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August 2024

Central Mississippi ITS Architecture Plan

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

ITS Architecture Update Process 2
ITS Deployment Plan 3
Use and Maintenance of the ITS Architecture 3

1 INTRODUCTION 4

1.1 Project Overview 5
1.2 Central Mississippi Region 6
1.3 Document Overview 9

2 ITS ARCHITECTURE DEVELOPMENT PROCESS 11

2.1 Stakeholder Involvement 12
2.2 2008 Central Region ITS Architecture Plan 13
2.3 RAD-IT Architecture 13

3 ITS INVENTORY 14

3.1 Stakeholder Inventory 15
3.2 Elements 17

4 ITS NEEDS 27

4.1 Jackson 2045 Metropolitan Transportation Plan Goals and Objectives 28
4.2 Regional ITS Needs Identified 29

5 ITS ARCHITECTURE 30

5.1 ITS Service Packages 31
5.2 Architecture Interfaces 42
5.3 Functional Requirements 42
5.4 Standards 43
5.5 Operational Concepts 44
5.6 Regional Agreements 52
5.7 Phases of Implementation 54

6 ITS DEPLOYMENT PLAN 55

6.1 Deployment Plan Project Development 56
6.2 Existing ITS Deployments 56
6.3 Regionally Significant ITS Project Deployments 58

7 USE AND MAINTENANCE OF THE ITS ARCHITECTURE 72

7.1 Incorporation into Regional Planning Process 73
7.2 Process for Determining ITS Architecture Conformity 73
7.3 ITS Architecture Plan Maintenance Process 74
7.4 Procedure for Submitting ITS Architecture Changes Between Scheduled Updates 75

APPENDIX 77

APPENDIX A - STAKEHOLDER ATTENDANCE A-1

APPENDIX B - ITS SERVICE PACKAGE DEFINITIONS B-1

APPENDIX C - SYSTEM FUNCTIONAL REQUIREMENTS C-1
APPENDIX D - EXISTING REGIONAL ITS AGREEMENTS D-1
APPENDIX E - MAINTENANCE DOCUMENTATION FORM E-1

LIST OF FIGURES

Figure 1: Central Mississippi Boundary 8
Figure 2: Stakeholder Input Process 12
Figure 3: Example Service Package Diagram - JTRAN Transit Signal Priority 35
Figure 4: Top Level System Interconnect Diagram 42

LIST OF TABLES

Table 1: Participating Stakeholders 7
Table 2: Central Mississippi Stakeholder Descriptions 16
Table 3: Central Mississippi ITS Elements 18
Table 4: Central Mississippi Regional ITS Needs 29
Table 5: Central Mississippi Prioritized Service Packages 33
Table 6: Service Packages with Corresponding Agency 37
Table 7: Central Mississippi Needs and Corresponding Packages 41
Table 8: Central Mississippi Regional ITS Standards 44
Table 9: Central Mississippi Stakeholder Roles and Responsibilities 46
Table 10: Existing and Future Agreements within the Central Mississippi Region 53
Table 11: Existing ITS Deployments 57
Table 12: Central Mississippi ITS Architecture Plan Maintenance Plan 75

LIST OF ACRONYMS

ATMS	Advanced Traffic Management System
AVL	Automated Vehicle Location
CALM	Communications Access for Land Mobiles
CCTV	Closed-Circuit Television
CMPDD	Central Mississippi Planning and Development District
DM	Data Management
DMS	Dynamic Message Sign
EAS	Emergency Alert System
FHWA	Federal Highway Administration
FSSP	Freeway Safety Service Patrol
FTA	Federal Transit Administration
ITS	Intelligent Transportation System
MAP-21	Moving Ahead for Progress in the 21st Century
MPO	Metropolitan Planning Organization
OBE	On-Board Equipment
PS	Public Safety
PTSS	Portable Traffic Signal Systems
RAD-IT	Regional Architecture Development for Intelligent Transportation
RWIS	Road Weather Information System
SDO	Standards Development Organization
ST	Sustainable Travel
SU	Support
TI	Traveler Information
TM	Traffic Management
TMC	Transportation Management Center (or Traffic Management Center)
TPAS	Truck Parking Availability Systems
USDOT	United States Department of Transportation
VS	Vehicle Safety
WX	Weather

Executive Summary

Originally developed in 2008 and most recently updated in 2024, the Central Mississippi Intelligent Transportation System (ITS) Architecture Plan provides a long-range plan for the deployment, integration, and operation of ITS within the Central Mississippi Planning and Development District (CMPDD). It allows stakeholders to plan for what they want their system to look like in the long term, and it organizes the regional ITS network into smaller pieces that can be implemented over time as funding permits. Development of a regional ITS architecture encourages interoperability and resource sharing among agencies and allows for cohesive long-range planning among regional stakeholders. Completing and regularly updating the plan is also required by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) to use federal transportation funds for ITS projects in the region.

The Central Mississippi region is made up of portions of Hinds, Madison, and Rankin Counties. These boundaries correspond with the boundaries of the Metropolitan Planning Organization (MPO) that is operated by the CMPDD. The region encompasses a population of approximately 500 thousand people according to 2022 population estimates. When developing the stakeholder group, the project team coordinated with the CMPDD to invite the appropriate city, county, regional, state, and federal agencies. Stakeholders included representatives from traffic, transit, public safety, and emergency management agencies in the Central Mississippi region.

ITS Architecture Update Process

The update of the regional ITS architecture for the Central Mississippi region relied heavily on stakeholder input to ensure that the architecture reflected regional needs. Two workshops were held with stakeholders to gather input, interviews were conducted with representatives from many of the regional stakeholder agencies, and a website was developed with the draft and final documents for the Central Mississippi ITS Architecture Plan. The Jackson 2045 Metropolitan Transportation Plan was also reviewed to determine other regional needs that could be addressed through ITS.

The Regional Architecture Development for Intelligent Transportation (RAD-IT) Version 9.2 was used to develop the Central Mississippi ITS Architecture Plan. Formerly referred to as Turbo Architecture, RAD-IT is a software application that was developed by the United States Department of Transportation (USDOT) to be used as a tool for documenting and maintaining ITS architectures. Both FHWA and FTA recommend using RAD-IT software in development of regional ITS architectures.

Website and Interactive ITS Architecture

A website was developed for the Central Mississippi ITS Architecture Plan which contains electronic versions of all documents, and an interactive version of the ITS Architecture based on the RAD-IT database. The website is located at the following address:

https://cmpdd.org/transportation/plans-and-programs/intelligent-transportation-systems-its-architecture/

The 2024 update to the Central Mississippi ITS Architecture focuses primarily on building a connected region. Many of the stakeholders in the Central Mississippi region have made significant investments in

ITS and operations within their jurisdictions. However, most noted that to fully optimize operations there is additional connectivity needed between agencies to operate the regional transportation network as one integrated system. The National ITS Architecture service packages were reviewed by the stakeholders and selected based on the relevance of the functionality that the ITS service package could provide to the region. Stakeholders selected 59 separate ITS service packages for implementation in the region.

ITS Deployment Plan

The ITS Deployment Plan section of the Central Mississippi ITS Architecture Plan serves as a tool for the region to identify regional projects that should be deployed to achieve the desired functionality identified in the ITS Architecture. The ITS Deployment Plan builds on the ITS Architecture by outlining project recommendations and strategies for the region, potential stakeholders, and deployment timeframes.

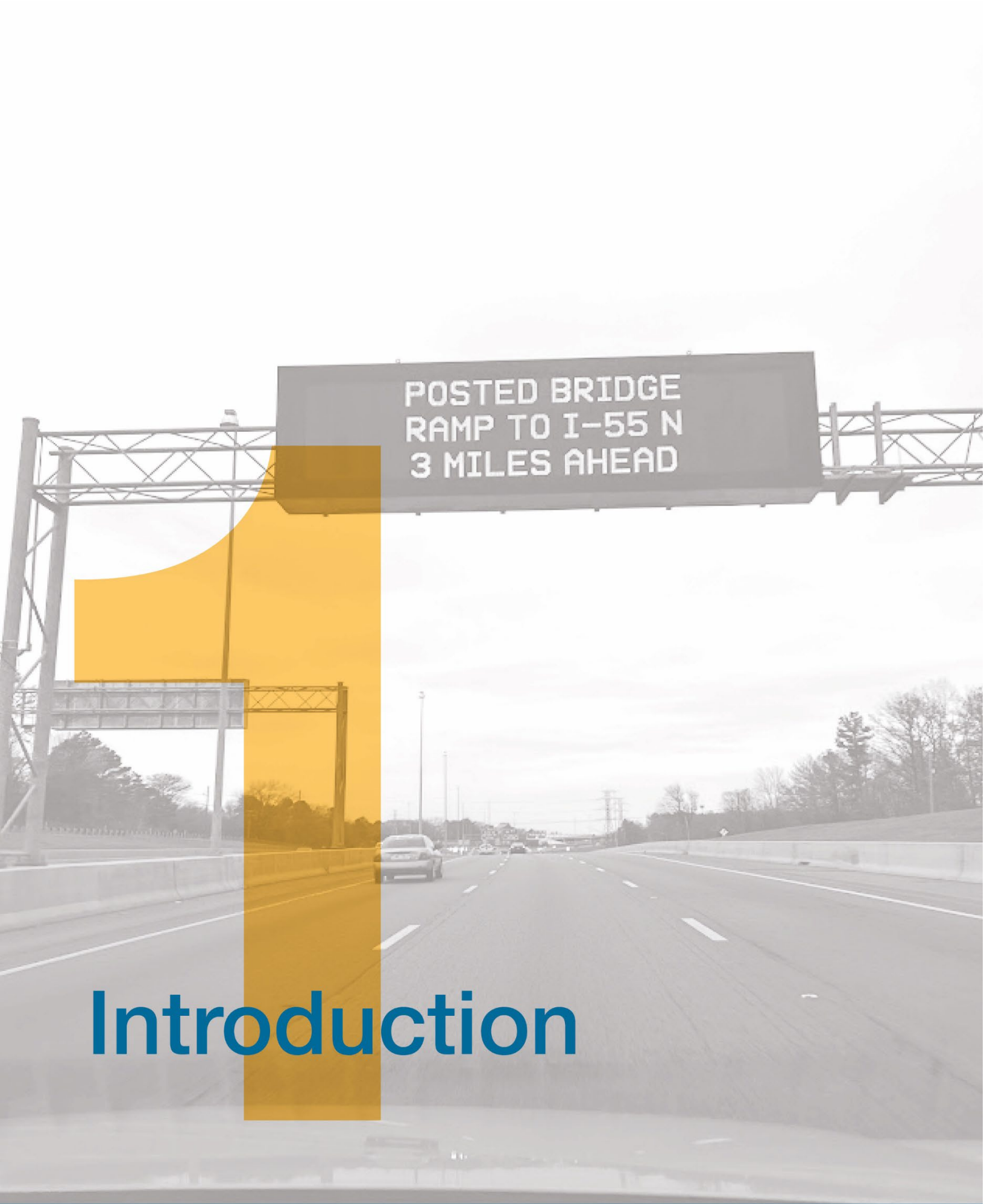
Central Mississippi stakeholders noted a strong need for the implementation of regional systems and programs to meet regional needs. Regional needs generally focused on traveler information, incident management, improved communications, and improved information sharing between agencies.

Stakeholders identified 13 regional deployment projects for ITS in the region. These 13 projects do not encompass all the regional ITS needs within the Central Mississippi region, but stakeholders recommended that emphasis be placed on implementation related to these 13 areas to provide the greatest benefit to travelers. The 13 regional deployment projects are:

- Regional Traffic Data Warehouse Implementation
- Regional Traffic Surveillance Coverage
- Regional Traffic Information Dissemination
- Regional Interagency Incident Coordination
- Regional Interagency Traffic Signal Coordination
- Regional Smart Work Zone Technologies
- Regional Maintenance and Construction Coordination
- Emergency Vehicle Preemption
- MDOT Commercial Vehicle Parking Availability
- MDOT Freeway Safety Service Patrol
- MDOT Wrong-Way Driving Systems and Alerts
- JTRAN Transit Fare Management
- JTRAN Transit Vehicle Priority

Use and Maintenance of the ITS Architecture

The Central Mississippi ITS Architecture Plan is considered a living document. Shifts in regional needs and focus, as well as changes in the National ITS Architecture, will necessitate that the Central Mississippi ITS Architecture Plan be updated periodically to remain a useful resource for the region. The update process will occur on an as needed basis as determined by CMPDD and FHWA. CMPDD will review the ITS Architecture Plan after major ITS deployments in the region and evaluate if an update is needed. CMPDD will lead the effort to maintain the ITS Architecture Plan for the three county region within the planning boundary, which is comprised of portions of Hinds, Madison, and Rankin Counties.



Introduction

INTRODUCTION

The Central Mississippi ITS Architecture Plan provides a long-range plan for the deployment, integration, and operation of ITS in Central Mississippi. The Central Mississippi ITS Architecture Plan allows stakeholders to plan for what they want their system to look like in the long term and then breaks the system into smaller projects that can be implemented over time as funding permits. Development of a regional ITS Architecture and Deployment Plan encourages interoperability and resource sharing among agencies and allows for cohesive long-range planning among regional stakeholders. Completion and update of the plan is also required by the FHWA and FTA to use federal funds for ITS projects in the region.

ITS can be defined as the application of electronic technologies and communications to improve transportation safety, mobility, and environmental sustainability. Examples of ITS technologies and systems include traffic detectors, Closed-Circuit Television (CCTV) cameras, Dynamic Message Signs (DMS), and real-time information on traffic and transit conditions.

1.1 Project Overview

ITS architecture plans are living documents and should be updated as necessary to reflect a region's needs and current guidelines. The Central Mississippi ITS Architecture Plan was first developed in 2008. Since that time, several ITS programs and projects have been implemented in the Central Mississippi region including Advanced Traffic Management System (ATMS) for freeway and traffic signal control, real-time video for traveler information, and the JTRAN Automated Vehicle Location (AVL) system. Additionally, the National ITS Architecture, which served as the basis for the Central Mississippi ITS Architecture Plan, was updated several times, with the most recent update occurring in 2024. To incorporate changes in the region and the National ITS Architecture, the CMPDD completed this update of the Central Mississippi ITS Architecture Plan in 2024.

The Central Mississippi ITS Architecture Plan consists of several key components:

- **ITS Needs** – The ITS needs describe the transportation related needs in the Central Mississippi region that could possibly be addressed by ITS.
- **ITS Inventory** – The ITS inventory describes all the ITS related elements that either exist or are planned for the region.
- **ITS Service Packages** – The ITS service packages describe the services that stakeholders in the Central Mississippi region want ITS to provide. ITS service package diagrams have been developed to illustrate how each service will be deployed and operated by each agency in the region that expressed interest in a particular service.
- **ITS Projects** – The ITS projects describe projects within the Central Mississippi region that ITS could adhere to. Projects were developed through needs identified during stakeholder outreach.
- **Use and Maintenance Plan** – The use and maintenance plan describes how to use the Central Mississippi ITS Architecture Plan for ITS planning and design efforts. It also describes how the Plan should be maintained in the future.

A regional ITS architecture is necessary to satisfy the ITS conformity requirements first established in the Transportation Equity Act for the 21st Century (TEA-21) highway bill passed in 1998 and continued in subsequent federal highway bills. In response to Section 5206(e) of TEA-21, FHWA issued a final rule and

the FTA issued a final policy in 2001 that required regions implementing any ITS project to have an ITS architecture in place. Any ITS projects must show conformance with their regional or statewide ITS architecture to be eligible for funding from FHWA or FTA. To show this conformance, it is important that the region deploying ITS have an updated regional ITS architecture in place.

The stakeholders developed the update of the Central Mississippi ITS Architecture Plan based on a vision of how they wanted to implement and operate ITS through the year 2050 in the Central Mississippi region. Additionally, the Central Mississippi ITS Architecture Plan includes an ITS Deployment Plan, which identifies projects that have been recommended by the stakeholders as priority projects for their agency that will help achieve the vision of the Central Mississippi ITS Architecture Plan.

The Central Mississippi ITS Architecture Plan was developed in close collaboration with local, state, and federal officials. To ensure comprehensive input, two stakeholder workshops were conducted, and additional feedback was gathered through individual interviews with stakeholders. Draft reports were shared with all stakeholders to ensure that the plan accurately reflected the unique needs of the region.

The Central Mississippi ITS Architecture Plan provides an overview of the existing ITS deployment and future plans in the region. However, it is important to recognize that the needs and priorities of the region may change over time. To ensure its continued effectiveness, it is recommended that the plan be periodically reviewed and updated to align with the evolving requirements of the region.

1.2 Central Mississippi Region

ITS Architecture Stakeholders

Since ITS often transcends traditional transportation infrastructure, it is important to involve a wide range of local, state, and federal stakeholders in the ITS architecture development and visioning process. Input from these stakeholders is a critical part of defining needs and overall vision for ITS in a region. In the Central Mississippi region, stakeholders that participated included not just representatives from transportation and public transit agencies, but also stakeholders that represented public safety and health.

Table 1 contains a list of stakeholders within the Central Mississippi region who participated in the project workshops or interviews to provide input to the study team as to the needs and issues that should be considered as part of the ITS Architecture Plan. A complete listing of stakeholders invited to participate in the project and workshop attendance records is included in the stakeholder database in **Appendix A.**

Table 1: Participating Stakeholders

Agency	Stakeholder	Email
City of Brandon	Matthew Miller	mmiller@benchmarkms.net
City of Clinton	Bill Owen	bowen@wgkengineers.com
City of Flowood	Paul Forster	pforster@cityofflowood.com
City of Jackson	Robert Lee	rlee@jacksonms.gov
City of Madison	Nick Brooks	nbrooks@madisonthecity.com
	Ruth Gibbons	rgibbons@madisonthecity.com
	Cole Smith	csmith@madisonthecity.com
	Gene Waldrop	gwaldrop@madisonthecity.com
City of Richland	Jake Shelby	jshelby@engservice.com
City of Ridgeland	Chris Bryson	chris.bryson@ridgelandms.org
	Alan Hart	alan.hart@ridgelandms.org
	Joe Kirchner	joe.kirchner@ridgelandms.org
	Brian Myers	brian.myers@ridgelandms.org
	Dexter Robinson	dexter.robinson@ridgelandms.org
FHWA	Necole Baker	necole.baker@dot.gov
	Kim Thurman	kim.thurman@dot.gov
Hinds County	Charles Sims	csims@co.hinds.ms.us
Hinds EMA	Joey Perkins	jperkins@co.hinds.ms.us
JTRAN	Marilyn Guice	mguice@city.jackson.ms.us
	Christine Welch	cwelch@jacksonms.gov
Madison County	Tim Bryan	tim.bryan@madison-co.com
	Latashee McLaurin	Latashee.mclaurin@madison-co.com
	Albert Jones	Albert.jones@madison-co.com
MEMA	Casey Randolph	crandolph@mema.ms.gov
	John Michael Sledge	jsledge@mema.ms.gov
MDOT	Amanda Clark	aclark@mdot.ms.gov
	Christie Levy	clevy@mdot.ms.gov
	Neil Patterson	npatterson@mdot.ms.gov
	Amrik Singh	asingh@mdot.ms.gov
	James Sullivan	jssullivan@mdot.ms.gov
	Trung Trinh	ttrinh@mdot.ms.gov
	Daniel Wilson	drwilson@mdot.ms.gov
Rankin County	Mark Faron	mfaron@rankincounty.org
	Tim Parker	tparker@engservice.com
	Brian Whittington	bwhittington@rankincounty.org

Geographic Boundaries

For the ITS Architecture Plan project, the Central Mississippi region corresponds to the Jackson MPO Boundary as shown in **Figure 1**. The region is centrally located within the state of Mississippi. The county

boundary is comprised of portions of Hinds County, Madison County, and Rankin County. Municipalities within the region include Bolton, Brandon, Byram, Canton, Clinton, Florence, Flora, Flowood, Gluckstadt, Jackson, Madison, Pearl, Pelahatchie, Raymond, Richland, Ridgeland, and Terry.

The CMPDD identified stakeholders from the appropriate city, county, regional, state, and federal agencies throughout the Central Mississippi region to guide the development of this update for the Central Mississippi ITS Architecture Plan.

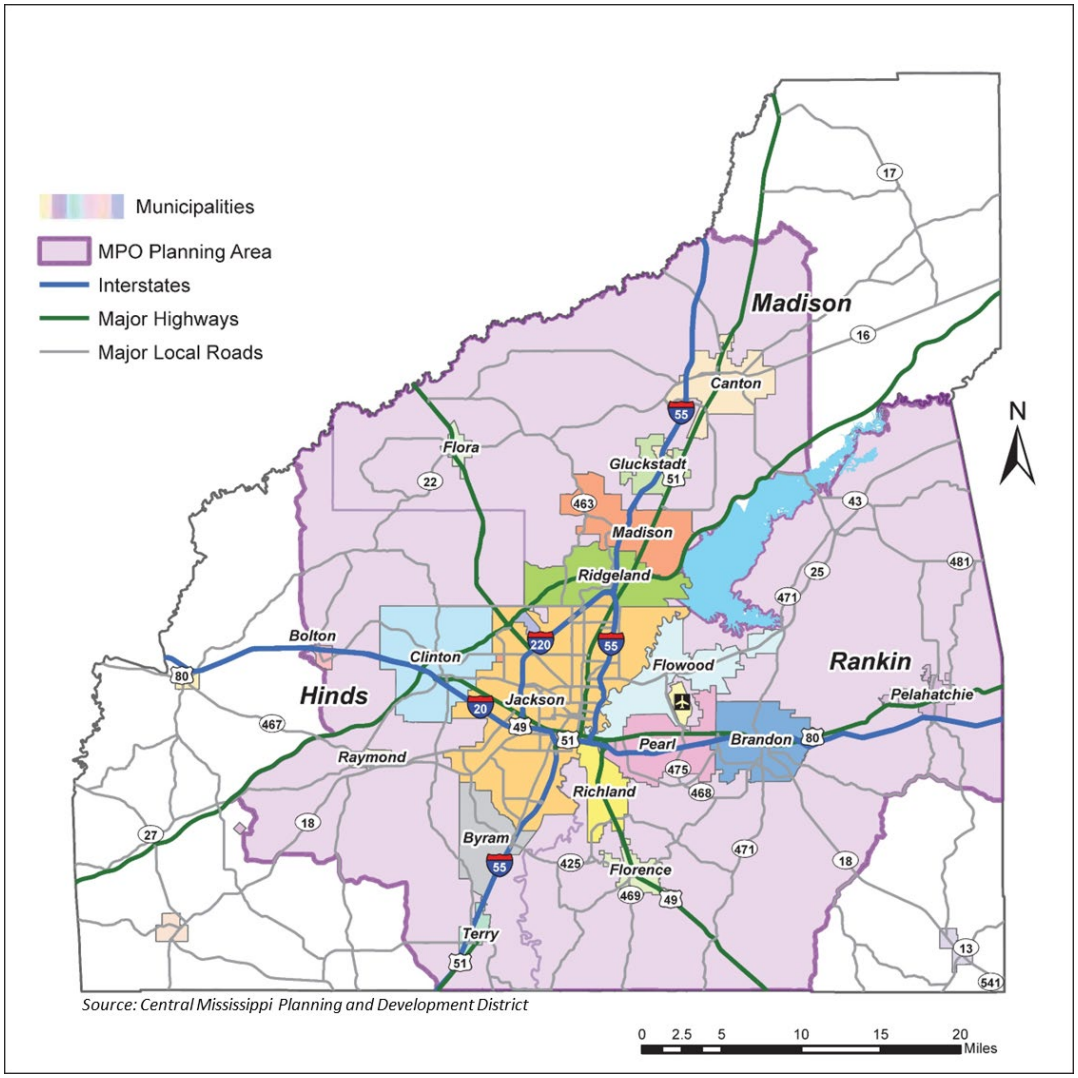


Figure 1: Central Mississippi Boundary

Transportation Infrastructure

The Central Mississippi region is served by several State and Federal Highways. The primary interstates that run through Central Mississippi are I 20 and I 55. I 20 runs east-west through the region and connects Mississippi to the states of Alabama and Louisiana. I 55, which runs north-south through Central Mississippi, connecting to Tennessee north and Louisiana south.

The Central Mississippi region has undertaken several deployments of ITS programs throughout the region. These programs are led by a variety of agencies and cover multiple transportation modes. Multi-

agency participation has been present on many of these ITS initiatives. The following are a few of the larger ITS programs underway or existing within the Central Mississippi region:

JTRAN – JTRAN has developed an extensive ITS program that includes AVL, automated passenger counters, security cameras on buses, and transit fleet monitoring for fixed route and paratransit vehicles. Additionally, JTRAN has created a website that provides trip planning, general information, and real time bus location tracking.

City of Jackson ITS –The City of Jackson has the capability to remotely monitor traffic with CCTV cameras. The City of Jackson owns and operates its own signal system.

City of Ridgeland Traffic Management – The City of Ridgeland operates a Traffic Management Center (TMC) that operates from 8 AM to 5 PM Monday through Friday. The TMC controls 45 traffic signals within the City of Ridgeland. They have the ability to remotely monitor and operate traffic signals and CCTV cameras. The City of Ridgeland has also installed signal preemption systems on signals for fire vehicles within the City.

MDOT Traffic Management – The Mississippi Department of Transportation (MDOT) operates a statewide TMC from its headquarters in the City of Jackson. MDOT owns and controls CCTV cameras, DMS, Road Weather Information Systems (RWIS), and a smartphone app to inform the public. MDOT also operates "MDOTtraffic.com" which is a website that displays live camera feeds, DMS displays, traffic conditions, road work, closures, weather sensors, and alerts to the public.

1.3 Document Overview

This report is organized to reflect the steps taken in the development of the Central Mississippi ITS Architecture Plan.

Section 1 – Introduction

This section provides an overview of the Central Mississippi ITS Architecture, including a description of the region and a list of stakeholders who participated in the development of the plan.

Section 2 – ITS Architecture Development Process

This section describes the process for developing the Central Mississippi ITS Architecture, Central Mississippi's previous version, and describes the RAD-IT software.

Section 3 – ITS Inventory

This section identifies existing and planned ITS elements within the Central Mississippi region.

Section 4 – ITS Needs

This section describes needs identified within the Central Mississippi region that were developed through stakeholder outreach.

Section 5 – ITS Architecture

This section identifies service packages that are applicable to the Central Mississippi region. The identified service packages were used to define interfaces and functional requirements that are necessary for the implementation of the customized service packages.

Section 6 – ITS Deployment Plan

This section describes the recommended projects for ITS deployment in the Central Mississippi region. Thirteen projects were identified through the development of the ITS Architecture. For each project, a description of the need, stakeholders involved, deployment components, and regional ITS architecture conformance is described.

Section 7 – Use and Maintenance of the ITS Architecture

This section describes a process for updating and maintaining the Central Mississippi ITS Architecture.

Website and Interactive ITS Architecture

A website was developed for the Central Mississippi ITS Architecture Plan which contains electronic versions of all documents, and an interactive version of the ITS Architecture based on the RAD-IT database. The website is located at the following address:

https://cmpdd.org/transportation/plans-and-programs/intelligent-transportation-systems-its-architecture/

2 ITS Architecture Development Process

ITS ARCHITECTURE DEVELOPMENT PROCESS

2.1 Stakeholder Involvement

The development of the Central Mississippi ITS Architecture Plan relied heavily on stakeholder input to ensure that the architecture reflected local needs. Two workshops were held along with a series of stakeholder interviews to gather additional input, and draft documents were made available to stakeholders for review and comment.

Stakeholder Input Process

The process followed for the Central Mississippi region was designed to ensure that stakeholders could provide input and review the update of the Central Mississippi ITS Architecture Plan. **Figure 2** illustrates the process followed.

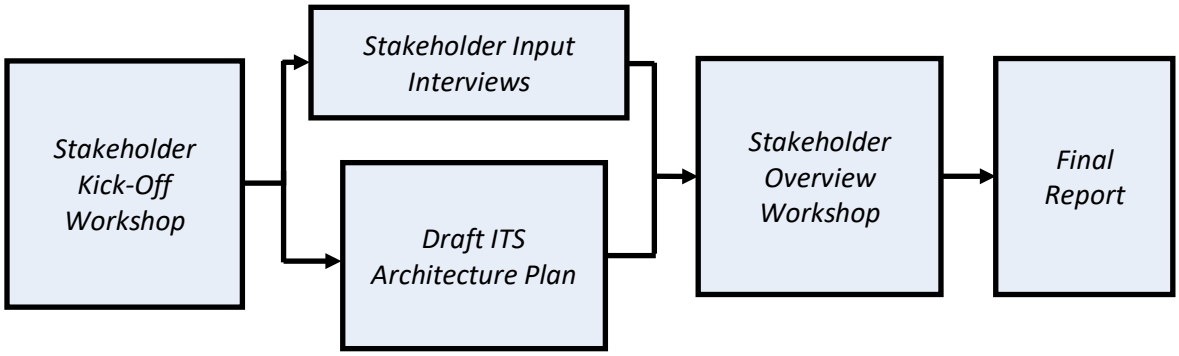


Figure 2: Stakeholder Input Process

Two workshops with stakeholders were held to update the Central Mississippi ITS Architecture Plan. These workshops included:

- Stakeholder Kick-Off Workshop – November 28, 2023
- Stakeholder Overview Workshop – May 7, 2024

In addition, interviews were conducted with many of the key stakeholder agencies that attended the workshops to gather additional information for developing the update of the Central Mississippi ITS Architecture Plan. Key components of the process are described below:

Stakeholder Kick-Off Workshop: A stakeholder group was identified that included representatives from regional transportation, public works, public safety, and emergency management agencies. The group was invited to the Stakeholder Kick-Off Workshop in November 2023 where an overview of the project was provided, the regional boundaries were defined, existing and planned ITS deployments in the Central Mississippi region were discussed, and ITS needs for the region were identified.

Stakeholder Input Interviews and System Inventory: Stakeholder input was gathered through a series of interviews that were conducted with individual stakeholder agencies in February 2024. The interviews were used to complete the system inventory for the region, define how ITS services are currently being operated, define how ITS services could be operated in the future, and identify potential ITS projects for the region.

Develop Draft ITS Architecture Plan: Following the initial stakeholder input, a draft report was developed which identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the ITS system, identifies projects for deployment, and establishes a maintenance plan.

Stakeholder Overview Workshop: A second stakeholder workshop was conducted in May 2024 to review the draft of the updated Central Mississippi ITS Architecture Plan document, as well as identify priorities for ITS service packages and confirm the list of potential ITS projects for the Central Mississippi region. Use and maintenance of the Central Mississippi ITS Architecture Plan was also discussed.

Final Report: The final document of the updated Central Mississippi ITS Architecture Plan was developed, which included an executive summary, project report, RAD-IT Architecture database, and project website with an interactive version of the Central Mississippi ITS Architecture Plan.

The corresponding website for the updated Central Mississippi ITS Architecture Plan contains electronic versions of all documents and an interactive version of the RAD-IT Architecture database. The website is located at the following address: https://cmpdd.org/transportation/plans-and-programs/intelligent-transportation-systems-its-architecture/

2.2 2008 Central Region ITS Architecture Plan

The Central Region ITS Architecture was last updated by CMPDD in 2008 and has not undergone any subsequent revisions. This 2008 plan was developed to provide a 20-year vision for ITS activities in the Central Mississippi region, encompassing both existing systems and those planned for development over the next two decades. Since the update, new ITS projects have been implemented in the Central Mississippi region, along with updates to RAD-IT software. To align with the current ITS Architecture, an updated version was necessary for these new projects. This ITS architecture update will be a living document often updated in coordination with the Regional Transportation Plan, which is scheduled to be updated in 2025.

2.3 RAD-IT Architecture

RAD-IT Version 9.2 was used to develop the Central Mississippi ITS Architecture. RAD-IT is a software application that supports development of regional and project ITS architectures using ARC-IT as a starting point. RAD-IT assists transportation planners and system integrators, both in the public and private sectors. The user interface provides support for meeting the requirements of 23 CFR 940.09 for regional ITS architectures and standards.

3 ITS Inventory

ITS INVENTORY

The stakeholder interviews and workshops provided valuable input for the development of the ITS Architecture Plan. These inputs helped customize the National ITS Architecture to create the Central Mississippi ITS Architecture Plan.

In the 2024 update, CMPDD decided to create separate elements for data management, maintenance, safety, traffic management, and emergency management for the City of Jackson and the City of Ridgeland, as they operate and maintain their own ITS systems and components. Smaller communities in the region were included in the local city elements. This documentation ensures that all communities are part of the ITS Architecture and eligible for federal funding for future ITS deployments, even if there are no immediate plans for implementation.

3.1 Stakeholder Inventory

The Central Mississippi ITS Architecture includes elements that are associated with specific stakeholder agencies**. Table 2** displays a complete list of stakeholders identified in the Central Mississippi ITS Architecture and their descriptions. Rather than individually documenting each smaller municipality in the region, a single stakeholder named Local City was created for cities that currently do not operate their own ITS systems and components.

Table 2: Central Mississippi Stakeholder Descriptions

Stakeholder Name	Stakeholder Description
Central Mississippi Planning and Development District	The MPO for the Central Mississippi regional urbanized area that provides transportation planning and technical assistance services to various agencies within the region.
City of Brandon	Municipal government for the City of Brandon. Includes traffic, public safety, and maintenance sections for the City.
City of Clinton	Municipal government for the City of Clinton. Includes traffic, public safety, and maintenance sections for the City.
City of Flowood	Municipal government for the City of Flowood. Includes traffic, public safety, and maintenance sections for the City.
City of Jackson	Municipal government for the City of Jackson. Includes traffic, public safety, and maintenance sections for the City.
City of Madison	Municipal government for the City of Madison. Includes traffic, public safety, and maintenance sections for the City.
City of Pearl	Municipal government for the City of Pearl. Includes traffic, public safety, and maintenance sections for the City.
City of Richland	Municipal government for the City of Richland. Includes traffic, public safety, and maintenance sections for the City.
City of Ridgeland	Municipal government for the City of Ridgeland. Includes traffic, public safety, and maintenance sections for the City.
Commercial Vehicle Operators	Operators of commercial vehicles.
Financial Institution	Handles exchange of money for transit electronic fare collection.
Hinds County	Represents the county offices and stakeholders of Hinds County. Includes all county departments including the Sheriff's Office and transportation services as well as the Hinds County Emergency Management Agency.
JTRAN	Public transportation system that operates in the City of Jackson.
Local City	Government for various municipalities within the region that are not specifically called out. Covers all departments including those that deal with traffic, maintenance, and public safety.
Madison County	Represents the county offices and stakeholders of Madison County. Includes all county departments including the Sheriff's Office and transportation services as well as the Madison County Emergency Management Agency.
MDOT	Mississippi Department of Transportation. Responsible for the construction, maintenance, and operation of state roads in Mississippi.
Media	Local media outlets. This can include television stations, newspapers, radio stations and their associated websites.
Mississippi Emergency Management Agency	Statewide emergency management agency. Plans and coordinates with local emergency service providers to respond to disasters and emergencies.

Stakeholder Name	Stakeholder Description
Mississippi Highway Patrol	Statewide law enforcement agency responsible for the enforcement of traffic safety laws on state and federal highways.
National Park Service	The National Park Service for Natchez Trace Parkway which runs through Central Mississippi.
Private Information Provider	Private sector business responsible for the gathering and distribution of traveler information. This service is typically provided on a subscription basis.
Public/Private Vehicles	Vehicles that travel within the Central Mississippi region.
Rail Operators	Companies that operate trains and/or are responsible for the maintenance and operations of railroad tracks.
Rankin County	Represents the county offices and stakeholders of Rankin County. Includes all county departments including the Sheriff's Office and transportation services as well as the Rankin County Emergency Management Agency.
System Users	All of the users of the transportation system.

3.2 Elements

The ITS inventory is documented in the Central Mississippi ITS Architecture Plan as elements. **Table 3** sorts the inventory by stakeholder so that each stakeholder can easily identify and review all the architecture elements associated with their agency. The table includes a description of the element and the status of the element, which is indicated as either existing or planned. In many cases, an element classified as existing might still need to be enhanced to attain the service level desired by the region.

Interactive ITS Architecture – Elements

The ITS elements included in the Central Mississippi ITS Architecture Plan can also be found in the online Interactive Architecture located at:

https://cmpdd.org/transportation/plans-and-programs/intelligent-transportation-systems-its-architecture/

To access the elements and definitions from the website, select the "Central Mississippi Interactive ITS Architecture", then select the "Inventory" page from the left sidebar, then click the desired element name. To see a list of the ITS elements sorted by the stakeholder that owns the element, select "Inventory by Stakeholder" from the left sidebar.

Table 3: Central Mississippi ITS Elements

Stakeholder	Element Name	Element Description	Status
Central Mississippi Planning and Development District	CMPDD Data Archive	ITS data warehouse for the Central Mississippi region.	Future
City of Brandon	City of Brandon CCTV Cameras	CCTV cameras owned and operated by the City of Brandon.	Future
City of Brandon	City of Brandon Fire Dispatch	Emergency dispatch functions for the City of Brandon Fire Department.	Existing
City of Brandon	City of Brandon Fire Vehicles	City of Brandon Fire Department vehicles.	Existing
City of Brandon	City of Brandon TMC	City of Brandon traffic management center that can operate city roadside equipment including traffic signal system and traffic control and management.	Future
City of Brandon	City of Brandon Traffic Signals	Traffic signal system operated by the City of Brandon.	Future
City of Brandon	City of Brandon Website	City of Brandon website used to provide information to the public.	Existing
City of Clinton	City of Clinton CCTV Cameras	CCTV cameras operated by the City of Clinton.	Future
City of Clinton	City of Clinton Fire Dispatch	Emergency dispatch functions for the City of Clinton Fire Department.	Existing
City of Clinton	City of Clinton Fire Vehicles	City of Clinton Fire Department vehicles.	Existing
City of Clinton	City of Clinton TMC	City of Clinton traffic management center that can operate city roadside equipment including traffic signal system and traffic control and management.	Future
City of Clinton	City of Clinton Traffic Signals	Traffic signal system operated by the City of Clinton.	Future
City of Clinton	City of Clinton Website	City of Clinton website used to provide information to the public.	Existing
City of Flowood	City of Flowood CCTV Cameras	CCTV cameras operated by the City of Flowood.	Future
City of Flowood	City of Flowood Fire Dispatch	Emergency dispatch functions for the City of Flowood Fire Department.	Existing
City of Flowood	City of Flowood Fire Vehicles	City of Flowood Fire Department vehicles.	Existing

Stakeholder	Element Name	Element Description	Status
City of Flowood	City of Flowood Parking Management	Parking management for surface parking, parking lots, and parking garages within the City of Flowood	Future
City of Flowood	City of Flowood Parking Management Equipment	Electronic parking payment equipment within the City of Flowood	Future
City of Flowood	City of Flowood Police Department	Police department for the City of Flowood. Non-emergency functions include the collection of crash data and enforcement of speed limits and commercial vehicles.	Existing
City of Flowood	City of Flowood TMC	City of Flowood traffic management center that can operate city roadside equipment including traffic signal system and traffic control and management.	Future
City of Flowood	City of Flowood Traffic Signals	Traffic signal system operated by the City of Flowood.	Existing
City of Flowood	City of Flowood Website	City of Flowood website used to provide information to the public.	Existing
City of Jackson	City of Jackson CCTV Cameras	CCTV cameras operated by the City of Jackson.	Existing
City of Jackson	City of Jackson Data Archive	City of Jackson TMC data archive for transportation data.	Future
City of Jackson	City of Jackson DMS	Dynamic message signs owned by the City of Jackson for traffic information dissemination.	Future
City of Jackson	City of Jackson Fire Dispatch	Emergency dispatch functions for the City of Jackson Fire Department.	Existing
City of Jackson	City of Jackson Fire Vehicles	City of Jackson Fire Department vehicles.	Existing
City of Jackson	City of Jackson Maintenance and Construction	City of Jackson maintenance and construction center.	Existing
City of Jackson	City of Jackson Parking Management	Parking management within the City of Jackson.	Existing
City of Jackson	City of Jackson Parking Management Equipment	Electronic parking payment systems within the City of Jackson.	Existing
City of Jackson	City of Jackson Police Department	Police department for the City of Jackson. Non-emergency functions include the collection of crash data and enforcement of speed limits and commercial vehicles.	Existing

Stakeholder	Element Name	Element Description	Status
City of Jackson	City of Jackson Police Vehicles	City of Jackson Police Department vehicles.	Existing
City of Jackson	City of Jackson Queue Warning	System to identify and monitor queues and provide real-time traveler information to travelers within the City of Jackson.	Future
City of Jackson	City of Jackson Rail Crossing	Standard at grade rail crossing within the City of Jackson.	Existing
City of Jackson	City of Jackson Rail Roadway Warning	Roadway equipment used to alert motorists that a crossing is currently blocked by a train within the City of Jackson.	Existing
City of Jackson	City of Jackson Signal Preemption	Signal preemption dedicated to City of Jackson emergency service providers.	Existing
City of Jackson	City of Jackson Speed Warning	City of Jackson field equipment that monitors vehicles speeds and sends a visual or other type of warning to the driver if speeds are excessive.	Future
City of Jackson	City of Jackson TMC	City of Jackson traffic management center that can operate city roadside equipment including traffic signal system and traffic control and management.	Existing
City of Jackson	City of Jackson Traffic Signals	Traffic signals operated by the City of Jackson.	Existing
City of Jackson	City of Jackson Website	City of Jackson website used to provide information to the public.	Existing
City of Jackson	City of Jackson Work Zone Intrusion Detector	Roadside equipment that detects vehicle intrusions in work zones in the City of Jackson and warns crew workers and drivers of imminent encroachment.	Future
City of Madison	City of Madison CCTV Cameras	CCTV cameras operated by the City of Madison.	Future
City of Madison	City of Madison Fire Dispatch	Emergency dispatch functions for the City of Madison Fire Department.	Existing
City of Madison	City of Madison Fire Vehicles	City of Madison Fire Department Vehicles.	Existing
City of Madison	City of Madison TMC	City of Madison traffic management center that can operate city roadside equipment including traffic signal system and traffic control and management.	Future
City of Madison	City of Madison Traffic Signals	Traffic signals operated by the City of Madison.	Future
City of Madison	City of Madison Website	City of Madison website used to provide information to the public.	Existing
City of Pearl	City of Pearl CCTV Cameras	CCTV cameras operated by the City of Pearl.	Future

Stakeholder	Element Name	Element Description	Status
City of Pearl	City of Pearl Fire Dispatch	Emergency dispatch functions for the City of Pearl Fire Department.	Existing
City of Pearl	City of Pearl Fire Vehicles	City of Pearl Fire Department vehicles.	Existing
City of Pearl	City of Pearl TMC	City of Pearl traffic management center that can operate city roadside equipment including traffic signal system and traffic control and management.	Future
City of Pearl	City of Pearl Traffic Signals	Traffic signal system operated by the City of Pearl.	Future
City of Pearl	City of Pearl Website	City of Pearl website used to provide information to the public.	Existing
City of Ridgeland	City of Ridgeland CCTV Cameras	CCTV cameras operated by the City of Ridgeland.	Existing
City of Ridgeland	City of Ridgeland Data Archive	City of Ridgeland TMC data archive for transportation data.	Existing
City of Ridgeland	City of Ridgeland DMS	Dynamic message signs owned by the City of Ridgeland for traffic information dissemination.	Future
City of Ridgeland	City of Ridgeland Fire Dispatch	Emergency dispatch functions for the City of Ridgeland Fire Department.	Existing
City of Ridgeland	City of Ridgeland Fire Vehicles	City of Ridgeland Fire Department vehicles.	Existing
City of Ridgeland	City of Ridgeland Maintenance and Construction	City of Ridgeland maintenance and construction center.	Existing
City of Ridgeland	City of Ridgeland Police Department	Police department for the City of Ridgeland. Non-emergency functions include the collection of crash data and enforcement of speed limits and commercial vehicles.	Existing
City of Ridgeland	City of Ridgeland Police Vehicles	City of Ridgeland Police Department vehicles.	Existing
City of Ridgeland	City of Ridgeland Queue Warning	System to identify and monitor queues and provide real-time traveler information to travelers within the City of Ridgeland.	Future
City of Ridgeland	City of Ridgeland Rail Crossing	Standard at grade rail crossing within the City of Ridgeland.	Existing
City of Ridgeland	City of Ridgeland Signal Preemption	Signal preemption for emergency vehicles when approaching signals within the City of Ridgeland.	Existing

Stakeholder	Element Name	Element Description	Status
City of Ridgeland	City of Ridgeland Speed Warning	City of Ridgeland field equipment that monitors vehicles speeds and sends a visual or other type of warning to the driver if speeds are excessive.	Future
City of Ridgeland	City of Ridgeland TMC	City of Ridgeland traffic management center responsible for operating the traffic signal system, closed-circuit television cameras, and dynamic message signs.	Existing
City of Ridgeland	City of Ridgeland Traffic Signals	Traffic signal system operated by the City of Ridgeland.	Existing
City of Ridgeland	City of Ridgeland Video Detection	City of Ridgeland cameras equipped with video and detection capabilities.	Existing
City of Ridgeland	City of Ridgeland Website	City of Ridgeland website used to provide information to the public.	Existing
City of Ridgeland	City of Ridgeland Work Zone Intrusion Detector	Roadside equipment that detects vehicle intrusions in work zones within the City of Ridgeland and warns crew workers and drivers of imminent encroachment.	Future
Commercial Vehicle Operators	Commercial Vehicles	Privately owned commercial vehicles traveling within the region.	Existing
Hinds County	Hinds County 911	Hinds County 911 Public Safety Answering Point.	Existing
Hinds County	Hinds County Emergency Management Agency	Emergency management agency for Hinds County. Responsible for coordination of local resources during a disaster or large-scale event.	Existing
JTRAN	JTRAN AVL Systems	JTRAN automated vehicle location systems which provide bus tracking information.	Existing
JTRAN	JTRAN Data Archive	JTRAN data archive for transit data.	Existing
JTRAN	JTRAN Electronic Fare Payment Card	JTRAN fare card payment system.	Future
JTRAN	JTRAN Fixed Route Dispatch Center	JTRAN fixed route dispatch center.	Existing
JTRAN	JTRAN Fixed-Route Vehicles	JTRAN fixed route transit vehicles.	Existing
JTRAN	JTRAN Maintenance Facility CCTV Camera Surveillance	JTRAN closed circuit television camera surveillance at JTRAN maintenance facility.	Existing
JTRAN	JTRAN Passenger Counters	JTRAN bus passenger counter system.	Existing

Stakeholder	Element Name	Element Description	Status
JTRAN	JTRAN Trip Routing Application	JTRAN online routing application to assist travelers in developing a customized transit plan for an upcoming trip.	Existing
Local City	Local City CCTV Camera	Local city CCTV cameras operated for traffic management and monitoring of incidents.	Future
Local City	Local City DMS	Local city dynamic message signs operated for traffic information dissemination.	Future
Local City	Local City Fire Dispatch	Emergency dispatch functions for local city fire departments.	Existing
Local City	Local City Fire Vehicles	Local city fire department vehicles.	Existing
Local City	Local City Maintenance and Construction	Local city maintenance and construction management.	Existing
Local City	Local City Police Department	Local city police department.	Existing
Local City	Local City Police Vehicle	Local city police vehicles.	Existing
Local City	Local City Queue Warning	Local city system to identify and monitor queues and provide real-time traveler information to travelers.	Future
Local City	Local City Rail Crossing	Standard at grade rail crossing within local city.	Existing
Local City	Local City Signal Preemption	Local city signal preemption for emergency vehicles.	Future
Local City	Local City Speed Warning	Local city field equipment that monitors vehicles speeds and sends a visual or other type of warning to the driver if speeds are excessive.	Future
Local City	Local City TMC	Local city traffic management center that can operate city roadside equipment including traffic signal system and traffic control and management.	Future
Local City	Local City Traffic Signals	Local city traffic signal system.	Existing
Local City	Local City Website	Local cities websites used to provide information to the public.	Future
Local City	Local City Work Zone Intrusion Detector	Local city roadside equipment that detects vehicle intrusions in work zones and warns crew workers and drivers of imminent encroachment.	Future
Madison County	Madison County 911	Madison County 911 Public Safety Answering Point.	Existing
Madison County	Madison County Emergency Management Agency	Emergency management agency for Madison County. Responsible for coordination of local resources during a disaster or large-scale event.	Existing

Stakeholder	Element Name	Element Description	Status
MDOT	MDOT Active Transportation Signal Operation	MDOT system to actively monitor, manage, and maintain traffic signals on the Highway 80 corridor through the City of Jackson.	Planned
MDOT	MDOT CCTV Cameras	CCTV cameras operated by MDOT for traffic management and monitoring of incidents.	Existing
MDOT	MDOT Connected Vehicle Roadside Equipment	Connected Vehicle roadside devices that are used to receive traveler information communications.	Existing
MDOT	MDOT Construction and Maintenance	MDOT entity responsible for the oversight of construction and maintenance in District 5.	Existing
MDOT	MDOT Crash Database	MDOT's database consisting of crash data from the past.	Planned
MDOT	MDOT Data Archive	MDOT database to archive field device data.	Existing
MDOT	MDOT District 5 Operations	Office that handles most of the routine roadway maintenance and responds to incidents when services are requested by local emergency management.	Existing
MDOT	MDOT DMS	MDOT dynamic message signs for traffic information dissemination.	Existing
MDOT	MDOT Electric Vehicle Charging	MDOT maintained electric vehicle infrastructure.	Planned
MDOT	MDOT Field Sensors	MDOT roadway equipment used to detect vehicle volumes and/or speeds. This information is used in the operation of the traffic signal system.	Existing
MDOT	MDOT Freeway Safety Service Patrol Dispatch	MDOT freeway safety service patrol dispatch.	Future
MDOT	MDOT Freeway Safety Service Patrol Vehicle	MDOT freeway safety service patrol vehicles.	Future
MDOT	MDOT Maintenance Vehicles	MDOT vehicles used in maintenance operations.	Existing
MDOT	MDOT Parking Area Equipment	MDOT system for electronic monitoring of parking facilities.	Future
MDOT	MDOT Queue Warning	MDOT system to identify and monitor queues and provide real-time traveler information to travelers.	Future
MDOT	MDOT RWIS Sensors	MDOT road weather information system sensors to monitor road conditions.	Existing
MDOT	MDOT Signal Operations Center	Signal operations center located in the City of Jackson operated by MDOT. Operates and maintains traffic signals owned by MDOT	Planned
MDOT	MDOT Signal Preemption	MDOT signal preemption for emergency vehicles when approaching signals.	Future

Stakeholder	Element Name	Element Description	Status
MDOT	MDOT Speed Warning	MDOT field equipment that monitors vehicles speeds and sends a visual or other type of warning to the driver if speeds are excessive.	Future
MDOT	MDOT TMC	MDOT traffic management center for the State of Mississippi. Responsible for monitoring and operating CCTV cameras, dynamic message signs, and other ITS deployments on state roads.	Existing
MDOT	MDOT Traffic Signals	MDOT operated traffic signals.	Existing
MDOT	MDOT Truck Parking Availability Sign	MDOT truck parking availability signs that provide truck drivers with information regarding available parking spaces.	Future
MDOT	MDOT Vehicle Speed Monitoring	MDOT system to monitors vehicle speeds and provide warning to drivers through notifications.	Existing
MDOT	MDOT Work Zone Intrusion Detector	MDOT roadside equipment that detects vehicle intrusions in work zones and warns crew workers and drivers of imminent encroachment.	Future
MDOT	MDOT Wrong-way Driving Detection and Warning Equipment	MDOT electronic warning signs, field sensors, or other devices used in the operation of wrong-way vehicle detection and warning.	Planned
MDOT	MDOTtraffic.com	MDOT traffic website providing road network conditions including incident and construction information, congestion, DMS messages, and camera views.	Existing
MDOT	Mississippi 511 System	511 traveler information system central server.	Existing
Media	Media	Local media that provide traffic or incident information to the public.	Existing
Mississippi Emergency Management Agency	MEMA	Mississippi Emergency Management Agency responsible for managing emergency operations during a disaster or large-scale incident.	Existing
Mississippi Highway Patrol	MHP Commercial Vehicle Check Equipment	MHP automated vehicle identification at mainline speeds for credential checking, roadside safety inspections, and weigh-in-motion using two-way data exchange.	Existing
Mississippi Highway Patrol	MHP Dispatch	MHP dispatch center. There are several dispatch centers around the State of Mississippi.	Existing
Mississippi Highway Patrol	MHP Vehicles	MHP vehicles.	Existing
Mississippi Highway Patrol	MHP Weigh and Inspection Station	MHP operated commercial vehicle inspection station with the capability to weigh commercial vehicles and evaluate their credentials.	Existing
Rankin County	Rankin County 911	Rankin County 911 Public Safety Answering Point.	Existing

Stakeholder	Element Name	Element Description	Status
Rankin County	Rankin County Emergency Management Agency	Emergency management agency for Rankin County. Responsible for coordination of local resources during a disaster or large-scale event.	Existing
System Users	Archived Data User	Users that request information from the data archive systems.	Existing
System Users	Traveler	Users of the transportation system.	Existing
System Users	Traveler Information	Traveler information system to disseminate information to travelers. Includes third party mapping and routing companies.	Existing
System Users	Traveler Information Device	Personal devices that provide traffic information, road conditions, and transit information to travelers.	Existing
System Users	Vehicle On-Board Equipment	Vehicle On-Board Equipment (OBE) provides the vehicle-based sensory, processing, storage, and communications functions that support efficient, safe, and convenient travel.	Existing

4 ITS Needs

ITS NEEDS

During the Stakeholder Kick-Off Workshop in November 2023 and individual stakeholder agency interviews conducted in February 2024, stakeholders identified regional needs that could be addressed through ITS. Additionally, the Jackson 2045 Metropolitan Transportation Plan was reviewed to identify other potential regional needs that could be potentially addressed through ITS.

4.1 Jackson 2045 Metropolitan Transportation Plan Goals and Objectives

The Jackson 2045 Metropolitan Transportation Plan outlines five goals and objectives that support the region's vision of an integrated transportation system. This system aims to promote sustainability and resiliency, while providing safe, convenient, and efficient connections for residents, workers, and visitors. An update to the Metropolitan Transportation Plan is scheduled to be published in 2025.

1. **Improve and Expand Transportation Choices**: Improve mobility and access across the region for pedestrians and bicyclists, make public transportation a viable choice mode of transportation, support shared mobility options to put more people into fewer vehicles, and support convenient and affordable access to local and regional, rail, and water transportation.
2. **Improve Safety and Security**: Reduce motor vehicle crash fatalities and serious injuries, reduce pedestrian and bicycle crash fatalities and serious injuries, strategically enhance corridors for safety and context, support coordination among local and state stakeholders to improve enforcement of traffic regulations, transportation safety education, and emergency response, increase the redundancy and diversity of the transportation system to provide emergency alternatives for evacuation and access during disruptive man-made or natural incidents.
3. **Provide a Reliable and High Performing Transportation System**: Enhance regional connectivity, maintain the transportation infrastructure and assets in a good state of repair, improve mobility by reducing traffic congestion and delay, prepare for technological advances that will efficiently and dynamically manage roadway demand and capacity and overall systems operations.
4. **Support the Economic Vitality of the Region**: Improve the transportation system to enhance economic competitiveness and to provide access to national and global markets, use transportation improvements to provide equitable benefits across the region, use transportation improvements to support vibrant activity centers and that are consistent with local plans for growth and economic development, improve the mobility of freight by truck, rail, and other modes, support a fiscally constrained 25-year Metropolitan Transportation Plan that addresses existing and future needs while maximizing projected revenues.
5. **Manage the Relationship of Transportation, Community, and Environment**: Make the transportation system resilient, especially to effectively manage and mitigate stormwater runoff, minimize or avoid adverse impacts from transportation improvements to the natural environment and the human environment (historic sites, recreational areas, environmental justice populations), improve mobility for underserved communities, provide an inclusive setting for regional transportation decision-making, support the reduction of transportation-related greenhouse gas emissions and the improvement of air quality through fleet fuel management and the reduction of congestion, provide access to active transportation options, healthcare facilities, and healthy food.

4.2 Regional ITS Needs Identified

Through the stakeholder workshops and interviews conducted in November 2023 and February 2024, regional needs that could be addressed by ITS were identified. These needs were determined based on the Central Mississippi ITS Architecture Plan process, as well as the goals outlined in the Jackson 2045 Metropolitan Transportation Plan regional goals. **Table 4** highlights the specific needs identified by stakeholders in the Central Mississippi region.

Table 4: Central Mississippi Regional ITS Needs

ITS Needs
Commercial Vehicle Operations
Need to increase the amount of commercial vehicle parking and provide advanced information.
Data Management
Need to share data gathered through ITS to other agencies.
Maintenance and Construction
Need to improve coordination of maintenance and construction operations between agencies. Need to implement and maintain smart work zone technologies.
Public Safety
Need to implement a freeway safety service patrol. Need to assist emergency vehicles with traffic signal preemption and monitoring. Need to improve coordination between agencies during large-scale incidents.
Public Transportation
Need for transit vehicle priority within the City of Jackson. Need to establish a cashless fare system across all transit.
Traffic Management
Need to expand CCTV camera coverage in high traffic areas. Need to improve coordination of traffic signal system timing between agencies. Need increased staffing for operations. Need to deploy systems that will alert and divert wrong-way drivers.
Traveler Information
Need to convey information to drivers through dynamic message signs, radio alerts, social media, and web mapping applications. Need to continue to improve the dissemination of real-time transit information.

5 ITS Architecture

ITS ARCHITECTURE

After completing the inventory of the Central Mississippi ITS Architecture, the next step in the update process is to determine the ITS services that are important to the region. The National ITS Architecture classifies ITS services into twelve groups of service areas as follows:

- **Commercial Vehicle Operations** – Addresses the management of the efficiency, safety, and operation of commercial vehicle fleets and the movement of freight.
- **Data Management** – Addresses the management of data that can be used to support transportation planning, performance monitoring, safety analysis, and research.
- **Maintenance and Construction** – Addresses the monitoring, maintaining, improving, and managing of the roadway physical condition, including infrastructure equipment.
- **Parking Management** – Includes parking space management and the electronic payment for parking.
- **Public Safety** – Includes emergency operations/management centers, improved information sharing among traffic and emergency services, AVL systems on emergency vehicles, traffic signal preemption for emergency vehicles, and wide-area alerts.
- **Public Transportation** – Addresses the management, operations, maintenance, and security of public transportation.
- **Support** – Includes data distribution, map management, and vehicle maintenance.
- **Sustainable Travel** – Includes systems that monitor emissions and adjusted traffic signal timings to reduce emissions generated by vehicles.
- **Traffic Management** – Addresses the management of the movement of vehicles, travelers, and pedestrians. Includes information collection, dissemination, and processing for the surface transportation system.
- **Traveler Information and Personal Mobility** – Includes the broadcasting of traveler information about the transportation network both prior to and during their trips.
- **Vehicle Safety** – Addresses the vehicle's safety for automated, connected, and non-equipped vehicles. Includes the enhancement of safety, security, and efficiency in vehicle operations by warning and assisting travelers.
- **Weather** – Addresses activities that monitor and notify users and transportation network managers of weather and environmental conditions.

The Central Mississippi ITS Architecture update process takes into consideration the existing, planned, and future systems in the region across all ITS service areas. However, sustainable travel service packages were not included as the region has decided to leave electric vehicle support to private companies. Additionally, support service packages were not included in this report, as they are already captured in service packages from other areas. The report does include guidance on the use and maintenance of the Central Mississippi ITS Architecture.

5.1 ITS Service Packages

In the National ITS Architecture, services that are provided by ITS are referred to as ITS service packages, which are provided in **Appendix B** of this report. ITS service packages can include several stakeholders and elements that work together to provide a service in the region. Examples of ITS service packages from the National ITS Architecture include Infrastructure-Based Traffic Surveillance, Traffic Information Dissemination, and Transit Vehicle Tracking. There are currently 156 ITS service packages identified in

the National ITS Architecture Version 9.2, which was the most recent version available of the National ITS Architecture at the time of the 2024 update of the Central Mississippi ITS Architecture Plan.

Overview of ITS Service Package Structure

An ITS service package is made up of elements and information flows. Each identified system or component in the Central Mississippi region's ITS inventory, which is documented in the previous section, was mapped to a subsystem or terminator in the National ITS Architecture. Subsystems and terminators represent the various functional categories that define the role of an element in ITS and the regional architecture. The elements are connected by information flows that document the existing and planned flow of information.

Elements represent the ITS inventory for the Central Mississippi region. Both existing, planned, and future elements have been included in the inventory and incorporated into the architecture through the development of the service package diagrams.

Subsystems are the highest-level building blocks of the physical architecture, and the National ITS Architecture groups them into four major classes: Centers, Field, Vehicles, and Travelers. Each of these major classes includes various subsystems that represent a set of transportation functions (or processes). Each set of functions is grouped under one agency, jurisdiction, or location, and correspond to physical elements such as: Traffic Management Centers (TMCs), traffic signals, or vehicles. Each element is assigned to one or more subsystems.

Terminators are the people, systems, other facilities, and environmental conditions outside of ITS that need to communicate or interface with ITS subsystems. Terminators help define the boundaries of the National ITS Architecture as well as a regional system. Examples of terminators include drivers, weather services, and information service providers.

Architecture Flows (or Information Flows) provide a standardized method for documenting the types of information that transfer between elements. A flow can be shown as either existing or future/planned. Existing flows indicate a connection that has already been established to share at least a portion of the desired information, but showing a flow as existing is not meant to imply that the function is complete. For example, the traffic information coordination flow between traffic management agencies includes the sharing of video images, incident information and other relevant data. The flow could be shown as existing to capture the sharing of video images while incident information is still a desired expansion of functionality. Many of the information flows have associated technical specifications, known as standards, which define the format of the data being shared.

Selection and Prioritization of Regional Service Packages

In the Central Mississippi region, the National ITS Architecture service packages were reviewed by the stakeholders and selected based on the relevance of the functionality that the ITS service package could provide to the region. Stakeholders selected 49 ITS service packages for implementation in the Central Mississippi region. Stakeholders prioritized the selected service packages during the second stakeholder workshop, the Stakeholder Overview Workshop. These ITS service packages are identified in **Table 5**, where they are organized into service areas and priority groupings. ITS service packages that were not included in the 2008 Central Mississippi ITS Architecture Plan but have been added to the 2024 version are indicated with an asterisk.

Table 5: Central Mississippi Prioritized Service Packages

High Priority ITS Service Packages	Medium Priority ITS Service Packages	Low Priority ITS Service Packages
Commercial Vehicle Operations		
	CVO05 Commercial Vehicle Parking* CVO07 Roadside CVO Safety	
Data Management		
DM01 ITS Data Warehouse* DM02 Performance Monitoring		
Maintenance and Construction		
MC06 Work Zone Management MC07 Work Zone Safety Monitoring* MC08 Maintenance and Construction Activity Coordination	MC02 Maintenance and Construction Vehicle Maintenance MC05 Roadway Maintenance and Construction	MC01 Maintenance and Construction Vehicle and Equipment Tracking MC04 Winter Maintenance
Parking Management		
	PM01 Parking Space Management* PM04 Regional Parking Management*	
Public Safety		
PS01 Emergency Call-Taking and Dispatch PS02 Emergency Response PS03 Emergency Vehicle Preemption* PS10 Wide-Area Alert PS13 Evacuation and Reentry Management	PS08 Roadway Service Patrols PS12 Disaster Response and Recovery PS14 Disaster Traveler Information	PS11 Early Warning System
Public Transportation		
PT01 Transit Vehicle Tracking PT02 Transit Fixed-Route Operations PT03 Dynamic Transit Operations PT04 Transit Fare Collection Management PT08 Transit Traveler Information PT09 Transit Signal Priority*	PT05 Transit Security PT06 Transit Fleet Management PT07 Transit Passenger Counting*	PT14 Multi-modal Coordination

High Priority ITS Service Packages	Medium Priority ITS Service Packages	Low Priority ITS Service Packages
Sustainable Travel		
ST04 Roadside Lighting*		ST05 Electric Charging Stations Management*
Traffic Management		
TM01 Infrastructure-Based Traffic Surveillance TM03 Traffic Signal Control* TM06 Traffic Information Dissemination TM07 Regional Traffic Management TM08 Traffic Incident Management System TM25 Wrong-Way Vehicle Detection and Warning*	TM13 Standard Railroad Grade Crossing TM19 Roadway Closure Management*	TM12 Dynamic Roadway Warning* TM15 Railroad Operations Coordination* TM17 Speed Warning and Enforcement TM22 Dynamic Lane Management and Shoulder Use*
Traveler Information and Personal Mobility		
TI01 Broadcast Traveler Information TI02 Personalized Traveler Information*	TI07 In-Vehicle Signage*	
Vehicle Safety		
VS08 Queue Warning*	VS09 Reduced Speed Zone Warning / Lane Closure*	
Weather		
	WX01 Weather Data Collection* WX02 Weather Information Processing and Distribution*	

**Indicates an added ITS service package compared to the 2008 Central Mississippi ITS Architecture Plan*

Customization of Regional ITS Service Packages

The Central Mississippi ITS Architecture has customized the service packages in the National ITS Architecture to align with the unique systems, subsystems, and terminators in the region. These service packages represent integrated capabilities that will be deployed. Each service package is visually represented with its name, the local agencies involved, and the desired data flows. Data flows are categorized as existing, planned, or future. Existing data flows indicate that the connection already exists in at least one location within the jurisdiction. However, the existence of a data flow does not necessarily mean that the deployment of that service is complete. In some cases, there may be a need to expand the service to additional locations. Planned data flows indicate that stakeholders have plans to install ITS infrastructure, while future data flows indicate that stakeholders do not currently have plans to implement the ITS infrastructure but may consider doing so in the future.

Figure 3 is an example of an ITS service package for the potential future JTRAN transit signal priority service. This ITS service package identifies the data flows that might be implemented to support this service and the elements that would be connected. Data flows in blue represent connections that are currently existing and data flows in green represent future connections that might be established to implement the service. Each of the identified information flows is also tied to standards in the National ITS Architecture.

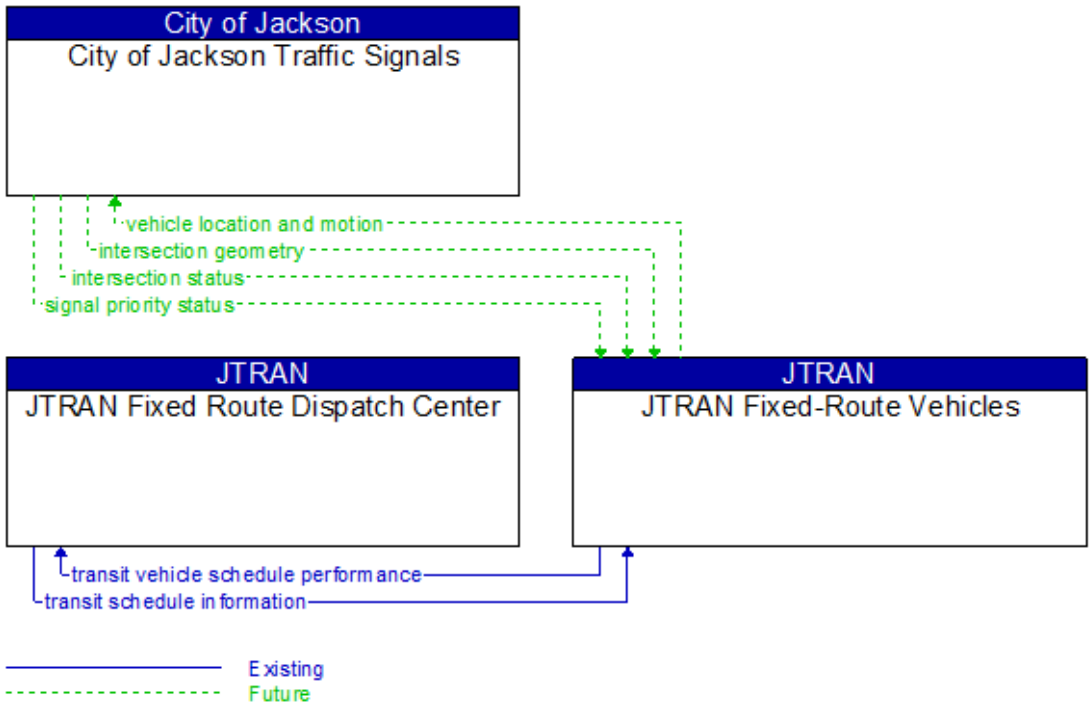


Figure 3: Example Service Package Diagram - JTRAN Transit Signal Priority

Interactive ITS Architecture – ITS Service Packages

All ITS service packages that were customized for the Central Mississippi ITS Architecture Plan can be found in the online Interactive Architecture located at:

https://cmpdd.org/transportation/plans-and-programs/intelligent-transportation-systems-its-architecture/

To access these diagrams from the website, select the "Central Mississippi Interactive ITS Architecture", then select the "Services" page from the left sidebar, then click the desired Service Package Name. The link below the "Diagram" heading will lead to the service package diagram.

Some service packages are created for a specific agency, while others are more general and apply to all agencies in the region. **Table 6** lists all service packages within the Central Mississippi ITS Architecture and includes which agency the service package applies to when specific agencies were called out.

Table 6: Service Packages with Corresponding Agency

Service Package	Service Package Name	Agency / Agencies
Commercial Vehicle Operations		
CVO05	Commercial Vehicle Parking	MDOT
CVO07	Roadside CVO Safety	MDOT
Data Management		
DM01	ITS Data Warehouse	CMPDD MDOT
DM02	Performance Monitoring	CMPDD MDOT City of Jackson City of Ridgeland Local Cities JTRAN
Maintenance and Construction		
MC01	Maintenance and Construction Vehicle and Equipment Tracking	MDOT
MC02	Maintenance and Construction Vehicle Maintenance	MDOT
MC04	Winter Maintenance	MDOT
MC05	Roadway Maintenance and Construction	MDOT
MC06	Work Zone Management	MDOT City of Jackson City of Ridgeland Local Cities
MC07	Work Zone Safety Monitoring	MDOT City of Jackson City of Ridgeland Local Cities
MC08	Maintenance and Construction Activity Coordination	MDOT City of Jackson City of Ridgeland Local Cities
Parking Management		
PM01	Parking Space Management	City of Jackson City of Flowood
PM04	Regional Parking Management	City of Flowood

Service Package	Service Package Name	Agency / Agencies
Public Safety		
PS01	Emergency Call-Taking and Dispatch	Hinds County Madison County Rankin County
PS02	Emergency Response	Hinds County Madison County Rankin County
PS03	Emergency Vehicle Preemption	MDOT City of Jackson City of Ridgeland Local Cities
PS08	Roadway Service Patrols	MDOT
PS10	Wide-Area Alert	MDOT Hinds County Madison County Rankin County
PS11	Early Warning System	MDOT Hinds County Madison County Rankin County
PS12	Disaster Response and Recovery	MDOT Hinds County Madison County Rankin County
PS13	Evacuation and Reentry Management	MDOT Hinds County Madison County Rankin County
PS14	Disaster Traveler Information	MDOT Hinds County Madison County Rankin County
Public Transportation		
PT01	Transit Vehicle Tracking	JTRAN
PT02	Transit Fixed-Route Operations	JTRAN
PT03	Dynamic Transit Operations	JTRAN
PT04	Transit Fare Collection Management	JTRAN
PT05	Transit Security	JTRAN
PT06	Transit Fleet Management	JTRAN
PT07	Transit Passenger Counting	JTRAN

Service Package	Service Package Name	Agency / Agencies
PT08	Transit Traveler Information	JTRAN
PT09	Transit Signal Priority	JTRAN
PT14	Multi-modal Coordination	JTRAN
Traffic Management		
TM01	Infrastructure-Based Traffic Surveillance	MDOT City of Jackson City of Ridgeland City of Brandon City of Clinton City of Flowood City of Madison City of Pearl Local Cities JTRAN
TM03	Traffic Signal Control	MDOT City of Jackson City of Ridgeland City of Brandon City of Clinton City of Flowood City of Madison City of Pearl Local Cities JTRAN
TM06	Traffic Information Dissemination	MDOT City of Jackson City of Ridgeland Local Cities
TM07	Regional Traffic Management	MDOT City of Jackson City of Ridgeland Local Cities
TM08	Traffic Incident Management System	MDOT City of Jackson City of Ridgeland Local Cities
TM12	Dynamic Roadway Warning	City of Jackson
TM13	Standard Railroad Grade Crossing	City of Jackson City of Ridgeland Local Cities

Service Package	Service Package Name	Agency / Agencies
TM15	Railroad Operations Coordination	City of Jackson City of Ridgeland Local Cities
TM17	Speed Warning and Enforcement	MDOT
TM19	Road Closure Management	MDOT
TM22	Dynamic Lane Management and Shoulder Use	MDOT
TM25	Wrong-Way Vehicle Detection and Warning	MDOT
Traveler Information and Personal Mobility		
TI01	Broadcast Traveler Information	MDOT City of Jackson City of Ridgeland City of Brandon City of Clinton City of Flowood City of Madison City of Pearl Local Cities
TI02	Personalized Traveler Information	MDOT
TI07	In-Vehicle Signage	MDOT
Vehicle Safety		
VS08	Queue Warning	MDOT City of Jackson City of Ridgeland Local Cities
VS09	Reduced Speed Zone Warning / Lane Closure	MDOT City of Jackson City of Ridgeland Local Cities
Weather		
WX01	Weather Data Collection	MDOT
WX02	Weather Information Processing and Distribution	MDOT

Regional Needs and Corresponding Service Packages

Input received from stakeholders during the stakeholder workshops and interviews provided valuable input for the service package customization process. The needs identified during discussions with stakeholders, as well as needs from the Jackson MTP, are identified in **Table 7**. The table also identifies which ITS service packages could be implemented to address the need.

Table 7: Central Mississippi Needs and Corresponding Packages

Need	Corresponding Service Package
Need to increase the amount of commercial vehicle parking	CVO05 – Commercial Vehicle Parking
Need to share data gathered through ITS to other agencies	DM01 – ITS Data Warehouse
Need to improve coordination of maintenance and construction operations between agencies	MC05 – Roadway Maintenance and Construction MC06 – Work Zone Management
Need to implement and maintain smart work zone technologies	MC05 – Roadway Maintenance and Construction MC06 – Work Zone Management MC07 – Wok Zone Safety Monitoring
Need to implement a freeway safety service patrol	PS08 – Roadway Service Patrols
Need to assist emergency vehicles with traffic signal preemption and monitoring	PS02 – Emergency Response PS03 – Emergency Vehicle Preemption
Need to improve coordination between agencies during large-scale incidents	TM08 – Traffic Incident Management System
Need for transit vehicle priority within the City of Jackson	PT09 – Transit Signal Priority
Need to establish a cashless fare system across all transit	PT04 – Transit Fare Collection Management
Need to deploy systems that will alert and divert wrong-way drivers	TM25 – Wrong-Way Vehicle Detection and Warning
Need to expand CCTV camera coverage in high traffic areas	TM01 – Infrastructure-Based Traffic Surveillance TM06 – Traffic Information Dissemination TM07 – Regional Traffic Management
Need to convey information to drivers through dynamic message signs, radio alerts, social media, and web mapping applications.	TM06 – Traffic Information Dissemination TI01 – Broadcast Traveler Information
Need to continue to improve the dissemination of real-time transit information	TI01 – Broadcast Traveler Information
Need for monitoring rail crossings and notifying motorists of blockages	TM13 - Standard Railroad Grade Crossing TM15 - Railroad Operations Coordination
Need to improve coordination of traffic signal system timing between agencies	TM03 – Traffic Signal Control

5.2 Architecture Interfaces

The ITS architecture for the Central Mississippi region not only identifies the various systems and stakeholders involved, but it also emphasizes the importance of connectivity between these transportation systems. The system interconnect diagram provides a high-level overview of the relationships between subsystems, terminators, local projects, and systems in the region. The customized ITS service packages, on the other hand, represent integrated capabilities that can be deployed.

The National ITS Architecture system interconnect diagram has been customized for the Central Mississippi region is shown in **Figure 4**. The customized system interconnect diagram is based on the system inventory and information gathered from the stakeholders. Each of the sub-systems that are included in the Central Mississippi ITS Architecture Plan have been shown in black text. Subsystems that are not included are shown in gray text.

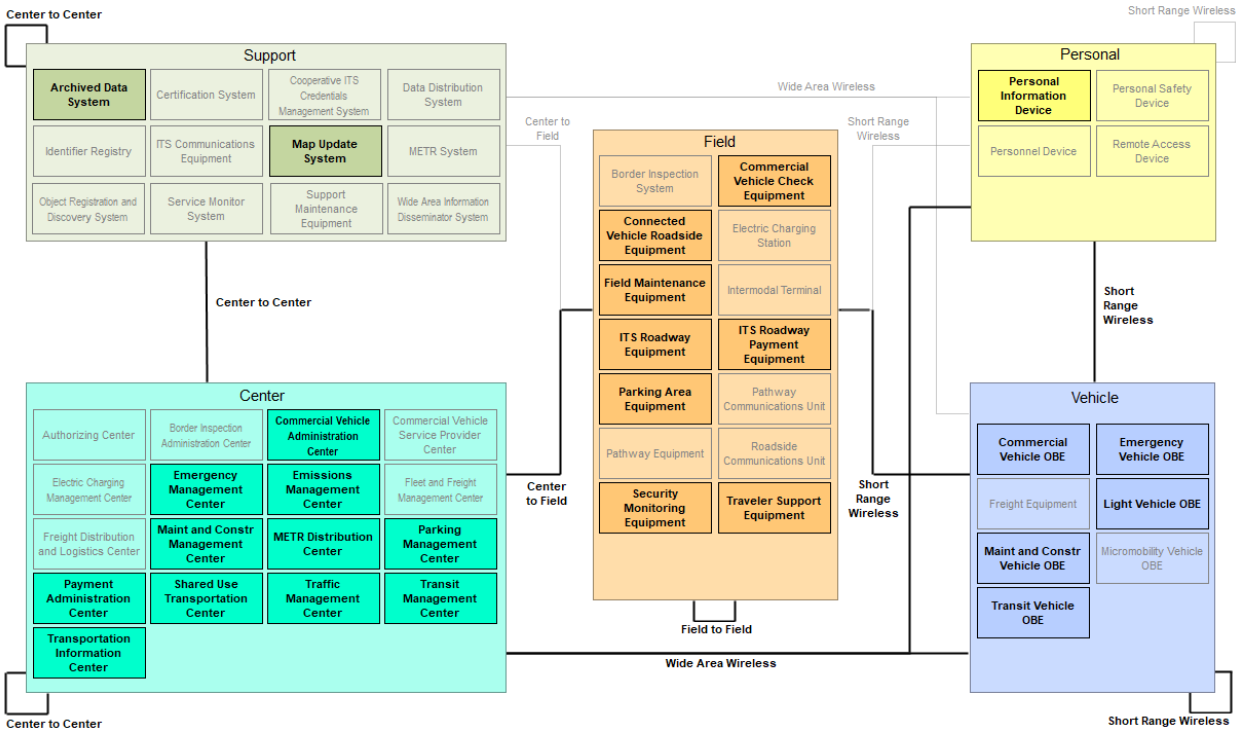


Figure 4: Top Level System Interconnect Diagram

5.3 Functional Requirements

Functions are a description of what the system must do. In the National ITS Architecture, functions are defined at several different levels, ranging from general subsystem descriptions through somewhat more specific equipment package descriptions to process specifications that include substantial detail. Guidance from the USDOT on developing a regional ITS architecture recommends that each region determine the level of detail of the functional requirements for their region. In the Central Mississippi region, it is recommended that the development of detailed functional requirements such as the "shall" statements included in process specifications for a system be developed at the project level. These detailed "shall" statements identify all functions that a project or system needs to perform.

For the Central Mississippi ITS Architecture, functional requirements have been identified at two levels. The customized service packages, discussed previously in Section 5.1, describe the services that ITS needs to provide in the region and the architecture flows between the elements. These service packages and data flows describe what ITS in the Central Mississippi region has to do and the data that needs to be shared among elements.

At a more detailed level, functional requirements for the Central Mississippi region are described in terms of functions that each element in the architecture performs or will perform in the future.

Appendix C contains a table that summarizes the functions by element.

5.4 Standards

Standards are an important tool that will allow efficient implementation of the elements in the Central Mississippi ITS Architecture 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. The USDOT's ITS Joint Program Office is supporting Standards Development Organizations (SDOs) with an extensive, multi-year program of accelerated, consensus-based standards development to facilitate successful ITS deployment in the United States.

Table 8 identifies each of the ITS standards that could apply to the Central Mississippi ITS Architecture Plan. These standards are based on the physical subsystem architecture flows previously identified in Section 5.1 and shown in the ITS Architecture service package diagrams.

Interactive ITS Architecture – Standards

Relevant standards in the Central Mississippi ITS Architecture Plan can also be found in the online Interactive Architecture located at:

https://cmpdd.org/transportation/plans-and-programs/intelligent-transportation-systems-its-architecture/

To access these standards, from the website select the "Central Mississippi Interactive ITS Architecture", then select the "Inventory" page from the left sidebar, then then select the "Standards" page from the left sidebar, then click the desired Standard title.

Table 8: Central Mississippi Regional ITS Standards

Standards Development Organization	Document ID	Standard Title
Advanced Traffic Controller Joint Committee	ITE ATC 5201	Advanced Transportation Controller
Advanced Traffic Controller Joint Committee	ITE ATC 5202	Model 2070 Controller Standard
Advanced Traffic Controller Joint Committee	ITE ATC 5301	Intelligent Transportation System Standard Specification for Roadside Cabinets
Advanced Traffic Controller Joint Committee	ITE ATC 5401	Application Programming Interface Standard for the Advanced Transportation Controller
International Organization for Standardization	ISO 21217	Intelligent transport systems -- Communications Access for Land Mobiles (CALM) -- Architecture
National Electrical Manufacturers Association	NEMA TS 5	Portable Traffic Signal Systems (PTSS) Standard
National Electrical Manufacturers Association	NEMA TS 8	Cyber and Physical Security for Intelligent Transportation Systems
National Electrical Manufacturers Association	NEMA TS2	Traffic Controller Assemblies with NTCIP Requirements
National Electrical Manufacturers Association	NEMA TS4	Hardware Standards for Dynamic Message Signs (DMS) With NTCIP Requirements
National Institute for Standards and Technology	NIST FIPS PUB 140-2	Security Requirements for Cryptographic Modules

5.5 Operational Concepts

Operational concepts, shown in **Table 9**, document each stakeholder's current and future roles and responsibilities across a range of transportation services. In the Central Mississippi region, these operational concepts are documented for eight separate service areas and are described in more detail in the RAD-IT Architecture, with each area describing an aspect of the operation of an interconnected, regional ITS network. The service areas covered are described briefly below:

- **Archived Data System** – Operation of systems to collect and maintain archived data.
- **Emergency Management** – Operation of systems to provide emergency call taking, public safety dispatch, and emergency operations center operations.
- **Freeway Management** – Operation of systems to provide wrong-way driving warning, variable speed limits, service patrols, and roadside traveler information.

- **Incident Management** – Operation of systems to provide rapid and effective response to traffic incidents. This service area includes systems to detect and verify incidents as well as coordinated agency response to the incidents.
- **Maintenance and Construction Management** – Operation of systems to monitor and manage roadside maintenance and construction work zone activities.
- **Traffic Signal Management** – Operation of traffic signal systems that react to changing traffic conditions and provide coordinated intersection timing over a corridor or an area.
- **Transit Services** – Operation of systems to manage fleets of transit vehicles and overall transit systems more efficiently.
- **Traveler Information Dissemination** – Operation of systems to provide static and real-time transportation information to travelers.

Additional detail on operational concept roles and responsibilities can be found in the Central Mississippi Interactive ITS Architecture through the online RAD-IT database.

Interactive ITS Architecture – Roles and Responsibilities

Roles and responsibilities for stakeholders related to each operational concept service area in the Central Mississippi ITS Architecture Plan can be found in the Interactive ITS Architecture through the online RAD-IT database located at:

https://cmpdd.org/transportation/plans-and-programs/intelligent-transportation-systems-its-architecture/

To access these roles and responsibilities, from the website select the "Central Mississippi Interactive ITS Architecture", then select the "Roles and Responsibilities" page from the left sidebar.

Table 9: Central Mississippi Stakeholder Roles and Responsibilities

Transportation Service	Stakeholder	Roles/Responsibilities
Archived Data System for the Central Mississippi ITS Architecture	CMPDD	Collect and maintain data from regional traffic, transit, and emergency management agencies.
Emergency Management for the Central Mississippi ITS Architecture	City of Jackson	911 Dispatch - Responsible for the dispatch of emergency vehicles to incidents and tracking of their location and status.
	City of Jackson	911 Dispatch - Participate in regional emergency planning to support large-scale incidents and disasters.
	City of Jackson	911 Dispatch - Responsible for emergency call-taking
	City of Jackson	911 Dispatch - Responsible for the routing of emergency vehicles to facilitate the safest/quickest arrival at an incident.
	City of Ridgeland	911 Dispatch - Responsible for emergency call-taking.
	City of Ridgeland	911 Dispatch - Participate in regional emergency planning to support large-scale incidents and disasters.
	City of Ridgeland	911 Dispatch - Responsible for the routing of emergency vehicles to facilitate the safest/quickest arrival at an incident.
	City of Ridgeland	911 Dispatch - Responsible for the dispatch of emergency vehicles to incidents and tracking of their location and status.
	Hinds County	911 Dispatch - Participate in regional emergency planning to support large-scale incidents and disasters.
	Hinds County	911 Dispatch - Responsible for emergency call-taking.
	Hinds County	911 Dispatch - Responsible for the dispatch of emergency vehicles to incidents and tracking of their location and status.
	Hinds County	911 Dispatch - Responsible for the routing of emergency vehicles to facilitate the safest/quickest arrival at an incident.
	Local City	911 Dispatch - Participate in regional emergency planning to support large-scale incidents and disasters.
	Local City	911 Dispatch - Responsible for emergency call-taking.
	Local City	911 Dispatch - Responsible for the dispatch of emergency vehicles to incidents and tracking of their location and status.

Transportation Service	Stakeholder	Roles/Responsibilities
	Local City	911 Dispatch - Responsible for the routing of emergency vehicles to facilitate the safest/quickest arrival at an incident.
	Madison County	911 Dispatch - Participate in regional emergency planning to support large-scale incidents and disasters.
	Madison County	911 Dispatch - Responsible for emergency call-taking.
	Madison County	911 Dispatch - Responsible for the dispatch of emergency vehicles to incidents and tracking of their location and status.
	Madison County	911 Dispatch - Responsible for the routing of emergency vehicles to facilitate the safest/quickest arrival at an incident.
	MEMA	Lead evacuation planning and coordination to manage evacuation and reentry in the vicinity of a disaster or other emergency situation.
	MEMA	Lead statewide efforts for emergency planning to support large-scale incidents and disasters.
	MEMA	Operates the EOC for the State of Mississippi in the event of a disaster or other large-scale emergency situation.
	MDOT	Provide transportation network condition data to private sector information service providers.
	MDOT	Dispatch service patrol vehicles along regional freeways.
	MDOT	Coordinate maintenance resources for incident response.
	MDOT	Operate DMS for the distribution of incident information to travelers on the roadway.
	MDOT	Responsible for coordination with other traffic operations centers and emergency management agencies for coordinated incident management.
	Rankin County	911 Dispatch - Participate in regional emergency planning to support large-scale incidents and disasters.
	Rankin County	911 Dispatch - Responsible for emergency call-taking.
	Rankin County	911 Dispatch - Responsible for the dispatch of emergency vehicles to incidents and tracking of their location and status.
	Rankin County	911 Dispatch - Responsible for the routing of emergency vehicles to facilitate the safest/quickest arrival at an incident.
Freeway Management for	MDOT	Disseminates work zone activity schedules and current asset restrictions to other agencies.

Transportation Service	Stakeholder	Roles/Responsibilities
the Central Mississippi ITS Architecture	MDOT	Supports work zone activities including the dissemination of work zone information through portable DMS, highway advisory radio, and sharing of information with other groups.
	MDOT	Operate network surveillance equipment including CCTV cameras and vehicle detection on roadways.
Incident Management for the Central Mississippi ITS Architecture	City of Jackson	Responsible for the collection and distribution of traveler information including incident information and maintenance and construction closure information.
	City of Jackson	Operate dynamic message signs for the distribution of incident information to travelers on the roadway.
	City of Jackson	Coordinate maintenance resources for incident response.
	City of Jackson	Responsible for coordination with other traffic operations centers and emergency management agencies for coordinated incident management.
	City of Jackson	Operate and maintain traffic signal systems within the City.
	City of Jackson	Operate network surveillance equipment including CCTV cameras and vehicle detection on roadways within the City to facilitate traffic signal operations.
	City of Jackson	Remotely control traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, and emergency vehicle preemptions.
	City of Jackson	Provide traffic signal preemption for emergency vehicles.
	City of Ridgeland	Responsible for the collection and distribution of traveler information including incident information and maintenance and construction closure information.
	City of Ridgeland	Responsible for coordination with other traffic operations centers and emergency management agencies for coordinated incident management.
	City of Ridgeland	Operate dynamic message signs for the distribution of incident information to travelers on the roadway.
	City of Ridgeland	Coordinate maintenance resources for incident response.
	City of Ridgeland	Operate and maintain traffic signal systems within the City.
	City of Ridgeland	Operate network surveillance equipment including CCTV cameras and vehicle detection on roadways within the City to facilitate traffic signal operations.
	City of Ridgeland	Provide traffic signal preemption for emergency vehicles.

Transportation Service	Stakeholder	Roles/Responsibilities
	City of Ridgeland	Remotely control traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, and emergency vehicle preemptions.
	Local City	Operate and maintain traffic signal systems within the City.
	Local City	Coordinate maintenance resources for incident response.
	Local City	Operate dynamic message signs for the distribution of incident information to travelers on the roadway.
	Local City	Responsible for coordination with other traffic operations centers and emergency management agencies for coordinated incident management.
	Local City	Operate network surveillance equipment including CCTV cameras and vehicle detection on roadways within the City to facilitate traffic signal operations.
	Local City	Provide traffic signal preemption for emergency vehicles.
	Local City	Remotely control traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, and emergency vehicle preemptions.
	MDOT	Provide transportation network condition data to private sector information service providers.
	MDOT	Coordinate maintenance resources for incident response.
	MDOT	Operate DMS for the distribution of incident information to travelers on the roadway.
	MDOT	Responsible for coordination with other traffic operations centers and emergency management agencies for coordinated incident management.
	MDOT	Operate network surveillance equipment including CCTV cameras and vehicle detection on roadways.
Maintenance and Construction Management for the Central Mississippi ITS Architecture	MDOT	Provide transportation network condition data to private sector information service providers.
	MDOT	Collection, processing, storage, and broadcast dissemination of traffic, transit, maintenance and construction, event and weather information to travelers via the MDOT Traffic Website and the Mississippi 511 system.
	MDOT	Coordinate maintenance resources for incident response.
	MDOT	Operate DMS for the distribution of incident information to travelers on the roadway.
	MDOT	Disseminates work zone activity schedules and current asset restrictions to other agencies.

Transportation Service	Stakeholder	Roles/Responsibilities
	MDOT	Supports work zone activities including the dissemination of work zone information through portable DMS, highway advisory radio, and sharing of information with other groups.
Traffic Signal Management for the Central Mississippi ITS Architecture	City of Jackson	Operate and maintain traffic signal systems within the City.
	City of Jackson	Operate network surveillance equipment including CCTV cameras and vehicle detection on roadways within the City to facilitate traffic signal operations.
	City of Jackson	Remotely control traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, and emergency vehicle preemptions.
	City of Jackson	Provide traffic signal preemption for emergency vehicles.
	City of Ridgeland	Operate and maintain traffic signal systems within the City.
	City of Ridgeland	Operate network surveillance equipment including CCTV cameras and vehicle detection on roadways within the City to facilitate traffic signal operations.
	City of Ridgeland	Provide traffic signal preemption for emergency vehicles.
	City of Ridgeland	Remotely control traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, and emergency vehicle preemptions.
	Local City	Operate and maintain traffic signal systems within the City.
	Local City	Operate network surveillance equipment including CCTV cameras and vehicle detection on roadways within the City to facilitate traffic signal operations.
	Local City	Provide traffic signal preemption for emergency vehicles.
	Local City	Remotely control traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, and emergency vehicle preemptions.
	MDOT	Operate and maintain traffic signal systems.
	MDOT	Operate network surveillance equipment including CCTV cameras and vehicle detection on roadways.
	MDOT	Provide traffic signal preemption for emergency vehicles.
	MDOT	Remotely control traffic signal controllers to implement traffic management strategies at signalized intersections based on traffic conditions, incidents, and emergency vehicle preemptions.
	JTRAN	Provide schedule and fare information on transit kiosks.

Transportation Service	Stakeholder	Roles/Responsibilities
Transit Services for the Central Mississippi ITS Architecture	JTRAN	Coordinate transit service with other regional transit providers.
	JTRAN	Operate on-board systems to provide next stop annunciation.
	JTRAN	Operate demand response and fixed-route transit services from a central dispatch facility responsible for tracking their location and status.
	JTRAN	Provide transit security on transit vehicles and at transit terminals through silent alarms and surveillance systems.
	JTRAN	Provide real-time transit traveler information to the agency website, local private sector traveler information services, and the Mississippi 511 system.
Traveler Information Dissemination for the Central Mississippi ITS Architecture	City of Brandon	Responsible for the collection and distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.
	City of Brandon	Responsible for the collection and distribution of traveler information including incident information and maintenance and construction closure information.
	City of Clinton	Responsible for the collection and distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.
	City of Clinton	Responsible for the collection and distribution of traveler information including incident information and maintenance and construction closure information.
	City of Flowood	Responsible for the collection and distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.
	City of Flowood	Responsible for the collection and distribution of traveler information including incident information and maintenance and construction closure information.
	City of Jackson	Responsible for the collection and distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.
	City of Jackson	Responsible for the collection and distribution of traveler information including incident information and maintenance and construction closure information.
	City of Madison	Responsible for the collection and distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.
	City of Madison	Responsible for the collection and distribution of traveler information including incident information and maintenance and construction closure information.

Transportation Service	Stakeholder	Roles/Responsibilities
	City of Pearl	Responsible for the collection and distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.
	City of Pearl	Responsible for the collection and distribution of traveler information including incident information and maintenance and construction closure information.
	City of Richland	Responsible for the collection and distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.
	City of Richland	Responsible for the collection and distribution of traveler information including incident information and maintenance and construction closure information.
	City of Ridgeland	Responsible for the collection and distribution of emergency information to the traveling public, including evacuation information and wide-area alerts.
	City of Ridgeland	Responsible for the collection and distribution of traveler information including incident information and maintenance and construction closure information.
	MDOT	Provide transportation network condition data to private sector information service providers.
	MDOT	Collection, processing, storage, and broadcast dissemination of traffic, transit, maintenance and construction, event and weather information to travelers via the MDOTTraffic Website and the Mississippi 511 system.
	MDOT	Operate DMS to distribute traffic information and roadway conditions to travelers on the roadway.

5.6 Regional Agreements

The Central Mississippi ITS Architecture Plan has identified many agency interfaces, information exchanges, and integration strategies that would be needed to provide the ITS services and systems identified by the stakeholders in the Central Mississippi region. Interfaces and information flows among public and private entities in the region will require agreements among agencies that establish parameters for sharing agency information to support traffic management and incident management, provide traveler information, and perform other functions identified in the Central Mississippi ITS Architecture.

With the implementation of ITS technologies, integrating systems from one or more agencies, and the anticipated level of information exchange identified in the Central Mississippi ITS Architecture, it is likely that formal agreements between agencies will be needed in the future. These agreements, while perhaps not requiring a financial commitment from agencies in the Central Mississippi region, should outline specific roles, responsibilities, data exchanges, levels of authority, and other facets of regional

operations. Some agreements may also outline specific funding responsibilities, where appropriate and applicable.

Agreements should avoid being specific regarding technology when possible. Technology is likely to change, and changes to technology could require an update of the agreement if the agreement was not technology neutral. Focus of the agreement should be on the responsibilities of the agencies and types of information that need to be exchanged. Depending on the type of agreement being used, agencies should be prepared to negotiate for anywhere from several months to several years before completing an agreement. Agencies must first reach consensus on what should be in an agreement and then proceed through the approval process. The approval process for formal agreements varies by agency and can often be quite lengthy, so it is recommended that agencies plan ahead to ensure that the agreement does not delay project implementation.

Table 10 provides a list of existing and future agreements for the Central Mississippi region based on the interfaces identified in the Central Mississippi ITS Architecture Plan. It is important to note that as ITS services and systems are implemented in the region, part of the planning and review process for those projects should include a review of potential agreements that would be needed for implementation or operations.

Table 10: Existing and Future Agreements within the Central Mississippi Region

Agreement Status	Agreement Title	Description
Existing	Data Sharing and Usage (Public-Public) - MDOT	Agreement that allows data sharing between public sector agencies including CCTV camera feeds.
Existing	Data Sharing and Usage (Public-Private) - MDOT	Agreement allows private sector media and information service providers to access and broadcast public sector transportation agency CCTV camera video feeds.
Future	Incident Data Sharing (Public-Public)	Agreement would define the parameters, guidelines, and policies for inter-agency sharing of incident data between transportation and emergency management agencies in the region. Incident information could be sent directly to CAD systems and include information on lane closures, travel delays, and weather.
Future	Traffic Signal Timing Data Sharing (Public-Public)	Agreement that defines the parameters, guidelines, and policies for inter-agency traffic signal timing, including sharing of timing plans and joint operations of signals, between cities and counties.

In **Appendix D**, copies of the existing agreements that were available have been included. These agreements include:

- Agreement developed by MDOT for live CCTV video access and information sharing for governmental agency users.
- Agreement developed by MDOT for live CCTV video access for private entity users, such as the media.

5.7 Phases of Implementation

The services identified in the Central Mississippi ITS Architecture will be implemented over time through a series of projects. Though MDOT, JTRAN, CMPDD, and many of the larger municipalities have already made significant ITS deployments in the region, key foundation systems will need to be implemented for agencies with few existing ITS deployments to support other systems that have been identified in the Central Mississippi ITS Architecture. The deployment of all the systems required to achieve the final ITS Architecture build out will occur over many years.

Some of the key service packages that will provide the functions for the foundation systems in the Central Mississippi region are listed below. Service packages that support the primary needs identified in the Central Mississippi region are also identified. Existing deployments and regional projects associated with these, and other service packages identified for the region have been included in the ITS Deployment Plan. Anticipated deployment timeframes for the regional projects are also included in the deployment plan.

- TM01 – Infrastructure-Based Traffic Surveillance
- TM03 – Traffic Signal Control
- TM06 – Traffic Information Dissemination
- TM07 – Regional Traffic Management
- TM08 – Traffic Incident Management System
- TI01 – Broadcast Traveler Information
- PS08 – Roadway Service Patrols
- MC06 – Work Zone Management
- MC08 – Maintenance and Construction Activity Coordination
- PT04 – Transit Fare Collection Management
- PT08 – Transit Traveler Information
- PT09 – Transit Signal Priority
- DM01 – ITS Data Warehouse
- DM02 – Performance Monitoring

6 ITS Deployment Plan

ITS DEPLOYMENT PLAN

The ITS Deployment Plan Section identifies projects in the Central Mississippi region that should be implemented to achieve the desired functionality outlined in the ITS Architecture Plan. The ITS Deployment Plan Section expands upon the ITS Architecture Plan by providing recommendations and strategies for projects in the region, potential stakeholders involved, and proposed timelines for implementation. The ITS Deployment Plan Section also connects each regional project to the ITS Architecture by identifying ITS service packages that correspond to respective projects.

The ITS Deployment Plan Section provides stakeholders with a comprehensive list of significant ITS projects that align with the ITS Architecture and aim to address transportation needs in the region. It's important to note that the plan is not limited by financial constraints. The included projects represent the desired implementations of stakeholders, although funding will still be required to bring these projects to fruition.

6.1 Deployment Plan Project Development

Stakeholder input was gathered through a review of existing ITS inventory and deployments as well as a review of regional and local plans. Stakeholders provided input through workshops and agency interviews that included discussions on local and regional ITS needs for projects. The regional needs identified in the ITS Architecture Plan, as well as the prioritized list of ITS service packages, also contributed to projects identified in the ITS Deployment Plan Section.

As part of the Central Mississippi ITS Architecture Plan, regional project selections will identify a list of priority regional ITS projects for the Central Mississippi region. Each of the projects recommended in the plan has been checked against the Central Mississippi ITS Architecture to ensure they are in conformance. This should assist agencies deploying these projects in the future with meeting FHWA and FTA requirements for ITS architecture conformity. The projects in the plan could also feed into the long-range planning process and provide agencies with a list of priority ITS projects for consideration during future calls for projects from the CMPDD.

6.2 Existing ITS Deployments

The Central Mississippi region has made significant investments in the deployment of ITS throughout the region. In **Table 11**, a summary of ITS deployments by state and regional, municipal, and transit agencies is provided.

The section in the table for state and regional agencies focuses on existing and planned ITS elements owned by MDOT and CMPDD. The section for municipalities focuses on larger municipalities that currently operate ITS infrastructure. The regional transit agency is JTRAN. For each agency, both existing and planned ITS deployments have been identified.

Table 11: Existing ITS Deployments

Agency	Freeway and Arterial Applications																			Transit Applications											
	Automated Traffic Signal Performance Measures	Bluetooth Detection	CCTV Cameras	Center-to-Center Communication	Commercial Vehicle Parking Management	Data Warehouse	Dynamic Message Signs (DMS)	Emergency Vehicle Signal Preemption	Freeway Safety Service Patrol	Parking Management System	Portable DMS	Rail Closure Warning Signs	Real-Time Traveler Info. Website/Mobile Data	Road Weather Information Systems (RWIS) Sensors	Smart Work Zones	Traffic Management Center	Traffic Signal Battery Backup Monitoring	Traffic Signal System	Wrong-Way Driving	Automated Fare Payment	Automated Passenger Counters	Center-to-Center Communication for Traffic Information	Real-Time Traveler Info. at Transit Centers/Stops	Real-Time Traveler Info. Website/Mobile Data	Transit Archived Data	Transit Operations Center	Transit Operations Center Security CCTV Cameras	Transit Signal Priority	Transit Stop Security CCTV Cameras	Transit Vehicle Security CCTV Cameras	Transit Vehicle Tracking
State and Regional																															
MDOT	E	E	E	E		E	E	E			E		E	E	E	E	P	E	P												
CMPDD						E																									
Municipalities																															
City of Brandon																		E													
City of Clinton																		E													
City of Flowood																		E													
City of Jackson			E							E	E	E						E													
City of Madison																		E													
City of Pearl																		E													
City of Ridgeland	E		E	E				E								E	E	E													
Transit																															
JTRAN						E														P	E	E		E	P	E	E	P		E	E

E - Existing System

P - Planned System

6.3 Regionally Significant ITS Project Deployments

Stakeholders within the Central Mississippi region noted a strong need for the implementation of regional systems and programs to meet regional needs. Regional needs generally focused on traveler information, incident management, improved communications and information sharing between agencies, and enhancements to transit service.

Stakeholders identified 13 regional deployment projects for ITS in the region. These projects do not encompass all the regional ITS needs within the Central Mississippi region, however stakeholders recommended that emphasis be placed on implementation related to these 13 areas in order to provide the greatest benefit to travelers. The 13 projects are:

- Regional Traffic Data Warehouse Implementation
- Regional Traffic Surveillance Coverage
- Regional Traffic Information Dissemination
- Regional Interagency Incident Coordination
- Regional Interagency Traffic Signal Coordination
- Regional Smart Work Zone Technologies
- Regional Maintenance and Construction Coordination
- Emergency Vehicle Preemption
- MDOT Commercial Vehicle Parking Availability
- MDOT Freeway Safety Service Patrol
- MDOT Wrong-Way Driving Systems and Alerts
- JTRAN Transit Fare Management
- JTRAN Transit Vehicle Priority

A summary of each of the 13 regional projects is provided in this section. For each, the following information is provided:

Basis of Need – Describes how the regional deployment project or program meets one of more of the regional ITS needs that were identified in the ITS Architecture Plan.

Stakeholders – Identifies the stakeholder agencies that would be involved in the implementation of projects related to each deployment area. If possible, a lead agency is identified.

Timeframe – Describes the approximate timeframe it may take to develop and implement each project.

- Short-Term: Within the next five years
- Medium-Term: Within the next six to ten years
- Long-Term: Anything over ten years

ITS Architecture Plan Conformance – Identifies the ITS service packages from the Central Mississippi ITS Architecture Plan that are related to each of the regional deployment areas. Conformance of ITS projects with the ITS Architecture is important for any ITS project or program to be eligible for federal ITS funding.

Regional Traffic Data Warehouse Implementation

The implementation of various components of ITS in the Central Mississippi region has highlighted the need for effective management of the data collected by these technologies. Currently, not all stakeholders are aware or have access to archived data from other agencies, such as information on traffic volume, speeds, congestion levels, CCTV camera feeds, and DMS monitoring.

Agencies like MDOT, CMPDD, and JTRAN operate data warehouses; however, they do not share this data with other agencies. Therefore, there is a need to develop a comprehensive transportation data warehouse that encompasses the transportation data gathered by ITS devices managed by agencies throughout the Central Mississippi region.

By establishing a transportation data warehouse, stakeholders would have access to a centralized repository of transportation-related data. This would facilitate easy and efficient access to critical information for analysis, planning, and decision-making purposes. Moreover, the sharing of data among agencies would foster collaboration and enable a more holistic approach to transportation management in the region.

Basis of Need

During the development of the Central Mississippi ITS Architecture, stakeholders noted the need to access data from other agencies, both for real-time operations as well as for planning purposes. Archived data can be utilized for research, transportation studies, and to predict future conditions.

Stakeholders

Stakeholders include all agencies within the Central Mississippi region that currently deploy or plan to deploy ITS technologies. The lead agency for the implementation of a regional data management program would most likely be CMPDD since they serve as the regional planning agency for the Central Mississippi region.

Timeframe

While data management program is important, implementation within the next five to ten years would be sufficient to meet the region's needs and incorporate data from newly deployed technologies.

ITS Architecture Plan Conformance

The implementation of a data management program for the Central Mississippi region would conform to two ITS service packages in the Central Mississippi ITS Architecture:

- DM01 ITS Data Warehouse
- DM02 Performance Monitoring

Regional Traffic Data Warehouse Implementation

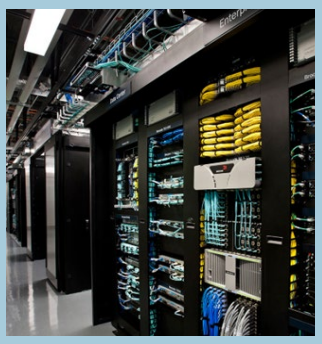
As agencies within Central Mississippi continue to implement ITS field infrastructure, it is important to track and monitor the data available to the region.

A traffic data warehouse provides a regional platform for sharing traffic information across agencies.

Time Frame: Medium-Term

Lead Agency: CMPDD

Supporting Agencies: MDOT, All cities and counties within Central Mississippi, JTRAN



Regional Traffic Surveillance Coverage

Traffic surveillance coverage allows transportation agencies and stakeholders to monitor traffic conditions in real-time. By having access to live camera feeds and data, they can identify congestion, crashes, and other incidents quickly and efficiently. This information is crucial for making informed decisions, such as adjusting signal timings or deploying emergency services, to ensure the safety and efficiency of the transportation network.

Traffic surveillance coverage also helps to improve traffic management and control. By monitoring traffic flow and detecting any abnormalities or bottlenecks, transportation agencies can proactively respond and implement strategies to alleviate congestion. This could include adjusting signal timings, rerouting traffic, or providing timely information to drivers through variable message signs or mobile applications. As a result, traffic surveillance coverage enhances the overall performance and reliability of the transportation system.

Basis of Need

During the development of the Central Mississippi ITS Architecture, stakeholders voiced the need for increased coverage of traffic surveillance. These stakeholders often rely on MDOTTraffic.com, which displays live feeds from CCTV cameras owned by MDOT. Stakeholders emphasized the need for more traffic surveillance in high traffic areas. MDOT also expressed the need for CCTV cameras at every signal that they operate.

Stakeholders

Stakeholders include MDOT and all cities within the Central Mississippi region that currently deploy or plan to deploy CCTV cameras in the Region.

Regional Traffic Surveillance Coverage

Expand CCTV camera coverage along high traffic routes within the Central Mississippi region and increase use of probe-based data for operations.

Traffic surveillance coverage is crucial for monitoring real-time traffic conditions and improving traffic management. It enables transportation agencies and stakeholders to respond promptly to incidents, mitigate congestion, and plan for future transportation needs.

Time Frame: Short-Term

Agencies: MDOT, cities within Central Mississippi

Timeframe

As the region continues to grow, it is crucial that traffic surveillance keeps pace. Traffic surveillance enables remote monitoring of traffic conditions in the region. It is recommended to implement expanded traffic surveillance coverage within the next five years.

ITS Architecture Plan Conformance

The implementation of a traffic surveillance program for the Central Mississippi region would conform to three ITS service packages in the Central Mississippi ITS Architecture:

- TM01 – Infrastructure-Based Traffic Surveillance
- TM06 – Traffic Information Dissemination
- TM07 – Regional Traffic Management

Regional Traffic Information Dissemination

There is a significant need for traffic information dissemination in transportation systems due to its crucial role in improving overall traffic management, enhancing traveler experience, and promoting safety. By providing real-time and accurate traffic information to travelers, they can make informed decisions about their routes, departure times, and mode of transportation. This helps to reduce congestion on the road network and improve overall traffic flow. Additionally, traffic information dissemination enables transportation agencies to communicate important information such as road closures, accidents, or weather-related incidents to travelers, allowing them to plan their journeys accordingly and avoid potential delays or hazards.

Basis of Need

During the development of the Central Mississippi ITS Architecture, stakeholders recognized the need for more advanced traveler information dissemination. They highlighted the importance of informing travelers about important traffic conditions or alerts through various channels, such as roadside devices, improved coordination with third party traveler information services such as Google and Waze, and geo-referenced alerts on mobile devices. These discussions reflected the stakeholders' desire to provide travelers with timely and relevant information to enhance their travel experience and enable them to make informed decisions. By leveraging technology and innovative communication methods, the aim is to ensure that travelers have access to up-to-date information about traffic conditions, road closures, and potential hazards.

Stakeholders

Stakeholders include MDOT, cities within the Central Mississippi Region, JTRAN, and CMPDD.

Timeframe

As technologies develop the increase and advancement of traffic information dissemination within the Central Mississippi region should advance as well. It is recommended to implement increased and advanced traffic information dissemination within the next five years.

ITS Architecture Plan Conformance

The increase and advancement of traffic information dissemination for the Central Mississippi region would conform to two ITS service packages in the Central Mississippi ITS Architecture:

- TM06 – Traffic Information Dissemination
- TI01 – Broadcast Traveler Information

Regional Traffic Information Dissemination

Traffic information dissemination is crucial for promoting efficient traffic management, enhancing traveler experience, improving safety, and supporting data-driven decision making in transportation systems. Traffic information dissemination includes the use of permanent and portable DMS, in-vehicle information, web-applications, coordination with third-party applications, and direct stakeholder connections through smart phones and other devices.

Time Frame: Short-Term

Agencies: MDOT, all cities within Central Mississippi, JTRAN, CMPDD

Regional Interagency Incident Coordination

Traffic incidents, such as crashes or disabled vehicles, can have significant impacts on the transportation system and public safety. In these situations, multiple agencies, and organizations, including law enforcement, transportation departments, emergency management, and first responders, need to work together seamlessly to ensure a coordinated and effective response. Interagency coordination allows for the sharing of resources, information, and expertise, enabling a more efficient and timely resolution of the incident. By collaborating and coordinating their efforts, agencies can minimize the disruption to traffic flow, expedite the clearance of roadways, and ensure the safety of both responders and the traveling public. Additionally, interagency incident coordination facilitates the sharing of real-time information, which improves situational awareness for all involved parties and allows for better decision-making.

Basis of Need

During the stakeholder workshop, participants emphasized the importance of improving real-time signal timing to manage incident traffic and enhancing interagency coordination. Stakeholders recognized that efficient signal timings can help alleviate congestion and improve traffic flow during these incidents. Additionally, they highlighted the need for better coordination among various agencies involved in incident management, such as law enforcement, transportation departments, and emergency services. By prioritizing these aspects, stakeholders believe that incidents can be managed more effectively, resulting in reduced disruptions to traffic and enhanced overall safety for the traveling public.

Stakeholders

Stakeholders include all cities within the Central Mississippi region and MDOT.

Timeframe

Improved incident management can reduce traffic delays and improve safety. It is recommended to focus on improved interagency coordination within the next five years.

ITS Architecture Plan Conformance

The improvement of interagency incident coordination for the Central Mississippi region would conform to one ITS service package in the Central Mississippi ITS Architecture:

- TM08 – Traffic Incident Management System

Regional Interagency Incident Coordination

Stakeholders expressed the importance of coordination between agencies in regard to incident management. Efficient coordination between agencies ensures that resources are properly allocated and actions are taken promptly to minimize disruptions and restore normal traffic flow as quickly as possible.

Improve coordination in the event of a major incident between MDOT and cities within the Central Mississippi region

Time Frame: Short-Term

Agencies: All cities within Central Mississippi and MDOT

Regional Interagency Traffic Signal Coordination

Signal timing plays a crucial role in reducing congestion and improving traffic conditions. By properly coordinating the timing of traffic signals along a roadway, agencies can optimize traffic flow and minimize delays for motorists.

One key benefit of optimized signal timing is the reduction of congestion. When traffic signals are synchronized, vehicles can move more smoothly through intersections, reducing the stop-and-go traffic that often leads to congestion. This helps to maintain a steady flow of traffic, improving travel times and reducing frustration for drivers.

In addition to reducing congestion, optimized signal timing also improves overall traffic conditions. By adjusting signal timings based on traffic patterns and demand, agencies can prioritize traffic movement on major routes or during peak travel times. This can help to alleviate bottlenecks and distribute traffic more evenly across the roadway network.

Basis of Need

Stakeholders in the Central Mississippi region have emphasized the need for congestion and corridor management. It is important to improve coordination between agencies in order to enhance signal timings across jurisdictions and optimize traffic flow.

Stakeholders

Stakeholders include MDOT and all cities within the Central Mississippi region that manage their traffic signals.

Timeframe

To decrease traffic congestion and improve roadway conditions for drivers, it is recommended to improve interagency traffic signal coordination within the next five years.

ITS Architecture Plan Conformance

The improvement of interagency traffic signal coordination for the Central Mississippi region would conform to one ITS service package in the Central Mississippi ITS Architecture:

- TM03 – Traffic Signal Control

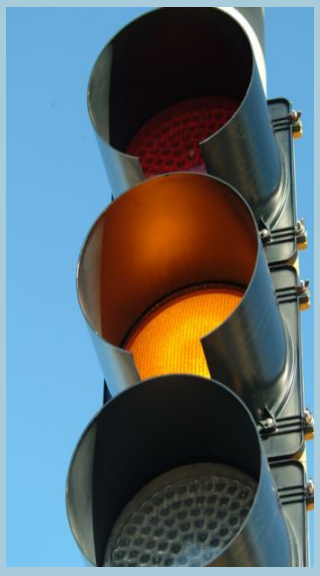
Regional Interagency Traffic Signal Coordination

Improve traffic signal coordination between MDOT and cities in the event of a major incident within the Central Mississippi region.

Traffic signal coordination improvement and coordination across jurisdictions can improve traffic conditions and alleviate bottlenecks during peak hours.

Time Frame: Short-Term

Agencies: MDOT and all cities within Central Mississippi that manage their signal systems



Regional Smart Work Zone Technologies

Smart work zone technologies refer to the use of advanced technologies and systems to improve safety and efficiency in work zones. These technologies use real-time data and intelligent systems to enhance communication, traffic management, and overall work zone operations.

Smart work zone technologies can include queue detection, speed monitoring, travel time information, and construction equipment alert systems. These technologies provide information to travelers about work zone conditions.

By implementing smart work zone technologies, agencies can enhance safety, reduce congestion, and improve the overall efficiency of work zone operations. These technologies provide timely information to drivers and improve the overall effectiveness of work zone management.

Basis of Need

Stakeholders expressed the need to utilize smart work zone technologies within the Central Mississippi region. Work zones impact travel time reliability and providing travelers with information regarding work zone conditions can improve traffic conditions.

Stakeholders

Stakeholders include all cities and counties within the Central Mississippi region and MDOT.

Timeframe

Implementing smart work zone technologies is recommended to be established in the Central Mississippi within five to ten years.

ITS Architecture Plan Conformance

Smart work zone technologies within the Central Mississippi region would conform to two ITS service packages in the Central Mississippi ITS Architecture:

- MC05 – Roadway Maintenance and Construction
- MC06 – Work Zone Management

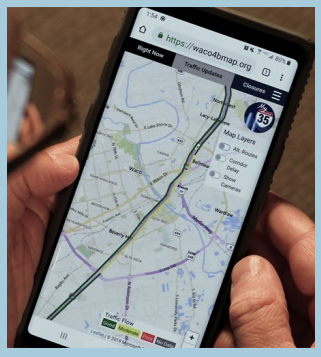
Regional Smart Work Zone Technologies

Install smart work zone technologies across Central Mississippi during roadway construction and maintenance.

Smart work zones have the potential to significantly improve the transportation network by enhancing safety, improving traffic flow, facilitating better communication, enabling data-driven decision making, and generating cost savings.

Time Frame: Medium-Term

Agencies: All cities and counties within Central Mississippi, MDOT



Regional Maintenance and Construction Coordination

Improving coordination among agencies in planned roadway maintenance and construction activities can have significant benefits, including reducing driver delays and increasing overall efficiency on roadways. Regular meetings dedicated to coordinating these activities allow all agencies involved to stay informed about upcoming closures and construction projects. A regional maintenance and construction closure real-time database that keeps track of scheduled maintenance would ensure all agencies have the necessary knowledge to effectively communicate these closures to the public.

If all agencies involved have knowledge of closures, they can collaborate to disseminate this information through various channels, such as official announcements, road signs, and digital platforms. This allows drivers to plan their routes accordingly and avoid unnecessary delays.

Basis of Need

Central Mississippi stakeholders have highlighted the need for improved coordination in maintenance and construction activities on roadways in the region. They have observed that closures are not always communicated between different agencies and to drivers. Additionally, stakeholders have emphasized the importance of notifying web mapping applications about closures in order to alert drivers of closures.

Stakeholders

Stakeholders include MDOT and all cities and counties within the Central Mississippi region.

Timeframe

Increasing interagency maintenance and construction coordination is recommended to be established in the Central Mississippi within five years.

Regional Maintenance and Construction Coordination

Improve coordination for major maintenance and construction between MDOT and cities within the Central Mississippi region.

Regional maintenance and construction coordination would allow agencies within Central Mississippi to stay informed on closures. This would also allow for the collaboration of traffic information dissemination between agencies with travelers by notifying mapping applications of closures and delays.

Time Frame: Short-Term

Agencies: MDOT and all cities and counties within Central Mississippi

ITS Architecture Plan Conformance

Improving maintenance and construction coordination in the Central Mississippi region would conform to two ITS service packages in the Central Mississippi ITS Architecture:

- MC05 – Roadway Maintenance and Construction
- MC06 – Work Zone Management

Emergency Vehicle Preemption

Emergency vehicle preemption systems are technology-based systems designed to prioritize the movement of emergency vehicles through traffic. These systems utilize a combination of GPS, radio frequency communication, and traffic signal control to give emergency vehicles the right of way at intersections.

The benefits of emergency vehicle preemption systems include reducing response times for emergency vehicles, improving safety for both emergency responders and other road users, and minimizing traffic congestion caused by emergency vehicle movements.

Basis of Need

Emergency services, including city fire departments and city police departments, from cities within Central Mississippi stated their need for emergency vehicle preemption systems. Emergency vehicle preemption systems allow for better incident management on roadways by decreasing response times.

Stakeholders

Stakeholders include MDOT and all cities within the Central Mississippi region.

Timeframe

Providing emergency vehicles with preemption technologies and installing systems on traffic signals is recommended to be implemented in the Central Mississippi within five years.

Emergency Vehicle Preemption

Install emergency vehicle preemption systems to traffic signals to assist emergency vehicles with traffic signal preemption and monitoring.

Emergency vehicle preemption systems allow emergency vehicles to navigate through traffic more efficiently, reducing response times and potentially saving lives.

Time Frame: Short-Term

Agencies: MDOT and all cities within Central Mississippi

ITS Architecture Plan Conformance

Installing emergency vehicle preemption within the Central Mississippi region would conform to two ITS service packages in the Central Mississippi ITS Architecture:

- PS02 – Emergency Response
- PS03 – Emergency Vehicle Preemption

MDOT Commercial Vehicle Parking Availability

By designating specific areas for truck parking, it helps prevent trucks from parking in hazardous locations such as ramps or road shoulders. This reduces the risk of accidents and improves traffic flow. Sufficient truck parking spaces can contribute to the efficient operation of supply chains by allowing drivers to comply with hours-of-service regulations and rest requirements.

Truck Parking Availability Systems (TPAS) are designed to provide real-time information about the availability of parking spaces at rest areas or other designated truck parking locations. These systems help truck drivers by displaying up-to-date information on parking availability, allowing them to plan their stops more efficiently. By reducing the need for drivers to park in hazardous areas such as ramps or road shoulders, TPAS can contribute to improved safety on the roads. It is important to note that the effectiveness of these systems depends on the availability of adequate parking spaces at the designated locations.

Basis of Need

Stakeholders in Central Mississippi have raised concerns about the ongoing issue of truck parking availability in the region and state. Due to a lack of available parking spaces, truck drivers often resort to parking on the shoulders of highways or off ramps. MDOT has taken steps to strengthen the shoulders of off ramps to prevent damage from parked commercial vehicles. Additionally, MDOT is currently conducting a statewide study on truck parking to further understand and address this issue.

Stakeholders

MDOT is the lead stakeholder for this regional project.

Timeframe

Increasing commercial vehicle parking and installing truck parking availability systems is recommended to be established in the Central Mississippi region within five to ten years.

ITS Architecture Plan Conformance

Increasing commercial vehicle parking information would conform to one ITS service package in the Central Mississippi ITS Architecture:

- CVO05 – Commercial Vehicle Parking

MDOT Commercial Vehicle Parking Availability

Increasing the amount of truck parking improves driver satisfaction, enhances road safety, and supports the efficient operation of the transportation network.

Install commercial vehicle parking availability signs to provide parking information to operators both pre-trip and en-route.

Time Frame: Medium-Term

Agencies: MDOT

MDOT Freeway Safety Service Patrol

Freeway Safety Service Patrols (FSSP) can improve safety and reduce congestion by supporting quick removal of disabled vehicles, clearing debris from the travel way, and supporting traffic control during large incidents. Possible services of a FSSP include providing gas, tire changes, and minor repairs to quickly move disabled vehicles from shoulders, removal of debris from travel lanes, traffic and lane control during incidents, and directing traffic during long-term closures. Some FSSP vehicles include the capability to provide short term tow relocation of disabled vehicles from freeway shoulders to safer parking areas off the freeways where the driver can perform repairs or wait for a private towing service in a safer location. These capabilities can prevent secondary crashes by removing obstacles and distractions to other drivers, as well as reduce congestion by removing stranded motorists blocking the travel lanes.

Basis of Need

During the stakeholder interview with the MDOT Statewide TMC, operators stated the TMC receives many calls requesting roadside assistance. MDOT relies heavily on law enforcement to assist stranded motorists. A FSSP within the Central Mississippi region would allow the TMC and MDOT to directly help getting stranded motorists off the roadway to prevent secondary crashes.

Stakeholders

MDOT is the lead stakeholder for this regional project.

Timeframe

Implementing a freeway safety service patrol within Central Mississippi is recommended to be established within ten years.

MDOT Freeway Safety Service Patrol

Establish deployment of a Safety Service Patrol within Central Mississippi to provide basic incident management support.

Implementing a freeway safety service patrol involves deploying trained personnel and vehicles to assist stranded motorists and manage incidents on the roadway. This proactive approach not only helps to alleviate congestion caused by incidents, but also enhances incident response times, reducing the potential for secondary crashes and improving overall safety for drivers.

Time Frame: Long-Term

Agencies: MDOT

ITS Architecture Plan Conformance

Providing the Central Mississippi region with a FSSP would conform to one ITS service package in the Central Mississippi ITS Architecture:

- PS08 – Roadway Service Patrol

MDOT Wrong-Way Driving Systems and Alerts

Wrong-way driving systems and alerts are designed to detect and warn drivers when they are traveling in the wrong direction on a roadway. These systems typically use a combination of sensors, cameras, and signage to detect and notify drivers of their incorrect path. When a wrong-way driver is detected, the system can trigger alerts such as flashing lights, audible warnings, and messages on electronic signs to immediately notify both the wrong-way driver and other motorists in the area. These alerts serve as a critical safety measure to prevent head-on collisions and potentially save lives.

Basis of Need

During the MDOT stakeholder interview, the topic of wrong-way driving was discussed, and MDOT is actively working to address this issue. In 2024, MDOT applied for a grant to install wrong-way driving systems and alerts at 70 ramps within the Central Mississippi region. However, MDOT also mentioned that regardless of the grant, they are committed to implementing wrong-way driving systems as it remains a priority for the region. This initiative aims to enhance safety by promptly notifying drivers who are traveling in the wrong direction.

Stakeholders

MDOT is the lead stakeholder for this regional project.

Timeframe

Installing wrong-way detection and warning systems is recommended to be established in the Central Mississippi region within five years.

MDOT Wrong-Way Driving Systems and Alerts

Deploy wrong-way driving systems and alerts within the Central Mississippi region to alert and divert wrong-way drivers.

Wrong-way driving systems are designed to detect when a vehicle is traveling in the wrong direction and promptly alert the driver. These systems aim to prevent potential accidents by providing immediate warnings to both the driver and nearby authorities.

Time Frame: Short-Term

Agencies: MDOT

ITS Architecture Plan Conformance

Installing wrong-way detection and warning systems in the Central Mississippi region would conform to one ITS service package in the Central Mississippi ITS Architecture:

- TM25 – Wrong-Way Vehicle Detection and Warning

JTRAN Transit Fare Management

A cashless fare system is a payment method used in transit systems where passengers are not required to use physical cash to pay for their fares. Instead, they can use electronic payment options such as contactless mobile wallets or credit/debit cards to pay for their transit rides.

A cashless transit fare management system offers several benefits. It increases efficiency by eliminating the need for cash handling, reducing transaction time and enabling quicker boarding and disembarking. A cashless transit fare system also improves security by reducing the risk of theft or robbery, as there is no physical cash involved. It provides convenience for passengers, as they can easily reload their fare cards or use contactless payment methods. Installing a fare system involves the implementation of technology and infrastructure to enable the collection and processing of fares from passengers. This typically includes the installation of ticket vending machines, fare gates, or electronic validators on vehicles.

Basis of Need

In recent years, JTRAN has made significant progress in modernizing their transit system. They have implemented AVL systems, launched a transit website, and introduced passenger counting systems. JTRAN's next priority is to upgrade their fare management systems, with plans to implement a cashless fare system. This would allow transit users to conveniently purchase passes through the JTRAN website or mobile application.

Stakeholders

JTRAN is the lead stakeholder for this regional project.

Timeframe

Installing a cashless transit fare system is recommended to be established in the Central Mississippi region within five years.

ITS Architecture Plan Conformance

A transit fare collection management system would conform to one ITS service package in the Central Mississippi ITS Architecture:

- PT04 – Transit Fare Collection Management

JTRAN Transit Fare Management

A cashless fare system enables passengers to pay for their transit rides using electronic payment methods, such as smart cards or mobile wallets, instead of physical cash. This system offers convenience, security, and efficiency by eliminating the need for cash handling and enabling faster transactions.

The installation of a fare system aims to speed up the payment process, improve efficiency, and enhance the overall passenger experience. It also allows transit agencies to gather data on ridership and revenue, which can be used for planning and optimization purposes.

Time Frame: Short-Term

Agencies: JTRAN

JTRAN Transit Vehicle Priority

Transit vehicle priority refers to the implementation of measures that give priority to public transit vehicles on roadways or at intersections. Transit vehicle priority systems are installed to improve the efficiency and reliability of public transit by reducing delays and travel times. Examples of transit vehicle priority measures include dedicated bus lanes, signal priority systems, and queue jumps at intersections. These measures help to ensure that public transit vehicles can move more smoothly through traffic, reducing congestion on the roads.

JTRAN Transit Vehicle Priority

Install transit vehicle priority systems on traffic signals to assist transit vehicles with traffic signal priority and monitoring.

Time Frame: Medium-Term

Agencies: JTRAN

Basis of Need

JTRAN stated that signal priority systems will improve the operations of transit within Central Mississippi. All new JTRAN buses will be equipped with technology to communicate with signals when a bus is approaching. However, it has been noted that signal priority systems are not currently installed on signals within the City of Jackson, indicating the need for their deployment to allow transit vehicles to benefit from signal priority.

Stakeholders

JTRAN is the lead stakeholder for this regional project. The City of Jackson is a supporting agency as systems would have to be installed on signals operated by the City.

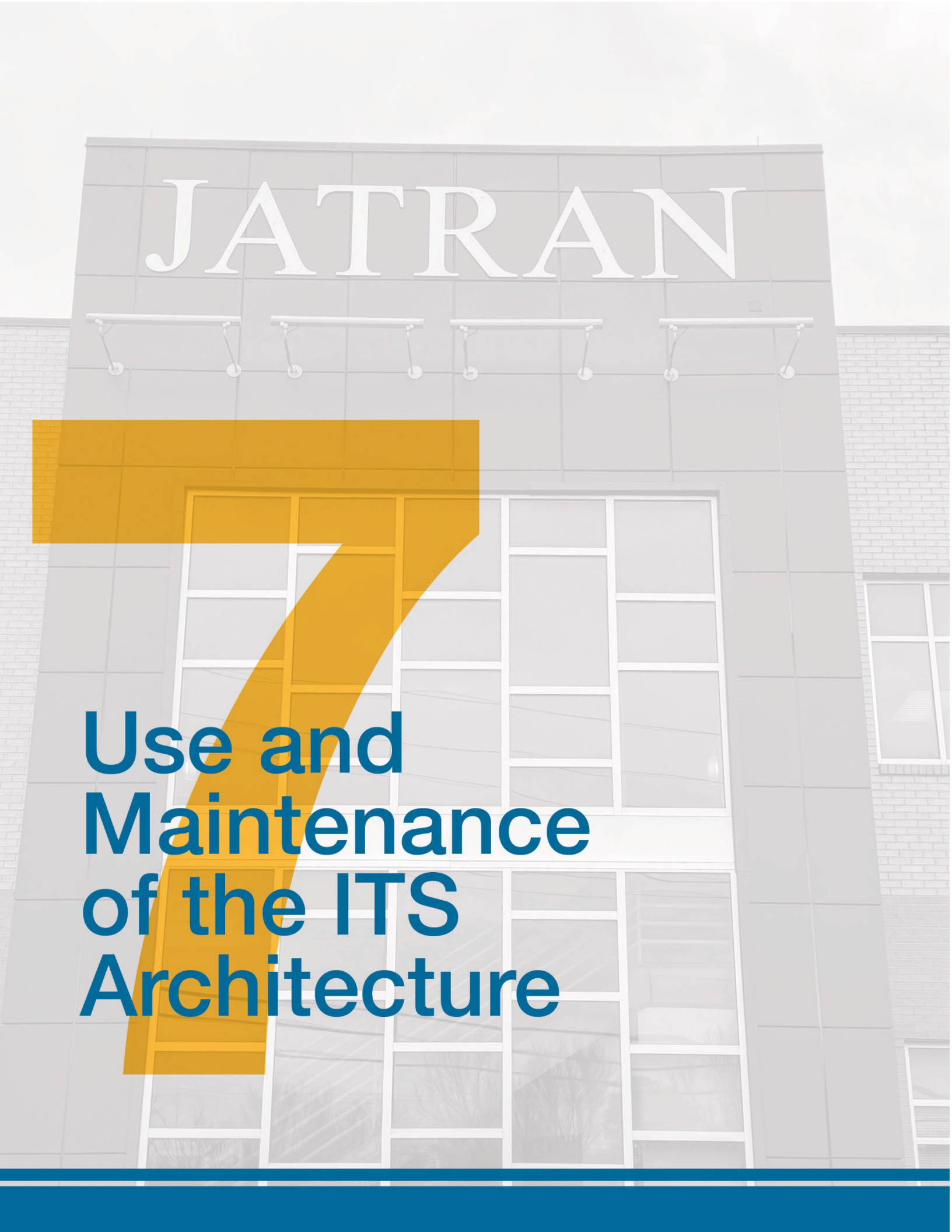
Timeframe

Installing transit signal priority systems on transit routes within Central Mississippi is recommended to be established within five to ten years.

ITS Architecture Plan Conformance

Installing transit signal priority systems in the Central Mississippi region would conform to one ITS service package in the Central Mississippi ITS Architecture:

- PT09 – Transit Signal Priority



7 Use and Maintenance of the ITS Architecture

USE AND MAINTENANCE OF THE ITS ARCHITECTURE

The Central Mississippi ITS Architecture addresses the region's vision for ITS implementation at the time the plan was developed. With the growth of the region, needs will change and as technology progresses, new ITS opportunities will arise. Shifts in regional needs and focus as well as changes in the National ITS Architecture will necessitate that the Central Mississippi ITS Architecture be updated periodically to remain a useful resource for the region. As projects are developed and deployed, it will be important that those projects conform to the ITS Architecture Plan so that they are consistent with both the region's vision for ITS as well as the national standards described in the ITS Architecture Plan. In some cases, if projects do not conform, it may be necessary to modify the ITS Architecture Plan to reflect changes in the region's vision for ITS rather than modify the project. In this section, a process for determining architecture conformity of projects is presented and a plan for how to maintain and update the ITS Architecture Plan is described.

In 2001 the FHWA issued Final Rule 23 CFR 940, which required that ITS projects using federal funds (or ITS projects that integrate with systems that were deployed with federal funds) conform to a regional ITS architecture and be developed using a systems engineering process. The purpose of this report section is to discuss how the Central Mississippi ITS Architecture can be used to support meeting the ITS architecture conformity and systems engineering requirements.

7.1 Incorporation into Regional Planning Process

Stakeholders invested considerable effort in the development of the ITS Architecture Plan. The plan needs to be incorporated into the regional planning process so that the ITS vision for the region is considered when implementing ITS projects and to ensure that the region remains eligible for federal funding for implementation of the projects. To ease this needed incorporation of separate documents, the regional ITS vision was developed specifically to reflect the transportation planning themes already identified in the greater regional transportation planning process.

FHWA and FTA require that any project that includes ITS elements and is implemented with federal funds conforms to the Central Mississippi ITS Architecture Plan. Many metropolitan or transportation planning organizations around the country now require that an agency certify that a project with ITS elements conforms to the ITS Architecture Plan before allowing the project to be included in the MTP.

7.2 Process for Determining ITS Architecture Conformity

The Central Mississippi ITS Architecture documents the customized service packages that were developed as part of the ITS architecture process. To satisfy FHWA and FTA requirements and remain eligible to use federal funds, a project must be accurately documented. The steps of the process are as follows:

1. Identify the ITS components in the project.
2. Identify the corresponding service packages from the ITS Architecture Plan.
3. Locate the component within the service package.
4. Compare the connections to other agencies or elements documented in the ITS architecture as well as the information flows between them to the connections that will be part of the project.
5. Document any changes necessary to the ITS Architecture Plan or the project to ensure there is conformance.

The steps for determining ITS architecture conformity of a project are described in more detail below.

Step 1 – Identify the ITS Components

ITS components can be fairly apparent in an ITS focused project such as CCTV or DMS deployments but could also be included in other types of projects where they are not as apparent. For example, an arterial widening project could include the installation of signal system interconnect, signal upgrades, and the incorporation of the signals in the project limits into a city's closed loop signal system. These are all ITS functions and should be included in the ITS Architecture.

Step 2 – Identify the Corresponding Service Packages

If a project was included in the list of projects in Section 6 - ITS Deployment Plan, then the applicable service package(s) for that project were also identified. However, ITS projects are not required to be included in the ITS Deployment Plan in order to be eligible for federal funding; therefore, service packages might need to be identified for projects that have not been covered in Section 6. In that case, the service packages selected and customized for the Central Mississippi region should be reviewed to determine if they adequately cover the project.

Step 3 - Identify the Component within the Service Package

Once the element is located within the appropriate service package, the evaluator should determine if the element name used in the service package is accurate or if a change to the name is needed. For example, a future element called MDOT Roadway Service Patrols was included in the Central Mississippi ITS Architecture for future implementation of a freeway safety service patrol service by MDOT. Detailed planning has not begun, and funding has not been identified, and MDOT may select a different name for the system once planning and implementation are underway. Such a name change in the project should be documented within the Central Mississippi ITS Architecture Plan.

Step 4 – Evaluate the Connections and Flows

The connections and architecture flows documented in the service package diagrams were selected based on the information available at the time the ITS Architecture was developed. As the projects are designed, decisions will be made on the system layout that might differ from what is shown in the service package. These changes in the project should be documented in the ITS service packages.

Step 5 – Document Required Changes

If any changes are needed to accommodate a project under review, Section 7.4 describes how those changes should be documented. Any changes will be incorporated during the next ITS Architecture Plan. Conformance will be accomplished by documenting how the ITS service packages should be modified so that the connections and data flows are consistent with the project.

7.3 ITS Architecture Plan Maintenance Process

CMPDD will be responsible for leading the process to update the Central Mississippi ITS Architecture Plan. **Table 12** summarizes the maintenance process agreed upon by stakeholders in the region.

Table 12: Central Mississippi ITS Architecture Plan Maintenance Plan

Maintenance Details	Full Plan Update Guidance
Timeframe for Updates	Updates will occur on an as needed basis as determined by CMPDD and FHWA. CMPDD will review the ITS Architecture Plan after major ITS deployments in the region and evaluate if an update is needed
Scope of Update	Entire ITS Architecture Plan
Lead Agency	Central Mississippi Planning and Development District
Participants	Entire Stakeholder Group
Results	Updated ITS Architecture Plan document, Appendices, RAD-IT Architecture database, and Interactive ITS Architecture on ITS Architecture page of CMPDD's website.

Stakeholders agreed that a full update of the Central Mississippi ITS Architecture Plan should occur on an as needed basis. CMPDD will work with the FHWA Mississippi Division to determine if there have been enough changes to warrant a full update. Changes that will be considered when evaluating the need to update the Architecture Plan include:

- Major ITS deployments in the region that add new functionality not currently covered in the Central Mississippi ITS Architecture Plan.
- Major updates to the National ITS Architecture that add new service packages, or substantially change existing service packages, to the extent that the Central Mississippi ITS Architecture Plan is no longer consistent with the National ITS Architecture.

As with all projects in the MTP, ITS projects are reviewed for compliance with all federal rules and regulations, just as non-ITS projects. If new proposed projects are found to be non-compliant corrective action will be taken or not included for federal funding.

CMPDD, in coordination with the FHWA Mississippi Division, will be responsible for completing updates of the Deployment Plan when needed. During the update process, all stakeholder agencies that participated in the original development of the Central Mississippi ITS Architecture Plan should be included in addition to any other agencies in the region that are deploying or may be impacted by ITS projects.

7.4 Procedure for Submitting ITS Architecture Changes Between Scheduled Updates

Updates to the Central Mississippi ITS Architecture Plan will occur as described in Section 7.3 to maintain the architecture as a useful planning tool. In between updates, ITS project owners will need to submit documentation of any requested change to the Plan to CMPDD, the maintainer of the Central Mississippi ITS Architecture and Deployment Plan.

For situations where a change is required, an ITS Architecture Maintenance Documentation Form was developed and is in **Appendix E**.

This form should be completed and submitted to the architecture maintenance contact person identified on the form whenever a change to the ITS Architecture Plan is proposed. There are several key questions that need to be answered when completing the Architecture Maintenance Documentation Form including those described on the next page.

Change Information: The type of change that is being requested can include an Administrative Change, Functional Change (Single Agency or Multiple Agency), or a Project Change. A description of each type of change is summarized below.

- **Administrative Change** – Basic changes that do not affect the structure of the ITS service packages in the ITS Architecture Plan. Examples include changes to stakeholder or element names, element status, or information flow status.
- **Functional Change (Single Agency)** – Structural changes to the ITS service packages that impact only one agency in the ITS Architecture Plan. Examples include the addition of a new ITS service package or changes to information flow connections of an existing ITS service package. The addition or change would only impact a single agency.
- **Functional Change (Multiple Agencies)** – Structural changes to the ITS service packages that have the potential to impact multiple agencies in the ITS Architecture Plan. Examples include the addition of a new ITS service package or changes to information flow connections of an existing ITS service package. The addition or changes would impact multiple agencies and require coordination between the agencies.
- **Project Change** – Addition, modification, or removal of a project in the ITS Deployment Plan section of the Central Mississippi ITS Architecture Plan.

Description of the requested change: A brief description of the type of change being requested should be included.

Service packages being impacted by the change: Each of the ITS service packages that are impacted by the proposed change should be listed on the ITS Architecture Maintenance Documentation Form. If the proposed change involves creating or modifying an ITS service package, then the agency completing the ITS Architecture Maintenance Documentation Form is asked to include a sketch of the new or modified service package.

Impact of proposed change on other stakeholders: If the proposed change is expected to have any impact on other stakeholders in the region, then those stakeholders should be listed on the ITS Architecture Maintenance Documentation Form. A description of any coordination that has occurred with other stakeholders that may be impacted by the change should be also included. Ideally all stakeholders that may be impacted by the change should be contacted and consensus should be reached on any new or modified ITS service packages that will be included as part of the ITS Architecture Plan.

Interactive ITS Architecture – Maintenance Form

The maintenance form for the Central Mississippi ITS Architecture can be found on the Central Mississippi ITS Architecture Plan website located here:

https://cmpdd.org/transportation/plans-and-programs/intelligent-transportation-systems-its-architecture/

To access a Microsoft Word version of the maintenance form, from the website select the "ITS Architecture Maintenance Form" link.

Appendix

APPENDIX A - STAKEHOLDER ATTENDANCE

Agency	Stakeholder	Email	Kick-Off Workshop	Stakeholder Interview	Stakeholder Overview
Central Mississippi Planning and Development District	Lesley Callender	lcallender@cmpdd.org	x	x	x
	Scott Burge	sburge@cmpdd.org	x		x
	Robby Burt	rburt@cmpdd.org		x	x
City of Brandon	Matthew Miller	mmiller@benchmarkms.net	x		
City of Clinton	Bill Owen	bowen@wgkengineers.com			x
City of Flowood	Paul Forster	pforster@cityofflowood.com	x	x	
City of Jackson	Robert Lee	rlee@jacksonms.gov	x	x	
City of Madison	Nick Brooks	nbrooks@madisonthecity.com		x	
	Ruth Gibbons	rgibbons@madisonthecity.com	x		
	Cole Smith	csmith@madisonthecity.com		x	
	Gene Waldrop	gwaldrop@madisonthecity.com		x	
City of Richland	Jake Shelby	jshelby@engservice.com	x		x
City of Ridgeland	Chris Bryson	chris.bryson@ridgelandms.org	x	x	x
	Alan Hart	alan.hart@ridgelandms.org		x	
	Joe Kirchner	joe.kirchner@ridgelandms.org		x	
	Brian Myers	brian.myers@ridgelandms.org		x	
	Dexter Robinson	dexter.robinson@ridgelandms.org		x	x
FHWA	Necole Baker	necole.baker@dot.gov		x	x
	Kim Thurman	kim.thurman@dot.gov			x
Hinds County	Charles Sims	csims@co.hinds.ms.us	x		
Hinds EMA	Joey Perkins	jperkins@co.hinds.ms.us	x		
JTRAN	Marilyn Guice	mguice@city.jackson.ms.us		x	
	Christine Welch	cwelch@jacksonms.gov	x		
Madison County	Tim Bryan	tim.bryan@madison-co.com	x		x
	Latashee McLaurin	Latashee.mclaurin@madison-co.com	x		
	Albert Jones	Albert.jones@madison-co.com	x		
MEMA	Casey Randolph	crandolph@mema.ms.gov	x		x
	John Michael Sledge	jsledge@mema.ms.gov	x		
MDOT	Amanda Clark	aclark@mdot.ms.gov			x
	Christie Levy	clevy@mdot.ms.gov			x

Agency	Stakeholder	Email	Kick-Off Workshop	Stakeholder Interview	Stakeholder Overview
	Neil Patterson	npatterson@mdot.ms.gov	x		x
	Amrik Singh	asignh@mdot.ms.gov	x	x	x
	James Sullivan	jssullivan@mdot.ms.gov	x	x	
	Trung Trinh	ttrinh@mdot.ms.gov			x
	Daniel Wilson	drwilson@mdot.ms.gov		x	x
Rankin County	Mark Faron	mfaron@rankincounty.org	x		
	Tim Parker	tparker@engservice.com			x
	Brian Whittington	bwhittington@rankincounty.org	x		

APPENDIX B - ITS SERVICE PACKAGE DEFINITIONS

Service Package	Service Package Name	Service Package Description
CVO05	Commercial Vehicle Parking	This service package provides parking information to commercial vehicle operators both pre-trip and en route. The parking information will be based on information collected from each truck parking area using individual sensors in each space, or in/out sensors for the area. The raw data is processed by state DOT or third party providers and supplied to fleet managers, to mobile devices used by commercial vehicle operators, to DMS on the roadway or directly to in vehicle systems as commercial vehicles approach roadway exits with key facilities such as parking. This service package also provides the ability for the commercial vehicle driver, or fleet manager to request a parking reservation.
CVO07	Roadside CVO Safety	This service package provides for automated roadside safety monitoring and reporting. It automates commercial vehicle safety inspections at roadside check locations. The basic option, directly supported by this service package, facilitates safety inspection of vehicles that have been pulled off the highway, perhaps as a result of the automated screening process provided by the Electronic Clearance (CVO03) service package. In this scenario, only basic identification data and status information is read from the electronic tag on the commercial vehicle. The identification data from the tag enables access to additional safety data maintained in the infrastructure which is used to support the safety inspection, and may also inform the pull-in decision if system timing requirements can be met. More advanced implementations collect additional data from commercial vehicles. This service package focuses on manned inspection locations. See CVO08 for remote monitoring options using smart roadside infrastructure at unmanned, virtual inspection stations.
DM01	ITS Data Warehouse	This service package provides access to transportation data to support transportation planning, condition and performance monitoring, safety analysis, and research. Configurations range from focused repositories that house data collected and owned by a single agency, district, private sector provider, or research institution to broad repositories that contain multimodal, multidimensional data from varied data sources covering a broader region. Both central repositories and physical distributed ITS data repositories are supported. Requests for data that are satisfied by access to a single repository in the ITS Data Warehouse service package may be parsed by the local repository and dynamically translated to requests to other repositories that relay the data necessary to satisfy the request. The repositories could include a data registry capability that allows registration of data identifiers or data definitions for interoperable use throughout a region.

Service Package	Service Package Name	Service Package Description
DM02	Performance Monitoring	The Performance Monitoring service package uses information collected from detectors and sensors, connected vehicles, and operational data feeds from centers to support performance monitoring and other uses of historical data including transportation planning, condition monitoring, safety analyses, and research. The information may be probe data information obtained from vehicles in the network to determine network performance measures such as speed and travel times, or it may be information collected from the vehicles and processed by the infrastructure, e.g. environmental data and infrastructure conditions monitoring data. Additional data are collected including accident data, road condition data, road closures and other operational decisions to provide context for measured transportation performance and additional safety and mobility-related measures. More complex performance measures may be derived from the collected data.
MC01	Maintenance and Construction Vehicle and Equipment Tracking	This service package tracks the location of maintenance and construction vehicles and other equipment to ascertain the progress of their activities. Checks can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations.
MC02	Maintenance and Construction Vehicle Maintenance	This service package performs vehicle maintenance scheduling and manages both routine and corrective maintenance activities on vehicles and other maintenance and construction equipment. It includes on-board sensors capable of automatically performing diagnostics for maintenance and construction vehicles, and the systems that collect this diagnostic information and use it to schedule and manage vehicle and equipment maintenance.
MC04	Winter Maintenance	This service package supports winter road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), and other snow and ice control activities. This package monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.
MC05	Roadway Maintenance and Construction	This service package supports numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way. Maintenance services include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, CCTV, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling maintenance and construction activities.

Service Package	Service Package Name	Service Package Description
MC06	Work Zone Management	This service package manages work zones, controlling traffic in areas of the roadway where maintenance, construction, and utility work activities are underway. Traffic conditions are monitored using CCTV cameras and controlled using Dynamic Message Signs (DMS), Highway Advisory Radio (HAR), gates and barriers. Work zone information is coordinated with other groups (e.g., Transportation Information Center (TIC), traffic management, other maintenance and construction centers). Work zone speeds and delays are provided to the motorist prior to the work zones. This service package provides control of field equipment in all maintenance and construction areas, including fixed, portable, and truck-mounted devices supporting both stationary and mobile work zones.
MC07	Work Zone Safety Monitoring	This service package provides warnings to maintenance personnel within a work zone about potential hazards within the work zone. It enables vehicles or the infrastructure to provide warnings to workers in a work zone when a vehicle is moving in a manner that appears to create an unsafe condition (e.g., moving at high speed or entering the work zone).
MC08	Maintenance and Construction Activity Coordination	This service package supports the dissemination of maintenance and construction activity to centers that can utilize it as part of their operations, or to Transportation Information Centers who can provide the information to travelers. Center to center coordination of work plans supports adjustments to reduce disruption to regional transportation operations.
PM01	Parking Space Management	This service package monitors and manages parking spaces in lots, garages, and other parking areas and facilities. It assists in the management of parking operations by monitoring parking lot ingress and egress, parking space occupancy and availability. Infrastructure-based detectors and/or connected vehicles may be used to monitor parking occupancy. The service package shares collected parking information with local drivers and information providers for broader distribution.
PM04	Regional Parking Management	This service package supports communication and coordination between equipped parking facilities and also supports regional coordination between parking facilities and traffic and transit management systems. This service package also shares information with transit management centers and transportation information centers to support multimodal travel planning. Information including current parking availability, system status, and operating strategies are shared to enable local parking facility management that supports regional transportation strategies.

Service Package	Service Package Name	Service Package Description
PS01	Emergency Call-Taking and Dispatch	This service package provides basic public safety call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Emergency Management Centers supports emergency notification between agencies. Wide area wireless communications between the Emergency Management Center and an Emergency Vehicle supports dispatch and provision of information to responding personnel. This service package also provides information to support dynamic routing of emergency vehicles. Traffic information, road conditions, and weather advisories are provided to enhance emergency vehicle routing. The Emergency Management Center provides routing information based on real-time conditions and has the option to request an ingress/egress route from the Traffic Management Center.
PS02	Emergency Response	This service package supports emergency/ incident response by personnel in the field. It includes emergency vehicle equipment used to provide response status as well as video or images from either the vehicle or from emergency personnel in the field. Wide area wireless communications between the Emergency Management Center, Emergency Personnel and Emergency Vehicles supports a sharing of emergency response information. The service package also includes tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident, including the functions and interfaces commonly supported by a mobile command center.
PS03	Emergency Vehicle Preemption	This service package provides signal preemption for public safety first responder vehicles. Both traditional signal preemption systems and new systems based on connected vehicle technology are covered. In more advanced systems, movement of public safety vehicles through the intersection can be facilitated by clearing queues and holding conflicting phases. In addition, this SP also covers the transition back to normal traffic signal operations after providing emergency vehicle preemption.
PS08	Roadway Service Patrols	This service package supports roadway service patrol vehicles that monitor roads and aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. If problems are detected, the roadway service patrol vehicles will provide assistance to the motorist (e.g., push a vehicle to the shoulder or median). The service package monitors service patrol vehicle locations and supports vehicle dispatch to identified incident locations. Incident information collected by the service patrol is shared with traffic, maintenance and construction, and traveler information systems.

Service Package	Service Package Name	Service Package Description
PS10	Wide-Area Alert	This service package uses ITS driver and traveler information systems to alert the public in emergency situations such as child abductions, severe weather events, civil emergencies, and other situations that pose a threat to life and property. The alert includes information and instructions for transportation system operators and the traveling public, improving public safety and enlisting the public's help in some scenarios. The ITS technologies will supplement and support other emergency and homeland security alert systems such as the Emergency Alert System (EAS). When an emergency situation is reported and verified and the terms and conditions for system activation are satisfied, a designated agency broadcasts emergency information to traffic agencies, transit agencies, information service providers, toll operators, and others that operate ITS systems. The ITS systems, in turn, provide the alert information to transportation system operators and the traveling public using ITS technologies such as dynamic message signs, highway advisory radios, in-vehicle displays, transit displays, 511 traveler information systems, and traveler information websites.
PS11	Early Warning System	This service package monitors and detects potential, looming, and actual disasters including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and acts of terrorism including nuclear, chemical, biological, and radiological weapons attacks). The service package monitors alerting and advisory systems, ITS sensors and surveillance systems, field reports, and emergency call-taking systems to identify emergencies and notifies all responding agencies of detected emergencies.

PS12	Disaster Response and Recovery	This service package enhances the ability of the surface transportation system to respond to and recover from disasters. It addresses the most severe incidents that require an extraordinary response from outside the local community. All types of disasters are addressed including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and national security emergencies such as nuclear, chemical, biological, and radiological weapons attacks). The service package supports coordination of emergency response plans, including general plans developed before a disaster as well as specific tactical plans with short time horizon that are developed as part of a disaster response. The service package provides enhanced access to the scene for response personnel and resources, provides better information about the transportation system in the vicinity of the disaster, and maintains situation awareness regarding the disaster itself. In addition, this service package tracks and coordinates the transportation resources - the transportation professionals, equipment, and materials - that constitute a portion of the disaster response. The service package identifies the key points of integration between transportation systems and the public safety, emergency management, public health, and other allied organizations that form the overall disaster response. In this service package, the Emergency Management Center represents the federal, regional, state, and local Emergency Operations Centers and the Incident Commands that are established to respond to the disaster. The interface between the Emergency Management Center and the other centers provides situation awareness and resource coordination among transportation and other allied response agencies. In its role, traffic management implements special traffic control strategies and detours and restrictions to effectively manage traffic in and around the disaster. Maintenance and construction provides damage assessment of road network facilities and manages service restoration. Transit management provides a similar assessment of status for transit facilities and modifies transit operations to meet the special demands of the disaster. As immediate public safety concerns are addressed and disaster response transitions into recovery, this service package supports transition back to normal transportation system operation, recovering resources, managing on-going transportation facility repair, supporting data collection and revised plan coordination, and other recovery activities. This service package builds on the basic traffic incident response service that is provided by TM08, the Traffic Incident Management service package. This service package addresses the additional complexities and coordination requirements that are associated with the most severe incidents that warrant an extraordinary response from outside the local jurisdictions and require special measures such as the activation of one or more emergency operations centers. Many users of ARC-IT will want to consider both TM08 and this service package since every region is

Service Package	Service Package Name	Service Package Description
		concerned with both day-to-day management of traffic-related incidents and occasional management of disasters that require extraordinary response. Disaster Response and Recovery is also supported by PS14, the "Disaster Traveler Information" service package that keeps the public informed during a disaster response. See that service package for more information.

Service Package	Service Package Name	Service Package Description
PS13	Evacuation and Reentry Management	This service package supports evacuation of the general public from a disaster area and manages subsequent reentry to the disaster area. The service package addresses evacuations for all types of disasters, including disasters like hurricanes that are anticipated and occur slowly, allowing a well-planned orderly evacuation, as well as disasters like terrorist acts that occur rapidly, without warning, and allow little or no time for preparation or public warning. This service package supports coordination of evacuation plans among the federal, state, and local transportation, emergency, and law enforcement agencies that may be involved in a large-scale evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. Information is shared with traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes. Reversible lanes, shoulder use, closures, special signal control strategies, and other special strategies may be implemented to maximize capacity along the evacuation routes. Transit resources play an important role in an evacuation, removing many people from an evacuated area while making efficient use of limited capacity. Additional shared transit resources may be added and managed in evacuation scenarios. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. Evacuations are also supported by PS14, the "Disaster Traveler Information" service package, which keeps the public informed during evacuations. See that service package for more information.

Service Package	Service Package Name	Service Package Description
PS14	Disaster Traveler Information	This service package uses ITS to provide disaster-related traveler information to the general public, including evacuation and reentry information and other information concerning the operation of the transportation system during a disaster. This service package collects information from multiple sources including traffic, transit, public safety, emergency management, shelter provider, and travel service provider organizations. The collected information is processed and the public is provided with real-time disaster and evacuation information using ITS traveler information systems. A disaster will stress the surface transportation system since it may damage transportation facilities at the same time that it places unique demands on these facilities to support public evacuation and provide access for emergency responders. Similarly, a disaster may interrupt or degrade the operation of many traveler information systems at the same time that safety-critical information must be provided to the traveling public. This service package keeps the public informed in these scenarios, using all available means to provide information about the disaster area including damage to the transportation system, detours and closures in effect, special traffic restrictions and allowances, special transit schedules, and real-time information on traffic conditions and transit system performance in and around the disaster. This service package also provides emergency information to assist the public with evacuations when necessary. Information on mandatory and voluntary evacuation zones, evacuation times, and instructions are provided. Available evacuation routes and destinations and current and anticipated travel conditions along those routes are provided so evacuees are prepared and know their destination and preferred evacuation route. Information on available transit services and traveler services (shelters, medical services, hotels, restaurants, gas stations, etc.) is also provided. In addition to general evacuation information, this service package provides specific evacuation trip planning information that is tailored for the evacuee based on origin, selected destination, and evacuee-specified evacuation requirements and route parameters. This service package augments the Traveler Information (TI) service packages that provide traveler information on a day-to-day basis for the surface transportation system. This service package provides focus on the special requirements for traveler information dissemination in disaster situations.
PT01	Transit Vehicle Tracking	This service package monitors current transit vehicle location using an Automated Vehicle Location System. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time.

Service Package	Service Package Name	Service Package Description
PT02	Transit Fixed-Route Operations	This service package performs automated dispatch and system monitoring for fixed-route and flexible-route transit services. This service performs scheduling activities including the creation of schedules, blocks and runs, as well as operator assignment. This service monitors the transit vehicle trip performance against the schedule and provides information displays at the Transit Management Center.
PT03	Dynamic Transit Operations	The Dynamic Transit Operations service package allows travelers to request trips and obtain itineraries using a personal device such as a smart phone, tablet, or personal computer. The trips and itineraries cover multiple transportation services (public transportation modes, private transportation services, shared-ride, walking and biking). This service package builds on existing technology systems such as Computer-Aided Dispatch/ Automated Vehicle Location (CAD/AVL) systems and automated scheduling software, providing a coordination function within and between transit providers that would dynamically schedule and dispatch or modify the route of an in-service vehicle by matching compatible trips together. TI06 covers other shared use transportation options.
PT04	Transit Fare Collection Management	This service package manages transit fare collection on-board transit vehicles and at transit stops using electronic means. It allows transit users to use a traveler card or other electronic payment device such as a smart phone. Readers located either in the infrastructure or on-board the transit vehicles enable electronic fare payment. Data is processed, stored, and displayed on the transit vehicle and communicated as needed to the Transit Management Center. This service supports ad-hoc payments to the transport provider (typically through the 'payment' and 'fare' flows), payments using a transport provider's account system using account-based tokens or integrated multi-provider account systems (typically through the 'account', 'secureID' and 'authorization' flows).

Service Package	Service Package Name	Service Package Description
PT05	Transit Security	This service package provides for the physical security of transit passengers and transit vehicle operators. On-board equipment performs surveillance and sensor monitoring in order to identify potentially hazardous situations. The surveillance equipment includes video (e.g., CCTV cameras), audio systems and/or event recorder systems. The sensor equipment includes threat sensors (e.g., chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors (e.g., metal detectors). Transit user or transit vehicle operator activated alarms are provided on-board. Public areas (e.g., transit stops, park and ride lots, stations) are also monitored with similar surveillance and sensor equipment and provided with transit user activated alarms. In addition this service package provides surveillance and sensor monitoring of non-public areas of transit facilities (e.g., transit yards) and transit infrastructure such as bridges, tunnels, and transit railways or Bus Rapid Transit (BRT) guideways. The surveillance equipment includes video and/or audio systems. The sensor equipment includes threat sensors and object detection sensors as described above as well as, intrusion or motion detection sensors and infrastructure integrity monitoring (e.g., rail track continuity checking or bridge structural integrity monitoring). Most of the surveillance and sensor data that is collected by this service package may be monitored by either the Emergency Management Center or the Transit Management Center, providing two possible approaches to implementing this service package. This service package also supports remote transit vehicle disabling and transit vehicle operator authentication by the Transit Management Center.
PT06	Transit Fleet Management	This service package supports automatic transit maintenance scheduling and monitoring. On-board condition sensors monitor system status and transmit critical status information to the Transit Management Center. The Transit Management Center processes this data and schedules preventative and corrective maintenance. The service package also supports the day to day management of the transit fleet inventory, including the assignment of specific transit vehicles to blocks and the assignment of transit vehicle operators to runs.
PT07	Transit Passenger Counting	This service package counts the number of passengers entering and exiting a transit vehicle using sensors mounted on the vehicle and communicates the collected passenger data back to the management center. The collected data can be used to calculate reliable ridership figures and measure passenger load information at particular stops.
PT08	Transit Traveler Information	This service package provides transit users at transit stops and on-board transit vehicles with ready access to transit information. The information services include transit stop annunciation, imminent arrival signs, and real-time transit schedule displays that are of general interest to transit users. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by this service package.

Service Package	Service Package Name	Service Package Description
PT09	Transit Signal Priority	The Transit Signal Priority service package uses transit vehicle to infrastructure communications to allow a transit vehicle to request priority at one or a series of intersections. The service package provides feedback to the transit driver indicating whether the signal priority has been granted or not. This service package can contribute to improved operating performance of the transit vehicles by reducing the time spent stopped at a red light.
PT14	Multi-modal Coordination	This service package establishes two way communications between multiple transit and traffic agencies to improve service coordination. Multimodal coordination between transit agencies can increase traveler convenience at transit transfer points and clusters (a collection of stops, stations, or terminals where transfers can be made conveniently) and also improve operating efficiency.
TM01	Infrastructure-Based Traffic Surveillance	This service package includes traffic detectors, other surveillance equipment, the supporting field equipment, and Center to Field communications to transmit the collected data back to the Traffic Management Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Traffic Management Center). The data generated by this service package enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users and the Traveler Information Center physical object.
TM03	Traffic Signal Control	This service package provides the central control and monitoring equipment, communication links, and the signal control equipment that support traffic control at signalized intersections. A range of traffic signal control systems are represented by this service package ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests. This service package is generally an intra-jurisdictional package. Systems that achieve coordination across jurisdictions by using a common time base or other strategies that do not require real time coordination would also be represented by this package. Coordination of traffic signal systems using real-time communications is covered in the TM07-Regional Traffic Management service package. This service package is consistent with typical traffic signal control systems.

Service Package	Service Package Name	Service Package Description
TM06	Traffic Information Dissemination	This service package provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, travel restrictions, incident information, and emergency alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information. This package also covers the equipment and interfaces that provide traffic information from a traffic management center to the media (for instance via a direct tie-in between a traffic management center and radio or television station computer systems), Transit Management, Emergency Management, and Transportation Information Centers. A link to the Maintenance and Construction Management Center allows real time information on road/bridge closures and restrictions due to maintenance and construction activities to be disseminated.
TM07	Regional Traffic Management	This service package provides for the sharing of information and control among traffic management centers to support regional traffic management strategies. Regional traffic management strategies that are supported include inter-jurisdictional, real-time coordinated traffic signal control systems and coordination between freeway operations and traffic signal control within a corridor. This service package advances the TM03-Traffic Signal Control and TM05-Traffic Metering service packages by adding the communications links and integrated control strategies that enable integrated, interjurisdictional traffic management. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. This package relies principally on roadside instrumentation supported by the Traffic Signal Control and Traffic Metering service packages and adds hardware, software, and fixed-point communications capabilities to implement traffic management strategies that are coordinated between allied traffic management centers. Several levels of coordination are supported from sharing of information through sharing of device control between traffic management centers.

Service Package	Service Package Name	Service Package Description
TM08	Traffic Incident Management System	This service package manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. The service package includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and through regional coordination with other traffic management, maintenance and construction management and emergency management centers as well as rail operations and event promoters. Information from these diverse sources is collected and correlated by this service package to detect and verify incidents and implement an appropriate response. This service package supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications or resource coordination between centers. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination service package and dissemination of incident information to travelers through the Broadcast Traveler Information or Interactive Traveler Information service packages. The roadside equipment used to detect and verify incidents also allows the operator to monitor incident status as the response unfolds. The coordination with emergency management might be through a CAD system or through other communication with emergency personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel. This service package is closely related with the Public Safety service packages, which focus on services that support first responders. In particular, local management of the incident using an incident command system is covered by PS02.
TM12	Dynamic Roadway Warning	This service package includes systems that dynamically warn drivers and other road users of hazards on a roadway. Such hazards include roadway weather conditions, road surface conditions, traffic conditions including queues, obstacles or animals in the roadway and any other transient event that can be sensed. These dynamic roadway warning systems can alert approaching drivers and other road users via warning signs, flashing lights, in-vehicle messages, etc. Such systems can increase the safety of a roadway by reducing the occurrence of incidents. The system can be centrally monitored and controlled by a traffic management center or it can be autonomous. Speed warnings that consider the limitations of a given vehicle for the geometry of the roadway (e.g., rollover risk for tall vehicles) are not included in this service package but are covered by the TM17 – Speed Warning and Enforcement service package. Roadway warning systems, especially queue warning systems are an Active Traffic Management (ATM) strategy and are typically used in conjunction with other ATM strategies (such as TM20-Variable Speed Limits and TM22-Dynamic Lane Management and Shoulder Use).

Service Package	Service Package Name	Service Package Description
TM13	Standard Railroad Grade Crossing	This service package manages highway traffic at Highway-Rail Intersections (HRIs) where operational requirements do not dictate more advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Both passive (e.g., the crossbuck sign) and active warning systems (e.g., flashing lights and gates) are supported. (Note that passive systems exercise only the single interface between the ITS Roadway Equipment and the driver in the physical view.) These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported to both highway and railroad officials through wayside interfaces and interfaces to the Traffic Management Center.
TM15	Railroad Operations Coordination	This service package provides an additional level of strategic coordination between freight rail operations and other transportation centers. Rail operations provides train schedules, maintenance schedules, and any other forecast events that will result in Highway-Rail Intersection (HRI) closures. This information is used to develop forecast HRI closure times and durations that may be used in advanced traffic control strategies or to enhance the quality of traveler information.
TM17	Speed Warning and Enforcement	This service package monitors vehicle speeds and supports warning drivers when their speed is excessive. Also the service includes notifications to an enforcement agency to enforce the speed limit of the roadway. Speed monitoring can be made via spot speed or average speed measurements. Roadside equipment can display the speed of passing vehicles and/or suggest a safe driving speed. Environmental conditions and vehicle characteristics may be monitored and factored into the safe speed advisories that are provided to the motorist. For example, warnings can be generated recognizing the limitations of a given vehicle for the geometry of the roadway such as rollover risk for tall vehicles. This service focuses on monitoring of vehicle speeds and enforcement of the speed limit while the variable speed limits service (covered in TM20-Variable Speed Limits service package) focuses on varying the posted speed limits to create more uniform speeds along a roadway, to promote safer driving during adverse conditions (such as fog) and/or to reduce air pollution.

Service Package	Service Package Name	Service Package Description
TM19	Roadway Closure Management	This service package closes roadways to vehicular traffic when driving conditions are unsafe, maintenance must be performed, and other scenarios where access to the roadway must be prohibited. The service package includes automatic or remotely controlled gates or barriers that control access to roadway segments including ramps and traffic lanes. Remote control systems allow the gates to be controlled from a central location or from a vehicle at the gate/barrier location, improving system efficiency and reducing personnel exposure to unsafe conditions during severe weather and other situations where roads must be closed. Surveillance systems allow operating personnel to visually verify the safe activation of the closure system and driver information systems (e.g., DMS) provide closure information to motorists in the vicinity of the closure. The equipment managed by this service package includes the control and monitoring systems, the field devices (e.g., gates, warning lights, DMS, CCTV cameras) at the closure location(s), and the information systems that notify other systems of a closure. This service package covers general road closure applications; specific closure systems that are used at railroad grade crossings, drawbridges, reversible lanes, etc. are covered by other Traffic Management service packages.
TM22	Dynamic Lane Management and Shoulder Use	This service package provides for active management of travel lanes along a roadway. The package includes the field equipment, physical overhead lane signs and associated control electronics that are used to manage and control specific lanes and/or the shoulders. This equipment can be used to change the lane configuration on the roadway according to traffic demand and lane destination along a typical roadway section or on approach to or access from a border crossing, multimodal crossing or intermodal freight depot. This package can be used to allow temporary or interim use of shoulders as travel lanes. The equipment can be used to electronically reconfigure intersections and interchanges and manage right-of-way dynamically including merges. Also, lanes can be designated for use by special vehicles only, such as buses, High Occupancy Vehicles (HOVs), vehicles attending a special event, etc. Prohibitions or restrictions of types of vehicles from using particular lanes can be implemented. The lane management system can be centrally monitored and controlled by a traffic management center or it can be autonomous. This service also can include automated enforcement equipment that notifies the enforcement agency of violators of the lane controls. Dynamic lane management and shoulder use is an Active Traffic Management (ATM) strategy and is typically used in conjunction with other ATM strategies (such as TM20-Variable Speed Limits and TM12-Dynamic Roadway Warning).

Service Package	Service Package Name	Service Package Description
TM25	Wrong-Way Vehicle Detection and Warning	This service package detects wrong-way vehicles on the main roadway and at the exit of divided freeways, tunnels, and bridges. Wrong-way vehicle drivers are immediately warned. If the driver continues onto the roadway, warnings are issued to oncoming drivers of the wrong-way entry and traffic management and public safety centers are notified.
VS08	Queue Warning	This service package utilizes connected vehicle technologies, including Vehicle-To-Infrastructure (V2I) and Vehicle-To-Vehicle (V2V) communications, to enable vehicles within the queue event to automatically broadcast their queued status information (e.g., rapid deceleration, disabled status, lane location) to nearby upstream vehicles and to centers (such as the TMC). The infrastructure will broadcast queue warnings to vehicles in order to minimize or prevent rear-end or other secondary collisions. This service package is not intended to operate as a crash avoidance system. In contrast to such systems, this service package will engage well in advance of any potential crash situation, providing messages and information to the driver in order to minimize the likelihood of his needing to take crash avoidance or mitigation actions later. It performs two essential tasks: queue determination (detection and/or prediction) and queue information dissemination using vehicle-based, infrastructure-based, or hybrid solutions.
VS09	Reduced Speed Zone Warning / Lane Closure	This service package provides connected vehicles that are approaching a reduced speed zone with information on the zone's posted speed limit and/or if the configuration of the roadway is altered (e.g., lane closures, lane shifts). Reduced speed zones include (but are not be limited to) construction/work zones, school zones, pedestrian crossing areas, and incorporated zones (e.g., rural towns). The connected vehicle uses the revised speed limit along with any applicable changed roadside configuration information to determine whether to provide an alert or warning to the driver. Additionally, to provide warnings to non-equipped vehicles, infrastructure equipment measures the speed of the approaching vehicles and if greater than the reduced speed zone posted speed limit will provide warning signage. It will provide an alert to drivers in advance when aggressive braking is required to reduce to the posted speed limit.

Service Package	Service Package Name	Service Package Description
WX01	Weather Data Collection	This service package collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. It also collects data from vehicles in the road network that can be used to directly measure or infer current environmental conditions. It leverages vehicle on-board systems that measure temperature, sense current weather conditions (rain and sun sensors) and also can monitor aspects of the vehicle operational status (e.g., use of headlights, wipers, and traction control system) to gather information about local environmental conditions. In addition, environmental sensor systems located on Maintenance and Construction Vehicles are also potential data sources. The collected environmental data is used by the Weather Information Processing and Distribution service package to process the information and make decisions on operations. The collected environmental data may be aggregated, combined with data attributes and sent to meteorological systems for data qualification and further data consolidation. The service package may also request and receive qualified data sets from meteorological systems.
WX02	Weather Information Processing and Distribution	This service package processes and distributes the environmental information collected from the Weather Data Collection service package. This service package uses the environmental data to detect environmental hazards such as icy road conditions, high winds, dense fog, etc. so operational centers and decision support systems can make decisions on corrective actions to take. The continuing updates of road condition information and current temperatures can be used to more effectively deploy road maintenance resources, issue general traveler advisories, issue location specific warnings to drivers using the Traffic Information Dissemination service package, and aid operators in scheduling work activity.

APPENDIX C - SYSTEM FUNCTIONAL REQUIREMENTS

Element Name	Functions
Archived Data User	Archive Data Repository
City of Brandon CCTV Cameras	Roadway Basic Surveillance
	Roadway Passive Monitoring
City of Brandon Fire Dispatch	Emergency Dispatch
	Emergency Response Management
City of Brandon Fire Vehicles	EV On-Board En Route Support
	Vehicle Basic Safety Communication
	Vehicle Intersection Warning
City of Brandon TMC	MCM Incident Management
	MCM Roadway Maintenance
City of Brandon Traffic Signals	Roadway Basic Surveillance
	Roadway Field Management Station Operation
	Roadway Passive Monitoring
	Roadway Signal Control
City of Brandon Website	TIC Connected Vehicle Traveler Info Distribution
	TIC Data Collection
	TIC Traveler Information Broadcast
City of Clinton CCTV Cameras	Roadway Basic Surveillance
	Roadway Passive Monitoring
City of Clinton Fire Dispatch	Emergency Dispatch
	Emergency Response Management
City of Clinton Fire Vehicles	EV On-Board En Route Support
	Vehicle Basic Safety Communication
	Vehicle Intersection Warning
City of Clinton TMC	MCM Environmental Information Collection
	MCM Environmental Information Processing
	MCM Incident Management
	MCM Infrastructure Monitoring
	MCM Roadway Maintenance
	MCM Work Zone Management
City of Clinton Traffic Signals	Roadway Basic Surveillance
	Roadway Field Management Station Operation
	Roadway Passive Monitoring
	Roadway Signal Control
City of Clinton Website	TIC Connected Vehicle Traveler Info Distribution
	TIC Data Collection
	TIC Traveler Information Broadcast
City of Flowood CCTV Cameras	Roadway Basic Surveillance
	Roadway Passive Monitoring
City of Flowood Fire Dispatch	Emergency Dispatch

Element Name	Functions
	Emergency Response Management
City of Flowood Fire Vehicles	EV On-Board En Route Support
	Vehicle Basic Safety Communication
	Vehicle Intersection Warning
City of Flowood Parking Management	Parking Area Management
	Parking Coordination
	Parking Management
City of Flowood Parking Management Equipment	Parking Area Management
	Roadway Traffic Information Dissemination
City of Flowood Police Department	Emergency Call-Taking
	Emergency Data Collection
	Emergency Dispatch
	Emergency Response Management
City of Flowood TMC	TMC Multi-Modal Coordination
	TMC Traffic Information Dissemination
City of Flowood Traffic Signals	Roadway Basic Surveillance
	Roadway Signal Control
City of Flowood Website	TIC Connected Vehicle Traveler Info Distribution
	TIC Data Collection
	TIC Traveler Information Broadcast
City of Jackson CCTV Cameras	Roadway Basic Surveillance
	Roadway Passive Monitoring
	Roadway Work Zone Safety
City of Jackson Data Archive	Archive Data Repository
	Archive Government Reporting
	Archive On-Line Analysis and Mining
	Archive Situation Data Archival
City of Jackson DMS	Roadway Traffic Information Dissemination
	Roadway Work Zone Traffic Control
City of Jackson Fire Dispatch	Emergency Dispatch
	Emergency Response Management
City of Jackson Fire Vehicles	EV On-Board En Route Support
	EV On-Board Incident Management Communication
	Vehicle Basic Safety Communication
	Vehicle Intersection Warning
City of Jackson Maintenance and Construction	MCM Work Activity Coordination
	MCM Work Zone Safety Management
City of Jackson Parking Management	Parking Coordination
	Parking Management

Element Name	Functions
City of Jackson Parking Management Equipment	Parking Area Management
City of Jackson Police Department	Emergency Call-Taking
	Emergency Data Collection
	Emergency Dispatch
	Emergency Response Management
City of Jackson Police Vehicles	EV On-Board En Route Support
	EV On-Board Incident Management Communication
	Vehicle Basic Safety Communication
	Vehicle Traveler Information Reception
City of Jackson Queue Warning	RSE Environmental Monitoring
	RSE Queue Warning
	RSE Traffic Monitoring
City of Jackson Rail Crossing	Roadway Standard Rail Crossing
City of Jackson Rail Roadway Warning	Roadway Restriction Monitoring and Warning
	Roadway Standard Rail Crossing
City of Jackson Signal Preemption	Roadway Signal Control
	Roadway Signal Preemption
City of Jackson Speed Warning	Roadway Speed Monitoring and Warning
City of Jackson TMC	Archive Data Repository
	Archive Government Reporting
	ITS Security Support
	TMC Basic Surveillance
	TMC Data Collection
	TMC Evacuation Support
	TMC Incident Detection
	TMC Incident Dispatch Coordination
	TMC Multi-Modal Coordination
	TMC Signal Control
	TMC Standard Rail Crossing Management
	TMC Traffic Information Dissemination
	TMC Work Zone Traffic Management
City of Jackson Traffic Signals	Roadway Basic Surveillance
	Roadway Signal Control
City of Jackson Website	TIC Connected Vehicle Traveler Info Distribution
	TIC Data Collection
	TIC Traveler Information Broadcast
City of Jackson Work Zone Intrusion Detector	Roadway Basic Surveillance
	Roadway Incident Detection
	Roadway Standard Rail Crossing

Element Name	Functions
	Roadway Traffic Information Dissemination
	Roadway Warning
	Roadway Work Zone Safety
	Roadway Work Zone Traffic Control
City of Madison CCTV Cameras	Roadway Basic Surveillance
	Roadway Passive Monitoring
City of Madison Fire Dispatch	Emergency Dispatch
	Emergency Response Management
City of Madison Fire Vehicles	EV On-Board En Route Support
	Vehicle Basic Safety Communication
	Vehicle Intersection Warning
City of Madison TMC	MCM Environmental Information Collection
	MCM Environmental Information Processing
	MCM Incident Management
	MCM Infrastructure Monitoring
	MCM Roadway Maintenance
	MCM Work Zone Management
City of Madison Traffic Signals	Roadway Basic Surveillance
	Roadway Signal Control
City of Madison Website	TIC Connected Vehicle Traveler Info Distribution
	TIC Data Collection
	TIC Traveler Information Broadcast
City of Pearl CCTV Cameras	Roadway Basic Surveillance
	Roadway Passive Monitoring
City of Pearl Fire Dispatch	Emergency Dispatch
	Emergency Response Management
City of Pearl Fire Vehicles	EV On-Board En Route Support
	Vehicle Basic Safety Communication
	Vehicle Intersection Warning
City of Pearl TMC	TIC Connected Vehicle Traveler Info Distribution
	TIC Data Collection
	TIC Traveler Information Broadcast
	TMC Basic Surveillance
	TMC Passive Surveillance
	TMC Roadway Equipment Monitoring
	TMC Signal Control
City of Pearl Traffic Signals	Roadway Basic Surveillance
	Roadway Field Management Station Operation
	Roadway Passive Monitoring
	Roadway Signal Control

Element Name	Functions
City of Pearl Website	TIC Connected Vehicle Traveler Info Distribution
	TIC Data Collection
	TIC Traveler Information Broadcast
City of Ridgeland CCTV Cameras	ITS Security Support
	Roadway Basic Surveillance
City of Ridgeland Data Archive	Archive Data Repository
	Archive Government Reporting
	Archive On-Line Analysis and Mining
	Archive Situation Data Archival
City of Ridgeland DMS	Roadway Traffic Information Dissemination
	Roadway Work Zone Traffic Control
City of Ridgeland Fire Dispatch	Emergency Dispatch
	Emergency Response Management
City of Ridgeland Fire Vehicles	EV On-Board En Route Support
	EV On-Board Incident Management Communication
	Vehicle Basic Safety Communication
	Vehicle Intersection Warning
City of Ridgeland Maintenance and Construction	MCM Work Activity Coordination
	MCM Work Zone Safety Management
City of Ridgeland Police Department	Emergency Call-Taking
	Emergency Data Collection
	Emergency Dispatch
	Emergency Response Management
City of Ridgeland Police Vehicles	EV On-Board En Route Support
	EV On-Board Incident Management Communication
City of Ridgeland Queue Warning	RSE Environmental Monitoring
	RSE Queue Warning
	RSE Traffic Monitoring
City of Ridgeland Rail Crossing	Roadway Standard Rail Crossing
City of Ridgeland Signal Preemption	Roadway Signal Control
	Roadway Signal Preemption
City of Ridgeland Speed Warning	Roadway Speed Monitoring and Warning
City of Ridgeland TMC	Archive Data Repository
	Archive Government Reporting
	ITS Security Support
	MCM Environmental Information Collection
	MCM Environmental Information Processing
	MCM Incident Management

Element Name	Functions
	MCM Infrastructure Monitoring
	MCM Roadway Maintenance
	MCM Work Zone Management
	TMC Basic Surveillance
	TMC Data Collection
	TMC Evacuation Support
	TMC Incident Detection
	TMC Incident Dispatch Coordination
	TMC Multi-Modal Coordination
	TMC Signal Control
	TMC Traffic Information Dissemination
	TMC Work Zone Traffic Management
City of Ridgeland Traffic Signals	Roadway Basic Surveillance
	Roadway Signal Control
City of Ridgeland Video Detection	Roadway Basic Surveillance
City of Ridgeland Website	TIC Connected Vehicle Traveler Info Distribution
	TIC Data Collection
	TIC Traveler Information Broadcast
City of Ridgeland Work Zone Intrusion Detector	Roadway Basic Surveillance
	Roadway Incident Detection
	Roadway Passive Monitoring
	Roadway Standard Rail Crossing
	Roadway Traffic Information Dissemination
	Roadway Work Zone Safety
	Roadway Work Zone Traffic Control
CMPDD Data Archive	Archive Data Repository
	Archive Government Reporting
	Archive Situation Data Archival
Commercial Vehicles	CV On-Board Electronic Screening Support
	CV On-Board Safety and Security
	CV On-Board Travel Information
Hinds County 911	Emergency Call-Taking
	Emergency Early Warning System
	Emergency Incident Command
	Emergency Response Management
	Emergency Routing
Hinds County Emergency Management Agency	Emergency Early Warning System
	Emergency Evacuation Support
	Emergency Incident Command
	Emergency Response Management

Element Name	Functions
JTRAN AVL Systems	Transit Vehicle On-Board Information Services
	Transit Vehicle On-Board Maintenance
	Transit Vehicle On-Board Paratransit Operations
	Transit Vehicle On-Board Trip Monitoring
	Transit Vehicle Schedule Management
	Transit Vehicle Security
	Archive Data Repository
	Archive Government Reporting
	Archive On-Line Analysis and Mining
	Archive Situation Data Archival
JTRAN Fixed Route Dispatch Center	ITS Management Support
	Transit Center Data Collection
	Transit Center Fare Management
	Transit Center Fixed-Route Operations
	Transit Center Information Services
	Transit Center Multi-Modal Coordination
	Transit Center Operator Assignment
	Transit Center Paratransit Operations
	Transit Center Passenger Counting
	Transit Center Security
	Transit Center Vehicle Assignment
	Transit Center Vehicle Tracking
	Transit Garage Maintenance
JTRAN Fixed-Route Vehicles	ITS Management Support
	Transit Vehicle On-Board Fare Management
	Transit Vehicle On-Board Information Services
	Transit Vehicle On-Board Maintenance
	Transit Vehicle On-Board Paratransit Operations
	Transit Vehicle On-Board Trip Monitoring
	Transit Vehicle Passenger Counting
	Transit Vehicle Schedule Management
	Transit Vehicle Security
JTRAN Maintenance Facility CCTV Camera Surveillance	Field Secure Area Sensor Monitoring
	Field Secure Area Surveillance
	ITS Management Support
	ITS Security Support
JTRAN Passenger Counters	Transit Vehicle On-Board Maintenance
	Transit Vehicle On-Board Paratransit Operations
	Transit Vehicle Passenger Counting
	Transit Vehicle Schedule Management
JTRAN Trip Routing Application	ITS Management Support

Element Name	Functions
	Personal Interactive Traveler Information
Local City CCTV Camera	Roadway Basic Surveillance
	Roadway Passive Monitoring
Local City DMS	Roadway Basic Surveillance
	Roadway Environmental Monitoring
	Roadway Traffic Information Dissemination
	Roadway Warning
	Roadway Work Zone Traffic Control
Local City Fire Dispatch	Emergency Call-Taking
	Emergency Dispatch
	Emergency Environmental Monitoring
	Emergency Incident Command
	Emergency Routing
Local City Fire Vehicles	EV On-Board En Route Support
	EV On-Board Incident Management Communication
	Vehicle Basic Safety Communication
	Vehicle Intersection Warning
Local City Maintenance and Construction	MCM Work Activity Coordination
	MCM Work Zone Management
	MCM Work Zone Safety Management
Local City Police Department	Emergency Call-Taking
	Emergency Dispatch
	Emergency Environmental Monitoring
	Emergency Incident Command
	Emergency Routing
Local City Police Vehicle	EV On-Board En Route Support
	EV On-Board Incident Management Communication
Local City Queue Warning	RSE Environmental Monitoring
	RSE Queue Warning
	RSE Traffic Monitoring
Local City Rail Crossing	Roadway Standard Rail Crossing
Local City Signal Preemption	Roadway Signal Control
	Roadway Signal Preemption
Local City Speed Warning	Roadway Speed Monitoring and Warning
Local City TMC	TMC Basic Surveillance
	TMC Evacuation Support
	TMC Incident Detection
	TMC Incident Dispatch Coordination
	TMC Passive Surveillance
	TMC Regional Traffic Management

Element Name	Functions
	TMC Roadway Equipment Monitoring
	TMC Signal Control
	TMC Standard Rail Crossing Management
	TMC Traffic Information Dissemination
	TMC Work Zone Traffic Management
Local City Traffic Signals	Roadway Basic Surveillance
	Roadway Signal Control
Local City Website	TIC Connected Vehicle Traveler Info Distribution
	TIC Data Collection
	TIC Traveler Information Broadcast
Local City Work Zone Intrusion Detector	Roadway Basic Surveillance
	Roadway Field Management Station Operation
	Roadway Incident Detection
	Roadway Passive Monitoring
	Roadway Signal Control
	Roadway Standard Rail Crossing
Madison County 911	Emergency Call-Taking
	Emergency Early Warning System
	Emergency Incident Command
	Emergency Response Management
	Emergency Routing
Madison County Emergency Management Agency	Emergency Early Warning System
	Emergency Evacuation Support
	Emergency Incident Command
	Emergency Response Management
MDOT Active Transportation Signal Operation	ITS Security Support
	SM Time Synchronization
MDOT CCTV Cameras	ITS Security Support
	Roadway Basic Surveillance
	Roadway Work Zone Traffic Control
MDOT Connected Vehicle Roadside Equipment	RSE Traveler Information Communications
MDOT Construction and Maintenance	ITS Management Support
	MCM Environmental Information Collection
	MCM Environmental Information Processing
	MCM Incident Management
	MCM Infrastructure Monitoring
	MCM Roadway Maintenance
	MCM Work Zone Management
MDOT Crash Database	Archive Data Repository
	Archive Government Reporting
MDOT Data Archive	Archive Data Repository

Element Name	Functions
	Archive Government Reporting
	Archive Situation Data Archival
MDOT District 5 Operations	ITS Management Support
	ITS Security Support
	MCM Environmental Information Collection
	MCM Environmental Information Processing
	MCM Incident Management
	MCM Infrastructure Monitoring
	MCM Roadway Maintenance
	MCM Work Zone Management
MDOT DMS	Roadway Traffic Information Dissemination
	Roadway Work Zone Traffic Control
MDOT Electric Vehicle Charging	Electric Charging Station Management
MDOT Field Sensors	ITS Management Support
	Roadway Basic Surveillance
	Roadway Environmental Monitoring
	Roadway Work Zone Traffic Control
MDOT Freeway Safety Service Patrol Dispatch	Emergency Dispatch
	Emergency Incident Command
	Emergency Response Management
	ITS Management Support
MDOT Freeway Safety Service Patrol Vehicle	EV On-Board En Route Support
	EV Service Patrol Vehicle Operations
MDOT Maintenance Vehicles	ITS Management Support
	MCV Vehicle Location Tracking
	MCV Work Zone Support
MDOT Parking Area Equipment	Parking Area Management
MDOT Queue Warning	RSE Environmental Monitoring
	RSE Queue Warning
	RSE Traffic Monitoring
MDOT RWIS Sensors	Roadway Basic Surveillance
	Roadway Environmental Monitoring
MDOT Signal Operations Center	TMC Basic Surveillance
	TMC Roadway Equipment Monitoring
	TMC Signal Control
MDOT Signal Preemption	Roadway Signal Control
	Roadway Signal Preemption
MDOT Speed Warning	Roadway Speed Monitoring and Warning
MDOT TMC	ITS Management Support
	ITS Security Support

Element Name	Functions
	TMC Basic Surveillance
	TMC Data Collection
	TMC Environmental Monitoring
	TMC Evacuation Support
	TMC Incident Detection
	TMC Incident Dispatch Coordination
	TMC Multi-Modal Coordination
	TMC Road Weather Advisories and Warnings
	TMC Signal Control
	TMC Traffic Information Dissemination
	TMC Work Zone Traffic Management
	TMC Wrong-Way Vehicle Warning
MDOT Traffic Signals	Roadway Basic Surveillance
	Roadway Signal Control
	Roadway Work Zone Traffic Control
MDOT Truck Parking Availability Sign	Parking Area Management
	Roadway Basic Surveillance
	Roadway Traffic Information Dissemination
MDOT Vehicle Speed Monitoring	Roadway Speed Monitoring and Warning
MDOT Work Zone Intrusion Detector	Roadway Work Zone Safety
	RSE Work Zone Safety
MDOT Wrong-Way Driving Detection and Warning Equipment	Roadway Basic Surveillance
	Roadway Traffic Information Dissemination
	Roadway Wrong-way Vehicle Detection
MDOTtraffic.com	ITS Management Support
	TMC Road Weather Advisories and Warnings
MEMA	Emergency Evacuation Support
	Emergency Incident Command
	Emergency Response Management
MHP Commercial Vehicle Check Equipment	CVCE Citation and Accident Electronic Recording
	CVCE Electronic Screening
	CVCE Safety and Security Inspection
MHP Dispatch	Emergency Call-Taking
	Emergency Dispatch
	Emergency Incident Command
	Emergency Response Management
	Emergency Routing
	ITS Management Support
MHP Vehicles	EV On-Board En Route Support
MHP Weigh and Inspection Station	CVAC Information Exchange

Element Name	Functions
	CVAC Safety and Security Administration
Mississippi 511 System	TIC Emergency Traveler Information
	TIC Traveler Information Broadcast
	TIC Traveler Telephone Information
Rankin County 911	Emergency Call-Taking
	Emergency Early Warning System
	Emergency Incident Command
	Emergency Response Management
	Emergency Routing
Rankin County Emergency Management Agency	Emergency Early Warning System
	Emergency Evacuation Support
	Emergency Incident Command
	Emergency Response Management
Traveler Information	Traveler Information Reception
	Traveler Interactive Information
Traveler Information Device	Traveler Information Reception
	Traveler Interactive Information
Vehicle On-Board Equipment	Vehicle Basic Safety Communication
	Vehicle Speed Management Assist
	Vehicle Traveler Information Reception

APPENDIX D - EXISTING REGIONAL ITS AGREEMENTS

MDOTTRAFFIC HQ STREAMING SERVICE
GOVERNMENTAL AND PUBLIC SAFETY END-USERS License Agreement

This MDOTtraffic HQ Streaming Service Broadcast Television Media End-Users License Agreement ("Agreement") is made by and between the Mississippi Transportation Commission, acting by and through the Executive Director of the Mississippi Department of Transportation ("Licensor"), and [Insert Government/Public Safety Organization] ("Licensee"), effective upon signature of the Licensor.

1. The Licensor is the owner of the MDOTtraffic traffic-camera master video streaming service and has the right to enter into this Agreement.

2. Licensor grants to Licensee access to its MDOTtraffic live HQ video streaming services.

3. Licensee may not exploit or monetize the video stream or feeds. Licensee may not provide the stream or any feeds on its webpage(s), specifically excepting still digital images produced from a feed.

4. This Agreement is understood as an addendum to the terms and conditions of the MDOT Web Portal Terms of Use. To the extent that any of the terms and provisions of this Agreement contravene any of that the MDOT Web Portal Terms of Use, the terms and provisions of this Agreement will control.

5. Licensee may not assign, sublicense, or otherwise transfer any of its privileges or obligations under this Agreement. MDOT reserves the right to modify or discontinue the stream and/or feeds at any time without notice and reserves the right to require payment of user fees or the immediate cessation of any use of the stream or feeds by any Licensee.

6. This agreement is governed by the laws of the State of Mississippi. All questions or concerns of the Licensee shall be directed to MDOT's Chief Information Officer at Mississippi Department of Transportation c/o Chief Information Officer, P.O. Box 1850, Jackson, MS 39215-1850, or via email at ITSSupport@mdot.ms.gov.

7. By continuing to use and access this account, Licensee acknowledges that it has read and agreed to the terms of this Agreement and the MDOT Web Portal Terms of Use.

MDOTTRAFFIC HQ STREAMING SERVICE
BROADCAST TELEVISION MEDIA END-USERS LICENSE AGREEMENT

This MDOTtraffic HQ Streaming Service Broadcast Television Media End-Users License Agreement ("Agreement") is made by and between the Mississippi Transportation Commission, acting by and through the Executive Director of the Mississippi Department of Transportation ("Licensor"), and [insert the name of the company] ("Licensee"), effective upon signature of the Licensor.

1. The Licensor is the owner of the MDOTtraffic traffic-camera master video streaming service and has the right to grant this Agreement.

2. Licensor grants to Licensee limited access to its MDOTtraffic live HQ video streaming services.

3. Licensee may not exploit or monetize the video stream or feeds. Licensee may not provide the stream or any feeds on its webpage(s), specifically excepting still digital images produced from a feed.

4. This Agreement is understood as an addendum to the terms and conditions of the MDOT Web Portal Terms of Use. To the extent that any of the terms and provisions of this Agreement contravene any of the MDOT Web Portal Terms of Use, the terms and provisions of this Agreement will control.

5. All MDOTtraffic information and video feeds will be branded with a suitable MDOT color banner logo at the top center and always remain affixed to the video feed. The data feeds will include a tag "courtesy of MDOT" within the incident description field.

5. Licensee may not assign, sublicense, or otherwise transfer any of its privileges or obligations under this Agreement. MDOT reserves the right to modify or discontinue the stream and/or feeds at any time without notice and reserves the right to require payment of user fees or the immediate cessation of any use of the stream or feeds by any Licensee.

6. This Agreement is governed by the laws of the State of Mississippi. All questions or concerns of the Licensee shall be directed to MDOT's Chief Information Officer at Mississippi Department of Transportation c/o Director of Public Affairs, P.O. Box 1850, Jackson, MS 39215-1850, or via email at comments@mdot.ms.gov.

7. By continuing use and access of this account, Licensee acknowledges that it has read and agreed to the terms of this Agreement and the MDOT Web Portal Terms of Use.

APPENDIX E - MAINTENANCE DOCUMENTATION FORM

Central Mississippi
ITS Architecture Plan
Maintenance Form

Please complete the following form to document changes to the 2024 Central Mississippi ITS Architecture Plan. Forms should be submitted to the Central Mississippi Planning and Development District (CMPDD) for review and acceptance. All accepted changes will be kept on file by CMPDD. Changes will be incorporated into the Central Mississippi ITS Architecture Plan during the next scheduled update.

Contact Information

Agency	
Agency Contact Person	
Street Address	
City	
State, Zip Code	
Telephone	
Fax	
E-Mail	

Change Information

Please indicate the type of change to the ITS Architecture or Deployment Plan:

- ☐ Administrative Change – Basic changes that do not affect the structure of the ITS service packagesin the ITS Architecture Plan.
  Examples include: Changes to stakeholder or element name, element status, or data flow status.
- ☐ Functional Change – Single Agency: Structural changes to the ITS service packages that impact only one agency in the ITS Architecture Plan.
  Examples include: Addition of a new ITS service package or changes to data flow connections of an existing ITS service package. The addition or changes would only impact a single agency.
- ☐ Functional Change – Multiple Agencies: Structural changes to the ITS service packages that have the potential to impact multiple agencies in the ITS Architecture Plan.
  Examples include: Addition of a new ITS service package or changes to data flow connections of an existing ITS service package. The addition or changes would impact multiple agencies and require coordination between the agencies.
- ☐ Project Change – Addition, modification, or removal of a project in the ITS DeploymentPlan.
- ☐ Other: _____

_____

Submittal

Please submit ITS Architecture Plan Maintenance Documentation form to:

Central Mississippi Planning and Development District
1020 Centre Pointe Blvd
Pearl, MS 39208
Phone: 601-981-1511
E-mail: mpo@cmpdd.org

Form Submittal Date: _____

ITS Architecture Plan Maintenance Form

Central Mississippi
ITS Architecture Plan
Maintenance Form

Question 1 Describe the requested change to the ITS Architecture or Deployment Plan.	
Question 2 Are any of the ITS Architecture Plan service packages impacted by the proposed change?	☐ Yes: Please complete Questions 2A and 2B ☐ No: Please proceed to Question 3 ☐ Unknown: Please coordinate with CMPDD to determine impacts of the change to the ITS Architecture Plan
Question 2A List all of the ITS service packages impacted by the proposed change.	
Question 2B Include a copy of the ITS service packages impacted by the proposed change and mark any proposed modifications to the ITS service packages. Add any additional notes on proposed changes in this section.	
Question 3 Does the proposed change impact any stakeholder agencies other than the agency completing this form?	☐ Yes: Please complete Questions 3A and 3B ☐ No: Form is complete ☐ Unknown: Please coordinate with CMPDD to determine impacts of change to other agencies in the ITS Architecture Plan
Question 3A Identify the stakeholder agencies impacted by the change and a contact person for each agency.	
Question 3B Describe the coordination that has occurred with the stakeholder agencies and the results of the coordination?	

ITS Architecture Plan Maintenance Form

Central Mississippi
ITS Architecture Plan
Maintenance Form (Example of Completed Form)

Question 1 Describe the requested change to the ITS Architecture or Deployment Plan.	*Example: City A is planning to deploy CCTV cameras for network surveillance on arterial streets. In the ITS Architecture Plan, the City A Traffic Management Center (TMC) is shown as the only center controlling the CCTV cameras. The City A TMC is now planning to provide images and control of the CCTV cameras to the City A Police Department for use during incidents.*
Question 2 Are any of the ITS Architecture Plan service packages impacted by the proposed change?	☑ Yes: Please complete Questions 2A and 2B ☐ No: Please proceed to Question 3 ☐ Unknown: Please coordinate with CMPDD to determine impacts of the change to the ITS Architecture Plan
Question 2A List all of the ITS service packages impacted by the proposed change.	*Example: TM01 – Infrastructure-Based Traffic Surveillance* *TM08 – Traffic Incident Management System*
Question 2B Include a copy of the ITS service packages impacted by the proposed change and mark any proposed modifications to the ITS service packages. Add any additional notes on proposed changes in this section.	*Example: A sketch of the TM08 – Traffic Incident Management System service package diagram for City A is attached. Changes have been marked by hand to indicate the new data connections that will be established to allow the City A TMC to send traffic images to the City A Police Department and for the City A Police Department to control the CCTV cameras. The deployment of the CCTV cameras will also result in several of the data flows in TM01 – Infrastructure-Based Traffic Surveillance being changed from planned to existing. These have also been marked on the service package diagram.*
Question 3 Does the proposed change impact any stakeholder agencies other than the agency completing this form?	☑ Yes: Please complete Questions 3A and 3B ☐ No: Form is complete ☐ Unknown: Please coordinate with CMPDD to determine impacts of change to other agencies in the ITS Architecture Plan
Question 3A Identify the stakeholder agencies impacted by the change and a contact person for each agency.	*Example: The City A TMC and City A Police Department are the two agencies impacted by this change. (Note: Assuming the City A TMC representative is completing this form, the contact person from the City A Police Department working on this project should be listed.)*
Question 3B Describe the coordination that has occurred with the stakeholder agencies and the results of the coordination?	*Example: The City A TMC and City A Police Department have had several meetings in the last year to discuss the operations of the arterial CCTV cameras. An operational agreement for the joint operations of the CCTV cameras is currently being developed.*

ITS Architecture Plan Maintenance Form