



CONNECT-IT

Connect and Integrate Transportation Technology
An ITS Architecture for the LA Region

Prepared for:



Metro

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Prepared by:



In Association with:

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CONNECT AND INTEGRATE TRANSPORTATION TECHNOLOGY (CONNECT-IT)

Final Report

January 24, 2019

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1. BACKGROUND	1
1.2. PROJECT OVERVIEW AND SCOPE	1
1.3. PURPOSE OF THE ARCHITECTURE DOCUMENT	2
1.4. HOW TO USE CONNECT-IT	2
2. REGIONAL DESCRIPTION AND STAKEHOLDERS	4
2.1. TRANSPORTATION/TRAFFIC MANAGEMENT	5
2.1.1. Local Agencies	5
2.1.2. Regional Agencies	7
2.1.3. Regional Integration of ITS (RIITS)	8
2.1.4. Southern California 511	9
2.2. TRANSIT SERVICES	9
2.2.1. City of Los Angeles Department of Transportation (LADOT) Transit	11
2.2.2. Metro (Transit)	12
2.2.3. Metrolink and Amtrak	12
2.3. ACTIVE TRANSPORTATION	12
2.4. EMERGENCY MANAGEMENT SERVICES (EMS)	13
2.4.1. California Highway Patrol (CHP)	13
2.4.2. Metro Emergency Security Operations	14
2.4.3. Los Angeles County Sheriff and Fire Department	14
2.4.4. Los Angeles County and Local City Emergency Medical Services Agencies	14
2.4.5. Local Police and Fire	15
2.5. AIR AND SEA PORTS	15
2.5.1. Los Angeles International Airport (LAX)	15
2.5.2. Other Airports	15
2.5.3. Ports of Long Beach and Los Angeles	16
2.6. PRIVATE COMPANIES	16
3. STAKEHOLDER INPUT	18
3.1. METHODOLOGY	18
3.1.1. Stakeholder Outreach	18
3.1.2. Project Steering Committee	20
3.1.3. Agency Participation and Survey Results	21
3.1.4. Needs Assessment	25
3.1.5. Current and Planned ITS Projects and Programs	26
4. OPERATIONAL CONCEPTS	30
5. OPERATIONAL AGREEMENTS	34
6. FUNCTIONAL REQUIREMENTS	39

7. INTERFACES	40
7.1. INFORMATION FLOWS	40
8. STANDARDS.....	46
9. PROJECT DEPLOYMENT SEQUENCING	52
10. ARCHITECTURE MAINTENANCE MANAGEMENT PLAN	60
10.1. CONNECT-IT MAINTENANCE COMMITTEE	60
10.2. APPROACH TO CHANGES.....	60

LIST OF TABLES

Table 1 – Local Agencies Traffic Control Systems.....	6
Table 2 – Transit Agency CAD/AVL Systems.....	11
Table 3 – Meeting Type with Project Stakeholders	19
Table 4 – Steering Committee Members	20
Table 5 – Survey Results	22
Table 6 – Needs and Relevant Service Package Areas	26
Table 7 – LA County Stakeholder Roles and Responsibilities	31
Table 8 –Types of Agreements by Operational Concept.....	34
Table 9 - Summary List of the National ITS Architecture Service Packages.....	42
Table 10 – CONNECT-IT Standards	46
Table 11 – Project Sequencing Table.....	53

LIST OF FIGURES

Figure 1 – Los Angeles County Region Map	4
Figure 2 – The IEN System Architecture	8
Figure 3 – Survey Results Graphical Representation	25
Figure 4 – PT14 Transit Multimodal Coordination (LA Region)	40
Figure 5 – TM07 Regional Traffic Management (LA County)	41

LIST OF APPENDICES

- APPENDIX A: ITS Architecture Inventory Survey Questionnaire
- APPENDIX B: Existing Agreements, Samples Agreements, And Templates of Agreements
- APPENDIX C: Metro’s ITS Policy
- APPENDIX D: List of Functional Requirements

LIST OF ACRONYMS

Acronym	Description
AASHTO	American Association of State Highway and Transportation Officials
ADMS	Archived Data Management System
AITS	Arterial ITS Architecture
ANSI	American National Standards Institute
APTA	American Public Transportation Association
ARC-IT	Architecture Reference for Cooperative and Intelligent Transportation
ARCC	Airport Response Coordination Center
ASC	Actuated Traffic Signal Controller
ASTM	American Society for Testing and Materials
ATCMTD	Advanced Transportation and Congestion Management Technologies Deployment (Projects)
ATDM	Active Transportation Demand Management
ATIS	Advanced Traveler Information System
ATM	Active Transit Management
ATMIS	Advanced Traffic Management and Information System
ATMS	Advanced Traffic Management System
ATSAC	Automated Traffic Surveillance and Control (System)
ATSP	Active Transportation Strategic Plan (Metro)
AV	Automated/Autonomous Vehicles
BCO	Beneficial Cargo Owner
BOC	Bus Operations Control
BOS	Bus Operations Subcommittee
BRT	Bus Rapid Transit
C2F	Center-to-Field
CAD	Computer Aided Dispatch
CCMS	Cooperative ITS Credentials Management System
CCTV	Closed-Circuit Television (Cameras)
CEN	European Committee for Standardization (<i>Comite' Europe'en de Normalisation</i>)
CHP	California Highway Patrol
CM	Configuration Management
CMP	Configuration Management Plan
CMS	Changeable Message Sign
COG	Council of Governments
CONNECT-IT	Connect and Integrate Transportation Technology
CTA	Central Terminal Area
CTC	County Transportation Commission
CTNET	Caltrans Traffic Signal Management System (Existing)
CV	Connected Vehicle
CVRIA	Connected Vehicle Reference ITS Architecture
DATEX	Data Exchange
DCCM	Dynamic Corridor Congestion Management
DCM	Data Collection and Monitoring (Devices)
DCRMS	Dynamic Corridor Ramp Metering System

Acronym	Description
DMS	Dynamic Message Signs
DSRC	Dedicated Short Range Communication
DSS	Decision Support Systems
EDAP	Emergency Departments Approved for Pediatrics
ELMS	Electrical and Lighting Management Systems
EMS	Emergency Management Services
EOC	Emergency Operations Center
ESOC	Emergency Security Operations Center
ESS	Environmental Sensor Stations
EVP	Emergency Vehicle Preemption
EV	Electronic Vehicle
FHWA	Federal Highway Administration
FMS	Field Management System
FRATIS	Freight Advanced Traveler Information Systems
FTA	Federal Transit Administration
GIS	Geographic Information Systems
GTFS	General Transit Feed Specification
HAR	Highway Advisory Radio
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
ICM	Integrated Corridor Management
IEEE	Institute of Electrical and Electronic Engineers
IEN	Information Exchange Network
ISP	Information Service Providers
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation System
IVR	Interactive Voice Responsive
JSON	JavaScript Object Notation
LACDPW	Los Angeles County Department of Public Works
LADOT	Los Angeles Department of Transportation
LARTMC	Los Angeles Regional Traffic Management Center
LAWA	Los Angeles World Airports
LAX	Los Angeles International
LRTP	Long Range Transportation Plan
LTSS	Local Transit Systems Subcommittee
Metro	Metropolitan Transportation Authority
MOU	Memorandum of Understanding
MS/ETMCC	Message Sets for External Traffic Management Center Communications
MTO	Martine Terminal Operators
NEMA	National Electrical Manufacturers Association
NTCIP	National Transportation Communications for Intelligent Transportation System Protocol
PATH	Partners for Advanced Transportation Technology
PeMS	Performance Measurement System (Caltrans)

Acronym	Description
PMC	Pediatric Medical Centers
POLA	Port of Los Angeles
POLB	Port of Long Beach
PVPTA	Palos Verdes Peninsula Transit Authority
QI	Quality Improvement
QEW	Queue End Warning
RAD-IT	Regional Architecture Development for Intelligent Transportation
RIITS	Regional Integration of Intelligent Transportation Systems
RMC	Ramp Meter Control (Units)
ROC	Rail Operations Control
RSE	Roadside Equipment
RTP	Regional Transportation Plan
SAE	Society of Automotive Engineers
SCAG	Southern California Association of Governments
SCP	Signal Control and Prioritization
SIRI	Service Interface for Real-Time Information
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SRC	Short Range Communication
TAP	Transit Access Pass
TCS	Traffic Control System (i.e. Traffic Management System)
TEN	Truck Enforcement Network
TMC	Transportation Management Center
TMDD	Traffic Management Data Dictionary
TMS	Traffic Monitoring Stations
TNC	Transportation Network Companies
TS	Technical Specification
TSA	Transportation Security Administration
TSS	Transportation Sensor Station
TSP	Transit Signal Priority (System)
UDP	User Datagram Protocol
VSL	Variable Speed Limits
V2I	Vehicle-to-Infrastructure
V2V	Vehicle-to-Vehicle
V2X	Vehicle-to-Everything
WAB	Wide Area Broadcast
WAID	Wide-Area Information Disseminator
WAVE	Wireless Access in Vehicular Environments
WAW	Wide Area Wireless
WSMP	WAVE Short Message Protocol
XML	Extensible Markup Language

RELEASE VERSION:

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5/31/18	1.2 Draft Report	AG/JD	MH/CO
07/27/18	1.3 Draft Report	JD	CO
01/24/18	Final Report	EA	MH

1. INTRODUCTION

1.1. Background

CONNECT-IT (Connect and Integrate Transportation Technology) is the Regional Intelligent Transportation System (ITS) Architecture for the Los Angeles (LA) County region. CONNECT-IT leverages long standing investments in ITS by fostering coordination, integration, and cooperation among public agency and private sector stakeholders. A regional ITS architecture provides a framework for ITS projects that promotes interoperability and communication across jurisdictional boundaries and with private sector partners. Projects developed under a regional framework extend the value of any single project by making information easily accessible for operators and users of the system; by considering integration opportunities among projects in the region; and by encouraging compatibility with the existing and future technology framework.

The Los Angeles County Metropolitan Transportation Authority (Metro) has revamped the Regional ITS Architecture to address the deployment of ITS projects and technologies that has accelerated in pace and complexity in recent years. From a policy standpoint, this update brings the LA County region into compliance with federal regulations that requires ITS projects using federal transportation funds to be consistent with the National ITS Architecture and Standards (pursuant to 23 CFR §§ 940.9 and 940.11).

1.2. Project Overview and Scope

The original LA County Regional ITS Architecture was developed over a decade ago with the purpose of showcasing and planning for the integration of transportation management systems in LA County and was comprised of two companion documents. The Regional Integration of Intelligent Transportation Systems (RIITS) Architecture traces back to the 1998 LA/Ventura Strategic Deployment Plan that defined an architecture of a Showcase network for system-to-system integration in LA County. That Showcase network is now referred to as RIITS and is the core of the Regional ITS Architecture. The Arterial ITS Architecture (AITS) was developed as a companion to the RIITS Architecture to show more detailed interconnections between RIITS and local ITS elements.

With the recent developments at the federal level, and the advancements in ITS and connected/automated vehicles, Metro initiated an update to the regional ITS architecture. This update includes new ITS services and interfaces, such as those for connected vehicles, as described in the current National ITS Architecture at the time of this final report's publication – Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT) version 8.1. ARC-IT combined two previously separate national architectures – National ITS Architecture Version 7.1 and the Connected Vehicle Reference ITS Architecture (CVRIA) Version 2.2. Prior to ARC-IT, regional ITS architectures were developed using the Turbo Architecture tool. ARC-IT was released with a new software tool called the Regional Architecture Development for Intelligent Transportation (RAD-IT).

Additionally, LA County has continued to be a national leader in ITS deployment with new technologies and services that are increasing mobility, multimodal travel choices and ways that people access information. The architecture also needs to reflect the many existing ITS deployments and planned ITS developments since 2004. This project presents a forward-looking opportunity for regional stakeholders

to revisit the architecture as a planning framework to support the next wave of ITS investments and innovative transportation technology initiatives that will shape mobility in LA County in the years to come.

According to federal guidelines, the Regional ITS Architecture should look far enough into the future so that the efficient integration of ITS services can be guided over time. The **CONNECT-IT planning horizon is 10 years**, which is long enough to include most of the system integration opportunities as anticipated by the regional stakeholders, yet represents a reasonable planning horizon for technologies, given the fast-evolving nature of this industry.

1.3. Purpose of the Architecture Document

CONNECT-IT is a comprehensive plan that serves as a framework for planning and deploying technology and for managing and operating the transportation system in Los Angeles County. It is a tool and resource that provides guidance to stakeholders, local agencies, and regional agencies throughout the ITS project lifecycle – systems engineering, design and implementation.

It describes how ITS activities in Los Angeles County are organized, coordinated and integrated as follows:

- **Institutional aspects** – describes who the stakeholders are, their roles and responsibilities, and the operational concepts that the technology enables;
- **Technology aspects** – identifies the systems (inventory elements), the communications connections are between the systems (interface and standards) and the information that is sent from one center/system to another (data flows); and
- **Policy aspects** – supports regional initiatives and plans (Long Range Transportation Plan [LRTP] by Metro/Regional Transportation Plan-Sustainable Communities Strategy [RTP/SCS] by SCAG), maintains consistency with federal requirements and the national ITS architecture, and supports countywide ITS policies and funding programs.

1.4. How to Use CONNECT-IT

CONNECT-IT has been developed to promote operational coordination and technical connectivity across the region by providing an easy-to-use tool to support project development and advancement. This report provides an overview of all components of the architecture in a single document. An interactive website <https://www.laconnect-it.com> allows for stakeholders to identify specific components that are applicable to an organization or project. The website provides access to the architecture details that were developed using RAD-IT and can be searched by technology (service package) or by organization to get quickly to the specific connections and agencies that are related to a search term.

This report consists of the following sections:

- **1. Introduction:** background and purpose of the project and project scope
- **2. Regional Description and Stakeholders:** describes the geographic and functional scope
- **3. Regional Stakeholders:** provides a list of stakeholders and the inputs provided to the plan
- **4. Operational Concept:** describes the roles and responsibilities of the stakeholders in managing the network using technology tools

- **5. Operational Agreements:** summarizes the agreements in place and those that might be needed in the future
- **6. Functional Requirements:** provides a high-level description of the functionality provided for each major component of the architecture
- **7. Information Flows and Interface Requirements:** documents existing and planned connections among systems and elements in the region
- **8. Standards:** summarizes standards currently in use and available for future deployment to allow for projects to function and to potentially share information
- **9. Project Deployment Sequencing:** clarifies dependencies among future projects
- **10. Architecture Maintenance Management Plan:** provides a maintenance management plan for keeping CONNECT-IT up-to-date over time

2. REGIONAL DESCRIPTION AND STAKEHOLDERS

This section provides an overview of the general geographic area, demographic characteristics, stakeholders, and existing transportation systems and services that are relevant to CONNECT-IT which concentrates on Los Angeles County. The Los Angeles County region and its sub-regional boundaries is shown in Error! Reference source not found..

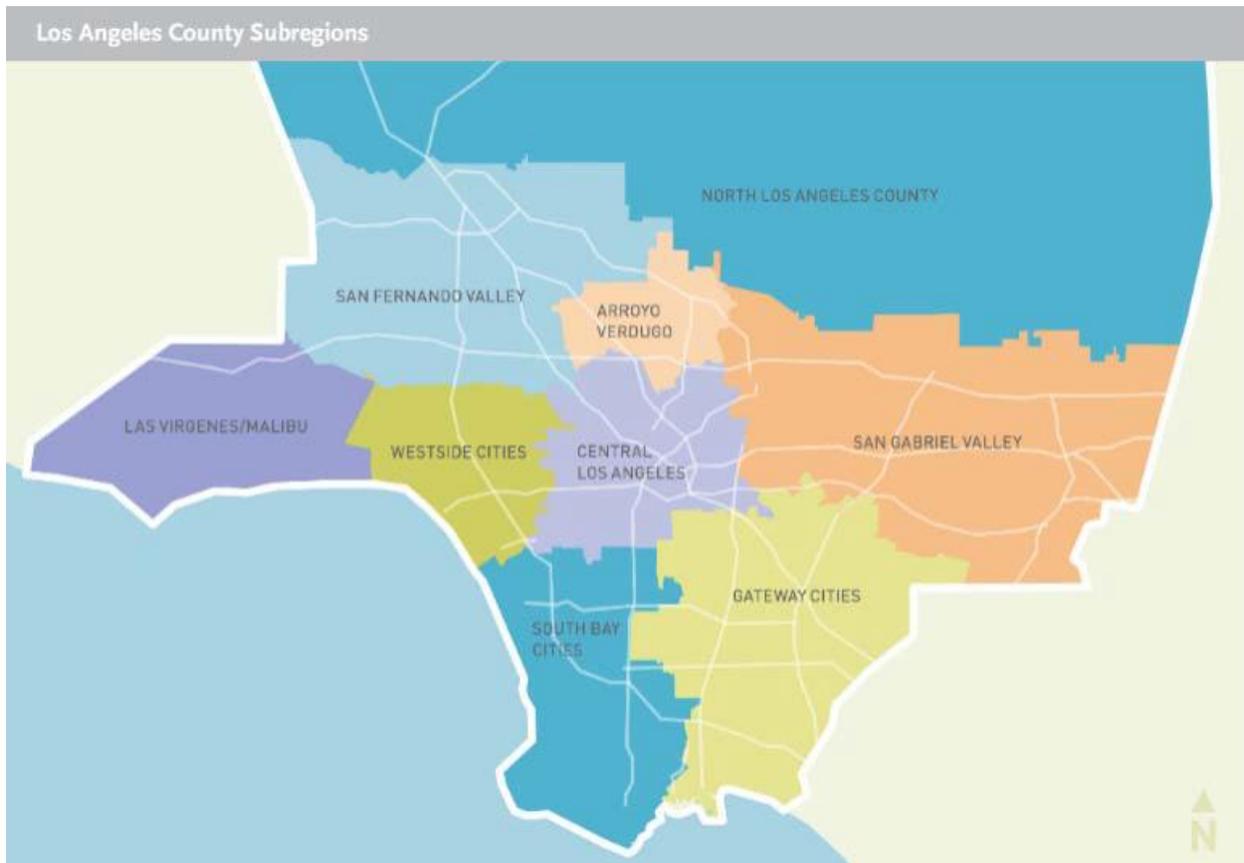


Figure 1 – Los Angeles County Region Map

Los Angeles County has a population of 10,241,335¹. The geographic area is 4,084 square miles. Los Angeles County is bordered on the south by Orange County, on the east by San Bernardino County, on the north by Kern County, and on the west by Ventura County and the Pacific Ocean. Its coastal mainline is 75 miles long. There are 88 cities within the county and approximately 40% of the county is unincorporated. The location and scale of the county contributes to the diversity of the area, roadway and highway networks, transportation systems, cities, airports, seaports, and the agencies that govern them.

¹ Source of statistics: <https://www.lacounty.gov/government/geography-statistics/statistics> (Year 2016)

CONNECT-IT is part of national efforts to coordinate ITS through local regions and the State of California. The Southern California Association of Governments (SCAG), as the Metropolitan Transportation Organization (MPO), is responsible for architectures for six counties, including, Orange, Ventura, Los Angeles, Riverside, San Bernardino, and Imperial Counties. The SCAG architecture is built upon the regional architectures for each county and includes additional architectural elements important to the SCAG region or that cross jurisdictional boundaries that would be best served by being explained in the architecture provided by SCAG. CONNECT-IT concentrates on ITS within Los Angeles County; however, it is not meant to limit this architecture to Los Angeles County.

2.1. Transportation/Traffic Management

The Los Angeles County network includes freeways, highways, and arterials that are maintained and operated by local cities, Los Angeles County Department of Public Works (LACDPW), and Caltrans District 7. In addition, Metro prepares the Long-Range Transportation Plan (LRTP) for Los Angeles County, which plans and programs transportation investments in a 40-year horizon. The LRTP identifies highway and arterial improvements in Los Angeles County that are funded through local sales tax measures (Proposition C, Measure R, and Measure M). This includes investments on the carpool system, congested freeway interchanges, express lanes, signal synchronization, and other ITS strategies.

2.1.1. Local Agencies

Local agencies in Los Angeles County vary in the approach to managing the surface transportation system. The 88 cities can be roughly categorized into two groups.

- **Local Agency-Managed Systems:** Many of the cities operate their own systems that were either procured individually or through a county umbrella contract. In some cases, advanced technologies are also used to supplement management of surface street traffic, parking and other aspects of the network.
- **LACDPW-Managed Systems:** Many of the cities contract operations and/or maintenance of traffic signals to LA County. In some cases, the cities have a remote workstation or remote server that are extensions of the County-owned system.

Table 1 provides a list of the local agencies and the traffic control system (TCS) that they currently operate or plan to operate. For local agencies that do not have a centralized TCS and are not on the LACDPW TCS, they may be included in one of the categories summarized below in the future.

Table 1 – Local Agencies Traffic Control Systems

Managed TCS Type	Traffic Control System Name: Local City, County or State
Local Agency-Managed TCS	KITS: Agoura Hills, Beverly Hills, Claremont, Commerce, San Dimas
	Centracs: Compton, Glendora, La Verne, Norwalk, Redondo Beach, Santa Fe Springs, South Gate, Torrance
	QuicNet: Artesia, Beverly Hills, Burbank, Calabasas, Gardena, Pomona, West Hollywood
	Transparity: Azusa, Beverly Hills, Culver City, Downey, Glendale, Inglewood, Palmdale, Pasadena, Santa Clarita
	TransSuite: Alhambra, Arcadia, Diamond Bar, Irwindale, Vernon, West Covina
	MaxView: Lancaster, Santa Monica
	LADOT ATCS: Los Angeles
	ATCS: Long Beach (parts of Lakewood, Signal Hill)
	SCATS: Pasadena
	KLD: Arcadia
	Econolite Aries: Cerritos
	Caltrans TSMSS (TransSuite): Caltrans District 7
	Caltrans ATCS: Caltrans District 7
Caltrans CT-NET: Caltrans District 7	
LA County DPW-Managed TCS	KITS: Baldwin Park, Bell, Carson, Covina, Cudahy, Duarte, El Monte, El Segundo, Hawthorne, Hermosa Beach, Huntington Park, Industry, La Mirada, Lawndale, Lomita, Lynwood, Manhattan Beach, Maywood, Monrovia, Paramount, Pico Rivera, Rolling Hills Estates, Rosemead, San Gabriel, San Marino, South Pasadena, Temple City, Unincorporated LA County
	Centracs: Bell Gardens, Carson, Hawthorne, Monterey Park
Notes: TCS information represents existing systems or future/planned systems to be deployed as of May 1, 2018.	

2.1.1.1 City of Los Angeles Department of Transportation (LADOT)

The City of Los Angeles is the largest city in LA County, and LADOT operates and manages over 4,000 traffic signals. The Automated Traffic Surveillance and Control (ATSAC) traffic management center houses the operations functions and is staffed during business hours and for many special events.

LADOT also uses technology for LA Express Park. LA Express Park is a parking management program that provides real-time parking information including availability, cost, location, and parking guidance to available parking meters, and parking spaces in lots and garages. The program incorporates new parking meter technology, parking space vehicle sensors, a real-time parking guidance system, an integrated parking management system, and the LADOT Parking Management Center.²

² Source: <http://www.laexpresspark.org/>

LADOT is preparing for the shift to shared mobility, fleet electrification, and testing and deployment of connected and automated vehicle (CAV) technologies. Under a current Transportation Technology Services Contract, LADOT will be focusing on the following categories: Mobility Technologies (Connected/Automated Vehicles, Shared Mobility, Drones, Mobility Software, etc.); Connectivity Technologies (V2I, V2V, V2X, Connectivity, Communication, Cybersecurity, Privacy Hardware/Software, etc.); Data Technologies (Data Platforms, Analytics, Modeling, Machine Learning, Artificial Intelligence, Other Hardware/Software, etc.); and Electrification Technologies (Charging Technologies, etc.).

2.1.2. Regional Agencies

There are county and state agencies that plan, implement, operate and maintain transportation systems in the Los Angeles County region. The following agencies and programs are major regional stakeholders in transportation/traffic management in the Los Angeles County region.

2.1.2.1 Caltrans District 7

Caltrans District 7 operates and maintains over 1,200 miles of state freeways and highways in Los Angeles County and Ventura County. The freeways are equipped with Traffic Monitoring Stations (TMS), Closed-Circuit Television (CCTV) camera systems, Changeable Message Sign (CMS) systems, and ramp metering systems. There are High Occupancy Vehicle (HOV) lanes along various freeway segments. Caltrans also operates and maintains traffic signals at freeway on/off-ramps and along state highways. These ITS field elements and traffic signals are connected to the Caltrans District 7 TMC, called Los Angeles Regional Transportation Management Center (LARTMC), located in the City of Los Angeles.

Caltrans is also operating, developing and deploying more advanced technologies such as dynamic lane management (currently in place on the northbound I-5 to US 101 connector, and being planned for the US 101 Arroyo Seco Parkway corridor), the I-210 Connected Corridors [an integrated corridor management (ICM) project], the Dynamic Corridor Ramp Metering System (DCRMS), and the Dynamic Corridor Congestion Management (DCCM) project.

In addition, Caltrans existing traffic signal management system (CTNET) has a connection to RIITS. Caltrans is currently developing a center-to-center interface to RIITS for their latest traffic signal management system being developed through the I-210 Connected Corridor project.

2.1.2.2 Los Angeles County Department of Public Works (LACDPW)

LACDPW operates and maintains approximately 1,100 traffic signals in unincorporated Los Angeles County; many of the traffic signal systems, ITS elements, and communications along arterial roadways for other local agencies; and a countywide CCTV system and travel-time performance measurement program.

LACDPW also manages the Information Exchange Network (IEN) that establishes a coordinated network for sharing second-by-second traffic signal timing data of numerous traffic control systems with the local agencies, Caltrans, and Metro throughout Los Angeles County using a common network backbone. Currently, there are at least twenty-four (24) local agencies that are connected to the IEN including a connection with RIITS (see description below). IEN will soon be undergoing a modernization that will upgrade the system and expand its capabilities. The modernized IEN is expected to be in place by 2020

and will utilize the National Transportation Communications for Intelligent Transportation System Protocol (NTCIP), Traffic Management Data Dictionary (TMDD) communications protocol.

illustrates a high-level system architecture diagram of the IEN and connectivity with the local cities, Caltrans, LADOT and other systems.

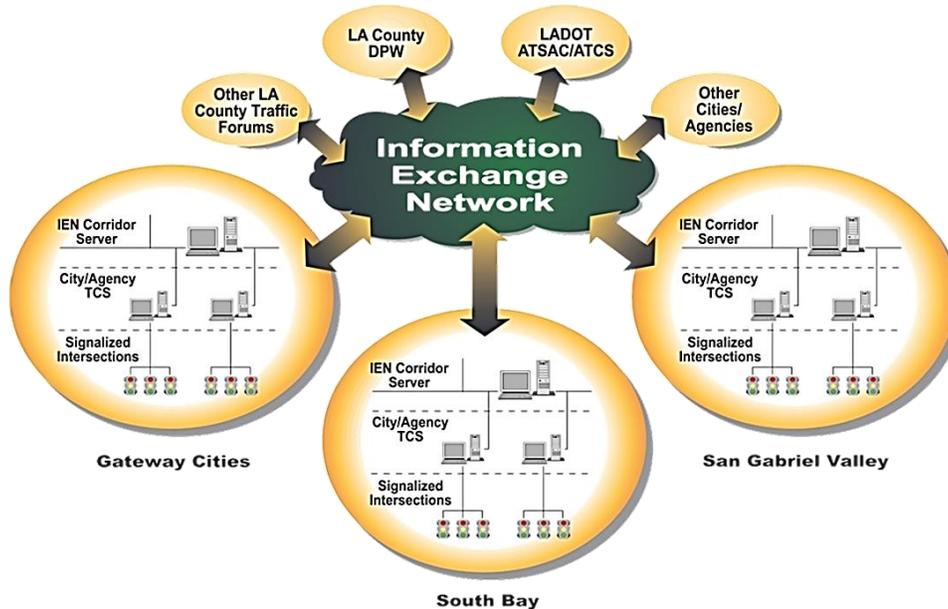


Figure 2 – The IEN System Architecture³

2.1.2.3 Metro

Metro is the designated County Transportation Commission (CTC) and a designated transit district of Los Angeles County. Metro funds many transportation, transit, and ITS projects in the region, in addition to being a transit service provider for bus and rail (see below for more about Metro’s transit services).

Metro also operates dynamically-priced HOV lanes, known as ExpressLanes, along I-110 between SR-91 and I-5 and on I-10 between I-5 and I-605. Caltrans and Metro have an agreement to operate and manage the existing ExpressLanes along the freeway segments mentioned above. In addition, Metro and Caltrans are in the beginning/planning stages for potential implementation of ExpressLanes on I-105 between I-405 and I-605 and on other routes in the region.

2.1.3. Regional Integration of ITS (RIITS)

³ Source: Los Angeles County Regional Traffic Forum Program Presentation dated March 2012.

RIITS is a coalition of agencies who, through membership agreements, are working together to share data in the LA County region. Currently the network, hosted by LA Metro, includes Caltrans, LADOT, California Highway Patrol (CHP), Long Beach Transit, Foothill Transit, and LA SAFE. The RIITS network shares real-time transportation data from agencies across Los Angeles County.

RIITS has also identified areas for transportation data environment enhancements, such as providing: a comprehensive, timely, and reliable regional data source; a complementary relationship with other ITS investments; a public platform for private innovation; and a platform for regional data management/archived data management system.

2.1.4. Southern California 511

Southern California 511 is operated by the Los Angeles County Service Authority for Freeway Emergencies (LA SAFE), which is a Los Angeles government agency. This multi-county traveler information system is provided and managed jointly with partners at the Orange County Transportation Authority (OCTA) and Ventura County Transportation Commission (VCTC). Southern California 511 provides traveler information for Los Angeles County and the four counties of Orange, Ventura, Riverside, and San Bernardino that surround Los Angeles. LA SAFE chose to include traveler information for five counties as a means to best serve the public and their transportation partners.

2.2. Transit Services

There are many transit agencies in Los Angeles County, the largest being Metro with over 2,400 buses and a rail system under its control. Other agencies can be categorized into municipal bus services (serving more than one city), local bus and shuttle services, demand responsive dial-a-ride and paratransit services, and rail. These are:

Municipal Operators

Arcadia Transit
Antelope Valley Transit Authority
Beach Cities Transit
Commerce Municipal Bus Lines
Culver City Municipal Bus Lines
Foothill Transit
Gardena Municipal Bus Lines
LADOT
La Mirada Transit
Long Beach Transit
Montebello Bus Lines
Metro
Norwalk Transit System
Santa Clarita Transit
Santa Monica's Big Blue Bus
Torrance Transit System

Rail (Local, Commuter, and Regional)

Metro
Amtrak
Metrolink

Local Bus and Shuttle Services

Alhambra Community Transit
Baldwin Park Shuttle
Bell Gardens Town Trolley
Bellflower Bus
Burbank Bus
Calabasas Shuttle
Carson Circuit
Catalina Island Services
Cudahy Transit
DowneyLINK
Duarte Transit System
El Monte Transit

Local Bus and Shuttle Services

El Segundo Lunchtime Shuttle
 El Sol Shuttle
 Glendale Beeline
 Glendora Mini Bus
 Go West Shuttle
 GTrans
 Huntington Park Combi
 Inglewood I-line
 LA County Beach Shuttle
 La Puente Link
 Lakewood Dash Transit
 Lawndale Beat
 LAX Flyaway
 Los Nietos Shuttle
 Mission City Transit
 Monterey Park Spirit
 Ocean Express
 Palos Verdes Peninsula Transit Authority (PVPTA)
 Pasadena Transit
 Pomona Get About
 Pomona Valley Transportation Authority
 Rosemead Shuttle
 Santa Fe Springs
 Sierra Madre Gateway
 South Whittier Sunshine Shuttle
 Thousand Oaks Transit
 UCLA Campus Shuttle
 West Hollywood Cityline

Demand Responsive and Paratransit Services

Access
 Acton/Agua Dulce Shuttle
 Agoura Hills Dial-a-Ride
 Alhambra Senior Ride
 Antelope Valley Transit Authority Dial-a-Ride
 Artesia Dial-a-Ride
 Avalon Dial-a-Ride
 Bell Dial-a-Ride
 Bell Gardens Dial-a-Ride
 Bellflower Dial-a-Ride

Demand Responsive and Paratransit Services

Beverly Hills Dial-a-Ride
 Burbank Senior and Disable Transit Services
 Calabasas Dial-a-Ride
 Carson Dial-a-Ride
 Cerritos Dial-a-Ride
 Cerritos on Wheels
 City of Commerce Medi Ride
 Claremont Dial-a-Ride
 Compton Dial-a-Ride
 Covina Transit Dial-a-Ride
 Culver City Dial-a-Ride
 Diamond Ride
 Downey Dial-a-Ride
 East Los Angeles Dial-a-Ride
 El Monte Dial-a-Ride
 El Segundo Dial-a-Ride
 Gardena Special Transit
 Glendale Dial-a-Ride
 Hawaiian Gardens Dial-a-Ride
 Hermosa Beach Dial-a-Taxi
 Inglewood Senior Center's Van Service
 Irwindale Dial-a-Ride
 La Canada-Flintridge Dial-a-Ride
 LA County Dial-a-Ride
 La Habra Heights Dial-a-Ride
 La Puente Dial-a-Ride
 La Verne Dial-a-Ride
 Lancaster Dial-a-Ride
 Lawndale Dial-a-Ride
 Lomita Dial-a-Ride
 Long Beach Dial-a-Lift
 Lynwood Dial-a-Taxi
 Malibu Dial-a-Ride
 Manhattan Beach Dial-a-Ride
 Maywood Dial-a-Ride
 Monrovia Dial-a-Ride
 Montebello Dial-a-taxi
 Monterey Park Dial-a-Ride
 Norwalk Dial-a-Ride
 Palos Verdes Peninsula Dial-a-Ride/ Dial-a-Lift

Demand Responsive and Paratransit Services

- Paramount Dial-a-Ride
- Pasadena Dial-a-Ride
- Pico Rivera Dial-a-Ride
- Rosemead Dial-a-Ride
- San Dimas Dial-a-Ride
- San Fernando Dial-a-Ride
- San Gabriel Senior Ride
- Santa Clarita Dial-a-Ride
- Santa Fe Springs Dial-a-Ride
- Santa Monica Dial-a-Ride
- Signal Hill Dial-a-Ride/ Dial-a-Lift

Demand Responsive and Paratransit Services

- South El Monte Dial-a-Ride
- South Gate Phone-a-Ride
- South Pasadena Dial-a-Ride
- Temple City Dial-a-Ride
- The WAVE (paratransit)
- Torrance Dial-a-Taxi
- Walnut Dial-a-Cab
- West Covina Dial-a-Ride
- West Hollywood Dial-a-Ride
- Westlake Village Senior & Disabled Dial-a-Ride
- Whittier Dial-a-Ride

In addition, **Table 2** provides a list of the municipal operators and the computer aided dispatch/automated vehicle tracking (CAD/AVL) that they currently operate, or plan to operate. For transit operators and services that do not have a CAD/AVL system, they may be included in the future.

Table 2 – Transit Agency CAD/AVL Systems

CAD/AVL System	Transit Agency
Avail	Foothill Transit, Montebello Bus Lines
Clever	Culver City Bus, Torrance Transit
Conduent	LA Metro
Transit Master (Trapeze)	Santa Monica Big Blue Bus, Long Beach Transit
Notes: CAD/AVL information represents existing systems or future/planned systems to be deployed as of September 1, 2018.	

2.2.1. City of Los Angeles Department of Transportation (LADOT) Transit

LADOT Transit includes several services for different transit markets in the region: DASH, Commuter Express and CityRide. LADOT Transit has approximately 300-350 buses in their fleet. DASH provides frequent, low-cost bus service in downtown Los Angeles and 27 neighborhoods across the City. Each route is designed to serve travel within that neighborhood and to connect to other regional transit services such as Metro Rapid and local routes, Metrolink and Metro rail lines. Commuter Express provides limited stop bus services to commuters in the morning and afternoon peaks to/from downtown Los Angeles and several other major employment centers. CityRide provides door-to-door service for the elderly and persons with mobility impairments.

LADOT Transit has recently deployed (and is in progress of implementing other) advanced transportation technologies. One of the advanced transportation technologies is a real-time alert system for buses (e.g. bus driver assistance). It captures data about bus movements, has sensors to detect pedestrians and bicyclists, provides alerts when pedestrians and bicyclists enter the detection zone, uses annunciators to communicate with the public curbside, and pushes information to the cloud. Other planned mobility

enhancements include: green light assist, bus stop signs with real-time bus arrival and departure information; connected vehicle transit signal priority (TSP) system; wireless pedestrian signal activation; and advanced bus driver assistance.

2.2.2. Metro (Transit)

Metro operates regional bus and rail services across the county. Bus service is provided countywide via 170 bus routes and over 2,400 vehicles. Rail service consists of six lines, including two rapid transit subway lines (the Red and Purple lines) and four light-rail lines (the Blue, Green, Gold and Expo lines) serving 93 stations via 105 miles of service. The standard Metro base fare applies for all trips. Fare collection is based on a partial proof-of-payment system. Passengers are required to purchase a transit access pass (TAP) card to enter stations equipped with fare gates. Passengers using a TAP card can transfer between Metro routes.

Metro also deployed bus signal priority (BSP) on selected Metro Rapid routes throughout LA County. Outside the City of LA, Metro uses wireless communications for signal priority requests at each intersection. Currently, there are five corridors equipped with BSP technology within LA County. Within the City of LA, Metro uses “loop and transponder” technology for BSP.

2.2.3. Metrolink and Amtrak

Metrolink and Amtrak provide commuter rail train service within the county providing interregional services to/from Orange County, Inland Empire, San Diego, Ventura, and points beyond. Both agencies are installing positive train control, have interaction with traffic signals at at-grade crossings, and provide traveler information to be able to track and receive status updates for trains.

2.3. Active Transportation

The Metro Active Transportation Strategic Plan (ATSP) demonstrates Metro’s ongoing commitment to improving mobility in the region for people who walk, bike, and take transit and to creating safer streets that benefit all roadway users⁴. “Active transportation” refers to any non-motorized mode of travel, including walking, bicycling, roller skating, roller blading, skateboarding, or scootering. This includes dockless personal mobility devices such as electric scooters and bikes. The ATSP will serve as Metro’s overall strategy for funding and supporting implementation of active transportation infrastructure and programs in Los Angeles County. It identifies strategies to improve and grow the active transportation network, to expand the reach of transit, and to develop a regional active transportation network to increase personal travel options. It is intended to provide guidance to Metro and partner organizations, including local jurisdictions, regional government, and other stakeholders, in setting regional active

⁴ Source: Metro’s Active Transportation Strategic Plan (ATSP) dated April 2016

transportation policies and guidelines to meet transportation goals and targets established in local, regional, state, and federal plans.

Implementation of some of the active transportation strategies will include ITS components. Metro has implemented and operates the Metro Bike Share program, which features approximately 1,400 bikes available in Downtown Los Angeles, the City of Pasadena, and communities of San Pedro and Venice⁵. The system can provide bike share data such as trip data, origin/destination data, station information, station status, miles traveled, and emissions reduced through their website.

Other cities throughout Los Angeles County are also implementing bike share programs including the Cities of Santa Monica and Long Beach. In the City of Santa Monica, their bike share operator provides user data via a closed network to City staff. The City of Long Beach has installed eco-counter systems at select locations to count bicyclists along these routes. The City of Long Beach is using SoBi as its bike share program operator. They provide reports showing where people traveled based on GPS data.

2.4. Emergency Management Services (EMS)

The following provides a high-level description of the EMS within the Los Angeles County region. This includes agencies responsible for law enforcement, fire, and rescue services.

2.4.1. California Highway Patrol (CHP)

The CHP Southern Division provides traffic patrols and response to incidents and emergencies, within their jurisdiction of freeways, state routes, and roadways in unincorporated areas. CHP maintains a staff presence in the LARTMC, primarily for incident management and emergency management. CHP and Caltrans staff use real-time traffic information and video feeds from the LARTMC to rapidly detect and respond to incidents while managing the resulting congestion. CHP and Caltrans staff gather information at the LARTMC and disseminate it to field staff for various purposes, such as responding to incidents, stalled vehicles blocking lanes, traffic breaks, and clearing debris from the freeway. Information gathered may include CCTV camera images, status reports from field crews, traffic flow data, weather data, CHP reports, or summaries of 911 calls. The field staff may include CHP officers, Caltrans maintenance, local agencies (i.e., police or public works departments), or private firms with contracts to clean up hazardous material spills. Basic, anonymous incident information is also shared with traveler information systems through RIITS.

⁵ Sources: Metro's Regional Bike Share Implementation Plan dated April 2015 by Febr and Peers. Metro's bike share website: <https://bikeshare.metro.net/about/>

2.4.2. Metro Emergency Security Operations

Metro is designing and building a new Emergency Security Operations Center (ESOC) on Metro-owned property in the City of Los Angeles Arts District⁶. ESOC will be a secured facility for authorized personnel only. The project is comprised of two phases. Once constructed as part of the first phase, the facility will house the Emergency Operations Center (EOC) and Security Operations Center as a central location for Metro security operations, radio dispatch, and emergency coordination. Metro is planning to integrate Rail and Bus Operations Centers into this facility as part of a future second phase to have a consolidated operations center for more effective management of Metro's expanding transportation network systems.

The new ESOC will serve as a crucial element of Metro's emergency response capabilities and provide efficient and effective transportation services in a central location for personnel to command, control, and communicate the latest and developing intelligence to respond to emergencies and/or incidents. This capability will allow Metro to make real-time decisions that make it possible to avoid catastrophes and mitigate disruptions to transportation services. Furthermore, it is important to develop a central location to house these operations centers to allow centralized communications and coordination, thereby improving business continuity in day-to-day operations and enhancing Metro's disaster and terrorism response capabilities⁷.

The new ESOC may serve as another form of a TMC that can allow operators to view on-street traffic conditions, monitor video surveillance cameras, and post messages on CMS.

2.4.3. Los Angeles County Sheriff and Fire Department

Los Angeles County has Sheriff and Fire Departments that provide law enforcement, fire protection, and EMS in unincorporated areas of the county and to certain city jurisdictions under contract arrangements. These departments are dispatched through county 911 centers. These centers are equipped with CAD/AVL systems that allow dispatchers to initiate emergency response through radio dispatch communications and then track response activities performed by field personnel.

2.4.4. Los Angeles County and Local City Emergency Medical Services Agencies

The Los Angeles County Emergency Medical Services is responsible for the regulatory oversight of the emergency medical services system in Los Angeles County⁸. The Los Angeles County emergency medical services system encompasses both public and private emergency services, including 68 emergency medical service providers, 72 (911) receiving hospitals, 21 paramedic base hospitals, 14 trauma hospitals,

⁶ Source: <https://www.metro.net/projects/esoc/d>

⁷ Source: *Initial Study/Mitigated Negative Declaration (IS/MND) for Metro Emergency Security Operations Center (ESOC) dated December 2015.*

⁸ Source: *Los Angeles County Emergency Medical Services Agency Quality Improvement Plan 2014/15.*

33 heart attack receiving centers, 37 approved stroke centers, 42 emergency departments approved for pediatrics, and 8 pediatric medical centers.

2.4.5. Local Police and Fire

At the local city level, many of the larger cities have their own police and/or fire departments, which handle law enforcement, fire protection, and EMS for their jurisdictions.

2.5. Air and Sea Ports

This following provides a high-level description of the airports and seaports within the Los Angeles County region. This includes agencies responsible for air traffic control, airside operations, freight management, and seaside operations.

2.5.1. Los Angeles International Airport (LAX)

Los Angeles International Airport (LAX) is administered by the Los Angeles World Airports (LAWA), a department of the City of Los Angeles. LAX accommodates commercial passengers and cargo movement. LAWA has plans for technology improvements including an automated people mover, future intermodal transportation facilities, a consolidated rent-a-car facility, enhanced traveler information system, and a joint integrated corridor management system for primary corridors providing access to and from LAX including Inglewood, Culver City, LADOT, LAWA, and Caltrans. LAWA is also piloting technology projects including a home-to-gate traveler information app, data collection for Transportation Security Administration (TSA) wait times, and several other data collection efforts. LAWA also operates an Airport Response Coordination Center (ARCC) that provides 24/7 oversight of airport operations including remote access to the LADOT ATMS with the ability to override traffic signal timing at traffic signals in the central terminal area (CTA) and a consolidated system for video viewing and management for the many cameras on site at the airport.

2.5.2. Other Airports

There are other airports in Los Angeles County including Long Beach Municipal Airport, Hollywood/Burbank Airport, LA/Palmdale Regional Airport, Agua Dulce Airport, Catalina Airport, Hawthorne Airport, Torrance Airport, Santa Monica Airport, and Van Nuys Airport.

Los Angeles County owns and operates five small airports including Brackett Field Airport in the City of La Verne, Compton/Woodley Airport in the City of Compton, San Gabriel Valley Airport in the City of El Monte, General William J. Fox Airfield in the City of Lancaster, and Whiteman Airport in the City of Los Angeles.

2.5.3. Ports of Long Beach and Los Angeles

The Port of Long Beach (POLB) is a department of the City of Long Beach (Long Beach Harbor Department) and the Port of Los Angeles (POLA) is a department of the City of Los Angeles (Los Angeles Harbor Department). POLB and POLA are landlords to Marine Terminal Operators (MTOs), who lease property at the Ports to transfer freight between ships and land-based carriers involving multiple organizations. The ports operate in coordination with ocean carriers, MTOs, longshore workers, railroad operators, and trucking companies. The Ports implemented a joint system involving the use of vehicle detection, changeable message signs and CCTV cameras for monitoring access and circulation called the Advanced Transportation Management and Information System (ATMIS). POLB has also developed a second system called Virtual Port, which is a Geographic Information Systems (GIS)-based system that tracks and monitors vessels accessing the ports, consolidates video feeds from CCTV cameras, and supports identification and management of incidents and events at the Ports. ATMIS is being enhanced and integrated into the Virtual Port System. Some of the enhancements proposed for ATMIS 2.0/Virtual Port include:

- Improved monitoring of real-time conditions
- Expanded network of CCTV camera systems
- Enhanced event tracking functionality via Virtual Port / Web Portal
- Common central software to remotely control changeable message signs and portable message signs
- Improved coordination of incident response and regional data-sharing
- Connections to regional systems such as RIITS

2.6. Private Companies

More and more, technology is being introduced and advanced by the private sector. Transportation Network Companies (TNCs), such as Uber and Lyft, use phone apps to coordinate reservations for door-to-door services. Crowdsourced data is collected and sold by companies like Google and Inrix that is then used by the public sector for traveler information, traffic operations, and performance monitoring. A major shift in traveler information has occurred with more travelers turning to private providers like Google and Waze for their mapping, transit planning, and real-time traffic/transit information. In addition, fleet operations for commercial vehicles and delivery services (e.g., UPS, FedEx, Amazon, etc.) use technology for fleet management and have an increasing impact on the road network as more consumers turn to online purchasing and home delivery.

RIITS (described in Section 2.1.3 above) provides a means for transportation operations to securely share or exchange transportation data with private companies as RIITS is the transportation information center consolidator and disseminator for Southern California. The Interagency Memorandum of Understanding included in this architecture provides RIITS members and associates with a revocable agreement to non-exclusively license their data to each other and to private companies. The sources of RIITS data also agree to exchanging data with non-voting associates (government agencies that join RIITS without voting) and through the Transportation Data Access Agreement with researchers and private company users. RIITS has also secured licenses to INRIX data for Los Angeles and Waze data for California that can be sublicensed through RIITS membership to agencies in Southern California by becoming a member of RIITS and signing a separate license for access to private company data.

It is understood that fleet management and other transportation technology applications employed by private sector exist outside this architecture. This also includes the advancements of Internet of Things (IoT) for fleet vehicles and other modes of transportation, using the cloud, and other types connectivity, security, and interoperability for current and next generation technologies. This is a living architecture, and as other current and future technologies within public and private sector are introduced and/or interface with ITS in Los Angeles County, this information will be added to CONNECT-IT as part of the maintenance of this architecture.

3. STAKEHOLDER INPUT

A major outreach effort was conducted to provide local agencies and stakeholders information about the ITS Architecture update, to solicit input to the process, and to establish an understanding of the need and purpose of using and maintaining the architecture. This section describes the methodology and results of the stakeholder engagement and input.

3.1. Methodology

The stakeholder outreach and needs analysis approach consisted of various strategies to maximize stakeholders' participation. This included leveraging existing working groups, committees, and councils of government (COGs); and delineating roles and responsibilities to establish clear expectations for their involvement. The meetings that were held included:

- Steering Committee Meetings
- Group Workshops
- Transit Agency Meetings
- Parking Management Meeting
- Individual Stakeholder Meetings

Other strategies to help understand the stakeholders' needs and maximize participation included:

- Providing and collecting surveys online, via e-mail, and hardcopies to understand the ITS services that each agency is currently providing or is planning to provide in the near future.
- Developing and maintaining a customized project website that is easy to use by stakeholders for current and future projects.

3.1.1. Stakeholder Outreach

There were over 20 stakeholder meetings that were conducted throughout the project. **Table 3** summarizes the number of stakeholder meetings that were conducted with the participating stakeholders. The meetings that were held with the LA County COGs included representative agencies/stakeholders from each area. Other meetings were held with Southern California Association of Governments (SCAG), the Coalition for Transportation Technology, Metro Board subcommittees, and a focused group with the North County agencies.

Table 3 – Meeting Type with Project Stakeholders

	Meeting Type	Stakeholders
	Steering Committee Meetings	<ul style="list-style-type: none"> • Metro Highway Program ITS • RIITS • LA Metro Congestion Reduction • LA Metro Information Technology Services • LA Metro Parking Management • LACDPW • LADOT • City of Arcadia • City of Pasadena • City of Santa Clarita • City of Santa Monica • SCAG • Santa Monica’s Big Blue Bus • Foothill Transit • Long Beach Transit • Montebello Transit • Caltrans District 7 • Port of Los Angeles • Port of Long Beach • FHWA
	Group Workshops	<ul style="list-style-type: none"> • SCAG • Coalition for Transportation Technology • Gateway Cities COG • Arterial ITS Committee • South Bay Cities COG • San Gabriel Valley COG • Focused Group Meeting with Local Agencies in north LA County area (held at the City of Burbank)
	Transit Agency Group Meetings	<ul style="list-style-type: none"> • Bus Operations Subcommittee (BOS) • Local Transit Systems Subcommittee (LTSS)
	Parking Management Meeting	<ul style="list-style-type: none"> • Metro - Parking Management Department
	Strategic Individual Meetings	<ul style="list-style-type: none"> • Santa Monica Mobility Group • Long Beach Active Transportation • LAWA • LADOT Transit • Port of Long Beach • Port of Los Angeles

3.1.2. Project Steering Committee

The Project Steering Committee was comprised of a representative group of agencies and stakeholders with lead roles in ITS and technology implementation in Los Angeles County. Steering Committee members participated in several meetings to provide strategic guidance to the project and develop the updated architecture that reflects ITS deployments in recent years including the establishment of the regional needs, goals and objectives. The Steering Committee reviewed and provided input to project deliverables. **Table 4** summarizes the Steering Committee members, the agency each represents, and the topic(s) each represented.

Table 4 – Steering Committee Members

Agency	Representatives	Architecture Topic(s) Represented
LA Metro – Highway Program ITS	Ed Alegre Steven Gota Eva Pan Shrota Sharma	<ul style="list-style-type: none"> Overall direction and project management Countywide Signal Priority Continuity with Highway Program activities including CV Pilot and related Coalition activities
RIITS	Kali Fogel	<ul style="list-style-type: none"> RIITS Modernization for data sharing, data archiving, and performance measurements
LA Metro – Congestion Reduction	Tim Lew Robert Campbell	<ul style="list-style-type: none"> ExpressLanes
LA Metro – Information Technology Services	Doug Anderson Al Martinez	<ul style="list-style-type: none"> Transit Applications ATMS
LA Metro – Parking Management	Shannon Hamlin	<ul style="list-style-type: none"> Metro Parking Master Plan
LA County Department of Public Works	Jane White	<ul style="list-style-type: none"> Information Exchange Network (IEN) Countywide traffic signal operations Connected Vehicles
Southern Association of Governments (SCAG)	Matt Gleason Philip Law	<ul style="list-style-type: none"> Southern California Regional ITS Architecture Regional Transportation Plan (RTP)
Caltrans District 7	Ali Zaghari (Operations) Allen Chen (ITS) Paul Marquez (Planning) Mort Fahrtash (TMC) Dan Kopulsky (Planning)	<ul style="list-style-type: none"> Los Angeles Regional Traffic Management Center (LARTMC) Integrated Corridor Management (Connected Corridors and DCCM)
Federal Highway Administration (FHWA)	Jesse Glazer	<ul style="list-style-type: none"> Federal requirements for ITS Architectures
City of Los Angeles Department of Transportation (LADOT)	George Chen	<ul style="list-style-type: none"> Automated Traffic Surveillance and Control (ATSAC) System Autonomous Vehicles Transportation Technology Services

Agency	Representatives	Architecture Topic(s) Represented
Port of Long Beach	Theresa Dau-Ngo	<ul style="list-style-type: none"> • Port ITS Applications
Port of Los Angeles	Kerry Cartwright	<ul style="list-style-type: none"> • Port ITS Applications
City of Santa Clarita	Cesar Romo	<ul style="list-style-type: none"> • Citywide ITS Applications
City of Arcadia	Kevin Merrill	<ul style="list-style-type: none"> • Citywide ITS Applications
City of Santa Monica	Andrew Maximous	<ul style="list-style-type: none"> • Citywide ITS Applications
City of Pasadena	Victor Koo	<ul style="list-style-type: none"> • Citywide ITS Applications
Foothill Transit	Joe Raquel	<ul style="list-style-type: none"> • Transit Applications • ATMS • Signal Priority
Long Beach Transit	Carri Sabel	<ul style="list-style-type: none"> • Transit Applications • ATMS
Santa Monica Big Blue Bus	Barbara Andres	<ul style="list-style-type: none"> • Transit Applications • ATMS • Signal Priority
Montebello Transit	David Tsuen Tom Barrio	<ul style="list-style-type: none"> • Small Municipal Operator Transit Applications

3.1.3. Agency Participation and Survey Results

The involvement of regional agencies and stakeholders was important in updating the architecture with the most recent ITS planning and development activities. Having the stakeholders invested in this process was critical to the acceptance and use of CONNECT-IT as a planning tool. There are currently several ITS deployments and planned projects throughout the region. To initiate and maintain agency participation, the following was conducted as part of the stakeholder outreach:

- Identifying recent ITS planning and development activities
- Identifying additional stakeholders to engage
- Identifying challenges and solutions
- Promoting stakeholders' project understanding and benefits
- Understanding stakeholders' transportation needs that have the potential to be solved by technology

To identify recent ITS planning and development activities, stakeholders were surveyed via email and hardcopy to understand ITS services and deployments that each agency is currently providing and/or with plans to provide in the near future. There was a total of **46 surveys** that were collected from the participating agencies, as shown below. The agencies include local cities, LACDPW, transit agencies, Caltrans District 7, Metro (Active Transportation Department, Congestion Reduction Department), RIITS, LAWA, POLA, and POLB.

Agency

- Antelope Valley Transit Authority
- Caltrans District 7
- City of Agoura Hills
- City of Alhambra
- City of Arcadia

- City of Azusa
- City of Bellflower
- City of Burbank
- City of Calabasas
- City of Carson
- City of Compton
- City of Culver City
- City of Diamond Bar
- City of Diamond Bar
- City of Gardena
- City of Glendale - Transit Operations
- City of Hawthorne
- City of Inglewood
- City of Lancaster
- City of Long Beach
- City of Los Angeles
Department of Transportation (LADOT)
- City of Malibu
- City of Manhattan Beach
- City of Maywood
- City of Monrovia
- City of Montebello
- City of Palmdale
- City of Pasadena
- City of Pomona
- City of Santa Clarita
- City of Santa Monica
- City of Santa Monica
- City of Santa Monica Big Blue Bus
- City of Torrance
- City of West Hollywood
- LA County Department of Public Works
- LA Metro Parking Management
- LA Metro ExpressLanes
- Long Beach Transit
- Los Angeles World Airports (LAWA)
- LA Metro Countywide Planning
- Montebello Bus Lines
- Port of Long Beach
- Port of Los Angeles
- RIITS

The survey included 35 types of ITS projects and services. The results of the surveys are also used to understand common themes, and to assess the current and future needs of the region. The ITS architecture inventory survey questionnaire results are provided in **Appendix A**.

Table 5 summarizes the results of the survey including the percentage and number of participants that operate, plan to operate, or that are not applicable (N/A) for each ITS project and services that is listed.

Table 5 – Survey Results

No.	ITS Project and Services	Operate		Planned		Not Applicable (N/A)		Total
		%	No.	%	No.	%	No.	
1	Adaptive Traffic Control	19.57%	9	36.96%	17	47.83%	22	46
2	Automated/Autonomous Vehicle Technologies	0.00%	0	41.30%	19	58.70%	27	46
3	Bikesharing	23.91%	11	32.61%	15	47.83%	22	46
4	Centralized Arterial Traffic Management	47.83%	22	23.91%	11	39.13%	18	46
5	Centralized Freeway Traffic Management	4.35%	2	2.17%	1	93.48%	43	46

No.	ITS Project and Services	Operate		Planned		Not Applicable (N/A)		Total
		%	No.	%	No.	%	No.	
6	Center-to-Field Communications (e.g., fiber, copper, wireless)	63.04%	29	21.74%	10	23.91%	11	46
7	Congestion Pricing (e.g., variably priced lanes, area pricing)	4.35%	2	6.52%	3	91.30%	42	46
8	Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	2.17%	1	45.65%	21	54.35%	25	46
9	Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	0.00%	0	34.78%	16	65.22%	30	46
10	Construction/Maintenance Management	45.65%	21	21.74%	10	36.96%	17	46
11	Coordinated Incident Management	26.09%	12	30.43%	14	45.65%	21	46
12	Data Management (e.g., archived data)	41.30%	19	32.61%	15	28.26%	13	46
13	Detection of Non-Motorized Users	34.78%	16	28.26%	13	39.13%	18	46
14	Decision Support Tools (e.g., recommended actions for event response)	10.87%	5	50.00%	23	43.48%	20	46
15	Dynamic Lane Management	8.70%	4	6.52%	3	86.96%	40	46
16	Electronic Transit Fare Collection	17.39%	8	21.74%	10	63.04%	29	46
17	Emergency Vehicle Preemption (EVP)	36.96%	17	17.39%	8	45.65%	21	46
18	Multi-Jurisdictional Traffic Management	28.26%	13	34.78%	16	36.96%	17	46
19	Non-Motorized Safety Applications	28.26%	13	28.26%	13	45.65%	21	46
20	Parking Management	26.09%	12	26.09%	12	54.35%	25	46
21	Performance Measurement Systems (e.g., data analytics and reporting)	26.09%	12	54.35%	25	21.74%	10	46
22	Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	2.17%	1	10.87%	5	86.96%	40	46

No.	ITS Project and Services	Operate		Planned		Not Applicable (N/A)		Total
		%	No.	%	No.	%	No.	
23	Real-time Traffic Data Collection (Crowd-sourced)	17.39%	8	32.61%	15	50.00%	23	46
24	Real-time Traffic Data Collection (Infrastructure-based)	39.13%	18	41.30%	19	26.09%	12	46
25	Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	36.96%	17	32.61%	15	34.78%	16	46
26	Ridesharing Services	28.26%	13	21.74%	10	50.00%	23	46
27	Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	21.74%	10	26.09%	12	52.17%	24	46
28	Toll Management (e.g., roadside toll collection, back office operations)	2.17%	1	0.00%	0	97.83%	45	46
29	Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	30.43%	14	30.43%	14	43.48%	20	46
30	Transit Management Systems (Fixed Route or Demand Responsive)	34.78%	16	21.74%	10	47.83%	22	46
31	Transit Signal Preemption	30.43%	14	28.26%	13	41.30%	19	46
32	Transit Signal Priority (Buses)	28.26%	13	34.78%	16	41.30%	19	46
33	Transit Signal Priority (Rail)	30.43%	14	8.70%	4	60.87%	28	46
34	Variable Speed Limits	6.52%	3	13.04%	6	80.43%	37	46
35	Other Projects or Services							13

A graphical representation of the survey results is shown in Error! Reference source not found..

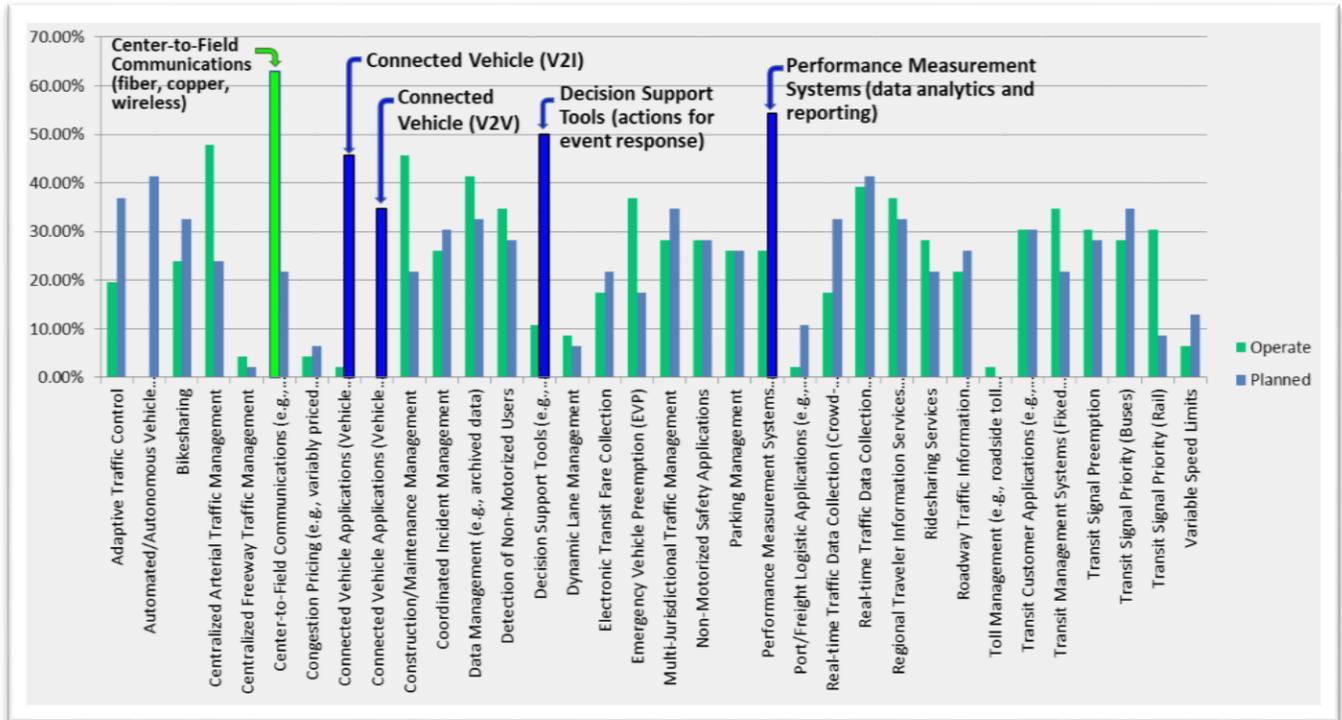


Figure 3 – Survey Results Graphical Representation

Based on the surveys, the top three ITS projects and services that are currently in operation by local agencies are: Center-to-Field Communications (approximately 63% of the participants), Centralized Arterial Traffic Management Systems (approximately 48% of the participants), and Construction/Maintenance Management Services (approximately 46% of the participants).

The top three ITS projects and services that are planned by local agencies are: Performance Measurement Systems (approximately 54% of the participants), Decisions Support Tools (approximately 50% of the participants), and Connected Vehicle Applications (V2I) (approximately 46% of the participants are planning).

While these top ITS projects and services represent mostly local agencies, other specific stakeholders currently are operating ITS elements and have planned ITS elements as it relates to the specific services they provide. As an example, approximately 35% of the participants are currently operating Transit Management Systems, and approximately 30% of the participants are planning Transit Customer Applications.

3.1.4. Needs Assessment

A needs assessment was conducted to determine additional components to include within the ITS Architecture update. The stakeholder needs were discussed during the outreach meetings, steering

committee meetings and collected in the surveys. **Table 6** summarizes the overlying regional needs and relevant service package areas for CONNECT-IT.

Table 6 – Needs and Relevant Service Package Areas

Need	Source	Service Package Area
Integration of 3 rd party information	Survey Results	Data management
Maintenance and construction coordination	Survey Results	Maintenance and Construction
Emissions monitoring	Survey Results	Sustainable Travel
Operations and maintenance resources	Survey Results	Traffic Management
Integrated operations across jurisdictions	Survey Results	Traffic Management
Transit Priority (bus)	Survey Results	Public Transportation
County-wide performance measurements	Survey Results/ Steering Committee Meetings	Data management
Sharing of data and information among operating agencies	Steering Committee Meetings	Various
Cybersecurity	Steering Committee Meetings	Various

3.1.5. Current and Planned ITS Projects and Programs

ITS projects and programs that have been developed, planned, and/or deployed since the 2004 LA County Regional ITS Architecture have also been identified and will be included in this Architecture update. Based on feedback from local agencies and stakeholders, the following summarizes these ITS projects and programs.

- ✓ I-210 Connected Corridors Project and I-110 South Bay Corridor Dynamic Corridor Congestion Management (DCCM) Project
 - These projects have similar ICM elements and decision support systems, such as:
 - Adaptive Ramp Metering
 - The adaptive ramp metering is called Dynamic Corridor Ramp Metering System (DCRMS)
 - Queue End Warning (QEW)
 - Speed Harmonization/Variable Speed Limits (VSL)

- Traffic Signal Control, including adaptive
 - Smart Signals
 - Traffic Demand Management
 - Decision Support Systems (DSS)/Response Plans
 - Multimodal DSS
 - Predictive travel time calculations
 - Accident response strategy assessments
 - Urban and interurban congestion management
 - ITS Transit Management Strategies
 - Active Transit Management (ATM) Strategies
 - Active Transportation Demand Management (ATDM) Strategies
 - Performance Measurement
- As the projects develop, other stakeholders may extend to additional public sector and private sector participants. The private sector's role may include operations and maintenance support and/or 3rd party support for integration and monitoring systems.
 - Caltrans is currently developing a center-to-center interface to RIITS for their latest traffic signal management system through the I-210 Connected Corridor project.
- ✓ **Countywide Signal Priority**
- Planned improvements will be monitored along corridors and will involve both the transit agencies and the local agencies along the transit corridors.
 - The private sector's role may include operations and maintenance support and 3rd party support for integration and monitoring systems.
- ✓ **Parking Management Systems**
- Smart parking management systems have been implemented in several jurisdictions including Metro and the Cities of Santa Monica, Pasadena, and Long Beach.
 - Metro has developed a Supportive Transit Parking Program Master Plan that outlines recommendations for policy, technology and enforcement strategies for Metro's 24,000 parking spaces across the region.
- ✓ **Bike Share Program**
- Bike share programs have been implemented within the County.
 - The stakeholders involved in these upgrades include Metro, and the Cities of Los Angeles, Long Beach, Santa Monica, and Pasadena.
 - The private sector's role may include operations and maintenance support and 3rd party support for integration and monitoring systems.

- ✓ Transit Access Pass (TAP) Program
 - The TAP program is used by Metro and over two dozen other transit agencies in the region including Metrolink, regional services, and local services (A list of participating transit systems is provided at: https://www.taptogo.net/articles/en_US/Website_content/where-to-ride). TAP is also being used for parking payments at some locations. A mobile application is in the trial phase.
 - As of July 2018, TAP is instituting all-door boarding on Metro Rapid routes; transfers between transit agencies is exclusively on TAP; TAP is working on developing an application to scan phones to pay for transit fares, pay for Metro Bike and Bike Share Connect, and other ride hailing services; permits at Metro Parking facilities may be purchased using TAP.

- ✓ LA County Information Exchange Network (IEN) Expansion/Enhancements
 - The IEN will be updated and enhanced in the near-term. Planned improvements will be monitored and updates will be reflected in CONNECT-IT as details become available.
 - The stakeholders involved include LACDPW, Metro, RIITS, and participating agencies in the Los Angeles County region.

- ✓ RIITS expansion/enhancements
 - New agreements will be established as new partners join to contribute to the sharing and exchange of available data.

- ✓ Goods Movement – Freight Advanced Traveler Information Systems (FRATIS)/Los Angeles/Gateway Cities
 - Metro is leading the development and deployment of modernizing FRATIS. Stakeholders include the Ports of Long Beach and Los Angeles, MTOs, Beneficial Cargo Owners (BCOs), truck operators, trucking associations, and local agencies.

- ✓ POLA and POLB Advanced Traffic Management and Information System (ATMIS)
 - The POLA and POLB ATMIS is being enhanced and integrated into the Virtual Port System, which includes upgrades to the viewer-only, online platform referred to as Web Portal and shared access with POLA.
 - Some of the enhancements proposed for ATMIS 2.0/Virtual Port are as follows:
 - Improved monitoring of real-time conditions

- Expanded network of CCTV camera systems
 - Enhanced event tracking functionality
 - Common central software to remotely control changeable message signs and portable message signs
 - Improved coordination of incident response and regional data-sharing
 - Connections to regional systems such as RIITS
-
- ✓ Private Sector – Mobile Applications (Google, Waze, Shared Mobility, etc.)
 - Partnerships and coordination with the private sector mobile applications are more prevalent in recent years.
 - RIITS has an agreement with Waze and is a member of the Waze Connected Citizens program. Through this agreement, members of RIITS can have access to Waze.

 - ✓ Metro’s new Emergency Security Operations Center (ESOC)
 - The ESOC will integrate the functions of the Emergency Operations Control (EOC), Rail Operations Center (ROC) and Bus Operations Center (BOC) in the ESOC.

4. OPERATIONAL CONCEPTS

An operational concept documents each stakeholder's current and future roles and responsibilities. The transportation services include the following:

- **Arterial Management** – Signal systems that react to changing traffic conditions and provide coordinated intersection timing over a corridor, an area, or multiple jurisdictions.
- **Commercial Vehicle Operations** – Systems to facilitate the management of commercial vehicles (e.g., electronic clearance.)
- **Data Management** – Systems to collect transportation data for use in both non-operational purposes (e.g., planning and research) and operational purposes (e.g., changes to signal timing.)
- **Freeway Management** – Systems to monitor freeway (or tollway) traffic flow and roadway conditions, and provide strategies such as ramp metering or lane access control to improve the flow of traffic. Includes systems to provide information to travelers on the roadway. This includes congestion management of both recurrent and non-recurrent congestion.
- **Incident Management** – Systems to provide rapid and effective response to incidents. Includes systems to detect and verify incidents, along with coordinated agency response to the incidents.
- **Maintenance and Construction Management** – Systems to manage the maintenance and construction of roadways in the region.
- **Parking Management** – Electronic fare payment systems for use by transit and other agencies (e.g., parking.)
- **Public Transportation Management** – Systems to more efficiently manage fleets of transit vehicles.
- **Support** – Support services enable the secure, managed operation of applications.
- **Traveler Information** – Systems to provide static and real-time transportation information to travelers.
- **Vehicle Safety** – Systems to support private sector vehicle safety initiatives (e.g., intersection collision avoidance.)
- **Weather** – Systems to collect, analyze, and disseminate weather data for use in operations.

Table 7 identifies stakeholder agencies and their roles/responsibilities for different ITS services within the region.

Table 7 – LA County Stakeholder Roles and Responsibilities

Transportation Service	Stakeholder	Roles/Responsibilities
Arterial Management	LADOT, LACDPW, Caltrans, Local Agencies, POLA and POLB	Operate signals, network surveillance equipment, CCTV cameras, field sensors, and other technology to facilitate arterial mobility and safety.
		Provide traffic information to RIITS, IEN, and other agencies.
		Coordinate traffic information and control with other agencies.
Freeway Management	Caltrans, Metro (ExpressLanes)	Coordinate traffic information and traffic control with other agencies.
		Operate technology for freeway mobility and safety.
Incident Management	Caltrans, LADOT, LACDPW, Local Agencies, CHP, Local Police and Fire, Sherriff, POLA and POLB	Coordinate with other agencies for coordinated incident management.
		Perform network surveillance for detection and verification of incidents.
		Provide incident information to travelers via traffic information devices (e.g., CMS).
		Coordinate maintenance resources for incident response with Construction and Maintenance Operations.
		Participate in the incident response, coordination, and reporting.
Data Management	Caltrans, Metro, RIITS, Local Agencies, LADOT, LACDPW, SCAG, POLB and POLA	Collect and archive traffic and transit information for planning and operations analysis purposes.
Maintenance and Construction Management	Caltrans, LACDPW, Local Agencies, LADOT, POLB and POLA	Provide maintenance of state highways and local arterials including pavement maintenance and construction activities.

Transportation Service	Stakeholder	Roles/Responsibilities
Public Transportation	LADOT, Metro, Local Transit Agencies, Regional Transit Agencies, Metrolink	Operate and maintain transit services.
Commercial Vehicle Operations	CHP, Caltrans, POLA, POLB, Private Sector	Provide enforcement of permits for overheight/overweight or HAZMAT commercial vehicles.
		Provide first response to commercial vehicle incidents and coordinate for HAZMAT conditions/clean-up.
		Provide route restriction information to private fleet systems.
		Provide automated weigh-in-motion inspections for private fleet operations.
		Provide permit information to regional emergency management providers and regional enforcement agencies.
		Provide terminal queues/wait times and parking information to drayage operators
Support	RIITS	Manage distribution of data from data providers.
Traveler Information	LA SAFE, LADOT, Metro, Regional Transit Agencies, CHP, Caltrans, Local Agencies, POLA, POLB, Private Sector	Collection, processing, storage, and broadcast dissemination of traffic, transit, maintenance and construction, and weather information to travelers via the 511 Traveler Information System or private applications.

Transportation Service	Stakeholder	Roles/Responsibilities
		<p>Provide traveler information to the media.</p> <p>Collect traffic and transit information (road network conditions), work zone information, travel times, and weather information.</p>
Vehicle Safety	Caltrans, LACDPW, Local Agencies, Local and Regional Transit Agencies, Rail Operators, Private Sector	Collect and share traffic safety information that is distributed from vehicle to vehicle and vehicle to infrastructure.

5. OPERATIONAL AGREEMENTS

This section identifies the existing agreements among the different stakeholders, agencies, and organizations from existing and planned (near-term) projects that are relevant to CONNECT-IT. These agreements are typically related to different levels of involvement from multiple agencies, cross-jurisdictional boundaries, organizations, and/or public-private partnerships. The list of agreements may be leveraged to add stakeholders to current projects and programs or may be used as examples for future projects.

Agreements among the different stakeholder agencies and organizations in the Los Angeles County region may be required to realize the integration proposed in CONNECT-IT. The focus is usually on the scope-of-service and specific agency responsibilities for various components of the service, rather than on technologies. For example, agreements can describe the information that each agency needs to exchange to meet the goals and expectations of the other rather than defining how the delivery of that information will occur.

Table 8 summarizes the existing, planned and potential agreements related to ITS services in CONNECT-IT. This list is organized by the ITS service (as applicable), the stakeholders involved, the type of agreement, status, and a high-level description of the agreement. **Appendix B** contains existing agreements, sample agreements, and templates of agreements that were used to develop the agreements list.

Table 8 –Types of Agreements by Operational Concept

Operational Concept	Service	Possible Stakeholders	Type of Agreement	Description
Arterial Management	Interagency Traffic Coordination	All agencies (such as Local Agencies, Caltrans, LADOT, LACDPW, Metro)	Interagency Agreement	Agreement describing roles and responsibilities in case regional traffic coordination is required
Arterial Management	Traffic Control	LACDPW, LADOT, Local Agencies	Interagency Agreement	Agreement describing an agency viewing and/or controlling another agencies' traffic signals
Arterial Management	Emergency Vehicle Preemption	Emergency Agencies, Local Agencies, and LACDPW	Memorandum of Understanding (MOU)	Agreement describing emergency vehicle preemption parameters
Arterial Management/ Public Transportation Management	Transit Signal Priority	Metro, LACDPW, Local Agencies, Local and Regional	Memorandum of Understanding (MOU)	Agreement describing transit signal priority parameters, operations and maintenance of on-street equipment

Operational Concept	Service	Possible Stakeholders	Type of Agreement	Description
		Transit Agencies		
Arterial Management/ Freeway Management/ Incident Management	Integrated Corridor Management	All agencies (such as Local Agencies, Caltrans, LADOT, LACDPW, Metro, Local and Regional Transit Agencies)	Project Charter	Specifies participation, timely review of documents and deliverables, proactive coordination, collaboration and operations, letters of support for funding, seeking of additional funding, participation in MOU development, active cooperation with stakeholders
Arterial Management/ Freeway Management/ Incident Management	Integrated Corridor Management	All agencies (such as Local Agencies, Caltrans, LADOT, LACDPW, Metro, Local and Regional Transit Agencies)	Memorandum of Understanding (MOU)	Agreement describing the roles and responsibilities when an incident occurs, operations and maintenance, and proactive coordination
Arterial Management/ Freeway Management	Regional Traffic Management and Operations	Caltrans, LADOT	Memorandum of Understanding (MOU)	Collocation of additional partners at Regional TMC. The agreement to provide interagency operational guidelines, responsibilities, and procedures for inter-agency traffic operation and management for sharing real-time traffic information, congestion data, incident reports and operations
Arterial Management/ Freeway Management	Regional Traffic Operations and Management	Metro, Caltrans, LACDPW, Local Agencies, LADOT, RIITS	Memorandum of Understanding (MOU)	Agreement to provide interagency operational guidelines, responsibilities, and procedures for interagency traffic

Operational Concept	Service	Possible Stakeholders	Type of Agreement	Description
				operation and management for the purpose of sharing real-time traffic information, congestion data, incident reports and operation resources
Data Management/Support	Information Dissemination	Metro, LA SAFE, LACDPW, Local Agencies, Caltrans	Inter-agency Agreement	Agreement describing roles and responsibilities in information dissemination
Data Management/Support	Transportation Data Access	RIITS, Local Agencies, Caltrans, LACDPW, Media, Metro	Transportation Data Access/ Users Agreement	Agreement for a user (an information service provider) to access transportation data through RIITS; identifies how the user can disseminate the transportation data to others
Data Management/Support	Transportation Data (RIITS Membership)	All agencies (such as Local Agencies, Caltrans, LADOT, LACDPW, Metro, Local and Regional Transit Agencies)	Memorandum of Understanding (MOU)	Membership agreement to abide by and uphold bylaws and jointly with other members, develop, review, and approve additional bylaws, guidelines, protocols, terms and conditions, agreements, MOUs between and for members, associates, and users and/or licensees; including the use, access and exchange of RIITS Data, and third-party contracts
Data Management/Support	Data Feed/ Data Access	Metro, RIITS, LACDPW, local agencies, third party users, and ISPs	Service Agreement	Identifies user responsibilities to access, view and display the data; prevention of unauthorized user of data; use of data; liability, and uphold

Operational Concept	Service	Possible Stakeholders	Type of Agreement	Description
				requirements to disseminate data
Data Management/ Support	Archived Data Management	All agencies (such as Local Agencies, Caltrans, LADOT, LACDPW, Metro)	Interagency Agreement and/or Memorandum of Understanding (MOU)	Documents expectations, roles, and responsibilities for the dissemination of transportation-related data and information for archive purposes
Data Management/ Incident Management/ Support	Private Company Data Access	RIITS, Local Agencies, Caltrans, LADOT, LACDPW, Metro	License Agreement	Private company license to access data.
Freeway Management	Congestion Pricing	Metro, Caltrans	Inter-agency Agreement, or Memorandum of Understanding (MOU)	Documents provisions for design, development, maintenance, enforcement, price setting, and revenue sharing
Incident Management	Incident Management	Metro, LACDPW, Local Agencies	Operational Agreement	Agreement describing the roles and responsibilities when an incident occurs
Parking Management	Regional Parking Payment	Metro, Public and Private sector organizations	Inter-agency Agreement, or Memorandum of Understanding (MOU)	Documents provisions for design, development, maintenance, enforcement, price setting, and revenue sharing
Public Transportation Management	Transit Fare Collection Management	Metro, Regional and Local Transit Agencies	Inter-agency Agreement, or Memorandum of Understanding (MOU)	Provides details regarding payment collection and system, or smart card system (such as Metro's Transit Access Pass (TAP) Program)
Traveler Information	Real-Time Transit Information	Metro, Regional and Local Transit Agencies	Inter-agency Agreement, or Memorandum of Understanding (MOU)	Documents provisions for funding with stipulations for data sharing and maintenance

Operational Concept	Service	Possible Stakeholders	Type of Agreement	Description
Traveler Information	Communication Infrastructure Maintenance	Metro, LACDPW, and Local Agencies	Funding Agreement	Agreement describing the funding sources and budget to maintain the Advanced Traveler Information System (ATIS) infrastructure

6. FUNCTIONAL REQUIREMENTS

Functional Requirements for CONNECT-IT are high-level descriptions of the functions or activities of each ITS element. They are developed for two reasons:

- To provide input to the identification of interfaces and information flows of the architecture (see Section 7); and
- To provide a resource for project sponsors and stakeholders in defining activities and functional relationships of the systems that may be developed or upgraded to provide ITS services.

A list of requirements that describe the functions covered by the architecture is a requisite component of the architecture according to the FHWA Final Rule for Architecture and Standards. This list of requirements describes the functionality of the existing and planned elements of the architecture. **The architecture does not prescribe that future projects meet any or all of the requirements.** The intent of the CONNECT-IT functional requirements is to provide a set of requirements that can be used to assist project implementers in the development of functional requirements definition as required by the Final Rule. This does not preclude future projects from identifying different or additional functions

For all projects that are funded with Highway Trust Funds, the Final Rule states that the project should be based on a system engineering analysis, and specifically states that the analysis shall include a requirements definition. This is consistent with Metro’s ITS policy called, “Los Angeles Countywide Policy and Procedures Intelligent Transportation Systems (ITS)” (see **Appendix C**) and applies to projects with state and local funding sources programmed and administered by Metro. The purpose of this policy is to monitor funding compliance with the Federal Transit Administration (FTA), National ITS Policy and FHWA ITS Final Rule. This policy applies to all ITS project funded from the Highway Trust Fund. This includes funding through the Mass Transit Account and any other funds distributed by the FTA and the FHWA. In addition, it applies to all ITS project funds programmed and administered by Metro through the Call for Projects, and Propositions A and C Local Return revenues if they were being used to match state and federal funds.⁹

Future projects may choose to utilize the lists of requirements as a reference or tool to develop specific requirements that address each individual project’s needs. If a project is developed that has additional functions not documented in the current list, future updates to CONNECT-IT can add those requirements. This update to the architecture would assist in identifying the interconnects and information flows that may also be changed, added, or implemented because of future technological developments. The interconnects should also be revised in the process of updating the architecture.

The full list of functional requirements defined for CONNECT-IT is provided in **Appendix D**.

⁹ Source: Metro’s Los Angeles Countywide Policy and Procedures Intelligent Transportation Systems (ITS)

7. INTERFACES

One of the key aspects of CONNECT-IT is the definition of interfaces and information flows that define the connections between ITS systems to support the desired operational concepts and services established in earlier sections. The interfaces are a detailed view of system interconnections. These interconnections are described in diagram, table, and database formats.

7.1. Information Flows

A primary purpose of the architecture is to identify the *connectivity* between transportation systems. The customized *service packages* represent services that can be deployed, and the *service package diagrams* show the information flows between the *subsystems* and *terminators* (*terminators* are end points of the architecture, for example an adjoining county's freeway management system would represent one endpoint of CONNECT-IT) that are most important to the operation of the *service packages*. How these systems interface with each other is an integral part of the overall architecture.

shows an example of the service package Transit Multimodal Coordination while Error! Reference source not found. shows an example of the Regional Traffic Management service package.

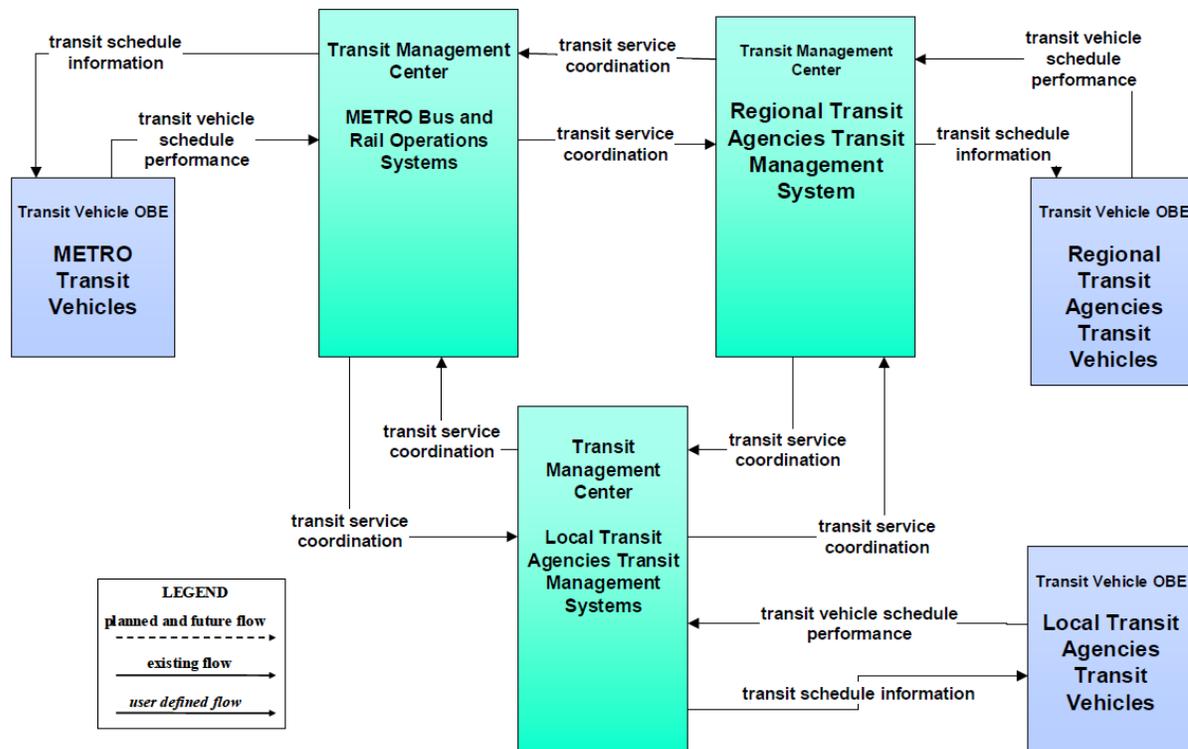


Figure 4 – PT14 Transit Multimodal Coordination (LA Region)

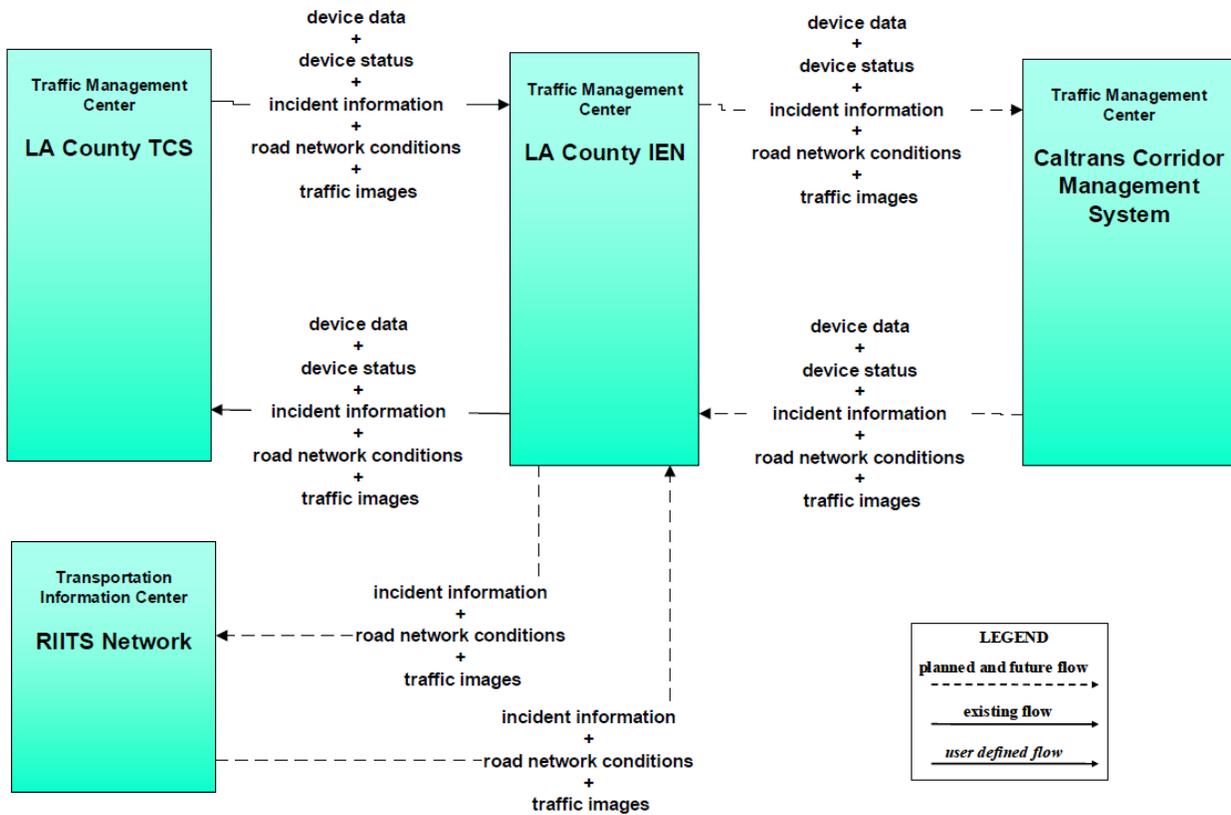


Figure 5 – TM07 Regional Traffic Management (LA County)

The two figures above are outputs from RAD-IT database. RAD-IT is a tool that supports the development of the regional ITS architecture details. Outputs of RAD-IT include diagrams that depict what data is flowing between different elements in the region. A full set of service package diagrams can be found in the CONNECT-IT RAD-IT database on the website.

Table 9 provides a summary list of the National ITS Architecture service packages.

Table 9 - Summary List of the National ITS Architecture Service Packages

Service Package Area	Short Name	Name
Commercial Vehicle Operations	CVO01	Carrier Operations and Fleet Management
	CVO02	Freight Administration
	CVO03	Electronic Clearance
	CVO04	CV Administrative Processes
	CVO05	International Border Electronic Clearance
	CVO06	Freight Signal Priority
	CVO07	Roadside CVO Safety
	CVO08	Smart Roadside and Virtual WIM
	CVO09	Freight-Specific Dynamic Travel Planning
	CVO10**	Road Weather Information for Freight Carriers
	CVO11	Freight Drayage Optimization
	CVO12	HAZMAT Management
	CVO13**	Roadside HAZMAT Security Detection and Mitigation
	CVO14	CV Driver Security Authentication
	CVO15	Fleet and Freight Security
	CVO16*	Electronic Work Diaries
	CVO17*	Intelligent Access Program
	CVO18*	Intelligent Access Program - Weight Monitoring
	CVO19*	Intelligent Speed Compliance
Data Management	DM01	ITS Data Warehouse
	DM02	Performance Monitoring
Maintenance and Construction	MC01	Maintenance and Construction Vehicle and Equipment Tracking
	MC02	Maintenance and Construction Vehicle Maintenance
	MC03**	Roadway Automated Treatment
	MC04**	Winter Maintenance
	MC05	Roadway Maintenance and Construction
	MC06	Work Zone Management
	MC07	Work Zone Safety Monitoring
	MC08	Maintenance and Construction Activity Coordination
	MC09**	Infrastructure Monitoring
Parking Management	PM01	Parking Space Management
	PM02	Smart Park and Ride System
	PM03	Parking Electronic Payment
	PM04	Regional Parking Management
	PM05	Loading Zone Management

Service Package Area	Short Name	Name
Public Safety	PS01	Emergency Call-Taking and Dispatch
	PS02	Routing Support for Emergency Responders
	PS03	Emergency Vehicle Preemption
	PS04	Mayday Notification
	PS05	Vehicle Emergency Response
	PS06	Incident Scene Pre-Arrival Staging Guidance for Emergency Responders
	PS07	Incident Scene Safety Monitoring
	PS08	Roadway Service Patrols
	PS09**	Transportation Infrastructure Protection
	PS10	Wide-Area Alert
	PS11	Early Warning System
	PS12	Disaster Response and Recovery
	PS13	Evacuation and Reentry Management
	PS14	Disaster Traveler Information
Public Transportation	PT01	Transit Vehicle Tracking
	PT02	Transit Fixed-Route Operations
	PT03	Dynamic Transit Operations
	PT04	Transit Fare Collection Management
	PT05	Transit Security
	PT06	Transit Fleet Management
	PT07	Transit Passenger Counting
	PT08	Transit Traveler Information
	PT09	Transit Signal Priority
	PT10	Intermittent Bus Lanes
	PT11	Transit Pedestrian Indication
	PT12**	Transit Vehicle at Station/Stop Warnings
	PT13**	Vehicle Turning Right in Front of a Transit Vehicle
	PT14	Multi-modal Coordination
	PT15**	Transit Stop Request
	PT16	Route ID for the Visually Impaired
	PT17	Transit Connection Protection
	PT18	Integrated Multi-Modal Electronic Payment
Support	SU01	Connected Vehicle System Monitoring and Management
	SU02	Core Authorization
	SU03	Data Distribution
	SU04	Map Management
	SU05	Location and Time
	SU06	Object Registration and Discovery
	SU07	Privacy Protection
	SU08	Security and Credentials Management
	SU09	Center Maintenance
	SU10	Field Equipment Maintenance
	SU11	Vehicle Maintenance

Service Package Area	Short Name	Name
	SU12	Traveler Device Maintenance
Sustainable Travel	ST01	Emissions Monitoring
	ST02	Eco-Traffic Signal Timing
	ST03	Eco-Traffic Metering
	ST04	Roadside Lighting
	ST05	Electric Charging Stations Management
	ST06	HOV/HOT Lane Management
	ST07**	Eco-Lanes Management
	ST08	Eco-Approach and Departure at Signalized Intersections
	ST09	Connected Eco-Driving
	ST10**	Low Emissions Zone Management
Traffic Management	TM01	Infrastructure-Based Traffic Surveillance
	TM02	Vehicle-Based Traffic Surveillance
	TM03	Traffic Signal Control
	TM04	Connected Vehicle Traffic Signal System
	TM05	Traffic Metering
	TM06	Traffic Information Dissemination
	TM07	Regional Traffic Management
	TM08	Traffic Incident Management System
	TM09	Integrated Decision Support and Demand Management
	TM10	Electronic Toll Collection
	TM11	Road Use Charging
	TM12	Dynamic Roadway Warning
	TM13	Standard Railroad Grade Crossing
	TM14	Advanced Railroad Grade Crossing
	TM15	Railroad Operations Coordination
	TM16	Reversible Lane Management
	TM17	Speed Warning and Enforcement
	TM18**	Drawbridge Management
	TM19	Roadway Closure Management
	TM20	Variable Speed Limits
	TM21	Speed Harmonization
	TM22	Dynamic Lane Management and Shoulder Use
	TM23**	Border Management Systems
Traveler Information	TI01	Broadcast Traveler Information
	TI02	Personalized Traveler Information
	TI03	Dynamic Route Guidance
	TI04	Infrastructure-Provided Trip Planning and Route Guidance
	TI05	Travel Services Information and Reservation
	TI06	Dynamic Ridesharing and Shared Use Transportation
	TI07	In-Vehicle Signage
Vehicle Safety	VS01	Autonomous Vehicle Safety Systems
	VS02	V2V Basic Safety
	VS03	V2V Situational Awareness

Service Package Area	Short Name	Name	
	VS04	V2V Special Vehicle Alert	
	VS05	Curve Speed Warning	
	VS06**	Stop Sign Gap Assist	
	VS07**	Road Weather Motorist Alert and Warning	
	VS08	Queue Warning	
	VS09	Reduced Speed Zone Warning / Lane Closure	
	VS10	Restricted Lane Warnings	
	VS11	Oversize Vehicle Warning	
	VS12	Pedestrian and Cyclist Safety	
	VS13	Intersection Safety Warning and Collision Avoidance	
	VS14	Cooperative Adaptive Cruise Control	
	VS15	Infrastructure Enhanced Cooperative Adaptive Cruise Control	
	VS16	Automated Vehicle Operations	
	VS17	Traffic Code Dissemination	
	Weather	WX01**	Weather Data Collection
		WX02**	Weather Information Processing and Distribution
		WX03**	Spot Weather Impact Warning

****These Service Packages are incorporated from the European Union and Australian applications to support international ITS harmonization efforts; however they are not incorporated or used within the current RAD-IT tool.***

***** These Service Packages have not been incorporated into the current CONNECT-IT. They will remain as a reference for future updates.***

8. STANDARDS

Standards are an important tool that will allow efficient implementation of the elements in CONNECT-IT over time. Standards facilitate deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances, vendors change, and as new approaches evolve. **Table 10** identifies each of the ITS standards that could apply to CONNECT-IT. These standards are based on the services and functions of the region.

Table 10 – CONNECT-IT Standards

SDO	Document ID	Standard Title	Standard Type
American National Standards Institute (ANSI)	ANSI TS813	Electronic Filing of Tax Return Data	Message/Data
American Public Transportation Association (APTA)	APTA TCIP-S-001 3.0.4	Standard for Transit Communications Interface Profiles	Message/Data
American Society for Testing and Materials (ASTM)	ASTM E2468-05	Standard Practice for Metadata to Support Archived Data Management Systems	Message/Data
American Society for Testing and Materials (ASTM)	ASTM E2665-08	Standard Specifications for Archiving ITS-Generated Traffic Monitoring Data	Message/Data
Consortium of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) – National Transportation Communications for ITS Protocol (NTCIP)	NTCIP 1201	Global Object Definitions	Message/Data
Consortium of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) – National Transportation Communications for ITS Protocol (NTCIP)	NTCIP 1202	Object Definitions for Actuated Traffic Signal Controller (ASC) Units	Message/Data
Consortium of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical	NTCIP 1203	Object Definitions for Dynamic Message Signs (DMS)	Message/Data

SDO	Document ID	Standard Title	Standard Type
Manufacturers Association (NEMA) – National Transportations Communications for ITS Protocol (NTCIP)			
Consortium of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) – National Transportations Communications for ITS Protocol (NTCIP)	NTCIP 1204	Object Definitions for Environmental Sensor Stations (ESS)	Message/Data
Consortium of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) – National Transportations Communications for ITS Protocol (NTCIP)	NTCIP 1205	Object Definitions for Closed Circuit Television (CCTV) Camera Control	Message/Data
Consortium of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) – National Transportations Communications for ITS Protocol (NTCIP)	NTCIP 1206	Object Definitions for Data Collection and Monitoring (DCM) Devices	Message/Data
Consortium of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) – National Transportations Communications for ITS Protocol (NTCIP)	NTCIP 1207	Object Definitions for Ramp Meter Control (RMC) Units	Message/Data
Consortium of American Association of State Highway and Transportation Officials	NTCIP 1208	Object Definitions for Closed Circuit Television (CCTV) Switching	Message/Data

SDO	Document ID	Standard Title	Standard Type
(AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) – National Transportation Communications for ITS Protocol (NTCIP)			
Consortium of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) – National Transportation Communications for ITS Protocol (NTCIP)	NTCIP 1209	Data Element Definitions for Transportation Sensor Systems (TSS)	Message/Data
Consortium of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) – National Transportation Communications for ITS Protocol (NTCIP)	NTCIP 1210	Field Management Stations (FMS) - Part 1: Object Definitions for Signal System Masters	Message/Data
Consortium of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) – National Transportation Communications for ITS Protocol (NTCIP)	NTCIP 1211	Object Definitions for Signal Control and Prioritization (SCP)	Message/Data
Consortium of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA) – National Transportation Communications for ITS Protocol (NTCIP)	NTCIP 1213	Object Definitions for Electrical and Lighting Management Systems (ELMS)	Message/Data

SDO	Document ID	Standard Title	Standard Type
European Committee for Standardization (CEN)	Technical Specification (TS) 15531	Service Interface for Real-Time Information (SIRI)	Message/Data
General Transit Feed Specification (GTFS) Discussion Group	GTFS	General Transit Feed Specification (GTFS) Static	Message/Data
General Transit Feed Specification (GTFS) Discussion Group	GTSF-Realtime	General Transit Feed Specification (GTFS) Realtime	Message/Data
Institute of Electrical and Electronic Engineers (IEEE)	IEEE 1512 - 2006	Standard for Common Incident Management Message Sets for use by Emergency Management Centers	Message/Data
Institute of Electrical and Electronic Engineers (IEEE)	IEEE 1512.3-2006	Standard for Hazardous Material Incident Management Message Sets for Use by Emergency Management Centers	Message/Data
Institute of Electrical and Electronic Engineers (IEEE)	IEEE 1570-2002	Standard for the Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection	Message/Data
Institute of Electrical and Electronic Engineers (IEEE)	IEEE 1609.11	Standard for Wireless Access in Vehicular Environments (WAVE) - Over-the-Air Data Exchange Protocol for Intelligent Transportation Systems (ITS)	Message/Data
Institute of Transportation Engineers (ITE)	ITE TMDD	Traffic Management Data Dictionary (TMDD) and Message Sets for External Traffic Management Center Communications (MS/ETMCC)	Message/Data
Society of Automotive Engineers (SAE)	J2945/1	On-Board System Requirements for V2V Safety Communications	Communications Protocol
Society of Automotive Engineers (SAE)	SAE J2313	On-Board Land Vehicle Mayday Reporting Interface	Message/Data
Society of Automotive Engineers (SAE)	SAE J2354	Message Set for Advanced Traveler Information System (ATIS)	Message/Data
Society of Automotive Engineers (SAE)	SAE J2735	Dedicated Short Range Communications (DSRC) Message Set Dictionary	Message/Data
Society of Automotive Engineers (SAE)	SAE J3067	Candidate Improvements to Dedicated Short Range Communications (DSRC) Message Set Dictionary [SAE J2735] Using Systems Engineering Methods	Message/Data

SDO	Document ID	Standard Title	Standard Type
Profile	Cooperative ITS Credential Management System (CCMS)	CCMS Communications	Standard Profile
Profile	Contact-Proximity-Interface	Proximity Communication Interface	Standard Profile
Profile	DSRC-UDP	Vehicle-to-Vehicle/Infrastructure using user datagram protocol (UDP)	Standard Profile
Profile	DSRC-WSMP	Vehicle-to-Vehicle/Infrastructure using WAVE short message protocol (WSMP)	Standard Profile
Profile	NTCIP-DATEX	NTCIP using Data Exchange (DATEX)	Standard Profile
Profile	NTCIP-SMTP	NTCIP using simple mail transfer protocol (SMTP)	Standard Profile
Profile	NTCIP-SNMP	NTCIP using simple network management protocol (SNMP)	Standard Profile
Profile	RSE-C2F	Roadside Equipment (RSE) - Center to Field (C2F) Communications	Standard Profile
Profile	RSE-C2F-SNMP	RSE - Center to Field (C2F) Communications - SNMP	Standard Profile
Profile	RSE-F2F	Roadside Equipment to ITS Roadway Equipment	Standard Profile
Profile	RSEGateway - VehicleDestination	Vehicle Communications via RSEs, Vehicle Destination	Standard Profile
Profile	RSEGateway - VehicleSource	Vehicle Communications via RSEs, Vehicle Source	Standard Profile
Profile	SRC-Legacy	Legacy Short Range Comm (SRC) Using IEEE 1455	Standard Profile
Profile	VehicleGateway-CenterSource	Vehicle Cluster from Center	Standard Profile
Profile	Vehicle-On-Board	Vehicle-On-Board	Standard Profile

SDO	Document ID	Standard Title	Standard Type
Profile	WAB-Via-WAID	Wide-Area-Broadcast (WAB)-Via-Wide-Area Information Disseminator (WAID)	Standard Profile
Profile	WAW-ASN1	Wide Area Wireless (WAW) using ASN.1 as encoding method	Standard Profile
Profile	WAW-WWWBrowser-JSON	Wide Area Wireless using JSON as encoding method	Standard Profile
Profile	WAW-XML	Wide Area Wireless using XML as encoding method	Standard Profile
Profile	XML	eXtensible Markup Language (XML)	Standard Profile

9. PROJECT DEPLOYMENT SEQUENCING

This ITS Architecture is implemented via a series of projects led by public sector agencies and private sector initiatives that occur over many years. In some cases, foundation systems will need to be implemented to support other systems and projects. The project sequencing identifies foundation systems, projects, or infrastructures that need to be in place before other projects can move forward, as shown in **Table 11**.

The project sequencing table assigns each project a level based upon the whether the functionalities included in the project may help another project move forward. The more foundational the functionality, the higher the level (e.g., RIITS provides foundational center-to-center data sharing platform for the region and is identified as level 1.) Because the region's infrastructure is relatively matured, projects that have a lower level in the table below can be deployed concurrently or even before the higher-level projects in most cases.

The levels are provided to inform project sequencing and are not intended to imply priority.

Table 11 – Project Sequencing Table

Sequencing Level	Project Name	Project Description	Agency	Service Packages
1	Regional Integration of Intelligent Transportation Systems (RIITS) Expansion	RIITS provides a platform for data exchange in real-time between freeway, traffic, transit and emergency service agencies to improve management of the regional transportation system and better serve the traveling public.	RIITS Local Agencies LACDPW LADOT Caltrans Local and Regional Transit Agencies Metro	DM01 DM02 PS14 PT08 PT14 TM06 TM07 TM08 TM09 TI01 TI02 TI04 TI05
1	LA County Information Exchange Network (IEN) Expansion	The IEN is a platform for exchange of second-by-second traffic signal timing data that acts as a coordinated network for sharing information and control of the various traffic control systems throughout LA County using a common network backbone. Currently, there are at least twenty-four (24) local agencies that are connected to the IEN including connections with RIITS and the Caltrans Performance Measurement System (PeMS). An upgrade/replacement project is scheduled for the near term.	LACDPW Local Agencies Caltrans Metro	DM01 DM02 TM01 TM03 TM06 TM07 TM08

Sequencing Level	Project Name	Project Description	Agency	Service Packages
2	SoCal 511	The existing SoCal 511 system includes a web portal, interactive voice responsive (IVR) phone line, and a mobile application that provide traveler information.	LA SAFE	PM01 PM02 PM03 PM04 PT04 PT08 TI01 TI02 TI03 TI04 TM06
2	Arterial Traffic Management	This project type represents many local arterial traffic management projects, which may include synchronization of traffic signals across one or multiple cities' jurisdictions, transit signal priority, emergency vehicle preemption, adaptive traffic control system, traffic monitoring, and other similar projects.	Local Agencies Metro LADOT Caltrans LACDPW	CVO06 PT09 ST02 TM03 TM04

Sequencing Level	Project Name	Project Description	Agency	Service Packages
2	Integrated Corridor Management (ICM) Projects	<p>ICM projects improve mobility through a corridor by seeking ways to improve how freeways, arterials, transit, and parking systems work together. ICM projects in the region include the I-210 Connected Corridors Project, the LAX ITS Project, DCCM, and several future corridors. The I-210 pilot is planning to launch in late 2019. The South Bay Corridor Dynamic Corridor Congestion Management (DCCM) Project will also use ICM strategies to address congestion the region will face over the next decades. This project is undergoing the planning phase and the most appropriate active traffic demand management strategies will move forward to implementation.</p> <p>Though ICM projects will benefit from IEN and RIITS deployment, ICM project development and implementation can move forward in parallel with IEN and RIITS development.</p>	Local Agencies Metro Caltrans LACDPW	DM01 PT08 PT14 TI01 TI02 TM01 TM02 TM03 TM04 TM06 TM07 TM09 TM20 TM21 TM22 VS08

Sequencing Level	Project Name	Project Description	Agency	Service Packages
2	Transit Access Pass (TAP) Program	Metro’s universal fare payment system is called Transit Access Pass (TAP). TAP is a program that allows riders to travel seamlessly across Los Angeles County paying for rides with a single payment card. There are approximately 24 transit agencies that use the TAP program. TAP is a payment card that can be loaded electronically with regional and local transit passes, store value (cash amount) or transfers. The system includes TAP fareboxes or validators onboard the transit vehicles and at rail stations that allows access for patrons. Future plans for the TAP program include: a Bluetooth Pilot project for ADA gates; a TAP mobile app; regional ticket vending machines; payment compliance; and partnerships with bikeshare, parking, Transportation Network Companies (TNC), EV carshare, and mobility hubs.	LA Metro Local Transit Agencies Regional Transit Agencies	DM01 PM01 PM02 PM03 PM04 PT04
2	Emergency Management	This includes projects in local and regional agencies that provide technology for incident and emergency management. Systems may work in coordination with the emergency operations center and assist in delivering traveler/public safety information for area-wide alerts.	Local Agencies Local Emergency First Responders Local Emergency Dispatchers Caltrans	PS01 PS02 PS06 PS08 PS10 PS12 PS13 PS14

Sequencing Level	Project Name	Project Description	Agency	Service Packages
2	Local Agency Traffic Management Centers (TMC)	This project includes TMCs implemented either individually or jointly with other neighboring agencies. These TMCs have varying levels of capability, but basically allow for command and control of the field assets of each individual agency and may include the ability to share data and/or information with other agencies on an as-needed basis.	Local Agencies LACDPW LADOT	DM01 DM02 TM01 TM03 TM07
3	Countywide Bus Signal Priority /Bus Rapid Transit (BRT) Program	Numerous transit signal priority corridors that are currently deployed throughout the county and that are planned for the future.	LA Metro Local Agencies Regional Transit Agencies Local Transit Agencies	PT01 PT02 PT09 TM07
3	Bike Share Programs	<p>Metro currently operates a regional bike share system. It features approximately 1,400 bikes available 24/7, 365 days a year in Downtown Los Angeles, Pasadena, Port of Los Angeles, and Venice. Metro Bike Share passes may be purchased at bike stations or online with various pricing, and in the future, it may be integrated with Metro's TAP program.</p> <p>The system also provides bike share data including trip data, origin/destination data, station information, station status, miles traveled, and emissions reduced through their website. Metro owns and manages the system's equipment. Metro also manages a master operations contract to provide operations and maintenance for the entire regional system.</p>	LA Metro Local Agencies Private Sector	PM02 PM03 TI01 TI02 TI03 TI04 TI05 TI06

Sequencing Level	Project Name	Project Description	Agency	Service Packages
		<p>Programs are also in place and being planned for cities across the region.</p>		
3	Parking Management Systems	<p>In 2016, Metro initiated a Paid Parking Pilot Program (Pilot Program) that was developed to show parking availability at Metro parking facilities that currently operate at capacity. The program will be evaluated for nine Metro Stations and could include license plate recognition, TAP card ridership identification, dynamic pricing, mobile payment, and more.</p> <p>Other agencies in the region also operate or plan to deploy parking management systems including LADOT's Express Park and in Santa Monica.</p>	<p>LA Metro Local Agencies City of LA Caltrans</p>	<p>PM01 PM02 PM03 PM04</p>

Sequencing Level	Project Name	Project Description	Agency	Service Packages
3	Gateway Cities Technology Plan for Goods Movement	The Gateway Cities Technology Plan for Goods Movement is a Business and Implementation Plan that outlines a comprehensive program to leverage technology to improve the efficiency of goods movement in the Gateway Cities region. The intent is to enhance productivity and better utilize existing and future transportation resources, and to support the sustainability goals of the region. Projects identified in the plan include autonomous truck research, goods movement information projects, Truck Enforcement Network (TEN), freeway and arterial Smart Corridors, and 511 upgrades.	Gateway Cities COG Local Agencies Port of Long Beach Port of LA Caltrans Metro Private Sector	CVO01 CVO02 CVO03 CVO06 CVO08 CVO09 VS16
3	Freight Advanced Traveler Information Systems (FRATIS) in Los Angeles/Gateway Cities	FRATIS demonstrates its effectiveness in: improving intermodal truck utilization; improving and automating the process in which containers are transferred between marine terminals and drayage companies; and achieving improvements in regional freight mobility and air quality. The project is in place and near-term enhancements are underway.	Port of Los Angeles Port of Long Beach Gateway Cities COG Metro Caltrans Private Sector	CVO01 CVO02 CVO06 CVO11
3	ExpressLanes Expansion	Dynamically priced express lanes in LA County, ExpressLanes, are existing in operation on I-10 and I-110. Metro and Caltrans are planning implementation of ExpressLanes on the I-105 freeway and other corridors.	Caltrans Metro CHP	ST06 TM09 TM10

10. ARCHITECTURE MAINTENANCE MANAGEMENT PLAN

CONNECT-IT addresses the County’s vision for ITS implementation as of 2018, when this architecture was developed. Over time, needs will change and, as technology progresses, new ITS opportunities will arise. Shifts in the region’s needs and focus and changes in the National ITS Architecture will necessitate that CONNECT-IT be updated to remain a useful resource for the region.

10.1. CONNECT-IT Maintenance Committee

Metro will continue to be the champion and maintainer of CONNECT-IT and intends to proactively manage changes into the future. Metro will convene a CONNECT-IT Maintenance Committee consisting of a cross section of members representative of the region’s stakeholders. A 9-member committee is suggested consisting of Metro, LA County DPW, Caltrans, Port(s), small city, large city, transit agency, RIITS, and an emergency service provider. The committee may reach out to get input from other stakeholders in the region as needed. This committee will meet regularly (likely quarterly) to take a proactive approach to maintaining the architecture and will meet as needed to oversee and approve interim or full updates as defined below.

10.2. Approach to Changes

When projects are being planned in the region that are not currently reflected in the architecture, project sponsors can provide information via a form on the website. The maintenance team retained by Metro will provide technical support to revise the architecture as needed.

It is recommended to enact three different categories of modifications: administrative, interim and full updates.

Administrative Update

Small changes that are more administrative in nature that do not have broad impacts to other projects or data flows may be conducted at Metro’s request without input from the committee.

Interim Update

An interim update is less intensive, requiring fewer in-person interactions and less demanding on available resources. The updates that would warrant this level of update would be new project implementations or expansions. Changes would be documented through the website on a maintenance form that will be submitted to the CONNECT-IT maintenance team. The type of information to be updated would include agency name changes, element changes, or flow status (change from future to existing.) The CONNECT-IT maintenance team will then make minor changes to this architecture document and companion RAD-IT database. Changes will then be uploaded to the website. As the configuration management process takes some time, a list of changes will be kept, and the architecture will be updated likely on a quarterly basis as needed.

Full Update

A full update focuses on updating all facets of a regional architecture. It requires more interactions with the stakeholders over multiple meetings and workshops. A full update is more comprehensive will take

more time and resources as it requires outreach to elicit new information from all involved stakeholders (as opposed to the interim update that is reactive to requests from stakeholders). It is recommended that a full update be conducted approximately every 5 years or if needed based on one or more significant projects in the region that affect multiple stakeholders and/or interfaces.

#1

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IP Address: 64.251.230.39

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Arcadia

Q2 Your Name

Kevin Merrill

Q3 Your Title

Principle Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Operate
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Operate
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Planned
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Planned
Parking Management	Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Planned
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Planned
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Planned
Other Projects or Services	
Arcadia TSP Project Transit	

#2

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IP Address: 64.251.230.39

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Culver City

Q2 Your Name

Gabe Garcia

Q3 Your Title

Traffic Engineering Manager

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned, Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Planned
Centralized Arterial Traffic Management	Operate, Planned, Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Planned
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Planned
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Planned
Electronic Transit Fare Collection	Planned
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Planned
Parking Management	Operate, Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate, Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Operate, Planned
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Planned
Other Projects or Services	
Adaptive Traffic Control by 03/01/18 Bikesharing- underway Centralized Arterial Traffic Management (Operate)-Kits Centralized Arterial Traffic Management (Planned)-Transparency	

#3

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Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

La County

Q2 Your Name

Jane White

Q3 Your Title

Senior CE

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Planned
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Operate
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Planned
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Operate
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Operate
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Not Applicable (N/A)
Other Projects or Services	
Emergency Vehicle Preemption (EVP) - Limited	

#4

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Time Spent: 00:01:40
IP Address: 64.251.230.39

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

LADOT

Q2 Your Name

George Chen

Q3 Your Title

Senior Traffic Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Operate
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Operate
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate
Coordinated Incident Management	Operate
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Operate, Planned

Dynamic Lane Management	Operate
Electronic Transit Fare Collection	Operate
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Operate
Parking Management	Operate
Performance Measurement Systems (e.g., data analytics and reporting)	Operate
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Operate
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Operate
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Operate
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Operate

#5

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Last Modified: Wednesday, August 09, 2017 6:44:03 PM
Time Spent: 00:01:43
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Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Santa Clarita

Q2 Your Name

Joel Bareng

Q3 Your Title

Associate Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Operate
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Planned
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Operate
Coordinated Incident Management	Operate
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Operate

Dynamic Lane Management	Operate
Electronic Transit Fare Collection	Operate
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Operate
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Operate
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Not Applicable (N/A)

#6

COMPLETE

Collector: Web Link 1 (Web Link)
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Time Spent: 00:02:01
IP Address: 64.251.230.39

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Azusa

Q2 Your Name

Christina Curiel

Q3 Your Title

Engineering Assitant II

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Planned
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Planned
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Not Applicable (N/A)
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)
Other Projects or Services In Design Phase of its master plan	

#7

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, August 09, 2017 6:46:15 PM
Last Modified: Wednesday, August 09, 2017 6:47:42 PM
Time Spent: 00:01:27
IP Address: 64.251.230.39

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Diamond Bar

Q2 Your Name

Christina Malpica

Q3 Your Title

Associate Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Planned
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Planned
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Planned
Variable Speed Limits	Planned
Other Projects or Services	
None	

#8

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, August 09, 2017 6:47:50 PM
Last Modified: Wednesday, August 09, 2017 6:51:08 PM
Time Spent: 00:03:17
IP Address: 64.251.230.39

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Calabasas

Q2 Your Name

Benjamin Chan

Q3 Your Title

Deputy Public Works Director

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Operate
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Planned
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Planned
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Planned
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate
Transit Management Systems (Fixed Route or Demand Responsive)	Planned
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#9

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, August 09, 2017 6:51:13 PM
Last Modified: Wednesday, August 09, 2017 6:52:52 PM
Time Spent: 00:01:38
IP Address: 64.251.230.39

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Santa Monica

Q2 Your Name

Andrew Maximous

Q3 Your Title

Principle Traffic Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Operate
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Operate
Coordinated Incident Management	Operate
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Operate
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Operate
Parking Management	Operate
Performance Measurement Systems (e.g., data analytics and reporting)	Operate
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Operate
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Operate
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Operate
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Not Applicable (N/A)

#10

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, August 09, 2017 6:52:57 PM
Last Modified: Wednesday, August 09, 2017 6:54:34 PM
Time Spent: 00:01:37
IP Address: 64.251.230.39

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Pasadena

Q2 Your Name

Joaquin Siques

Q3 Your Title

Acting Principle Engineer- Traffic

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Operate
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Operate
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Planned
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Operate
Coordinated Incident Management	Operate
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Operate
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Operate
Parking Management	Operate
Performance Measurement Systems (e.g., data analytics and reporting)	Operate
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Operate
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Operate
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Operate
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Not Applicable (N/A)

#11

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, August 09, 2017 6:54:42 PM
Last Modified: Wednesday, August 09, 2017 6:56:13 PM
Time Spent: 00:01:31
IP Address: 64.251.230.39

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Long Beach

Q2 Your Name

Kevin Riley

Q3 Your Title

Traffic Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Operate
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Operate
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Operate, Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Operate
Real-time Traffic Data Collection (Crowd-sourced)	Operate
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Planned
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Planned
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Not Applicable (N/A)

#12

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, August 10, 2017 6:31:37 PM
Last Modified: Thursday, August 10, 2017 6:47:19 PM
Time Spent: 00:15:42
IP Address: 204.145.132.2

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Torrance

Q2 Your Name

Steve Finton

Q3 Your Title

Engineering Manager

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Operate
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Not Applicable (N/A)
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Operate
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#13

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, August 10, 2017 6:43:31 PM
Last Modified: Thursday, August 10, 2017 6:57:34 PM
Time Spent: 00:14:02
IP Address: 207.114.131.66

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Pomona

Q2 Your Name

Ron Chan

Q3 Your Title

Senior Civil Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Planned
Centralized Arterial Traffic Management	Planned
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#14

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, August 11, 2017 10:39:35 AM
Last Modified: Friday, August 11, 2017 10:56:36 AM
Time Spent: 00:17:01
IP Address: 64.251.230.39

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Carson

Q2 Your Name

Reata Kulcsar

Q3 Your Title

Civil Engineering Assistant

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Planned
Centralized Arterial Traffic Management	Planned
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Planned
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Planned
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Operate
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Planned
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Operate
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Planned
Other Projects or Services	
Heavy rail Preemption - Planned	

#15

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, August 14, 2017 11:08:52 AM
Last Modified: Monday, August 14, 2017 1:45:29 PM
Time Spent: 02:36:37
IP Address: 208.19.220.5

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

CITY OF HAWTHORNE

Q2 Your Name

ALAN LEUNG

Q3 Your Title

SENIOR TRANSPORTATION ENGINEER

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Planned
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Not Applicable (N/A)
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Planned
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Planned
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Planned
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Operate
Transit Signal Priority (Rail)	Planned
Variable Speed Limits	Not Applicable (N/A)

#16

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, August 14, 2017 6:09:42 PM
Last Modified: Monday, August 14, 2017 6:15:55 PM
Time Spent: 00:06:13
IP Address: 76.79.155.2

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Gardena

Q2 Your Name

Jun De Castro

Q3 Your Title

Associate Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Not Applicable (N/A)
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#17

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, August 16, 2017 9:46:26 AM
Last Modified: Wednesday, August 16, 2017 9:49:29 AM
Time Spent: 00:03:03
IP Address: 206.171.67.2

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of West Hollywood

Q2 Your Name

Hany Demitri

Q3 Your Title

Principle Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Operate
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate
Coordinated Incident Management	Operate
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Operate
Parking Management	Operate
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Operate
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#18

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, August 21, 2017 9:51:32 PM
Last Modified: Monday, August 21, 2017 9:53:55 PM
Time Spent: 00:02:22
IP Address: 216.165.241.78

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Monrovia

Q2 Your Name

Sean Sullivan

Q3 Your Title

Public Works Division Manager

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Planned
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Not Applicable (N/A)
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Planned
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Planned
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Not Applicable (N/A)
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Planned
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Planned
Variable Speed Limits	Not Applicable (N/A)

#19

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, August 23, 2017 9:43:13 AM
Last Modified: Wednesday, August 23, 2017 9:50:44 AM
Time Spent: 00:07:31
IP Address: 64.60.66.50

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

Alhambra

Q2 Your Name

Mary Chavez

Q3 Your Title

Director of Public Works

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Planned
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Planned
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Operate
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#20

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, August 24, 2017 1:28:06 PM
Last Modified: Thursday, August 24, 2017 6:01:10 PM
Time Spent: 04:33:03
IP Address: 47.44.161.131

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Montebello

Q2 Your Name

Sam Kouri

Q3 Your Title

City Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Not Applicable (N/A)
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Operate
Emergency Vehicle Preemption (EVP)	Planned
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Operate
Parking Management	Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Not Applicable (N/A)
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#21

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, August 24, 2017 7:56:43 PM
Last Modified: Thursday, August 24, 2017 7:59:47 PM
Time Spent: 00:03:04
IP Address: 65.60.91.100

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Diamond Bar

Q2 Your Name

Christian Malpica

Q3 Your Title

Associate Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Operate

#22

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, August 25, 2017 7:19:24 PM
Last Modified: Friday, August 25, 2017 7:21:41 PM
Time Spent: 00:02:16
IP Address: 47.176.8.47

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Manhattan Beach

Q2 Your Name

Stephanie Katsouleas

Q3 Your Title

Director of Public Works

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Operate
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Not Applicable (N/A)
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Operate
Parking Management	Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Not Applicable (N/A)
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#23

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, August 29, 2017 11:29:12 AM
Last Modified: Tuesday, August 29, 2017 11:36:01 AM
Time Spent: 00:06:49
IP Address: 207.105.49.50

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

city of compton

Q2 Your Name

glen kau

Q3 Your Title

public works director

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Operate, Planned
Centralized Arterial Traffic Management	Operate, Planned
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Planned
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Planned
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Planned
Emergency Vehicle Preemption (EVP)	Planned
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Planned
Parking Management	Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Planned
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Planned
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Operate, Planned
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Not Applicable (N/A)

#24

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, September 12, 2017 9:07:04 AM
Last Modified: Tuesday, September 12, 2017 9:15:56 AM
Time Spent: 00:08:52
IP Address: 216.64.186.226

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Lancaster

Q2 Your Name

Alan Perkins

Q3 Your Title

Principal Traffic Engineering Tech

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Operate, Planned
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate, Planned
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate, Planned
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#25

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, September 15, 2017 12:25:44 PM
Last Modified: Friday, September 15, 2017 12:37:35 PM
Time Spent: 00:11:50
IP Address: 206.117.120.59

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Glendale - Transit Operations

Q2 Your Name

Kathryn Engel

Q3 Your Title

Transit Manager

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Not Applicable (N/A)
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Planned
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Planned
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Not Applicable (N/A)
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#26

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Sunday, September 17, 2017 12:39:39 PM
Last Modified: Sunday, September 17, 2017 12:42:56 PM
Time Spent: 00:03:17
IP Address: 216.36.93.67

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Bellflower

Q2 Your Name

Len Gorecki

Q3 Your Title

Asst. City Manager / Director of Public Works

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Planned
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Not Applicable (N/A)
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Not Applicable (N/A)
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#27

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, September 27, 2017 4:51:13 PM
Last Modified: Wednesday, September 27, 2017 4:54:50 PM
Time Spent: 00:03:36
IP Address: 198.2.37.242

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

Antelope Valley Transit Authority

Q2 Your Name

Len Engel

Q3 Your Title

CEO

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate
Coordinated Incident Management	Operate
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Planned
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Operate
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#28

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, October 25, 2017 10:29:05 AM
Last Modified: Wednesday, October 25, 2017 10:31:51 AM
Time Spent: 00:02:45
IP Address: 161.149.63.239

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Los Angeles Department of Transportation

Q2 Your Name

George Chen

Q3 Your Title

Sr. Transportation Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Operate
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Operate
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A), Planned
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Operate
Coordinated Incident Management	Operate
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Operate

Dynamic Lane Management	Operate
Electronic Transit Fare Collection	Operate
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Operate
Parking Management	Operate
Performance Measurement Systems (e.g., data analytics and reporting)	Operate
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Operate
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Operate
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Operate
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Operate

#29

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, October 25, 2017 5:01:17 PM
Last Modified: Wednesday, October 25, 2017 5:10:28 PM
Time Spent: 00:09:11
IP Address: 47.44.161.131

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

Montebello Bus Lines

Q2 Your Name

David Tsuen

Q3 Your Title

IS Manager

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Planned
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Not Applicable (N/A)
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Planned
Emergency Vehicle Preemption (EVP)	Planned
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Planned
Variable Speed Limits	Not Applicable (N/A)
Other Projects or Services	
Not sure which on would fall under connectivity for shared bandwidth.	

#30

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, October 25, 2017 7:05:11 PM
Last Modified: Wednesday, October 25, 2017 7:08:25 PM
Time Spent: 00:03:13
IP Address: 173.196.144.188

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

LACMTA ExpressLanes

Q2 Your Name

Robert Campbell

Q3 Your Title

Manager, Transportation Planning

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Operate
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Operate
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Operate, Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate, Planned
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Operate
Toll Management (e.g., roadside toll collection, back office operations)	Operate
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)
Other Projects or Services	
My answers here are specifically for ExpressLanes.	

#31

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, October 26, 2017 2:17:04 PM
Last Modified: Thursday, October 26, 2017 2:26:44 PM
Time Spent: 00:09:39
IP Address: 38.95.224.253

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Santa Monica's Big Blue Bus

Q2 Your Name

Barbara Andres

Q3 Your Title

Executive Admin Assistant

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate, Planned
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Operate, Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Planned, Operate
Detection of Non-Motorized Users	Planned, Operate
Decision Support Tools (e.g., recommended actions for event response)	Planned, Operate

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Planned, Operate
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Operate
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Operate, Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate, Planned
Ridesharing Services	Planned
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate, Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Operate, Planned
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Operate, Planned
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)
Other Projects or Services	
App/account based mobile ticketing; fixed route CAD-AVL applications; electronic wayfinding and real-time signage, integrated on-board systems and data management (e.g. fare collection, GPS, APC, etc.); Regulatory Transit Asset Management (onboard and land-based assets) and Safety Management Systems.	

#32

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, November 07, 2017 12:04:43 PM
Last Modified: Tuesday, November 07, 2017 12:12:00 PM
Time Spent: 00:07:17
IP Address: 76.80.142.162

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Inglewood

Q2 Your Name

Victor Nunez

Q3 Your Title

Transportation Operation Manager

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Planned
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate
Coordinated Incident Management	Operate
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Planned
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Planned
Parking Management	Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Planned
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Planned
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Operate
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Not Applicable (N/A)

#33

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, November 08, 2017 9:03:41 PM
Last Modified: Wednesday, November 08, 2017 9:10:32 PM
Time Spent: 00:06:50
IP Address: 198.140.114.12

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

Los Angeles World Airports

Q2 Your Name

Justin Erbacci

Q3 Your Title

Respondent skipped this question

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Planned
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate
Coordinated Incident Management	Operate
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Planned
Dynamic Lane Management	Not Applicable (N/A)

Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Operate
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Operate
Parking Management	Operate
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Operate
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Planned
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#34

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, November 22, 2017 7:05:26 PM
Last Modified: Wednesday, November 22, 2017 7:09:38 PM
Time Spent: 00:04:12
IP Address: 96.240.58.55

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

Long Beach Transit

Q2 Your Name

Carrie Sabel

Q3 Your Title

Manager, IT Projects

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Not Applicable (N/A)
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Operate
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Operate
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#35

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, November 27, 2017 9:49:24 AM
Last Modified: Monday, November 27, 2017 10:18:29 AM
Time Spent: 00:29:05
IP Address: 64.251.224.99

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

Port of Long Beach

Q2 Your Name

Theresa Dau-Ngo

Q3 Your Title

Transportation Development Manager

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Operate
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Planned
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Operate
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#36

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, November 27, 2017 10:20:43 AM
Last Modified: Monday, November 27, 2017 10:27:29 AM
Time Spent: 00:06:46
IP Address: 64.251.224.99

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

Caltrans District 7

Q2 Your Name

Allen Chen

Q3 Your Title

Chief of Office of ITS

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Operate, Planned
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Planned
Centralized Arterial Traffic Management	Operate, Planned
Centralized Freeway Traffic Management	Operate
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate, Planned
Congestion Pricing (e.g., variably priced lanes, area pricing)	Operate
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Operate, Planned
Coordinated Incident Management	Operate, Planned
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Operate, Planned
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Planned
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Operate, Planned
Parking Management	Operate, Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Operate, Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Planned
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Operate, Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Planned
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Operate
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Planned
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Planned

Other Projects or Services

Notes from paper survey: ADV | MBI PM 19k | 24 k LT - | 22k Pot Holing 5100 <counts ^16,000

#37

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, November 30, 2017 12:50:55 PM
Last Modified: Thursday, November 30, 2017 12:54:53 PM
Time Spent: 00:03:57
IP Address: 173.196.144.188

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

LA Metro

Q2 Your Name

Shannon Hamelin

Q3 Your Title

Senior Manager, Parking Management

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Operate
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Not Applicable (N/A)
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Operate
Performance Measurement Systems (e.g., data analytics and reporting)	Not Applicable (N/A)
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#38

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, November 30, 2017 2:55:26 PM
Last Modified: Thursday, November 30, 2017 3:03:02 PM
Time Spent: 00:07:35
IP Address: 173.196.144.188

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

RIITS

Q2 Your Name

Kali Fogel

Q3 Your Title

RIITS Program Manager

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Not Applicable (N/A)
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Planned
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Planned
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Operate
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Operate
Transit Management Systems (Fixed Route or Demand Responsive)	Operate
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Operate
Transit Signal Priority (Rail)	Operate
Variable Speed Limits	Not Applicable (N/A)

Other Projects or Services

It is hard to respond to the survey as RIITS is involved in the operation of most of the technologies listed, but only handles aspects of those systems surrounding data exchange and coordination amount transportation agencies.

#39

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, November 30, 2017 4:13:13 PM
Last Modified: Thursday, November 30, 2017 4:17:33 PM
Time Spent: 00:04:19
IP Address: 64.251.224.99

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Burbank

Q2 Your Name

Jonathan Yee

Q3 Your Title

Asst. PW Director Traffic

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Planned
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Planned
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Planned
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Operate
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Operate
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Operate
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#40

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, November 30, 2017 4:17:47 PM
Last Modified: Thursday, November 30, 2017 4:20:00 PM
Time Spent: 00:02:12
IP Address: 64.251.224.99

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Agoura Hills

Q2 Your Name

Carlie Campuzano

Q3 Your Title

Traffic Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Planned
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Operate
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Planned
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Operate
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Operate
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#41

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, November 30, 2017 4:20:08 PM
Last Modified: Thursday, November 30, 2017 4:22:41 PM
Time Spent: 00:02:32
IP Address: 64.251.224.99

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Malibu

Q2 Your Name

Jorge Rubalcaua

Q3 Your Title

Assist. Civil Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Planned
Bikesharing	Not Applicable (N/A)
Centralized Arterial Traffic Management	Planned
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Planned
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Planned
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Operate
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Planned
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Planned

#42

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, December 01, 2017 9:05:55 AM
Last Modified: Friday, December 01, 2017 9:11:03 AM
Time Spent: 00:05:07
IP Address: 70.211.131.48

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Maywood

Q2 Your Name

Dan Garcia

Q3 Your Title

City Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Operate
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Planned
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Planned
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Operate
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Planned
Parking Management	Operate
Performance Measurement Systems (e.g., data analytics and reporting)	Not Applicable (N/A)
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)
Other Projects or Services KITS being implemented by LA County.	

#43

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, December 01, 2017 2:41:41 PM
Last Modified: Friday, December 01, 2017 2:46:39 PM
Time Spent: 00:04:58
IP Address: 70.197.71.134

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

Metro

Q2 Your Name

Julia Salinas

Q3 Your Title

Manager, Transportation Planning

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Operate, Planned
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Not Applicable (N/A)
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Planned
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Planned
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Not Applicable (N/A)
Non-Motorized Safety Applications	Planned
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Not Applicable (N/A)
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Not Applicable (N/A)
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)

#44

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, December 05, 2017 11:55:52 AM
Last Modified: Tuesday, December 05, 2017 11:59:53 AM
Time Spent: 00:04:01
IP Address: 199.245.255.5

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

Port of Los Angeles

Q2 Your Name

Kerry Cartwright

Q3 Your Title

Director of Goods Movement

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Not Applicable (N/A)
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Operate
Centralized Arterial Traffic Management	Not Applicable (N/A)
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate, Planned
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Planned
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Planned
Data Management (e.g., archived data)	Planned
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Planned

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Not Applicable (N/A)
Emergency Vehicle Preemption (EVP)	Not Applicable (N/A)
Multi-Jurisdictional Traffic Management	Planned
Non-Motorized Safety Applications	Not Applicable (N/A)
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Planned
Real-time Traffic Data Collection (Crowd-sourced)	Planned
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Planned
Ridesharing Services	Not Applicable (N/A)
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Not Applicable (N/A)
Transit Management Systems (Fixed Route or Demand Responsive)	Not Applicable (N/A)
Transit Signal Preemption	Not Applicable (N/A)
Transit Signal Priority (Buses)	Not Applicable (N/A)
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)
Other Projects or Services	
Port/Freight: empty container & chassis management systems, which reduce truck trips; terminal uniform reservation systems which reduce roadway and terminal queuing/idling emissions	

#45

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, December 05, 2017 11:55:19 AM
Last Modified: Tuesday, December 05, 2017 12:35:44 PM
Time Spent: 00:40:25
IP Address: 206.171.111.149

Page 1: Purpose of the Architecture and Survey

Q1 Agency or Organization Name

City of Palmdale

Q2 Your Name

Guillermo "Bill" Padilla

Q3 Your Title

City Engineer

Q4 Overview of Intelligent Transportation Systems (ITS) Please indicate the types of ITS projects and services that your agency currently operate or planning to operate within the next 5 years.

Adaptive Traffic Control	Planned
Automated/Autonomous Vehicle Technologies	Not Applicable (N/A)
Bikesharing	Planned
Centralized Arterial Traffic Management	Operate
Centralized Freeway Traffic Management	Not Applicable (N/A)
Center-to-Field Communications (e.g., fiber, copper, wireless)	Operate
Congestion Pricing (e.g., variably priced lanes, area pricing)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Infrastructure [V2I] Safety, Mobility, Environment)	Not Applicable (N/A)
Connected Vehicle Applications (Vehicle to Vehicle [V2V] Safety)	Not Applicable (N/A)
Construction/Maintenance Management	Not Applicable (N/A)
Coordinated Incident Management	Not Applicable (N/A)
Data Management (e.g., archived data)	Not Applicable (N/A)
Detection of Non-Motorized Users	Not Applicable (N/A)
Decision Support Tools (e.g., recommended actions for event response)	Not Applicable (N/A)

Dynamic Lane Management	Not Applicable (N/A)
Electronic Transit Fare Collection	Planned
Emergency Vehicle Preemption (EVP)	Planned
Multi-Jurisdictional Traffic Management	Operate
Non-Motorized Safety Applications	Planned
Parking Management	Not Applicable (N/A)
Performance Measurement Systems (e.g., data analytics and reporting)	Planned
Port/Freight Logistic Applications (e.g., delivery optimization, route planning, freight traveler information)	Not Applicable (N/A)
Real-time Traffic Data Collection (Crowd-sourced)	Not Applicable (N/A)
Real-time Traffic Data Collection (Infrastructure-based)	Planned
Regional Traveler Information Services (e.g., websites, mobile apps, phone services)	Not Applicable (N/A)
Ridesharing Services	Planned
Roadway Traffic Information Dissemination (e.g., changeable message signs, highway advisory radio [HAR])	Planned
Toll Management (e.g., roadside toll collection, back office operations)	Not Applicable (N/A)
Transit Customer Applications (e.g., multi-modal trip planners, predictive arrivals, push notifications, wayfinding)	Planned
Transit Management Systems (Fixed Route or Demand Responsive)	Planned
Transit Signal Preemption	Planned
Transit Signal Priority (Buses)	Planned
Transit Signal Priority (Rail)	Not Applicable (N/A)
Variable Speed Limits	Not Applicable (N/A)



Los Angeles Countywide Metro Policy and Procedures *Intelligent Transportation Systems (ITS)*

POLICY STATEMENT

Federal regulations (23 CFR Parts 655 and 940 Intelligent Transportation System (ITS) Architecture and Standards; Final Rule) now require ITS projects funded with the Highway Trust Fund to conform to the National ITS Architecture and Standards; be guided by a regional architecture with geographic boundaries defined by stakeholder needs; and use systems engineering analysis on a scale commensurate with the project scope. It is Metro's Policy to abide by the Federal ITS regulations and requirements for those agencies seeking federal funding programmed by Metro for projects subject to this rule. For consistency and to maximize benefits, Los Angeles Countywide ITS Policy and Procedures is also applied to projects with state and local funding sources programmed and administered by the Metro.

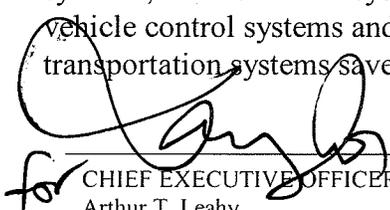
PURPOSE

The purpose of this policy is to monitor funding compliance with the Federal Transit Administration (FTA) National ITS Policy and Federal Highway Administration (FHWA) ITS Final Rule.

APPLICATION

This policy applies to all ITS projects funded from the Highway Trust Fund. This includes funding through the Mass Transit Account and any other funds distributed by the FTA and the FHWA. In addition it applies to all ITS project funds programmed and administered by Metro through the Call For Projects, and Propositions A and C Local Return revenues if they were being used to match state and federal funds.

ITS involves the use of advanced computer, electronic and communications technologies to increase the safety and effectiveness of the surface transportation system. Metro encourages the use of ITS technologies to enhance the productivity of the existing infrastructure and vehicles that carry passengers, goods and services in Los Angeles County (e.g., highways, streets, bridges, mass transit vehicles and tracks). Some examples of transportation systems supported by ITS technologies include: advanced traffic signals; automated bus and maintenance vehicle location systems; electronic fare systems; electronic roadside and transit information signs; automated vehicle control systems and traveler information systems. Adding such technologies to our transportation systems saves lives, time and money.


for CHIEF EXECUTIVE OFFICER
Arthur T. Leahy


EXECUTIVE DIRECTOR COUNTYWIDE PLANNING
Martha Welborne, FAIA


EXECUTIVE DIRECTOR HIGHWAY PROGRAMS
Douglas R. Failing, P.E.



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Los Angeles Countywide Policy and Procedures *Intelligent Transportation Systems (ITS)*

1.0 PROCEDURES

1.1 ITS Project Definition

An ITS project is defined as “any project that in whole or in part funds the acquisition of technologies or systems of technologies that provide or significantly contribute to the provision of one or more ITS User Services as defined in the National ITS Architecture.” See attachment A for ITS User Services version 6.1. This definition applies equally to both projects that are internal and external to Metro.

1.2 ITS Project Planning and Development

During project planning and development, all external agency project sponsors and Metro internal departments must certify that the project ITS elements are consistent with the Los Angeles County Regional ITS Architecture by filling out the “Consistency Self-Certification Form” (Attachment B). Failure to meet the requirements of this policy may result in delaying the programming and allocation of federal, state and local funds.

1.3 Los Angeles County Regional ITS Architecture

The purpose of the Los Angeles County Regional ITS Architecture is to maximize the benefits of all of the investments in ITS technology by promoting their integration and following the system engineering process. Integration gives access to data for multiple partners at little or no additional investment. The Regional ITS Architecture for Los Angeles County can be found at www.riits.net. It describes the process and the roles and responsibilities for maintaining the Regional Architecture after it is adopted.

The Los Angeles Regional ITS Architecture is used as the base framework for SCAG’s high level Regional ITS Architecture. This architecture covers the six counties that constitute the SCAG Region, and is also consistent with the California Statewide ITS Architecture and System Plan. Both the SCAG and State ITS architectures will ensure regional and statewide coordination and consistency at all levels and integration within the same communication framework.

The Los Angeles County Regional ITS Architecture provides a framework for ensuring institutional agreement and technical integration of ITS projects or groups of projects. Current or future ITS project sponsors receiving funding programmed and administered by Metro should acquaint themselves with the Los Angeles Regional ITS Architecture and participate in its future development. The Los Angeles County Regional ITS



Metro

Los Angeles Countywide Policy and Procedures *Intelligent Transportation Systems (ITS)*

Architecture and Plan must also be maintained and be consistent with the region's transportation plans and improvements programs.

To support the need for consistency with the Los Angeles Regional ITS Architecture, the Metro Highway Programs is responsible for:

- Making consistency information available to external agencies and Metro internal departments;
- Reviewing and adding consistency requirements to the Metro Call for Projects requirements;
- Reviewing and adding consistency requirements to Prop A and Prop C funding guidelines;
- Reviewing and adding consistency requirements to Short Range Transit Plan (SRTP) countywide guidelines;
- Coordinating with transportation, transit agencies, emergency service providers and Metro internal Departments to define their ITS projects, their concept of operations and providing assistance to meet the consistency requirements; and developing necessary integration interfaces to the Los Angeles County Regional ITS Architecture;
- Providing support and guidance to transportation, transit agencies and emergency service providers using the Regional ITS Architecture guide book and tools for interface development;
- Participating and ensuring inter-agency system operation and management agreements are executed as appropriate and described in the Los Angeles Regional ITS Architecture;
- Administering the function and expansion of Los Angeles County Regional ITS Architecture; organizing ITS coordination committees and working groups that address technical and institutional issues that are associated with the operation, upgrade and maintenance of the Los Angeles Regional ITS Architecture; and
- Maintaining and updating the Los Angeles Regional ITS Architecture Plan for incorporation into the Southern California Associated Government (SCAG) Regional ITS Plan, Regional Transportation Plan (RTP), and Metro's Long Range Transportation Plan (LRTP) and Short Range Transportation Plan (SRTP).



Metro

Los Angeles Countywide Policy and Procedures *Intelligent Transportation Systems (ITS)*

1.4 ITS Project Compliance

1.4.1 To ensure compliance with the ITS Policy, all ITS project sponsor agencies including Metro internal departments are required to complete the Los Angeles County Regional ITS Architecture Consistency Certification Form (Attachment B) and to self certify that their project's ITS elements in whole or in part are consistent with the Los Angeles County Regional ITS Architecture through the following:

- Identification of ITS systems elements
- An outline concept of operations for the project;
- Identification of participating agency roles and responsibilities;
- A commitment to perform a lifecycle analysis for all ITS system elements;
- A commitment to maintain and operate the system after the project completion;
- A commitment to the use of systems engineering either directly by the agency and or their vendors;
- A commitment to document the systems engineering steps followed at project completion; and,
- A commitment that the project will address the use of standards in the context of the Los Angeles County Regional ITS Architecture and participate in the configuration management process.

This self-certification should be completed and submitted at the time of the submittal of the project application. As an additional aid to understanding the system engineering process, a major reference resource is the Caltrans Local Assistance Home Page: www.dot.ca.gov/hq/LocalPrograms. The Local Programs Procedures Manual Update LPP 04-04 deals specifically with ITS projects and includes detailed guidelines for compliance with the regulations including discussion of the process and application of systems engineering to ITS projects. Additional federal guidelines will be made available on the Regional ITS Architecture website (www.riits.net) when they are completed.



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**Los Angeles Countywide
Policy and Procedures
*Intelligent Transportation Systems (ITS)***

REVISION HISTORY

Version No.	Date Submitted	Comments
Revision 09-24-10	9/24/10	Updated official signature blocks, National ITS Architecture User Service document (version 6.1)

ATTACHMENTS

A: Elements of National ITS Architecture User Services (Version 6.1)

**B: Los Angeles County Regional ITS Architecture Consistency
Self-Certification Form**



Metro

Los Angeles Countywide Policy and Procedures *Intelligent Transportation Systems (ITS)*

ATTACHMENT A

Elements of National ITS Architecture User Services (Version 6.1)

1. Travel And Traffic Management

- 1.1 Pre-trip Travel Information
- 1.2 En-route Driver Information
- 1.3 Route Guidance
- 1.4 Ride Matching And Reservation
- 1.5 Traveler Services Information
- 1.6 Traffic Control
- 1.7 Incident Management
- 1.8 Travel Demand Management
- 1.9 Emissions Testing And Mitigation
- 1.10 Highway Rail Intersection

2. Public Transportation Management

- 2.1 Public Transportation Management
- 2.2 En-route Transit Information
- 2.3 Personalized Public Transit
- 2.4 Public Travel Security

3. Electronic Payment

- 3.1 Electronic Payment Services

4. Commercial Vehicle Operations

- 4.1 Commercial Vehicle Electronic Clearance
- 4.2 Automated Roadside Safety Inspection
- 4.3 On-board Safety And Security Monitoring
- 4.4 Commercial Vehicle Administrative Processes
- 4.5 Hazardous Materials Security And Incident Response
- 4.6 Freight Mobility

5. Emergency Management

- 5.1 Emergency Notification And Personal Security
- 5.2 Emergency Vehicle Management
- 5.3 Disaster Response And Evacuation

6. Advanced Vehicle Safety Systems

- 6.1 Longitudinal Collision Avoidance
- 6.2 Lateral Collision Avoidance
- 6.3 Intersection Collision Avoidance
- 6.4 Vision Enhancement For Crash Avoidance
- 6.5 Safety Readiness
- 6.6 Pre-crash Restraint Deployment
- 6.7 Automated Vehicle Operation

7. Information Management

- 7.1 Archived Data

8. Maintenance And Construction Management

- 8.1 Maintenance And Construction Operations



Metro Los Angeles Countywide
Policy and Procedures
Intelligent Transportation Systems (ITS)

ATTACHMENT B

**LOS ANGELES COUNTY REGIONAL ITS ARCHITECTURE CONSISTENCY
SELF-CERTIFICATION FORM**

This form should be completed and executed for all ITS projects or projects with ITS elements except for routine maintenance and operation, traffic signal controller replacement, purchase of bus or rolling stock, expansion or enhancement of an existing operation system. The original form should be sent to Metro Highway Programs for any planned ITS projects or proposed funding involving Local, State or Federal funds programmed or administered through the MTA at the time of submittal of project application.

1. Name of Sponsoring Agency: _____

2. Contact Name: _____

3. Contact Phone: _____

4. Contact Email: _____

5. Project Description:

6. Identify the ITS elements being implemented and the relevant National Architecture User Service(s), see Attachment A. _____



Metro **Los Angeles Countywide**
Policy and Procedures
Intelligent Transportation Systems (ITS)

7. Outline of the concept of operations for the project.

8. Identify participating agencies roles and responsibilities _____

By signing and self-certifying this form, the agency commits itself to follow the ITS requirements listed below during project design and implementation. Please be advised that your project may be subject to further review and documentation by FHWA or FTA during project design and implementation phases:

- Perform a lifecycle analysis for the ITS project elements and incorporate these costs into the Operations and Maintenance plan as part of the system engineering process,
- Maintain and operate the system according to the recommendations of the Operations and Maintenance plan upon project completion,
- Use the systems engineering process and document the system engineering steps, and
- Use the Los Angeles County Regional ITS Architecture interface standards if required and conform to the regional configuration management process.

Signature:

_____ Date _____

Agency Representative

Submit this original Self-Certification Form to Call For Projects and a copy to:

Mr. Doug R. Failing, P.E., Executive Director Highway Programs, Atten: RIITS Program

APPENDIX D: LIST OF FUNCTIONAL REQUIREMENTS

Below is a list of functional requirements for CONNECT-IT.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	1	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	2	The field element shall determine whether the highway-rail intersection (HRI) is blocked by traffic in the roadway or some other obstruction.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	3	The field element shall notify the traffic management center and the rail wayside equipment of any intersection blockages, including trapped vehicles or other obstructions.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	4	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	5	The field element shall include pedestrian information systems under center control (e.g. warning pedestrians of a potential hazard, or providing mandatory instructions as to the availability of pedestrian access).

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	6	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the rail wayside equipment.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	7	The field element shall receive track status and arriving train information from the rail wayside equipment that can be passed on to the traffic management center. This may include the current status of the tracks and when a train is expected and/or how long the crossing will be closed.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	8	The field element shall collect pedestrian images and pedestrian sensor data, and respond to pedestrian crossing requests via display, audio signal, or other manner.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	9	The field element shall control the dynamic message signs (DMS) in the vicinity of a highway-rail intersection (HRI) to advise drivers, cyclists, and pedestrians of approaching trains.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	10	The field element shall close the highway-rail intersection (HRI) when a train is approaching with enough time for traffic to safely clear the crossing using gates, lights/signs, barriers, and traffic control signals.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	11	The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	12	The field element shall forward rail traffic advisories received from the Wayside Equipment to the traffic management center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Advanced Rail Crossing	13	The field element shall provide approaching train advisories using field-vehicle communications to vehicles approaching the grade crossing.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Barrier System Control	1	The field element shall activate barrier systems for transportation facilities and infrastructure under center control. Barrier systems include automated or remotely controlled gates, barriers and other systems that manage entry to roadways.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Barrier System Control	2	The field element shall return barrier system operational status to the controlling center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Barrier System Control	3	The field element shall return barrier system fault data to the maintenance center for repair.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Barrier System Control	4	The field element shall receive requests for access from approaching vehicles using field-vehicle communications and validate and authenticate the requests.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Barrier System Control	5	The field element shall grant access only to qualified vehicles.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Barrier System Control	6	The field element shall communicate access permission status and access instructions to approaching vehicles using field-vehicle communications.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	3	The field element shall collect, digitize, and send multimodal crossing and high occupancy vehicle (HOV), and high occupancy toll (HOT) lane sensor data to the center for further analysis and storage.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	4	The field element shall return sensor and CCTV system operational status to the controlling center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	5	The field element shall return sensor and CCTV system fault data to the controlling center for repair.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	1	The field element shall measure traffic conditions per lane, under center control.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	2	The field element shall determine how to change the lane controls to respond to current traffic and road conditions.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	3	The field element shall receive lane management control information from the controlling center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	4	The field element shall provide guidance and information to drivers regarding current lane configuration and status.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	5	The field element shall monitor vehicle characteristics and classify individual vehicles.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	6	The field element shall collect vehicle profile information from individual vehicles using field-vehicle communications.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	7	The field element shall monitor current lane usage to determine if vehicles are complying with current lane use restrictions.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	8	The field element shall capture vehicle information, including vehicle image(s) of vehicles violating current lane usage restrictions and report violations to the controlling center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	9	The field element shall monitor operational status of the dynamic lane control equipment and report operational status to the controlling center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	10	The field element shall identify and report fault conditions to the controlling center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	1	The field element shall include surface and sub-surface environmental sensors that measure road surface temperature, moisture, icing, salinity, and other measures.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	2	The field element shall include environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	3	The field element's environmental sensors shall be remotely controlled by a maintenance center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	4	The field element's environmental sensors shall be remotely controlled by a traffic management center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	5	The field element's environmental sensors shall be remotely controlled by weather service providers such as the National Weather Service or value-added sector specific meteorological services.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	6	The field element's environmental sensors shall be remotely controlled by a maintenance and construction vehicle.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	7	The field element shall provide environmental sensor equipment operational status to the controlling center or maintenance vehicle.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	8	The field element shall provide environmental sensor equipment fault indication to the controlling center or maintenance vehicle.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	9	The field element shall remotely aggregate environmental sensor data with environmental data collected from maintenance and construction vehicles.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	10	The field element shall provide weather and road surface condition data to centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	11	The field element shall provide weather and road surface condition data to maintenance and construction vehicles.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	12	The field equipment shall provide environmental sensor data to the Connected Vehicle Roadside Equipment.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Field Device Support	1	The field element shall monitor the operational status of field devices and detects and reports fault conditions.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Field Device Support	2	The field element shall detect and report any fault conditions with the equipment being monitored back to its controlling center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Field Device Support	3	The field element shall provide the capability for field personnel to locally control and configure this equipment.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Field Management Station Operation	2	The field element shall pass data provided by the center to local field devices and report data from the field devices back to the center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Passive Monitoring	1	The field element shall collect, process, and send data to the center to uniquely identify passing vehicles in order to support travel time measurement

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Safeguard System Control	1	The field element shall activate safeguard systems, equipment used to mitigate the impact of incidents on transportation infrastructure (e.g., blast shields, tunnel exhaust systems, etc.) under center control.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Safeguard System Control	2	The field element shall return safeguard system operational status to the controlling center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Safeguard System Control	3	The field element shall return safeguard system fault data to the maintenance center for repair.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	1	The field element shall control traffic signals under center control.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	2	The field element shall respond to pedestrian crossing requests by accommodating the pedestrian crossing.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	3	The field element shall provide the capability to notify the traffic management center of pedestrian calls and pedestrian accommodations.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	4	The field element shall report the current signal control information to the center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	5	The field element shall report current preemption status to the center.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	6	The field element shall return traffic signal controller operational status to the center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	7	The field element shall return traffic signal controller fault data to the center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	8	The field element shall report current transit priority status to the center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	9	The field element shall report current intersection signal timing information to roadside equipment for transmission to connected vehicles.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	10	The field element shall receive request for transit vehicle signal priority.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	11	The field element shall receive request for commercial vehicle signal priority.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	12	The field element shall report current commercial vehicle priority status to the center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	13	The field element shall provide to roadside equipment the intersection geometry and signal phase movement information including phase and timing information, alarm status, and priority/preempt status.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	14	The field element shall provide data to the Connected Vehicle Roadside Equipment.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Signal Control	15	The field element shall receive requests for emergency vehicle signal preemption.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Speed Monitoring and Warning	1	The field element shall include sensors to detect vehicle speeds, under traffic or maintenance center control.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Speed Monitoring and Warning	2	The field element shall include sensors to detect vehicle speeds, under enforcement agency control.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Speed Monitoring and Warning	3	If the speed detected by vehicle speed sensors is determined to be excessive, the field element shall provide a safe speed advisory to passing drivers via a driver information system (such as portable messages signs, field to vehicle communications to in-vehicle signing systems, etc.).
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Speed Monitoring and Warning	4	The field element shall base speed advisories to passing drivers on environmental conditions.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Speed Monitoring and Warning	5	The field element shall monitor notify an enforcement agency when a speed violation is detected.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Speed Monitoring and Warning	6	The field element shall return operational status for the vehicle speed sensors to the controlling traffic or maintenance center; including measured speeds, warning messages displayed, and violation records.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Speed Monitoring and Warning	7	The field element shall return operational status for the vehicle speed sensors to the enforcement agency.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Speed Monitoring and Warning	8	The field element shall return fault data for the vehicle speed sensors to the controlling center for repair.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	1	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	2	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	3	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the rail wayside equipment.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	4	The field element shall receive track status from the rail wayside equipment that can be passed on to the traffic management center. This may include the current status of the tracks and whether a train is approaching.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	5	The field element shall collect pedestrian images and pedestrian sensor data, and respond to pedestrian crossing requests via display, audio signal, or other manner.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	6	The field element shall control the dynamic message signs (DMS) in the vicinity of a highway-rail intersection (HRI) to advise drivers, cyclists, and pedestrians of approaching trains.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	7	The field element shall close the highway-rail intersection (HRI) when a train is approaching using gates, lights/signs, barriers, and traffic control signals.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	8	The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	9	The field element shall forward rail traffic advisories received from the Wayside Equipment to the traffic management center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	10	The field element shall warn drivers of crossing closures or potential crash-imminent situations.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	1	The field element shall include dynamic message signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	2	The field element shall include driver information systems that communicate directly from a center to the vehicle radio (such as Highway Advisory Radios) for dissemination of traffic and other information to drivers, under center control.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	3	The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	4	The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	5	The field element shall provide dynamic message sign information to roadside equipment for transmission to connected vehicles to support in-vehicle signing.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	6	The field element shall include devices that provide data and status information to other field element devices without center control.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	7	The field element shall include devices that receive configuration data from other field element devices, without center control.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Metering	1	The field element shall regulate the flow of traffic on ramps, interchanges, and the mainline, under center control.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Metering	2	The field element shall monitor operation of ramp, interchange, and mainline meters and report to the center any conflicts between received control plans and current system operation.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Metering	3	The field element shall return ramp, interchange, and mainline meter operational status to the controlling center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Metering	4	The field element shall provide indications to the driver that the metering system is active and provide safe transitions between active and inactive status.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Traffic Metering	5	The field element shall return ramp, interchange, and mainline meter fault data to the maintenance center for repair.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Variable Speed Limits	1	The field element shall monitor traffic and environmental conditions along the roadway.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Variable Speed Limits	2	The field element shall autonomously calculate and set variable speed limits based on current conditions by lane.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Variable Speed Limits	3	The field element shall receive commands from the controlling center that establish speed limits by lane.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Variable Speed Limits	4	The field element shall display the current speed limits per lane to drivers.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Variable Speed Limits	5	The field element shall display additional information such as basic safety rules and current traffic information to drivers.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Variable Speed Limits	6	The field element shall collect operational status of the variable speed limit field equipment and report the operational status to the controlling center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Variable Speed Limits	7	The field element shall monitor and report faults to the controlling center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Variable Speed Limits	8	As part of speed harmonization, the field element shall display suggested speed per lane to drivers.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Variable Speed Limits	9	As part of speed harmonization, the field element shall send suggested speed per lane to the RSE for transmittal to connected vehicles
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Safety	1	The field element shall include work zone intrusion detection devices that detect when a vehicle has intruded upon the boundary of a work zone, under center control.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Safety	2	The field element shall include work zone intrusion detection devices that detect when crew workers have crossed the boundary between the work zone and vehicle traffic, under center control.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Safety	3	The field element shall include work zone intrusion alerting devices that alert crew workers of a work zone emergency or safety issue such as the intrusion of a vehicle into the work zone area or movement of field crew into the travel lanes or vehicles approaching at an unsafe speed.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Safety	4	The field element shall include work zone intrusion alerting devices that notify crew via maintenance vehicles of a work zone emergency or safety issue such as the intrusion of a vehicle into the work zone area or movement of field crew into the travel lanes.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Safety	5	The field element shall include work zone intrusion alerting devices that alert drivers that they have intruded upon the perimeter of the work zone, or are about to do so; may provide alerts to drivers directly or via in-vehicle signing.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Safety	6	The field element shall provide operational status for the work zone intrusion detection devices to the maintenance center.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Safety	7	The field element shall provide fault data for the work zone intrusion detection devices to the maintenance center for repair.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Safety	8	The field element shall provide operational status for the work zone intrusion alerting devices to the maintenance center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Safety	9	The field element shall provide fault data for the work zone intrusion alerting devices to the maintenance center for repair.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	1	The field element shall collect, process, and send work zone images to the center for further analysis and distribution, under center control.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	2	Under traffic and maintenance center control, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around the work zone through which they are currently passing.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	3	Under the control of field personnel within maintenance vehicles, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around a work zone through which they are currently passing.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	4	The field element shall control access to the work zone using automated gate or barrier systems. This includes automated flagger assistance devices that include automated gate arms and other automated gate/barrier systems.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	5	The field element shall provide operational status for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center.
Caltrans D7 ATMS Field Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	6	The field element shall provide fault data for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center for repair.
Caltrans D7 Intertie	Traffic Management Center	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.
Caltrans D7 Intertie	Traffic Management Center	TMC Basic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.
Caltrans D7 Intertie	Traffic Management Center	TMC Basic Surveillance	3	The center shall monitor, analyze, and store multimodal crossing, high occupancy vehicle (HOV) and high occupancy toll (HOT) lane sensor data under remote control of the center.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Intertie	Traffic Management Center	TMC Basic Surveillance	4	The center shall distribute road network conditions data (raw or processed) based on collected and analyzed traffic sensor and surveillance data to other centers.
Caltrans D7 Intertie	Traffic Management Center	TMC Basic Surveillance	5	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution.
Caltrans D7 Intertie	Traffic Management Center	TMC Basic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each)
Caltrans D7 Intertie	Traffic Management Center	TMC Regional Traffic Management	1	The center shall exchange traffic information with other traffic management centers including incident information, congestion data, traffic data, signal timing plans, and real-time signal control information.
Caltrans D7 Intertie	Traffic Management Center	TMC Regional Traffic Management	2	The center shall exchange traffic control information with other traffic management centers to support remote monitoring and control of traffic management devices (e.g. signs, sensors, signals, cameras, etc.).
Caltrans D7 Intertie	Traffic Management Center	TMC Roadway Equipment Monitoring	1	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Intertie	Traffic Management Center	TMC Roadway Equipment Monitoring	2	The center shall collect and store CCTV surveillance system (traffic, pedestrian) operational status.
Caltrans D7 Intertie	Traffic Management Center	TMC Roadway Equipment Monitoring	3	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.
Caltrans D7 Intertie	Traffic Management Center	TMC Roadway Equipment Monitoring	4	The center shall collect and store CCTV surveillance system (traffic, pedestrian) fault data send to the maintenance center for repair.
Caltrans D7 Intertie	Traffic Management Center	TMC Roadway Equipment Monitoring	5	The center shall collect environmental sensor operational status.
Caltrans D7 Intertie	Traffic Management Center	TMC Roadway Equipment Monitoring	6	The center shall collect environmental sensor equipment fault data and send to the maintenance center for repair.
Caltrans D7 Intertie	Traffic Management Center	TMC Roadway Equipment Monitoring	7	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	1	The center shall remotely control traffic signal controllers.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	2	The center shall accept notifications of pedestrian calls.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	5	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	6	The center shall implement control plans to coordinate signalized intersections based on data from sensors.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	7	The center shall manage boundaries of the control sections used within the signal system.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	8	The center shall maintain traffic signal coordination including synchronizing clocks throughout the system.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	9	The center shall implement control plans to coordinate signalized intersections based on data from sensors and connected vehicles.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	10	The center shall adjust signal timing in respond to a signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other requests for right-of-way.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	11	The center shall collect commercial vehicle data (e.g., characteristics, route, schedule) for intermodal freight events.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	12	The center shall adjust signal timing in respond to traffic and environmental parameters at each intersection in real time and adapts so that the traffic network is optimized using available green time to serve the actual traffic demands while minimizing the environmental impact.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	13	The center shall process collected traffic and environmental data from sensors and connected vehicles.
Caltrans D7 Intertie	Traffic Management Center	TMC Signal Control	14	The center shall support requests from emergency management centers to provide responding emergency vehicles with signal preemption.
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	1	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers.
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	2	The center shall remotely control driver information systems that communicate directly from a center to the vehicle radio (such as Highway Advisory Radios) for dissemination of traffic and other information to drivers.
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	3	The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.).
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	4	The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	5	The center shall retrieve locally stored traffic information, including current and forecasted traffic information, road and weather conditions, traffic incident information, information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements), and the definition of the road network itself.
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	6	The center shall distribute traffic data to maintenance and construction centers, transit centers, emergency management centers, parking facilities, and traveler information providers.
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	7	The center shall distribute traffic data to the media.
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	8	The center shall provide the capability for center personnel to control the nature of the data that is available to non-traffic operations centers and the media.
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	9	The center shall collect current lane configurations status for the driver information systems equipment (DMS, HAR, etc.).
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	10	The center shall provide traffic information in both data stream and graphical display.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	11	The center shall provide drivers low emission zone restriction or fees information.
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	12	The center shall receive alert notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public from emergency management.
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	13	The center shall coordinate with emission management to establish low emission zone parameters based on air quality and transportation need.
Caltrans D7 Intertie	Traffic Management Center	TMC Traffic Information Dissemination	14	Traffic management shall provide operators information on the state of transportation system operations within the low emissions zone.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Connected Vehicle Traveler Info Distribution	1	The center shall collect traveler information for distribution including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Connected Vehicle Traveler Info Distribution	2	The center shall distribute location relevant traveler information to short range communications equipment at the roadside.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Connected Vehicle Traveler Info Distribution	3	The center shall provide the capability for a system operator to monitor connected vehicle system operation and control the type and update frequency of traveler information that is distributed.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Connected Vehicle Traveler Info Distribution	4	The center shall send eco-driving recommendations to connected vehicles so that the vehicle or the driver can adjust their driving behavior to save fuel and reduce emissions.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	1	The center shall collect, process, and store traffic and highway condition information, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	2	The center shall select real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, transit information, parking information, special event and incident information.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	3	The center shall collect, process, and store maintenance and construction information, including scheduled maintenance and construction work activities and work zone activities.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	4	The center shall collect, process, and store transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	5	The center shall collect, process, and store parking information, including location, availability, and fees.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	6	The center shall collect, process, and store toll fee information.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	7	The center shall collect, process, and store current and forecast road conditions and surface weather conditions.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	8	The center shall collect, process, and store event information.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	9	The center shall collect, process, and store air quality information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	10	The center shall collect, process, and store freight specific traveler information.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	11	The center shall collect, process, and store border crossing information.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	12	The center shall collect information on transit schedule and service changes that adapt the service to better meet needs of responders and the general public in an emergency situation, including special service schedules supporting evacuation.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	13	The center shall collect evacuation shelter information including location, hours of operation, special accommodations, and current vacancy/availability information.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	14	The center shall collect evacuation information including evacuation zones, evacuation times, and reentry times.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	15	The center shall collect alert information and status from emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	16	The center shall collect road condition information for freeways, arterials, and secondary roads that are used as freight routes.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	17	The center shall collect emissions information, including information from low emission zone operations.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	18	The center shall collect information concerning members of the population that may require additional assistance in the event of an evacuation, including the names of household members, address, special needs, and any care giver information (nurse or hospice service that may want to keep track of their patient's status).
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Data Collection	19	The center shall collect, store and process multimodal transportation service information (for example, from ferry, rail and airline operators), including current ferry and rail schedule and airport status information and transfer points.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Dynamic Ridesharing	1	The center shall accept requests from traveler interface systems for ridesharing as part of a trip plan request.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Dynamic Ridesharing	2	The center shall provide a rideshare match based on origin and destination of the traveler's proposed trip, any routing constraints, preferences specified by the traveler, compatibility of this rideshare with rideshares confirmed by other travelers, the requesting traveler's eligibility data, and traffic data.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Dynamic Ridesharing	3	The center shall process rideshare requests by balancing the relative benefits of the rideshare to each rideshare participant.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Dynamic Ridesharing	4	The center shall arrange connections to transit or other multimodal services for portions of a multi-segment trip that includes ridesharing.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Dynamic Ridesharing	5	The center shall provide a confirmation of the traveler's rideshare match and provide the capability to support a payment transaction for the rideshare service.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Dynamic Ridesharing	6	The center shall store all rideshare matches and traveler eligibility data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	1	The center shall disseminate emergency evacuation information to the traveler interface systems, including evacuation zones, shelter information, available transportation modes, road closures and detours, changes to transit services, and traffic and road conditions at the origin, destination, and along the evacuation routes.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	2	The center shall provide evacuation information to shelter providers.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	3	The center shall disseminate wide-area alert information to the traveler interface systems, including major emergencies such as a natural or man-made disaster, civil emergency, child abductions, severe weather watches and warnings, military activities, and law enforcement warnings.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	4	The center shall provide the capability for a system operator to control the type and update frequency of emergency and wide-area alert information distributed to travelers.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	5	The center shall provide evacuation information to personal information devices.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	6	The center shall provide evacuation information to connected vehicles.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	7	The center shall maintain a set of evacuation routes based on various incident scenarios, e.g., storm, industrial accident, etc.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	8	The center shall maintain a set of evacuation plans in the event that an evacuation is necessary, including: evacuation routes, call-plan, special needs evacuations, and shelter locations.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	9	The center shall provide evacuees with information about available shelters that match their needs, including: location, availability, route, and special needs accommodated.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	10	The center shall collect shelter data from multiple sources in accordance with the American Red Cross' National Shelter System format, including: type, location, availability, capability, route mapping to the shelter, traffic flow to and around the shelter, and weather conditions around the shelter.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	11	The center shall support requests for evacuation assistance from individuals or groups requiring assistance.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	12	The center shall match requests for evacuation assistance with the appropriate resource.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	13	The center shall provide information concerning available resources along an evacuation route including information provided by other evacuees.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Emergency Traveler Information	14	The center needs to provide evacuees with information regarding when they can return to their area, including evacuation return routes, evacuation return schedule, and evacuation return road conditions.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Freight-Specific Travel Planning	1	The center shall provide customized traveler information for freight users to include truck routes, permit information, truck stops, inspection stations, steep grades, high-profile vehicle advisories, etc. Information provided includes freight-related road and weather conditions, parking information, and route plans.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Freight-Specific Travel Planning	2	The center shall indicate the area covered by the freight traveler information service.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Freight-Specific Travel Planning	3	The center shall provide an interface to allow operators to identify roadway links as part of a key freight route.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Freight-Specific Travel Planning	4	The center shall provide traveler information for freight routes from source to destination, customized for freight users to indicate truck routes, truck stops, inspection stations, steep grades, etc.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Freight-Specific Travel Planning	5	The center shall collect metadata for road conditions information that includes the date and time when the information was generated.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Freight-Specific Travel Planning	6	The center shall indicate when collected data is older than a prescribed threshold with respect to a current operation.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	1	The center shall disseminate customized traffic and highway condition information to travelers, including incident information, detours and road closures, recommended routes, and current speeds on specific routes upon request.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	2	The center shall disseminate customized maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities upon request.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	3	The center shall disseminate customized transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information to travelers upon request.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	4	The center shall disseminate customized parking information to travelers, including location, availability, and fees upon request.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	5	The center shall disseminate customized toll fee information to travelers upon request.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	6	The center shall disseminate customized weather information to travelers upon request.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	7	The center shall disseminate customized multimodal transportation service information (for example, from ferry and airline operators), including transfer points and other information, to travelers upon request.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	8	The center shall disseminate customized event information to travelers upon request.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	9	The center shall disseminate customized air quality information to travelers upon request.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	10	The center shall provide all traveler information based on the traveler's current location or a specific location identified by the traveler, and filter or customize the provided information accordingly.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	11	The center shall accept traveler profiles for determining the type of personalized data to send to the traveler.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	12	The center shall accept requests for parking space information from travelers.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	13	The center shall manage payment for services, such as tolls, transit fares, parking lot charges, map updates, and advanced payment for tolls, and provide transaction success or failure details.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	14	The center shall provide park and ride space information to travelers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	15	The center shall provide the capability to exchange information with another traveler information service provider current or predicted data for road links that are outside the area served by the local supplier.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	16	The center shall provide the capability to support requests from the media for traffic and incident data.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	17	The center shall provide the capability for a system operator to control the type and update frequency of traveler information.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	18	The center shall support requests for traveler information and advanced payment for traveler services from commercial fleet operators.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Interactive Traveler Information	19	The center shall disseminate customized freight information to travelers, including truck routes, permit information, truck stops, inspection stations, steep grades, high-profile vehicle advisories. Information provided includes freight-related road and weather conditions, parking information, and route plans.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Road Weather Advisories and Warnings	1	The center shall collect environmental probe data (air temperature, exterior light status, wiper status, traction control status, etc.) from appropriately equipped vehicles and short range communications equipment.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Road Weather Advisories and Warnings	2	The center shall aggregate collected environmental probe data and disseminate the aggregated environmental probe data to other centers.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Road Weather Advisories and Warnings	3	The center shall receive traffic probe data collected by transit fleet operators and include this data in aggregated probe data provided to other centers.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Road Weather Advisories and Warnings	4	The center shall receive traffic probe data derived from electronic toll collection operations and include this data in aggregated probe data provided to other centers.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Road Weather Advisories and Warnings	5	The center shall develop short term weather warnings or advisories that can be provided to individual motorists through field equipment.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Road Weather Advisories and Warnings	6	The center shall obtain information regarding weather and road conditions for targeted weather impact, including visibility, wind speed, wind direction, snow accumulation, adjacent snow accumulation, ice/water accumulation.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Shared Use	1	The center shall accept requests for shared use transportation.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Shared Use	2	The center shall provide the traveler with a shared use transportation option.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Information Broadcast	1	The center shall disseminate traffic and highway condition information to travelers, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Information Broadcast	2	The center shall disseminate maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Information Broadcast	3	The center shall disseminate transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information to travelers.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Information Broadcast	4	The center shall disseminate parking information to travelers, including location, availability, and fees.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Information Broadcast	5	The center shall disseminate toll fee information to travelers.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Information Broadcast	6	The center shall disseminate weather information to travelers.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Information Broadcast	7	The center shall disseminate event information to travelers.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Information Broadcast	8	The center shall disseminate air quality information to travelers.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Information Broadcast	9	The center shall provide traffic and incident data to the media.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Information Broadcast	10	The center shall provide the capability for a system operator to control the type and update frequency of broadcast traveler information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Telephone Information	1	The center shall provide the capability to process voice-formatted requests for traveler information from a traveler telephone information system, and return the information in the requested format.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Telephone Information	2	The center shall provide the capability to process dual-tone multifrequency (DTMF)-based requests (touch-tone) for traveler information from a traveler telephone information system.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Telephone Information	3	The center shall provide the capability to process traveler information requests from a traveler telephone information system.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Telephone Information	4	The center shall provide information on traffic conditions in the requested voice format and for the requested location.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Telephone Information	5	The center shall provide work zone and roadway maintenance information in the requested voice format and for the requested location.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Telephone Information	6	The center shall provide roadway environment conditions information in the requested voice format and for the requested location.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Telephone Information	7	The center shall provide weather and event information in the requested voice format and for the requested location.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Telephone Information	8	The center shall provide transit service information in the requested voice format and for the requested location.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Telephone Information	9	The center shall provide current ferry and rail schedule and airport status information in the requested voice format and for the requested location.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Traveler Telephone Information	10	The center shall provide the capability to support both specific caller requests as well as bulk upload of regional traveler information.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	1	The center shall provide the capability to provide specific pre-trip and en route directions to travelers (and drivers), including costs, arrival times, and transfer points.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	2	The center shall include bicycle routes, walkways, skyways, and multi-use trails in the pre-trip and en route directions it provides to travelers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	3	The center shall support on-line route guidance for travelers using personal devices (such as PDAs).
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	4	The center shall support on-line route guidance for drivers in vehicles.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	5	The center shall support on-line route guidance for specialty vehicles, such as commercial vehicles.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	6	The center shall generate route plans based on current and/or predicted conditions of the road network, scheduled maintenance and construction work activities, and work zone activities.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	7	The center shall generate route plans based on transit services, including fares, schedules, and requirements for travelers with special needs.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	8	The center shall generate route plans based on current asset restrictions, such as height and weight restrictions on tunnels or bridges.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	9	The center shall generate route plans based on ferry, rail, air, or other multimodal transportation data.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	10	The center shall exchange route segment information with other centers outside the area served by the local center.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	11	The center shall generate trips based on the use of more than one mode of transport.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	12	The center shall use the preferences and constraints specified by the traveler in the trip request to select the most appropriate mode of transport.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	13	The center shall provide the capability for the traveler to confirm the proposed trip plan.
Caltrans D7 Traveler Information Services	Transportation Information Center	TIC Trip Planning	14	The center shall provide the capability for center personnel to control route calculation parameters.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	1	The center shall collect data from centers.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	2	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	3	The center shall store collected data in an information repository.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	4	The center shall perform quality checks on collected data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	5	The center shall notify the system operator of errors related to data collection, analysis and archival.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	6	The center shall include capabilities for archive to archive coordination.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	7	The center shall provide the capability to execute methods on the incoming data such as cleansing, summarizations, aggregations, or transformations applied to the data before it is stored in the archive.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	8	The center shall collect data from data distribution systems and other data sources.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	9	The center shall respond to requests from the administrator interface function to manage center-sourced data collection.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	10	The center shall respond to requests from the administrator interface function to manage the archive data.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	11	The center shall respond to requests for archive data from archive data users (centers, field devices).
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	12	The center shall provide a mechanism for archive data users to request archive data by meta-data range.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Data Repository	13	The center shall associate meta-data with archived data, including catalog data, statistical products determined from method execution and data longevity.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Government Reporting	1	The center shall provide archive data to federal, state, and local government reporting systems.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Government Reporting	2	The center shall respond to requests for government report data.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Government Reporting	3	The center shall provide the capability to format data suitable for input into government reports.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Government Reporting	4	The center shall provide the applicable meta-data for any ITS archived data to satisfy government reporting system requests. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive On-Line Analysis and Mining	1	The center shall respond to requests for archive data from center users.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive On-Line Analysis and Mining	2	The center shall provide the capability to perform activities such as data mining, data fusion, summarizations, aggregations, and recreation from archive data. This may include multidimensional analysis, selective summarization and expansion of data details, and many other advanced analysis services.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive On-Line Analysis and Mining	3	The center shall collect regional data from data distribution centers.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive On-Line Analysis and Mining	4	The center shall respond to users systems requests for a catalog of the archived data analysis products available.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive On-Line Analysis and Mining	5	The center shall be capable of processing vehicle probe data into transportation network performance measures.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive On-Line Analysis and Mining	6	The center shall be capable of processing vehicle probe data to support infrastructure conditions monitoring performed by Archived Data User Systems including maintenance and construction management centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive On-Line Analysis and Mining	7	The center shall be capable of processing vehicle probe data to determine roadway environmental conditions for non operational uses such as maintenance planning and research.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Situation Data Archival	1	The center shall collect data from roadside devices.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Situation Data Archival	2	The center shall respond to requests from the administrator interface function to manage field-sourced data collection.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Situation Data Archival	3	The center shall provide the capability to adjust the collection of field-sourced data based on the statistical measures.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Situation Data Archival	4	The center shall collect vehicle traffic probe data for performance monitoring and analysis.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Situation Data Archival	5	The center shall be capable of archiving vehicle traffic probe data.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Situation Data Archival	6	The center shall provide the capability to execute methods on the incoming field data such as aggregation and statistical measures before the data is stored in the archive.
Caltrans Performance Monitoring System (PeMS)	Archived Data System	Archive Situation Data Archival	7	The center shall respond to requests from the administrator interface function to select and manage data stored in the archive.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	1	The center shall collect, process, and store traffic and highway condition information, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	2	The center shall select real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, transit information, parking information, special event and incident information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	3	The center shall collect, process, and store maintenance and construction information, including scheduled maintenance and construction work activities and work zone activities.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	4	The center shall collect, process, and store transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	5	The center shall collect, process, and store parking information, including location, availability, and fees.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	6	The center shall collect, process, and store toll fee information.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	7	The center shall collect, process, and store current and forecast road conditions and surface weather conditions.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	8	The center shall collect, process, and store event information.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	9	The center shall collect, process, and store air quality information.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	10	The center shall collect, process, and store freight specific traveler information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	11	The center shall collect, process, and store border crossing information.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	12	The center shall collect information on transit schedule and service changes that adapt the service to better meet needs of responders and the general public in an emergency situation, including special service schedules supporting evacuation.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	13	The center shall collect evacuation shelter information including location, hours of operation, special accommodations, and current vacancy/availability information.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	14	The center shall collect evacuation information including evacuation zones, evacuation times, and reentry times.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	15	The center shall collect alert information and status from emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	16	The center shall collect road condition information for freeways, arterials, and secondary roads that are used as freight routes.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	17	The center shall collect emissions information, including information from low emission zone operations.
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	18	The center shall collect information concerning members of the population that may require additional assistance in the event of an evacuation, including the names of household members, address, special needs, and any care giver information (nurse or hospice service that may want to keep track of their patient's status).
Caltrans Quickmaps Website	Transportation Information Center	TIC Data Collection	19	The center shall collect, store and process multimodal transportation service information (for example, from ferry, rail and airline operators), including current ferry and rail schedule and airport status information and transfer points.
Caltrans Quickmaps Website	Transportation Information Center	TIC Freight-Specific Travel Planning	1	The center shall provide customized traveler information for freight users to include truck routes, permit information, truck stops, inspection stations, steep grades, high-profile vehicle advisories, etc. Information provided includes freight-related road and weather conditions, parking information, and route plans.
Caltrans Quickmaps Website	Transportation Information Center	TIC Freight-Specific Travel Planning	2	The center shall indicate the area covered by the freight traveler information service.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Quickmaps Website	Transportation Information Center	TIC Freight-Specific Travel Planning	3	The center shall provide an interface to allow operators to identify roadway links as part of a key freight route.
Caltrans Quickmaps Website	Transportation Information Center	TIC Freight-Specific Travel Planning	4	The center shall provide traveler information for freight routes from source to destination, customized for freight users to indicate truck routes, truck stops, inspection stations, steep grades, etc.
Caltrans Quickmaps Website	Transportation Information Center	TIC Freight-Specific Travel Planning	5	The center shall collect metadata for road conditions information that includes the date and time when the information was generated.
Caltrans Quickmaps Website	Transportation Information Center	TIC Freight-Specific Travel Planning	6	The center shall indicate when collected data is older than a prescribed threshold with respect to a current operation.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	1	The center shall disseminate customized traffic and highway condition information to travelers, including incident information, detours and road closures, recommended routes, and current speeds on specific routes upon request.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	2	The center shall disseminate customized maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities upon request.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	3	The center shall disseminate customized transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information to travelers upon request.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	4	The center shall disseminate customized parking information to travelers, including location, availability, and fees upon request.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	5	The center shall disseminate customized toll fee information to travelers upon request.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	6	The center shall disseminate customized weather information to travelers upon request.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	7	The center shall disseminate customized multimodal transportation service information (for example, from ferry and airline operators), including transfer points and other information, to travelers upon request.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	8	The center shall disseminate customized event information to travelers upon request.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	9	The center shall disseminate customized air quality information to travelers upon request.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	10	The center shall provide all traveler information based on the traveler's current location or a specific location identified by the traveler, and filter or customize the provided information accordingly.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	11	The center shall accept traveler profiles for determining the type of personalized data to send to the traveler.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	12	The center shall accept requests for parking space information from travelers.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	13	The center shall manage payment for services, such as tolls, transit fares, parking lot charges, map updates, and advanced payment for tolls, and provide transaction success or failure details.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	14	The center shall provide park and ride space information to travelers.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	15	The center shall provide the capability to exchange information with another traveler information service provider current or predicted data for road links that are outside the area served by the local supplier.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	16	The center shall provide the capability to support requests from the media for traffic and incident data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	17	The center shall provide the capability for a system operator to control the type and update frequency of traveler information.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	18	The center shall support requests for traveler information and advanced payment for traveler services from commercial fleet operators.
Caltrans Quickmaps Website	Transportation Information Center	TIC Interactive Traveler Information	19	The center shall disseminate customized freight information to travelers, including truck routes, permit information, truck stops, inspection stations, steep grades, high-profile vehicle advisories. Information provided includes freight-related road and weather conditions, parking information, and route plans.
Caltrans Quickmaps Website	Transportation Information Center	TIC Road Weather Advisories and Warnings	1	The center shall collect environmental probe data (air temperature, exterior light status, wiper status, traction control status, etc.) from appropriately equipped vehicles and short range communications equipment.
Caltrans Quickmaps Website	Transportation Information Center	TIC Road Weather Advisories and Warnings	2	The center shall aggregate collected environmental probe data and disseminate the aggregated environmental probe data to other centers.
Caltrans Quickmaps Website	Transportation Information Center	TIC Road Weather Advisories and Warnings	3	The center shall receive traffic probe data collected by transit fleet operators and include this data in aggregated probe data provided to other centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Quickmaps Website	Transportation Information Center	TIC Road Weather Advisories and Warnings	4	The center shall receive traffic probe data derived from electronic toll collection operations and include this data in aggregated probe data provided to other centers.
Caltrans Quickmaps Website	Transportation Information Center	TIC Road Weather Advisories and Warnings	5	The center shall develop short term weather warnings or advisories that can be provided to individual motorists through field equipment.
Caltrans Quickmaps Website	Transportation Information Center	TIC Road Weather Advisories and Warnings	6	The center shall obtain information regarding weather and road conditions for targeted weather impact, including visibility, wind speed, wind direction, snow accumulation, adjacent snow accumulation, ice/water accumulation.
Caltrans Quickmaps Website	Transportation Information Center	TIC Situation Data Management	1	The center shall collect traffic probe data (speeds, travel times, etc.) from appropriately equipped vehicles and short range communications equipment.
Caltrans Quickmaps Website	Transportation Information Center	TIC Situation Data Management	2	The center shall collect environmental probe data (air temperature, exterior light status, wiper status, traction control status, etc.) from appropriately equipped vehicles and short range communications equipment.
Caltrans Quickmaps Website	Transportation Information Center	TIC Situation Data Management	3	The center shall collect road condition data from probe-equipped transit vehicles via transit management centers; the data may be aggregated and preliminarily processed at the sending center.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Quickmaps Website	Transportation Information Center	TIC Situation Data Management	4	The center shall collect probe data from toll administrative centers containing travel times between toll collection points for those vehicles equipped for electronic toll collection; the data may be aggregated and processed at the sending center.
Caltrans Quickmaps Website	Transportation Information Center	TIC Situation Data Management	5	The center shall aggregate collected traffic probe data, calculate route segment travel times, route segment speeds, route usage, and road weather information for dissemination to other centers.
Caltrans Quickmaps Website	Transportation Information Center	TIC Traveler Telephone Information	1	The center shall provide the capability to process voice-formatted requests for traveler information from a traveler telephone information system, and return the information in the requested format.
Caltrans Quickmaps Website	Transportation Information Center	TIC Traveler Telephone Information	2	The center shall provide the capability to process dual-tone multifrequency (DTMF)-based requests (touch-tone) for traveler information from a traveler telephone information system.
Caltrans Quickmaps Website	Transportation Information Center	TIC Traveler Telephone Information	3	The center shall provide the capability to process traveler information requests from a traveler telephone information system.
Caltrans Quickmaps Website	Transportation Information Center	TIC Traveler Telephone Information	4	The center shall provide information on traffic conditions in the requested voice format and for the requested location.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Caltrans Quickmaps Website	Transportation Information Center	TIC Traveler Telephone Information	5	The center shall provide work zone and roadway maintenance information in the requested voice format and for the requested location.
Caltrans Quickmaps Website	Transportation Information Center	TIC Traveler Telephone Information	6	The center shall provide roadway environment conditions information in the requested voice format and for the requested location.
Caltrans Quickmaps Website	Transportation Information Center	TIC Traveler Telephone Information	7	The center shall provide weather and event information in the requested voice format and for the requested location.
Caltrans Quickmaps Website	Transportation Information Center	TIC Traveler Telephone Information	8	The center shall provide transit service information in the requested voice format and for the requested location.
Caltrans Quickmaps Website	Transportation Information Center	TIC Traveler Telephone Information	9	The center shall provide current ferry and rail schedule and airport status information in the requested voice format and for the requested location.
Caltrans Quickmaps Website	Transportation Information Center	TIC Traveler Telephone Information	10	The center shall provide the capability to support both specific caller requests as well as bulk upload of regional traveler information.
CHP SWITRS System	Archived Data System	Archive Data Repository	1	The center shall collect data from centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP SWITRS System	Archived Data System	Archive Data Repository	2	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).
CHP SWITRS System	Archived Data System	Archive Data Repository	3	The center shall store collected data in an information repository.
CHP SWITRS System	Archived Data System	Archive Data Repository	4	The center shall perform quality checks on collected data.
CHP SWITRS System	Archived Data System	Archive Data Repository	5	The center shall notify the system operator of errors related to data collection, analysis and archival.
CHP SWITRS System	Archived Data System	Archive Data Repository	6	The center shall include capabilities for archive to archive coordination.
CHP SWITRS System	Archived Data System	Archive Data Repository	7	The center shall provide the capability to execute methods on the incoming data such as cleansing, summarizations, aggregations, or transformations applied to the data before it is stored in the archive.
CHP SWITRS System	Archived Data System	Archive Data Repository	8	The center shall collect data from data distribution systems and other data sources.
CHP SWITRS System	Archived Data System	Archive Data Repository	9	The center shall respond to requests from the administrator interface function to manage center-sourced data collection.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP SWITRS System	Archived Data System	Archive Data Repository	10	The center shall respond to requests from the administrator interface function to manage the archive data.
CHP SWITRS System	Archived Data System	Archive Data Repository	11	The center shall respond to requests for archive data from archive data users (centers, field devices).
CHP SWITRS System	Archived Data System	Archive Data Repository	12	The center shall provide a mechanism for archive data users to request archive data by meta-data range.
CHP SWITRS System	Archived Data System	Archive Data Repository	13	The center shall associate meta-data with archived data, including catalog data, statistical products determined from method execution and data longevity.
CHP SWITRS System	Archived Data System	Archive Government Reporting	1	The center shall provide archive data to federal, state, and local government reporting systems.
CHP SWITRS System	Archived Data System	Archive Government Reporting	2	The center shall respond to requests for government report data.
CHP SWITRS System	Archived Data System	Archive Government Reporting	3	The center shall provide the capability to format data suitable for input into government reports.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP SWITRS System	Archived Data System	Archive Government Reporting	4	The center shall provide the applicable meta-data for any ITS archived data to satisfy government reporting system requests. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.
CHP SWITRS System	Archived Data System	Archive Situation Data Archival	1	The center shall collect data from roadside devices.
CHP SWITRS System	Archived Data System	Archive Situation Data Archival	2	The center shall respond to requests from the administrator interface function to manage field-sourced data collection.
CHP SWITRS System	Archived Data System	Archive Situation Data Archival	3	The center shall provide the capability to adjust the collection of field-sourced data based on the statistical measures.
CHP SWITRS System	Archived Data System	Archive Situation Data Archival	4	The center shall collect vehicle traffic probe data for performance monitoring and analysis.
CHP SWITRS System	Archived Data System	Archive Situation Data Archival	5	The center shall be capable of archiving vehicle traffic probe data.
CHP SWITRS System	Archived Data System	Archive Situation Data Archival	6	The center shall provide the capability to execute methods on the incoming field data such as aggregation and statistical measures before the data is stored in the archive.
CHP SWITRS System	Archived Data System	Archive Situation Data Archival	7	The center shall respond to requests from the administrator interface function to select and manage data stored in the archive.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Citation and Accident Electronic Recording	1	The roadside check facility equipment shall record the results of roadside inspections carried using an inspector's hand held terminal interface.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Citation and Accident Electronic Recording	2	The roadside check facility equipment shall provide an interface for an inspector to add comments to the inspection results.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Citation and Accident Electronic Recording	3	The roadside check facility equipment shall forward results of the roadside inspections to the commercial vehicle administration center either as needed or on a periodic basis. These reports include accident reports, violation notifications, citations, and daily site activity logs.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Citation and Accident Electronic Recording	4	The roadside check facility equipment shall receive driver records from the commercial vehicle administration center to support driver identification and collection of driver credentials and history information.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Citation and Accident Electronic Recording	5	The roadside check facility equipment shall collect safety data from the commercial vehicle and its freight equipment to help characterize the circumstances surrounding an accident.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Citation and Accident Electronic Recording	6	The roadside check facility equipment shall read the driver identification card provided by the commercial vehicle driver and support cross-check of the identification data with driver records.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Citation and Accident Electronic Recording	7	The roadside check facility equipment shall notify the enforcement agency of a violation describing the statute or regulation that was violated and how it was violated.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Electronic Screening	1	The roadside check facility equipment shall detect the presence of commercial vehicles and freight equipment approaching a facility.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Electronic Screening	2	The roadside check facility equipment shall differentiate between different types of vehicles and determine the number of axles, gross vehicle weight, and the identification of the vehicle and its cargo.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Electronic Screening	6	The roadside check facility equipment shall receive information about a breach or tamper event on a commercial vehicle or its attached freight equipment which includes identity, type of breach, location, and time.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Electronic Screening	7	The roadside check facility equipment shall request and input electronic screening data from the commercial vehicle's electronic tag data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Electronic Screening	8	The roadside check facility equipment shall collect safety data from the commercial vehicle and its freight equipment.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Electronic Screening	9	The roadside check facility equipment shall send a pass/pull-in notification to the commercial vehicle and its driver based on the information received from the vehicle, the administration center, enforcement agencies, and the inspector. The message may be sent to the on-board equipment in the commercial vehicle or transmitted to the driver using equipment such as dynamic message signs, red-green lights, flashing signs, etc.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Electronic Screening	10	The roadside check facility equipment shall verify that pull-in requests are heeded by drivers, notifying the facility operator if a vehicle fails to pull in as requested.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Electronic Screening	11	The roadside check facility equipment shall send a record of daily activities at the facility including summaries of screening events and inspections to the commercial vehicle administration center.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Electronic Screening	12	The roadside check facility equipment element shall alert the emergency management center about a Commercial Vehicle or Freight Equipment breach, non-permitted security sensitive hazmat detected at the roadside, route deviation, or Driver-Vehicle-Freight assignment mismatches which includes the location of the Commercial Vehicle and appropriate identities.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Electronic Screening	13	The roadside check facility equipment shall send an alarm to the appropriate emergency management center when it has determined there has been a container breach or tamper event on a commercial vehicle or its attached freight equipment which includes identity, type of breach, location, and time.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE HAZMAT Detection	1	The roadside check facility equipment shall detect the presence of commercial vehicles and freight equipment approaching a facility. Sensors can differentiate between different types of vehicles and determine the number of axles, gross vehicle weight, presence of security sensitive hazardous materials, and the identification of the vehicle and its cargo.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE HAZMAT Detection	2	The roadside check facility equipment shall detect the presence of security sensitive substances, e.g. detection of radiation or ammonia compounds, carried on-board commercial vehicles and freight equipment approaching a facility. This data is acquired by roadside sensors from the freight equipment electronically, optically, or manually.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE HAZMAT Detection	3	The roadside check facility equipment shall receive the credential information (e.g. snapshots) from the commercial vehicle administration center to maintain an up to date list of which vehicles with hazardous materials shipments have been cleared (enrolled).
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE HAZMAT Detection	4	The roadside check facility equipment shall send a pass/pull-in notification to the commercial vehicle and its driver based on the hazmat information received from the vehicle, the freight equipment, or the administration center. The message may be sent to the on-board equipment in the commercial vehicle via nearby connected vehicle roadside equipment or transmitted to the driver using equipment such as dynamic message signs, red-green lights, flashing signs, etc.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE HAZMAT Detection	5	The roadside check facility equipment shall raise and forward an alarm to the appropriate emergency management center if the hazmat-carrying commercial vehicle does not stop, or in the case of a positive identification of an unpermitted security sensitive hazmat cargo, to coordinate a traffic stop or some other action with respect to the offending commercial vehicle. The alarm will include information concerning the security sensitive hazmat detected at the roadside including the location, appropriate identifiers, route deviation, or assignment mismatches between the driver, commercial vehicle, or the freight equipment.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Safety and Security Inspection	1	The roadside check facility equipment shall receive information concerning commercial vehicles and freight equipment approaching a facility that are being pulled in for safety and security inspections.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Safety and Security Inspection	2	The roadside check facility equipment shall receive the safety and security inspection and status information from the commercial vehicle administration center to include information such as safety ratings, inspection summaries, and violation summaries.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Safety and Security Inspection	3	The roadside check facility equipment shall provide an interface to inspectors in the field to update safety inspection data including overrides to the pull-in decisions made by the system.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Safety and Security Inspection	4	The roadside check facility equipment shall request and input electronic safety data from the commercial vehicle's electronic tag data. This includes identities, driver logs, on-board safety data, safety inspection records, commercial vehicle breach information, as well as freight equipment information.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Safety and Security Inspection	5	The roadside check facility equipment shall send a pass/pull-in notification to the commercial vehicle and its driver based on the information received from the vehicle, the administration center, and the inspector. The message may be sent to the on-board equipment in the commercial vehicle or transmitted to the driver using equipment such as dynamic message signs, red-green lights, flashing signs, etc.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Safety and Security Inspection	6	The roadside check facility equipment shall receive driver records, accident reports, and citation records from the commercial vehicle administration center to support driver identification and access to driver credentials and history information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Safety and Security Inspection	7	The roadside check facility equipment shall read expected driver identity characteristics (e.g., PIN codes and biometric data) from the commercial vehicle equipment to support safety and security checking.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Safety and Security Inspection	8	The roadside check facility equipment shall read the driver identification card provided by the commercial vehicle driver and support cross-check of the identification data with driver records.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Safety and Security Inspection	9	The roadside check facility equipment shall forward results of the roadside safety inspections to the commercial vehicle administration center.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Safety and Security Inspection	10	The roadside check facility equipment shall support wireless roadside inspections that are conducted remotely, forwarding data provided by the commercial vehicle via Field-Vehicle communications to the center that performs the safety assessment.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Safety and Security Inspection	11	The roadside check facility equipment shall monitor the safety of commercial vehicles that have been remotely disabled, based on mismatched identities, or other situations as directed by commercial vehicle fleet management and the appropriate emergency management center.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Weigh-In-Motion	1	The roadside check facility equipment shall detect the presence of commercial vehicles and freight equipment approaching a facility.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Weigh-In-Motion	2	The roadside check facility equipment shall request and input electronic screening data from the commercial vehicle's electronic tag data.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Weigh-In-Motion	3	The roadside check facility equipment shall send a pass/pull-in notification to the commercial vehicle and its driver based on the information received from the vehicle and the measurements taken. The message may be sent to the on-board equipment in the commercial vehicle or transmitted to the driver using equipment such as dynamic message signs, red-green lights, flashing signs, etc.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Weigh-In-Motion	4	The roadside check facility equipment shall differentiate between different types of commercial vehicles, including number of axles, presence of containers, and types of connected freight equipment.
CHP Weigh-in-Motion	Commercial Vehicle Check Equipment	CVCE Weigh-In-Motion	5	The roadside check facility equipment shall determine the gross vehicle weight, weight per axle, and the identification of a passing commercial vehicle and its cargo.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
CHP Weigh-in-Motion	Connected Vehicle Roadside Equipment	RSE Commercial Vehicle Services	1	The field element shall communicate with approaching properly equipped commercial vehicles at mainline speeds for automated vehicle identification and credential checking.
CHP Weigh-in-Motion	Connected Vehicle Roadside Equipment	RSE Commercial Vehicle Services	2	The field element shall forward the collected vehicle information to commercial vehicle administration centers.
CHP Weigh-in-Motion	Connected Vehicle Roadside Equipment	RSE Commercial Vehicle Services	3	The field element shall send a pass/pull-in notification to the commercial vehicle and its driver based on the information received from the vehicle and the measurements taken.
CHP Weigh-in-Motion	Connected Vehicle Roadside Equipment	RSE Commercial Vehicle Services	4	The field element shall send the roadside safety inspections record to commercial vehicle administration operations.
CHP Weigh-in-Motion	Connected Vehicle Roadside Equipment	RSE Commercial Vehicle Services	5	The field element shall receive container manifest data and status of the electronic seal on a container.
CHP Weigh-in-Motion	Connected Vehicle Roadside Equipment	RSE Commercial Vehicle Services	6	The field element shall forward the collected vehicle information to commercial vehicle check facilities.
CHP Weigh-in-Motion	Connected Vehicle Roadside Equipment	RSE Infrastructure Restriction Warning	1	The roadside equipment shall provide infrastructure restriction warnings to connected vehicles.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	1	The emergency vehicle, including roadway service patrols, shall track its current location.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	2	The emergency vehicle, including roadway service patrols, shall send the vehicle's location and operational data to the center for emergency management and dispatch.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	5	The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	7	The emergency vehicle shall send patient status information to the care facility along with a request for further information.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	8	The emergency vehicle shall forward care facility status information to emergency vehicle personnel, including the location, specialized services, quality of care, waiting time, number of rooms available, and emergency room status of hospitals or emergency care providers.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	9	The emergency vehicle shall send the vehicle's location, speed and direction to other vehicles in the area.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	10	The roadway service patrols vehicle shall monitor roads and aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas).
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	11	The emergency vehicle shall receive the crash data from connected vehicles involved in a crash.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	12	The emergency vehicle shall receive the HAZMAT information from commercial vehicles involved in a crash.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	4	The emergency vehicle shall provide traffic incident information to other emergency vehicles using short range communications.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	5	The emergency vehicle shall receive container manifest and status of the electronic seal on a container.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	6	The emergency vehicle shall inspect the electronic seal on a container to verify the container has not been opened or tampered with.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	7	The vehicle shall collect vehicle occupants' electronic medical records to support emergency dispatch and staging of personnel and equipment.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	8	The emergency vehicle shall exchange information with other emergency vehicles to support the decision making and overall incident response.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV Service Patrol Vehicle Operations	1	The service patrol vehicle shall track its current location.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV Service Patrol Vehicle Operations	2	The service patrol vehicle shall send the vehicle's location and operational data to the center for dispatch.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV Service Patrol Vehicle Operations	3	The service patrol vehicle shall receive incident details and a suggested route when dispatched to a scene.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV Service Patrol Vehicle Operations	4	The service patrol vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV Service Patrol Vehicle Operations	5	The service patrol vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.
Emergency Management Public Safety Vehicles	Emergency Vehicle OBE	EV Service Patrol Vehicle Operations	6	The service patrol vehicle shall update the center with status of an incident response including the nature of the incident, e.g. flat tire, gas, minor accident.
Emergency Management Public Safety Vehicles	Vehicle OBE	Vehicle Emergency Notification	1	The vehicle shall provide the capability for a driver to report an emergency and summon assistance.
Emergency Management Public Safety Vehicles	Vehicle OBE	Vehicle Emergency Notification	2	The vehicle shall provide the capability to accept input from a driver via a panic button or some other functionally similar form of input device provided as part of the in-vehicle equipment.
Emergency Management Public Safety Vehicles	Vehicle OBE	Vehicle Emergency Notification	3	The vehicle shall acknowledge the driver's request for emergency assistance.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Emergency Management Public Safety Vehicles	Vehicle OBE	Vehicle Emergency Notification	4	The vehicle shall collect vehicle characteristics describing the vehicles typical and real time configuration, including damage to vehicle components.
Emergency Management Public Safety Vehicles	Vehicle OBE	Vehicle Emergency Notification	5	The vehicle shall notify emergency responders of the characteristics and damage identified to the vehicle involved in a collision.
Emergency Management Public Safety Vehicles	Vehicle OBE	Vehicle Emergency Notification	6	The vehicle shall provide the capability to automatically identify that a collision has occurred using equipment such as collision detection sensors with an interface to mayday type equipment that would automatically detect vehicle problems and send appropriate distress signals to the arriving public safety vehicles.
Emergency Management Public Safety Vehicles	Vehicle OBE	Vehicle Emergency Notification	7	The vehicle shall collect vehicle operational state information from the host vehicle.
Emergency Management Public Safety Vehicles	Vehicle OBE	Vehicle Emergency Notification	8	The vehicle shall analyze vehicle operational state information to determine if the host vehicle has been involved in a collision.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Commercial Vehicle Response	1	The center shall receive alerts about a Commercial Vehicle or Freight Equipment breach, non-permitted security sensitive hazmat detected at the roadside, route deviation, or Commercial Vehicle Driver / Commercial Vehicle / Freight Equipment assignment mismatches which includes the location of the Commercial Vehicle and appropriate identities.
LA County EOC/911 Center	Emergency Management Center	Emergency Commercial Vehicle Response	2	The center shall receive emergency notification information from commercial vehicles, commercial vehicle check stations, or commercial fleet operators and present the possible incident information to the emergency system operator. This may include detection of non-permitted transport of security sensitive hazmat, hazardous cargo spills, etc.
LA County EOC/911 Center	Emergency Management Center	Emergency Commercial Vehicle Response	3	The center shall receive details of the cargo being carried by commercial vehicles from their commercial fleet manager for incidents involving potential hazardous materials.
LA County EOC/911 Center	Emergency Management Center	Emergency Commercial Vehicle Response	4	The center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Commercial Vehicle Response	5	The center shall provide the capability to request Fleet and Freight Management to disable a specific vehicle in their fleet.
LA County EOC/911 Center	Emergency Management Center	Emergency Data Collection	1	The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.
LA County EOC/911 Center	Emergency Management Center	Emergency Data Collection	2	The center shall assign quality control metrics and meta-data to be stored along with the data. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.
LA County EOC/911 Center	Emergency Management Center	Emergency Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the emergency management data or for the data itself.
LA County EOC/911 Center	Emergency Management Center	Emergency Data Collection	4	The center shall be able to produce sample products of the data available.
LA County EOC/911 Center	Emergency Management Center	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.
LA County EOC/911 Center	Emergency Management Center	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.
LA County EOC/911 Center	Emergency Management Center	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.
LA County EOC/911 Center	Emergency Management Center	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.
LA County EOC/911 Center	Emergency Management Center	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.
LA County EOC/911 Center	Emergency Management Center	Emergency Dispatch	7	The center shall receive traffic images to support dispatch of emergency vehicles.
LA County EOC/911 Center	Emergency Management Center	Emergency Dispatch	8	The center shall provide the capability to request remote control of traffic surveillance devices.
LA County EOC/911 Center	Emergency Management Center	Emergency Dispatch	9	The center shall process road and weather conditions to provide updates to responding personnel.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	4	The center shall receive potential incident information from social media sources to support the early warning system.
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	7	The center shall broadcast wide-area alerts and advisories to transit management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	8	The center shall broadcast wide-area alerts and advisories to toll administration centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	9	The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	12	The center shall broadcast wide-area alerts and advisories to commercial vehicle administration centers and roadside check facilities for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	13	The center shall process status information from each of the centers that have been sent the wide-area alert.
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.
LA County EOC/911 Center	Emergency Management Center	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.
LA County EOC/911 Center	Emergency Management Center	Emergency Environmental Monitoring	1	The center shall collect current and forecast road and weather information from weather service providers (such as the National Weather Service and value-added sector specific meteorological services).
LA County EOC/911 Center	Emergency Management Center	Emergency Environmental Monitoring	2	The center shall collect road network conditions data, including advisories, from traffic management and traveler information centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Environmental Monitoring	3	The center shall collect asset restrictions information from roadway maintenance operations.
LA County EOC/911 Center	Emergency Management Center	Emergency Environmental Monitoring	4	The center shall assimilate current and forecast road conditions and surface weather information to support incident management.
LA County EOC/911 Center	Emergency Management Center	Emergency Environmental Monitoring	5	The center shall provide the road and weather warning and advisories to the emergency responders.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	6	The center shall request resources from transit agencies as needed to support the evacuation.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	11	The center shall submit evacuation information to toll administration centers along with requests for changes in the toll services or fee collection during an evacuation.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	12	The center shall retrieve information from public health systems to plan for and implement evacuations or in-place sheltering for biological, chemical, radiation, and other public health emergencies.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	13	The center shall make use of population and housing data to plan for and implement evacuations or in-place sheltering for biological, chemical, radiation, and other public health emergencies.
LA County EOC/911 Center	Emergency Management Center	Emergency Evacuation Support	14	The center shall maintain information on the population of an area in the event of an evacuation, including addresses, types of facility (residence, multi-family dwelling, commercial retail, commercial office, etc.), and special considerations (storage of flammable liquids, special needs residents).
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	6	The center shall provide other agencies real-time information on the current conditions at the incident scene.
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	7	The center shall collect modeling program outputs to support emergency dispatch and staging of personnel and equipment, e.g. predicted HAZMAT plumes or crash severity predictions.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	8	The center shall collect information about freight or cargo to support emergency dispatch and staging of personnel and equipment, e.g. cargo manifest or HAZMAT information.
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	9	The center shall collect medical care facility capabilities and availability, e.g., trauma level supported to support emergency dispatch and staging of personnel and equipment.
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	10	The center shall collect on-scene reports to support emergency dispatch and staging of personnel and equipment.
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	11	The center shall provide situational awareness information to emergency responders about an incident, both en-route and while they are on-scene.
LA County EOC/911 Center	Emergency Management Center	Emergency Incident Command	12	The center shall provide status of the current conditions at the incident scene to arriving responders.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	8	The center shall support remote control of field equipment normally under control of the traffic management center including traffic signals, dynamic message signs, gates, and barriers.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	9	The center shall provide the capability to remotely control and monitor CCTV systems normally operated by a traffic management center.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	10	The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	14	The center shall collect information about the status of the recovery efforts for the infrastructure during disasters.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	15	The center shall provide the overall status of infrastructure recovery efforts to traveler information providers and media.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	16	The center shall provide the capability to communicate information about emergency situations to local population through the Emergency Telecommunications System.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	17	The center shall provide the capability to identify neighborhoods and businesses that should be informed of an emergency situation based on information collected about incidents including their severity, impacted locations, and recovery schedule.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	18	The center shall retrieve information from public health systems to increase preparedness for, and implement a response to biological, chemical, radiation, and other public health emergencies.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	19	The center shall manage coordinated inter-agency responses to incidents at an international border.
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	20	The center shall receive temporary facility restrictions that are imposed during maintenance and construction.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Response Management	21	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible incident, and provide work plan feedback to the sending center.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	3	The center shall receive status information from care facilities to determine the appropriate facility and its location.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	5	The center shall receive current railroad schedule information for emergency vehicle route calculation.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	6	The center shall track current emergency vehicle location and status along with other emergency vehicle characteristics.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	9	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	10	The center shall provide the calculated route for emergency vehicles to the dispatch function.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	11	The center shall collect weather and maintenance activity data, e.g., which roads have been plowed to support emergency dispatch and staging of personnel and equipment.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	12	The center shall collect road and traffic conditions information, including current traffic conditions en route, current traffic conditions on-scene, and road weather conditions (e.g. wet, icy, snow-covered).

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	13	The center shall collect road and traffic conditions information from multiple sources including: traffic management centers, probe vehicle data, including traffic data and environmental conditions, and other private traffic data sources, e.g. private distributors that integrate connected (probe) vehicle data with cellular or surveillance device inputs.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	14	The center shall provide routing instructions for a dispatched emergency vehicle that may reflect current network conditions and the additional routing options available to en route emergency that are not available to the general public.
LA County EOC/911 Center	Emergency Management Center	Emergency Routing	15	the center shall collect location and situational information about the emergency vehicles responding to or on the scene of an incident.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	1	The center shall remotely monitor and control security sensor data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	2	The center shall remotely monitor and control security sensor data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	3	The center shall remotely monitor and control security sensor data collected on-board transit vehicles. The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors. The data may be raw or pre-processed in the field.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	4	The center shall exchange security sensor data with other emergency centers.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	5	The center shall identify potential security threats based on collected security sensor data.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	6	The center shall verify potential security threats by correlating security sensor data from multiple sources.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	7	The center shall perform threat analysis based on correlations of security sensor and surveillance data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	8	The center shall exchange threat analysis data with Alerting and Advisory Systems and use that data in local threat analysis processing.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	9	The center shall disseminate threat information to other agencies, including traffic, transit, maintenance, rail operations, and other emergency management centers.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	10	The center shall respond to control data from center personnel regarding security sensor data collection, processing, threat detection, and threat analysis.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	11	The center shall request activation of barriers and safeguards on request from center personnel.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Sensor Management	12	The center shall monitor maintenance status of the security sensor field equipment.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	1	The center shall remotely monitor video images and audio surveillance data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The data may be raw or pre-processed in the field.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	2	The center shall remotely monitor video images and audio surveillance data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The data may be raw or pre-processed in the field.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	3	The center shall remotely monitor video images and audio surveillance data collected on-board transit vehicles. The data may be raw or pre-processed in the field.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	4	The center shall exchange surveillance data with other emergency centers.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	5	The center shall identify potential security threats based on collected security surveillance data.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	6	The center shall verify potential security threats by correlating security surveillance data from multiple sources.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	7	The center shall remotely control security surveillance devices in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	8	The center shall remotely control security surveillance devices in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers).
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	9	The center shall remotely control security surveillance devices on-board transit vehicles.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	10	The center shall match traveler video images against a database from the Alerting and Advisory Systems of known images that may represent criminals and terrorists.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	11	The center shall exchange traveler images with other emergency management centers to support traveler image matching.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	12	The center shall respond to control data from center personnel regarding security surveillance data collection, processing, threat detection, and image matching.
LA County EOC/911 Center	Emergency Management Center	Emergency Secure Area Surveillance	13	The center shall monitor maintenance status of the security sensor field equipment.
LA County Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	1	The maintenance and construction vehicle shall track the location and status of safety systems on-board the vehicle.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	2	The maintenance and construction vehicle shall respond to control information from the center to allow remote operation of the on-board vehicle systems. These systems include routine maintenance equipment for cutting, repairs, hazard removal, etc.
LA County Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	3	The maintenance and construction vehicle shall monitor materials information including remaining quantity and current application rate of materials on the vehicle.
LA County Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.
LA County Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	5	The maintenance and construction vehicle shall send operational data to the center including the operational state of the maintenance equipment (e.g., blade up/down, spreader pattern), types and quantities of materials used for construction and maintenance activities, and a record of the actual work performed.
LA County Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle Location Tracking	1	The maintenance and construction vehicle shall track its current location.
LA County Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle Location Tracking	2	The maintenance and construction vehicle shall send the time stamped vehicle location to the controlling center.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Data Collection	1	The center shall collect maintenance and construction data (such as field equipment status, infrastructure status, maintenance and construction activity data) gathered from roadway, traffic, and other maintenance and construction sources.
LA County TCS	Maint and Constr Management Center	MCM Data Collection	2	The center shall assign quality control metrics and meta-data to be stored along with the data. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.
LA County TCS	Maint and Constr Management Center	MCM Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the maintenance and construction data or for the data itself.
LA County TCS	Maint and Constr Management Center	MCM Data Collection	4	The center shall be able to produce sample products of the data available.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Collection	1	The center shall remotely control environmental sensors that measure road surface temperature, moisture, icing, salinity, and other measures.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Collection	2	The center shall remotely control environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Collection	3	The center shall remotely control environmental sensors on-board maintenance and construction vehicles that measure road and weather conditions including air and surface temperatures, wind speed, humidity, precipitation, visibility and other measures.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Collection	4	The center shall collect environmental probe data (air temperature, exterior light status, wiper status, traction control status, etc.) from short range communications equipment that communicates with appropriately equipped probe vehicles.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Collection	5	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services), data from traffic and traveler information providers, and environmental data collected from sensors deployed on and about the roadway as well as the fleet of maintenance and construction vehicles and the broader population of vehicle probes.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Collection	6	The center shall provide weather and road condition information to weather service providers and center personnel.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Collection	7	The center shall respond to control data from center personnel regarding environmental sensor control and weather data collection and processing.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Collection	8	The center shall collect operational status for the roadside and vehicle-based environmental sensor equipment.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Collection	9	The center shall collect fault data for the roadside and vehicle-based environmental sensor equipment for repair.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Collection	10	The center shall collect environmental data from sensors that measure road surface temperature, moisture, icing, salinity, and other measures.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Collection	11	The center shall provide weather and road condition information to traffic management operations.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Processing	1	The center shall respond to control data from center personnel regarding environmental sensor control and weather data collection and processing.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Processing	2	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services) and local environmental sensor data.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Processing	3	The center shall use the various data inputs of environmental sensors and road weather data to develop a view of current and predicted road weather and road conditions.
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Processing	4	The center shall disseminate current and forecasted road weather and road condition information to weather service providers (such as the National Weather Service and value-added sector specific meteorological services) as well as other agencies including traffic, emergency, and transit management, traveler information providers, rail operations centers, media, and other maintenance management centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Environmental Information Processing	5	The center shall provide value-added sector specific meteorological services with information on basic road facility and treatment information that supports forecasts for road conditions.
LA County TCS	Maint and Constr Management Center	MCM Incident Management	1	The center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.
LA County TCS	Maint and Constr Management Center	MCM Incident Management	2	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, etc.
LA County TCS	Maint and Constr Management Center	MCM Incident Management	3	The center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Incident Management	4	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.
LA County TCS	Maint and Constr Management Center	MCM Incident Management	5	The center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.
LA County TCS	Maint and Constr Management Center	MCM Incident Management	6	The center shall exchange road network status assessment information with emergency management and traffic management centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Incident Management	7	The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.
LA County TCS	Maint and Constr Management Center	MCM Incident Management	8	The center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.
LA County TCS	Maint and Constr Management Center	MCM Incident Management	9	The center shall receive evacuation information including evacuation zones, evacuation times, and reentry times from emergency operation centers.
LA County TCS	Maint and Constr Management Center	MCM Maintenance Decision Support	1	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Maintenance Decision Support	2	The center shall tailor the decision support information to include filtering (selection from a large amount of external information), error reduction ('smoothing' the information), fusion (combination of disparate information to match the decision needs), and analysis (creating the decision).
LA County TCS	Maint and Constr Management Center	MCM Maintenance Decision Support	3	The center shall provide an interface to the center personnel to input control parameters for the decision support process and receive decisions or information presentation.
LA County TCS	Maint and Constr Management Center	MCM Maintenance Decision Support	4	The center shall provide dispatch information to maintenance and construction vehicles based on the outputs of the decision support system, including recommended roadway treatment actions.
LA County TCS	Maint and Constr Management Center	MCM Reduced Speed Zone Warning	1	The center shall be capable of remotely control and monitor reduced speed zone warning roadside equipment operations.
LA County TCS	Maint and Constr Management Center	MCM Reduced Speed Zone Warning	2	The center shall provide reduced speed zone posted speed limits and associated schedules and information about associated road configuration changes including lane merges and shifts for display on roadside devices.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Reduced Speed Zone Warning	3	The center shall provide to roadside equipment, for transmittal to connected vehicles, reduced speed zone posted speed limits and associated schedules and information about associated road configuration changes including lane merges and shifts.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	1	The center shall maintain an interface with asset management systems to track the inventory, restrictions, repair needs and status updates of transportation assets (pavement, bridges, signs, etc.) including location, installation and materials information, vendor/contractor, current maintenance status, standard height, width, and weight restrictions.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	2	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	3	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	4	The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	5	The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	6	The center shall collect the status and fault data from the centers that operate the equipment, including data for traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	7	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of roadway maintenance and construction activities.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	8	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	9	The center shall dispatch and route maintenance and construction vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	10	The center shall manage an interface with center personnel to accept vehicle systems control information and remotely control maintenance and construction vehicle on-board equipment.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	11	The center shall track the status of roadway maintenance and construction activities by monitoring collected data from the dispatched vehicles and equipment.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	12	The center shall report the status of field equipment maintenance activities to the centers that operate the equipment.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	13	The Center shall provide the status of field maintenance actions to other centers.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	14	The Center shall track the status of field equipment maintenance actions.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	15	The Center shall accept information from other Centers that indicates which Connected Vehicle Roadside Equipment needs maintenance.
LA County TCS	Maint and Constr Management Center	MCM Roadway Maintenance	16	The Center shall accept field equipment maintenance action requests from other centers.
LA County TCS	Maint and Constr Management Center	MCM Vehicle Tracking	1	The center shall monitor the locations of all maintenance and construction vehicles and other equipment under its jurisdiction.
LA County TCS	Maint and Constr Management Center	MCM Vehicle Tracking	2	The center shall present location data to center personnel for the fleet of maintenance and construction vehicles and other equipment.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Work Activity Coordination	1	The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.
LA County TCS	Maint and Constr Management Center	MCM Work Activity Coordination	2	The center shall provide status information about scheduled maintenance and construction activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, multimodal transportation providers, rail operations, and the media.
LA County TCS	Maint and Constr Management Center	MCM Work Activity Coordination	3	The center shall collect and respond to feedback concerning scheduled maintenance and construction activities with other management centers such as traffic, emergency, transit, and rail operations.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Work Activity Coordination	4	The center shall collect and disseminate asset restriction information levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions, and temporary facility restrictions that are imposed during maintenance and construction.
LA County TCS	Maint and Constr Management Center	MCM Work Activity Coordination	5	The Center shall provide road infrastructure restriction information to other Centers.
LA County TCS	Maint and Constr Management Center	MCM Work Activity Coordination	6	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance and construction activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.
LA County TCS	Maint and Constr Management Center	MCM Work Activity Coordination	7	The center shall exchange rail schedules and work plans with rail operations centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Work Zone Management	1	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.
LA County TCS	Maint and Constr Management Center	MCM Work Zone Management	2	The center shall control the collection of work zone status information including video images from cameras located in or near the work zone.
LA County TCS	Maint and Constr Management Center	MCM Work Zone Management	3	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media.
LA County TCS	Maint and Constr Management Center	MCM Work Zone Management	4	The center shall control traffic in work zones by providing remote control of dynamic message signs, highway advisory radio systems, gates, and barriers located in or near the work zone.
LA County TCS	Maint and Constr Management Center	MCM Work Zone Management	5	The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Maint and Constr Management Center	MCM Work Zone Management	6	The center shall collect real-time information on the state of the road network including current traffic and road conditions to support work zone scheduling and management.
LA County TCS	Maint and Constr Management Center	MCM Work Zone Safety Management	1	The center shall provide remote monitoring and control of work zone safety devices - including intrusion detection devices that have been installed in work zones or maintenance areas.
LA County TCS	Maint and Constr Management Center	MCM Work Zone Safety Management	2	The center shall provide remote monitoring and control of intrusion alert devices that have been installed in work zones or maintenance areas.
LA County TCS	Maint and Constr Management Center	MCM Work Zone Safety Management	3	The center shall collect status information of work zone safety device status from field equipment or the maintenance and construction vehicles.
LA County TCS	Maint and Constr Management Center	MCM Work Zone Safety Management	4	The center shall collect and store work zone data collected from work zone monitoring devices (such as intrusion detection or alert devices and speed monitoring devices) on-board the vehicle and at the roadside.
LA County TCS	Traffic Management Center	TMC Advanced Rail Crossing Management	1	The center shall remotely control highway-rail intersection (HRI) equipment located in the field.
LA County TCS	Traffic Management Center	TMC Advanced Rail Crossing Management	2	The center shall accept collect highway-rail intersection (HRI) advisory or alert data from rail operations centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Advanced Rail Crossing Management	3	The center shall collect highway-rail intersection (HRI) equipment operational status and compare against the control information sent by the center.
LA County TCS	Traffic Management Center	TMC Advanced Rail Crossing Management	4	The center shall provide the highway-rail intersection (HRI) equipment operational status to rail operations centers.
LA County TCS	Traffic Management Center	TMC Advanced Rail Crossing Management	5	The center shall collect incident information related to a highway-rail intersection (HRI), such as intersection blockages or crashes or equipment malfunctions.
LA County TCS	Traffic Management Center	TMC Advanced Rail Crossing Management	6	The center shall implement control plans to coordinate signalized intersections around highway-rail intersections (HRI), under control of center personnel, based on data from sensors and surveillance monitoring traffic conditions, incidents, equipment faults, pedestrian crossings, etc.
LA County TCS	Traffic Management Center	TMC Barrier System Management	1	The center shall remotely control barrier systems for transportation facilities and infrastructure. Barrier systems include automated or remotely controlled gates, barriers and other systems that manage entry to roadways.
LA County TCS	Traffic Management Center	TMC Barrier System Management	2	The center shall accept requests for barrier system activation from other centers and from center personnel to support emergency response and detours.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Barrier System Management	3	The center shall collect barrier system operational status.
LA County TCS	Traffic Management Center	TMC Barrier System Management	4	The center shall collect barrier system fault data and send to the maintenance center for repair.
LA County TCS	Traffic Management Center	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.
LA County TCS	Traffic Management Center	TMC Basic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.
LA County TCS	Traffic Management Center	TMC Basic Surveillance	3	The center shall monitor, analyze, and store multimodal crossing, high occupancy vehicle (HOV) and high occupancy toll (HOT) lane sensor data under remote control of the center.
LA County TCS	Traffic Management Center	TMC Basic Surveillance	4	The center shall distribute road network conditions data (raw or processed) based on collected and analyzed traffic sensor and surveillance data to other centers.
LA County TCS	Traffic Management Center	TMC Basic Surveillance	5	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Basic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each)
LA County TCS	Traffic Management Center	TMC Data Collection	1	The center shall collect traffic management data such as operational data, event logs, etc.
LA County TCS	Traffic Management Center	TMC Data Collection	2	The center shall assign quality control metrics and meta-data to be stored along with the data. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.
LA County TCS	Traffic Management Center	TMC Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the traffic data or for the data itself.
LA County TCS	Traffic Management Center	TMC Data Collection	4	The center shall be able to produce sample products of the data available.
LA County TCS	Traffic Management Center	TMC Environmental Monitoring	1	The center shall remotely control environmental sensors that measure road surface conditions including temperature, moisture, icing, salinity, and other measures.
LA County TCS	Traffic Management Center	TMC Environmental Monitoring	2	The center shall remotely control environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Environmental Monitoring	3	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services), data from roadway maintenance operations, and environmental data collected from sensors deployed on and about the roadway.
LA County TCS	Traffic Management Center	TMC Environmental Monitoring	4	The center shall be able to receive road condition information from weather service providers.
LA County TCS	Traffic Management Center	TMC Environmental Monitoring	5	The center shall receive aggregated and processed vehicle environmental data collected from vehicle safety and convenience systems through the connected vehicle roadside equipment.
LA County TCS	Traffic Management Center	TMC Environmental Monitoring	6	The center shall be able to share the collected environmental data with Maintenance and construction operations.
LA County TCS	Traffic Management Center	TMC Environmental Monitoring	7	The center shall provide drivers road weather advisories at warnings.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Incident Detection	1	The center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.
LA County TCS	Traffic Management Center	TMC Incident Detection	2	The center shall collect and store traffic flow and image data from the field equipment to detect and verify incidents.
LA County TCS	Traffic Management Center	TMC Incident Detection	3	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters and traveler information service providers.
LA County TCS	Traffic Management Center	TMC Incident Detection	4	The center shall exchange incident and threat information with emergency management centers as well as maintenance and construction centers; including notification of existence of incident and expected severity, location, time and nature of incident.
LA County TCS	Traffic Management Center	TMC Incident Detection	5	The center shall support requests from emergency management centers and border inspection systems to remotely control sensor and surveillance equipment located in the field.
LA County TCS	Traffic Management Center	TMC Incident Detection	6	The center shall provide road network conditions and traffic images to emergency management centers to support the detection, verification, and classification of incidents.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Incident Detection	7	The center shall provide video and traffic sensor control commands to the field equipment to detect and verify incidents.
LA County TCS	Traffic Management Center	TMC Incident Dispatch Coordination	1	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This may also identify specific information that should not be released to the public.
LA County TCS	Traffic Management Center	TMC Incident Dispatch Coordination	2	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.
LA County TCS	Traffic Management Center	TMC Incident Dispatch Coordination	3	The center shall support requests from emergency management centers to remotely control sensor and surveillance equipment located in the field, provide special routing for emergency vehicles, and to provide responding emergency vehicles with signal preemption.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Incident Dispatch Coordination	4	The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information.
LA County TCS	Traffic Management Center	TMC Incident Dispatch Coordination	5	The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers.
LA County TCS	Traffic Management Center	TMC Incident Dispatch Coordination	6	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.
LA County TCS	Traffic Management Center	TMC Incident Dispatch Coordination	7	The center shall provide road network conditions and traffic images to emergency management centers, maintenance and construction centers, and traveler information service providers.
LA County TCS	Traffic Management Center	TMC Incident Dispatch Coordination	8	The center shall monitor incident response performance and calculate incident response and clearance times.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Incident Dispatch Coordination	9	The center shall exchange road network status assessment information with emergency management and maintenance centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.
LA County TCS	Traffic Management Center	TMC Incident Dispatch Coordination	10	The center shall coordinate information and controls with other traffic management centers.
LA County TCS	Traffic Management Center	TMC Incident Dispatch Coordination	11	The center shall receive inputs from emergency management and transit management centers to develop an overall status of the transportation system including emergency transit schedules in effect and current status and condition of the transportation infrastructure.
LA County TCS	Traffic Management Center	TMC Multi-Modal Coordination	1	The center shall respond to requests from transit management centers for signal priority at one or more intersections along a particular transit route.
LA County TCS	Traffic Management Center	TMC Multi-Modal Coordination	2	The center shall exchange information with transit management centers including details current transit routes, the level of service on each route, and the progress of individual vehicles along their routes.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Multi-Modal Coordination	3	The center shall provide an integrated operations strategy for the parking facilities in the area. These strategies can include dynamic adjustments to parking fees and restrictions, and other active demand management strategies.
LA County TCS	Traffic Management Center	TMC Passive Surveillance	1	The center shall collect time stamped vehicle identities from field equipment.
LA County TCS	Traffic Management Center	TMC Passive Surveillance	2	The center shall correlate the time stamped vehicle identities in order to calculate link travel times and derive other traffic measures.
LA County TCS	Traffic Management Center	TMC Regional Traffic Management	1	The center shall exchange traffic information with other traffic management centers including incident information, congestion data, traffic data, signal timing plans, and real-time signal control information.
LA County TCS	Traffic Management Center	TMC Regional Traffic Management	2	The center shall exchange traffic control information with other traffic management centers to support remote monitoring and control of traffic management devices (e.g. signs, sensors, signals, cameras, etc.).
LA County TCS	Traffic Management Center	TMC Road Weather Advisories and Warnings	1	The center shall collect environmental data (air temperature, exterior light status, wiper status, traction control status, etc.) from appropriately equipped vehicles using short range communications equipment.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Road Weather Advisories and Warnings	2	The center shall aggregate collected environmental data and disseminate the aggregated environmental probe data to other centers.
LA County TCS	Traffic Management Center	TMC Road Weather Advisories and Warnings	3	The center shall develop short term weather warnings or advisories that can be provided to individual motorists through field equipment.
LA County TCS	Traffic Management Center	TMC Roadway Equipment Monitoring	1	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.
LA County TCS	Traffic Management Center	TMC Roadway Equipment Monitoring	2	The center shall collect and store CCTV surveillance system (traffic, pedestrian) operational status.
LA County TCS	Traffic Management Center	TMC Roadway Equipment Monitoring	3	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.
LA County TCS	Traffic Management Center	TMC Roadway Equipment Monitoring	4	The center shall collect and store CCTV surveillance system (traffic, pedestrian) fault data send to the maintenance center for repair.
LA County TCS	Traffic Management Center	TMC Roadway Equipment Monitoring	5	The center shall collect environmental sensor operational status.
LA County TCS	Traffic Management Center	TMC Roadway Equipment Monitoring	6	The center shall collect environmental sensor equipment fault data and send to the maintenance center for repair.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Roadway Equipment Monitoring	7	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.
LA County TCS	Traffic Management Center	TMC Safeguard System Management	1	The center shall remotely control safeguard systems, equipment used to mitigate the impact of incidents on transportation infrastructure (e.g., blast shields, tunnel exhaust systems, etc.)
LA County TCS	Traffic Management Center	TMC Safeguard System Management	2	The center shall accept requests for safeguard system activation from other centers and from center personnel to support emergency response.
LA County TCS	Traffic Management Center	TMC Safeguard System Management	3	The center shall collect safeguard system operational status.
LA County TCS	Traffic Management Center	TMC Safeguard System Management	4	The center shall collect safeguard system fault data and send to the maintenance center for repair.
LA County TCS	Traffic Management Center	TMC Signal Control	1	The center shall remotely control traffic signal controllers.
LA County TCS	Traffic Management Center	TMC Signal Control	2	The center shall accept notifications of pedestrian calls.
LA County TCS	Traffic Management Center	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.
LA County TCS	Traffic Management Center	TMC Signal Control	5	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.
LA County TCS	Traffic Management Center	TMC Signal Control	6	The center shall implement control plans to coordinate signalized intersections based on data from sensors.
LA County TCS	Traffic Management Center	TMC Signal Control	7	The center shall manage boundaries of the control sections used within the signal system.
LA County TCS	Traffic Management Center	TMC Signal Control	8	The center shall maintain traffic signal coordination including synchronizing clocks throughout the system.
LA County TCS	Traffic Management Center	TMC Signal Control	9	The center shall implement control plans to coordinate signalized intersections based on data from sensors and connected vehicles.
LA County TCS	Traffic Management Center	TMC Signal Control	10	The center shall adjust signal timing in respond to a signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other requests for right-of-way.
LA County TCS	Traffic Management Center	TMC Signal Control	11	The center shall collect commercial vehicle data (e.g., characteristics, route, schedule) for intermodal freight events.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Signal Control	12	The center shall adjust signal timing in respond to traffic and environmental parameters at each intersection in real time and adapts so that the traffic network is optimized using available green time to serve the actual traffic demands while minimizing the environmental impact.
LA County TCS	Traffic Management Center	TMC Signal Control	13	The center shall process collected traffic and environmental data from sensors and connected vehicles.
LA County TCS	Traffic Management Center	TMC Signal Control	14	The center shall support requests from emergency management centers to provide responding emergency vehicles with signal preemption.
LA County TCS	Traffic Management Center	TMC Situation Data Management	1	The center shall collect traffic probe data from vehicles via roadside field equipment.
LA County TCS	Traffic Management Center	TMC Situation Data Management	2	The center shall collect road condition data from probe-equipped transit vehicles via transit management centers; the data may be aggregated and preliminarily processed at the sending center.
LA County TCS	Traffic Management Center	TMC Situation Data Management	3	The center shall collect traffic data from traveler information centers based on data from their subscriber vehicles; the data may be aggregated and initial link time calculations performed at the sending center.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Situation Data Management	4	The center shall collect probe data from payment administrative centers containing travel times between toll collection points for those vehicles equipped for electronic toll collection; the data may be aggregated and processed at the sending center.
LA County TCS	Traffic Management Center	TMC Situation Data Management	5	The center shall collect operational status for the roadside probe data collection equipment.
LA County TCS	Traffic Management Center	TMC Situation Data Management	6	The center shall collect fault data for the roadside probe data collection equipment for repair.
LA County TCS	Traffic Management Center	TMC Speed Warning	1	The center shall provide the capability to notify an enforcement agency when vehicle speeds in the work zone are in excess of the posted speed limit or are creating an unsafe condition based upon the current environmental or traffic conditions.
LA County TCS	Traffic Management Center	TMC Speed Warning	2	The center shall provide the capability to control automated speed monitoring and speed warning systems.
LA County TCS	Traffic Management Center	TMC Speed Warning	3	The center shall monitor reduced speed zone warning field equipment.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Speed Warning	4	The center shall control reduced speed zone warning roadside equipment, providing the location and extent of the reduced speed zone, the posted speed limit(s) with information about the applicability of the speed limit(s) (e.g., time of day, day of week, seasonality, relevant vehicle types) and information about associated road configuration changes including lane merges and shifts.
LA County TCS	Traffic Management Center	TMC Standard Rail Crossing Management	1	The center shall collect highway-rail intersection (HRI) equipment operational status including both the current state or mode of operation and the current equipment condition.
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	1	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers.
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	2	The center shall remotely control driver information systems that communicate directly from a center to the vehicle radio (such as Highway Advisory Radios) for dissemination of traffic and other information to drivers.
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	3	The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.).
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	4	The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	5	The center shall retrieve locally stored traffic information, including current and forecasted traffic information, road and weather conditions, traffic incident information, information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements), and the definition of the road network itself.
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	6	The center shall distribute traffic data to maintenance and construction centers, transit centers, emergency management centers, parking facilities, and traveler information providers.
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	7	The center shall distribute traffic data to the media.
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	8	The center shall provide the capability for center personnel to control the nature of the data that is available to non-traffic operations centers and the media.
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	9	The center shall collect current lane configurations status for the driver information systems equipment (DMS, HAR, etc.).
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	10	The center shall provide traffic information in both data stream and graphical display.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	11	The center shall provide drivers low emission zone restriction or fees information.
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	12	The center shall receive alert notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public from emergency management.
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	13	The center shall coordinate with emission management to establish low emission zone parameters based on air quality and transportation need.
LA County TCS	Traffic Management Center	TMC Traffic Information Dissemination	14	Traffic management shall provide operators information on the state of transportation system operations within the low emissions zone.
LA County TCS	Traffic Management Center	TMC Work Zone Traffic Management	1	The center shall receive work zone images from a maintenance center.
LA County TCS	Traffic Management Center	TMC Work Zone Traffic Management	2	The center shall analyze work zone images for indications of a possible incident.
LA County TCS	Traffic Management Center	TMC Work Zone Traffic Management	3	The center shall remotely control driver information systems (such as dynamic messages signs, highway advisory radios) to advise drivers of activity around a work zone.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LA County TCS	Traffic Management Center	TMC Work Zone Traffic Management	4	The center shall collect operational status for the driver information systems equipment in work zones.
LA County TCS	Traffic Management Center	TMC Work Zone Traffic Management	5	The center shall collect fault data for the driver information systems equipment in work zones for repair.
LA County TCS	Traffic Management Center	TMC Work Zone Traffic Management	6	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible incident, and provide work plan feedback to the sending center.
LA County TCS	Traffic Management Center	TMC Work Zone Traffic Management	7	The center shall receive temporary facility restrictions that are imposed during maintenance and construction.
LARTMC	Archived Data System	Archive Data Repository	1	The center shall collect data from centers.
LARTMC	Archived Data System	Archive Data Repository	2	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).
LARTMC	Archived Data System	Archive Data Repository	3	The center shall store collected data in an information repository.
LARTMC	Archived Data System	Archive Data Repository	4	The center shall perform quality checks on collected data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Archived Data System	Archive Data Repository	5	The center shall notify the system operator of errors related to data collection, analysis and archival.
LARTMC	Archived Data System	Archive Data Repository	6	The center shall include capabilities for archive to archive coordination.
LARTMC	Archived Data System	Archive Data Repository	7	The center shall provide the capability to execute methods on the incoming data such as cleansing, summarizations, aggregations, or transformations applied to the data before it is stored in the archive.
LARTMC	Archived Data System	Archive Data Repository	8	The center shall collect data from data distribution systems and other data sources.
LARTMC	Archived Data System	Archive Data Repository	9	The center shall respond to requests from the administrator interface function to manage center-sourced data collection.
LARTMC	Archived Data System	Archive Data Repository	10	The center shall respond to requests from the administrator interface function to manage the archive data.
LARTMC	Archived Data System	Archive Data Repository	11	The center shall respond to requests for archive data from archive data users (centers, field devices).
LARTMC	Archived Data System	Archive Data Repository	12	The center shall provide a mechanism for archive data users to request archive data by meta-data range.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Archived Data System	Archive Data Repository	13	The center shall associate meta-data with archived data, including catalog data, statistical products determined from method execution and data longevity.
LARTMC	Archived Data System	Archive Government Reporting	1	The center shall provide archive data to federal, state, and local government reporting systems.
LARTMC	Archived Data System	Archive Government Reporting	2	The center shall respond to requests for government report data.
LARTMC	Archived Data System	Archive Government Reporting	3	The center shall provide the capability to format data suitable for input into government reports.
LARTMC	Archived Data System	Archive Government Reporting	4	The center shall provide the applicable meta-data for any ITS archived data to satisfy government reporting system requests. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.
LARTMC	Archived Data System	Archive On-Line Analysis and Mining	1	The center shall respond to requests for archive data from center users.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Archived Data System	Archive On-Line Analysis and Mining	2	The center shall provide the capability to perform activities such as data mining, data fusion, summarizations, aggregations, and recreation from archive data. This may include multidimensional analysis, selective summarization and expansion of data details, and many other advanced analysis services.
LARTMC	Archived Data System	Archive On-Line Analysis and Mining	3	The center shall collect regional data from data distribution centers.
LARTMC	Archived Data System	Archive On-Line Analysis and Mining	4	The center shall respond to users systems requests for a catalog of the archived data analysis products available.
LARTMC	Archived Data System	Archive On-Line Analysis and Mining	5	The center shall be capable of processing vehicle probe data into transportation network performance measures.
LARTMC	Archived Data System	Archive On-Line Analysis and Mining	6	The center shall be capable of processing vehicle probe data to support infrastructure conditions monitoring performed by Archived Data User Systems including maintenance and construction management centers.
LARTMC	Archived Data System	Archive On-Line Analysis and Mining	7	The center shall be capable of processing vehicle probe data to determine roadway environmental conditions for non operational uses such as maintenance planning and research.
LARTMC	Archived Data System	Archive Situation Data Archival	1	The center shall collect data from roadside devices.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Archived Data System	Archive Situation Data Archival	2	The center shall respond to requests from the administrator interface function to manage field-sourced data collection.
LARTMC	Archived Data System	Archive Situation Data Archival	3	The center shall provide the capability to adjust the collection of field-sourced data based on the statistical measures.
LARTMC	Archived Data System	Archive Situation Data Archival	4	The center shall collect vehicle traffic probe data for performance monitoring and analysis.
LARTMC	Archived Data System	Archive Situation Data Archival	5	The center shall be capable of archiving vehicle traffic probe data.
LARTMC	Archived Data System	Archive Situation Data Archival	6	The center shall provide the capability to execute methods on the incoming field data such as aggregation and statistical measures before the data is stored in the archive.
LARTMC	Archived Data System	Archive Situation Data Archival	7	The center shall respond to requests from the administrator interface function to select and manage data stored in the archive.
LARTMC	Center	Center Data Collection	1	The center shall collect transportation data such as traffic operational data, transit data, vehicle data, weather data, freight data, event logs, etc. and make it available for ITS Archives upon request.
LARTMC	Center	Center Data Collection	2	The center shall assign quality control metrics and meta-data to be stored along with the data. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Center	Center Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the traffic data or for the data itself.
LARTMC	Center	Center Data Collection	4	The center shall be able to produce sample products of the data available.
LARTMC	Center	Center Data Collection	5	The Center shall collect operational data from other Centers.
LARTMC	Center	Center Data Subscription Management	1	The center shall support peer-to-peer communications with other regional centers to support operational data sharing.
LARTMC	Emergency Management Center	Emergency Commercial Vehicle Response	1	The center shall receive alerts about a Commercial Vehicle or Freight Equipment breach, non-permitted security sensitive hazmat detected at the roadside, route deviation, or Commercial Vehicle Driver / Commercial Vehicle / Freight Equipment assignment mismatches which includes the location of the Commercial Vehicle and appropriate identities.
LARTMC	Emergency Management Center	Emergency Commercial Vehicle Response	2	The center shall receive emergency notification information from commercial vehicles, commercial vehicle check stations, or commercial fleet operators and present the possible incident information to the emergency system operator. This may include detection of non-permitted transport of security sensitive hazmat, hazardous cargo spills, etc.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Commercial Vehicle Response	3	The center shall receive details of the cargo being carried by commercial vehicles from their commercial fleet manager for incidents involving potential hazardous materials.
LARTMC	Emergency Management Center	Emergency Commercial Vehicle Response	4	The center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.
LARTMC	Emergency Management Center	Emergency Commercial Vehicle Response	5	The center shall provide the capability to request Fleet and Freight Management to disable a specific vehicle in their fleet.
LARTMC	Emergency Management Center	Emergency Data Collection	1	The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.
LARTMC	Emergency Management Center	Emergency Data Collection	2	The center shall assign quality control metrics and meta-data to be stored along with the data. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.
LARTMC	Emergency Management Center	Emergency Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the emergency management data or for the data itself.
LARTMC	Emergency Management Center	Emergency Data Collection	4	The center shall be able to produce sample products of the data available.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.
LARTMC	Emergency Management Center	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.
LARTMC	Emergency Management Center	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.
LARTMC	Emergency Management Center	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.
LARTMC	Emergency Management Center	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.
LARTMC	Emergency Management Center	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.
LARTMC	Emergency Management Center	Emergency Dispatch	7	The center shall receive traffic images to support dispatch of emergency vehicles.
LARTMC	Emergency Management Center	Emergency Dispatch	8	The center shall provide the capability to request remote control of traffic surveillance devices.
LARTMC	Emergency Management Center	Emergency Dispatch	9	The center shall process road and weather conditions to provide updates to responding personnel.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).
LARTMC	Emergency Management Center	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.
LARTMC	Emergency Management Center	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.
LARTMC	Emergency Management Center	Emergency Early Warning System	4	The center shall receive potential incident information from social media sources to support the early warning system.
LARTMC	Emergency Management Center	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
LARTMC	Emergency Management Center	Emergency Early Warning System	7	The center shall broadcast wide-area alerts and advisories to transit management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
LARTMC	Emergency Management Center	Emergency Early Warning System	8	The center shall broadcast wide-area alerts and advisories to toll administration centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Early Warning System	9	The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
LARTMC	Emergency Management Center	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
LARTMC	Emergency Management Center	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Early Warning System	12	The center shall broadcast wide-area alerts and advisories to commercial vehicle administration centers and roadside check facilities for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
LARTMC	Emergency Management Center	Emergency Early Warning System	13	The center shall process status information from each of the centers that have been sent the wide-area alert.
LARTMC	Emergency Management Center	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.
LARTMC	Emergency Management Center	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.
LARTMC	Emergency Management Center	Emergency Environmental Monitoring	1	The center shall collect current and forecast road and weather information from weather service providers (such as the National Weather Service and value-added sector specific meteorological services).
LARTMC	Emergency Management Center	Emergency Environmental Monitoring	2	The center shall collect road network conditions data, including advisories, from traffic management and traveler information centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Environmental Monitoring	3	The center shall collect asset restrictions information from roadway maintenance operations.
LARTMC	Emergency Management Center	Emergency Environmental Monitoring	4	The center shall assimilate current and forecast road conditions and surface weather information to support incident management.
LARTMC	Emergency Management Center	Emergency Environmental Monitoring	5	The center shall provide the road and weather warning and advisories to the emergency responders.
LARTMC	Emergency Management Center	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.
LARTMC	Emergency Management Center	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.
LARTMC	Emergency Management Center	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.
LARTMC	Emergency Management Center	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.
LARTMC	Emergency Management Center	Emergency Evacuation Support	6	The center shall request resources from transit agencies as needed to support the evacuation.
LARTMC	Emergency Management Center	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.
LARTMC	Emergency Management Center	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.
LARTMC	Emergency Management Center	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.
LARTMC	Emergency Management Center	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Evacuation Support	11	The center shall submit evacuation information to toll administration centers along with requests for changes in the toll services or fee collection during an evacuation.
LARTMC	Emergency Management Center	Emergency Evacuation Support	12	The center shall retrieve information from public health systems to plan for and implement evacuations or in-place sheltering for biological, chemical, radiation, and other public health emergencies.
LARTMC	Emergency Management Center	Emergency Evacuation Support	13	The center shall make use of population and housing data to plan for and implement evacuations or in-place sheltering for biological, chemical, radiation, and other public health emergencies.
LARTMC	Emergency Management Center	Emergency Evacuation Support	14	The center shall maintain information on the population of an area in the event of an evacuation, including addresses, types of facility (residence, multi-family dwelling, commercial retail, commercial office, etc.), and special considerations (storage of flammable liquids, special needs residents).
LARTMC	Emergency Management Center	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.
LARTMC	Emergency Management Center	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.
LARTMC	Emergency Management Center	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.
LARTMC	Emergency Management Center	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.
LARTMC	Emergency Management Center	Emergency Incident Command	6	The center shall provide other agencies real-time information on the current conditions at the incident scene.
LARTMC	Emergency Management Center	Emergency Incident Command	7	The center shall collect modeling program outputs to support emergency dispatch and staging of personnel and equipment, e.g. predicted HAZMAT plumes or crash severity predictions.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Incident Command	8	The center shall collect information about freight or cargo to support emergency dispatch and staging of personnel and equipment, e.g. cargo manifest or HAZMAT information.
LARTMC	Emergency Management Center	Emergency Incident Command	9	The center shall collect medical care facility capabilities and availability, e.g., trauma level supported to support emergency dispatch and staging of personnel and equipment.
LARTMC	Emergency Management Center	Emergency Incident Command	10	The center shall collect on-scene reports to support emergency dispatch and staging of personnel and equipment.
LARTMC	Emergency Management Center	Emergency Incident Command	11	The center shall provide situational awareness information to emergency responders about an incident, both en-route and while they are on-scene.
LARTMC	Emergency Management Center	Emergency Incident Command	12	The center shall provide status of the current conditions at the incident scene to arriving responders.
LARTMC	Emergency Management Center	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.
LARTMC	Emergency Management Center	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.
LARTMC	Emergency Management Center	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.
LARTMC	Emergency Management Center	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.
LARTMC	Emergency Management Center	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.
LARTMC	Emergency Management Center	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Response Management	8	The center shall support remote control of field equipment normally under control of the traffic management center including traffic signals, dynamic message signs, gates, and barriers.
LARTMC	Emergency Management Center	Emergency Response Management	9	The center shall provide the capability to remotely control and monitor CCTV systems normally operated by a traffic management center.
LARTMC	Emergency Management Center	Emergency Response Management	10	The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations.
LARTMC	Emergency Management Center	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.
LARTMC	Emergency Management Center	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.
LARTMC	Emergency Management Center	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Response Management	14	The center shall collect information about the status of the recovery efforts for the infrastructure during disasters.
LARTMC	Emergency Management Center	Emergency Response Management	15	The center shall provide the overall status of infrastructure recovery efforts to traveler information providers and media.
LARTMC	Emergency Management Center	Emergency Response Management	16	The center shall provide the capability to communicate information about emergency situations to local population through the Emergency Telecommunications System.
LARTMC	Emergency Management Center	Emergency Response Management	17	The center shall provide the capability to identify neighborhoods and businesses that should be informed of an emergency situation based on information collected about incidents including their severity, impacted locations, and recovery schedule.
LARTMC	Emergency Management Center	Emergency Response Management	18	The center shall retrieve information from public health systems to increase preparedness for, and implement a response to biological, chemical, radiation, and other public health emergencies.
LARTMC	Emergency Management Center	Emergency Response Management	19	The center shall manage coordinated inter-agency responses to incidents at an international border.
LARTMC	Emergency Management Center	Emergency Response Management	20	The center shall receive temporary facility restrictions that are imposed during maintenance and construction.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Response Management	21	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible incident, and provide work plan feedback to the sending center.
LARTMC	Emergency Management Center	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.
LARTMC	Emergency Management Center	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.
LARTMC	Emergency Management Center	Emergency Routing	3	The center shall receive status information from care facilities to determine the appropriate facility and its location.
LARTMC	Emergency Management Center	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.
LARTMC	Emergency Management Center	Emergency Routing	5	The center shall receive current railroad schedule information for emergency vehicle route calculation.
LARTMC	Emergency Management Center	Emergency Routing	6	The center shall track current emergency vehicle location and status along with other emergency vehicle characteristics.
LARTMC	Emergency Management Center	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.
LARTMC	Emergency Management Center	Emergency Routing	9	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.
LARTMC	Emergency Management Center	Emergency Routing	10	The center shall provide the calculated route for emergency vehicles to the dispatch function.
LARTMC	Emergency Management Center	Emergency Routing	11	The center shall collect weather and maintenance activity data, e.g., which roads have been plowed to support emergency dispatch and staging of personnel and equipment.
LARTMC	Emergency Management Center	Emergency Routing	12	The center shall collect road and traffic conditions information, including current traffic conditions en route, current traffic conditions on-scene, and road weather conditions (e.g. wet, icy, snow-covered).

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Routing	13	The center shall collect road and traffic conditions information from multiple sources including: traffic management centers, probe vehicle data, including traffic data and environmental conditions, and other private traffic data sources, e.g. private distributors that integrate connected (probe) vehicle data with cellular or surveillance device inputs.
LARTMC	Emergency Management Center	Emergency Routing	14	The center shall provide routing instructions for a dispatched emergency vehicle that may reflect current network conditions and the additional routing options available to en route emergency that are not available to the general public.
LARTMC	Emergency Management Center	Emergency Routing	15	the center shall collect location and situational information about the emergency vehicles responding to or on the scene of an incident.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	1	The center shall remotely monitor and control security sensor data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	2	The center shall remotely monitor and control security sensor data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	3	The center shall remotely monitor and control security sensor data collected on-board transit vehicles. The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors. The data may be raw or pre-processed in the field.
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	4	The center shall exchange security sensor data with other emergency centers.
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	5	The center shall identify potential security threats based on collected security sensor data.
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	6	The center shall verify potential security threats by correlating security sensor data from multiple sources.
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	7	The center shall perform threat analysis based on correlations of security sensor and surveillance data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	8	The center shall exchange threat analysis data with Alerting and Advisory Systems and use that data in local threat analysis processing.
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	9	The center shall disseminate threat information to other agencies, including traffic, transit, maintenance, rail operations, and other emergency management centers.
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	10	The center shall respond to control data from center personnel regarding security sensor data collection, processing, threat detection, and threat analysis.
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	11	The center shall request activation of barriers and safeguards on request from center personnel.
LARTMC	Emergency Management Center	Emergency Secure Area Sensor Management	12	The center shall monitor maintenance status of the security sensor field equipment.
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	1	The center shall remotely monitor video images and audio surveillance data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The data may be raw or pre-processed in the field.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	2	The center shall remotely monitor video images and audio surveillance data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The data may be raw or pre-processed in the field.
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	3	The center shall remotely monitor video images and audio surveillance data collected on-board transit vehicles. The data may be raw or pre-processed in the field.
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	4	The center shall exchange surveillance data with other emergency centers.
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	5	The center shall identify potential security threats based on collected security surveillance data.
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	6	The center shall verify potential security threats by correlating security surveillance data from multiple sources.
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	7	The center shall remotely control security surveillance devices in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	8	The center shall remotely control security surveillance devices in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers).
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	9	The center shall remotely control security surveillance devices on-board transit vehicles.
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	10	The center shall match traveler video images against a database from the Alerting and Advisory Systems of known images that may represent criminals and terrorists.
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	11	The center shall exchange traveler images with other emergency management centers to support traveler image matching.
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	12	The center shall respond to control data from center personnel regarding security surveillance data collection, processing, threat detection, and image matching.
LARTMC	Emergency Management Center	Emergency Secure Area Surveillance	13	The center shall monitor maintenance status of the security sensor field equipment.
LARTMC	Maint and Constr Management Center	MCM Automated Treatment System Control	1	The center shall remotely control automated roadway treatment systems. Treatments can be in the form of fog dispersion, anti-icing chemicals, etc.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Automated Treatment System Control	2	The center shall remotely control the environmental sensors that upon detecting changes in environmental or atmospheric conditions, automatically activate roadway treatment systems.
LARTMC	Maint and Constr Management Center	MCM Automated Treatment System Control	3	The center shall collect automated roadway treatment system and associated environmental sensor operational status.
LARTMC	Maint and Constr Management Center	MCM Automated Treatment System Control	4	The center shall collect automated roadway treatment system and associated environmental sensor fault data and request repair.
LARTMC	Maint and Constr Management Center	MCM Automated Treatment System Control	5	The center shall accept requests for automated roadway treatment system activation from center personnel.
LARTMC	Maint and Constr Management Center	MCM Data Collection	1	The center shall collect maintenance and construction data (such as field equipment status, infrastructure status, maintenance and construction activity data) gathered from roadway, traffic, and other maintenance and construction sources.
LARTMC	Maint and Constr Management Center	MCM Data Collection	2	The center shall assign quality control metrics and meta-data to be stored along with the data. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the maintenance and construction data or for the data itself.
LARTMC	Maint and Constr Management Center	MCM Data Collection	4	The center shall be able to produce sample products of the data available.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Collection	1	The center shall remotely control environmental sensors that measure road surface temperature, moisture, icing, salinity, and other measures.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Collection	2	The center shall remotely control environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Collection	3	The center shall remotely control environmental sensors on-board maintenance and construction vehicles that measure road and weather conditions including air and surface temperatures, wind speed, humidity, precipitation, visibility and other measures.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Collection	4	The center shall collect environmental probe data (air temperature, exterior light status, wiper status, traction control status, etc.) from short range communications equipment that communicates with appropriately equipped probe vehicles.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Environmental Information Collection	5	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services), data from traffic and traveler information providers, and environmental data collected from sensors deployed on and about the roadway as well as the fleet of maintenance and construction vehicles and the broader population of vehicle probes.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Collection	6	The center shall provide weather and road condition information to weather service providers and center personnel.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Collection	7	The center shall respond to control data from center personnel regarding environmental sensor control and weather data collection and processing.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Collection	8	The center shall collect operational status for the roadside and vehicle-based environmental sensor equipment.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Environmental Information Collection	9	The center shall collect fault data for the roadside and vehicle-based environmental sensor equipment for repair.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Collection	10	The center shall collect environmental data from sensors that measure road surface temperature, moisture, icing, salinity, and other measures.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Collection	11	The center shall provide weather and road condition information to traffic management operations.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Processing	1	The center shall respond to control data from center personnel regarding environmental sensor control and weather data collection and processing.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Processing	2	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services) and local environmental sensor data.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Processing	3	The center shall use the various data inputs of environmental sensors and road weather data to develop a view of current and predicted road weather and road conditions.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Environmental Information Processing	4	The center shall disseminate current and forecasted road weather and road condition information to weather service providers (such as the National Weather Service and value-added sector specific meteorological services) as well as other agencies including traffic, emergency, and transit management, traveler information providers, rail operations centers, media, and other maintenance management centers.
LARTMC	Maint and Constr Management Center	MCM Environmental Information Processing	5	The center shall provide value-added sector specific meteorological services with information on basic road facility and treatment information that supports forecasts for road conditions.
LARTMC	Maint and Constr Management Center	MCM Incident Management	1	The center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.
LARTMC	Maint and Constr Management Center	MCM Incident Management	2	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, etc.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Incident Management	3	The center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.
LARTMC	Maint and Constr Management Center	MCM Incident Management	4	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.
LARTMC	Maint and Constr Management Center	MCM Incident Management	5	The center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.
LARTMC	Maint and Constr Management Center	MCM Incident Management	6	The center shall exchange road network status assessment information with emergency management and traffic management centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Incident Management	7	The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.
LARTMC	Maint and Constr Management Center	MCM Incident Management	8	The center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.
LARTMC	Maint and Constr Management Center	MCM Incident Management	9	The center shall receive evacuation information including evacuation zones, evacuation times, and reentry times from emergency operation centers.
LARTMC	Maint and Constr Management Center	MCM Maintenance Decision Support	1	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Maintenance Decision Support	2	The center shall tailor the decision support information to include filtering (selection from a large amount of external information), error reduction ('smoothing' the information), fusion (combination of disparate information to match the decision needs), and analysis (creating the decision).
LARTMC	Maint and Constr Management Center	MCM Maintenance Decision Support	3	The center shall provide an interface to the center personnel to input control parameters for the decision support process and receive decisions or information presentation.
LARTMC	Maint and Constr Management Center	MCM Maintenance Decision Support	4	The center shall provide dispatch information to maintenance and construction vehicles based on the outputs of the decision support system, including recommended roadway treatment actions.
LARTMC	Maint and Constr Management Center	MCM Reduced Speed Zone Warning	1	The center shall be capable of remotely control and monitor reduced speed zone warning roadside equipment operations.
LARTMC	Maint and Constr Management Center	MCM Reduced Speed Zone Warning	2	The center shall provide reduced speed zone posted speed limits and associated schedules and information about associated road configuration changes including lane merges and shifts for display on roadside devices.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Reduced Speed Zone Warning	3	The center shall provide to roadside equipment, for transmittal to connected vehicles, reduced speed zone posted speed limits and associated schedules and information about associated road configuration changes including lane merges and shifts.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	1	The center shall maintain an interface with asset management systems to track the inventory, restrictions, repair needs and status updates of transportation assets (pavement, bridges, signs, etc.) including location, installation and materials information, vendor/contractor, current maintenance status, standard height, width, and weight restrictions.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	2	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	3	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	4	The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	5	The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	6	The center shall collect the status and fault data from the centers that operate the equipment, including data for traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	7	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of roadway maintenance and construction activities.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	8	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	9	The center shall dispatch and route maintenance and construction vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	10	The center shall manage an interface with center personnel to accept vehicle systems control information and remotely control maintenance and construction vehicle on-board equipment.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	11	The center shall track the status of roadway maintenance and construction activities by monitoring collected data from the dispatched vehicles and equipment.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	12	The center shall report the status of field equipment maintenance activities to the centers that operate the equipment.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	13	The Center shall provide the status of field maintenance actions to other centers.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	14	The Center shall track the status of field equipment maintenance actions.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	15	The Center shall accept information from other Centers that indicates which Connected Vehicle Roadside Equipment needs maintenance.
LARTMC	Maint and Constr Management Center	MCM Roadway Maintenance	16	The Center shall accept field equipment maintenance action requests from other centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Work Activity Coordination	1	The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.
LARTMC	Maint and Constr Management Center	MCM Work Activity Coordination	2	The center shall provide status information about scheduled maintenance and construction activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, multimodal transportation providers, rail operations, and the media.
LARTMC	Maint and Constr Management Center	MCM Work Activity Coordination	3	The center shall collect and respond to feedback concerning scheduled maintenance and construction activities with other management centers such as traffic, emergency, transit, and rail operations.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Work Activity Coordination	4	The center shall collect and disseminate asset restriction information levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions, and temporary facility restrictions that are imposed during maintenance and construction.
LARTMC	Maint and Constr Management Center	MCM Work Activity Coordination	5	The Center shall provide road infrastructure restriction information to other Centers.
LARTMC	Maint and Constr Management Center	MCM Work Activity Coordination	6	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance and construction activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.
LARTMC	Maint and Constr Management Center	MCM Work Activity Coordination	7	The center shall exchange rail schedules and work plans with rail operations centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Work Zone Management	1	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.
LARTMC	Maint and Constr Management Center	MCM Work Zone Management	2	The center shall control the collection of work zone status information including video images from cameras located in or near the work zone.
LARTMC	Maint and Constr Management Center	MCM Work Zone Management	3	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media.
LARTMC	Maint and Constr Management Center	MCM Work Zone Management	4	The center shall control traffic in work zones by providing remote control of dynamic message signs, highway advisory radio systems, gates, and barriers located in or near the work zone.
LARTMC	Maint and Constr Management Center	MCM Work Zone Management	5	The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Maint and Constr Management Center	MCM Work Zone Management	6	The center shall collect real-time information on the state of the road network including current traffic and road conditions to support work zone scheduling and management.
LARTMC	Maint and Constr Management Center	MCM Work Zone Safety Management	1	The center shall provide remote monitoring and control of work zone safety devices - including intrusion detection devices that have been installed in work zones or maintenance areas.
LARTMC	Maint and Constr Management Center	MCM Work Zone Safety Management	2	The center shall provide remote monitoring and control of intrusion alert devices that have been installed in work zones or maintenance areas.
LARTMC	Maint and Constr Management Center	MCM Work Zone Safety Management	3	The center shall collect status information of work zone safety device status from field equipment or the maintenance and construction vehicles.
LARTMC	Maint and Constr Management Center	MCM Work Zone Safety Management	4	The center shall collect and store work zone data collected from work zone monitoring devices (such as intrusion detection or alert devices and speed monitoring devices) on-board the vehicle and at the roadside.
LARTMC	Traffic Management Center	TMC Advanced Rail Crossing Management	1	The center shall remotely control highway-rail intersection (HRI) equipment located in the field.
LARTMC	Traffic Management Center	TMC Advanced Rail Crossing Management	2	The center shall accept collect highway-rail intersection (HRI) advisory or alert data from rail operations centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Advanced Rail Crossing Management	3	The center shall collect highway-rail intersection (HRI) equipment operational status and compare against the control information sent by the center.
LARTMC	Traffic Management Center	TMC Advanced Rail Crossing Management	4	The center shall provide the highway-rail intersection (HRI) equipment operational status to rail operations centers.
LARTMC	Traffic Management Center	TMC Advanced Rail Crossing Management	5	The center shall collect incident information related to a highway-rail intersection (HRI), such as intersection blockages or crashes or equipment malfunctions.
LARTMC	Traffic Management Center	TMC Advanced Rail Crossing Management	6	The center shall implement control plans to coordinate signalized intersections around highway-rail intersections (HRI), under control of center personnel, based on data from sensors and surveillance monitoring traffic conditions, incidents, equipment faults, pedestrian crossings, etc.
LARTMC	Traffic Management Center	TMC Advanced Rail Crossing Management	7	The center shall accept train schedules, maintenance schedules, and any other forecast events that will result in highway-rail intersection (HRI) closures data from rail operations centers.
LARTMC	Traffic Management Center	TMC Barrier System Management	1	The center shall remotely control barrier systems for transportation facilities and infrastructure. Barrier systems include automated or remotely controlled gates, barriers and other systems that manage entry to roadways.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Barrier System Management	2	The center shall accept requests for barrier system activation from other centers and from center personnel to support emergency response and detours.
LARTMC	Traffic Management Center	TMC Barrier System Management	3	The center shall collect barrier system operational status.
LARTMC	Traffic Management Center	TMC Barrier System Management	4	The center shall collect barrier system fault data and send to the maintenance center for repair.
LARTMC	Traffic Management Center	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.
LARTMC	Traffic Management Center	TMC Basic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.
LARTMC	Traffic Management Center	TMC Basic Surveillance	3	The center shall monitor, analyze, and store multimodal crossing, high occupancy vehicle (HOV) and high occupancy toll (HOT) lane sensor data under remote control of the center.
LARTMC	Traffic Management Center	TMC Basic Surveillance	4	The center shall distribute road network conditions data (raw or processed) based on collected and analyzed traffic sensor and surveillance data to other centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Basic Surveillance	5	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution.
LARTMC	Traffic Management Center	TMC Basic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each)
LARTMC	Traffic Management Center	TMC Data Collection	1	The center shall collect traffic management data such as operational data, event logs, etc.
LARTMC	Traffic Management Center	TMC Data Collection	2	The center shall assign quality control metrics and meta-data to be stored along with the data. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.
LARTMC	Traffic Management Center	TMC Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the traffic data or for the data itself.
LARTMC	Traffic Management Center	TMC Data Collection	4	The center shall be able to produce sample products of the data available.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	1	The center shall remotely monitor and control dynamically managed travel lanes.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	2	The center shall monitor traffic conditions and demand measured per lane.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	3	The center shall receive input from Border Inspection Systems to identify existing and planned lane configurations at the border.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	4	The center shall receive input from multimodal crossings such as draw bridges to identify existing and planned lane configurations at the crossings.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	5	The center shall receive input from an Intermodal Terminal to support monitoring and anticipation of commercial vehicle traffic originating at the depot and requests for dynamic lane management in the vicinity of the depot.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	6	The center shall monitor and coordinate dynamic lane controls with adjacent jurisdictions.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	7	Based on the collected data and operator input, the center shall determine suggested and required lane control configuration changes.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	8	The center shall support temporary use of shoulders as travel lanes.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	9	The center shall activate lane management field equipment that is used to dynamically manage specific lanes and shoulders.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	10	The center shall identify lane use restrictions, prohibiting specific types of vehicles (e.g., commercial vehicles) from specific lanes.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	11	The center shall designate lanes for use by special vehicles only, such as buses, high occupancy vehicles (HOVs), or vehicles attending a special event.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	12	The center shall receive environmental information from roadway sensors and connected vehicles to identify existing and planned lane configurations long the roadway.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	13	The center shall optimize lane use restrictions for the environment.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	14	The center shall reconfigure intersections and interchanges for compatibility with the current lane configuration.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	15	The center shall notify the enforcement agency of violators of the lane controls.
LARTMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	16	The field element shall analyze collected vehicle and sensor emissions data against reference data, and determines whether or not an eco-lane should be created or decommissioned along a roadway.
LARTMC	Traffic Management Center	TMC Environmental Monitoring	1	The center shall remotely control environmental sensors that measure road surface conditions including temperature, moisture, icing, salinity, and other measures.
LARTMC	Traffic Management Center	TMC Environmental Monitoring	2	The center shall remotely control environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Environmental Monitoring	3	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services), data from roadway maintenance operations, and environmental data collected from sensors deployed on and about the roadway.
LARTMC	Traffic Management Center	TMC Environmental Monitoring	4	The center shall be able to receive road condition information from weather service providers.
LARTMC	Traffic Management Center	TMC Environmental Monitoring	5	The center shall receive aggregated and processed vehicle environmental data collected from vehicle safety and convenience systems through the connected vehicle roadside equipment.
LARTMC	Traffic Management Center	TMC Environmental Monitoring	6	The center shall be able to share the collected environmental data with Maintenance and construction operations.
LARTMC	Traffic Management Center	TMC Environmental Monitoring	7	The center shall provide drivers road weather advisories at warnings.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Evacuation Support	1	The center shall coordinate planning for evacuation with emergency management centers - including pre-planning activities such as establishing routes, areas to be evacuated, timing, etc.
LARTMC	Traffic Management Center	TMC Evacuation Support	2	The center shall support requests from emergency management centers to preempt the current traffic control strategy, activate traffic control and closure systems such as gates and barriers, activate safeguard systems, or use driver information systems to support evacuation traffic control plans.
LARTMC	Traffic Management Center	TMC Evacuation Support	3	The center shall coordinate evacuation information and controls with other traffic management centers.
LARTMC	Traffic Management Center	TMC Evacuation Support	4	The center shall coordinate execution of evacuation strategies with emergency management centers - including activities such as setting closures and detours, establishing routes, updating areas to be evacuated, timing the process, etc.
LARTMC	Traffic Management Center	TMC Evacuation Support	5	The center shall provide road network conditions and traffic images to emergency management centers, maintenance and construction centers, and traveler information service providers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Incident Detection	2	The center shall collect and store traffic flow and image data from the field equipment to detect and verify incidents.
LARTMC	Traffic Management Center	TMC Incident Detection	3	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters and traveler information service providers.
LARTMC	Traffic Management Center	TMC Incident Detection	4	The center shall exchange incident and threat information with emergency management centers as well as maintenance and construction centers; including notification of existence of incident and expected severity, location, time and nature of incident.
LARTMC	Traffic Management Center	TMC Incident Detection	5	The center shall support requests from emergency management centers and border inspection systems to remotely control sensor and surveillance equipment located in the field.
LARTMC	Traffic Management Center	TMC Incident Detection	6	The center shall provide road network conditions and traffic images to emergency management centers to support the detection, verification, and classification of incidents.
LARTMC	Traffic Management Center	TMC Incident Detection	7	The center shall provide video and traffic sensor control commands to the field equipment to detect and verify incidents.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Incident Dispatch Coordination	1	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This may also identify specific information that should not be released to the public.
LARTMC	Traffic Management Center	TMC Incident Dispatch Coordination	2	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.
LARTMC	Traffic Management Center	TMC Incident Dispatch Coordination	3	The center shall support requests from emergency management centers to remotely control sensor and surveillance equipment located in the field, provide special routing for emergency vehicles, and to provide responding emergency vehicles with signal preemption.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Incident Dispatch Coordination	4	The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information.
LARTMC	Traffic Management Center	TMC Incident Dispatch Coordination	5	The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers.
LARTMC	Traffic Management Center	TMC Incident Dispatch Coordination	6	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.
LARTMC	Traffic Management Center	TMC Incident Dispatch Coordination	7	The center shall provide road network conditions and traffic images to emergency management centers, maintenance and construction centers, and traveler information service providers.
LARTMC	Traffic Management Center	TMC Incident Dispatch Coordination	8	The center shall monitor incident response performance and calculate incident response and clearance times.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Incident Dispatch Coordination	9	The center shall exchange road network status assessment information with emergency management and maintenance centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.
LARTMC	Traffic Management Center	TMC Incident Dispatch Coordination	10	The center shall coordinate information and controls with other traffic management centers.
LARTMC	Traffic Management Center	TMC Incident Dispatch Coordination	11	The center shall receive inputs from emergency management and transit management centers to develop an overall status of the transportation system including emergency transit schedules in effect and current status and condition of the transportation infrastructure.
LARTMC	Traffic Management Center	TMC Infrastructure Restriction Warning	2	The center shall provide infrastructure restriction information, including temporary size and weight restrictions, to drivers.
LARTMC	Traffic Management Center	TMC Infrastructure Restriction Warning	3	The center shall use infrastructure measurements of vehicle characteristics to determine if a vehicle exceeds the roadway or tunnel dimensions.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Infrastructure Restriction Warning	4	The center shall use infrastructure measurements of vehicle characteristics to determine if a vehicle exceeds the roadway or tunnel dimensions.
LARTMC	Traffic Management Center	TMC Infrastructure Restriction Warning	5	The center shall provide warnings to connected vehicles if the measured height or width exceeds the dimensions for safe passage through the roadway or tunnel.
LARTMC	Traffic Management Center	TMC In-Vehicle Signing Management	1	The center shall format and output sign information such as traffic and road conditions to field equipment that supports in-vehicle signage communications.
LARTMC	Traffic Management Center	TMC In-Vehicle Signing Management	2	The center shall format and output advisory information, such as detour information, wide-area alerts, work zone intrusion information, and other special information to field equipment that supports in-vehicle signage communications.
LARTMC	Traffic Management Center	TMC In-Vehicle Signing Management	3	The center shall monitor and manage output of indicator and fixed sign information, including static sign information (e.g., stop, curve warning, guide signs, service signs, and directional signs) and dynamic information (e.g., current signal states and local conditions warnings identified by local environmental sensors) by field equipment that supports in-vehicle signage communications.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC In-Vehicle Signing Management	4	The center shall receive system operational status from field equipment that supports in-vehicle signage communications.
LARTMC	Traffic Management Center	TMC In-Vehicle Signing Management	5	The center shall receive system fault data from field equipment that supports in-vehicle signage communications.
LARTMC	Traffic Management Center	TMC In-Vehicle Signing Management	6	The center shall format and output restricted lane information to field equipment that supports in-vehicle signage communications.
LARTMC	Traffic Management Center	TMC In-Vehicle Signing Management	7	The center shall format and output low emission zone information to field equipment that supports in-vehicle signage communications.
LARTMC	Traffic Management Center	TMC Multi-Modal Coordination	1	The center shall respond to requests from transit management centers for signal priority at one or more intersections along a particular transit route.
LARTMC	Traffic Management Center	TMC Multi-Modal Coordination	2	The center shall exchange information with transit management centers including details current transit routes, the level of service on each route, and the progress of individual vehicles along their routes.
LARTMC	Traffic Management Center	TMC Multi-Modal Coordination	3	The center shall provide an integrated operations strategy for the parking facilities in the area. These strategies can include dynamic adjustments to parking fees and restrictions, and other active demand management strategies.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Passive Surveillance	1	The center shall collect time stamped vehicle identities from field equipment.
LARTMC	Traffic Management Center	TMC Passive Surveillance	2	The center shall correlate the time stamped vehicle identities in order to calculate link travel times and derive other traffic measures.
LARTMC	Traffic Management Center	TMC Regional Traffic Management	1	The center shall exchange traffic information with other traffic management centers including incident information, congestion data, traffic data, signal timing plans, and real-time signal control information.
LARTMC	Traffic Management Center	TMC Regional Traffic Management	2	The center shall exchange traffic control information with other traffic management centers to support remote monitoring and control of traffic management devices (e.g. signs, sensors, signals, cameras, etc.).
LARTMC	Traffic Management Center	TMC Restricted Lanes CV Application	1	The Center shall notify drivers and vehicles when a travel lane is a dedicated bus lane.
LARTMC	Traffic Management Center	TMC Restricted Lanes CV Application	2	The Center shall notify drivers and vehicles when a dedicated bus lane becomes an open travel lane.
LARTMC	Traffic Management Center	TMC Restricted Lanes CV Application	3	The Center shall notify a Transit Center of the status of a dynamic transit lane.
LARTMC	Traffic Management Center	TMC Restricted Lanes CV Application	4	The center shall notify enforcement when a violation of the dynamic transit lane usage is detected.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Restricted Lanes CV Application	5	The center shall provide current lane access requirements and restrictions that effects commercial vehicles.
LARTMC	Traffic Management Center	TMC Restricted Lanes CV Application	6	The center shall provide connected vehicle the location, duration, and operating parameters for lanes that are reserved for the HOV or HOT. It identifies the lane(s), the start and stop locations, start and end times, vehicle restrictions, and vehicle occupancy.
LARTMC	Traffic Management Center	TMC Restricted Lanes CV Application	7	The center shall report enforcement agency of detected HOV or HOT lane entry violations. This notification identifies the vehicle and documents the lane parameter that was violated.
LARTMC	Traffic Management Center	TMC Restricted Lanes CV Application	8	The center shall report operators status information of the HOV or HOT lanes including start and stop locations, start and end times, vehicle restrictions, and vehicle occupancy.
LARTMC	Traffic Management Center	TMC Restricted Lanes CV Application	9	The center shall provide current lane access requirements and restrictions to roadside equipment to provide to connected vehicles.
LARTMC	Traffic Management Center	TMC Restricted Lanes CV Application	10	The center shall provide current lane access requirements and restrictions to roadside equipment to provide directly to drivers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Road Weather Advisories and Warnings	1	The center shall collect environmental data (air temperature, exterior light status, wiper status, traction control status, etc.) from appropriately equipped vehicles using short range communications equipment.
LARTMC	Traffic Management Center	TMC Road Weather Advisories and Warnings	2	The center shall aggregate collected environmental data and disseminate the aggregated environmental probe data to other centers.
LARTMC	Traffic Management Center	TMC Road Weather Advisories and Warnings	3	The center shall develop short term weather warnings or advisories that can be provided to individual motorists through field equipment.
LARTMC	Traffic Management Center	TMC Roadway Equipment Monitoring	1	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.
LARTMC	Traffic Management Center	TMC Roadway Equipment Monitoring	2	The center shall collect and store CCTV surveillance system (traffic, pedestrian) operational status.
LARTMC	Traffic Management Center	TMC Roadway Equipment Monitoring	3	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.
LARTMC	Traffic Management Center	TMC Roadway Equipment Monitoring	4	The center shall collect and store CCTV surveillance system (traffic, pedestrian) fault data send to the maintenance center for repair.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Roadway Equipment Monitoring	5	The center shall collect environmental sensor operational status.
LARTMC	Traffic Management Center	TMC Roadway Equipment Monitoring	6	The center shall collect environmental sensor equipment fault data and send to the maintenance center for repair.
LARTMC	Traffic Management Center	TMC Roadway Equipment Monitoring	7	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.
LARTMC	Traffic Management Center	TMC Safeguard System Management	1	The center shall remotely control safeguard systems, equipment used to mitigate the impact of incidents on transportation infrastructure (e.g., blast shields, tunnel exhaust systems, etc.)
LARTMC	Traffic Management Center	TMC Safeguard System Management	2	The center shall accept requests for safeguard system activation from other centers and from center personnel to support emergency response.
LARTMC	Traffic Management Center	TMC Safeguard System Management	3	The center shall collect safeguard system operational status.
LARTMC	Traffic Management Center	TMC Safeguard System Management	4	The center shall collect safeguard system fault data and send to the maintenance center for repair.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Service Patrol Management	1	The center shall dispatch roadway service patrol vehicles to identified incident locations.
LARTMC	Traffic Management Center	TMC Service Patrol Management	2	The center shall store the current status of all service patrol vehicles available for dispatch and those that have been dispatched.
LARTMC	Traffic Management Center	TMC Service Patrol Management	3	The center shall share incident information collected by the service patrol with traffic, maintenance and construction, and traveler information centers for incident management, incident notification to travelers, and incident cleanup.
LARTMC	Traffic Management Center	TMC Service Patrol Management	4	The center shall track the location and status of service patrol vehicles.
LARTMC	Traffic Management Center	TMC Signal Control	1	The center shall remotely control traffic signal controllers.
LARTMC	Traffic Management Center	TMC Signal Control	2	The center shall accept notifications of pedestrian calls.
LARTMC	Traffic Management Center	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.
LARTMC	Traffic Management Center	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Signal Control	5	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.
LARTMC	Traffic Management Center	TMC Signal Control	6	The center shall implement control plans to coordinate signalized intersections based on data from sensors.
LARTMC	Traffic Management Center	TMC Signal Control	7	The center shall manage boundaries of the control sections used within the signal system.
LARTMC	Traffic Management Center	TMC Signal Control	8	The center shall maintain traffic signal coordination including synchronizing clocks throughout the system.
LARTMC	Traffic Management Center	TMC Signal Control	9	The center shall implement control plans to coordinate signalized intersections based on data from sensors and connected vehicles.
LARTMC	Traffic Management Center	TMC Signal Control	10	The center shall adjust signal timing in respond to a signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other requests for right-of-way.
LARTMC	Traffic Management Center	TMC Signal Control	11	The center shall collect commercial vehicle data (e.g., characteristics, route, schedule) for intermodal freight events.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Signal Control	12	The center shall adjust signal timing in respond to traffic and environmental parameters at each intersection in real time and adapts so that the traffic network is optimized using available green time to serve the actual traffic demands while minimizing the environmental impact.
LARTMC	Traffic Management Center	TMC Signal Control	13	The center shall process collected traffic and environmental data from sensors and connected vehicles.
LARTMC	Traffic Management Center	TMC Signal Control	14	The center shall support requests from emergency management centers to provide responding emergency vehicles with signal preemption.
LARTMC	Traffic Management Center	TMC Situation Data Management	1	The center shall collect traffic probe data from vehicles via roadside field equipment.
LARTMC	Traffic Management Center	TMC Situation Data Management	2	The center shall collect road condition data from probe-equipped transit vehicles via transit management centers; the data may be aggregated and preliminarily processed at the sending center.
LARTMC	Traffic Management Center	TMC Situation Data Management	3	The center shall collect traffic data from traveler information centers based on data from their subscriber vehicles; the data may be aggregated and initial link time calculations performed at the sending center.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Situation Data Management	4	The center shall collect probe data from payment administrative centers containing travel times between toll collection points for those vehicles equipped for electronic toll collection; the data may be aggregated and processed at the sending center.
LARTMC	Traffic Management Center	TMC Situation Data Management	5	The center shall collect operational status for the roadside probe data collection equipment.
LARTMC	Traffic Management Center	TMC Situation Data Management	6	The center shall collect fault data for the roadside probe data collection equipment for repair.
LARTMC	Traffic Management Center	TMC Speed Warning	1	The center shall provide the capability to notify an enforcement agency when vehicle speeds in the work zone are in excess of the posted speed limit or are creating an unsafe condition based upon the current environmental or traffic conditions.
LARTMC	Traffic Management Center	TMC Speed Warning	2	The center shall provide the capability to control automated speed monitoring and speed warning systems.
LARTMC	Traffic Management Center	TMC Speed Warning	3	The center shall monitor reduced speed zone warning field equipment.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Speed Warning	4	The center shall control reduced speed zone warning roadside equipment, providing the location and extent of the reduced speed zone, the posted speed limit(s) with information about the applicability of the speed limit(s) (e.g., time of day, day of week, seasonality, relevant vehicle types) and information about associated road configuration changes including lane merges and shifts.
LARTMC	Traffic Management Center	TMC Standard Rail Crossing Management	1	The center shall collect highway-rail intersection (HRI) equipment operational status including both the current state or mode of operation and the current equipment condition.
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	1	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers.
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	2	The center shall remotely control driver information systems that communicate directly from a center to the vehicle radio (such as Highway Advisory Radios) for dissemination of traffic and other information to drivers.
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	3	The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.).
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	4	The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	5	The center shall retrieve locally stored traffic information, including current and forecasted traffic information, road and weather conditions, traffic incident information, information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements), and the definition of the road network itself.
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	6	The center shall distribute traffic data to maintenance and construction centers, transit centers, emergency management centers, parking facilities, and traveler information providers.
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	7	The center shall distribute traffic data to the media.
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	8	The center shall provide the capability for center personnel to control the nature of the data that is available to non-traffic operations centers and the media.
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	10	The center shall provide traffic information in both data stream and graphical display.
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	11	The center shall provide drivers low emission zone restriction or fees information.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	12	The center shall receive alert notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public from emergency management.
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	13	The center shall coordinate with emission management to establish low emission zone parameters based on air quality and transportation need.
LARTMC	Traffic Management Center	TMC Traffic Information Dissemination	14	Traffic management shall provide operators information on the state of transportation system operations within the low emissions zone.
LARTMC	Traffic Management Center	TMC Traffic Metering	1	The center shall remotely control systems to manage use of the freeways, including ramp, interchange, and mainline metering.
LARTMC	Traffic Management Center	TMC Traffic Metering	2	The center shall collect operational status from ramp meters, interchange meters, and mainline meters and compare against the control information sent by the center.
LARTMC	Traffic Management Center	TMC Traffic Metering	3	The center shall collect fault data from ramp meters, interchange meters, and mainline meters.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Traffic Metering	4	The center shall implement control strategies, under control of center personnel, on some or all of the freeway network devices (e.g. ramp meters, interchange meters, and mainline meters), based on data from sensors monitoring traffic conditions upstream, downstream, and queue data on the approaches to the meters.
LARTMC	Traffic Management Center	TMC Traffic Metering	5	The center shall be able to, under control of center personnel, use collected environmental and vehicle emissions data to regulate the flow of traffic on ramps, interchanges, and the mainline.
LARTMC	Traffic Management Center	TMC Variable Speed Limits	1	The center shall monitor data on traffic and environmental conditions collected from sensors along the roadway.
LARTMC	Traffic Management Center	TMC Variable Speed Limits	2	Based on the measured data, the center shall calculate and set suitable speed limits by lane.
LARTMC	Traffic Management Center	TMC Variable Speed Limits	3	The center shall control field equipment that posts the current speed limits and displays additional information such as basic safety rules and current traffic information to drivers.
LARTMC	Traffic Management Center	TMC Variable Speed Limits	4	The center shall monitor the operational status of the variable speed limit equipment, including fault reports.
LARTMC	Traffic Management Center	TMC Variable Speed Limits	5	The center shall provide center personnel current system status and respond to control data from center personnel regarding variable speed limits.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
LARTMC	Traffic Management Center	TMC Variable Speed Limits	6	The center shall provide the current speed limits and additional information such as basic safety rules and current traffic information to drivers.
LARTMC	Traffic Management Center	TMC Work Zone Traffic Management	1	The center shall receive work zone images from a maintenance center.
LARTMC	Traffic Management Center	TMC Work Zone Traffic Management	2	The center shall analyze work zone images for indications of a possible incident.
LARTMC	Traffic Management Center	TMC Work Zone Traffic Management	3	The center shall remotely control driver information systems (such as dynamic messages signs, highway advisory radios) to advise drivers of activity around a work zone.
LARTMC	Traffic Management Center	TMC Work Zone Traffic Management	4	The center shall collect operational status for the driver information systems equipment in work zones.
LARTMC	Traffic Management Center	TMC Work Zone Traffic Management	5	The center shall collect fault data for the driver information systems equipment in work zones for repair.
LARTMC	Traffic Management Center	TMC Work Zone Traffic Management	6	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible incident, and provide work plan feedback to the sending center.
LARTMC	Traffic Management Center	TMC Work Zone Traffic Management	7	The center shall receive temporary facility restrictions that are imposed during maintenance and construction.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	1	The personal traveler interface shall receive traffic information from a center and present it to the traveler upon request.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	2	The personal traveler interface shall receive transit information from a center and present it to the traveler upon request.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	3	The personal traveler interface shall receive traveler services information (such as lodging, restaurants, theaters, bicycle facilities, and other tourist activities) from a center and present it to the traveler upon request.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	4	The personal traveler interface shall receive event information from a center and present it to the traveler upon request.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	5	The personal traveler interface shall receive evacuation information from a center and present it to the traveler.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	6	The personal traveler interface shall receive wide-area alerts and present it to the traveler.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	7	The personal traveler interface shall accept reservations for confirmed trip plans.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	8	The personal traveler interface shall support payment for services, such as confirmed trip plans, tolls, transit fares, parking lot charges, map updates, and advanced payment for tolls.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	9	The personal traveler interface shall provide an interface through which credit identity, stored credit value, or traveler information may be collected from a traveler card being used by a traveler with a personal device.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	10	The personal traveler interface shall base requests from the traveler on the traveler's current location or a specific location identified by the traveler, and filter the provided information accordingly.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	11	The personal traveler interface shall support traveler input in audio or manual form.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	12	The personal traveler interface shall present information to the traveler in audible or visual forms consistent with a personal device, and suitable for travelers with hearing and vision physical disabilities.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	13	The personal traveler interface shall be able to store frequently requested or used data, including the traveler's identity, home and work locations, etc.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	14	The personal traveler interface shall receive travel alerts and present them to the traveler. Relevant alerts are provided based on pre-supplied trip characteristics and preferences.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	15	The personal traveler interface shall accept personal preferences, recurring trip characteristics, and traveler alert subscription information from the traveler and send this information to a center to support customized traveler information services.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	16	The personal traveler interface shall provide an interface to establish and manage user road pricing accounts, process road pricing payments, and access road pricing reports under user control
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	17	The personal traveler interface shall receive traveler information including traffic and road conditions, advisories, incidents, payment information, transit services, parking information, weather information, and other travel-related data updates and confirmations.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	18	The personal traveler interface shall provide an interface to establish and manage user road pricing accounts, process road pricing payments, and access road pricing reports under user control.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	19	The personal traveler interface shall provide the ability for a traveler to set up and modify a user account for a regional electronic payment system.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	20	The personal traveler interface shall be able to provide payment information for road use charges.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	21	The personal traveler interface shall be able to provide payment information for use of a low emission zone.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	22	The personal traveler interface shall provide the ability for a traveler to select customized information about a disaster and evacuation routing.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	23	The personal traveler interface shall provide the ability for a traveler to select customized information on evacuation resources including self-evacuation options, anticipated pickup time and location if a transportation asset is to be deployed, destination shelter, and supporting information on what to bring.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	24	The personal traveler interface shall provide the ability for a traveler to select customized information on resources along evacuation routes based on inputs from other evacuees.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	25	The personal traveler interface shall provide the ability for a traveler to select customized information on estimated reentry date/times following a disaster.
Personal Computing Devices	Personal Information Device	Personal Local Route Guidance	1	The personal traveler interface shall provide the capability for a traveler to obtain route guidance from a specified source to a destination.
Personal Computing Devices	Personal Information Device	Personal Local Route Guidance	2	The personal traveler interface shall calculate the requested route using data obtained from a navigable map database stored in the device.
Personal Computing Devices	Personal Information Device	Personal Local Route Guidance	3	The personal traveler interface shall provide multi-modal guidance for the shortest route, within the preferences and constraints specified by the traveler.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Personal Computing Devices	Personal Information Device	Personal Local Route Guidance	4	The personal traveler interface shall present information to the traveler in audible or visual forms consistent with a personal device, and suitable for travelers with hearing and vision physical disabilities.
Personal Computing Devices	Personal Information Device	Personal Location Determination	1	The Personal device shall determine the traveler's current location. It is intended for use by traveler personal navigation and guidance systems, as well as emergency notification systems.
Personal Computing Devices	Personal Information Device	Personal Location Determination	2	The Personal device shall obtain time and position data from its local location and time data source.
Personal Computing Devices	Personal Information Device	Personal Location Determination	3	The Personal device shall make time and position data to device applications.
Personal Computing Devices	Personal Information Device	Personal Location Determination	4	The Personal device shall obtain position correction data from the Connected Vehicle Roadside Equipment.
Personal Computing Devices	Personal Information Device	Personal Location Determination	5	The Personal device shall apply position correction data to its base positional data.
Personal Computing Devices	Personal Information Device	Personal Shared Use Planning	1	The personal traveler device shall allow the traveler to make a request for a shared use transportation.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Personal Computing Devices	Personal Information Device	Personal Shared Use Planning	2	The personal traveler device shall allow the traveler to confirm a shared use transportation trip.
Personal Computing Devices	Personal Information Device	Personal Trip Planning and Route Guidance	1	The personal traveler interface shall allow a traveler to request and confirm multi-modal route guidance from a specified source to a destination.
Personal Computing Devices	Personal Information Device	Personal Trip Planning and Route Guidance	2	The personal traveler interface shall forward the request for route guidance to a traveler information center for route calculation.
Personal Computing Devices	Personal Information Device	Personal Trip Planning and Route Guidance	3	The personal traveler interface shall forward user preferences, background information, constraints, and payment information to the supplying traveler information center.
Personal Computing Devices	Personal Information Device	Personal Trip Planning and Route Guidance	4	The personal traveler interface shall present information to the traveler in audible or visual forms consistent with a personal device, and suitable for travelers with hearing and vision physical disabilities.
Personal Computing Devices	Personal Information Device	Personal Trip Planning and Route Guidance	5	The personal traveler interface shall provide the capability for a traveler to request and receive freight specific traveler information including truck routes, permit information, truck stops, inspection stations, steep grades, high-profile vehicle advisories, etc. Information provided includes freight-related road and weather conditions, parking information, and route plans.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Personal Computing Devices	Personal Information Device	Personal Trip Planning and Route Guidance	6	The personal traveler interface shall allow a traveler to send a stop request to an approaching transit vehicle.
Personal Computing Devices	Personal Information Device	Personal Trip Planning and Route Guidance	7	The personal traveler interface shall allow a traveler to request connection protection be provided as part of the traveler's trip request.
Personal Computing Devices	Personal Information Device	Personal Trip Planning and Route Guidance	8	The personal traveler interface shall provide to the traveler with updates regarding their transit trip in order to provide connection protection.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Call-Taking	1	The center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Call-Taking	2	The center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Call-Taking	3	The center shall receive emergency call information from vehicles and present the possible incident information to the emergency system operator.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Call-Taking	4	The center shall receive emergency call information from other emergency management centers, e.g. mayday service providers, and present the possible incident information to the emergency system operator.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Call-Taking	5	The center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Call-Taking	6	The center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Call-Taking	7	The center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Call-Taking	8	The center shall send a request for remote control of Closed-circuit Television (CCTV) systems from a traffic management center in order to verify the reported incident.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Call-Taking	9	The center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Call-Taking	10	The center shall update the incident information log once the emergency system operator has verified the incident.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Commercial Vehicle Response	1	The center shall receive alerts about a Commercial Vehicle or Freight Equipment breach, non-permitted security sensitive hazmat detected at the roadside, route deviation, or Commercial Vehicle Driver / Commercial Vehicle / Freight Equipment assignment mismatches which includes the location of the Commercial Vehicle and appropriate identities.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Commercial Vehicle Response	2	The center shall receive emergency notification information from commercial vehicles, commercial vehicle check stations, or commercial fleet operators and present the possible incident information to the emergency system operator. This may include detection of non-permitted transport of security sensitive hazmat, hazardous cargo spills, etc.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Commercial Vehicle Response	3	The center shall receive details of the cargo being carried by commercial vehicles from their commercial fleet manager for incidents involving potential hazardous materials.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Commercial Vehicle Response	4	The center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Commercial Vehicle Response	5	The center shall provide the capability to request Fleet and Freight Management to disable a specific vehicle in their fleet.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Dispatch	7	The center shall receive traffic images to support dispatch of emergency vehicles.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Dispatch	8	The center shall provide the capability to request remote control of traffic surveillance devices.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Dispatch	9	The center shall process road and weather conditions to provide updates to responding personnel.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	4	The center shall receive potential incident information from social media sources to support the early warning system.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	7	The center shall broadcast wide-area alerts and advisories to transit management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	8	The center shall broadcast wide-area alerts and advisories to toll administration centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	9	The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	12	The center shall broadcast wide-area alerts and advisories to commercial vehicle administration centers and roadside check facilities for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	13	The center shall process status information from each of the centers that have been sent the wide-area alert.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Environmental Monitoring	1	The center shall collect current and forecast road and weather information from weather service providers (such as the National Weather Service and value-added sector specific meteorological services).
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Environmental Monitoring	2	The center shall collect road network conditions data, including advisories, from traffic management and traveler information centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Environmental Monitoring	3	The center shall collect asset restrictions information from roadway maintenance operations.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Environmental Monitoring	4	The center shall assimilate current and forecast road conditions and surface weather information to support incident management.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Environmental Monitoring	5	The center shall provide the road and weather warning and advisories to the emergency responders.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	6	The center shall provide other agencies real-time information on the current conditions at the incident scene.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	7	The center shall collect modeling program outputs to support emergency dispatch and staging of personnel and equipment, e.g. predicted HAZMAT plumes or crash severity predictions.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	8	The center shall collect information about freight or cargo to support emergency dispatch and staging of personnel and equipment, e.g. cargo manifest or HAZMAT information.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	9	The center shall collect medical care facility capabilities and availability, e.g., trauma level supported to support emergency dispatch and staging of personnel and equipment.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	10	The center shall collect on-scene reports to support emergency dispatch and staging of personnel and equipment.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	11	The center shall provide situational awareness information to emergency responders about an incident, both en-route and while they are on-scene.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Incident Command	12	The center shall provide status of the current conditions at the incident scene to arriving responders.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	1	The center shall be able to determine that a crash or emergency situation has taken place, based on on-board sensor data collected from the vehicle.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	2	The center shall monitor subscribed vehicle data, including changes in velocity, attitude/orientation, position, and air bag status to determine when an emergency situation (crash) has happened.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	3	The center shall collect mayday messages from travelers via personal handheld devices.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	4	The center shall collect mayday messages from drivers via onboard devices.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	5	The center shall acknowledge the request for emergency assistance, whether originated by the driver, automatically by the vehicle's safety systems, or by a traveler via a personal handheld device.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	6	The center shall communicate with the mayday emergency message sender (driver) to determine the nature and severity of their situation.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	7	After the mayday becomes a verified incident, the center shall determine the appropriate response to the mayday message.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	8	The center shall determine whether the mayday message indicates an emergency that requires the attention of public safety agencies, and forward mayday emergency data to the appropriate agency as necessary.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	9	The center shall support the activation of remote controlled functions requested by a vehicle, such as requests to unlock doors.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	10	The center shall request additional emergency details from or issue commands to the vehicle's security systems or vehicle driver if needed.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	11	The center shall maintain a log of all mayday signals received from vehicles.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	12	The center shall provide all mayday data to center personnel and respond to the vehicle, driver, or traveler using the portable handheld device as directed by the personnel.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	13	The center shall determine that a collision has occurred based on changes in vehicle sensor data.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	14	The center shall determine the location of the sender when it receives a collision notification broadcast.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	15	The center shall determine the nature of the emergency from the contents of the received collision notification message.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Notification Support	16	AACN-Relay shall maintain a registry of emergency communications center (ECCs) based on factors such as coverage area (county, state, continent), types of emergencies serviced (e.g. all, hazmat, rail crossing, Brand X autos), and hours of service (days, 24 hr, etc.).
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	8	The center shall support remote control of field equipment normally under control of the traffic management center including traffic signals, dynamic message signs, gates, and barriers.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	9	The center shall provide the capability to remotely control and monitor CCTV systems normally operated by a traffic management center.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	10	The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	14	The center shall collect information about the status of the recovery efforts for the infrastructure during disasters.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	15	The center shall provide the overall status of infrastructure recovery efforts to traveler information providers and media.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	16	The center shall provide the capability to communicate information about emergency situations to local population through the Emergency Telecommunications System.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	17	The center shall provide the capability to identify neighborhoods and businesses that should be informed of an emergency situation based on information collected about incidents including their severity, impacted locations, and recovery schedule.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	18	The center shall retrieve information from public health systems to increase preparedness for, and implement a response to biological, chemical, radiation, and other public health emergencies.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	19	The center shall manage coordinated inter-agency responses to incidents at an international border.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	20	The center shall receive temporary facility restrictions that are imposed during maintenance and construction.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Response Management	21	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible incident, and provide work plan feedback to the sending center.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	3	The center shall receive status information from care facilities to determine the appropriate facility and its location.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	5	The center shall receive current railroad schedule information for emergency vehicle route calculation.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	6	The center shall track current emergency vehicle location and status along with other emergency vehicle characteristics.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	9	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	10	The center shall provide the calculated route for emergency vehicles to the dispatch function.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	11	The center shall collect weather and maintenance activity data, e.g., which roads have been plowed to support emergency dispatch and staging of personnel and equipment.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	12	The center shall collect road and traffic conditions information, including current traffic conditions en route, current traffic conditions on-scene, and road weather conditions (e.g. wet, icy, snow-covered).
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	13	The center shall collect road and traffic conditions information from multiple sources including: traffic management centers, probe vehicle data, including traffic data and environmental conditions, and other private traffic data sources, e.g. private distributors that integrate connected (probe) vehicle data with cellular or surveillance device inputs.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	14	The center shall provide routing instructions for a dispatched emergency vehicle that may reflect current network conditions and the additional routing options available to en route emergency that are not available to the general public.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Routing	15	the center shall collect location and situational information about the emergency vehicles responding to or on the scene of an incident.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Alarm Support	1	The center shall collect silent and audible alarms received from travelers in secure areas (such as transit stops, rest areas, park and ride lots, modal interchange facilities).
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Alarm Support	2	The center shall collect silent and audible alarms received from transit vehicles, originated by the traveler or the transit vehicle operator.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Alarm Support	3	After the alarm message has been received, the center shall generate an alarm acknowledgment to the sender.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Alarm Support	4	After the alarm message becomes a verified incident, the center shall determine the appropriate response.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Alarm Support	5	The center shall determine whether the alarm message indicates an emergency that requires the attention of public safety agencies, and forward alarm message data to the appropriate agency as necessary.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Alarm Support	6	The center shall forward the alarm message to center personnel and respond to the traveler or transit vehicle operator as directed by the personnel.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	1	The center shall remotely monitor and control security sensor data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	2	The center shall remotely monitor and control security sensor data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	3	The center shall remotely monitor and control security sensor data collected on-board transit vehicles. The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors. The data may be raw or pre-processed in the field.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	4	The center shall exchange security sensor data with other emergency centers.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	5	The center shall identify potential security threats based on collected security sensor data.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	6	The center shall verify potential security threats by correlating security sensor data from multiple sources.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	7	The center shall perform threat analysis based on correlations of security sensor and surveillance data.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	8	The center shall exchange threat analysis data with Alerting and Advisory Systems and use that data in local threat analysis processing.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	9	The center shall disseminate threat information to other agencies, including traffic, transit, maintenance, rail operations, and other emergency management centers.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	10	The center shall respond to control data from center personnel regarding security sensor data collection, processing, threat detection, and threat analysis.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	11	The center shall request activation of barriers and safeguards on request from center personnel.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Sensor Management	12	The center shall monitor maintenance status of the security sensor field equipment.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	1	The center shall remotely monitor video images and audio surveillance data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The data may be raw or pre-processed in the field.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	2	The center shall remotely monitor video images and audio surveillance data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The data may be raw or pre-processed in the field.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	3	The center shall remotely monitor video images and audio surveillance data collected on-board transit vehicles. The data may be raw or pre-processed in the field.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	4	The center shall exchange surveillance data with other emergency centers.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	5	The center shall identify potential security threats based on collected security surveillance data.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	6	The center shall verify potential security threats by correlating security surveillance data from multiple sources.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	7	The center shall remotely control security surveillance devices in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	8	The center shall remotely control security surveillance devices in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers).
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	9	The center shall remotely control security surveillance devices on-board transit vehicles.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	10	The center shall match traveler video images against a database from the Alerting and Advisory Systems of known images that may represent criminals and terrorists.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	11	The center shall exchange traveler images with other emergency management centers to support traveler image matching.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	12	The center shall respond to control data from center personnel regarding security surveillance data collection, processing, threat detection, and image matching.
Police and Fire Departments/911 Centers	Emergency Management Center	Emergency Secure Area Surveillance	13	The center shall monitor maintenance status of the security sensor field equipment.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	1	The center shall send data concerning enrollment of commercial vehicles for electronic clearance and tax filing to the appropriate commercial vehicle administration center. The data may include driver and vehicle identification, safety inspections/status, carrier credentials, related citations, and accident information.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	2	The center shall obtain and manage commercial vehicle routes for its fleet of vehicles, taking into account route restrictions, advance payment of tolls, HAZMAT restrictions, current traffic and road conditions, and incident information provided by traveler information systems.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	3	The center shall support an interface with a map update provider, or other appropriate data sources, through which updates of digitized map data can be obtained and used as the background for commercial vehicle fleet administration - includes commercial vehicle specific data such as route or HAZMAT restrictions.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	4	The center shall monitor the locations and progress of commercial vehicles against their planned routes and raise appropriate warnings based on route monitoring parameters.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	5	The center shall coordinate the response to security incidents and the sharing of security threat information involving commercial vehicles with other agencies including emergency management centers and alerting/advisory systems.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	6	The center shall access driver records from the appropriate commercial vehicle administration center and use the records to support pre-hiring checks for potential drivers and monitor the performance of each driver hired.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	7	The center shall monitor geographic trigger areas for wireless roadside inspection programs and distribute the trigger areas to their commercial vehicles.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	8	The center shall provide fleet status information including safety status, routing information, current vehicle information, and emergency information to commercial vehicle operators.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	9	The center shall send data to its commercial vehicles including dispatch, routing, trigger areas, and special instructions, including alerts and other advisories.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	10	The center shall collect road weather conditions data and advisories from other centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	11	The center shall coordinate intermodal load-matching information including availability of a container, container capacity, available truck, equipment, for use in load matching between peer systems.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	12	The center shall collect environmental probe data (air temperature, exterior light status, wiper status, traction control status, etc.) from appropriately equipped commercial vehicles
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	13	The center shall provide the appropriate emergency management center with information about a Commercial Vehicle or Freight Equipment breach, non-permitted security sensitive hazmat detected at the roadside, route deviation, or Commercial Vehicle Driver / Commercial Vehicle / Freight Equipment assignment mismatches which includes the location of the Commercial Vehicle and appropriate identities.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	14	The center shall provide routes to its fleet of vehicles, taking into account route restrictions, advance payment of tolls, HAZMAT restrictions, current traffic and road conditions, and incident information.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	15	The center shall use collected environmental probe data from vehicles and other centers to determine when weather conditions may affect fleet activities.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	16	The center shall provide warnings and advisories to commercial vehicle drivers concerning road conditions and weather events.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	17	The center shall maintain records of the mileage and time in service of its fleet of vehicles and freight equipment.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	18	The center shall monitor the status of its fleet, including vehicles and freight equipment, for maintenance issues or repairs that may be needed.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Administration	19	The center shall report required commercial vehicle repairs and other corrections of identified deficiencies to the appropriate commercial vehicle administration center.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Credentials and Taxes Management and Reporting	1	The center shall send data concerning enrollment and purchase of commercial vehicles credentials and tax filing to the appropriate commercial vehicle administration center.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Credentials and Taxes Management and Reporting	2	The center shall receive compliance review reports from the appropriate commercial vehicle administration centers concerning the operations of the commercial vehicle fleet, including concomitant out-of-service notifications, and carrier warnings/notifications.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Credentials and Taxes Management and Reporting	3	The center shall provide audit data to the appropriate commercial vehicle administration center to support tax audits.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Fleet Credentials and Taxes Management and Reporting	4	The center shall support an interface with a commercial vehicle driver that is acting in the role of a commercial vehicle fleet manager for the purposes of obtaining credentials, obtaining permits, filing taxes and audit data, and receiving compliance reports and status information.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	1	The center shall collect data from the commercial vehicles carrying freight or from the freight equipment itself. Data includes container, trailer, or chassis information regarding identity, type, location, brake wear data, mileage, seal number/type, door open/close status, chassis bare/covered status, tethered/untethered status, bill of lading, and sensor status.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	2	The center shall provide the interface with intermodal freight shippers to setup transportation for freight equipment. Inputs to this include information about the shipper, consignee, commodities, pick-up and drop-off locations for freight equipment. Outputs include information about the driver and commercial vehicle that will be transporting the freight.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	3	The center shall coordinate the shipment of cargo using freight equipment with intermodal freight depots. Information to be coordinated includes information regarding a freight transportation booking and the assigned driver and vehicle scheduled to transport the freight along with cargo movement logs, routing information, and cargo ID's.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	4	The center shall track the progress of freight equipment as it moves from source to destination based on inputs from the commercial vehicles, the freight equipment, intermodal freight depots, shippers, and commercial vehicle administration centers that provide border clearance status information.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	5	The center shall collect diagnostic information from freight equipment to schedule preventative and corrective maintenance.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	6	The center shall notify other security functions within the center of deviations in the movement of freight equipment from its planned route.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	7	The center shall support the submission of cargo manifest data to the appropriate government border inspection administration system.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	8	The center shall support the registration of its vehicles, drivers, and cargo for expedited border crossings with the appropriate government border inspection administration system.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	9	The center shall coordinate the response to security incidents and the sharing of security threat information involving freight equipment with other agencies including emergency management centers, intermodal freight shippers, and alerting/advisory systems.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	10	The center shall provide emergency management information about a particular hazmat load including nature of the load and unloading instructions. May also include hazmat vehicle route and route update information.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	11	The center shall collect the border crossing clearance status of commercial freight shipment scheduled to enter the U.S, from commercial vehicle administration systems.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	12	The center shall provide traveler information center information about vehicle trips including load information, location, speed, and routing.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	13	The center shall receive customized traveler information for freight users from traveler information center to indicate truck routes, permit information, truck stops, inspection stations, steep grades, high-profile vehicle advisories, etc. Information provided includes freight-related road and weather conditions, parking information, and route plans.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	14	The center shall provide traveler information centers with fleet-specific traveler information preferences including area covered by fleet/driver, types of freight managed (including special restrictions), preferred routes, and other travel preferences pertaining to trip costs or tolls.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	15	The center shall collect freight equipment location and status of the freight, container, or chassis equipment.
Port of Los Angeles Operations Center	Fleet and Freight Management Center	Freight Administration and Management	16	The center shall collect Commercial vehicle identities including licenses plate number or USDOT number, Freight Equipment (e.g., container, chassis, or trailer identification), Carrier, and Driver from commercial vehicle.
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	1	The vehicle shall provide its location with lane-level accuracy to on-board applications.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	2	The vehicle shall provide its location with road-level accuracy to on-board applications.
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	3	The vehicle shall collect road condition data from other vehicles.
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	4	The vehicle shall calculate vehicle paths in order to determine if an impending collision is detected.
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	5	The vehicle shall exchange location and motion information with roadside equipment and nearby vehicles.
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	6	The vehicle shall be able to receive warnings, informational road signs, traffic meters, and signals provided by infrastructure devices.
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	7	The vehicle shall warn the driver of an Emergency Electronic Brake Light (EEBL) Event.
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	8	The vehicle shall determine when its host Vehicle is braking in an emergency fashion and broadcast an Emergency Electronic Brake Light (EEBL) notification.
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	9	The vehicle shall determine the status of host vehicle systems including vehicle speed, heading, yaw, wheelspin, ABS, traction control, and wiper status.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	10	The vehicle shall determine if vehicle systems status indicates a potentially hazardous road condition.
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	11	The vehicle shall analyze its own applications' performance and enter fail-safe mode (a mode such that the application cannot provide information or perform actions that affect its host) when critical components fail.
Vehicles	Vehicle OBE	Vehicle Basic Safety Communication	12	The vehicle shall notify the driver when onboard components or safety applications are offline.
Vehicles	Vehicle OBE	Vehicle Basic Toll/Parking Payment	1	The vehicle shall respond to requests from toll collection equipment for credit identity, stored value card cash, etc.
Vehicles	Vehicle OBE	Vehicle Basic Toll/Parking Payment	2	The vehicle shall respond to request from parking field equipment for credit identity, stored value card cash, etc.
Vehicles	Vehicle OBE	Vehicle Basic Toll/Parking Payment	3	The vehicle shall provide an interface to the driver to make requests for advance payments of tolls, parking, and transit fares and present the status of electronic payment transactions.
Vehicles	Vehicle OBE	Vehicle Basic Toll/Parking Payment	4	The vehicle shall provide an interface with the traveler card / payment instrument carried on-board the vehicle - to exchange identity information and payment transactions.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Vehicles	Vehicle OBE	Vehicle Basic Toll/Parking Payment	5	The vehicle shall present information to the driver in audible or visual forms without impairing the driver's ability to control the vehicle in a safe manner.
Vehicles	Vehicle OBE	Vehicle Emergency Notification	1	The vehicle shall provide the capability for a driver to report an emergency and summon assistance.
Vehicles	Vehicle OBE	Vehicle Emergency Notification	2	The vehicle shall provide the capability to accept input from a driver via a panic button or some other functionally similar form of input device provided as part of the in-vehicle equipment.
Vehicles	Vehicle OBE	Vehicle Emergency Notification	3	The vehicle shall acknowledge the driver's request for emergency assistance.
Vehicles	Vehicle OBE	Vehicle Emergency Notification	4	The vehicle shall collect vehicle characteristics describing the vehicles typical and real time configuration, including damage to vehicle components.
Vehicles	Vehicle OBE	Vehicle Emergency Notification	5	The vehicle shall notify emergency responders of the characteristics and damage identified to the vehicle involved in a collision.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Vehicles	Vehicle OBE	Vehicle Emergency Notification	6	The vehicle shall provide the capability to automatically identify that a collision has occurred using equipment such as collision detection sensors with an interface to mayday type equipment that would automatically detect vehicle problems and send appropriate distress signals to the arriving public safety vehicles.
Vehicles	Vehicle OBE	Vehicle Emergency Notification	7	The vehicle shall collect vehicle operational state information from the host vehicle.
Vehicles	Vehicle OBE	Vehicle Emergency Notification	8	The vehicle shall analyze vehicle operational state information to determine if the host vehicle has been involved in a collision.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	1	The vehicle shall receive formatted traffic and travel advisories from a center and present them to the driver upon request.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	2	The vehicle shall receive travel alerts from a center and present them to the driver. Relevant alerts are provided based on pre-supplied trip characteristics and preferences.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	3	The vehicle shall receive yellow pages information (such as lodging, restaurants, theaters, and other tourist activities) from a center and present it to the driver upon request.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	4	The vehicle shall receive event information from a center and present it to the driver upon request.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	5	The vehicle shall collect vehicle data and present it to the driver (including vehicle conditions, environmental conditions, safety and position warnings, and enhanced vision images) upon request.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	6	The vehicle shall provide the capability of translating signage for presentation to the driver, including fixed signage, situational messages, or work zone intrusion messages.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	7	The vehicle shall accept reservations for yellow pages services, non-motorized transportation information and event information.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	8	The vehicle shall prioritize safety and warning messages to supersede advisory and broadcast messages.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	9	The vehicle shall base requests from the driver on the vehicle's current location, and filter the provided information accordingly.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	10	The vehicle shall accept personal preferences, recurring trip characteristics, and traveler alert subscription information from the driver and send this information to a center to support customized traveler information services.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	11	The vehicle shall support driver input in audio or manual form.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	12	The vehicle shall present information to the driver in audible or visual forms without impairing the driver's ability to control the vehicle in a safe manner.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	13	The vehicle shall receive information on evacuation resources including self-evacuation options, anticipated pickup time and location if a transportation asset is to be deployed, destination shelter, and supporting information on what to bring, estimated reentry date/time, from a center and present it to the traveler.
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	14	The vehicle shall receive wide-area alerts from the center and present it to the traveler.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Vehicles	Vehicle OBE	Vehicle Interactive Traveler Information	15	The vehicle shall receive information on available parking including available spaces with associated information about parking restrictions and location for each available space.
Vehicles	Vehicle OBE	Vehicle Location Determination	1	The vehicle shall provide the vehicle's current location to other in-vehicle functions.
Vehicles	Vehicle OBE	Vehicle Location Determination	2	The vehicle shall calculate the location from one or more data sources including positioning systems such as GPS, sensors that track vehicle movement, and maps used to determine the likely vehicle route.
Vehicles	Vehicle OBE	Vehicle Location Determination	3	The Vehicle shall obtain position correction data from the Connected Vehicle Roadside Equipment.
Vehicles	Vehicle OBE	Vehicle Location Determination	4	The Vehicle shall apply position correction data to its base positional data.
Vehicles	Vehicle OBE	Vehicle Location Determination	5	The Vehicle shall provide its location with lane-level accuracy to on-board applications.
Vehicles	Vehicle OBE	Vehicle Location Determination	6	The Vehicle shall provide its location with road-level accuracy to on-board applications.
Vehicles	Vehicle OBE	Vehicle Situation Data Monitoring	1	The Vehicle shall obtain data collection parameters from Connected Vehicle Roadside Equipment.
Vehicles	Vehicle OBE	Vehicle Situation Data Monitoring	2	The Vehicle shall collect data collection parameters from Centers.

Element Name	Physical Object Name	Functional Object	Requirement #	Requirement
Vehicles	Vehicle OBE	Vehicle Situation Data Monitoring	3	The vehicle shall provide traffic-related data including snapshots of measured speed and heading and events including starts and stops, speed changes, and other vehicle control from vehicle.
Vehicles	Vehicle OBE	Vehicle Situation Data Monitoring	4	The Vehicle shall provide data to Centers in accordance with data collection parameters provided by Centers/Connected Vehicle Roadside Equipment.
Vehicles	Vehicle OBE	Vehicle Situation Data Monitoring	5	The Vehicle shall provide data to Connected Vehicle Roadside Equipment. in accordance with data collection parameters provided by Centers/Connected Vehicle Roadside Equipment.