x 768.						
Need_64	The display in the first floor conference room needs to be of such quality to display a presentation to the audience that is bright, sharp, and high-resolution in the full configuration.	1st floor conference room	SysReq_135	The presentation projectors shall provide at a minimum 4000 lumens of projected light.								
			SysReq_137	The video projectors shall provide a minimum resolution of 1024 x 768.								
			SysReq_168	An infrastructure for computer generated presentations shall be provided in the first floor conference room.	SysReq_41	In the first floor conference room, equipment to display computer generated presentations shall be independent on both sides in the divided/two room configuration.						
					SysReq_42	In the first floor conference room, equipment to display computer generated presentations shall be linked together when in the full/one room configuration.						
					SysReq_132	The first floor conference room shall have adjacent dual independent screens for side-by-side presentations in the full/one room configuration.						
					SysReq_133	The first floor conference room shall have adjacent dual independent projectors for side-by-side presentations in the full/one room configuration.						
					SysReq_135	The presentation projectors shall provide at a minimum 4000 lumens of projected light.						
					SysReq_137	The video projectors shall provide a minimum resolution of 1024 x 768.						
Need_65	The first floor conference room should have a public address system(s) that can be used for the full configuration, or separate and independently for the divided configuration.	1st floor conference room	SysReq_138	The first floor conference room shall have a public address system for the full/one room configuration.								
			SysReq_139	The first floor conference room shall have a dual independent public address system for the divided/two room configuration.								
			SysReq_170	An infrastructure for public address shall be provided in the first floor conference room.	SysReq_138	The first floor conference room shall have a public address system for the full/one room configuration.						
					SysReq_139	The first floor conference room shall have a dual independent public address system for the divided/two room configuration.						

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
					SysReq_151	When selected, conference calls in the first floor conference room shall be connected to the public address system in the full/one room configuration.						
					SysReq_152	When selected, conferences calls in the first floor conference room shall be independently connected to public address systems in each room in the divided/two room configuration.						
			SysReq_184	A minimum of fifteen (15) wired microphones with mute control switches shall be provided in the first floor conference room.								
Need_66	The first floor conference room should record the output of the public address system(s) in both the full configuration or separate and independently in the divided configuration.	1st floor conference room	SysReq_140	When selected, the first floor conference room's audio output from the public address system shall be digitally recorded in the full/one room configuration.								
			SysReq_141	When selected, the first floor conference room's audio outputs from the dual independent public address systems shall be digitally recorded in the divided/two room configuration.								
			SysReq_170	An infrastructure for public address shall be provided in the first floor conference room.	SysReq_138	The first floor conference room shall have a public address system for the full/one room configuration.						
					SysReq_139	The first floor conference room shall have a dual independent public address system for the divided/two room configuration.						
					SysReq_151	When selected, conference calls in the first floor conference room shall be connected to the public address system in the full/one room configuration.						
					SysReq_152	When selected, conferences calls in the first floor conference room shall be independently connected to public address systems in each room in the divided/two room configuration.						
Need_67	Each microphone used needs to be able to be muted by the user in the first floor conference room.	1st floor conference room	SysReq_142	In the first floor conference room, muting of each microphone shall be performed with a switch on the microphone unit.								
			SysReq_171	An infrastructure for microphones shall be provided in the first floor conference room.	SysReq_142	In the first floor conference room, muting of each microphone shall be performed with a switch on the microphone unit.						
					SysReq_143	When selected, the first floor conference room's audio output from the microphones shall be recorded.						
					SysReq_148	The first floor conference room shall be equipped with a minimum of one (1) wireless microphone in the full/one room configuration.						
					SysReq_149	The first floor conference room shall be equipped with a minimum of two (2) wireless microphones, one (1) per each, in the divided/two room configuration.						
					SysReq_150	In the first floor conference room, wireless microphones shall not interfere with each other.						
					SysReq_153	When selected, conferences calls in the first floor conference room shall be connected to the microphone system in the full/one room configuration.						
					SysReq_154	When selected, conferences calls in the first floor conference room shall be independently connected to the microphone systems in each room in the divided/two room configuration.						
					SysReq_183	A minimum of 15 wired microphones connections shall be provided for in the first floor conference room in the full/one (1) room configuration.						
					SysReq_184	A minimum of fifteen (15) wired microphones with mute control switches shall be provided in the first floor conference room.						

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
			SysReq_184	A minimum of fifteen (15) wired microphones with mute control switches shall be provided in the first floor conference room.								
Need_68	The selection of microphone for recording needs to be done at the head end in the first floor conference room.	1st floor conference room	SysReq_143	When selected, the first floor conference room's audio output from the microphones shall be recorded.								
			SysReq_171	An infrastructure for microphones shall be provided in the first floor conference room.	SysReq_142	In the first floor conference room, muting of each microphone shall be performed with a switch on the microphone unit.						
					SysReq_143	When selected, the first floor conference room's audio output from the microphones shall be recorded.						
					SysReq_148	The first floor conference room shall be equipped with a minimum of one (1) wireless microphone in the full/one room configuration.						
					SysReq_149	The first floor conference room shall be equipped with a minimum of two (2) wireless microphones, one (1) per each, in the divided/two room configuration.						
					SysReq_150	In the first floor conference room, wireless microphones shall not interfere with each other.						
					SysReq_153	When selected, conferences calls in the first floor conference room shall be connected to the microphone system in the full/one room configuration.						
					SysReq_154	When selected, conferences calls in the first floor conference room shall be independently connected to the microphone systems in each room in the divided/two room configuration.						
					SysReq_183	A minimum of 15 wired microphones connections shall be provided for in the first floor conference room in the full/one (1) room configuration.						
					SysReq_184	A minimum of fifteen (15) wired microphones with mute control switches shall be provided in the first floor conference room.						
			SysReq_183	A minimum of 15 wired microphones connections shall be provided for in the first floor conference room in the full/one (1) room configuration.								
			SysReq_184	A minimum of fifteen (15) wired microphones with mute control switches shall be provided in the first floor conference room.								
Need_69	Video needs to be recorded for the first floor conference room in the full configuration, and separate and independently in the divided configuration.	1st floor conference room	SysReq_144	When selected, video of the first floor conference room shall be recorded in the full/one room configuration.								
			SysReq_145	When selected, in the first floor conference room, video of each room shall be recorded in the divided/two room configuration.								
Need_70	Audio needs to be recorded with the video for the first floor conference room in the full configuration, and separate and independently in the divided configuration.	1st floor conference room	SysReq_146	When selected, audio of the video of the first floor conference room shall be recorded in the full/one room configuration.								
			SysReq_147	When selected, the first floor conference room's audio with the video of each room shall be recorded in the divided/two room configuration.								
Need_71	Wireless microphones are needed in the first floor conference room for the full configuration, and separate and independent wireless microphones for the divided configuration.	1st floor conference room	SysReq_148	The first floor conference room shall be equipped with a minimum of one (1) wireless microphone in the full/one room configuration.								
			SysReq_149	The first floor conference room shall be equipped with a minimum of two (2) wireless microphones, one (1) per each, in the divided/two room configuration.								
			SysReq_150	In the first floor conference room, wireless microphones shall not interfere with each other.								

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
			SysReq_171	An infrastructure for microphones shall be provided in the first floor conference room.	SysReq_142	In the first floor conference room, muting of each microphone shall be performed with a switch on the microphone unit.						
					SysReq_143	When selected, the first floor conference room's audio output from the microphones shall be recorded.						
					SysReq_148	The first floor conference room shall be equipped with a minimum of one (1) wireless microphone in the full/one room configuration.						
					SysReq_149	The first floor conference room shall be equipped with a minimum of two (2) wireless microphones, one (1) per each, in the divided/two room configuration.						
					SysReq_150	In the first floor conference room, wireless microphones shall not interfere with each other.						
					SysReq_153	When selected, conferences calls in the first floor conference room shall be connected to the microphone system in the full/one room configuration.						
					SysReq_154	When selected, conferences calls in the first floor conference room shall be independently connected to the microphone systems in each room in the divided/two room configuration.						
					SysReq_183	A minimum of 15 wired microphones connections shall be provided for in the first floor conference room in the full/one (1) room configuration.						
					SysReq_184	A minimum of fifteen (15) wired microphones with mute control switches shall be provided in the first floor conference room.						
Need_72	Conference calls in the first floor conference room need to be able to be connected to the public address system(s) in the full configuration, as well as separate and independently in the divided configuration.	1st floor conference room	SysReq_151	When selected, conference calls in the first floor conference room shall be connected to the public address system in the full/one room configuration.								
			SysReq_152	When selected, conferences calls in the first floor conference room shall be independently connected to public address systems in each room in the divided/two room configuration.								
			SysReq_170	An infrastructure for public address shall be provided in the first floor conference room.	SysReq_138	The first floor conference room shall have a public address system for the full/one room configuration.						
					SysReq_139	The first floor conference room shall have a dual independent public address system for the divided/two room configuration.						
					SysReq_151	When selected, conference calls in the first floor conference room shall be connected to the public address system in the full/one room configuration.						
					SysReq_152	When selected, conferences calls in the first floor conference room shall be independently connected to public address systems in each room in the divided/two room configuration.						
Need_73	Conference calls in the first floor conference room need to be able to be connected to the microphone system(s) in the full configuration, and separately and independently for the divided configuration.	1st floor conference room	SysReq_153	When selected, conferences calls in the first floor conference room shall be connected to the microphone system in the full/one room configuration.								
			SysReq_154	When selected, conferences calls in the first floor conference room shall be independently connected to the microphone systems in each room in the divided/two room configuration.								
			SysReq_171	An infrastructure for microphones shall be provided in the first floor conference room.	SysReq_142	In the first floor conference room, muting of each microphone shall be performed with a switch on the microphone unit.						
					SysReq_143	When selected, the first floor conference room's audio output from the microphones shall be recorded.						

User Need ID	Description	Facility Location	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	Sys Rqmt ID	Description	System/Device	Sign-Off
					SysReq_148	The first floor conference room shall be equipped with a minimum of one (1) wireless microphone in the full/one room configuration.						
					SysReq_149	The first floor conference room shall be equipped with a minimum of two (2) wireless microphones, one (1) per each, in the divided/two room configuration.						
					SysReq_150	In the first floor conference room, wireless microphones shall not interfere with each other.						
					SysReq_153	When selected, conferences calls in the first floor conference room shall be connected to the microphone system in the full/one room configuration.						
					SysReq_154	When selected, conferences calls in the first floor conference room shall be independently connected to the microphone systems in each room in the divided/two room configuration.						
					SysReq_183	A minimum of 15 wired microphones connections shall be provided for in the first floor conference room in the full/one (1) room configuration.						
					SysReq_184	A minimum of fifteen (15) wired microphones with mute control switches shall be provided in the first floor conference room.						
Need_74	The video conference system in the first floor conference room needs to record the displayed presentations as well as the audio from the presenter and audience.	1st floor conference room	SysReq_155	When selected, the video conference system in the first floor conference room shall display computer generated presentations.								
			SysReq_168	An infrastructure for computer generated presentations shall be provided in the first floor conference room.	SysReq_41	In the first floor conference room, equipment to display computer generated presentations shall be independent on both sides in the divided/two room configuration.						
					SysReq_42	In the first floor conference room, equipment to display computer generated presentations shall be linked together when in the full/one room configuration.						
					SysReq_132	The first floor conference room shall have adjacent dual independent screens for side-by-side presentations in the full/one room configuration.						
					SysReq_133	The first floor conference room shall have adjacent dual independent projectors for side-by-side presentations in the full/one room configuration.						
					SysReq_135	The presentation projectors shall provide at a minimum 4000 lumens of projected light.						
					SysReq_137	The video projectors shall provide a minimum resolution of 1024 x 768.						
Need_75	Video conference images from the training room should display in the control room.	Control Room	SysReq_131	Training room video conferencing shall be a selectable item to be displayed in the control room.								
Need_76	Need for an isolated ground bus on the roof of the RTMC for radio antenna and satellite television grounding.	RTMC	SysReq_156	Isolated grounding shall be installed on the roof of the RTMC.								