MDOT
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

HATTIESBURG REGION INTELLIGENT TRANSPORTATION SYSTEM ARCHITECTURE

VERSION 1.0

Prepared by:

URS Corporation
Gresham, Smith and Partners, MS, P.C.

August 2008

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FHWA
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DIVISION OFFICE

HATTIESBURG REGION
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FINAL VERSION

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EXECUTIVE SUMMARY

The Hattiesburg Region Intelligent Transportation System (ITS) Architecture is a framework for ITS deployment and integration in the Hattiesburg Mississippi region. The purpose of the Hattiesburg Region ITS Architecture is to provide a "road map" for the deployment of ITS programs and projects in the Hattiesburg Mississippi region over the next 20 years. While a Statewide ITS Architecture has been developed and updated for the entire state of Mississippi, this Hattiesburg Region ITS Architecture specifically concentrates on the ITS components planned for the Hattiesburg Mississippi region.

An ITS Architecture describes the "big picture" for ITS deployment in terms of individual components (i.e. subsystems) that will perform the functions necessary to deliver the desired services. An ITS Architecture supports effective and efficient deployment of transportation and ITS projects that address the transportation problems and needs. The Hattiesburg Region ITS Architecture has been developed by the Mississippi Department of Transportation (MDOT) in conjunction with various stakeholders in the Hattiesburg Mississippi region. The architecture represents a shared vision of how each agency's systems will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers. The architecture is a living document and will change as stakeholders and needs change.

VISION, MISSION, AND GOALS

MDOT, the Hattiesburg-Petal-Forrest-Lamar (HPFL) Metropolitan Planning Organization (MPO) and the various stakeholders in the Hattiesburg Mississippi region have recognized the need for vision and strategic planning with respect to ITS technology. The vision for the Hattiesburg Region ITS Architecture is one of enhanced transportation productivity, mobility, safety, efficiency and security through the use of integrated, cost-effective ITS technologies and systems and strong operational relationships.

The Hattiesburg Region ITS program mission is similar to the MDOT ITS program mission and their corresponding Mission Statement is:

"Hattiesburg Region Stakeholders will use ITS technologies to improve the quality of life for Pine Belt area residents and visitors by providing more reliable, informative, safer, and flexible passenger and freight multi-modal transportation services."

In developing the Hattiesburg Region ITS Architecture, it is important to consider the transportation-related goals of the stakeholders in the Hattiesburg Mississippi region. These transportation goals for the Hattiesburg Mississippi region were set forth by MDOT and are as follows:

GOAL ONE:

Enhance transportation system mobility and accessibility for all users, uses and modes

GOAL TWO:

Enhance regional connectivity and economic viability

GOAL THREE:

Enhance environmental quality and public safety

GOAL FOUR:

Support local values and conserve existing community resources

GOAL FIVE:

Provide a transportation planning process that informs and involves the public as well as elected officials

GOAL SIX:

Develop a long-range regional transportation plan that is consistent with all applicable federal, state and local laws

While these goals do not provide specific details regarding the deployment of individual ITS projects, they do outline the general requirements necessary when considering the development of the Hattiesburg Region's ITS program. It is from these goals that specific objectives and ITS projects will be developed.

DESCRIPTION OF REGION

The area covered by this architecture is the Hattiesburg Mississippi region, including all portions of Forrest, Lamar, Perry and Jones Counties. The region also includes the two cities with populations (based on a 2005 estimate) greater than 15,000:

- Hattiesburg
- Laurel

The region is strategically located in the southeast area of the state, near the mid-point between Jackson and Gulfport and between Meridian and New Orleans. The HPFL MPO serves as the MPO for the Hattiesburg region. Initially, MDOT will be the lead agency responsible for the utilization and maintenance/update of the Hattiesburg Region ITS Architecture. However, in the future, the HPFL MPO may assume a leading or supporting role or take the lead role. The HPFL MPO addresses transportation planning and programming issues in the Hattiesburg Mississippi metropolitan area, and is responsible for developing metropolitan transportation plans and the transportation improvement programs (TIP) within regional boundaries. The HPFL MPO boundary only covers a portion of the area covered by the Hattiesburg Region ITS Architecture.

ARCHITECTURE DEVELOPMENT PROCESS

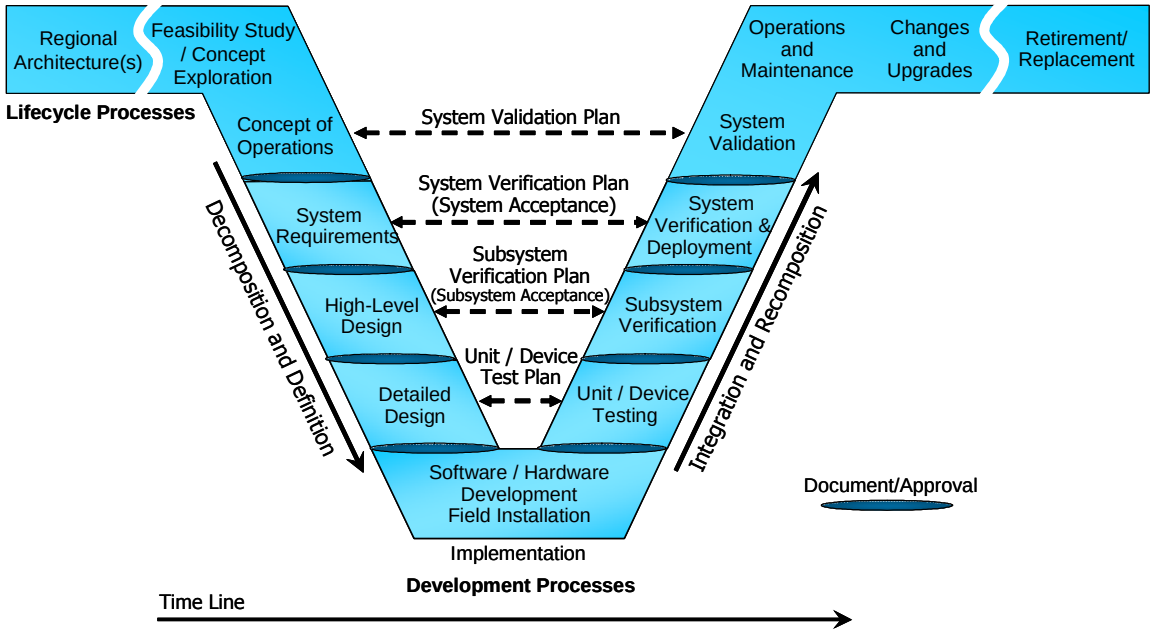
The process for developing the Hattiesburg Region ITS Architecture was based on the National ITS Architecture developed by the United States Department of Transportation (USDOT). Compliance with the National Architecture is mandatory, as set forth in Final Rule 940 published by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) on January 8, 2001, for receiving federal funds for ITS projects. By taking advantage of the USDOT's National ITS Architecture and developing a regional ITS Architecture that is consistent with the National ITS Architecture, the Hattiesburg Region will be able to take advantage of the growing supplier/vendor market for ITS products and services.

Development of the Hattiesburg Region ITS Architecture began with the identification of stakeholders and their corresponding transportation needs. The objective of this task was to identify and engage stakeholders that own or operate ITS systems and other agencies that have an interest in the transportation issues within the Hattiesburg Region. Information on existing and planned ITS projects within the region was collected through a comprehensive stakeholder survey. The survey results were then compiled and used as a baseline for the Hattiesburg Region ITS Architecture. As transportation systems become increasingly complex, it is important to ensure that the ITS systems deployed within a state or region are compatible and can be integrated with one another. This, in turn, promotes the use of common standards and facilitates the expansion of ITS systems, which will lead to national compatibility of ITS systems.

A series of stakeholder meetings was held in the Hattiesburg Region in February and May of 2008. Stakeholders from MDOT, city and county traffic engineering, law enforcement, planning, and other agencies attended one of two meetings held in Hattiesburg. During these meetings, the attendees were given an overview of the Hattiesburg Region ITS Architecture project and the National ITS Architecture effort, and common themes and user needs were addressed on a regional basis.

As illustrated in the Systems Engineering Approach recommended by the FHWA, an ITS Architecture provides a starting point for systems engineering analyses that are performed during ITS project development. The ITS Architecture is a dynamic document that requires periodic

updates to reflect changes in an agency's ITS program due to funding levels, evolving project or system requirements, or the introduction of improved technology. Once ITS projects are programmed, the ITS Architecture provides initial inputs to support the systems engineering process, including the establishment of the concept of operations, requirements, and high-level design and test planning of ITS projects. The ITS Architecture improves continuity across the project lifecycle, from planning through project development and operations. As required by the FHWA, the regional ITS Architecture serves to meet the criteria of Final Rule 940. Final Rule 940 requires that all ITS projects funded with highway trust funds be developed based on a systems engineering analysis.



Systems Engineering Approach

OPERATIONAL CONCEPT

The Hattiesburg Region ITS Architecture is intended to facilitate data sharing and cooperative control among ITS systems throughout the Hattiesburg Mississippi region. The architecture defines an operational concept that describes each stakeholder's current and future roles and responsibilities in the implementation and operation of ITS systems. The architecture describes and categorizes the stakeholders' roles and responsibilities in eleven transportation service areas. These areas provide general classifications of the functions that the participating agencies are providing or will provide. The eleven transportation service areas are:

- Archived Data Management
- Electronic Payment
- Incident Management
- Parking Management
- Transportation Planning and Architecture Maintenance
- Traffic Management
- Commercial Vehicle Operations
- Emergency Management
- Public Transportation
- Traveler Information
- Maintenance and Construction Management

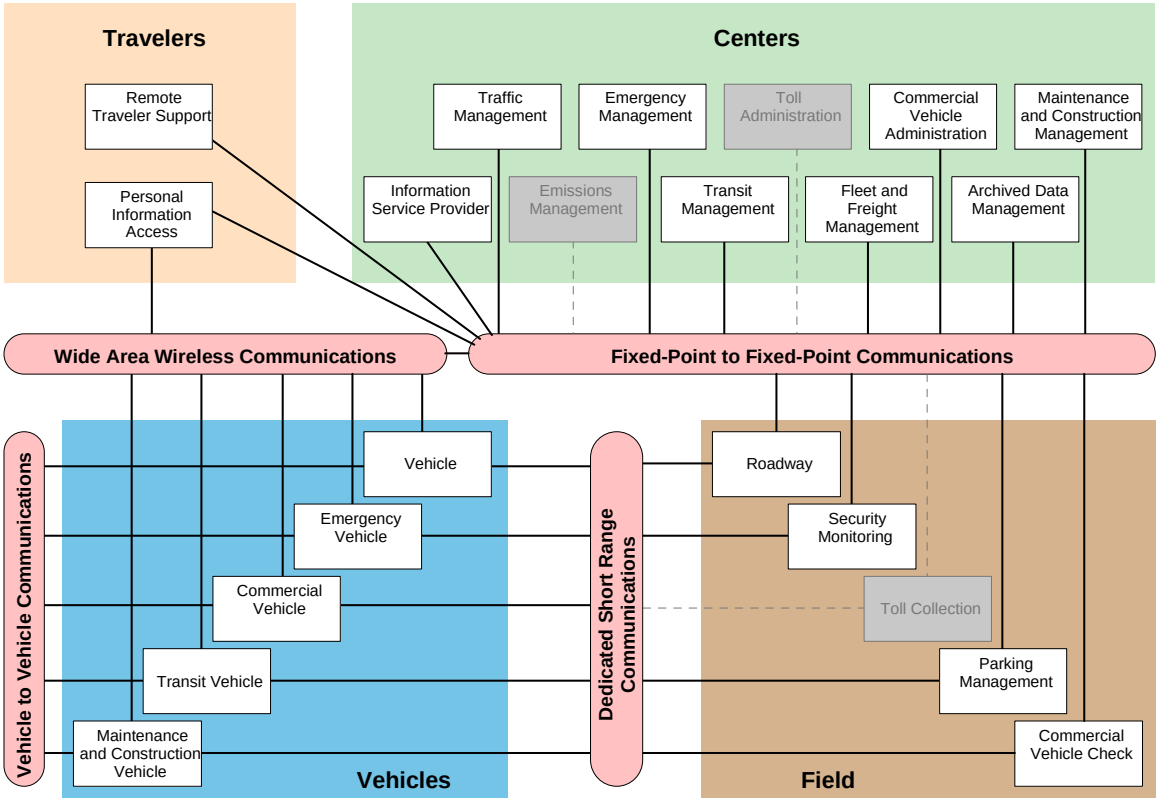
HATTIESBURG REGION ITS ARCHITECTURE

The Hattiesburg Region ITS Architecture describes coordination of overall system operations by defining interfaces between equipment and systems which have been or will be deployed by different organizational or operating agencies throughout the Hattiesburg Mississippi region. The architecture identifies the current ITS deployment and how these systems interact and communicate with each other. It also builds on the existing systems and addresses the additional components deemed necessary to grow the ITS systems in the Hattiesburg Mississippi region over the next 20 years to accommodate specific needs and to address issues of participating stakeholders.

An inventory of current and potential ITS projects in the region was gathered from discussion during the stakeholder meetings and the completed stakeholder surveys. From this effort, a set of customized services and corresponding systems and functions that could benefit stakeholders and subsystems in the region was defined.

A high-level interconnect diagram for the Hattiesburg Region ITS Architecture, often referred to as a "sausage diagram" illustrates the architecture subsystems and primary types of interconnections (or communications) between these subsystems. The sausage diagram shown below was customized to reflect the systems in the Hattiesburg Region ITS Architecture. The shaded areas indicate the functions and services that are not currently existing or planned in the Hattiesburg Mississippi region.

This diagram shows the four classes of subsystems (Travelers, Centers, Vehicles, and Field) of an ITS system and how each subsystem can communicate with the other subsystems.



APPLICABLE ITS STANDARDS

ITS Standards are fundamental to the establishment of an open ITS environment that achieves the goals originally envisioned by the USDOT. Standards facilitate deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances and new approaches evolve. Standards can be thought of as the glue that holds the various pieces of architecture together. They define how the communications within an ITS environment take place.

While the Hattiesburg Region ITS Architecture is a comprehensive plan which includes various ITS applications, it does not cover every conceivable ITS technology. As such, not all ITS standards will be applicable to the existing and planned projects. The applicable National ITS standards were identified that support the ITS projects in the Hattiesburg Mississippi region. A guide to the key ITS standards that should be considered for use in different types of ITS projects was developed in terms of an application area matrix on Page 83. The application areas are

deployment-oriented categories focused on specific ITS services or systems. They can assist deployers in finding the application area within which a particular ITS project fits.

PROJECT SEQUENCE

The Hattiesburg Region ITS Architecture recommends a sequence in which ITS projects may be implemented. The project implementation sequence is based on a combination of two factors:

- **Prioritization of projects based on existing conditions and stakeholder needs.** ITS projects were prioritized to reflect a deployment path (sequence) of stakeholder needs. As technology, funding opportunities, and requirements continue to evolve, it is expected that the HPFL MPO will reevaluate and reprioritize projects frequently.
- **Project dependencies, based on how successive ITS projects can build upon one another.** Project dependencies influence the project sequencing. It is beneficial to identify the information and functional dependencies between projects.

AGREEMENTS FOR IMPLEMENTATION AND OPERATION

The Hattiesburg Region ITS Architecture provides both a technical and institutional framework for the deployment of ITS in the Hattiesburg Mississippi region. Institutional integration involves cooperation and coordination between various agencies and jurisdictions to achieve seamless operations and interoperability. Information sharing and exchanges between systems require knowledge of the transmission protocol and data formats to ensure compatibility. Coordinating field device operations owned by different agencies requires procedures for submitting data requests and rules that govern when such requests can be honored. While all interfaces involve good working relationships between agencies for data compatibility, agreements for procedure, operation, maintenance, and training may also be critical elements to optimizing the benefits of the architecture. The Hattiesburg Region ITS Architecture identifies and summarizes common types of agreements used for implementation and operation of ITS projects and systems.

IMPLEMENTATION AND INTEGRATION STRATEGIES

The Hattiesburg Region ITS Architecture provides guidance for planning and deploying ITS projects within the Hattiesburg Mississippi region. It represents a detailed plan for the evolution of ITS systems and can be used to support transportation planning efforts and ITS project development efforts. In addition, the Hattiesburg Region ITS Architecture defines how the planning of ITS projects will be integrated into the existing Project Development Process for MDOT and the HPFL MPO. It provides information that can be used in the initial stages of project definition and development. A typical ITS project development cycle begins with project definition, followed by Request for Proposal (RFP) generation, which leads to project implementation. Information in the Hattiesburg Region ITS Architecture can assist in all phases of project development. It is through the Hattiesburg Region ITS Architecture that program management and project deployment will be a planned and coordinated effort on a regional basis.

An ITS Architecture focuses on the integration of systems to gain the maximum benefit of each system's information and capabilities across the transportation network. The most challenging issue in the integration of an ITS Architecture in the planning process is the fact that there is more than one planning process. Coordination is important among MDOT, the HPFL MPO and local cities/counties for ITS projects in their respective plans. Integration opportunities can be taken advantage of within the region and with other regions. This is the primary intent of the ITS Architecture compliance where federal funding is involved.

Another difficult issue to address is coordination of ITS project planning between the federally funded projects and non-federally funded projects. The Hattiesburg Region ITS Architecture provides a bridge between federally and non-federally funded projects and systems. Coordinating all of these projects requires an understanding by all existing and potential ITS stakeholders within the entire region. The Hattiesburg Region ITS Architecture provides a common reference point for all stakeholders to gain insight into the integration of the systems in the region.

DOCUMENTATION OF ITS ARCHITECTURES

The Hattiesburg Region ITS Architecture is documented in two forms. The first is this document, which provides an overview of the architecture and summary information regarding various aspects of the architecture. The second form of documentation is the Turbo Architecture database. The database, prepared using Turbo Architecture, a software tool developed by FHWA, captures the details of the Hattiesburg Region ITS Architecture including definitions of:

- stakeholders
- projects
- market packages
- interconnects
- functional requirements
- agreements
- inventory
- operational concept
- equipment packages
- interfaces
- standards

ARCHITECTURE MAINTENANCE

By its nature, an ITS Architecture is not a static set of outputs. The Hattiesburg Region ITS Architecture is a living document and should be modified as plans and priorities change, ITS projects are implemented, and the ITS needs and services evolve in the Hattiesburg Mississippi region. An architecture maintenance plan is developed to address the needs for maintenance and updates. The architecture maintenance plan defines the key aspects of the process for updating and maintaining the Hattiesburg Region ITS Architecture, including:

- Who is responsible for architecture maintenance?
- What will be maintained?
- How will it be maintained?

MDOT will initially be responsible for all aspects of maintenance of the Hattiesburg Region ITS Architecture; however the HPFL MPO may assume a leading or supporting role n the future.

1. INTRODUCTION

The Hattiesburg Region Intelligent Transportation System (ITS) Architecture provides a roadmap for the ITS deployment and integration in the Hattiesburg Mississippi region and ensures ITS system compatibility, connectivity, and standardization.

An ITS Architecture describes the "big picture" for ITS deployment in terms of individual components (i.e. subsystems) that will perform the functions necessary to deliver the desired services. It does not specify the technology used in project implementation, nor does it define how a project is deployed. The ITS Architecture does, however, describe the functions (e.g., gather traffic information or request a route) that are required for ITS, the physical entities or subsystems where these functions reside (e.g., the field or the vehicle), and the information flows and data flows that connect these functions and physical subsystems together into an integrated system.

The United States Department of Transportation (USDOT) set a deadline for the implementation of a regional architecture in order for an agency or region to continue receiving funding through the federal Highway Trust Fund for ITS projects. Any region that is currently implementing ITS projects shall have a regional architecture. In addition, any region that is not implementing ITS projects shall have a regional ITS Architecture within four years of the first ITS project for that region advancing to final design. Generally, rural areas may adopt the statewide architecture as their regional architecture.

The Hattiesburg Region ITS Architecture has been developed by the Mississippi Department of Transportation (MDOT). The architecture represents a vision of how each agency's systems will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in the Hattiesburg Mississippi region.

This architecture is based on a 20-year horizon for ITS activities in the Hattiesburg Mississippi region. This means that the Hattiesburg Region ITS Architecture will address existing ITS systems, as well as those planned for development over the next 20 years. It represents a

snapshot of the currently anticipated projects based on information from stakeholders. As such, the architecture requires regular updates to ensure that it accurately represents the region.

The process for developing the Hattiesburg Region ITS Architecture was based on the National ITS Architecture developed by the USDOT. Compliance with the National Architecture is mandatory, as part of Final Rule 940 published by the Federal Highway Administration (FHWA) and the policy published by the Federal Transit Administration (FTA) on January 8, 2001 for receiving federal funds for ITS projects. By taking advantage of the USDOT's National ITS Architecture for developing the Hattiesburg Region ITS Architecture, the Hattiesburg Mississippi region will be able to take advantage of consistent standards and a growing supplier/vendor market for ITS products and services. As the standards are implemented across the nation, economies of scale will be realized in the purchase and development of ITS related products and services.

1.1 Vision, Mission, and Goals

Vision

MDOT, the HPFL MPO and various stakeholders in the Hattiesburg Mississippi region have recognized the need for vision and strategic planning with respect to ITS technology. The vision for the Hattiesburg Region ITS Architecture is one of enhanced transportation productivity, mobility, safety, efficiency, and security through the use of integrated, cost-effective ITS technologies and systems and strong operational relationships.

Mission

The Hattiesburg Region ITS program mission is similar to MDOT's ITS program mission, and their corresponding Mission Statement is:

> ***"Hattiesburg Region Stakeholders will use ITS technologies to improve the quality of life for Pine Belt area residents and visitors by providing more reliable, informative, safer, and flexible passenger and freight multi-modal transportation services."***

Goals

In developing the Hattiesburg Region ITS Architecture, it was important to consider the transportation-related goals and objectives of the stakeholders in the Hattiesburg Mississippi region. All ITS projects in the Hattiesburg Mississippi region should be developed in an effort to achieve these goals and objectives. The goals and objectives were set forth by MDOT are as follows:

GOAL ONE:

Enhance transportation system mobility and accessibility for all users, uses and modes

Objectives:

- Relieve traffic congestion and decrease travel time on Hattiesburg Urbanized Area roadways.
- Optimize the use of available resources by prioritizing potential projects on the basis of their probable effectiveness in relieving congested conditions.
- Expand the availability and attractiveness of public transportation and other ridesharing modes that serve to reduce congestion by increasing average vehicle occupancy.
- Improve regional access to community facilities, recreation sites, shopping outlets, employment centers, hospitals and other medical facilities.
- Enhance the mobility of those who are elderly, physically or mentally impaired or lacking the economic means to take advantage of existing transportation options.
- Facilitate multimodal travel opportunities and intermodal goods movement.

GOAL TWO:

Enhance regional connectivity and economic viability

Objectives:

- Improve mobility between different parts of the Hattiesburg Area in order to promote the overall economic sustainability of the region as a whole.
- Optimize the use of available resources by prioritizing potential projects on the basis of their regional significance and potential benefit to the Hattiesburg Area as a whole.

- Maximize the economic development potential of transportation system improvements by giving priority consideration to potential projects that would enhance access to employment centers, ports, airports, industrial areas and other locations characterized by the concentration of significant economic activity.
- Increase the potential benefits to be derived from expenditure of scarce public resources by developing projects capable of attracting private-sector investment and broad community support.

GOAL THREE:

Enhance environmental quality and public safety

Objectives:

- Support emergency evacuation planning efforts by giving priority consideration to proposed transportation system improvements that would facilitate the safe and expeditious removal of people from the area in the event of an impending catastrophe.
- Promote the safety of motorists, pedestrians and bicyclists by giving priority consideration to potential projects that would mitigate existing safety deficiencies.
- Promote the safety of users of non-motorized modes by giving priority consideration to potential roadway or transit projects that would incorporate facilities or meet design standards intended to ensure the safety and well-being of pedestrians and bicyclists.
- Promote the safety of motorists and users of non-motorized modes by supporting the allocation of resources to upgrade grade crossing protection and warning systems on major rail lines in the region.
- Enhance air quality in the region by developing projects that would help reduce mobile-source emissions of pollutants.

GOAL FOUR:

Support local values and conserve existing community resources

Objectives:

- Preserve and make use of existing transportation infrastructure wherever possible by encouraging the development of projects that optimize available system capacity through the application of intelligent transportation system (ITS) techniques and transportation system management (TSM) concepts.
- Ensure that proposed improvements are consistent with local plans, goals, and objectives.
- Support local standards by giving priority consideration to projects that meet community expectations regarding walkability, aesthetic appeal and other quality-of-life issues.
- Support local land use and community planning activities by developing projects that are consistent with access management and traffic-calming strategies for transportation system development.

GOAL FIVE:

Provide a transportation planning process that informs and involves the public and elected officials

Objectives:

- Increase public understanding of and involvement in the regional transportation planning process.
- Identify stakeholders and encourage their participation in development of the long-range Regional Transportation Plan.
- Identify and implement appropriate strategies for securing the involvement of groups that historically have been inadequately represented in the process of planning transportation system improvements.

GOAL SIX:

Develop a long-range regional transportation plan that is consistent with all applicable federal, state and local laws.

Objectives:

- Develop a plan that meets the requirements of the U. S. Department of Transportation (Federal Highway Administration and Federal Transit Administration) and the Mississippi Department of Transportation

1.2 Description of the Region

Geographic Scope

The area covered by this architecture is the Hattiesburg Mississippi region, including all portions of Forrest, Lamar, Perry and Jones Counties. The region also includes the two cities with populations (based on a 2005 estimate) greater than 15,000:

- Hattiesburg
- Laurel

The region is strategically located in the southeast area of the state, near the mid-point between Jackson and Gulfport and between Meridian and New Orleans. The Region is serviced by Interstate 59, US Highways 11, 49 and 98 and State routes 13, 15, 29 and 42. Hattiesburg is referred to as the "Hub City" because of its geographic proximity in the state and its related road network. The region is sometimes referred to as the "Pine Belt" which refers to its large area of pine forests in the vicinity. The location of the Hattiesburg region makes it a critical point in times of hurricane evacuations form the Gulf Coasts of Mississippi, Alabama and Louisiana.

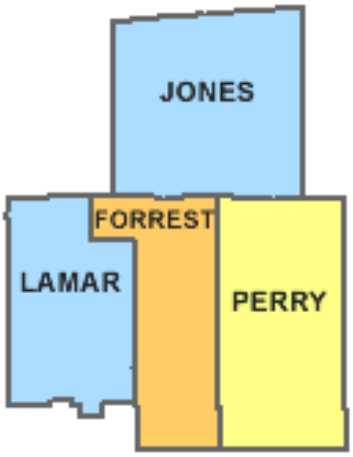


Figure 1-1. Hattiesburg Region ITS Architecture Boundaries

The HPFL MPO serves as the MPO for the Hattiesburg region. Initially, MDOT will be the lead agency responsible for the utilization and maintenance/update of the Hattiesburg Region ITS Architecture. However, in the future, the HPFL MPO may assume a leading or supporting role. The HPFL MPO addresses transportation planning and programming issues in the Hattiesburg Mississippi metropolitan area, and is responsible for developing metropolitan transportation plans and the transportation improvement programs (TIP) within regional boundaries.

Service Scope

The Hattiesburg Region ITS Architecture covers services across a broad range of ITS, including traffic management, public transportation, traveler information, commercial vehicle operations, emergency management, maintenance and construction management, archived data management, and electronic payment.

Time Frame

The timeframe considered for the Hattiesburg Region ITS Architecture is a 20-year vision for ITS activities in the Hattiesburg Mississippi region. This means that the Hattiesburg Region ITS Architecture addresses existing ITS systems as well as those planned for development over the next 20 years, and represents a vision of how each agency's systems will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective

transportation system for residents and travelers in the Hattiesburg Mississippi region. The architecture represents a snapshot of the currently anticipated projects based on information from stakeholders. As such, the architecture requires regular updates to ensure that it maintains an accurate representation of the region.

1.3 Organization of the Report

This report is organized to reflect the steps undertaken in the development of the Hattiesburg Region ITS Architecture. The major sections of the report are summarized below:

- **Section 1 – Introduction**: This section identifies the vision, mission, and goals of the Hattiesburg Region ITS Architecture. It also provides a general description of the area covered and timeframe associated with the Hattiesburg Region ITS Architecture.

- **Section 2 – ITS Architecture Development Process**: This section describes the process for developing the Hattiesburg Region ITS Architecture and summarizes the requirements of Final Rule 940 and FTA policy on ITS Architecture and Standards.

- **Section 3 – Stakeholders and Operational Concept**: This section identifies and describes participating agencies and stakeholders and their roles and responsibilities in the operation and implementation of the ITS systems and/or components within the Hattiesburg Mississippi region.

- **Section 4 – Inventory**: This section identifies the existing and planned ITS elements within the Hattiesburg Mississippi region.

- **Section 5 – User Services and Market Packages**: This section identifies a list of user services and market packages that are applicable to the Hattiesburg Mississippi region. The user services describe what transportation functions and services should be provided from the user's perspective. The market packages provide a collection of service-oriented technology bundles that can be incorporated in the development of the Hattiesburg Region ITS Architecture.

- **Section 6 – Subsystems, Equipment Packages and Functional Requirements**: The customized list of market packages developed in Section 5 was used to define the subsystems, equipment packages, and functional requirements that are necessary for the implementation of those customized market packages.

- **Section 7 – Interconnects and Architecture Flows**: This section describes the physical architecture by defining interfaces between equipment and systems that may be deployed by different organizational or operating agencies throughout the region.

- **Section 8 – ITS Standards**: This section describes a list of key standards that support the implementation of the Hattiesburg Region ITS Architecture.

- **Section 9 – Project Sequencing**: This section provides an implementation strategy as well as the sequencing of ITS projects required for implementation over the next 20 years.

- **Section 10 – Agreements**: This section identifies and summarizes a list of agreements between agencies that may be necessary for operations.

- **Section 11 – Implementation and Integration Strategy**: This section describes the relationship between the Hattiesburg Region ITS Architecture and the transportation planning process. It summarizes how the Hattiesburg Region ITS Architecture can be used to assist in transportation planning and project implementation. This section also describes the opportunities and considerations for integrating ITS projects and systems at the regional and statewide levels.

- **Section 12 – Architecture Maintenance Plan**: This section describes a process for controlled updates to the Hattiesburg Region ITS Architecture baseline so that the architecture continues to accurately reflect the existing ITS capabilities and future plans in the Hattiesburg Mississippi region.

2. ITS ARCHITECTURE DEVELOPMENT PROCESS

2.1 National ITS Architecture

The process for developing the Hattiesburg Region ITS Architecture is based on the National ITS Architecture developed by the United States Department of Transportation (USDOT). National ITS Architecture developed by the USDOT. Compliance with the National Architecture is mandatory, as part of Final Rule 940. By taking advantage of the USDOT's National ITS Architecture and developing the Hattiesburg Region ITS Architecture that is consistent with the National ITS Architecture, the Hattiesburg Mississippi region will be able to secure federal funding for ITS projects as well as take advantage of the growing supplier/vendor market for ITS products and services.

As stated previously, an ITS Architecture provides a "road map" for system development and ensures system compatibility, connectivity, and standardization. This is accomplished by:

- Identifying key stakeholders and interrelationships in the region;
- Describing required activities and/or functions to be completed;
- Defining the interconnections and interdependencies between functions; and
- Developing a "blueprint" for integration of systems.

Standardization helps by establishing a common "language" or vocabulary to describe ITS systems, which reduces confusion and facilitates communication within an organization, between organizations within a region, with contractors or clients, and among counterparts and colleagues nationwide.

The National ITS Architecture provides a common framework for planning, defining and integrating ITS systems and ensures system compatibility, connectivity, and standardization. It comprises the logical architecture and physical architecture which satisfy a defined set of user services. Compliance with the National ITS Architecture is a mandatory requirement for receiving federal funds for ITS projects. The National ITS Architecture is maintained by the USDOT and the latest version is available at http://www.iteris.com/itsarch/index.htm.

In discussing the National ITS Architecture, it is important to be familiar with certain terminologies, which are described below:

User Services describe what the system will do from the user's perspective. This term can be used to describe ITS systems in a rural, suburban, or urban setting. Identifying user services allows the process of system or project definition to begin by establishing the high-level services that will be provided to address a region's problems and/or needs. There are 33 user services defined in Version 6.0 of the National ITS Architecture. These user services are grouped by eight user service bundles, including:

- Travel and Traffic Management
- Public Transportation Management
- Electronic Payment
- Commercial Vehicle Operations
- Emergency Management
- Advanced Vehicle Safety Systems
- Information Management
- Maintenance and Construction Management

The ***Logical Architecture*** part of the National ITS Architecture "defines what must be done to support the ITS user services. It defines the processes that perform ITS functions and the information that is shared between these processes. The logical architecture consists of data flow diagrams, process specifications, and data dictionary entries. The logical architecture is not technology specific, nor does it dictate a particular implementation. This implementation independence makes the logical architecture accommodating to innovation, scalable from small-scale implementations to large regional systems, and supportive of widely varied system designs".[1]

The ***Physical Architecture*** part of the National ITS Architecture "provides agencies with a physical representation of the important ITS interfaces and major system components. It

[1] US Department of Transportation. http://itsarch.iteris.com/itsarch/html/glossary/glossary.htm.

provides a high-level structure around the processes and data flows defined in the logical architecture. The principal elements in the physical architecture are the subsystems and architecture flows that connect these subsystems and terminators into an overall structure. The physical architecture takes the processes identified in the logical architecture and assigns them to subsystems. In addition, the data flows (also from the logical architecture) are grouped together into architecture flows. These architecture flows and their communication requirements define the interfaces required between subsystems, which form the basis for much of the ongoing standards work in the ITS program".[1]

Subsystems are individual pieces of the overall ITS that perform particular functions, such as managing traffic or providing traveler information. Subsystems are grouped into four classes: centers, vehicles, field, and travelers.

Market Packages are pieces of the architecture that are required to implement a particular transportation service. It also describes a collection of equipment packages that provides the functions necessary to deliver a given ITS service. Market packages are tailored to fit real world transportation problems and needs, either separately or in combination with each other. Currently, there are a total of 91 market packages in the National ITS Architecture.

Equipment Packages group similar functions of a particular subsystem together into a package of hardware and software capabilities. They are closely associated with market packages and are used as a basis for estimating deployment costs. Currently, there are a total of 205 equipment packages defined in the National ITS Architecture.

Standards define the interfaces between physical architecture components or entities and are fundamental to the establishment of an open ITS environment. Standards also facilitate the deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances and new approaches evolve. There are currently over 110 ITS standards defined in the National ITS Architecture. By requiring compliance with these defined standards, the interoperability, interchangeability, and expandability of ITS systems can be ensured.

2.2 Hattiesburg Region ITS Architecture Development Process

The process to develop the Hattiesburg Region ITS Architecture is illustrated in Figure 2-1. Figure 2-1 shows six general steps in the "lifecycle" of an ITS Architecture. In the first four steps, the ITS Architecture products were developed, and then these products are used and maintained in Steps 5 and 6. The development process began with basic scope definition and team building and moves through increasingly detailed steps, culminating in specific products that will guide the "implementation" of the Hattiesburg Region ITS Architecture.

Development of the Hattiesburg Region ITS Architecture began with the identification of stakeholders and their corresponding transportation needs. The initial list of regional ITS stakeholders was developed from the ITS stakeholder list used for the Statewide ITS Architecture and expanded by HPFL MPO staff who were familiar with the various transportation stakeholders in the region. The objective of this task was to identify and engage stakeholders that own or operate ITS systems and other agencies interested in the transportation issues within the Hattiesburg Mississippi region. Information on existing and planned ITS projects within the region was collected from a comprehensive stakeholder survey that was distributed to ITS Stakeholders in the region. The survey results were then compiled and used as the foundation for developing the Hattiesburg Region ITS Architecture and further augmented with stakeholder input received during the two Hattiesburg Region stakeholder meetings conducted in February and May of 2008.

The stakeholders' needs were then consolidated and mapped against the market packages and the physical architecture defined in the National ITS Architecture. A market package is a "bundle" of technology services that is often purchased together as a group to provide the functions necessary to deploy the services. The selection of market packages allows for the identification of equipment packages and subsystems – a collection of building blocks for the development of an ITS Architecture. The physical architecture defines the physical entities (Subsystems and Terminators) that make up an ITS system. It defines the architecture flows that connect the various Subsystems and Terminators into an integrated system.

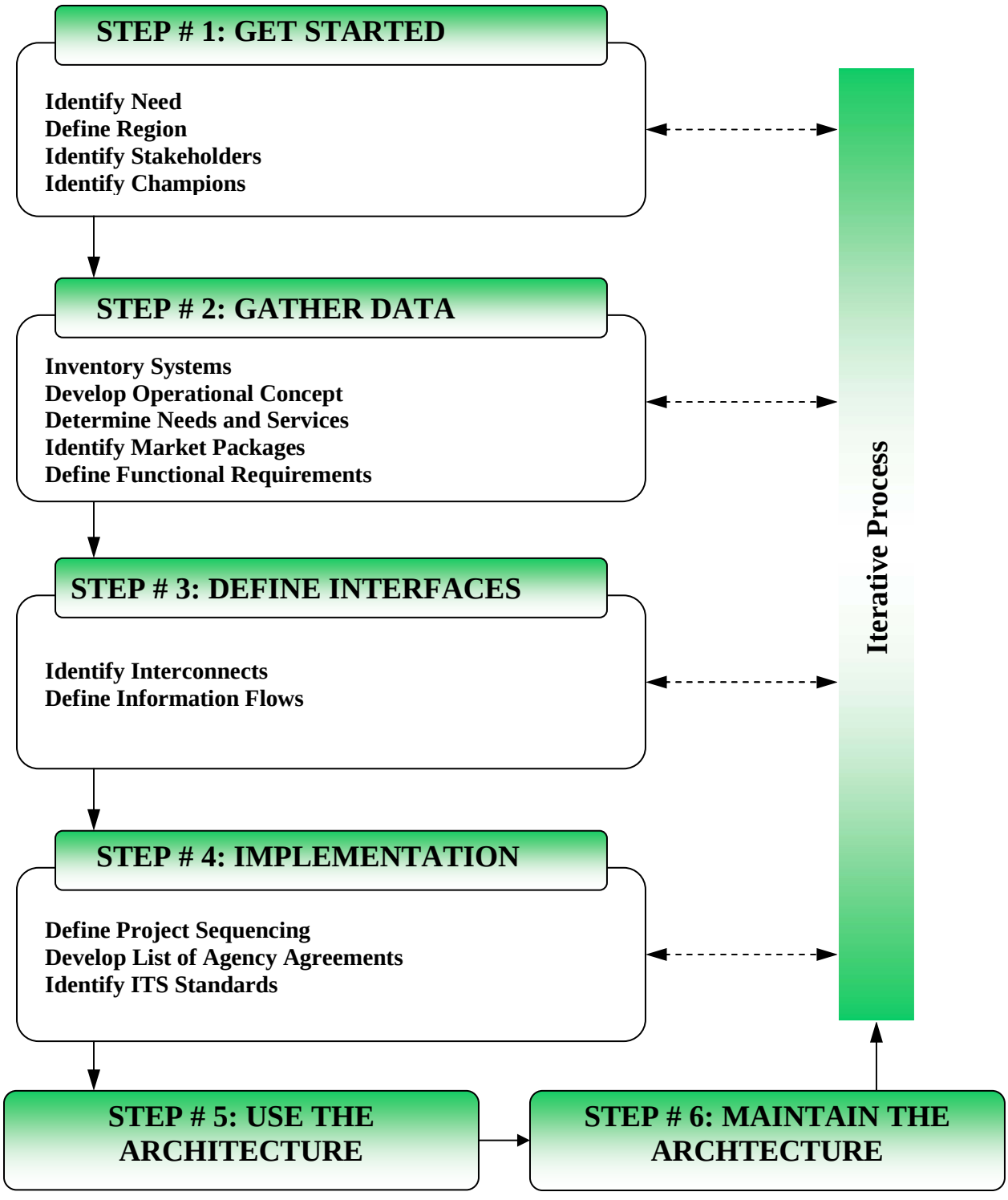


Figure 2-1. Architecture Development Process

This Hattiesburg Region ITS Architecture coordinates overall system operations by defining interfaces between equipment and systems (interconnects and architecture flows). These interfaces describe the functions of the systems by showing the information that flows between various systems and subsystems.

Upon identification of the system interfaces, additional products were defined to guide the implementation of planned ITS projects. These products include a sequence of projects, list of agency agreements required for operations, and a list of ITS standards that should be considered for project implementation.

2.3 Systems Engineering

Final Rule 940 requires that all ITS projects funded with highway trust funds be developed based on a systems engineering analysis. Systems engineering is a phrase used to describe the cyclical process of planning, designing, implementing, testing, operation, and maintenance of an ITS system or project throughout its useful life. The system engineering process begins with the development and implementation of an ITS Architecture and continues by outlining the steps and level of detail of each phase of project deployment, from high-level tasks such as establishing the Concept of Operations to very detailed component design, installation, and testing. The purpose of the system engineering process is to ensure that a well-planned foundation is in place and to affirm the requirements of an ITS system.

As illustrated in Figure 2-2, the Systems Engineering Approach recommended by the FHWA, provides a starting point for the systems engineering analyses that are performed during ITS project development. The ITS Architecture is a dynamic document that requires periodic updates to reflect changes in an agency's ITS program due to funding levels, evolving project or system requirements, or the introduction of improved technology. Once ITS projects are programmed, the ITS Architecture provides initial inputs to support the systems engineering process including the establishment of the concept of operations, requirements, high-level design and test planning of ITS projects. The ITS Architecture improves continuity across the project lifecycle, from planning through development and operations. As required by the FHWA, the Hattiesburg Region ITS Architecture serves to meet the criteria set forth in Final Rule 940.

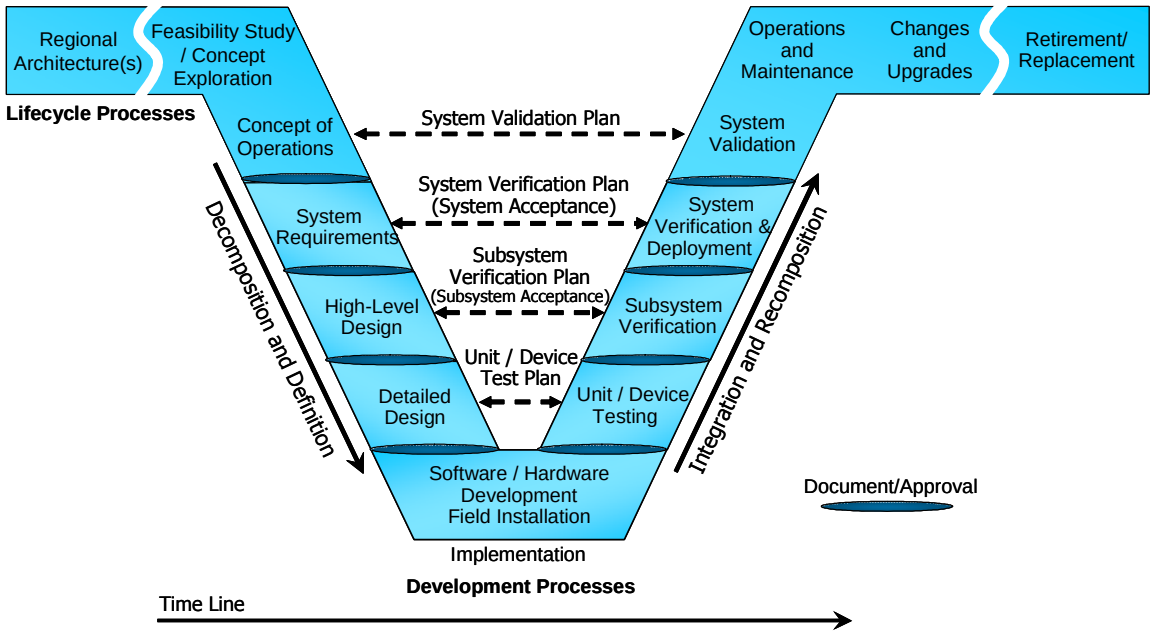


Figure 2-2. Systems Engineering Approach

2.4 Requirements of the Final FHWA Rule 940 and FTA Policy on Architecture

Final Rule 940 (23 CFR 940) and FTA Policy on ITS Architecture and Standards define a set of requirements that regional ITS Architectures should meet. Final Rule 940 and FTA Final Policy state that "ITS projects shall conform to the National ITS Architecture and Standards in accordance with the requirements. Conformance with the National ITS Architecture is interpreted to mean the use of the National ITS Architecture to develop a Regional ITS Architecture, and the subsequent adherence of all ITS projects to that regional ITS Architecture. Development of the regional ITS Architecture should be consistent with the transportation planning process for Statewide and Metropolitan Transportation Planning." Table 2-1 shows how the requirements of the rule are met by the outputs developed for the Hattiesburg Region ITS Architecture.

Table 2-1. Mapping of Requirements to Architecture Outputs

Statewide/Regional ITS Architecture Requirements	Where Requirements are Documented
Description of region	Geographic definition, as well as timeframe and scope of services are given in Section 1 of this document.
Identification of participating agencies/stakeholders, their respective needs and the existing ITS inventory	Listing of stakeholders and their definitions is given in Section 3.1 of this document. An inventory of the elements operated by the stakeholders is contained in Section 4 of this document.
An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders	The operational concept is defined in Section 3.2 of this document.
A list of any agreements (existing or new) for deployment and/or operations	A discussion of existing and new agreements is given in Section 10 of this document.
System functional requirements	The functional requirements of the ITS systems are described in an overview in Section 6 of this document, and are provided in detail in the Turbo Architecture database.
Interface requirements and information exchanges with planned and existing systems and subsystems	The interfaces and information flows are described in an overview in Section 6 of the document, and are described in detail in the Turbo Architecture database.
Identification of ITS standards supporting regional and national interoperability	An overview of the ITS standards is given in Section 8 of the document. The detailed listing of ITS standards applicable to each interface in the architecture is described in the Turbo Architecture database.
The sequence of projects required for implementation	Projects and their sequencing are covered in Section 9 of this document.

As summarized in Table 2-1, this document, with the Turbo Architecture database for the Hattiesburg Region ITS Architecture, satisfies the mandatory requirements defined in Final Rule 940 and Policy set forth by the FHWA and FTA.

3. STAKEHOLDERS AND OPERATIONAL CONCEPT

3.1 Identification of Participating Agencies and Stakeholders

Stakeholders are commonly considered to be those who own or operate ITS systems in the region as well as those who have an interest in regional transportation issues. Stakeholders provide crucial input regarding the region's transportation investment and ITS deployments, and stakeholder participation and coordination is critical to the successful development of an ITS Architecture. Through an extensive outreach process, including meetings and surveys, a wide range of participating agencies and stakeholders for the Hattiesburg Region ITS Architecture were identified. Table 3-1 lists the agencies and stakeholders participating in the implementation and operation of the ITS projects in the region.

Table 3-1 includes both specific individual stakeholders and broadly defined generic stakeholders. Generic stakeholders, representing a group of stakeholders that provide similar roles, responsibilities and functions, are typically at county/city levels. The main purpose of defining and using generic stakeholder was to allow a more efficient way to organize the Hattiesburg Region ITS Architecture and to keep the architecture at a maintainable level.

Table 3-1. Hattiesburg Region ITS Architecture Stakeholders

Stakeholder	Description
AMTRAK	Commercial rail service providing passenger rail transportation.
Camp Shelby	A U.S. Army training installation located in Forrest County. Military convoys arrive in and depart from Camp Shelby throughout the year.
City of Hattiesburg	City of Hattiesburg departments/services include Urban Development, Police, Fire and Public Services. The City also has a Traffic Control Center (TCC) and related Roadside Equipment.
City of Laurel	City of Laurel departments/services include Planning Development, Police, Fire and Public Works.
City/County 911 Dispatch Centers	A stakeholder group representing 911 dispatch centers that receive 911 emergency call and dispatch sheriff, police, fire and EMS within the jurisdiction areas. Dispatch centers may belong to city police departments, county sheriffs' offices or university police.
City/County Public Safety Agencies	A stakeholder group representing agencies and stakeholders (sheriff, police, fire and EMS) that receive emergency calls and respond to emergency dispatch within the jurisdiction area.

Stakeholder	Description
County Emergency Management Agencies (EMA)	A stakeholder group representing county civil defense and emergency management agencies promoting emergency preparedness, assisting with the coordination of disaster response and recovery operations, and encouraging mitigation efforts before, during and after a disaster or major emergency.
Educational Institutions	A stakeholder group representing public and private schools, colleges and universities. Stakeholder group members may have or provide transportation/transit services.
Greyhound Bus Service	Commercial provider of passenger transportation service between cities.
Hattiesburg-Laurel Regional Airport	Hattiesburg-Laurel Regional Airport is a general aviation airport that serves air traffic in the Hattiesburg Mississippi region.
Hattiesburg-Petal-Forrest-Lamar (HPFL) MPO	Serves as the MPO for the Hattiesburg urbanized area.
Hub City Transit	Hub City Transit is public transportation service provided by the City of Hattiesburg. Hub City transit is managed by the Planning and Development Department and is a designated recipient of State and Federal funding for urban transportation in the Hattiesburg area.
Intermodal Rail Facilities	Represent railroad intermodal facilities which transport goods between railroad and other transportation modes including truck and water. The terminals coordinate freight movement with fleet-freight management, gather information on traffic conditions, and provide information on intermodal freight activities that is pertinent to traffic movement in the surrounding area.
Local Cities and Counties	This stakeholder group represents cities with a population < 15,000 as well as the counties of Forrest, Lamar, Perry and Jones. These jurisdictions may contain public works, engineering departments, community development, fire, and police.
Local Traffic Generators	A stakeholder group representing agencies and stakeholders that share knowledge of events (date, time, location, duration, etc.) that may impact travel on roadways with MDOT, city/county governments, and emergency service providers.
Media Outlets	Provide public broadcast of information pertaining to travel conditions, incidents, special events and other transportation related news services to the traveling public through radio, TV and other media.
Medical Providers	A stakeholder group representing hospitals and other medical care facilities/institutions.
Mississippi Department of Transportation (MDOT)	MDOT plans, constructs, maintains and improves the state's roads and bridges, and provides planning and financial support for other modes of transportation.
MDOT District 6	The Hattiesburg Mississippi regional area is under the jurisdiction of MDOT District 6 which serves the counties of Forrest, Lamar, Perry and Jones and other counties not part of the jurisdiction of the proposed Hattiesburg Regional TMC.

Stakeholder	Description
Mississippi Emergency Management Agency (MEMA)	Plans and coordinates with local emergency service providers to respond to threats from technological, man-made and natural origins; activates Emergency Operations Center, allocates resources, and maintains operational control of the State Emergency Response Team, the Mobile Operations Center, the Disaster Reconnaissance Team and the communications/state warning point section.
Mississippi Bureau of Investigations	A bureau of the Mississippi Dept. of Public Safety that is responsible for issuing AMBER Alerts.
Mississippi Department of Environmental Quality	A government agency that works with MEMA and other agencies to respond to truck or train hazardous material incidents.
Mississippi Department of Public Safety	A government agency that protects citizens and property by enforcing state laws, deterring criminal activity, assuring highway and public safety, and providing scientific, technical, and operational support to other criminal justice agencies.
Mississippi Highway Patrol (MHP)	A division of the Mississippi Department of Public Safety which routinely patrols state roadways, including interstates, state highways and secondary county roads, enforces motor vehicle laws, and assists in major incidents.
Mississippi Office of Homeland Security (OHS)	An office of the Mississippi Dept. of Public Safety that coordinates maintains and administers homeland security practices within the state.
Mississippi Public Service Commission	Motor Carrier Division that manages motor carrier applications and registrations within the state.
Mississippi Tax Commission	Tax Commission administers tax laws of the state and manages motor carrier applications and registrations within the state.
National Weather Service (NWS)	The National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.
Private Trucking Companies	A stakeholder group representing trucking companies that operate commercial vehicles.
Railroad Companies	A stakeholder group representing owner/operators of rail transportation facilities and associated ITS equipment and communications. Includes Kansas City Southern, Canadian National, Illinois Central, CSC, BNSF, and Norfolk Southern.
Southern Mississippi Planning And Development District (SMPDD)	Serves the South Mississippi region and provides transportation planning and technical assistance services to various agencies within the region.
Transit Service Providers	A stakeholder group that provides fixed-time, demand responsive, or intercity transit services to the general public, elderly, disabled, school students, and others within the Hattiesburg Mississippi region.

3.2 Operational Concept

An operational concept defines each stakeholder's current and future roles and responsibilities in the implementation and operation of the regional ITS systems. Table 3-2 summarizes the general roles and responsibilities of the participating stakeholders identified above. As illustrated, the roles and responsibilities are categorized into eleven transportation service areas. These transportation service areas provide general classifications of what functions the participating agencies are providing or will provide. The eleven service areas and their major functions are described below.

Archived Data Management – Represents the functions that collect, process, store and utilize transportation data for traffic, accidents, maintenance and construction, public transportation, commercial vehicle, vehicle emissions, parking and other types of transportation related data.

Commercial Vehicle Operations – Represents the administrative functions that support commercial vehicle credentials, tax, and safety regulations.

Emergency Management – Represents the functions that provide emergency call taking, public safety dispatch, disaster response and evacuation, securing monitoring and other security and public safety-oriented services.

Incident Management – Represents the functions that manage both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. It includes incident detection and verification, appropriate incident response, and regional coordination between traffic management agencies, maintenance and construction management agencies, emergency management agencies and others.

Maintenance and Construction Management – Represents the functions that provide construction management and maintenance of roadways.

Public Transportation – Represents the functions that plan, manage, operate and maintain transit services. It also includes the function that provides transit traveler information.

Traffic Management – Represents the functions that manage a broad range of transportation facilities including freeway systems, rural and suburban highway systems, and urban and suburban traffic control systems. In the context of this project, it primarily includes network monitoring, traffic signal control, traffic information dissemination, and highway-rail intersection management.

Traveler Information – Represents the functions that collect, process, store, and disseminate static and real time transportation information to the traveling public.

Transportation Planning and Architecture Maintenance – Represents transportation planning functions and other related services. It also includes roles and responsibilities for the development and maintenance of an ITS Architecture within the stakeholder's jurisdictional boundary.

Parking Management – Represents the functions for electronic monitoring and management of parking facilities. It supports a dedicated short-range communications (DSRC) link to the Vehicle Subsystem that allows electronic collection of parking fees. It also includes the instrumentation, signs, and other infrastructure that monitors parking lot usage and provides local information about parking availability and other general parking information.

Table 3-2. Operational Concept for the Hattiesburg Region ITS Architecture

Stakeholder	Transportation Service	Role/Responsibility	Status
City of Hattiesburg	Emergency Management	Support disaster response, recovery and evacuation.	Existing
	Incident Management	Coordinate incident information and response with local incident response agencies.	Existing
		Perform incident detection and verification through video surveillance.	Planned
		Distribute incident information to the public.	Planned
		Operate roadside equipment for incident response.	Planned
	Maintenance and Construction Management	Coordinate construction and maintenance activities with other agencies, as needed.	Existing
	Surface Street Management	Notify MDOT District office of incidents or events that will impact freeway operations.	Existing
		Operate and maintain signal systems and other infrastructure as required.	Existing
		Request traffic management assistance from law enforcement agencies as needed.	Existing
	Traffic Management	Provide road closure updates and live traffic conditions (sharing MDOT camera images) to the public via website.	Existing
City of Laurel	Emergency Management	Support disaster response, recovery and evacuation.	Existing
	Incident Management	Coordinate incident information and response with local incident response agencies.	Existing
		Distribute incident information to the public.	Existing
	Maintenance and Construction Management	Coordinate construction and maintenance activities with other agencies, as needed.	Existing
	Surface Street Management	Notify MDOT District office of incidents or events that will impact freeway operations.	Existing
		Operate and maintain signal systems and other infrastructure as required.	Existing
		Request traffic management assistance from law enforcement agencies as needed.	Existing
County and City 911 Dispatch Centers	Emergency Management	Provide emergency call taking (911) within the county and/or city jurisdiction area and dispatch Sheriff, Police, Fire and EMS services.	Existing
		Coordinate emergency response with local emergency agencies.	Existing
		Support disaster response and recovery, and disaster evacuation.	Existing
		Provide disaster-related information to the public.	Existing

Stakeholder	Transportation Service	Role/Responsibility	Status
County and City 911 Dispatch Centers (cont'd)	Incident Management	Provide emergency call taking for incidents within the county and/or city jurisdiction and dispatch Sheriff, Police, Fire and EMS services to incidents.	Existing
		Coordinate incident response with local incident response agencies including emergency management, public safety, and/or transportation.	Existing
City/County Public Safety Agencies	Commercial Vehicle Operations	Exchange safety and/or security information with other agencies.	Existing
		Participate in roadside vehicle inspection for law and regulation enforcement.	Existing
	Emergency Management	Coordinate emergency response with local emergency agencies.	Existing
		Dispatch appropriate response vehicles to scene.	Existing
		Implement appropriate emergency or disaster response plan based on level of emergency.	Existing
		Provide disaster-related information to the public.	Existing
		Receive emergency calls and information regarding disasters and other emergency situations.	Existing
		Support disaster evacuation, response and recovery.	Existing
	Incident Management	Coordinate incident response with local incident response agencies including emergency management, public safety, and/or transportation	Existing
		Monitor situation and adjust response plans accordingly.	Existing
		Provide emergency call taking for incidents within the county and/or city jurisdiction area and dispatch appropriate vehicles to scene, as needed.	Existing
		Respond to incident dispatches.	Existing
		Responsible for accident reporting.	Existing
	Surface Street Management	Provide traffic management assistance from law enforcement agencies as needed.	Existing
County Emergency Management Agencies	Emergency Management	Develop countywide emergency management plan addressing preparation, response, recover and mitigation actions for all potential risks to the public.	Planned
		Issue countywide warnings.	Existing
		Provide emergency management center for countywide emergency operations and homeland security practices during major emergencies and disasters.	Planned

Stakeholder	Transportation Service	Role/Responsibility	Status
	Incident Management	Coordinate incident response with local incident response agencies.	Existing
Educational Institutions	Parking Management	Operate smart parking management system that includes transit information signs and information kiosks.	Planned
HPFL MPO	Archived Data Management	Collect and archive transportation-related data within the region.	Existing
	Surface Street Management	Provide traffic forecast and demand management for the region.	Existing
	Traffic Management	Provide traffic forecast and demand management for the region.	Existing
	Transportation Planning and Architecture Development	Assist MDOT in coordinating the Hattiesburg Regional ITS development and implementation with stakeholders.	Planned
Intermodal Rail Facilities	Transit Management	Operate railroad intermodal facilities which transport goods between railroad and other transportation modes including truck and water.	Existing
Hattiesburg-Laurel Regional Airport	Emergency Management	Coordinate airport emergency information with other agencies.	Existing
		Disseminate emergency information to travelers.	Planned
		Operate cameras to monitor airport terminal, parling lot and surrounding roadways for security.	Planned
		Support disaster response, recovery and evacuation.	Existing
	Incident Management	Coordinate incident information and response with local incident response agencies within airport area.	Existing
	Parking Management	Operate electronic parking payment system.	Planned
		Provide electronic parking management and parking information to prospective users.	Existing
	Transit Management	Provide access to multimodal services for travelers (bus, taxi, etc.)	Existing
		Provide current schedule information regarding airline operations.	Existing
Hub City Transit	Emergency Management	Coordinate and implement response plans in the event that transit vehicles are needed in extraordinary situations (hurricane evacuations, etc.)	Planned
		Support disaster response, recovery and evacuation.	Existing

Stakeholder	Transportation Service	Role/Responsibility	Status
Hub City Transit (cont'd)	Transit Management	Coordinate with other transit service providers.	Existing
		Operate AVL/GPS system to track vehicle locations.	Planned
		Provide fixed-time and demand responsive transit services between cities.	Planned
Local Cities and Counties	Emergency Management	Support disaster response, recovery and evacuation.	Existing
	Incident Management	Coordinate incident information and response with local incident response agencies.	Existing
		Operate roadside equipment for incident response.	Planned
	Surface Street Management	Notify MDOT District office of incidents or events that will impact freeway operations.	Existing
		Operate and maintain signal systems and other infrastructure as required.	Existing
		Request traffic management assistance from law enforcement agencies as needed.	Existing
Mississippi DOT (MDOT)	Archived Data Management	Maintain MDOT databases including accident, traffic volume, road weather information, commercial vehicle credential and safety data, etc.	Planned
	Commercial Vehicle Operations (CVO)	Issue PrePass and ExpressPass permits.	Existing
		Operate and maintain PrePass, WIM and oversize/overweight monitoring devices and field equipment.	Existing
		Provide enforcement of CVO laws, rules, and regulations.	Existing
		Provide weather, traffic, and other information via Internet, kiosks, etc. to CVO carriers.	Existing
		Receive and disseminate credential and safety information to appropriate agencies as needed or requested.	Existing
		Administer credential and safety information of carriers, drivers and vehicles.	Existing
		Coordinate commercial vehicle inspection with Mississippi Highway Patrol and local law enforcement agencies.	Existing
		Manage Commercial Vehicle Information Systems and Networks (CVISN) Credentialing Infrastructure System.	Existing
		Operate permanent and portable Weigh-in-Motion stations, PrePass, and other roadside inspection equipment throughout the state for law and regulations enforcement.	Existing

Stakeholder	Transportation Service	Role/Responsibility	Status
Mississippi DOT (MDOT) (cont'd)	Commercial Vehicle Operations (CVO) (cont'd)	Provide electronic permit applications and reporting, electronic commercial vehicle inspection system, and commercial vehicle operation and management information via Internet.	Existing
	Emergency Management	Coordinate emergency response plans with EMAs and EOCs regarding the statewide transportation system, as applicable.	Existing
		Disseminate emergency information to motoring public through DMSs, HAR, etc.	Planned
		Provide support on transportation infrastructure as needed in the event of an emergency or disaster.	Existing
		Support disaster response and recovery, and disaster evacuation.	Existing
	Freeway Management	Provide backup support for freeway management operations at the MDOT Regional TMC.	Planned.
	Maintenance and Construction Management	Communicate maintenance and construction schedule and other related information with local agencies.	Existing
		Dispatch maintenance vehicles for planned activities (road maintenance, snow plowing, etc.) and unplanned incidents within the jurisdiction area.	Existing
		Maintain DOT roadside equipment.	Planned
		Provide construction management and perform maintenance of interstate, state highways and bridges.	Existing
		Provide maintenance on agency vehicle fleet.	Existing
		Operate automated vehicle location (AVL)/global positioning system (GPS) technology to track maintenance vehicles locations and collect relative data for analysis.	Planned
		Operate field devices including sensors, cameras, and DMS for maintenance and construction activities.	Planned
		Operate portable TMCs to manage work zone activities.	Planned
		Operate RWIS system (weather sensors and fog sensors) and collect road weather information along major roadways, and distribute road weather information to local public safety agencies and transportation agencies.	Planned

Stakeholder	Transportation Service	Role/Responsibility	Status
Mississippi DOT (MDOT) (cont'd)	Traffic Management	Manage and control roadside equipment (including CCTV, DMS, HAR, detection sensors, signal systems, and others).	Planned
		Operate highway-rail preemption and warning systems.	Planned
		Operate TMCs and communicate traffic related information to other agencies.	Planned
		Operate automatic gate closure systems.	Planned
		Operate portable TMCs for special events, etc.	Planned
		Operate reversible lane management systems.	Planned
		Operate speed warning systems.	Planned
	Transit Management	Coordinate ITS projects, funding support and other related management activities with local public transit agencies.	Planned
	Transportation Planning and Architecture Maintenance	Coordinate planning activities with the MPOs.	Planned
		Coordinate the Mississippi Statewide ITS Architecture development and implementation with stakeholders.	Planned
		Provide transportation planning services for state DOT.	Planned
		Responsible for the maintenance of the Mississippi Statewide ITS Architecture.	Planned
	Traveler Information	Provide real time traffic information through Internet, Kiosks, etc.	Existing
		Provide telephone traveler information (511 System) via either cell phone or landline.	Planned
MDOT District 6	Emergency Management	Communicate traffic information to local law enforcement and emergency response agencies, as needed.	Existing
		Coordinate emergency response plans with state MDOT office, regarding the statewide transportation system, as applicable.	Existing
		Disseminate emergency information to motoring public through DMSs, HAR, etc.	Planned
		Monitor and implement roadway closure measures as needed to manage evacuation efforts.	Existing
		Monitor emergency situation via CCTV system.	Planned
		Provide district-level support on transportation infrastructure as needed in the event of an emergency or disaster.	Existing

Stakeholder	Transportation Service	Role/Responsibility	Status
MDOT District 6 (cont'd)	Freeway Management	Operate and maintain roadside equipment (CCTV, traffic sensors, DMS, HAR, speed warning system, etc.) for freeway traffic control and management, and disseminate traveler information (congestion, incident, etc.) to drivers.	Planned
		Request traffic management assistance from MHP, service patrols, etc. as needed.	Existing
	Incident Management	Deploy maintenance personnel/equipment as appropriate to mitigate effects of incident.	Existing
		Monitor situation via CCTV system and adjust response plans according to current conditions.	Planned
		Monitor weather and external conditions and adjust response plans accordingly.	Existing
		Receive and disseminate freeway incident information to motoring public via DMSs, HAR, etc.	Planned
		Request traffic management assistance from MHP, service patrols, etc. as needed.	Planned
		Dispatch highway service patrol vehicle assisting motorists in minor incidents.	Planned
	Maintenance and Construction Management	Coordinate construction and maintenance activities with local City and County transportation agencies, as needed.	Existing
		Maintain construction and maintenance schedule for posting on websites and other traveler information sources.	Existing
		Operate and maintain RWIS system (weather sensors and fog sensors) and collect road weather information along major roadways, and distribute information to other agencies.	Planned
	Surface Street Management	Operate and maintain signal systems and other infrastructure as required.	Existing
		Receive and disseminate traveler information regarding surface street operations to motorists.	Planned
		Request traffic management assistance from law enforcement agencies as needed.	Existing
		Coordinate rail operations with railroad companies.	Planned
	Traveler Information	Provide real-time traffic information through Internet, kiosks, etc..	Planned

Stakeholder	Transportation Service	Role/Responsibility	Status
Media Outlets	Traveler Information	Collect travel-related information from the public sector and private information sources, and broadcast that information to their customers via TV, radio stations, news media, etc.	Existing
		Receive information from MDOT, MHP, etc. regarding congestion and incidents.	Existing
Medical Providers	Emergency Management	Communicate with EMS concerning incoming incident victims and appropriate resources.	Existing
Mississippi Emergency Management Agency (MEMA)	Emergency Management	Disseminate emergency/disaster information to MDOT, MHP, local EMAs & EOCs, etc., as appropriate.	Existing
		Issue nationwide and regional warnings to government authorities and the civilian population in areas endangered by disasters.	Existing
		Manage statewide response plans and coordinate with local EMAs.	Existing
		Provide emergency management center for statewide emergency operations and homeland security practices during major emergencies and disasters.	Existing
		Work with MEMA and other agencies to deal with truck or train hazardous material incidents.	Existing
Mississippi Bureau of Investigations	Emergency Management	Responsible for issuing AMBER Alerts.	Existing
		Monitor changes in situation and adjust response plans accordingly.	Existing
		Receive and disseminate emergency information to appropriate agencies.	Existing
Mississippi Department of Environmental Quality	Incident Management	Respond to truck or train hazardous material incidents.	Existing
Mississippi Department of Public Safety	Emergency Management	Monitor changes in situation and adjust response plans accordingly.	Existing
		Receive and disseminate emergency information to appropriate agencies.	Existing
	Traveler Information	Provide weather/road conditions to the public via website.	Existing
Mississippi Highway Patrol (MHP)	Commercial Vehicle Operations	Exchange safety and/or security information with other agencies.	Existing
		Participate in roadside vehicle inspection for law and regulations enforcement.	Existing

Stakeholder	Transportation Service	Role/Responsibility	Status
Mississippi Highway Patrol (MHP) (cont'd)	Emergency Management	Coordinate emergency response with local emergency agencies.	Existing
		Operate dispatch centers to provide emergency call taking (911, *HP, and Motorist Assistance Call Boxes), and dispatch state patrol vehicles on the jurisdiction roadways.	Existing
		Provide disaster-related information to the public.	Existing
		Support disaster response and recovery, and disaster evacuation.	Existing
	Incident Management	Coordinate incident response with local incident response agencies including emergency management, public safety, and/or transportation, including road closure.	Existing
		Receive emergency calls for incidents within the jurisdiction area and dispatch state patrol vehicles responding to emergency calls.	Existing
		Routinely patrol major roadways including interstates, US highways, state highways and secondary county roads, and enforce motor vehicle laws.	Existing
	Traveler Information	Observe/collect road/weather conditions on Interstates, US highways, and major state highways.	Existing
Mississippi Office of Homeland Security (OHS)	Emergency Management	Implement and coordinate appropriate response plans on statewide level.	Existing
		Issue homeland security warnings.	Existing
Mississippi Public Service Commission	Archived Data Management	Maintain and provide a SAFETYNET database management system.	Existing
	Commercial Vehicle Operations	Exchange safety and credential information as needed or requested.	Existing
		Manage motor carrier state application and registration.	Existing
Mississippi Tax Commission	Archived Data Management	Maintain a database for commercial vehicle tax records.	Existing
	Commercial Vehicle Operations	Manage commercial vehicle taxes including International Fuel Tax Agreement (IFTA) and Internal Registration Plan (IRP).	Existing
		Provide tax information to appropriate agencies as needed or requested.	Existing
Private Trucking Companies	Commercial Vehicle Operations	Coordinate commercial vehicle management activities with public agencies.	Existing
		Manage company vehicle fleets.	Existing
Railroad Companies	Surface Street Management	Coordinate rail operations with MDOT district office.	Planned

Stakeholder	Transportation Service	Role/Responsibility	Status
Railroad Companies (cont'd)	Traffic Management	Operate and maintain rail roadside equipment communicating with traffic signal systems or other traffic control devices at highway rail intersections.	Existing
Southern Mississippi Planning and Development District (SMPDD)	Archived Data Management	Collect and archive transportation-related data within the region.	Existing
Transit Service Providers	Emergency Management	Coordinate and implement response plans in the event that transit vehicles are needed in extraordinary situations (hurricane evacuations, etc.)	Existing
		Support disaster response, recovery, and evacuation.	Existing
	Transit Management	Coordinate transit information and operation with other transit service providers.	Existing
		Provide transit schedule information to users and information service providers.	Existing

4. INVENTORY

The inventory of existing and planned Hattiesburg Mississippi regional ITS elements supports development of interface requirements and information exchanges with these systems. A comprehensive inventory of these existing and planned systems was developed based on a survey of the region and stakeholder input. For development of the regional architecture, the Hattiesburg Mississippi Region was defined to encompass the following cities and counties:

- City of Hattiesburg
- City of Laurel
- Forrest County
- Jones County
- Lamar County
- Perry County

A regional ITS Architecture inventory is a list of all existing and planned ITS systems in the region as well as non-ITS systems that provide information to or get information from the ITS systems. The focus of the inventory is on those systems that support, or may support, interfaces that cross stakeholder boundaries. In general, the inventory should be managed so that it is as small as possible while still supporting the goal of identifying all key integration opportunities in the region. Each element in the inventory will normally include a name, associated stakeholder(s), a concise description, general status, and the associated subsystems or terminators from the National ITS Architecture. Table 4-1 provides a list of ITS systems, their general descriptions, and stakeholders involved with or responsible for operations and management of the systems. This inventory was developed based on the following sources:

- Discussion during the Stakeholder meetings
- Hattiesburg Region ITS Architecture Stakeholder Survey Responses
- Mississippi Statewide ITS Architecture
- Mississippi ITS Strategic Plan
- Comprehensive Emergency Transportation Response Plan
- Other relevant project reports and websites

The stakeholder survey questionnaire is included in Appendix A.

Table 4-1. Hattiesburg Region ITS Inventory

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
AMTRAK	AMTRAK	Provide passenger train services, and coordinate with other transit modes for efficient movement of people.	Existing	
City of Laurel	Public Works	Responsible for maintenance and construction activities.	Existing	
City of Hattiesburg	Database	Maintain/archive city data for a variety of uses such as traffic data and accident data.	Existing	
	Police	Provides transit security and monitors CCTV	Planned	
	Public Services	Responsible for maintenance and construction activities. Plan to operate DMS for work zone management.	Planned	
	TCC	City function using hardware and software and network communication to connect to and control remote traffic signals and any other City-owned ITS devices.	Planned	
	TCC Roadside Equipment	Equipment owned by the City of Hattiesburg associated with the TCC that is used to collect or broadcast data. Examples include CCTV and DMS.	Planned	
City/County 911 Dispatch Centers	City/County 911 Dispatch Centers	Receive 911 calls, and dispatch sheriff, police, fire and EMS within the jurisdiction area via communication system. Exchange mutual aid and incident information with other local agencies. CAD dispatch may be equipped.	Existing/ Planned	Counties of Forrest, Jones, Lamar & Perry; Cities with a population < 15,000
City/County Public Safety Agencies	City/County Emergency Vehicles	A collection of emergency vehicles responding to emergency/incident dispatches. Vehicles may be equipped with communication system, signal preemption, in-vehicle navigation system, etc.	Existing/ Planned	Counties of Forrest, Jones, Lamar & Perry; Cities with a population < 15,000

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
City/County Public Safety Agencies (cont'd)_	Emergency Response Performance Information	Review of emergency response times (from accident scene to hospitals).	Existing	
County Emergency Management Agencies	County Emergency Operations Centers	Provide emergency operations center for countywide emergency operations and homeland security practices during major emergencies and disasters.	Existing	Counties of Forrest, Jones, Lamar & Perry
Educational Institutions	Colleges & Universities	A stakeholder group consisting of all school systems, colleges and universities.	Existing	
Greyhound	Greyhound Bus Line	Commercial provider of transportation service between cities.	Existing	
Intermodal Rail Facilities	Intermodal Rail Freight Facility	Represent railroad intermodal facilities which transport goods between railroad and other transportation modes including truck and water. The terminals coordinate freight movement with Fleet-Freight management, gather information on traffic conditions, and provide information on intermodal freight activities that is pertinent to traffic movement in the surrounding area.	Existing	
Hattiesburg-Laurel Regional Airport	Airport Information System	Use website, email, PDA, and other methods to provide traveler information such as flight delay, ground transportation schedule, maintenance, incident, and disaster response.	Planned	
	Airport Security Monitoring System	Use CCTV to monitor airport terminals including ground transportation areas and parking ramps.	Planned	
Hattiesburg-Petal-Forrest-Lamar (HPFL) MPO	HPFL MPO	Provide traffic forecast and demand management for the Hattiesburg Mississippi region and maintain database of traffic data for the region	Existing	
	HPFL MPO Databases	Databases for all transportation related data in the Hattiesburg Mississippi region.	Existing	

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
Hub City Transit	Hub City Transit Traveler Information Systems	Collect and store transit-related data including ridership.	Existing	
	Hub City Transit Transit System Kiosks	Kiosks are public informational displays supporting various levels of interaction and information access.	Planned	
	Hub City Transit Transit Vehicles	A collection of transit vehicles responding to transit dispatches, AVL/GPS, on-board security cameras, electronic fare payment system, and transit signal priority are planned.	Existing/ Planned	
Local Cities and Counties	Local City/County Databases	Maintain/archive county or city data for a variety of uses such as maintaining emergency/accident data.	Existing	Counties of Forrest, Jones, Lamar and Perry; Cities with a population < 15,000
	Local City/ County Public Works	Responsible for maintenance and construction activities.	Planned	
	Local City/ County TMCs	Manage and control traffic signals, CCTV, DMS, detection sensors and other roadside equipment within the jurisdiction area for traffic control and management, and communicate traffic related information to other agencies.	Existing/ Planned	
	Local City /County TMC Roadside Equipment	Roadside equipment includes any and all equipment distributed on and along the roadway which monitors and controls traffic. Trailblazer directional signs are also desired for evacuation.	Existing/ Planned	
Local Traffic Generators	Event Promoters and Traffic Generators	Private entities that share knowledge of events (date, time, location, duration, etc.) that may impact travel on roadways with MDOT, City/County TCCs and emergency service providers.	Existing	

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
MDOT	MS Traffic.com	MDOT website provides real time traffic information (http://www.mstraffic.com/) including traffic conditions, incidents, streaming traffic video, road restrictions, roadway work, alerts, hurricane evacuation information, and other transportation-related information. Clearing house for real time incidents and travel speed information will be established, as well as information on transit service, airport/airline info, and commercial vehicle operation information.	Existing	
	Traveler Information Repository	A 511 system or similar systems that collect traveler information.	Planned	
	Statewide 511 System	Statewide 511 System will be an integrated statewide service, developed in phases. Initially the system will be implemented in Jackson. It will be connected to bordering states' 511 services where possible and available, and will be available to the traveling public 24 hours per day, 7 days per week.	Planned	
	Accident Database	Maintaining records on traffic accidents occurring on public roadways. A Safety Analysis Management System (SAMS) is planned as a Web-based application providing interactive GIS tools to assist in the query, visualization, and analysis of crash data.	Planned	
	Cellular Phone System for Incident Reporting	A system enables motorists to report incidents to the MDOT TMC using cellular phone numbers such as #999. This system could also allow users to contact local law enforcement, towing companies, ambulance services, and local transportation organizations highway helper vehicles.	Planned	
	Commercial Vehicle Traveler Information Network	Provide specific information to truck operators via the Internet and/or public kiosks at truck stops. The information might include road closures, incident, weather (i.e., fog, flooding), construction, and special permit routing.	Planned	

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
MDOT (cont'd)	Commercial Vehicle Information Systems & Networks (CVISN) Credentialing Infrastructure System	Develop a virtual one-stop shop for all the motor carrier transactions which process credential applications and collect fuel taxes, weight/distance taxes, and other taxes and fees associated with commercial vehicle operation. It will provide electronic access for motor carrier credentialing, tax payments and permits. Also, it is planned to provide Mississippi Public Service Commission and MDOT enforcement personnel with real-time safety and credential information. The national CVISN system databases will be connected and accessed, including Commercial Driver's License Information System (CDLIS), Safety and Fitness Electronic Records (SAFER), Motor Carrier Management System (MCMIS), National Law Enforcement Telecommunication System (NLETS), etc.	Existing	
	ExpressPass Permitting System	The website https://www.expresspass.ms.gov/trucking enables online application and account management of oversize/overweight commercial vehicle permits. Available ExpressPass routes are also provided.	Existing	
	PrePass System	PrePass is an automatic vehicle identification system that allows participating transponder equipped commercial vehicles to bypass designated weigh stations and port-of-entry facilities across the United States. The PrePass system has been installed at 12 locations in the state.	Existing	
	Highway Advisory Radio	Disseminate information to travelers via radio systems. HAR systems installation is planned during roadway and bridge reconstruction/rehabilitation. HAR is also planned to be installed in advance of decision points on high volume/high accident routes and in the vicinity of major attractions, airports, and parking facilities.	Planned	
	Highway Performance Monitoring System (HPMS)	Highway information system including data on the extent, condition, performance, use, and operating characteristics of the highways.	Existing	

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
MDOT (cont'd)	Statewide TMC	Statewide TMC in Jackson provides overall planning and implementation of incident management program, assists in incident detection and verification, initiates traffic management strategies on incident impacted facilities, controls signals on State routes outside of Jackson, provides traffic control, assists motorists with disabled vehicles, provides motorist information (HAR, VMS), determines incident clearance and roadway repair needs, establishes and operates alternate routes, dispatches freeway service patrols, dispatches maintenance resources such as dump trucks and sweepers, operates the GoMDOT web server, and shares video and data with City of Jackson TOC, media and police agencies.	Existing	
	Statewide TMC Kiosks	Kiosks are public informational displays supporting various levels of interaction and information access.	Planned	
	Truck Stop Kiosks	Provide specific information to truck operators. The information might include road closures, incident, weather (i.e., fog, flooding), construction, and special permit routing.	Planned	
	Variable Trailblazer Signs	Variable trailblazer signs form a directionally-oriented signing system on surface streets. This can provide necessary information to bypass heavily congested or closed interstate freeway entrance ramps or segments (for appropriate alternate routes), as well as keep traffic moving towards specific destinations (such as parking lots or special event centers, e.g. Jackson Coliseum). These signs combine route shields or destination symbols with variable directional arrow displays to provide travelers with the necessary directional information to reduce the chances of getting lost and tying up traffic due to quick movements.	Planned	

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
MDOT District 6	Regional Traffic Management Center	The District TMC in Hattiesburg will operate and maintain the ITS equipment deployed in the MDOT district. The District TMC will also participate in local incident management programs, assist in incident detection and verification (CCTV), initiate traffic management strategies on incident impacted facilities, provide motorist information (HAR/LPFM, VMS), determine incident clearance and roadway repair needs, establish and operate alternate routes, dispatch maintenance resources such as dump trucks and sweepers.	Planned	
	Regional Roadside Equipment	Equipment owned by MDOT associated with the TMC that is used to collect or broadcast data. Examples include CCTV and DMS.	Planned	
	Maintenance Vehicles	Maintenance vehicles that are utilized to support road maintenance, such as Salt/Sand trucks, and Road Repair trucks. Once an Automated Vehicle Location (AVL) system is implemented, the equipped maintenance vehicles, service patrol vehicles or buses can serve as traffic probes to provide additional traffic flow data to the ITS systems.	Planned	
	Closed Loop Signal System	Signal systems including traffic signals, loop detectors, video detection, and communications infrastructure. Signal systems may be operated and maintained by Counties and Cities under joint agreements. Emergency vehicle signal preemption and transit signal priority may be existing or planned at cities or counties.	Existing	
	Portable Dynamic Message Signs	Used to direct traffic for special events, maintenance and construction, and incident management.	Existing	
	Dynamic Message Signs	Permanent DMS are installed at major metro/municipal areas to disseminate information related to traffic incidents, amber alerts, special events and weather conditions.	Existing/ Planned	
	Dynamic Speed Zone Signs	Dynamic signs displaying speeds of vehicles approaching speed zones.	Planned	

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
MDOT Districts 6 (cont'd)	Maintenance and Construction Offices	Dispatch maintenance vehicles for planned activities (road maintenance, snow plowing, etc.) and unplanned incidents within the jurisdiction area, and communicate maintenance and construction schedule and other related information to other agencies.	Existing	
	Weigh-in-Motion Stations	Weigh-in-Motion (WIM) stations to measure truck weights and axle configuration for enforcing law and regulations. On-line access to enforcement data at all permanent scale facilities is planned. WIM data is also planned to be available to relevant agencies via Internet or through a database.	Existing	
	Highway Service Patrol Vehicles	Highway service patrol vehicles assist motorists in minor incidents (flat tire, accident, out of gas, etc.) to minimize disruption to the traffic stream. Vehicles are planned for the Hattiesburg area and will communicate with the MDOT TMC via voice communications. Vehicles will be equipped with AVL capability.	Planned	
	Weather Sensors	Weather sensors collect pavement temperature, surface temperature, ambient temperature, wind speed and direction, pavement wet/dry, perspiration, and relative humidity. Provide a network of pavement, visibility and other weather information that could be disseminated through various pre-trip and en-route information means.	Planned	
	Railroad Crossing Control	Deployment of railroad pre-emption and warning systems at at-grade railroad crossings. This process enables signals in the vicinity of the rail crossing to coordinate their timing when a train approaches. The system consists of gates and signals. Train detector circuitry and communication line from intelligent interface controller (IIC) to wayside interface equipment (WIE).	Planned	
	Traffic Surveillance Equipment	Monitor state major roadways to assist in incident management/emergency management. The CCTV camera is used to provide the ability to confirm specific conditions (e.g., incidents, lane blockages, congestion) and can aid in dispatching appropriate resources or formulating an appropriate traffic response.	Planned	

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
MDOT District 6 (cont'd)	Traffic Sensors	There are numerous types of traffic sensors to choose from, including in-pavement devices such as the commonly-used inductive loop detector and "non-intrusive" devices, including overhead sensors, including radar and microwave technologies, video image processing systems and acoustic sensors.	Existing	
	Speed Warning System	Includes static speed sign, speed detector (radar), and display system. Key features of the concept include mandatory speed limit signals, automatic and effective enforcement and automatic control of the speed signals.	Planned	
	Communication Infrastructure	It is planned to establish a more permanent approach for the primary communication links between MDOT Central Office and the Districts, and between the local Hattiesburg TCC and the Regional TMC. As more ITS functionality is added, the demand on the communication infrastructure will increase.	Existing	
Media Outlets	Media	Provide traffic reports on travel conditions, traffic and travel advisory, incident and special events and other transportation-related news services to the traveling public through radio, TV and other media.	Existing	
Mississippi Emergency Management Agency (MEMA)	Mississippi Emergency Management Agency (MEMA)	Plan and coordinate with local emergency service providers to respond to threats from technological, man-made and natural origins; activate Emergency Operations Center, allocate resources, and maintain operational control of the State Emergency Response Team, the Mobile Operations Center, the Disaster Reconnaissance Team and the communications/state warning point section.	Existing	

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
Mississippi Emergency Management Agency (MEMA) (cont'd)	MEMA Emergency Operations Center	The State Emergency Operations Center provides emergency management center for statewide emergency operations and homeland security practices during major emergencies and disasters, and coordinates with local, state, and federal agencies. The center alerts state and local officials to all natural or man-made incidents throughout the state. Communications includes satellite, low band and UHF radios. A computerized alphanumeric paging system allows for rapid notification of all MEMA personnel as well as personnel in 78 counties. A high-speed digital fax system has enhanced the ability to rapidly communicate essential information to the field. Emergency management software for recording disaster/incident information is also used.	Existing	
Mississippi Bureau of Investigation	Mississippi Bureau of Investigation	Issue AMBER Alerts.	Existing	
Mississippi Department of Environmental Quality	Mississippi Department of Environmental Quality	Work with MEMA and other agencies to deal with truck or train hazardous material incidents.	Existing	
Mississippi Department of Public Safety	Mississippi Road/Weather Conditions Website	Provides weather/road conditions for the entire state. The website is at http://www.dps.state.ms.us/dps/dps.nsf/roadmap?OpenForm.	Existing	
Mississippi Highway Patrol (MHP)	MHP District 7 Offices	Enforce traffic laws on state highways within the jurisdiction area covering the Central Region; assist local law enforcement agencies and responding to statewide/regional emergencies.	Existing	
	*HP Cellular Phone System	Receive incident/emergency calls from travelers who use cellular *HP.	Existing	

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
Mississippi Highway Patrol (cont'd)	MHP Dispatch Centers	Receive incident/emergency calls and utilize CAD system to dispatch emergency vehicles. CAD incident data and camera images will be shared between MHP dispatch centers and MDOT TMC.	Existing	
	MHP Emergency Vehicles	Emergency vehicles responding to dispatch. AVL is planned.	Existing/ Planned	
Mississippi Public Service Commission	SAFETYNET	A database management system that allows entry, access, analysis, and reporting of data from driver/vehicle inspections, crashes, compliance reviews, assignments, and complaints.	Existing	
Mississippi Office of Homeland Security (OHS)	Mississippi Office of Homeland Security	Coordinate, maintain and administer homeland security practices within the state and region.	Existing	
Mississippi Tax Commission	Commercial Vehicle Databases	A database for commercial vehicle tax records.	Existing	
National Weather Service (NWS)	National Weather Service Information	The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.	Existing	
Private Trucking Companies	Private Trucking Companies	Own and manage commercial fleets of vehicles.	Existing	
	Private Trucking Companies Commercial Vehicles	Commercial vehicle equipped with the sensory, processing, storage, and communications functions necessary to support safe and efficient commercial vehicle operations.	Existing	
Railroad Companies	Railroad Wayside Equipment	Rail roadside equipment communicating with traffic signal systems or other traffic control devices at highway rail intersections.	Existing	

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
Railroad Companies (cont'd)	Rail Companies	Coordinate with traffic management centers and provide train schedules, maintenance schedules, and any other forecast events that will result in highway-rail intersection (HRI) closures. The information is used to develop forecasts of highway rail intersection closure times and durations that may be used in advanced traffic control strategies or to enhance the quality of traveler information.	Existing	
Transit Service Providers	Multimodal Transit Centers	The Hattiesburg Intermodal Center serves as the area's AMTRAK terminal.	Existing	
	Driver	This terminator represents a human entity that operates a licensed vehicle on the roadway.	Existing	
	Emergency Telecommuni-cations System	This terminator represents the telecommunications systems that connect a caller with a Public Safety Answering Point (PSAP). These systems transparently support priority wireline and wireless caller access to the PSAP through 9-1-1 and other access mechanisms like 7 digit local access numbers and motorist aid call boxes. The calls are routed to the appropriate PSAP based on caller location when this information is available. When available, the caller's location and call-back number are also provided to the PSAP by this interface.	Existing	
	IFTA Clearinghouse	The IFTA Clearinghouse supports the IFTA base state agreement electronically. The IFTA Clearinghouse coordinates IFTA carrier information and transmittal records between participated jurisdictions.	Existing	
	IRP Clearinghouse	The IRP Clearinghouse supports the IRP base state agreement electronically. The Clearinghouse supports exchange of motor carrier and financial information between participating jurisdictions.	Existing	

Primary Stakeholder	System	Description	Status	Other Associated Stakeholder
	Telecommuni-cations System for Traveler Information	This terminator provides the caller interface and voice processing (voice recognition/synthesis) that supports voice-enabled traveler telephone information systems. It provides wireline and wireless caller access to 511 systems and other telephone access mechanisms like 7 or 10 digit local access numbers. It represents the boundary of the architecture where a call is received and processed and includes voice portal capabilities in scenarios where a distinct voice portal exists between ITS Centers and telecommunications providers. The terminator gathers traveler information, alerts, and advisories from information service provider(s) and uses this information to support voice-based interactions with a traveler.	Planned	
	User Personal Computing Devices	This terminator refers to equipment an individual owns and can personalize with his or her choices for information about transportation networks. An Internet-connected PC is an example.	Existing	

Information derived from source documents, the stakeholder meeting discussion and the results of the completed stakeholder surveys included the following current and/or potential transportation-related issues in the region for which ITS user services are needed:

- Improve traffic flow efficiency – The region needs interconnected traffic signals and dynamic message signs which could be monitored and controlled from the Regional and/or Local TMC/TCC.

- Incident management – Quick response is hindered by the lack of a bypass loop around Hattiesburg; incident response must usually pass through local streets. The railroad tracks with at-grade crossings create route blockages. Another hindering issue is the lack of an adequate east/west corridor through Hattiesburg.

- Camp Shelby – The presence of a large military training facility southeast of Hattiesburg creates a few challenges. There is congestion at the entrance on US 49 and a new entrance on US 98 is being promoted as an alternative. Each spring and summer, US military vehicle convoys travel to and from the installation from other parts of the country. Need to be able to notify drivers in the area of the convoy locations.

- Emergency management - Police, Fire and EMS need to be able to more effectively route responses and use real-time CCTV for incident detection, validation and monitoring.

- Special events – University (Southern Miss and William Carey) and Convention events require temporary signal timing adjustments in the vicinity of event traffic entering major thoroughfares as well as police assistance with traffic control through adjacent neighborhoods. Dynamic Message Signs (DMS) and/or Highway Advisory Radio (HAR) are needed to notify drivers of nearby events and parking information.

- Public transit – Hub City Transit was mentioned as a solution to take vehicles off the roads by offering park-and-ride service into the city and from the City of Petal.

- Schools – School officials and TMC operators need to be able to locate buses and communicate information on inclimate weather and/or early system closure to the schools, buses and parents through any available means

- Maintenance and construction – When roads are having major maintenance or construction performed that impedes traffic flows or a complete closure, public, the school system and the public safety community (Police, Fire EMS) need to be notified.

- Trailblazing – Portable DMS and HAR, in conjunction with an appropriate detour implementation plan, may be helpful in route traffic off the freeway through the main thoroughfares through Hattiesburg when necessary.

More details on the issues discussed during the stakeholder meetings can be found in the stakeholder meeting minutes Appendix E.

5. USER SERVICES AND MARKET PACKAGES

5.1 Identification of User Services

User services describe what should be provided from the user's perspective. Identification of user services for the Hattiesburg Region ITS Architecture helps to reveal the problems with transportation systems and the associated needs of stakeholders and assists in selecting market packages, which should support locally applicable user services. The National ITS Architecture defines thirty-three user services covering a wide breadth of surface transportation needs. Since many of the user services share common infrastructure elements, such as communications, they have been grouped together into eight "bundles":

- Travel and Traffic Management
- Public Transportation Management
- Electronic Payment
- Commercial Vehicle Operations
- Emergency Management
- Advanced Vehicle Safety Management
- Information Management
- Maintenance and Construction Management

Table 5-1 contains a list of all National ITS Architecture user services. Based upon the information obtained from the ITS inventory, stakeholder surveys and Mississippi Statewide ITS Architecture, those user services not applicable to the Hattiesburg Region ITS Architecture are shown in gray; all others are applicable to the Hattiesburg Mississippi region. A complete list of user service definitions can be obtained on the National ITS Architecture website at http://itsarch.iteris.com/itsarch/.

Table 5-1. List of User Services for the Hattiesburg Region

User Service Bundle	User Service
1. Travel and Traffic Management	1.1 Pre-Trip Information
	1.2 En-Route Driver Information
	1.3 Route Guidance
	1.4 Ride Matching and Reservation
	1.5 Traveler Services Information
	1.6 Traffic Control
	1.7 Incident Management
	1.8 Travel Demand Management
	1.9 Emissions Testing and Mitigation
	1.10 Highway Rail Intersection
2. Public Transportation Management	2.1 Public Transportation Management
	2.2 En-Route Transit Information
3. Electronic Payment	3.1 Electronic Payment Services
4. Commercial Vehicle Operations	4.1 Commercial Vehicle Electronic Clearance
	4.2 Automated Roadside Safety Inspections
	4.3 On-board Safety Monitoring
	4.4 Commercial Vehicle Administration Processes
	4.5 Hazardous Material Security and Incident Response
	4.6 Freight Mobility
5. Emergency Management	5.1 Emergency Notification and Personal Security
	5.2 Emergency Vehicle Management
	5.3 Disaster Response and Evacuation
6. Advanced Vehicle Safety Systems	6.1 Longitudinal Collision Avoidance
	6.2 Lateral Collision Avoidance
	6.3 Intersection Collision Avoidance
	6.4 Vision Enhancement for Crash Avoidance
	6.5 Safety Readiness
	6.6 Pre-Crash Restraint Deployment
	6.7 Automated Vehicle Operation
7. Information Management	7.1 Archived Data
8. Maintenance and Construction Management	8.1 Maintenance and Construction Operations

Note: *User services shown as gray are not applicable to the Hattiesburg Region ITS Architecture.*

5.2 Mapping User Services to Market Packages

Market packages provide an accessible, deployment-oriented perspective to the National ITS Architecture. They are tailored to address the region's real world transportation problems and

needs. Market packages enable transportation planners and decision makers to determine appropriate ITS services that satisfy local and statewide needs. Market packages consist of one or more equipment packages that work together to deliver a given transportation service and the architecture flows that connect them and other important external systems. They identify the pieces of the physical architecture required to implement a particular transportation service. As illustrated in Table 5-2, all eighty-five (85) market packages (in National ITS Architecture Version 6.0) were considered for their applicability to all thirty-three (33) user services. The user services, market packages and associated mapping relationships, which are applicable for the Hattiesburg Region ITS Architecture, have been identified through the mapping exercise.

Table 5-3 presents a list of market packages that are identified through the mapping process in Table 5-2. The market packages are grouped according to the type of ITS category they fall under, i.e., Archived Data Management, Advanced Public Transportation Systems, etc. As illustrated in Table 5-3, some of the market packages do not specifically address the user services identified for the Hattiesburg Region ITS Architecture, and they are not applicable to the implementation of the existing and proposed ITS systems in the Hattiesburg Mississippi region. Therefore, customization of the market packages is necessary so those that are inappropriate for the Hattiesburg Region ITS Architecture are eliminated. Descriptions of the market packages can be found on the National ITS Architecture website at http://itsarch.iteris.com/itsarch/.

Table 5-2. User Services Mapping to Market Packages

	Market Packages: The market packages provide an accessible, deployment oriented perspective to the national architecture. They are tailored to fit - separately or in combination - real world transportation problems and needs. Market packages collect together one or more Equipment Packages that must work together to deliver a given transportation service and the Architecture Flows that connect them and other important external systems. In other words, they identify the pieces of the Physical Architecture that are required to implement a particular transportation service.	1.1 Pre-Trip Travel Information	1.2 En-Route Driver Information	1.3 Route Guidance	1.4 Ride Matching And Reservation	1.5 Traveler Services Information	1.6 Traffic Control	1.7 Incident Management	1.8 Travel Demand Management	1.9 Emissions Testing And Mitigation	1.10 Highway Rail Intersection	2.1 Public Transportation Management	2.2 En-route Transit Information	2.3 Personalized Public Transit	2.4 Public Travel Security	3.1 Electronic Payment Services	4.1 Commercial Vehicle Electronic Clearance	4.2 Automated Roadside Safety Inspection	4.3 On-board Safety And Security Monitoring	4.4 Commercial Vehicle Administrative Proc.	4.5 Hazardous Mat'l Security And Incident Resp.	4.6 Freight Mobility	5.1 Emergency Notification And Personal Sec'ty	5.2 Emergency Vehicle Management	5.3 Disaster Response And Evacuation	6.1 Longitudinal Collision Avoidance	6.2 Lateral Collision Avoidance	6.3 Intersection Collision Avoidance	6.4 Vision Enhancement For Crash Avoidance	6.5 Safety Readiness	6.6 Pre-crash Restraint Deployment	6.7 Automated Vehicle Operation	7.1 Archived Data	8.1 Maintenance And Construction Operations
AD	**ITS Data Mart**																																X	
	ITS Data Warehouse																																X	
	ITS Virtual Data Warehouse																																X	
APTS	**Transit Vehicle Tracking**											X	X		X																		
	Transit Fixed Route Operations											X																					
	Demand Response Transit Operations											X		X																			
	Transit Passenger and Fare Management								X			X				X																	
	Transit Security											X			X																		
	Transit Maintenance											X																					
	Multi--Modal Coordination						X					X																					
	Transit Traveler Information											X	X			X																	
	Transit Signal Priority						X					X																					
	Transit Passenger Counting											X																					
ATIS	**Broadcast Traveler Information**	X	X																														
	Interactive Traveler Information	X	X		X	X		X								X																	
	Autonomous Route Guidance			X																													
	Dynamic Route Guidance			X		X																											
	ISP Based Route Guidance	X		X																													
	Integrated Transportation Management/Route Guidance	X		X																													
	Yellow Pages and Reservation	X				X									X																		
	Dynamic Ridesharing				X				X					X																				
	In-Vehicle Signing		X																														
	VII Traveler Information	X				X	X																				X						X
ATMS	**Network Surveillance**						X	X																									
	Probe Surveillance						X																										
	Surface Street Control						X	X			X																						
	Freeway Control						X	X																									
	HOV Lane Management						X		X																								
	Traffic Information Dissemination		X				X	X																									
	Regional Traffic Control						X																										
	Traffic Incident Management System							X																X	X								
	Traffic Forecast and Demand Management						X		X																								
	Electronic Toll Collection								X							X																	
	Emissions Monitoring and Management								X	X																								
	Virtual TMC an Smart Probe Data		X				X																										X
	Standard Railroad Grade Crossing										X																						
	Advanced Railroad Grade Crossing										X																						
	Railroad Operations Coordination										X																						
	Parking Facility Management														X																		
	Regional Parking Management								X																								
	Reversible Lane Management						X																										
	Speed Monitoring						X																										X
	Drawbridge Management						X																										
	Roadway Closure Management						X	X			X												X		X								
AVSS	Vehicle Safety Monitoring																													X			
	Driver Safety Monitoring																													X			
	Longitudinal Safety Warning																									X				X			
	Lateral Safety Warning																										X			X			
	Intersection Safety Warning																											X		X			
	Pre-Crash Restraint Requirement																														X		
	Driver Visibility Improvement																												X				
	Advanced Vehicle Longitudinal Control																									X							
	Advanced Vehicle Lateral Control																										X						
	Intersection Collision Avoidance																											X					
	Automated Highway System																															X	
	Cooperative Vehicle Safety Systems																									X	X						
CVO	Fleet Administration																			X													
	Freight Administration																			X													
	Electronic Clearance															X			X														
	CV Administrative Processes															X			X		X												
	International Border Electronic Clearance															X			X		X												
	Weigh-In-Motion															X																	
	Roadside CVO Safety															X	X				X												
	On-board CVO and Freight Safety & Security																	X															
	CVO Fleet Maintenance																X	X			X												
	HAZMAT Management																			X	X	X	X										
	Roadside HAZMAT Security Detection and Mitigation																			X	X												
	CV Driver Security Authentication																	X		X													
	Freight Assignment Tracking																	X		X	X												
EM	**Emergency Call-Taking and Dispatch**																			X			X										
	Emergency Routing			X			X																X										
	Mayday and Alarms Support																					X											
	Roadway Service Patrols																						X										
	Transportation Infrastructure Protection																					X											
	Wide-Area Alert																					X											
	Early Warning System																								X								
	Disaster Response and Recovery																								X								
	Evacuation and Reentry Management																								X								
	Disaster Traveler Information																								X								
MCO	Maintenance and Construction Vehicle and Equipment Tracking																																X
	Maintenance and Construction Vehicle Maintenance																																X
	Road Weather Data Collection																																X
	Weather Information Processing and Distribution	X																															X
	Roadway Automated Treatment																																X
	Winter Maintenance																																X
	Roadway Maintenance and Construction																																X
	Work Zone Management																																X
	Work Zone Safety Monitoring																																X
	Maintenance and Construction Activity Coordination																							X									X
	Environmental Probe Surveillance																																X
	Infrastructure Monitoring																																X

Note: Items shown in gray are not applicable to the Hattiesburg Region ITS Architecture.

Table 5-3. List of Market Packages for the Hattiesburg Region ITS Architecture

Category	Market Package	Market Package Name	Status
Archived Data Management (AD)	AD1	ITS Data Mart	Existing
	AD2	ITS Data Warehouse	Existing
Advanced Public Transportation Systems (APTS)	APTS1	Transit Vehicle Tracking	Existing
	APTS2	Transit Fixed Route Operations	Existing
	APTS3	Demand Response Transit Operations	Existing
	APTS5	Transit Security	Planned
	APTS6	Transit Maintenance	Existing
	APTS7	Multi-Modal Coordination	Planned
	APTS8	Transit Traveler Information	Existing
	APTS9	Transit Signal Priority	Planned
Advanced Traveler Information Systems (ATIS)	ATIS1	Broadcast Traveler Information	Existing
	ATIS2	Interactive Traveler Information	Planned
Advanced Traffic Management Systems (ATMS)	ATMS01	Network Surveillance	Existing
	ATMS03	Surface Street Control	Existing
	ATMS04	Freeway Control	Planned
	ATMS06	Traffic Information Dissemination	Existing
	ATMS07	Regional Traffic Control	Planned
	ATMS08	Traffic Incident Management System	Existing
	ATMS09	Traffic Forecast and Demand Management	Existing
	ATMS13	Standard Railroad Grade Crossing	Existing
	ATMS14	Advanced Railroad Grade Crossing	Planned
	ATMS16	Parking Facility Management	Planned
	ATMS19	Speed Monitoring	Planned
	ATMS21	Roadway Closure Management	Planned
Commercial Vehicle Operations (CVO)	CVO03	Electronic Clearance	Existing
	CVO04	CV Administrative Processes	Existing
	CVO06	Weigh In Motion	Existing
	CVO07	Roadside CVO Safety	Existing
	CVO10	HAZMAT Management	Existing
Emergency Management (EM)	EM01	Emergency Call-Taking and Dispatch	Existing
	EM02	Emergency Routing	Existing
	EM04	Roadway Service Patrols	Planned
	EM06	Wide-Area Alert	Existing
	EM07	Early Warning System	Existing
	EM08	Disaster Response and Recovery	Existing
	EM09	Evacuation and Reentry Management	Existing
	EM10	Disaster Traveler Information	Existing
Maintenance & Construction Management (MC)	MC02	Maintenance and Construction Vehicle Maintenance	Existing
	MC06	Winter Maintenance	Existing
	MC07	Roadway Maintenance and Construction	Existing
	MC08	Work Zone Management	Existing
	MC10	Maintenance and Construction Activity Coordination	Existing

5.3 Customization of Market Packages

Market packages, customized for the specific requirements of each stakeholder, represent the information that will be exchanged between specific stakeholder elements. The above market packages selected for the Hattiesburg Region ITS Architecture were customized to correspond with the existing ITS system elements and operations as well as future deployment and planned operations. Customization of market packages requires tailoring the elements (subsystems or terminators) in these market packages, along with associated architecture flows. In addition, architecture flows deemed by the stakeholders as not relevant to the deployment need to be removed. The results of such customization are summarized in terms of ITS elements and their deployment status as presented in Table 5-4. A comprehensive listing of the completed results of the customization is detailed in the Turbo Architecture database.

Table 5-4. List of Market Packages by Architecture Elements

Market Package	Market Package Name	Associated Element	Status
AD1	ITS Data Mart	City of Hattiesburg Public Services	
		City of Laurel Public Works	
		City of Hattiesburg Database	
		MDOT Regional TMC	
		Hattiesburg-Laurel Regional Airport Information System	
		Local City/County 911 Dispatch Centers	
		Local City/County Databases	
		Local City/County Public Works	
		Mississippi Public Service Commission SAFETYNET	
		Mississippi State Tax Commission CV Databases	
		Multimodal Transit Centers	
AD2	ITS Data Warehouse	HPFL MPO Databases	
		Local City/County 911 Dispatch Centers	
		Emergency Response Performance Information	
		MDOT Accident Database	
		MDOT District Maintenance and Construction Office	
		MDOT Regional TMC	
		MDOT District Traffic Sensors	
		MDOT ExpressPass Permitting System	
		MDOT Highway Performance Monitoring System (HPMS)	
		MHP District 7 Office	
		Mississippi Public Service Commission SAFETYNET	
		Mississippi State Tax Commission Commercial Vehicle Database	
		Multimodal Transit Centers	

Market Package	Market Package Name	Associated Element	Status
APTS01	Transit Vehicle Tracking	Hub City Transit	
		Hub City Transit Vehicles	
		Hattiesburg-Laurel Regional Airport Information System	
APTS02	Transit Fixed-Route Operations	Hub City Transit	
		Hub City Transit Vehicles	
		Hattiesburg-Laurel Regional Airport Information System	
APTS03	Demand Response Transit Ops	Hub City Transit	
		Hub City Transit Vehicles	
APTS05	Transit Security	City of Hattiesburg Police	
		Hub City Transit	
		Hub City Transit Vehicles	
		Local City/County 911 Dispatch Centers	
		MHP Dispatch Centers	
APTS06	Transit Maintenance	Hub City Transit	
		Hub City Transit Vehicles	
APTS07	Multi-modal Coordination	AMTRAK	
		Hub City Transit	
		Hub City Transit Vehicles	
		Greyhound	
		Multimodal Transit Centers	
		Other Transit Service Providers	
APTS08	Transit Traveler Information	Multimodal Transit Centers	
		Hub City Transit	
		Hub City Transit Vehicles	
		Hattiesburg-Laurel Regional Airport Information System	
		Other Transit Service Providers	
		User Personal Computing Devices	
APTS09	Transit Signal Priority	Hub City Transit Vehicles	
ATIS01	Broadcast Traveler Information	Hattiesburg-Laurel Regional Airport Information System	
		MDOT MSTraffic.com	
		MDOT Statewide TMC	
		MDOT Statewide TMC Kiosks	
		MDOT Truck Stop Kiosks	
		Media	
		Mississippi Road/Weather Conditions Website	
		User Personal Computing Devices	
ATIS02	Interactive Traveler Info	MDOT Statewide 511 System	
		Telecommunications Systems for Traveler Information	
ATMS01	Network Surveillance	MDOT Regional TMC	
		MDOT Regional Roadside Equipment	
		MDOT District Traffic Sensors	
		MDOT District Traffic Surveillance Equipment	
		MDOT MSTraffic.com	
		Mississippi Road Weather Conditions Website	
		City of Hattiesburg TCC	
		City of Hattiesburg Roadside Equipment	
ATMS03	Surface Street Control	MDOT Regional TMC and Roadside Equipment	
		City of Hattiesburg TCC and Roadside Equipment	

Market Package	Market Package Name	Associated Element	Status
ATMS03 (cont'd)	Surface Street Control (cont'd)	MDOT District Closed Loop Signal Systems	
		MDOT District Traffic Surveillance Equipment	
		MDOT District Traffic Sensors	
ATMS04	Freeway Control	MDOT District Dynamic Message Signs	
		MDOT District Dynamic Speed Signs	
		MDOT District Portable Dynamic Message Signs	
		MDOT District Speed Warning System	
		MDOT Regional TMC	
		MDOT Hattiesburg Regional Roadside Equipment	
		MDOT District Traffic Sensors	
		MDOT District Traffic Surveillance Equipment	
		MDOT Statewide TMC	
ATMS06	Traffic Information Dissemination	MDOT Regional TMC	
		MDOT Regional TMC Roadside Equipment	
		City of Hattiesburg TCC and Roadside Equipment	
		MDOT District Portable Dynamic Message Signs	
		MDOT Highway Advisory Radio	
		MDOT MSTraffic.com	
		MDOT Variable Trailblazer Sign	
		Media	
ATMS07	Regional Traffic Control	City of Hattiesburg Public Services	
		City of Laurel Public Works	
		MDOT Regional TMC and Roadside Equipment	
		City of Hattiesburg TCC and Roadside Equipment	
		MDOT Statewide TMC	
ATMS08	Traffic Incident Management System	MDOT Regional TMC	
		MDOT Regional TMC Roadside Equipment	
		County Emergency Operations Centers	
		City of Hattiesburg TCC and Roadside Equipment	
		Event Promoters and Traffic Generators	
		Hattiesburg-Laurel Regional Airport Information System	
		Hub City Transit	
		Local City/County 911 Dispatch Centers	
		Local City/County Emergency Vehicles	
		MDOT Commercial Vehicle Traveler Information Network	
		MDOT District Highway Service Patrol Vehicles	
		MDOT District Maintenance and Construction Offices	
		MDOT District Traffic Sensors	
		MDOT District Traffic Surveillance Equipment	
		MDOT MSTraffic.com	
		MDOT Statewide 511 System	
		MDOT Statewide TMC	
		Media	
		MHP Dispatch Centers	
		MHP District 7 Office	
		MHP Emergency Vehicles	
		Mississippi Department of Environmental Quality	
		Rail Companies	
ATMS09	Traffic Forecast and Demand Management	MDOT Regional TMC	
		HPFL MPO	
		City of Hattiesburg TCC	

Market Package	Market Package Name	Associated Element	Status
ATMS09 (cont'd)	Traffic Forecast and Demand Management (cont'd)	Hattiesburg-Laurel Regional Airport Information System	
		Hub City Transit	
ATMS13	Standard Railroad Grade Crossing	MDOT Regional TMC	
		MDOT Regional Roadside Equipment	
		City of Hattiesburg TCC	
		MDOT District Closed Loop Signal System	
		MDOT District Railroad Crossing Control	
		Rail Companies	
		Railroad Wayside Equipment	
ATMS14	Advanced Railroad Grade Crossing	MDOT Regional TMC	
		MDOT Regional Roadside Equipment	
		City of Hattiesburg TCC	
		MDOT District Closed Loop Signal System	
		MDOT District Railroad Crossing Control	
		Rail Companies	
		Railroad Wayside Equipment	
ATMS16	Parking Facility Management	Colleges and Universities	
		Driver	
		Hattiesburg-Laurel Regional Airport Security System	
ATMS19	Speed Monitoring	Driver	
		MDOT District Dynamic Speed Zone Signs	
		MDOT District Speed Warning System	
		MHP District 7 Offices	
ATMS21	Roadway Closure Management	City of Hattiesburg Public Services	
		MDOT Regional TMC	
		City of Hattiesburg TCC	
		MDOT Regional Roadside Equipment	
		City of Laurel Public Works	
		City of Hattiesburg TCC Roadside Equipment	
		County Emergency Operations Center	
		Local City/County 911 Dispatch Centers	
		Local City/County Public Works	
		MDOT District Portable Dynamic Message Signs	
		MEMA Emergency Operations Center	
		MHP Dispatch Center	
CVO03	Electronic Clearance	MDOT CVISN Credentialing Infrastructure System	
		MDOT PrePass System	
		Private Trucking Companies Commercial Vehicles	
CVO04	CV Administrative Processes	IFTA Clearinghouse	
		IRP Clearinghouse	
		MDOT CVISN Credentialing Infrastructure System	
		MDOT ExpressPass Permitting System	
		Mississippi Public Service Commission SAFETYNET	
		Mississippi State Tax Commission Commercial Vehicle Database	
		Private Trucking Companies	
CVO06	Weigh-In-Motion	MDOT District Weigh-in-Motion Stations	
		Private Trucking Companies Commercial Vehicles	
CVO07	Roadside CVO Safety	MDOT CVISN Credentialing Infrastructure System	
		MDOT District PrePass System	
		MDOT District Weigh-in-Motion Stations	

Market Package	Market Package Name	Associated Element	Status
	Roadside CVO Safety (cont'd)	Private Trucking Companies	
		Private Trucking Companies Commercial Vehicles	
CVO10	HAZMAT Management	County Emergency Operations Centers	
		Local City/County 911 Dispatch Centers	
		MDOT District Highway Service Patrol Vehicles	
		MHP Dispatch Centers	
		Mississippi Department of Environmental Quality	
		Private Trucking Companies Commercial Vehicles	
EM01	Emergency Call-Taking and Dispatch	MHP *HP Cellular Phone System	
		Local City/County Emergency Vehicles	
		Local City/County 911 Dispatch Centers	
		Hub City Transit	
		County Emergency Operations Center	
		Emergency Telecommunications System	
		MHP Dispatch Centers	
		MHP Emergency Vehicles	
		MHP District 7 Offices	
EM02	Emergency Routing	Local City/County 911 Dispatch Centers	
		Local City/County Emergency Vehicles	
		City of Hattiesburg TCC	
		City of Hattiesburg Roadside Equipment	
		MDOT District Closed Loop Signal Systems	
		MHP Dispatch Centers	
		MHP Emergency Vehicles	
EM04	Roadway Service Patrols	MDOTRegional TMC	
		MDOT District Highway Service Patrol Vehicles	
EM06	Wide-Area Alert	City of Hattiesburg TCC	
		City of Hattiesburg Police	
		Local City/County 911 Dispatch Centers	
		Hub City Transit System Kiosks	
		Hub City Transit Traveler Information Systems	
		County Emergency Operations Centers	
		Hattiesburg-Laurel Regional Airport Information System	
		MDOT Commercial Vehicle Traveler Information Network	
		MDOT District Highway Advisory Radio	
		MDOT District Dynamic Message Signs	
		MDOT District Maintenance and Construction Offices	
		MDOT District Portable Dynamic Message Signs	
		MDOT Regional TMC	
		MDOT MSTraffic.com	
		MDOT Statewide 511 System	
		MDOT Truck Stop Kiosks	
		MEMA Emergency Operations Center	
		MHP District 7 Offices	
		MHP Dispatch Centers	
		Mississippi Bureau of Investigation	
		Mississippi Emergency Management Agency	
		Mississippi Office of Homeland Security	
		Mississippi Road/Weather Conditions Website	
		Telecommunications Systems for Traveler Information	
		User Personal Computing Devices	

Market Package	Market Package Name	Associated Element	Status
EM07	Early Warning System	City of Hattiesburg TCC	
		County Emergency Operations Center	
		Hub City Transit	
		Local City/County TCCs	
		MDOT Regional TMC	
		MEMA Emergency Operations Center	
		MHP Dispatch Centers	
		Mississippi Emergency Management Agency	
		Mississippi Office of Homeland Security	
EM08	Disaster Response and Recovery	City of Hattiesburg TCC	
		County Emergency Operations Center	
		Hub City Transit	
		Local City/County TCCs	
		Local City/County 911 Dispatch Centers	
		MDOT Regional TMC	
		MDOT District Maintenance and Construction Offices	
		MDOT Statewide TMC	
		MEMA Emergency Operations Center	
		MHP District 7 Offices	
		MHP Dispatch Centers	
		Mississippi Department of Environmental Quality	
		Mississippi Emergency Management Agency	
		Mississippi Office of Homeland Security	
		Other Transit Service Providers	
EM09	Evacuation and Reentry Management	City of Hattiesburg TCC	
		County Emergency Operations Center	
		Hub City Transit	
		Local City/County TCCs	
		Local City/County 911 Dispatch Centers	
		MDOT Regional TMC	
		MDOT District Maintenance and Construction Offices	
		MDOT Statewide TMC	
		MEMA Emergency Operations Center	
		MHP Dispatch Centers	
		Mississippi Emergency Management Agency	
		Mississippi Office of Homeland Security	
EM10	Disaster Traveler Information	Multimodal Transit Centers	
		County Emergency Operations Center	
		Hattiesburg-Laurel Airport Information System	
		MDOT Statewide 511 System	
		MDOT MSTraffic.com	
		MDOT Regional TMC	
		Media	
		MEMA Emergency Operations Center	
		Mississippi Emergency Management Agency	
		Mississippi Office of Homeland Security	
		Telecommunications Systems for Traveler Information	
		Truck Stop Kiosks	
		User Personal Computing Devices	

Market Package	Market Package Name	Associated Element	Status
MC02	Maintenance and Construction Vehicle Maintenance	MDOT District Maintenance and Construction Offices	
		MDOT District 6 Maintenance Vehicles	
MC06	Winter Maintenance	City of Hattiesburg Public Services	
		City of Hattiesburg TCC	
		City of Laurel Public Works	
		Local City/County Public Works	
		Local City/County TCCs	
		MDOT District Maintenance and Construction Offices	
		MDOT District Maintenance Vehicles	
		MDOT Regional TMC	
		National Weather Service Information	
MC07	Roadway Maintenance and Construction	City of Hattiesburg Public Services	
		City of Hattiesburg TCC	
		City of Laurel Public Works	
		Local City/County Public Works	
		Local City/County TCCs	
		MDOT District Maintenance and Construction Offices	
		MDOT District Maintenance Vehicles	
		MDOT Regional TMC	
MC08	Work Zone Management	City of Hattiesburg Public Services	
		City of Hattiesburg TCC	
		City of Laurel Public Works	
		City of Hattiesburg TCC Roadside Equipment	
		Local City/County Public Works	
		Local City/County TCCs	
		Local City/County TCCs Roadside Equipment	
		MDOT District Dynamic Message Signs	
		MDOT District Dynamic Speed Zone Signs	
		MDOT District Maintenance and Construction Offices	
		MDOT Regional TMC	
		MDOT Regional Roadside Equipment	
		MDOT District Portable Dynamic Message Signs	
		MDOT District Traffic Surveillance Equipment	
		MDOT Highway Advisory Radio	
		Media	
MC10	Maintenance & Construction Activity Coordination	City of Hattiesburg Public Services	
		City of Hattiesburg TCC	
		City of Laurel Public Works	
		Hub City Transit	
		Local City/County 911 Dispatch Centers	
		Local City/County Public Works	
		MDOT District Maintenance and Construction Offices	
		MDOT Regional TMC	
		MDOT MSTraffic.com	
		MDOT Statewide 511 System	
		Media	
		MHP District 7 Office	
		Multimodal Transit Center	
		Rail Companies	

6. SUBSYSTEMS, EQUIPMENT PACKAGES AND FUNCTIONAL REQUIREMENTS

As one of the required components of an ITS Architecture identified in Final Rule 940 and the FTA Policy on ITS Architecture and Standards, this section of the report summarizes the system functional requirements for the Hattiesburg Region ITS Architecture in terms of market packages, subsystems, and equipment packages.

6.1 Mapping of Market Packages to Subsystems and Equipment Packages

A market package is implemented with a combination of interrelated equipment; this equipment often resides in several different subsystems within the architecture framework and may be operated by different stakeholders. For instance, the Maintenance and Construction Equipment and Vehicle Tracking market package includes equipment in the Vehicle Subsystem and a utilization and management element in the Maintenance and Construction Management Subsystem. In this example, the market package elements are owned and operated by the same traffic management stakeholder.

In other cases, the market package elements are owned and operated by different stakeholders. Many of the Advanced Traveler Information Systems (ATIS) market packages require equipment in the Information Service Provider Subsystem that is owned and operated by a public or private information provider and equipment that is acquired and operated by the consumer as part of the Vehicle Subsystem or Personal Information Access Subsystem. Since equipment in different subsystems may be purchased and operated by different end-users, these subsystem-specific components may encounter varied deployment.

To understand and analyze these potential deployment variations, the defined market packages must be reduced to their constituent elements. The portion of the market package capabilities allocated to each subsystem are segregated and defined as equipment packages to support this additional resolution. An equipment package represents a set of equipment/capabilities likely to be purchased by an end-user as a component to an overall system. It should be noted that there are no equipment packages defined for the terminators of the National ITS Architecture, as they

represent systems on the boundary of the architecture and do not have functional descriptions within the architecture.

Table 6-1 illustrates the subsystems and equipment packages that are mapped to the customized list of market packages. The table illustrates the specific market packages in the Hattiesburg Region ITS Architecture, the subsystems that are part of the market packages, and the equipment packages that make up the market packages. As indicated in the table, the architecture provides a means to map the market package to appropriate subsystems (components) and equipment packages (technology). The equipment packages identified in Table 6-1 were used to develop the specific functional requirements of each element. The definitions of the equipment packages can be found on the National ITS Architecture website at http://itsarch.iteris.com/itsarch/.

Table 6-1. Market Packages, Subsystems and Equipment Packages

Market Package	Market Package Name	Subsystem	Equipment Package
AD1	ITS Data Mart	Archived Data Management	Traffic and Roadside Data Archival
			ITS Data Repository
			Government Reporting System Support
			Online Analysis and Mining
		Commercial Vehicle Administration	CV Data Collection
		Emergency Management	Emergency Data Collection
		Information Service Provider	ISP Data Collection
		Maintenance and Construction Management	MCM Data Collection
		Roadway Subsystem	Roadway Data Collection
		Traffic Management	Traffic Data Collection
		Transit Subsystem	Transit Data Collection
AD2	ITS Data Warehouse	Archived Data Management	ITS Data Repository
			Traffic and Roadside Data Archival
			Government Reporting System Support
			On-line Analysis and Mining
		Commercial Vehicle Administration	CV Data Collection
		Emergency Management	Emergency Data Collection
		Maintenance and Construction Management	MCM Data Collection
		Roadway Subsystem	Roadway Data Collection
		Traffic Subsystem	Traffic Data Collection
		Transit Subsystem	Transit Data Collection
		Information Service Provider	Traveler Telephone Info
		Transit Vehicle Subsystem	On-board Transit Trip Monitoring
APTS2	Transit Fixed-Route Operations	Transit Management	Transit Center Fixed-Route Operations
		Information Service Provider	Traveler Telephone Info
		Transit Vehicle Subsystem	On-board Fixed Route Schedule Management
		Information Service Provider	Traveler Telephone Info
		Transit Vehicle Subsystem	On-board Paratransit Operations
APTS4	Transit Passenger and Fare Management	Transit Vehicle Subsystem	On-board Transit Fare and Load Management
APTS5	Transit Security	Transit Management	Transit Center Security
		Transit Vehicle Subsystem	On-board Transit Security
		Emergency Management	Center Secure Area Surveillance
			Emergency Response Management

Market Package	Market Package Name	Subsystem	Equipment Package
APTS6	Transit Maintenance	Transit Management	Transit Garage Maintenance
		Transit Vehicle Subsystem	On-board Maintenance
ATPS7	Multi-modal Coordination	Transit Management	Transit Center Multi-Modal Coordination
		Transit Vehicle Subsystem	On-board Transit Signal Priority
APTS8	Transit Traveler Information	Transit Management	Transit Center Information Services
		Personal Information Access	Personal Interactive Information Reception
		Transit Vehicle Subsystem	On-board Transit Information Services
		Information Service Provider	Infrastructure Provided Trip Planning
			ISP Traveler Data Collection
ATIS1	Broadcast Traveler Information	Information Service Provider	Basic Information Broadcast
			ISP Traveler Data Collection
		Personal Information Access	Personal Basic Information Reception
		Traffic Management	TMC Traffic Information Dissemination
		Remote Traveler Support	Remote Basic Information Reception
ATIS2	Interactive Traveler Information	Information Service Provider	Traveler Telephone Information
			ISP Traveler Data Collection
ATMS01	Network Surveillance	Traffic Management	Collect Traffic Surveillance
			Traffic Maintenance
		Information Service Provider	Basic Information Broadcast
			ISP Emergency Traveler Information
			ISP Traveler Data Collection
			Traveler Telephone Information
		Roadway Subsystem	Roadway Basic Surveillance
			Roadway Equipment Coordination
ATMS03	Surface Street Control	Traffic Management	Collect Traffic Surveillance
			TMC Signal Control
			Traffic Maintenance
		Roadway Subsystem	Roadway Signal Controls
			Roadway Basic Surveillance
			Roadway Equipment Coordination
AMTS04	Freeway Control	Traffic Management	Collect Traffic Surveillance
			TMC Freeway Management
			TMC Traffic Information Dissemination
			Traffic Maintenance
		Roadway Subsystem	Roadway Basic Surveillance
			Roadway Equipment Coordination
			Roadway Traffic Information Dissemination

Market Package	Market Package Name	Subsystem	Equipment Package
ATMS06	Traffic Information Dissemination	Traffic Management	TMC Traffic Information Dissemination
		Information Service Provider	Basic Information Broadcast
			ISP Emergency Traveler Information
			ISP Traveler Data Collection
			Traveler Telephone Information
		Roadway Subsystem	Roadway Traffic Information Dissemination
			Roadway Equipment Coordination
ATMS07	Regional Traffic Control	Traffic Management	TMC Regional Traffic Control
			TMC Signal Control
ATMS08	Traffic Incident Management System	Traffic Management	TMC Incident Detection
			TMC Incident Dispatch Coordination/Communication
		Roadway Subsystem	Roadway Incident Detection
			Roadway Equipment Coordination
		Information Service Provider	Basic Information Broadcast
			ISP Emergency Traveler Information
			ISP Traveler Data Collection
			Traveler Telephone Information
		Emergency Management	Emergency Response Management
			Incident Command
		Maintenance and Construction Management	MCM Incident Management
		Emergency Vehicle Subsystem	On-board EV Incident Management Communication
ATMS09	Traffic Forecast and Demand Management	Traffic Management	TMC Traffic Network Performance Evaluation
		Archived Data Management	Traffic and Roadside Data Archival
			ITS Data Repository
			Government Reporting System Support
			Online Analysis and Mining
		Information System Provider	Basic Information Broadcast
			ISP Emergency Traveler Information
			ISP Traveler Data Collection
			Traveler Telephone Information
ATMS10	Electronic Toll Collection	Toll Administration	Toll Administration
		Toll Collection	Toll Plaza Toll Collection
ATMS13	Standard Railroad Grade Crossing	Traffic Management	HRI Traffic Management
		Roadway Subsystem	Standard Rail Crossing
ATMS14	Advanced Railroad Grade Crossing	Traffic Management	HRI Traffic Management
		Roadway Subsystem	Advanced Rail Crossing
ATMS16	Parking Facility Management	Parking Management	Parking Management

Market Package	Market Package Name	Subsystem	Equipment Package
ATMS19	Speed Monitoring	Roadway Subsystem	Roadway Speed Monitoring
			Roadway Equipment Coordination
		Traffic Management	TMC Speed Monitoring
ATMS21	Roadway Closure Management	Emergency Management	Emergency Response Management
		Traffic Management	TMC Traffic Information Dissemination
			Collect Traffic Surveillance
			Barrier System Management
		Roadway Subsystem	Roadway Traffic Information Dissemination
			Roadway Basic Surveillance
			Roadway Work Zone Traffic Control
			Roadway Equipment Coordination
		Maintenance and Construction Management	MCM Work Zone Management
CVO03	Electronic Clearance	Commercial Vehicle Administration	CV Information Exchange
			CV Safety Administration
		Commercial Vehicle Check	Citation and Accident Electronic Recording
			Roadside Electronic Screening
		Commercial Vehicle Subsystem	On-board CV Electronic Data
CVO04	CV Administrative Processes	Commercial Vehicle Administration	Credentials and Taxes Administration
			CV Information Exchange
CVO06	Weigh-In-Motion	Commercial Vehicle Check	Roadside WIM
		Commercial Vehicle Subsystem	On-board CV Electronic Data
CVO07	Roadside CVO Safety	Commercial Vehicle Administration	CV Information Exchange
			CV Safety Administration
		Commercial Vehicle Check	Roadside Electronic Screening
			Roadside Safety and Security Inspection
			Citation and Accident Electronic Recording
		Commercial Vehicle Subsystem	On-board CV Electronic Data
CVO10	HAZMAT Management	Emergency Management	Emergency Commercial Vehicle Response
		Commercial Vehicle Subsystem	On-board Cargo Monitoring
			On-board CV Electronic Data

Market Package	Market Package Name	Subsystem	Equipment Package
EM01	Emergency Call-Taking and Dispatch	Emergency Management	Emergency Call-Taking
			Emergency Dispatch
		Emergency Vehicle Subsystem	On-board EV En Route Support
EM02	Emergency Routing	Emergency Management	Emergency Routing
		Emergency Vehicle	On-board EV En Route Support
		Traffic Management	TMC Incident Dispatch Coordination/Communication
			TMC Signal Control
		Roadway Subsystem	Roadway Signal Priority
EM04	Roadway Service Patrols	Emergency Management	Service Patrol Management
		Traffic Management	TMC Incident Detection
			TMC Incident Dispatch Coordination
		Emergency Vehicle Subsystem	On-board EV En-route Support
			On-board EV Incident Management Communication
EM06	Wide-Area Alert	Emergency Management	Emergency Early Warning System
		Information Service Provider	ISP Emergency Traveler Information
			ISP Traveler Data Collection
			Traveler Telephone Information
		Maintenance and Construction Management	MCM Incident Management
		Personal Information Access	Personal Basic Information Reception
		Traffic Management	TMC Traffic Information Dissemination
			TMC Incident Dispatch Coordination/Communication
		Transit Management	Transit Center Information Services
			Transit Center Security
		Remote Traveler Support	Remote Basic Information Reception
			Remote Transit Information Services
		Roadway Subsystem	Roadway Traffic Information Dissemination
EM07	Early Warning System	Emergency Management	Emergency Early Warning System
			Center Secure Area Surveillance
			Emergency Environmental Monitoring
		Traffic Management	TMC Incident Detection
EM08	Disaster Response and Recovery	Emergency Management	Emergency Response Management
			Incident Command
		Transit Management	Transit Center Security
		Traffic Management	TMC Incident Dispatch Coordination/Communication
EM09	Evacuation and Reentry Management	Emergency Management	Emergency Evacuation Support
		Traffic Management	TMC Evacuation Support
		Transit Management	Transit Evacuation Support

Market Package	Market Package Name	Subsystem	Equipment Package
EM10	Disaster Traveler Information	Information Service Provider	ISP Emergency Traveler Information
			ISP Traveler Data Collection
			Traveler Telephone Information
		Emergency Management	Emergency Evacuation Support
			Emergency Response Management
		Personal Information Access	Personal Basic Information Reception
			Personal Interactive Information Reception
		Traffic Management	TMC Evacuation Support
			TMC Traffic Information Dissemination
		Transit Management	Transit Evacuation Support
		Remote Traveler Support	Remote Basic Information Reception
MC02	Maintenance and Construction Vehicle Maintenance	Maintenance and Construction Management	MCM Vehicle and Equipment Maintenance Management
			MCM Incident Management
			MCM Maintenance Decision Support
			MCM Winter Maintenance Management
			MCM Roadway Maintenance and Construction
			MCM Work Zone Management
			MCM Work Activity Coordination
			MCM Data Collection
		Maintenance and Construction Vehicle	MCV Vehicle System Monitoring and Diagnostics
			MCV Vehicle Location Tracking
			MCV Winter Maintenance
			MCV Roadway Maintenance and Construction
MC06	Weather Information Processing and Distribution	Maintenance and Construction Management	MCM Environmental Information Processing
		Information Service Provider	ISP Traveler Data Collection
MC07	Roadway Maintenance and Construction	Maintenance and Construction Management	MCM Roadway Maintenance and Construction
			MCM Maintenance Decision Support
		Roadway Subsystem	Roadway Field Device Monitoring
		Maintenance and Construction Vehicle	MCV Roadway Maintenance and Construction
		Traffic Management	Traffic Maintenance

Market Package	Market Package Name	Subsystem	Equipment Package
MC08	Work Zone Management	Maintenance and Construction Management	MCM Work Zone Management
		Traffic Management	TMC Work Zone Traffic management
		Roadway Subsystem	Roadway Work Zone Traffic Control
MC10	Maintenance and Construction Activity Coordination	Maintenance and Construction Management	MCM Work Activity Coordination
		Traffic Management	TMC Incident Dispatch Coordination/Communication
		Information Service Provider	Traveler Telephone Information
			Basic Information Broadcast
		Emergency Management	Emergency Response Management

6.2 Functional Requirements

A functional requirement is a task or activity currently performed or planned to be performed by each system in the region to provide the required regional ITS services. In the National ITS Architecture, each functional area (i.e. equipment package) has several specific functional requirements that are necessary for performing the equipment package capabilities. These functional requirements of the National ITS Architecture are commonly used as a baseline to develop the functional requirements of a regional ITS Architecture.

The process to develop the functional requirements of the Hattiesburg Region ITS Architecture began with the mapping of functional areas to market packages and associated elements as an initial definition of the functions being performed by each element. The functional requirements of each equipment package are then tailored to provide a more accurate picture of the functions performed. Using Turbo Architecture, functional requirements that support ITS projects for the region were identified. These functional requirements are listed in Appendix B. The appendix includes the following information for each ITS element:

- **Element.** Name of the system that will be performing the function
- **Entity.** Describes the National ITS Architecture subsystem to which the element is mapped
- **Functional Area.** Description of the function performed by the element
- **Requirement.** High-level functional requirement to be performed by the element supporting the functional area

To illustrate functions and functional requirements, the traffic signal control and management function of MDOT District 6 Traffic Signal Systems is used as an example. In the Hattiesburg Region ITS Architecture, MDOT District 6 Traffic Signal Systems was mapped to the Roadway Subsystem as it provides signal control and management functions. The market package associated with these functions is ATMS03 Surface Street Control. Four functional areas (equipment packages) are required for the MDOT District 6 Traffic Signal Systems to perform the signal control and management functions. They are:

- **Roadway Signal Control:** This equipment package includes field elements such as traffic signal controllers for use at signalized intersections; also supports pedestrian crossings. It contains seven specific functional requirements in the National ITS Architecture.
- **Roadway Signal Priority:** This equipment package includes field elements that provide the capability to receive vehicle signal priority requests and control traffic signals accordingly. It contains three specific functional requirements.
- **Standard Rail Crossing:** This equipment package includes field elements at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Includes traditional HRI warning systems augmented with other standard traffic management devices. It contains nine specific functional requirements.
- **Roadway Equipment Coordination:** This equipment package includes field elements that control and send data to other field elements (such as environmental sensors that send data to a DMS or coordination between traffic controllers on adjacent intersections), without center control. It contains four specific functional requirements.

Not all of the functional requirements described above are applicable to the Hattiesburg Region ITS Architecture. The appropriate functional requirements for each equipment package were tailored to the Hattiesburg Mississippi region and are identified in Table 6-2.

Table 6-2. Functional Requirements Example: MDOT District 6 Traffic Signal Systems

Functional Area (Equipment Package)	Functional Requirements	Status
Roadway Signal Control	The field element shall control traffic signals at intersections and on main highways for urban and rural areas, under center control.	Existing
	The field element shall collect pedestrian images and pedestrian sensor data, and respond to pedestrian crossing requests via display, audio signal, or other manner.	Existing
	The field element shall provide the capability to notify the traffic management center that a pedestrian has requested right-of-way and when the request was or will be granted (request for right-of-way).	Existing
	The field element shall monitor operation of traffic signal controllers and report to the center any instances in which the indicator response does not match that expected from the indicator control information.	Existing
	The field element shall monitor operation of traffic signal controllers and report to the center any instances in which the indicator response does not match that expected from known indicator preemptions.	Existing
	The field element shall return traffic signal controller operational status to the controlling center.	Existing
	The field element shall return traffic signal controller fault data to the maintenance center for repair.	Existing
Roadway Signal Priority	The field element shall respond to requests for indicator (e.g., signal) preemption requests from emergency vehicles at intersections, pedestrian crossings, and multimodal crossings.	Planned
	The field element shall respond to requests for indicator (e.g., signal) priority requests from transit vehicles at intersections, pedestrian crossings, and multimodal crossings.	Planned
	The field element shall notify controlling traffic management center and maintenance center that the signal timing has changed based on a signal preemption/priority request to help those centers determine whether a fault detected at the signal is a true malfunction or due to a signal override.	Planned
Standard Rail Crossing	The field element shall collect and process traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Existing
	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Existing

Functional Area (Equipment Package)	Functional Requirements	Status
Standard Rail Crossing (cont'd)	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the rail wayside equipment.	Existing
	The field element shall receive track status from the rail wayside equipment that can be passed on to the traffic management center. This may include the current status of the tracks and whether a train is approaching.	Existing
	The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.	Existing
Roadway Equipment Coordination	The field element shall include sensors (such as traffic, environmental, and work zone intrusion detection sensors) that provide data and status information to other field element devices (such as dynamic message signs, ramp meters, traffic signals, work zone intrusion alert systems), without center control.	Existing
	The field element shall include sensors (such as traffic, environmental and work zone intrusion detection sensors) that receive control information from other field element devices, without center control.	Existing
	The field element shall include devices (such as arterial or freeway controllers, roadway automated treatment systems, barrier and safeguard systems, emissions or pollution systems, and work zone intrusion alert systems) that provide data and status information to other field element devices (such as dynamic message signs, traffic controllers on adjacent intersections), without center control.	Existing
	The field element shall include devices (such as arterial or freeway controllers, roadway automated treatment systems, barrier and safeguard systems, emissions or pollution systems, and work zone intrusion alert systems) that receive control information from other field element devices, without center control.	Existing

7. INTERCONNECTS AND ARCHITECTURE FLOWS

While it is important to identify the various ITS systems and associated stakeholders the primary purpose of the Hattiesburg Region ITS Architecture is to identify the *connectivity* between systems, which includes:

- **Interconnects** define an ITS Architecture from a physical perspective, which shows the connections that can be established between equipment and systems which may be deployed by different organizational or operating agencies throughout the region.
- **Architecture Flows** define an ITS Architecture from a logical perspective, which identify high-level information exchange associated with each interconnect between equipment and systems.

7.1 System Interconnects

Based on subsystems and market packages selected for each ITS inventory element, a set of interconnects between the elements has been identified. As shown in Figure 7-1, a high-level interconnect diagram for the Hattiesburg Region ITS Architecture, often referred to as a "sausage diagram," illustrates the subsystems and primary types of interconnects (or communications) between these subsystems. The sausage diagram was customized to reflect the ITS systems in the region. The shaded areas in Figure 7-1 indicate the functions and services not currently existing or planned in the region. The sausage diagram identifies four basic types of communications used to interconnect the elements. The definitions of the four types of communications are:

- **Fixed-point to fixed-point Communications:** a communication link serving stationary entities. It may be implemented using a variety of public or private communication networks and technologies. It can include, but is not limited to, twisted pair, coaxial cable, fiber optic, microwave relay networks, spread spectrum, etc. In fixed-point to fixed-point communication the important issue is that it serves stationary entities. Both dedicated and shared communication resources may be used.
- **Wide-Area Wireless Communications:** a communications link that provides communications via a wireless device between a user and an infrastructure-based system. Both broadcast (one-way) and interactive (two-way) communications services are grouped into wide-area wireless communications in the National ITS Architecture. These

links support a range of services in the National ITS Architecture including real-time traveler information and various forms of fleet communications.

- **Dedicated Short-Range Communications:** a wireless communications channel used for close-proximity communications between vehicles and the immediate infrastructure. It supports location-specific communications for ITS capabilities such as toll collection, transit vehicle management, driver information, and automated commercial vehicle operations.
- **Vehicle-to-Vehicle Communications:** dedicated wireless system handling high data rate, low probability of error, and line-of-sight communications between vehicles. Advanced vehicle services may use this link in the future to support advanced collision avoidance implementations, road condition information sharing, and active coordination to advanced control systems.

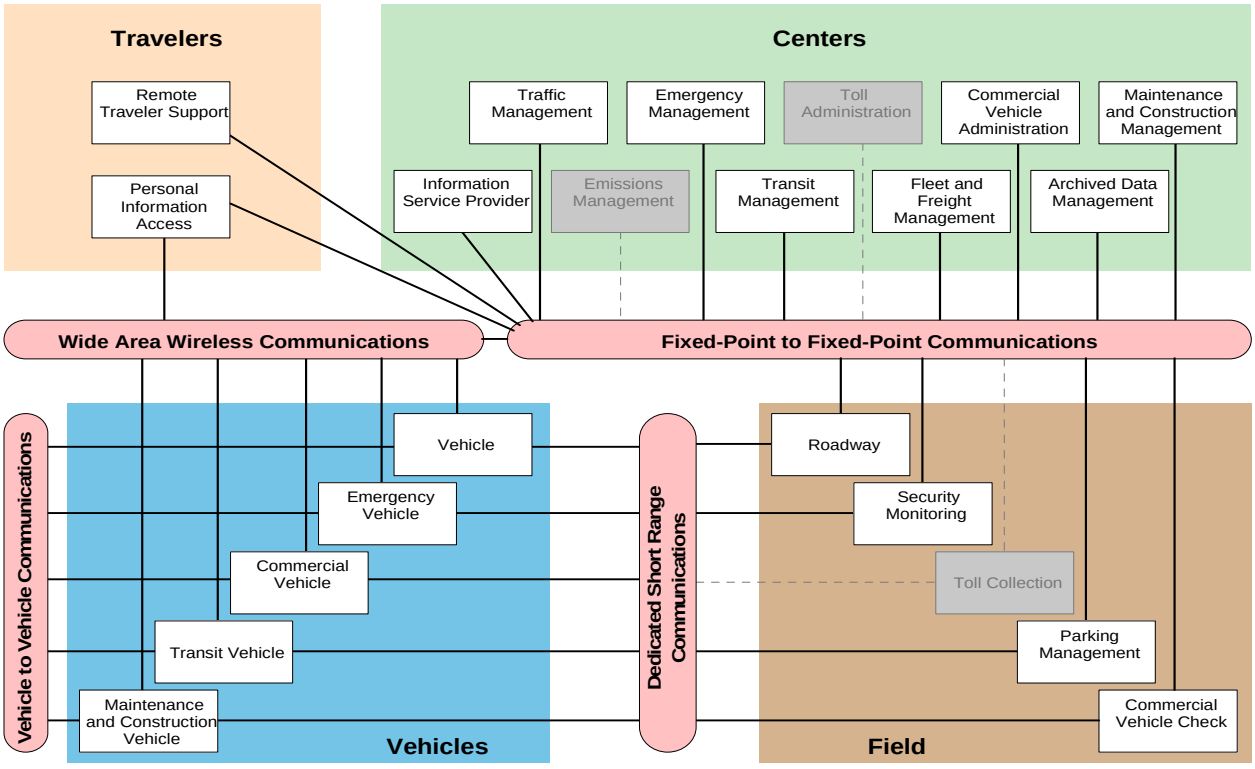


Figure 7-1. High Level Interconnect Diagram

On a more specific level, interconnect diagrams can depict the interactions between specific elements and other associated agencies and their systems within the architecture. Figures 7-2 to 7-4 illustrate interconnects focused on the following key regional ITS market packages:

- Transit Security;
- Surface Street Control
- Early Warning System

A complete set of the interconnect diagrams for the Hattiesburg Region ITS Architecture is included in Appendix C and can also be found in the Turbo Architecture database. A set of diagrams organized around each ITS element can be created in a batch process using the Turbo Architecture.

7.2 Architecture Flows

Architecture flows provide a high level description of information exchange associated with each interconnect between equipment and systems. The architecture flows identified in the Hattiesburg Region ITS Architecture were derived from the architecture flow diagrams within the National ITS Architecture, and therefore, they are consistent with the National ITS Architecture. Through the architecture flows, stakeholders can easily identify the existing or future information exchange between agencies and systems. This provides a framework for analyzing how elements are related and thereby identifies the areas for potential coordination and cooperation among agencies. Detailed definitions of architecture flows can be found on the National ITS Architecture website at http://www.iteris.com/itsarch/. A sample architecture flow diagram for a portion of Surface Street Control interconnected elements is presented in Figure 7-5. A complete list of architecture flows for the Hattiesburg Region ITS Architecture is provided in Appendix D and can be found in the Turbo Architecture database.

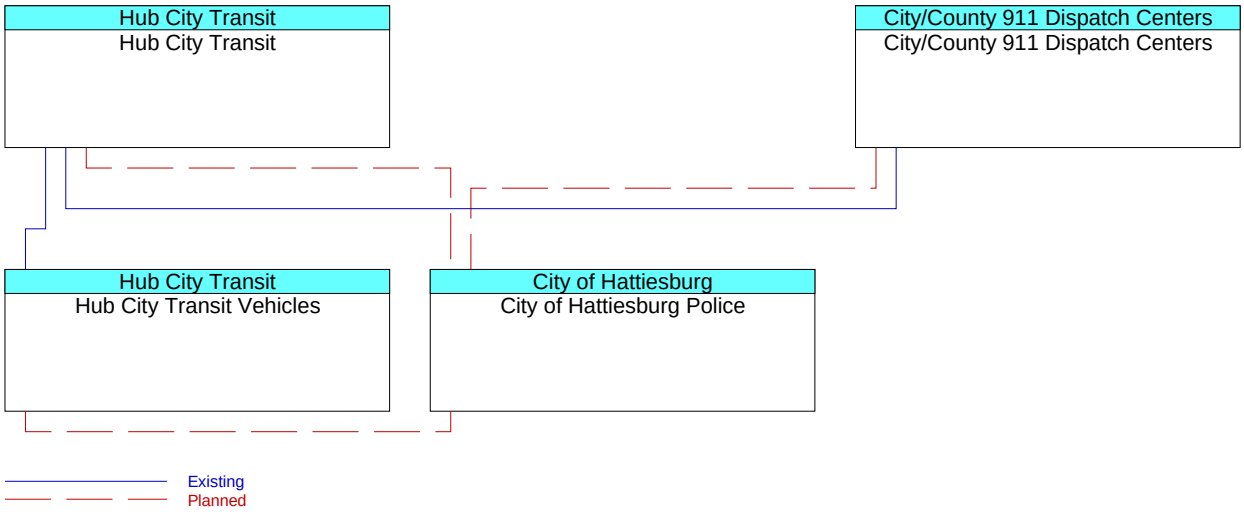


Figure 7-2. Transit Security Interconnect Diagram

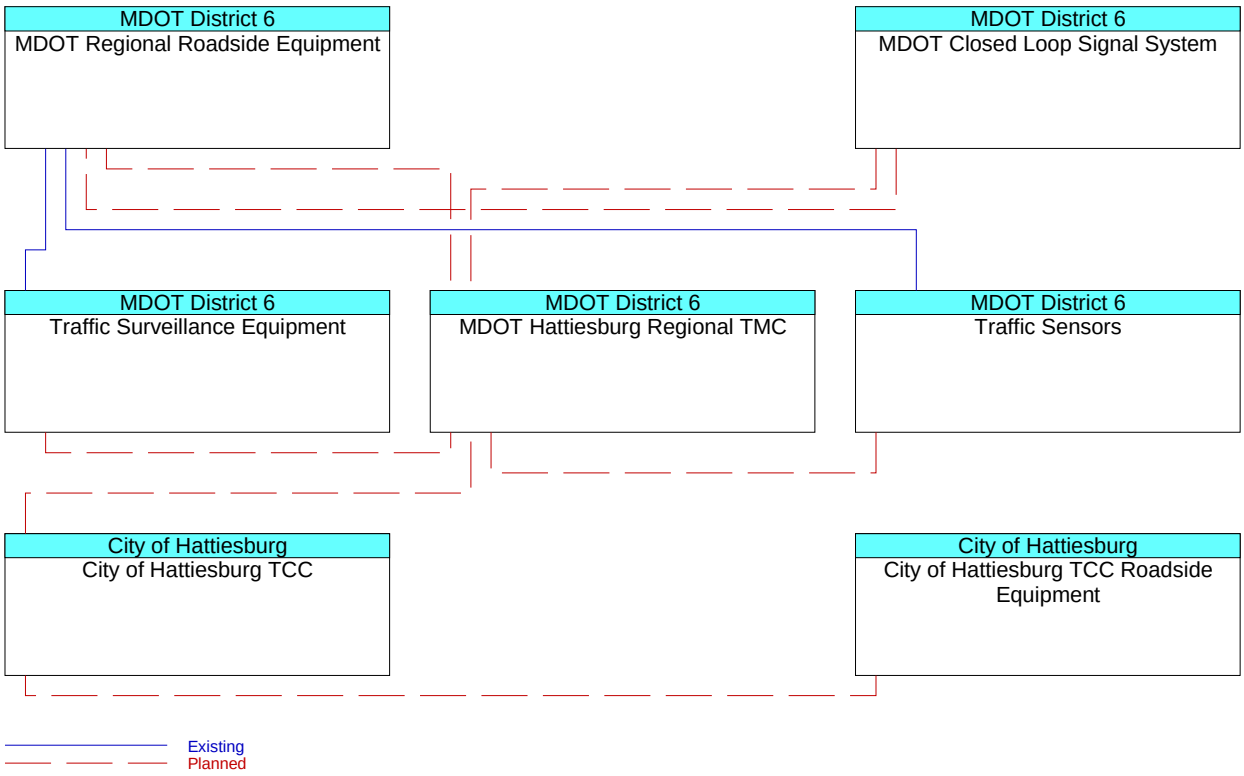


Figure 7-3. Surface Street Control Interconnect Diagram

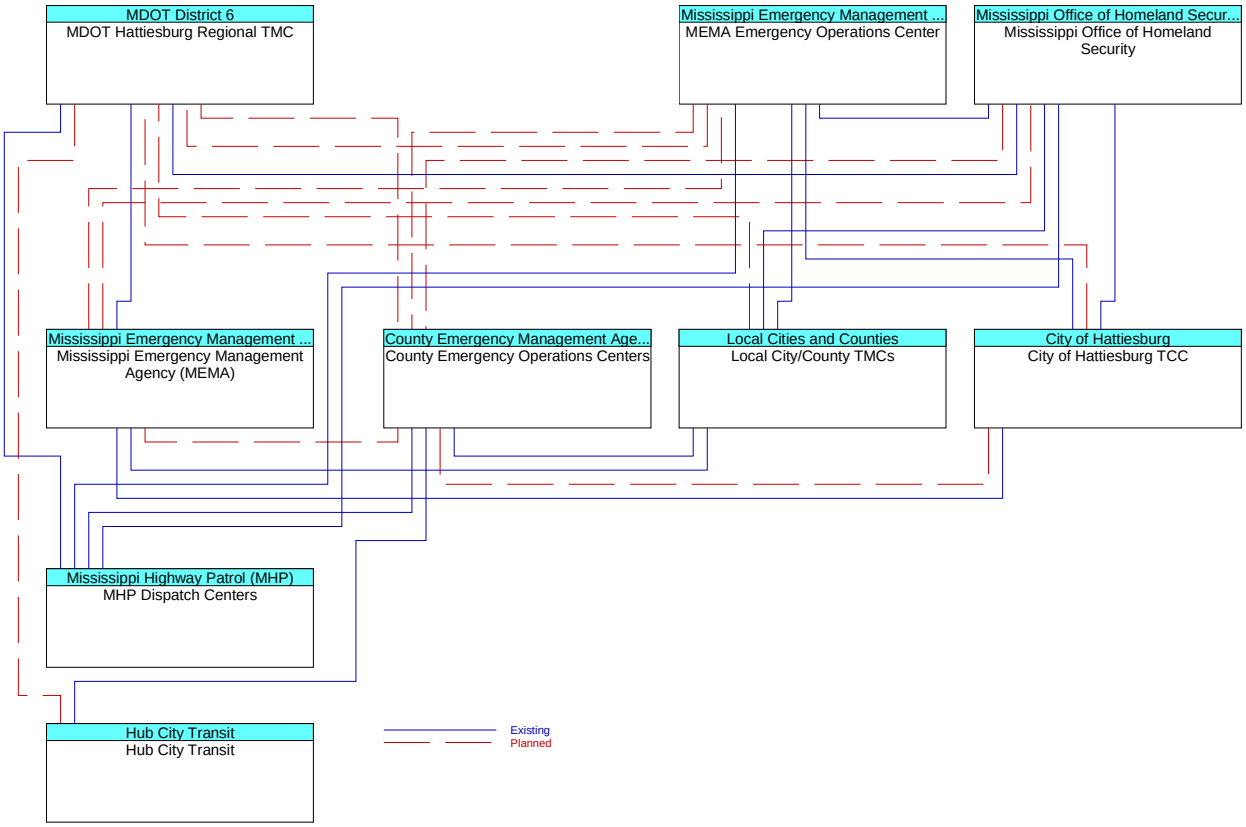


Figure 7-4. Early Warning System Interconnect Diagram

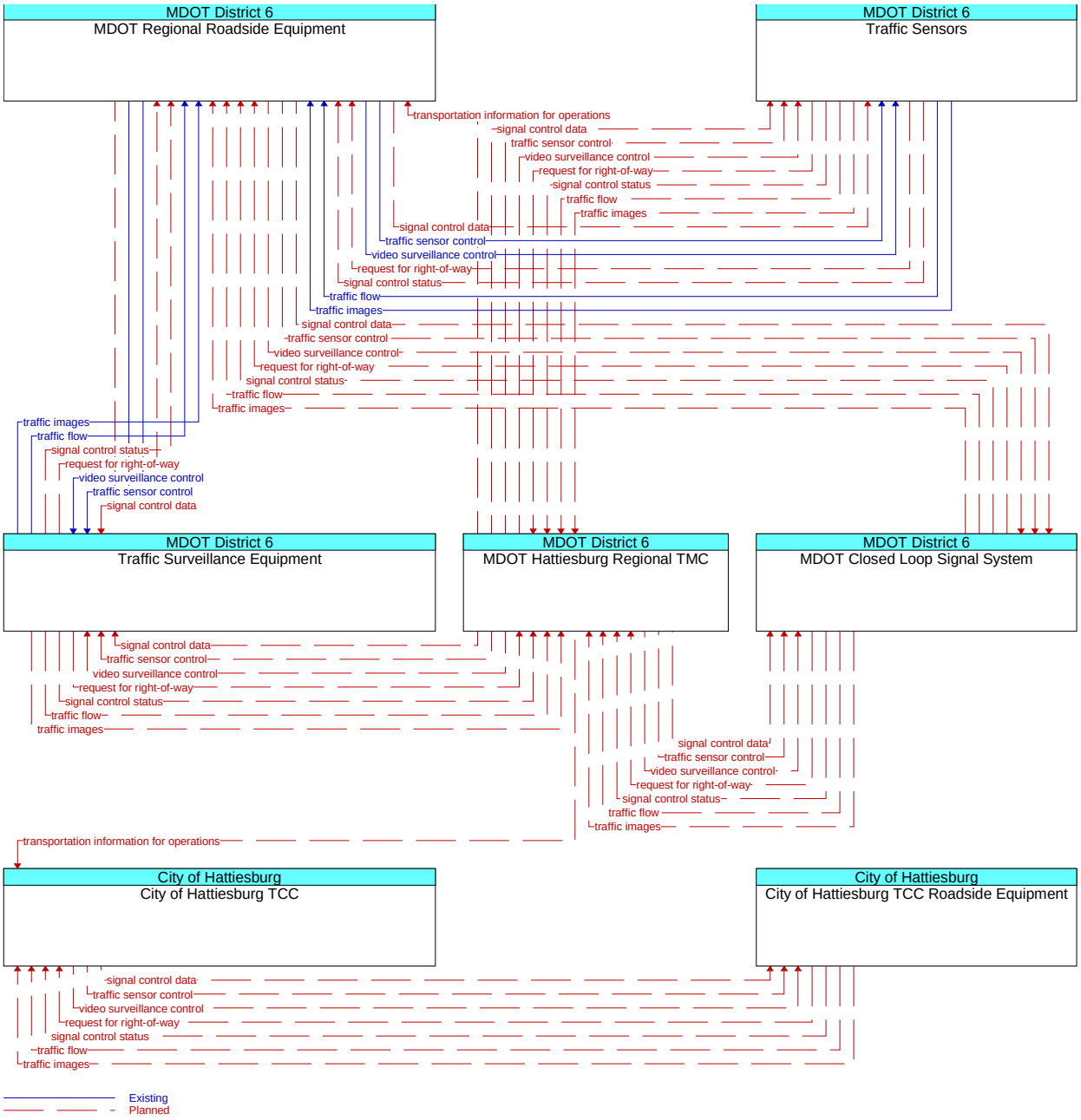


Figure 7-5 – Surface Street Control Architecture Flow Diagram

8. ITS STANDARDS

ITS Standards are fundamental to the establishment of an open environment that achieves the goals originally envisioned by the USDOT. Standards facilitate deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances and new approaches evolve.

Standards can be thought of as the glue that holds the various components of architecture together. The logical architecture presents a functional view of the ITS user services. It defines the functions or processes that are required to perform the selected ITS user services, and the information or data flows that need to be exchanged between these functions. The physical architecture partitions the functions defined by the logical architecture into systems and subsystems. To accomplish the functions outlined in the logical architecture, communication must take place between the elements of the physical architecture. Standards define how these communications take place.

8.1 Standards Benefits

Many of the benefits the public receives from the National ITS Architecture are a direct result of the development and implementation of standards. Primarily, standards provide benefits in the following areas:

- **National Compatibility** – National compatibility is represented by the ability to use the same equipment and services, regardless of the geographical location. The architecture identifies specific interfaces requiring nationwide compatibility. Examples include the delivery of real-time traveler information to in-vehicle devices and the dedicated short-range communication interface between the vehicle and the roadside. Nationwide standards for these types of interfaces will allow travelers and commercial vehicles to use their compliant equipment anywhere within the United States.
- **Multiple Suppliers** – The architecture can encourage competition in the delivery of ITS services through the implementation of standards in areas where a standard is not necessarily required to provide a traveler with seamless operation of his ITS service. These interfaces will benefit from standards in allowing multiple suppliers of equipment and software that will directly connect to other ITS systems.

- **Ranges of Functionality** – The standard packages contain data flows that support several levels of service. For example, the *trip plan* data flow contains a large number of optional data fields. The standards developer is encouraged to maintain the flexibility in the data flow specifications to allow for multiple implementations.
- **Synergy** – As discussed above, the architecture began with a logical architecture that satisfied the identified user services. As a result, there are functions and data flows common to several of the services. These "processes" appear in several higher-level data flows, and because they come from a single source, they support synergy and consistency.
- **Risk Reduction** – The architecture reduces risk to public providers, private providers and consumers. For public providers, the existence of standards means that equipment purchased in one year will be likely to operate with new equipment purchased several years from now. This also means that agencies will not be locked into specific vendors since all vendors will be able to build to the same standard. For private providers, the existence of standards means that they can gather information from multiple sources using well-defined message sets and thereby increase the level of service to their customers. For consumers, products built to a particular standard will allow a user to select their service provider from a number of companies, not just the company that manufactured their equipment.

Defined standards are fundamental to the establishment of nationally compatible and interoperable ITS deployments. Standards will enable deployment of consistent, non-interfering, reliable systems on local, regional and national levels. Open standards will further benefit the consumer by enhancing competition for the range of products necessary to implement the ITS user services. Larger markets for specific products will reduce production costs through economy of scale. Producers benefit from standards because they assure a wider market over which the product can be sold. As deployment occurs, diverse systems will be developed to address the special needs of urban, suburban and rural environments. Standards must ensure interoperability across these implementations without impeding innovation as technology advances and new approaches evolve.

Well-chosen, well-timed, and broadly-accepted standards can provide the following frequently referenced benefits:

- **Interoperability between diverse systems** – This benefit facilitates cost-effective area-wide implementations that ultimately provide enhanced service to the consumer.
- **Preservation of investment** – Timely standards can reduce investments in multiple incompatible approaches, some of which will become casualties of natural selection in the market place.
- **Technology insertion** – Systems can be incrementally improved to take advantage of new technologies.
- **Creation of broader markets** – Interoperability standards set the stage for national and/or international markets. The lack of a standard may ultimately limit the size of the market.
- **Interchangeability** – Interchangeable equipment reduces capital costs through increased competition and reduces maintenance costs through smaller spares inventories of less expensive replacement parts.

It should be noted that the adopted standards must be comprehensive in order to support interoperability.

8.2 Using Standards

More than 110 standards have been identified as part of the National ITS Architecture standard development activities. The task of working with the public and private sector ITS community to develop these standards has been assigned to seven different Standards Development Organizations (SDOs). These SDOs include:

- American Association of State Highway and Transportation Officials (AASHTO)
- American National Standards Institute (ANSI)
- American Society for Testing and Materials (ASTM)
- Institute of Electrical and Electronics Engineers (IEEE)
- International Organization for Standardization (ISO)
- Institute of Transportation Engineers (ITE)
- National Electrical Manufactures Association (NEMA)

- Society of Automotive Engineers (SAE)

Information on the complete list of ITS Standards can be found on the ITS Standards webpage at http://www.standards.its.dot.gov/.

While the Hattiesburg Region ITS Architecture is a comprehensive plan which includes various ITS applications, it does not cover every conceivable ITS technology. As such, not all ITS standards will be applicable to the existing and proposed projects. Table 8-1 summarizes the appropriate ITS standards for all existing and proposed projects in the Hattiesburg Mississippi region.

8.3 Mapping of Standards to Application Areas

Table 8-2 provides a guide to ITS standards that could be considered for use in different types of ITS projects in the Hattiesburg Mississippi region. Each row in the table represents an ITS standard and each column represents one of nineteen application areas. The standards included in the table are those that relate to the subsystems and information flows between them that are likely to be included in the ITS projects in the region. The application areas are deployment-oriented categories that focus on specific ITS services or systems. Each application area consists of one or more interfaces in the National ITS Architecture. They were chosen so that agencies and service providers can easily find the application area within which a particular ITS project fits. Most ITS projects will relate to only one application area, although larger projects may relate to more than one application area.

Note that not all interfaces in the Hattiesburg Region ITS Architecture are represented by an application area. This is because not all interfaces are currently represented by approved or published ITS standards. Additional application areas may be added in the future as additional ITS standards become available. The inclusion of a standard in an application area indicates that standard may apply — not that it must apply. Conversely, the exclusion of a standard from an application area does not mean that the standard may not be used in a project for that application area. For example, traffic management standards do not include traveler information standards;

however, traffic management centers may benefit from knowing what traveler information systems do with the information.

Table 8-1. Key Standards Supporting the Hattiesburg Region ITS Projects

Standard Name	SDO	Document ID	Status*
Simple Transportation Management Framework (STMF)	AASHTO/ITE/NEMA	NTCIP 1101	P
Octet Encoding Rules (OER) Base Protocol	AASHTO/ITE/NEMA	NTCIP 1102	P
Transportation Management Protocols (TMP)	AASHTO/ITE/NEMA	NTCIP 1103	A
Center-to-Center Naming Convention Specification	AASHTO/ITE/NEMA	NTCIP 1104	A
CORBA Security Service Specification	AASHTO/ITE/NEMA	NTCIP 1105	S
CORBA Near-Real Time Data Service Specification	AASHTO/ITE/NEMA	NTCIP 1106	S
Global Object Definitions	AASHTO/ITE/NEMA	NTCIP 1201	P
Object Definitions for Actuated Traffic Signal Controller Units	AASHTO/ITE/NEMA	NTCIP 1202	P
Object Definitions for Dynamic Message Signs (DMS)	AASHTO/ITE/NEMA	NTCIP 1203	P
Environmental Sensor Station (ESS) Interface Standard	AASHTO/ITE/NEMA	NTCIP 1204	P
Object Definitions for Closed Circuit Television (CCTV) Camera Control	AASHTO/ITE/NEMA	NTCIP 1205	P
Object Definitions for Data Collection and Monitoring (DCM) Devices	AASHTO/ITE/NEMA	NTCIP 1206	P
Object Definitions for Closed Circuit Television (CCTV) Switching	AASHTO/ITE/NEMA	NTCIP 1208	P
Data Element Definitions for Transportation Sensor Systems (TSS)	AASHTO/ITE/NEMA	NTCIP 1209	P
Field Management Stations - Part 1: Object Definitions for Signal System Masters	AASHTO/ITE/NEMA	NTCIP 1210	U
Object Definitions for Signal Control and Prioritization	AASHTO/ITE/NEMA	NTCIP 1211	A
TCIP Common Public Transportation (CPT) Objects	AASHTO/ITE/NEMA	NTCIP 1401	P
TCIP Incident Management (IM) Objects	AASHTO/ITE/NEMA	NTCIP 1402	P
TCIP Passenger Information (PI) Objects	AASHTO/ITE/NEMA	NTCIP 1403	P
TCIP Scheduling/Runcutting (SCH) Objects	AASHTO/ITE/NEMA	NTCIP 1404	P
TCIP Spatial Representation (SP) Objects	AASHTO/ITE/NEMA	NTCIP 1405	P
TCIP On-Board (OB) Objects	AASHTO/ITE/NEMA	NTCIP 1406	P
TCIP Control Center (CC) Objects	AASHTO/ITE/NEMA	NTCIP 1407	P
TCIP Fare Collection (FC) Business Area Objects	AASHTO/ITE/NEMA	NTCIP 1408	P
Point to Multi-Point Protocol Using RS-232 Subnetwork Profile	AASHTO/ITE/NEMA	NTCIP 2101	P
Point to Multi-Point Protocol Using FSK Modem Subnetwork Profile	AASHTO/ITE/NEMA	NTCIP 2102	P
Point-to-Point Protocol Over RS-232 Subnetwork Profile	AASHTO/ITE/NEMA	NTCIP 2103	P
Ethernet Subnetwork Profile	AASHTO/ITE/NEMA	NTCIP 2104	P
Transportation Transport Profile	AASHTO/ITE/NEMA	NTCIP 2201	P
Internet (TCP/IP and UDP/IP) Transport Profile	AASHTO/ITE/NEMA	NTCIP 2202	P
Simple Transportation Management Framework (STMF) Application Profile	AASHTO/ITE/NEMA	NTCIP 2301	P
Trivial File Transfer Protocol (TFTP) Application Profile	AASHTO/ITE/NEMA	NTCIP 2302	P
File Transfer Protocol (FTP) Application Profile	AASHTO/ITE/NEMA	NTCIP 2303	P
Application Profile for DATEX-ASN (AP-DATEX)	AASHTO/ITE/NEMA	NTCIP 2304	P
Application Profile for CORBA (AP-CORBA)	AASHTO/ITE/NEMA	NTCIP 2305	S
Application Profile for XML Message Encoding and Transport in ITS C2C Communications	AASHTO/ITE/NEMA	NTCIP 2306	B

Standard Name	SDO	Document ID	Status*
Information Profile for DATEX	AASHTO/ITE/NEMA	NTCIP 2501	S
Information Profile for CORBA	AASHTO/ITE/NEMA	NTCIP 2502	S
Commercial Vehicle Safety Reports	ANSI	ANSI TS284	P
Commercial Vehicle Safety and Credentials Information Exchange	ANSI	ANSI TS285	P
Commercial Vehicle Credentials	ANSI	ANSI TS286	P
Electronic Filing of Tax Return Data	ANSI	ANSI TS813	P
Transit Communications Interface Profile	APTA	TCIP-S-001	P
Standard Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz Band	ASTM	ASTM E2158-01	P
Standard Specification for Telecommunications and Information Exchange Between Roadside and Vehicle Systems - 5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) Specifications	ASTM	ASTM E2213-03	P
Standard Practice for Metadata to Support Archived Data Management Systems	ASTM	ASTM WK7592	U
Standard Specification for Archiving ITS Generated Traffic Monitoring Data	ASTM	ASTM WK7604	U
Standard Provisional Specification for Dedicated Short Range Communication (DSRC) Data Link Layer	ASTM	ASTM PS 105-99	S
Logical Link (Layer 2) for DSRC 5.9 GHz	IEEE	IEEE 802.2	P
Standard for Message Sets for Vehicle/Roadside Communications	IEEE	IEEE 1455-1999	P
Standard for Common Incident Management Message Sets (IMMS) for use by EMCs	IEEE	IEEE 1512-2006	P
Standard for Traffic Incident Management Message Sets for Use by EMCs	IEEE	IEEE 1512.1-2006	P
Standard for Public Safety IMMS for use by EMCs	IEEE	IEEE 1512.2-2004	P
Standard for Hazardous Material IMMS for use by EMCs	IEEE	IEEE 1512.3-2006	P
Standard for Common Traffic Incident Management Message Sets for Use in Entities External to Centers	IEEE	IEEE 1512.4	U
Standard for Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection	IEEE	IEEE 1570-2002	P
Resource Manager for DSRC 5.9 GHz	IEEE	IEEE 1609.1	U
Application Services (Layers 6,7) for DSRC 5.9 GHz	IEEE	IEEE 1609.2	U
Communications Services (Layers 4,5) for DSRC 5.9 GHz (Future Standard)	IEEE	IEEE 1609.3	U
Medium Access Control (MAC) Extension & the MAC Extension Management Entity for DSRC 5.9 GHz	IEEE	IEEE 1609.4	U
Networking Services (Layer 3) for DSRC 5.9 GHz	ISO	ISO 21210	U
Standard for Functional Level Traffic Management Data Dictionary (TMDD)	ITE	ITE TM 1.03	A

***Status (as of December 2006):**

P – Published: Standards that are available for purchase.

A – Approved: Standards that have passed all necessary ballots and have been approved by a standards development organization, but not yet published.

B – In Ballot: Standards that are being voted upon by a committee or working group, or are undergoing other SDO procedures.

U – Under Development: Standards that are being written, but are not yet ready for a formal ballot.

S – Standard Development Work has been suspended; or standards have been withdrawn.

Standard Name	SDO	Document ID	Status*
Message Sets for External TMC Communication (MS/ETMCC)	ITE	ITE TM 2.01	A
Location Referencing Message Specification (LRMS)	SAE	SAE J2266	P
Message Set for Advanced Traveler Information System (ATIS)	SAE	SAE J2354	P
Standard for ATIS Message Sets Delivered Over Reduced Bandwidth Media	SAE	SAE J2369	P
Messages for Handling Strings and Look-Up Tables in ATIS Standards	SAE	SAE J2540	P
RDS (Radio Data System) Phrase Lists	SAE	SAE J2540-1	P
ITIS (International Traveler Information Systems) Phrase Lists	SAE	SAE J2540-2	P
National Names Phrase List	SAE	SAE J2540-3	P

***Status (as of December 2006):**

P – Published: Standards that are available for purchase.

A – Approved: Standards that have passed all necessary ballots and have been approved by a standards development organization, but not yet published.

B – In Ballot: Standards that are being voted upon by a committee or working group, or are undergoing other SDO procedures.

U – Under Development: Standards that are being written, but are not yet ready for a formal ballot.

S – Standard Development Work has been suspended; or standards have been withdrawn.

Table 8-2. Key ITS Standards Application Area Matrix

			Center to Center						Center to Roadside							Center to Vehicle/Traveler			Roadside to Roadside	Roadside to Vehicle	
SDO	**Doc ID**	**Standard Name**	**Data Archival**	**Incident Management**	**Rail Coordination**	**Traffic Management**	**Transit Management**	**Traveler Information**	**Data Collection/Monitoring**	**Dynamic Message Signs**	**Environmental Monitoring**	**Ramp Metering**	**Traffic Signals**	**Vehicle Sensors**	**Video Surveillance**	**Mayday**	**Transit Vehicle Communications**	**Traveler Information**	**Highway Rail Intersection (HRI)**	**Signal Priority**	**Toll/Fee Collection**
AASHTO	1101	Simple Transportation Management Framework (STMF)							●	●	●	●	●	●	●						
AASHTO	1102	Octet Encoding Rules (OER) Base Protocol	●	●	●	●	●	●	●	●	●	●	●	●	●						
AASHTO	1103	Transportation Management Protocols (TMP)							●	●	●	●	●	●	●						
AASHTO	1104	Center-to-Center Naming Convention Specification	●	●	●	●	●	●													
AASHTO	1105	CORBA Security Service Specification	●	●	●	●	●	●													
AASHTO	1106	CORBA Near-Real Time Data Service Specification	●	●	●	●	●	●													
AASHTO	1201	Global Object Definitions		●					●	●	●	●	●	●	●					●	
AASHTO	1202	Object Definitions for Actuated Traffic Signal Controller Units											●								
AASHTO	1203	Object Definitions for Dynamic Message Signs (DMS)								●											
AASHTO	1204	Environmental Sensor Station (ESS) Interface Standard							●		●										
AASHTO	1205	Object Definitions for Closed Circuit Television (CCTV) Camera Control							●					●	●						

			Center to Center						Center to Roadside							Center to Vehicle/Traveler			Roadside to Roadside	Roadside to Vehicle	
SDO	**Doc ID**	**Standard Name**	**Data Archival**	**Incident Management**	**Rail Coordination**	**Traffic Management**	**Transit Management**	**Traveler Information**	**Data Collection/Monitoring**	**Dynamic Message Signs**	**Environmental Monitoring**	**Ramp Metering**	**Traffic Signals**	**Vehicle Sensors**	**Video Surveillance**	**Mayday**	**Transit Vehicle Communications**	**Traveler Information**	**Highway Rail Intersection (HRI)**	**Signal Priority**	**Toll/Fee Collection**
AASHTO	1206	Object Definitions for Data Collection and Monitoring (DCM) Devices							●		●			●							
AASHTO	1208	Object Definitions for Closed Circuit Television (CCTV) Switching							●					●	●						
AASHTO	1209	Data Element Definitions for Transportation Sensor Systems (TSS)							●			●	●	●							
AASHTO	1210	Field Management Stations - Part 1: Object Definitions for Signal System Masters				●							●								
AASHTO	1211	Object Definitions for Signal Control and Prioritization		●																●	
AASHTO	1401	TCIP Common Public Transportation (CPT) Objects	●				●										●				
AASHTO	1402	TCIP Incident Management (IM) Objects	●	●			●									●	●				
AASHTO	1403	TCIP Passenger Information (PI) Objects	●				●										●	●			
AASHTO	1404	TCIP Scheduling/Runcutting (SCH) Objects	●				●										●				
AASHTO	1405	TCIP Spatial Representation (SP) Objects	●																		
AASHTO	1406	TCIP On-Board (OB) Objects	●													●	●				
AASHTO	1407	TCIP Control Center (CC) Objects	●				●									●	●				

			Center to Center						Center to Roadside							Center to Vehicle/Traveler			Roadside to Roadside	Roadside to Vehicle	
SDO	**Doc ID**	**Standard Name**	**Data Archival**	**Incident Management**	**Rail Coordination**	**Traffic Management**	**Transit Management**	**Traveler Information**	**Data Collection/Monitoring**	**Dynamic Message Signs**	**Environmental Monitoring**	**Ramp Metering**	**Traffic Signals**	**Vehicle Sensors**	**Video Surveillance**	**Mayday**	**Transit Vehicle Communications**	**Traveler Information**	**Highway Rail Intersection (HRI)**	**Signal Priority**	**Toll/Fee Collection**
AASHTO	1408	TCIP Fare Collection (FC) Business Area Objects	●				●										●	●			
AASHTO	2101	Point to Multi-Point Protocol Using RS-232 Subnetwork Profile							●	●	●	●	●	●	●						
AASHTO	2102	Point to Multi-Point Protocol Using FSK Modem Subnetwork Profile							●	●	●	●	●	●	●						
AASHTO	2103	Point-to-Point Protocol Over RS-232 Subnetwork Profile							●	●	●	●	●	●	●						
AASHTO	2104	Ethernet Subnetwork Profile	●	●	●	●	●	●	●	●	●	●	●	●	●						
AASHTO	2201	Transportation Transport Profile							●	●	●	●	●	●	●						
AASHTO	2202	Internet (TCP/IP and UDP/IP) Transport Profile	●	●	●	●	●	●	●	●	●	●	●	●	●						
AASHTO	2301	Simple Transportation Management Framework (STMF) Application Profile							●	●	●	●	●	●	●						
AASHTO	2302	Trivial File Transfer Protocol (TFTP) Application Profile							●	●	●			●	●						
AASHTO	2303	File Transfer Protocol (FTP) Application Profile	●	●	●	●	●	●	●	●	●			●	●						
AASHTO	2304	Application Profile for DATEX-ASN (AP-DATEX)	●	●	●	●	●	●													
AASHTO	2305	Application Profile for CORBA (AP-CORBA)	●	●	●	●	●	●													
AASHTO	2306	Application Profile for XML Message Encoding and Transport in ITS C2C Communications	●	●	●	●	●	●													

			Center to Center						Center to Roadside							Center to Vehicle/Traveler			Roadside to Roadside	Roadside to Vehicle	
SDO	**Doc ID**	**Standard Name**	**Data Archival**	**Incident Management**	**Rail Coordination**	**Traffic Management**	**Transit Management**	**Traveler Information**	**Data Collection/Monitoring**	**Dynamic Message Signs**	**Environmental Monitoring**	**Ramp Metering**	**Traffic Signals**	**Vehicle Sensors**	**Video Surveillance**	**Mayday**	**Transit Vehicle Communications**	**Traveler Information**	**Highway Rail Intersection (HRI)**	**Signal Priority**	**Toll/Fee Collection**
AASHTO	2501	Information Profile for DATEX	●	●	●	●	●	●													
AASHTO	2502	Information Profile for CORBA	●	●	●	●	●	●													
ANSI	TS285	Commercial Vehicle Safety and Credentials Information Exchange	●																		
ANSI	TS286	Commercial Vehicle Credentials	●																		
APTA	TCIP-S-001	Transit Communications Interface Profile		●			●									●	●	●			
ASTM	E2158-01	Standard Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz Band																		●	●
ASTM	E2213-03	Standard Specification for Telecommunications and Information Exchange Between Roadside and Vehicle Systems - 5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) Specifications																		●	●
ASTM	WK7592	Standard Practice for Metadata to Support Archived Data Management Systems	●																		

			Center to Center						Center to Roadside							Center to Vehicle/Traveler			Roadside to Roadside	Roadside to Vehicle	
SDO	**Doc ID**	**Standard Name**	**Data Archival**	**Incident Management**	**Rail Coordination**	**Traffic Management**	**Transit Management**	**Traveler Information**	**Data Collection/Monitoring**	**Dynamic Message Signs**	**Environmental Monitoring**	**Ramp Metering**	**Traffic Signals**	**Vehicle Sensors**	**Video Surveillance**	**Mayday**	**Transit Vehicle Communications**	**Traveler Information**	**Highway Rail Intersection (HRI)**	**Signal Priority**	**Toll/Fee Collection**
ASTM	WK7604	Standard Specification for Archiving ITS Generated Traffic Monitoring Data	●																		
ASTM	PS 105-99	Standard Provisional Specification for Dedicated Short Range Communication (DSRC) Data Link Layer																		●	
IEEE	802.2	Logical Link (Layer 2) for DSRC 5.9 GHz																		●	●
IEEE	1455-1999	Standard for Message Sets for Vehicle/Roadside Communications																			●
IEEE	1512-2000	Standard for Common Incident Management Message Sets (IMMS) for use by EMCs	●	●																	
IEEE	1512.1-2003	Standard for Traffic Incident Management Message Sets for Use by EMCs	●	●		●															
IEEE	1512.2-2004	Standard for Public Safety IMMS for use by EMCs	●	●																	
IEEE	1512.3-2002	Standard for Hazardous Material IMMS for use by EMCs	●	●																	
IEEE	1512.4	Standard for Common Traffic Incident Management Message Sets for Use in Entities External to Centers	●	●																	

			Center to Center						Center to Roadside							Center to Vehicle/Traveler			Roadside to Roadside	Roadside to Vehicle	
SDO	**Doc ID**	**Standard Name**	**Data Archival**	**Incident Management**	**Rail Coordination**	**Traffic Management**	**Transit Management**	**Traveler Information**	**Data Collection/Monitoring**	**Dynamic Message Signs**	**Environmental Monitoring**	**Ramp Metering**	**Traffic Signals**	**Vehicle Sensors**	**Video Surveillance**	**Mayday**	**Transit Vehicle Communications**	**Traveler Information**	**Highway Rail Intersection (HRI)**	**Signal Priority**	**Toll/Fee Collection**
IEEE	1570-2002	Standard for Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection																	●		
IEEE	1609.1	Resource Manager for DSRC 5.9 GHz																		●	●
IEEE	1609.2	Application Services (Layers 6,7) for DSRC 5.9 GHz																		●	●
IEEE	1609.3	Communications Services (Layers 4,5) for DSRC 5.9 GHz																		●	●
IEEE	1609.4	Medium Access Control (MAC) Extension & the MAC Extension Management Entity for DSRC 5.9 GHz																		●	●
ISO	21210	Networking Services (Layer 3) for DSRC 5.9 GHz																		●	●
ITE	TM 1.03	Standard for Functional Level Traffic Management Data Dictionary (TMDD)	●	●		●	●														
ITE	TM 2.01	Message Sets for External TMC Communication (MS/ETMCC)	●	●		●	●														
SAE	J2266	Location Referencing Message Specification (LRMS)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
SAE	J2354	Message Set for Advanced Traveler Information System (ATIS)	●			●	●	●								●	●	●			
SAE	J2369	Standard for ATIS Message Sets Delivered Over Reduced Bandwidth Media																●			

			Center to Center						Center to Roadside							Center to Vehicle/Traveler			Roadside to Roadside	Roadside to Vehicle	
SDO	**Doc ID**	**Standard Name**	**Data Archival**	**Incident Management**	**Rail Coordination**	**Traffic Management**	**Transit Management**	**Traveler Information**	**Data Collection/Monitoring**	**Dynamic Message Signs**	**Environmental Monitoring**	**Ramp Metering**	**Traffic Signals**	**Vehicle Sensors**	**Video Surveillance**	**Mayday**	**Transit Vehicle Communications**	**Traveler Information**	**Highway Rail Intersection (HRI)**	**Signal Priority**	**Toll/Fee Collection**
SAE	J2540	Messages for Handling Strings and Look-Up Tables in ATIS Standards	●			●	●	●								●	●	●			
SAE	J2540-1	RDS (Radio Data System) Phrase Lists	●			●	●	●								●	●	●			
SAE	J2540-2	ITIS (International Traveler Information Systems) Phrase Lists	●			●	●	●								●	●	●			
SAE	J2540-3	National Names Phrase List	●			●	●	●								●	●	●			

9. PROJECT SEQUENCING

A project sequence defines the order in which ITS projects may be implemented. A good sequence is based on a combination of two factors:

- **Prioritization of projects based on existing conditions and stakeholder needs.** The ITS projects were prioritized to reflect a deployment path (sequence) on stakeholder needs. Although the information, which was collected through stakeholder surveys and meetings, was the basis of the ITS Architecture, technology, funding opportunities and requirements continue to evolve. It is expected that MDOT will reevaluate and reprioritize projects frequently.
- **Project dependencies, based on how successive ITS projects can build upon one another.** Project dependencies influence the project sequencing. It is beneficial to identify the information and functional dependencies between projects.

In most cases, the sequence of planned projects has already been programmed and can simply be extracted from existing transportation plans. Successive projects will then be added to the sequence based on the project dependencies and other planning factors.

The process for determining the sequence of projects for the Hattiesburg Region ITS Architecture includes three steps:

- Review of the Mississippi Statewide ITS Architecture;
- Review of relevant planning documents; and
- Stakeholder feedback.

The Hattiesburg Region ITS Architecture represents a roadmap for systems deployment and integration in the Hattiesburg Mississippi region over the next 20 years. ITS projects that are planned during this time are listed in Table 9-1. While there is no true sequencing of ITS projects for the Hattiesburg Mississippi region, the list was further refined to establish which projects were allocated to the short-term (<5 years), medium-term (5 to 10 years), and long-term (>10 years). This list denotes a general order for project implementation, and it should be noted that although Table 9-1 does not include all planned ITS projects within the region, it mainly consists of projects that may impact ITS operations and management at local and regional levels.

Table 9-1. Planned ITS Projects for the Hattiesburg Mississippi Region

Project	Description	Timeframe*	Dependency
City/County Trailblazer Signs for Evacuation	This project would provide for the deployment of emergency evacuation trailblazer signs throughout the Hattiesburg region to facilitate the evacuation of residents and visitors along designated evacuation routes.	Short Term	Hwy 49 and I-59 Hurricane Evacuation projects
County and City Portable DMS	Used to direct traffic for special events, maintenance and construction, emergency management and incident management.	Short Term	Stand Alone
School Bus Notification System	This project would establish the procedures for notifying school bus drivers of emergency conditions and/or school closings. This project would also include the communications system required to perform the notifications.	Short Term	Stand Alone
County and City Signal System Upgrades	This project would allow for the interconnection of signals through the Hardy Street and US 49 corridors to facilitate more efficient movement of traffic, particularly during peak travel times.	Short/Medium Term	Stand Alone
MDOT Regional TMC	This project would include the development of a fully operational Traffic Management Center for the Hattiesburg Region. Initially, the center will start out small with responsibility for controlling traffic signals. The center will then integrate other ITS elements such as DMS, HAR, and CCTV. This TMC is to be located in the offices of MDOT District 6.	Medium Term	Stand Alone
MDOT Emergency Vehicle Signal Preemption	This project would deploy signal preemption in corridors in urban areas with high density of emergency vehicle response vehicles (e.g. fire routes) and congested traffic conditions.	Medium Term	Stand Alone
City of Hattiesburg CCTV System	This project would include the deployment of a CCTV system for license plate recognition in key intersections.	Medium Term	Stand Alone
Transit System CCTV	This project would include the deployment of a CCTV system for surveillance at the Hattiesburg Intermodal Center	Medium Term	Stand Alone

Project	Description	Timeframe*	Dependency
City of Hattiesburg AVL System	This project would facilitate installation of an Automated Vehicle Location system on maintenance vehicles.	Medium Term	Stand Alone
MDOT Communication Backbone	This project would establish a more permanent approach for the primary communication links between the Hattiesburg Regional TMC and the Statewide TMC in Jackson.	Medium Term	Stand Alone
Hattiesburg TCC Fiber Optic Cable	This project would provide communication between the Hattiesburg TCC and the MDOT network.	Medium Term	MDOT Hattiesburg TMC
City of Hattiesburg Surveillance	This project would enable 911 Center to access City of Hattiesburg TCC CCTV at intersections for surveillance.	Medium Term	Hattiesburg TOC
MDOT Regional Incident Management	This project would define agency roles, responsibilities, operations, and procedures for interurban incident management. Methods of incident detection, verification, motorist information, response, site management and clearance will be covered. The project may include the deployment of such devices as CCTV and vehicle detection.	Medium Term	MDOT Statewide& MDOT Communication Backbone
MDOT Cellular Phone System for Incident Reporting	This project would enable motorists to report incidents to the MDOT TMC using a cellular phone number such as *999. When used statewide, these systems could allow users to contact the local law enforcement, towing companies, ambulance services and local transportation organizations highway helper vehicles.	Medium Term	Stand Alone
City of Hattiesburg Railroad Crossing Control	Integrated train detection and traffic control is desired for surface streets near the vicinity of the downtown Hattiesburg railroad crossings.	Medium Term	Stand Alone
MDOT Highway Service Patrol	In the medium term MDOT could deploy 1-2 vehicles operating on fixed routes in the Hattiesburg Region and will communicate with the MDOT Statewide TMC via voice communications. In the long term additional vehicles/routes can be added. Vehicles will be equipped with AVL capability.	Long Term	MDOT Statewide TMC

10. AGREEMENTS

The Hattiesburg Region ITS Architecture provides both a technical and institutional framework for the deployment of ITS in the Hattiesburg Mississippi region. Institutional integration involves coordination between various agencies and jurisdictions to achieve seamless operations and interoperability.

The previous sections of the report identified the stakeholder roles and responsibilities, key market packages, and ITS deployment activities that would require establishment of an electronic link between organizations. From an institutional integration perspective, these electronic links or interfaces may require the establishment of some form of agreement to define the roles and responsibilities of each party.

There are several types of arrangements associated with the interfaces identified in the Hattiesburg Region ITS Architecture. Information sharing and exchanges between systems require knowledge of the transmission protocol and data formats to ensure compatibility. Coordinating field device operations owned by different agencies requires defined procedures for submitting message requests and rules governing when such requests can be honored. Such coordination may be done with informal arrangements such as a Memorandum of Understanding (MOU). Sharing control of field devices operated by different agencies could involve more liability issues, which may require more formal agreements. Coordinated incident response may also require formal agreements, but also requires group training of personnel from various agencies. Agreements may be obtained for data sharing, procedure, operation, maintenance, and training.

Some common types of agreements are listed in Table 10-1. The agreement process may begin with something as simple as a handshake agreement. However, once interconnections and integration of systems begin, agencies may want to have something more substantial in place. A documented agreement will aid agencies in planning their operational costs, understanding their respective roles and responsibilities and building trust for future projects. Formal agreements may be necessary where funding or financial arrangements are defined or participation in large regionally significant projects is required.

Table 10-2 provides a list of the potential agreements identified in the stakeholder survey. Table 10-3 presents a list of potential agreements that would be required for the implementation and operations of an integrated ITS system in the Hattiesburg Mississippi region.

Table 10-1. Types of Agreements

Type of Agreement	Description
Handshake Agreement	▪ Early agreement between one or more partners. ▪ Not recommended for long term operations.
Memorandum of Understanding (MOU)	▪ Initial agreement used to provide minimal detail and usually demonstrating a general consensus. ▪ Used to expand a more detailed agreement like an Interagency Agreement that may be broad in scope but contains all of the standard contract clauses required by a specific agency. ▪ May serve as a means to modify a much broader Master Funding Agreement, allowing the master agreement to cover various ITS projects throughout the region and the MOUs to specify the scope and differences between the projects.
Interagency Agreement	▪ Between public agencies (i.e., transit authorities, cities, counties, etc.) for operations, services or funding. ▪ Documents responsibility, functions and liability at a minimum.
Intergovernmental Agreement	▪ Between governmental agencies (i.e., agreements between universities and the State DOT, as well as between MPOs and the State DOT, etc.).
Operational Agreement	▪ Between any agency involved in funding, operating, maintaining or using the right of way of another public or private agency. ▪ Identifies respective responsibilities for all activities associated with shared systems being operated and / or maintained.
Funding Agreement	▪ Documents the funding arrangements for ITS projects (and other projects). ▪ Includes at a minimum standard funding clauses, detailed scope, services to be performed, detailed project budgets, etc.

Type of Agreement	Description
Master Agreements	▪ Standard contract and/or legal verbiage for a specific agency and serving as a master agreement by which all business is done. These agreements can be found in the legal department of many public agencies. ▪ Allows states, cities, transit agencies and other public agencies that do business with the same agencies over and over (i.e., cities and counties) to have one Master Agreement that uses smaller agreements (i.e., MOUs, Scope of Work and Budget Modifications, Funding Agreements, Project Agreements, etc.) to modify or expand the boundaries of the larger agreement to include more specific language.

Table 10-2. Potential Agreements from Surveys

Type of Agreement	Description	Associated Stakeholder
Fiber Optic Cable Usage Standards	City of Hattiesburg seeks an agreement with MDOT to allow each agency to share access to each other's CCTV and Fiber Optic Cable installations.	City of Hattiesburg and MDOT

Table 10-3. Hattiesburg Region ITS Architecture Potential Agreements

Agreement	Description	Associated Stakeholder
Inter-Agency Data Sharing Agreement	Formal agreements are required to cover the exchange of data between different agencies in different regions. However, informally, the exchange of information may occur on an as-needed basis. Data may include traffic flow, video images, road weather, road conditions, etc.	MDOT, MHP, County and City Traffic Management Agencies, County and City Public Safety Agencies, County School Systems, Camp Shelby, Media Outlets, Private Information Service Providers
Inter-Agency Operations Agreement	Address equipment operation coordination, equipment maintenance, operational information exchange and other issues. Equipment may include traffic signal systems, DMS, CCTV, etc.	MDOT, MHP, County and City Traffic Management Agencies, County, County School Systems, Camp Shelby, and City Public Safety Agencies
Multi-Agency Communication Infrastructure Sharing Agreement	There are multiple examples and opportunities for the sharing of communications infrastructure throughout the regions. A regional plan and subsequent agreements that define responsibilities could result in the communications network required to link the various ITS applications together.	MDOT, County and City Traffic Management Agencies, Mississippi Universities

Agreement	Description	Associated Stakeholder
Inter-Agency Road Maintenance Agreement	Define roles and responsibilities for roadway maintenance.	MDOT, County and City Maintenance Agencies
Multi-Agency EMS Communications Integration Agreement	Integrated EMS communications allows for quick sharing of current incident response status between allied response agencies and creates a flow of information that reduces or eliminates delay due to a lag in communications.	County and City Public Safety Agencies
Multi-Agency Incident Response Coordination Agreement	Supports incident information exchange, incident response coordination, resource coordination, etc. among multiple agencies in different regions.	MDOT, MHP, County and City Public Safety Agencies, County and City Traffic Management and Maintenance Agencies, other agencies
Multi-Agency Disaster Response Coordination Agreement	Defines roles, responsibilities, and functions for disaster response, recovery and evacuation and reentry management.	Mississippi Public Safety Division, MEMA, MDOT, MHP, County and City Public Safety Agencies, County and City Traffic Management and Maintenance Agencies, Transit Agencies, other agencies
Multi-Agency Disaster Information Coordination Agreement	Defines roles, responsibilities and functions for accessing and disseminating disaster information.	Mississippi Public Safety Division, MHP, MDOT, MEMA, County and City Public Safety Agencies
Multi-Agency Limited Liability Agreements	Agreements will be developed to address the varying levels of liability limitation associated with the various agencies that would need to work together to enable coordinated, multi-agency transportation and emergency management strategies.	Agencies involved in transportation and emergency management.
Transit Electronic Payment Agreement	Supports transit electronic payment systems. Agreements may define roles and responsibilities of transit agencies and financial institutions to share information such as revenue from smart cards, etc.	Transit Agencies, Parking Operators, Financial Institutions
Transit Bus Signal Priority Agreement	Allows transit vehicles to activate signal priority at signalized intersections.	Transit Agencies, MDOT, County and City Traffic Management Agencies
Emergency Vehicle Signal Preemption Agreement	Defines roles, responsibilities and functions for emergency vehicle preemption at signalized intersections	County and City Public Safety Agencies, MDOT, MHP, County and City Traffic Management Agencies
Railroad Crossing Management Agreement	Defines roles, responsibilities and functions for rail grade crossing coordination and optimization at signalize intersections.	Railroad Companies, MDOT, County and City Traffic Management Agencies

11. IMPLEMENTATION AND INTEGRATION STRATEGY

A crucial part of developing an ITS Architecture is establishing an approach to using it. A Regional ITS Architecture provides guidance for planning ITS projects within that region. It also provides information that can be used in the initial stages of project definition and development. This section of the report presents the approach for integrating the Hattiesburg Region ITS Architecture into the transportation planning process and leveraging the ITS Architecture in project definition. In addition, opportunities and considerations for integrating ITS projects and systems at the regional and statewide levels, especially for systems providing traffic management, incident management, and traveler information functions, are discussed.

11.1 Using ITS Architecture in Planning and Project Definition

The Hattiesburg Region ITS Architecture represents a detailed plan for the evolution of the ITS systems in the Hattiesburg Mississippi Region and can be used to support transportation planning efforts and ITS project development efforts at state and regional levels.

Support Transportation Planning Process

Once an ITS Architecture has been created, it can be used as a key reference in the transportation planning process. This will ensure all proposed ITS projects are consistent with the ITS Architecture and additional integration opportunities are considered, leading to more efficient implementations. The following sections describe three aspects of the transportation planning process.

- ***Long Range Transportation Plan***

One of the principal planning documents is the HPFL MPO Transportation Plan Update. This document is a long-range transportation plan that provides a vision for transportation projects to be constructed out to the year 2030. It is a fiscally constrained, staged improvement program for the Hattiesburg Mississippi region. The Hattiesburg Region goals and objectives are defined in Chapter 1 of this report. The HPFL MPO is responsible for the development of the 2030 Hattiesburg Urbanized Area Transportation Plan .

The Hattiesburg Region ITS Architecture can serve as an input to this document. The ITS Services and projects identified in the ITS Architecture can support the development of long-range and short-range strategies/actions during the regional transportation planning process that leads to an integrated, efficient inter-modal transportation system. The descriptions of the goals and attributes of the systems and services included in the Hattiesburg Region ITS Architecture can support measurement assessment during the regional transportation planning process. The Project Sequencing from the Hattiesburg Region ITS Architecture can assist the development of prioritized projects and address the consistency of proposed transportation investments in the financial plan. In addition, the Hattiesburg Region ITS Architecture provides a framework for analyzing how ITS elements are related and identifying areas for potential coordination and cooperation among agencies. This can promote both systems and inter-jurisdictional integration during the transportation planning process.

The Hattiesburg Region ITS Architecture can also serve as an input to the Statewide ITS Architecture which then serves as an input to Mississippi's Unified Long-Range Transportation Infrastructure Plan (MULTIPLAN). MULTIPLAN addresses the needs of the transportation system at local, regional, and state levels and how those needs can achieve economic development objectives, contribute to environmental stewardship ideals, and improve the quality of life for Mississippi citizens. The plan is reviewed approximately every five years to reflect changing situations. MDOT is responsible for developing and maintaining the MULTIPLAN.

- ***ITS Strategic Plans***

MULTIPLAN incorporates the objectives of the Mississippi's ITS Strategic Plan into its overall framework. The ITS Strategic Plan is a consensus based approach that provides the framework for ITS planning and project development within the State of Mississippi. The plan is dynamic in nature and can be altered to reflect changes in policy considerations, state financial conditions, newly identified transportation needs, and new advances in technology. The ITS Strategic Plan also features a strategy for implementing projects in the short-term (<5 years), medium-term (5 to 10 years), and long-term (>10 years) and makes recommendations for taking appropriate steps for successful ITS development. The Hattiesburg Region ITS Architecture can support what has been developed in the ITS Strategic Plan and assist in the prioritization of ITS projects.

- ***Other Planning Activities***

The Hattiesburg Region ITS Architecture can also support other planning activities. The state's Comprehensive Emergency Transportation Response Plan (CETRP) identifies emergency policies, responsibilities, and procedures for the use of highways and highway facilities throughout the state. The plan is implemented under the following conditions: 1) upon the declaration of a national emergency by the President of the United States, 2) by concurrent resolution of the Congress, 3) by order of the Chief Executive of the State of Mississippi, or 4) in the absence of such specific direction and upon occurrence of a state or national emergency due to a natural, man-made or technological event.

Support Programming and Budgeting

In addition to supporting the transportation planning process, the Hattiesburg Region ITS Architecture can assist in the development of the Transportation Improvement Program (TIP) and in the budgeting for planning projects.

- ***Transportation Improvement Program***

The Transportation Improvement Program (TIP) is a primary transportation planning output that can be supported by the Hattiesburg Region ITS Architecture. The TIP is developed and approved by MDOT and the HPFL MPO and is included, without modification, in the Statewide Transportation Improvement Program (STIP). Federal funding is made available through the Surface Transportation Program (STP) and is transferred to MDOT and allocated through the MPO for eligible transportation projects. The TIP is a three-year listing of projects within the region proposed for federal-aid funding under Title 23 (Federal Highway Funding) and Title 49 (Federal Transit Assistance) of the United States Code. The TIP is updated every two years and may be amended every six months. The TIP should be consistent with the JUATP long-range plan.

As part of the TIP preparation, a project prioritization and selection process is conducted, where the Hattiesburg Region ITS Architecture can play a role. The project sequencing output from this ITS Architecture can be an input to prioritization. Integration opportunities identified in the

Hattiesburg Region ITS Architecture can be used to better define the benefits of ITS projects. In addition, some of the project description information might be available from the outputs of the Hattiesburg Region ITS Architecture, especially the Project Sequencing output.

In addition to the JUATP and TIP planning, the Hattiesburg Region ITS Architecture can be considered to support other transportation planning activities or services associated with ITS projects or projects with ITS elements in the region.

- ***Capital Budgeting***

The Hattiesburg Region ITS Architecture will define existing and planned ITS elements for stakeholders at all levels and how those elements interface with other existing or planned ITS elements in the region. The results of this process can be used by all stakeholders and organizations to define ITS projects and use that information in their budgeting process.

Support ITS Project Development

The Hattiesburg Region ITS Architecture can be used for support in the ITS project development cycle. A typical ITS project development cycle begins with project definition, followed by Request for Proposal (RFP) generation, which leads to project implementation. Information in the Hattiesburg Region ITS Architecture can assist in all three of these areas of project development.

- ***Project Definition***

Project Definition may occur at several levels of detail. Early in the planning process a project may be defined only in terms of the transportation services it will provide, or by the major system pieces it contains. Prior to the beginning of implementation, the details of the project must be developed. This could include further system definition and interface definition including exactly what systems or parts of systems will make up the project, what interconnections the project entails, or what information needs to flow across the system interconnections. Requirement definition may go through similar levels of detail, starting with very high-level description of project functions and moving toward system specifications. By

identifying the portions of the Hattiesburg Region ITS Architecture that define the project, the architecture outputs can be used to create aspects of the project definition.

The areas that an ITS Architecture can assist in project definition are:

- The identification of agency roles and responsibilities (including any inter-agency cooperation) can come from the operational concept developed as part of the ITS Architecture. This operational concept can either serve as a starting point for a more detailed definition, or possibly provide all of the needed information.
- Requirements definition can be completely or partly defined by using the ITS Architecture functional requirements applicable to the project.
- The ITS Architecture includes a map to ITS standards, and the project mapping to the Hattiesburg Region ITS Architecture can extract the applicable ITS standards for the project.

- ***RFP Generation***

Once a project is defined and funding is committed, the implementation process can commence with the generation of an RFP, which is the common governmental practice for initiating a contract with the private sector to implement the project. Once a contract is in place, project implementation begins and moves through design, development, integration, and testing.

The Hattiesburg Region ITS Architecture, and the products produced during its development, can support this RFP generation. First, the project definition described above forms the basis for what is being procured. Mapping the project to the Hattiesburg Region ITS Architecture allows bidders to have a clear understanding of the scope of the project and of the interfaces that need to be developed. The functional requirements created as part of the Hattiesburg Region ITS Architecture can be used to describe the functional requirements for the project. In addition, a subset of the ITS Standards identified as part of the Hattiesburg Region ITS Architecture development can be specified in the RFP.

- ***Project Implementation***

Because ITS projects involve systems and their interconnections, it is very important to follow a system engineering approach to designing and implementing the project. While the exact process followed is at the discretion of the local agency, Final Rule 940 and FTA Policy lay out a set of required systems engineering analyses for ITS projects funded through the highway trust fund. The required systems engineering analysis steps are:

- Identification of portions of the ITS Architecture being implemented;
- Identification of participating agencies' roles and responsibilities;
- Requirements definitions;
- Analysis of alternative system configurations and technology options to meet requirements;
- Procurement options;
- Identification of applicable ITS standards and testing procedures; and
- Procedures and resources necessary for operations and management of the system.

The ITS Architecture can provide inputs to a number of these steps as shown in Table 11-1.

Table 11-1. Systems Engineering Requirements Supported by ITS Architecture

Systems Engineering Requirements	ITS Architecture Output
Identification of portions of the ITS Architecture being implemented	Mapping the project to the elements and interfaces of the ITS Architecture
Identification of participating agencies' roles and responsibilities	Using Operational Concept as a starting point
Requirements definitions	Using Functional Requirements as a starting point
Identification of applicable ITS standards and testing procedures	Using architecture standards outputs as a starting point for the standards definition

11.2 Integration Strategy

The overall objective of an ITS Architecture is to support the effective and efficient deployment of ITS projects that address the transportation problems and needs of the region. The ITS Architecture focuses on the integration of systems to gain the maximum benefit of each system's information and capabilities across the transportation network. The integration strategy provides

the process connection between the ITS projects that are deployed within the region. The ITS Architecture defines what needs to be put in place to address the needs and requirements of the region. The transportation planning process can leverage the ITS Architecture as a roadmap to project sequencing and interdependency to achieve an integrated transportation system that addresses those strategic objectives.

The most challenging issue of integrating the ITS Architecture into the planning process is the fact that there is more than one planning process. Coordination is important between the MDOT, the HPFL MPO and other Planning and Development Districts throughout the region for ITS projects in their respective plans. Integration opportunities can be taken advantage of within the region as well as with other regions. This is the primary intent of the ITS Architecture compliance where federal funding is involved.

Another difficult issue to address is coordination of ITS project planning between the federally funded projects and non-federally funded projects. Generally, non-federally funded projects are not part of the Long Range Planning Process or the Transportation Improvement Program. The ITS Architecture can provide a bridge between federally and non-federally funded projects and systems. Coordinating all of these projects requires an understanding by all existing and potential ITS stakeholders within the entire region. The Hattiesburg Region ITS Architecture provides a common reference point for all stakeholders to gain insight into the integration of various ITS systems.

12. ARCHITECTURE MAINTENANCE PLAN

12.1 Introduction

The Hattiesburg Region ITS Architecture has been created as a consensus view of stakeholders within the Hattiesburg Mississippi region of ITS systems they have implemented and systems they plan to implement in the future. By its nature, the architecture is not a static set of outputs. The architecture should be modified as plans and priorities change, ITS projects are implemented, and the ITS needs and services evolve in the region. There are many actions that may necessitate an update to the architecture, including:

- **Changes in Project Definition.** When actually defined, a project may add, subtract or modify elements, interfaces, or information flows of the Hattiesburg Region ITS Architecture. Because the architecture is meant to describe not only planned ITS, but also current ITS implementations, it should be updated to correctly reflect the deployed projects.
- **Changes due to Project Addition/Deletion.** Occasionally a project will be added, deleted or modified during the planning process. When this occurs, corresponding aspects of the Hattiesburg Region ITS Architecture should also be added, deleted or modified.
- **Changes in Project Status.** As projects are deployed, the status of the architecture elements, services and flows that are part of the projects must be updated. Elements, services and flows should be changed from planned to existing when they are substantially complete.
- **Changes in Project Priority.** Due to funding constraints, technological changes or other considerations, a planned project may be delayed or accelerated. Such changes should be reflected in the Hattiesburg Region ITS Architecture.
- **Changes in Regional/Local Needs.** Transportation planning is done to address both regional and local transportation needs. Over time these needs change and the corresponding aspects of the ITS Architecture should be updated.
- **Changes in Participating Stakeholders.** Stakeholder involvement can also change over time. The Hattiesburg Region ITS Architecture should be updated to reflect the

participating stakeholder roles in the statewide view of ITS elements, interfaces, and information flows.

- **Changes in Other Architectures.** The Hattiesburg Region ITS Architecture includes not only elements and interfaces within the MPO's own region, but also interfaces to elements in adjoining regions or states. Changes in the ITS Architecture in adjoining regions or states may necessitate changes in the Hattiesburg Region ITS Architecture to maintain consistency. The Hattiesburg Region ITS Architecture may also overlap with the Statewide ITS Architecture and a change in one architecture may necessitate a change in the other.
- **Changes in National ITS Architecture.** The National ITS Architecture may be expanded and evolved from time to time to include new user services or refine existing services. These changes should be considered as the ITS Architecture is updated.

The Hattiesburg Region ITS Architecture will be maintained in accordance with the provisions contained in the Code of Federal Regulation, 23 CFR 940.9(f). The following sections define the key aspects of the process for the maintenance of the Hattiesburg Region ITS Architecture:

- Who is responsible for architecture maintenance?
- What will be maintained?
- How will it be maintained (i.e. What configuration control process will be used?)?

12.2 Who Is Responsible for Architecture Maintenance?

Responsibility for maintaining the Hattiesburg Region ITS Architecture will initially lie with MDOT, but may in the future be transferred to the HPFL MPO. MDOT will create a core group that will review proposed changes to the architecture. This group may be called the Hattiesburg Region ITS Architecture Maintenance Committee, and they will be responsible for reviewing proposed changes. The Committee should be given an opportunity to review all proposed changes before any are accepted and the architecture is updated. It is proposed that the Committee meet on an annual basis, or more frequently as necessary, to review any proposed changes to the architecture.

The Chair of the Committee should serve as the Maintenance Manager responsible for

overseeing and guiding the maintenance effort. The Maintenance Manager should coordinate the activities of the architecture maintenance, including calling the meetings, making arrangements, assembling an agenda, leading the meetings, and approving minutes.

12.3 What Will Be Maintained?

There are several different components that make up the Hattiesburg Region ITS Architecture. Some may require more frequent updates than others, but the entire architecture will need periodic review to ensure that it is consistent with regional and statewide goals. This version of the Hattiesburg Region ITS Architecture shall be the baseline architecture upon which future revisions are conducted as necessary. The maintenance timeframe identified in this document will become effective upon completion of this Hattiesburg Region ITS Architecture.

The Hattiesburg Region ITS Architecture was established using Turbo Architecture Software Version 4.0 and stored in an electronic Turbo Architecture database. The architecture is represented through a set of outputs including various reports and diagrams. Collectively these outputs can be used to develop a general ITS architecture document. The architecture will be maintained through updates in the electronic database using Turbo Architecture.

The following may be reviewed and updated at regular intervals:

- Description of the region;
- Participating agencies and other stakeholders, including key contact information;
- Inventory of existing and planned ITS systems in the region;
- Operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems;
- Agreements for operations and interoperability;
- System functional requirements;
- Interface requirements and information exchanges with planned and existing systems and subsystems;
- Applicable ITS standards supporting regional and national interoperability;
- Sequence of projects for implementation.

Outputs such as interconnect and architecture flow diagrams, inventory lists, stakeholders lists and other diagrams and reports can be produced from the Turbo Architecture software, so they

are by-products of the architecture database. These outputs can be updated as necessary for meetings or outreach activities.

To aid the architecture version document control, it is recommended that the filename of the database should contain the version number and/or date on which the architecture was updated. Also, the version number and date should be included in the Turbo Architecture database.

12.4 How Will It Be Maintained?

Once the architecture baseline is defined, the process for making changes to this baseline must be established. The configuration control (change management) process specifies how changes are identified, how often changes are to be made, and how the changes will be reviewed, implemented, and released.

How Changes are Identified

Changes to the Hattiesburg Region ITS Architecture may be identified by two channels. One is that MDOT or the HPFL MPO proposes changes to the architecture according to the ITS projects or projects with ITS components within the region. Another channel is that any stakeholders identified as a participant in the Hattiesburg Region ITS Architecture may propose potential changes. If the proposed change is to add a new stakeholder and the stakeholder's ITS elements and interfaces, that agency should submit the change request. All change requests should be sent to the Maintenance Manager.

Stakeholders should use the Change Request Form to propose changes. A Change Request form is shown on page 113. The changes to the architecture, the reasons for the proposed modifications and the stakeholder contact should be clearly defined in the request. Upon receiving a Change Request form, the Maintenance Manager will perform an initial assessment of the proposed change for the impact to the Hattiesburg Region ITS Architecture and/or the affected document. If the proposed change has an impact on other stakeholders, the Maintenance Manager should contact the stakeholders to confirm their agreement with the proposed modification.

How Often Changes are Made

A comprehensive, formal update of the Hattiesburg Region ITS Architecture Baseline should be performed annually. This maintenance schedule will ensure that the architecture continues to accurately represent statewide and regional goals. Minor, informal modifications may be made at the discretion of the Maintenance Manager, given the modifications are approved by the Architecture Maintenance Committee.

Change Review, Implementation, and Release

The general steps in the process of change review, implementation and release are:

- Stakeholders define and propose changes per the recommendations given above.
- The Maintenance Manager, in coordination with the stakeholders affected by the proposed changes, evaluates the changes and determines what impact they may have on the architecture and/or associated documentation.
- The Architecture Maintenance Committee reviews the proposed changes and offers comments.
- Upon its review, the Committee makes decisions to accept the change, reject it, or ask for additional information.
- The Maintenance Manager implements the decisions. If the decision is to accept the change, then the appropriate portions of the architecture baseline are updated (per the schedule discussed above) and an updated architecture baseline is defined.
- Once the Hattiesburg Region ITS Architecture has been modified, the stakeholders should be notified by the Maintenance Manager of architecture updates and informed on how to obtain the latest version of the architecture.

The time required to perform this configuration control process will be a direct function of the number of changes suggested to the architecture, which will be driven by how much the architecture is being used. It is suggested that this process be reviewed periodically and fine-tuned to most appropriately address the level of change that has occurred.

Mississippi Hattiesburg ITS Architecture Change Request Form

Originator Name:		**Date Submitted:**
Originator Agency:		
Originator Telephone:	**Originator Fax:**	**Originator E-Mail:**
Agency Authorized Signature:		**Signature Date:**

Description of Proposed Change:		
Rationale for Proposed Change:		
Impacted Agency:	**Authorized Signature:**	**Signature Date:**
Impacted Agency:	**Authorized Signature:**	**Signature Date:**
Impacted Agency:	**Authorized Signature:**	**Signature Date:**
List of Attachments:		
Baseline Document(s) Impacted: ☐ **Turbo Architecture** ☐ **Architecture Report** ☐ **Other (describe)**		

To Be Completed By Maintenance Manager		
Change Request No.:	**Date Received:**	**Date Logged:**
Date Initially Discussed:	**Disposition:** ☐ **Accepted** ☐ **Rejected** ☐ **More Info**	**Comments:**
Data Discussed:	**Disposition:** ☐ **Accepted** ☐ **Rejected** ☐ **More Info**	**Comments:**
Data Discussed:	**Disposition:** ☐ **Accepted** ☐ **Rejected** ☐ **More Info**	**Comments:**
Date of Committee Approval (If Applicable):		
Baseline Documents Impacted/Version Implemented: ☐ **Turbo Architecture** **Date:** _____ **Version:** _____ ☐ **Architecture Report** **Date:** _____ **Version:** _____ ☐_____ **Date:** _____ **Version:** _____		

Appendix A: Stakeholder Survey Questionnaire

Before completing this survey, please provide the following information:

Name: _____

Title: _____

Agency: _____

Division: _____

Phone: _____

Fax: _____

E-mail: _____

QUESTIONNAIRE

The questionnaire is organized by the following sections:

- General Questions
- User Needs and Services
- Data Management and Archiving
- Roadway Operations – including freeway and arterial management and operations
- Roadway Maintenance – including general roadway maintenance, winter maintenance, and work zone activities
- Transportation Security
- Incident & Emergency Management
- Transit Operations
- Commercial Vehicle Operations

Instructions

You are not required to fill out the entire survey questionnaire. To save your time, a matrix shown below is developed to instruct which sections of the questionnaire you should complete. Please fill out the sections of the questionnaire that are applicable to you. You are certainly welcome to fill out other sections and provide additional information. Feel free to skip any questions that you do not consider relevant to your agency.

Type of Agency	Section								
	A	B	C	D	E	F	G	H	I
Transportation Operations and Maintenance Agency (District Office, Project Office, Maintenance Office, Traffic and Safety Office, Public Works Department, Engineers Office, etc.)	X	X	X	X	X	X			
Roadway Service Patrol	X	X	X			X	X		
DOT Office of Enforcement, Law Enforcement and Emergency Management Agency (Sheriff Department, Police Department, Fire Department, Emergency Management Agency, Emergency Medical Services, etc.)	X	X	X			X	X		X
Planning	X	X	X	X	X	X	X	X	X
Public Transportation Agency	X	X	X					X	
Data Archives/Data Management Agency	X	X	X						
Others	X	X	X						

General Questions

1. Is your agency planning any ITS projects, including but not limited to traffic management centers, dispatch centers, transit vehicles, communications infrastructure, etc.

   ☐ YES ☐ NO

   If YES, please describe the project(s) and/or provide project name(s) and available documentation source(s).

   _____

   _____

   _____

   _____

   _____

   _____

2. Does your agency exchange voice or data information (including by telephone or fax) with any of the following types of organizations/agencies? Please select all that apply and list the appropriate organizations/agencies by name.

☐ Incident/Emergency_____

_____

_____

☐ Freeway_____

_____

_____

☐ Arterial or Non-Freeway _____

_____

_____

☐ Maintenance and Construction_____

_____

_____

☐ Public Transportation_____

_____

_____

☐ Commercial Vehicle Operations/Inspection_____

_____

_____

3. What specific types of information do you share with these organizations/agencies?

Incident/Emergency_____

_____

_____

_____

Freeway_____

_____

_____

_____

Arterial or Non-Freeway _____

_____

_____

_____

Maintenance and Construction_____

_____

_____

_____

Public Transportation_____

_____

_____

_____

Commercial Vehicle Operations/Inspection_____

_____

_____

_____

4. Please indicate what communications technologies are available within your agency that might be used to exchange information with other agencies?

- Center-to-Center Communications ☐ EXISTING ☐ PLANNED
- Internet System Access and Browsing ☐ EXISTING ☐ PLANNED
- Agency Radio Network ☐ EXISTING ☐ PLANNED
- Telephone ☐ EXISTING ☐ PLANNED
- Fax ☐ EXISTING ☐ PLANNED
- Pager ☐ EXISTING ☐ PLANNED
- E-mail ☐ EXISTING ☐ PLANNED
- Scheduled Mailings ☐ EXISTING ☐ PLANNED
- Other_____

5. What existing communicating infrastructure (for transportation or other uses) is controlled/owned by your organization or agency?

- Radio ☐ EXISTING ☐ PLANNED
- Cobber Cable ☐ EXISTING ☐ PLANNED
- Fiber Cable ☐ EXISTING ☐ PLANNED
- Wireless ☐ EXISTING ☐ PLANNED
- Other_____

6. Does your agency disseminate (or plan to disseminate) traffic or weather condition information to the public in any of the following ways?

- Dynamic Message Signs (DMS) (permanent or portable) ☐ EXISTING ☐ PLANNED
- Highway Advisory Radio (HAR) ☐ EXISTING ☐ PLANNED
- In-Vehicle Navigation Systems ☐ EXISTING ☐ PLANNED
- TV/Radio ☐ EXISTING ☐ PLANNED
- Internet ☐ EXISTING ☐ PLANNED
- Kiosks ☐ EXISTING ☐ PLANNED
- E-mail ☐ EXISTING ☐ PLANNED
- 511 or Other Telephone Services ☐ EXISTING ☐ PLANNED
- Pager or Personal Data Assistants (PDAs) ☐ EXISTING ☐ PLANNED
- DMS controlling parking access ☐ EXISTING ☐ PLANNED

- Other_____

7. Does your agency receive (or plan to receive) information from the National Weather Service?

   ☐ EXISTING ☐ PLANNED ☐ NO

8. Does your agency receive (or plan to receive) surface transportation specific weather information from a value-added sector specific meteorological service provider?

   ☐ EXISTING ☐ PLANNED ☐ NO

9. Does your agency have (or plan to have) the capability to provide any of the following information?

   a. Broadcast of Static or Real-Time Traffic, Transit, or Maintenance and Construction Information? ☐ EXISTING ☐ PLANNED ☐ NO

   b. Personalized provision of Traffic, Transit, or Maintenance and Construction Information to users? ☐ EXISTING ☐ PLANNED ☐ NO

   c. Route Guidance (either pre-trip or enroute)? ☐ EXISTING ☐ PLANNED ☐ NO

   d. Yellow Pages Information or Reservation? ☐ EXISTING ☐ PLANNED ☐ NO

10. Please list any current agreements or memoranda of understanding that your agency has in place with any other organizations/agencies (e.g., maintenance of traffic signals, media agreements).

    _____

    _____

    _____

    _____

    _____

Additional Information / Comments

_____

_____

_____

A. User Needs and Services

1. What are the major transportation problems and issues in your jurisdictional area?

_____

_____

_____

_____

_____

_____

2. Please identify and rank the top 10 user needs and services (across all service areas) for mitigating critical transportation problems and issues in your jurisdiction. Use the numbers from 1 to 10 with 1 being the most critical user needs and services.

Travel and Traffic Management

___ Pre-trip Travel Information
___ En-route Driver Information
___ Route Guidance
___ Ride Matching and Reservation
___ Traveler Services Information
___ Traffic Control
___ Incident Management
___ Travel Demand Management
___ Emissions Testing and Mitigation
___ Highway Rail Intersection

Public Transportation Management

___ Public Transportation Management
___ En-route Transit Information
___ Personalized Public Transit
___ Public Travel Security

Electronic Payment

___ Electronic Payment Services

Commercial Vehicle Operations

___ Commercial Vehicle Electronic Clearance
___ Automated Roadside Safety Inspection
___ On-board Safety and Security Monitoring
___ Commercial Vehicle Administrative Processes
___ Hazardous Materials Security and Incident Response
___ Freight Mobility

Emergency Management

___ Emergency Notification and Personal Security
___ Emergency Vehicle Management
___ Disaster Response and Evacuation

Advanced Vehicle Safety Systems

___ Longitudinal Collision Avoidance
___ Lateral Collision Avoidance
___ Intersection Collision Avoidance
___ Vision Enhancement for Crash Avoidance
___ Safety Readiness
___ Pre-crash Restraint Deployment
___ Automated Vehicle Operation

Information Management

___ Archived Data

Maintenance and Construction Management

___ Maintenance and Construction Operations

3. Based on your understanding of ITS technology in transportation, what opportunities do you see in the future for the application of ITS technologies in your area? (Please check all applied)

☐ CCTV Surveillance
☐ Integrated Statewide Emergency Response
☐ Coordinated Signal Systems
☐ Integrated Regional Incident Management
☐ Advanced Highway/Rail Grade Crossing Control
☐ Variable/Dynamic Message Signs
☐ Pre-planned Detour/Evacuation Routes
☐ Highway Advisory Radio (HAR)
☐ Transit/Parking Smart Card Payment System
☐ Traffic Signal Priority for transit vehicles
☐ Traffic Signal Priority for emergency vehicles
☐ Internet Traveler Information Website
☐ Telephone Traveler Information
☐ Aerial Detection
☐ Road Weather Systems
☐ Advanced Work Zone Management
☐ AVL/In-vehicle Navigation System for Emergency or Maintenance Vehicles
☐ Transit Location/ Information System
☐ Cell number for incident detection (e.g. *999)
☐ Cable TV Traveler Information

☐ Highway Service Patrol

☐ Hazardous Materials Response

Others:

_____

_____

Additional Information / Comments

_____

_____

_____

_____

Data Management and Archiving

1. Does your agency collect and store (or plan to collect and store) data (data archiving)?

   ☐ YES ☐ NO

   If YES, please select all that apply and list the appropriate data types (traffic volume, speed, incident, condition assessment, video, ridership, etc.), data sources (organizations/agencies, systems, equipment, etc.) and data formats (electronic database, paper files, etc.)

   - Traffic Data ☐ EXISTING ☐ PLANNED

   Data Types: _____

   Data Sources: _____

   Data Formats: _____

   - Emergency/Accident Data ☐ EXISTING ☐ PLANNED

   Data Types: _____

   Data Sources: _____

   Data Formats: _____

   - Maintenance and Construction Data ☐ EXISTING ☐ PLANNED

   Data Types: _____

   Data Sources: _____

   Data Formats: _____

- Public Transportation Data ☐ EXISTING ☐ PLANNED

Data Types: _____

Data Sources: _____

Data Formats: _____

- Commercial Vehicle Data ☐ EXISTING ☐ PLANNED

Data Types: _____ _____

Data Sources: _____

Data Formats: _____

- Emission Data ☐ EXISTING ☐ PLANNED

Data Types: _____ _____

Data Sources: _____

Data Formats: _____

- Parking Data ☐ EXISTING ☐ PLANNED

Data Types: _____

Data Sources: _____

Data Formats: _____

- Other_____

_____

_____

_____

2. Does your archived data management system provide general query and report functionality?

☐ EXISTING ☐ PLANNED ☐ NO

3. Does your archived data management system provide advanced features such as data analysis, summarization, and data mining to facilitate discovery of information, patterns, and correlations in large data sets?

☐ EXISTING ☐ PLANNED ☐ NO

4. Does your organization or agency use Geographic Information Systems (GIS)?

☐ EXISTING ☐ PLANNED ☐ NO

If EXISTING or PLANNED, what types of information are GIS used for?

_____

_____

_____

Additional Information / Comments

_____

_____

_____

_____

_____

_____

Roadway Operations

1. Does your agency use (or plan to use) any of the following real-time traffic data collection technologies?

   - Loop Detectors that provide volume and speed data at midblock locations (this **excludes** actuators on intersection approaches)
     ☐ EXISTING ☐ PLANNED
   - CCTV Cameras ☐ EXISTING ☐ PLANNED
   - Vehicle Probe Readers to estimate travel times on arterials
     ☐ EXISTING ☐ PLANNED
   - Road Weather Information System ☐ EXISTING ☐ PLANNED
   - Overheight Vehicle Detection ☐ EXISTING ☐ PLANNED
   - Other_____

     _____

     _____

     _____

2. Does your agency detect and verify (or plan to detect and verify) traffic incidents using sensors and surveillance equipment?

   ☐ EXISTING ☐ PLANNED ☐ NO

3. Does your agency operate (or plan to add) lane control devices (e.g., changeable overhead directional arrows)?

   ☐ EXISTING ☐ PLANNED ☐ NO

4. Does your agency manage (or plan to manage) automatic or remotely controlled gates or barriers that control access to roadway segments including ramps and traffic lanes?

   ☐ EXISTING ☐ PLANNED ☐ NO

5. Does your agency operate (or plan to add) ramp meters on freeway entrances?

   ☐ YES ☐ NO

   If YES, please indicate what is (or will be) used:

   - Pre-emption for emergency vehicles ☐ EXISTING ☐ PLANNED
   - Priority for transit vehicles ☐ EXISTING ☐ PLANNED

6. Does your agency control (or plan to control) any signalized intersections?

   ☐ YES ☐ NO

   If NO, skip to Section E.
   If YES, do any of your signalized intersections have (or plan to have):

   - Closed Loop or Centralized Control ☐ EXISTING ☐ PLANNED
   - Real-Time traffic adaptive control such as SCOOT/SCATS or similar ☐ EXISTING ☐ PLANNED
   - Signal Preemption for emergency vehicles ☐ EXISTING ☐ PLANNED
   - Signal Priority for Transit Vehicles ☐ EXISTING ☐ PLANNED
   - Wireless Communications ☐ EXISTING ☐ PLANNED
   - Other_____

     _____

7. Does your agency have (or plan to have) any signalized intersections that are interconnected with active railroad crossing devices?

   ☐ EXISTING ☐ PLANNED ☐ NO

8. Does your agency monitor highway-rail intersections with any of the following technologies?

   - Vehicle Detectors ☐ EXISTING ☐ PLANNED
   - Video Surveillance/Detection ☐ EXISTING ☐ PLANNED
   - Train Arrival Prediction (Predict Train Arrival Electronically) ☐ EXISTING ☐ PLANNED
   - Electronic Traffic Violator Devices ☐ EXISTING ☐ PLANNED
   - Other_____

     _____

Additional Information / Comments

_____

_____

_____

Roadway Maintenance

1. Does your agency provide or support (or plan to provide or support) on-going operations and maintenance activities?

   ☐ EXISTING ☐ PLANNED ☐ NO

2. Does your agency have (or plan to have) a maintenance and construction vehicle fleet?

   ☐ EXISTING ☐ PLANNED ☐ NO

   If NO, skip to question #7.

3. Does your agency operate or maintain (or plan to operate or maintain) a dispatch facility?

   ☐ EXISTING ☐ PLANNED ☐ NO

   If EXISTING or PLANNED, how do your dispatchers communicate with the vehicle operators?

   _____

   _____

   _____

4. Does your agency use (or plan to use) an Automated Vehicle Location (AVL) system?

   ☐ EXISTING ☐ PLANNED ☐ NO

5. Does your agency provide (or plan to provide) maintenance of the vehicles in your fleet?

   ☐ EXISTING ☐ PLANNED ☐ NO

6. Does your agency have (or plan to have) the capability to automate vehicle maintenance scheduling and manage both routine and corrective maintenance activities on vehicles?

   ☐ EXISTING ☐ PLANNED ☐ NO

7. Does your agency collect (or plan to collect) road and weather conditions data from environmental sensors located on or near the roadway?

   ☐ EXISTING ☐ PLANNED ☐ NO

8. Does your agency use (or plan to use) environmental data or information to detect environmental hazards such as icy road conditions, high winds, or dense fog?

   ☐ EXISTING ☐ PLANNED ☐ NO

9. Does your agency have (or plan to have) any roadway deicing systems?

   ☐ EXISTING ☐ PLANNED ☐ NO

10. Does your agency provide (or plan to provide) maintenance services such as landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), or repair and maintenance of equipment (both ITS and non-ITS) on the roadway?

    ☐ EXISTING ☐ PLANNED ☐ NO

11. Does your agency perform (or plan to perform) winter maintenance activities?

    ☐ EXISTING ☐ PLANNED ☐ NO

12. Does your agency manage roadway work zone activities?

    ☐ YES ☐ NO

    If YES, please identify below the devices or systems currently deployed or planned for work zone monitoring.

    - Dynamic Message Signs (DMS) ☐ EXISTING ☐ PLANNED

- Closed Circuit Television (CCTV) ☐ EXISTING ☐ PLANNED
- Vehicle Speed Monitoring using Remote Devices (i.e. Sensors/Detectors) ☐ EXISTING ☐ PLANNED
- Work Zone Intrusions (Detection system on/near the roadway or on-board of maintenance vehicles) ☐ EXISTING ☐ PLANNED
- Other _____

Additional Information / Comments

_____

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_____

B. Transportation Security

1. Does your agency monitor (or plan to monitor) the transportation infrastructure (e.g., bridges, tunnels, and management centers) for potential threats using sensors and surveillance equipment?

   ☐ EXISTING ☐ PLANNED ☐ NO

2. Does your agency remotely control (or plan to remotely control) barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate the impact of an incident?

   ☐ EXISTING ☐ PLANNED ☐ NO

3. Does your agency monitor (or plan to monitor) public travel-related areas such as transit stations, transit stops, rest stops, and kiosk locations for potential threats using sensors and surveillance equipment?

   ☐ EXISTING ☐ PLANNED ☐ NO

4. Does your agency use (or plan to use) ITS devices and traveler information systems (such as dynamic message signs, highway advisory radio, 511 or other telephone services, TV/radios, Internet, e-mail, and kiosks) 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?

☐ EXISTING ☐ PLANNED ☐ NO

5. Does your agency use (or plan to use) sensors and surveillance equipment to monitor and detect potential, looming, and actual disasters including natural disasters and technological and man-made disasters (hazardous materials incidents, nuclear, chemical, biological, and radiological attacks) and notify all responding agencies of detected emergencies?

   ☐ EXISTING ☐ PLANNED ☐ NO

6. Does your agency support (or plan to support) disaster response and recovery, including coordination of emergency response plans and resources, damage assessment, service restoration, and transition back to normal operation?

   ☐ EXISTING ☐ PLANNED ☐ NO

7. Does your agency support (or plan to support) evacuation of the general public from a disaster area and manage subsequent reentry to the disaster area using transportation resources?

   ☐ EXISTING ☐ PLANNED ☐ NO

8. Does your agency provide (or plan to provide) disaster-related traveler information to the general public, regarding evacuation and reentry information and other information concerning the operation and availability of the transportation system during a disaster?

   ☐ EXISTING ☐ PLANNED ☐ NO

Additional Information / Comments

_____

_____

_____

_____

_____

Incident/Emergency Management

1. Does your agency currently perform (or plan to perform) Computer Aided Dispatch (CAD) of emergency vehicles?

   ☐ EXISTING ☐ PLANNED ☐ NO

2. Does your agency use (or plan to use) an Automated Vehicle Location (AVL) system?

   ☐ EXISTING ☐ PLANNED ☐ NO

3. Does your agency receive (or plan to receive) incident data from an arterial, freeway, transit, or other emergency management agencies?

Arterial Management:	☐ EXISTING	☐ PLANNED	☐ NO
Freeway Management:	☐ EXISTING	☐ PLANNED	☐ NO
Maintenance and Construction:	☐ EXISTING	☐ PLANNED	☐ NO
Transit Agency(ies):	☐ EXISTING	☐ PLANNED	☐ NO
Other Emergency Management:	☐ EXISTING	☐ PLANNED	☐ NO

   Other _____

4. Does your agency send (or plan to send) incident data to an arterial, freeway, transit, or other emergency management agencies?

Arterial Management:	☐ EXISTING	☐ PLANNED	☐ NO
Freeway Management:	☐ EXISTING	☐ PLANNED	☐ NO
Maintenance and Construction:	☐ EXISTING	☐ PLANNED	☐ NO
Transit Agency(ies):	☐ EXISTING	☐ PLANNED	☐ NO
Other Emergency Management:	☐ EXISTING	☐ PLANNED	☐ NO

   Other _____

5. Does your agency have (or plan to have) preemption lights for signalized intersections or ramp meters?

   ☐ EXISTING ☐ PLANNED ☐ NO

6. Does your agency receive (or plan to receive) real-time traffic information and conditions from transportation agencies to support and enhance emergency vehicle routing?

   ☐ EXISTING ☐ PLANNED ☐ NO

If EXISTING or PLANNED, from which agency(ies):

_____

_____

_____

_____

Additional Information / Comments

_____

_____

_____

_____

_____

Transit Operations

1. What types of transit services does your agency operate (or plan to operate)?

   - Fixed Route ☐ EXISTING ☐ PLANNED
   - Demand Responsive (Paratransit) ☐ EXISTING ☐ PLANNED
   - Rail ☐ EXISTING ☐ PLANNED
   - Ferries ☐ EXISTING ☐ PLANNED
   - Other _____

2. Does your agency provide (or plan to provide) maintenance of the transit vehicles?

   ☐ EXISTING ☐ PLANNED ☐ NO

3. Does your agency have (or plan to have) the capability to automate vehicle maintenance scheduling and manage both routine and corrective maintenance activities on vehicles?

   ☐ EXISTING ☐ PLANNED ☐ NO

4. Does your agency use (or plan to use) an Automated Vehicle Location (AVL) system?

   ☐ EXISTING ☐ PLANNED ☐ NO

5. Does your agency have (or plan to have) security monitoring systems on-board transit vehicles?

   ☐ EXISTING ☐ PLANNED ☐ NO

6. Does your agency monitor (or plan to monitor) public areas (e.g. stops, park & ride lots, stations) using sensors and surveillance equipment?

   ☐ EXISTING ☐ PLANNED ☐ NO

7. Does your agency use sensors and surveillance equipment to perform security monitoring (or plan to monitor) non-public areas (e.g. transit yards or other infrastructure)?

   ☐ EXISTING ☐ PLANNED ☐ NO

8. Does your agency directly or indirectly (i.e. thru another agency) provide (or plan to provide) transit information to the public?

   ☐ YES ☐ NO

   If YES, please identify below the method(s) currently used or planned to provide transit information:

   - Internet Web Page ☐ EXISTING ☐ PLANNED
   - Pagers or Personal Data Assistants ☐ EXISTING ☐ PLANNED
   - Kiosks ☐ EXISTING ☐ PLANNED
   - Display/Audio in Transit Vehicles ☐ EXISTING ☐ PLANNED
   - E-mail or other direct PC communications ☐ EXISTING ☐ PLANNED
   - Electronic Displays/Audio Announcements at Transit Stops and Stations (includes video monitors) ☐ EXISTING ☐ PLANNED
   - TV (interactive or dedicated Cable) ☐ EXISTING ☐ PLANNED
   - Other _____

9. Does your agency provide (or plan to provide) real-time transit information (i.e., latest available information on transit routes, schedules, transfer options, bicycle accessibility, fares, real-time schedule adherence, etc.) at stops or parking facilities?

   ☐ EXISTING ☐ PLANNED ☐ NO

10. Does your agency provide transit trip planning?

    ☐ YES ☐ NO

If YES, please identify below the method(s) currently used or planned for provide the trip planning information:

- Internet ☐ EXISTING ☐ PLANNED
- E-mail or other direct PC communications ☐ EXISTING ☐ PLANNED
- Kiosks ☐ EXISTING ☐ PLANNED
- Other _____

11. Does your agency have (or plan to have) an Electronic Fare Payment System (smart card, swipe card, credit card, etc.)?

☐ EXISTING ☐ PLANNED ☐ NO

12. Does your transit vehicles have (or plan to have) the capability to receive priority lights at signalized intersections?

☐ EXISTING ☐ PLANNED ☐ NO

Additional Information / Comments

_____

_____

_____

_____

_____

Commercial Vehicle Operations

1. Does your agency perform (or plan to perform) electronic credential administrative services for commercial vehicles?

☐ EXISTING ☐ PLANNED ☐ NO

2. Does your agency participate (or plan to participate) in roadside commercial vehicle inspection?

☐ EXISTING ☐ PLANNED ☐ NO

If NO, no further responses are required in this section.

3. Does your agency perform (or plan to perform) electronic screening?

   ☐ EXISTING ☐ PLANNED ☐ NO

4. Does your agency exchange (or plan to exchange) safety and/or security information?

   ☐ EXISTING ☐ PLANNED ☐ NO

5. Does your agency perform (or plan to perform) a high speed weigh-in-motion service?

   ☐ EXISTING ☐ PLANNED ☐ NO

6. Does your agency participate (or plan to participate) in HAZMAT detection?

   ☐ EXISTING ☐ PLANNED ☐ NO

   If EXISTING or PLANNED, please list any handheld or roadside equipment for detection and classification of security sensitive HAZMAT on commercial vehicles, and for accessing credentials information on driver verification.

   _____

   _____

Additional Information / Comments

_____

_____

_____

Please complete and return this questionnaire by [Date] and send to:

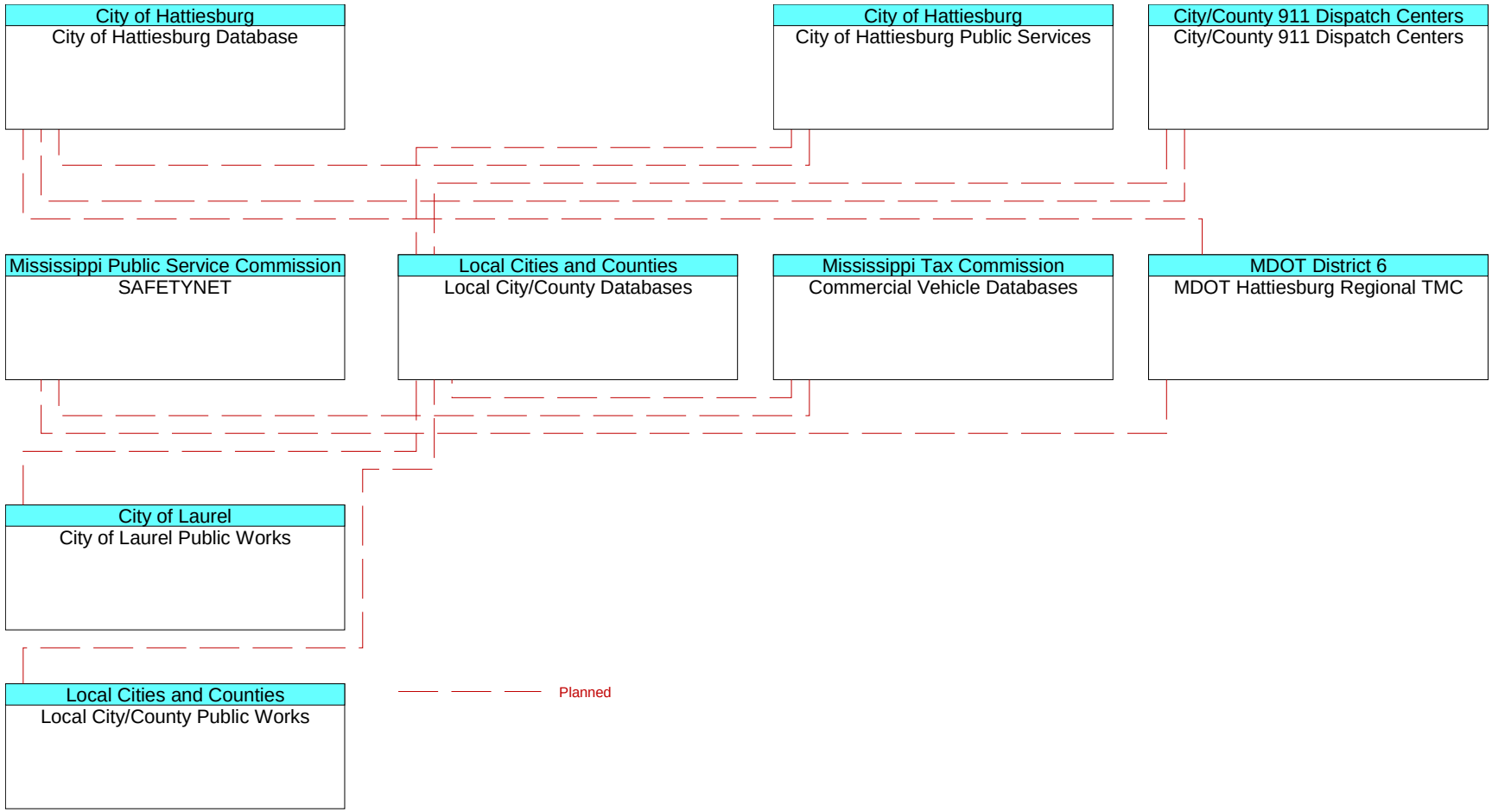
[Name & Address]

Thank You!

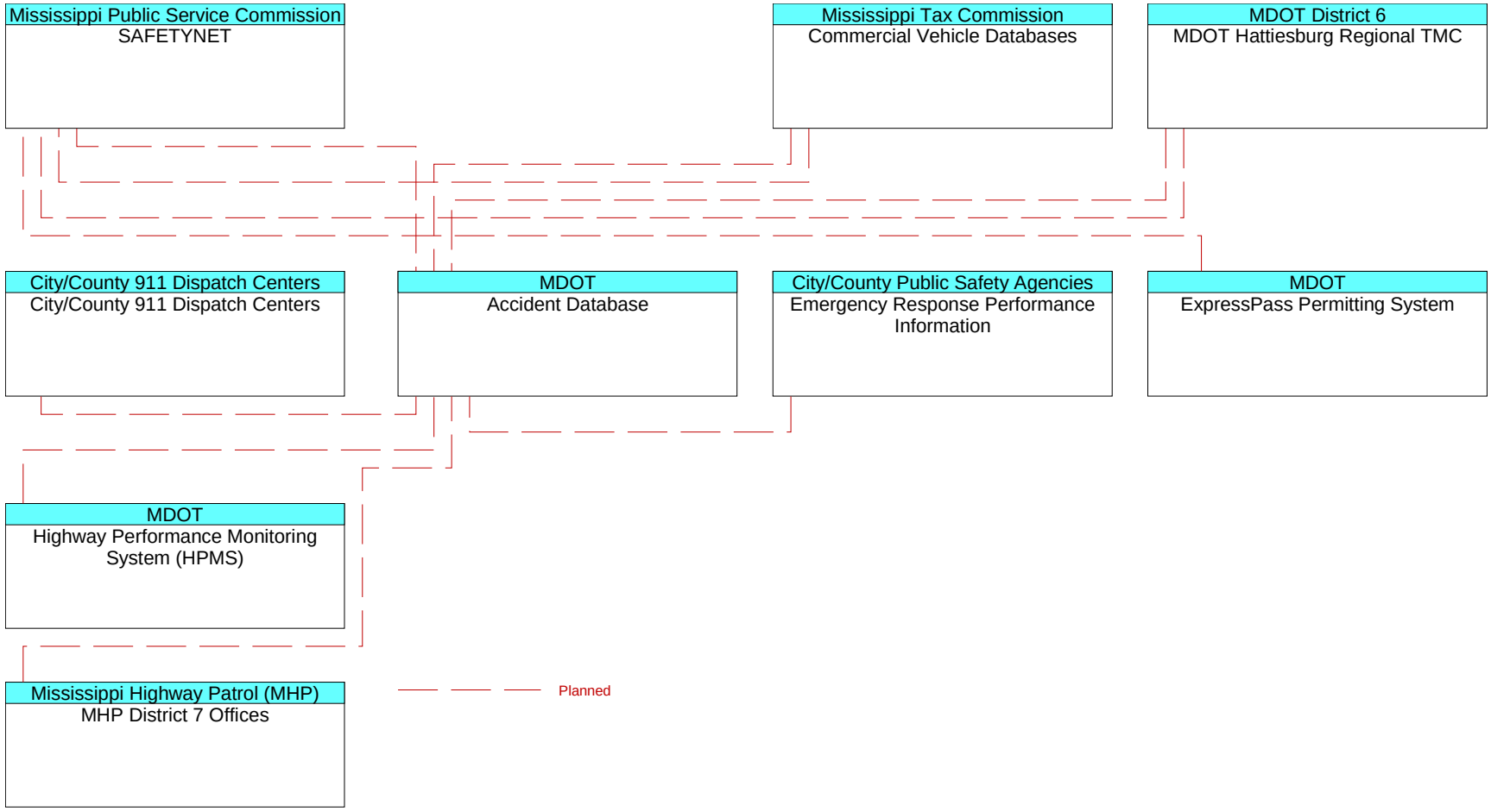
Appendix B: Functional Requirements

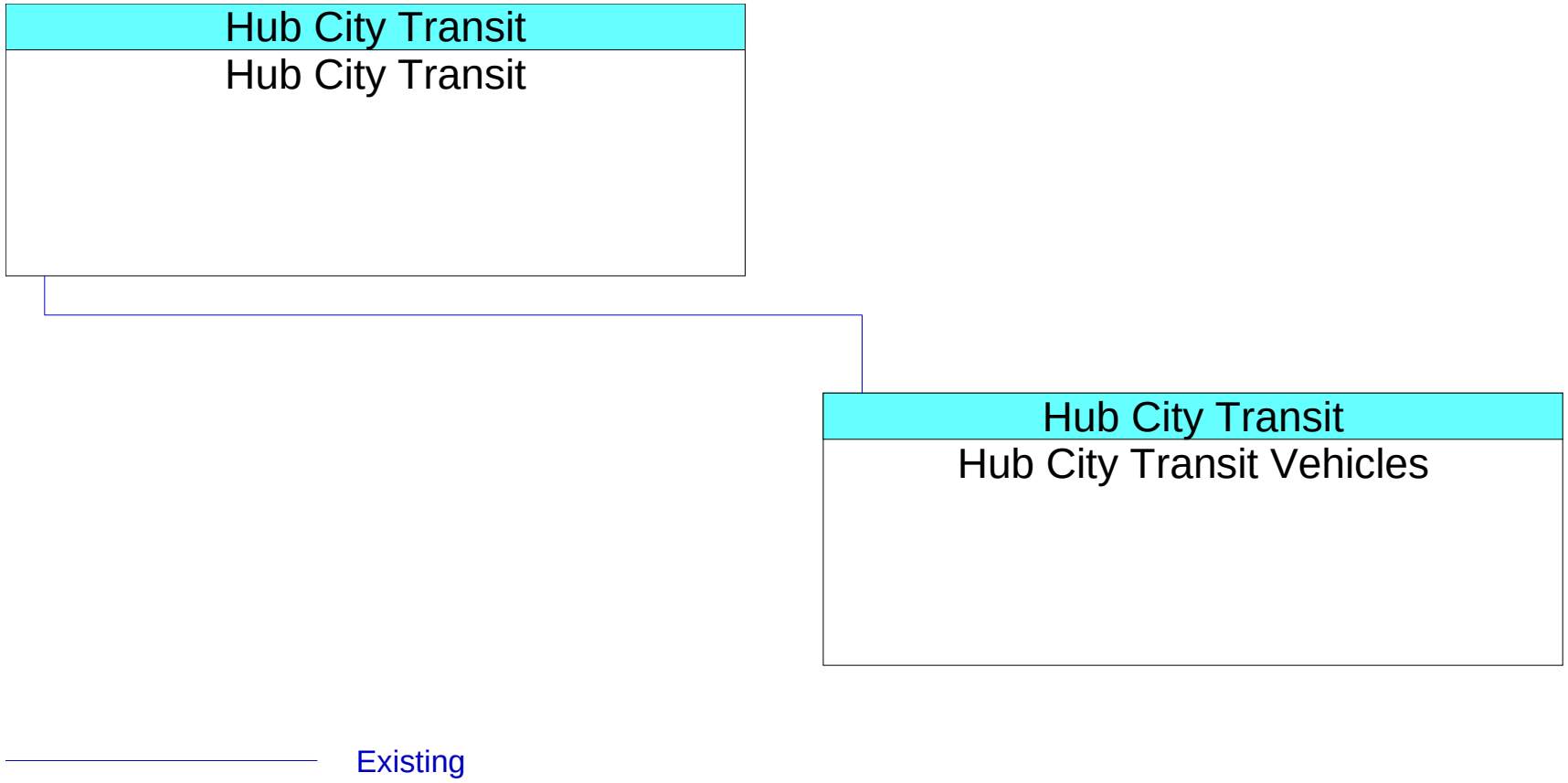
Appendix C: Architecture Interconnect Diagrams

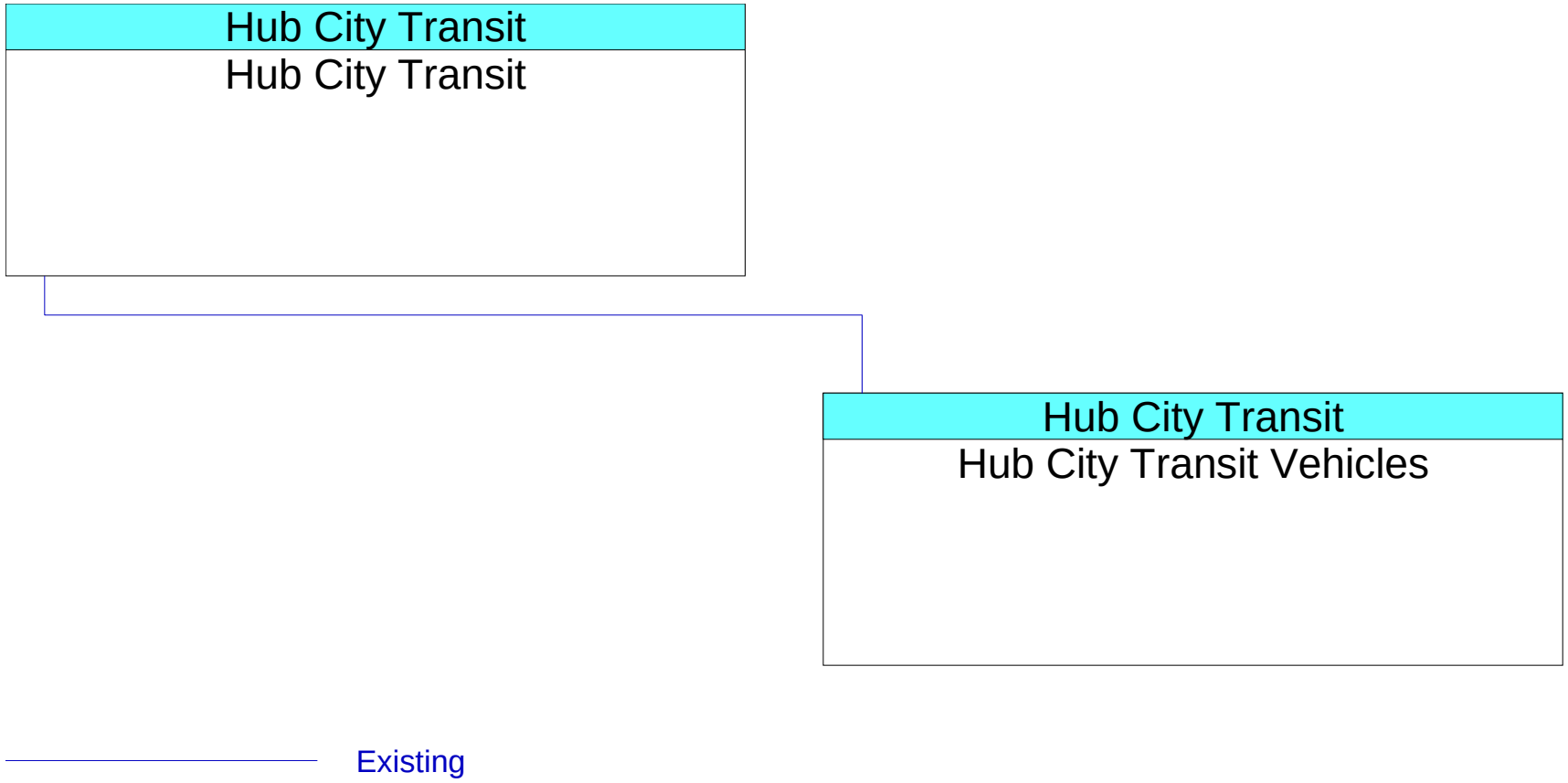
Hattiesburg Region Intelligent Transportation System Architecture

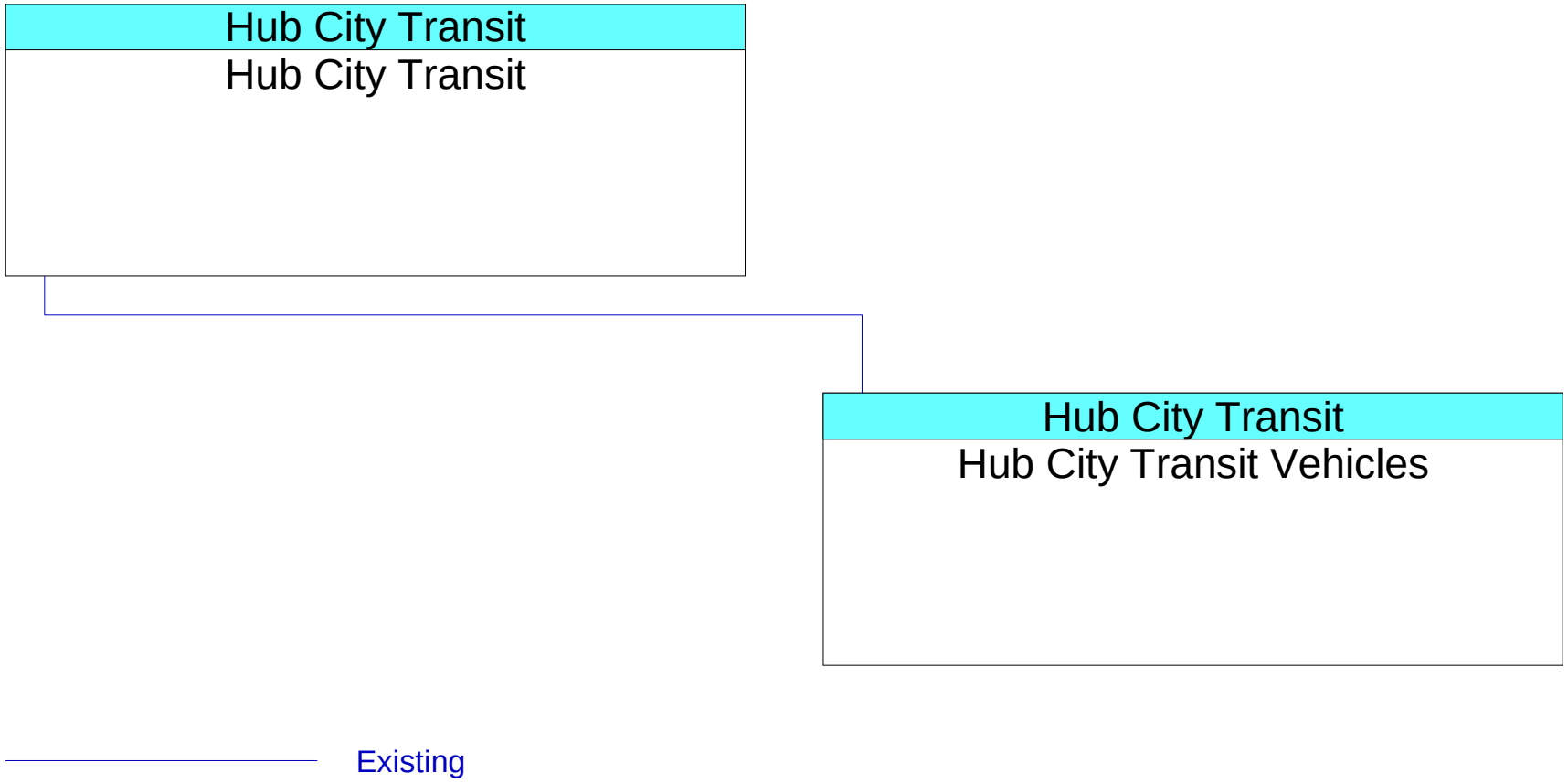


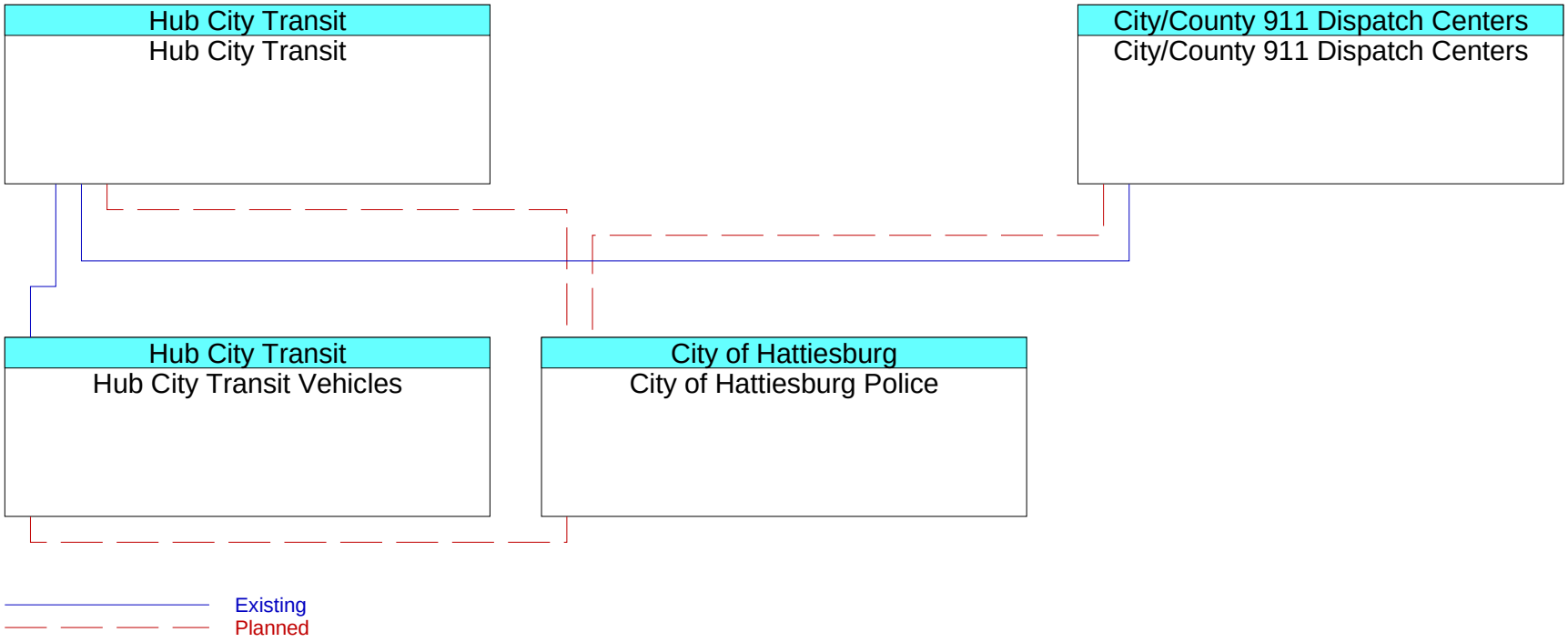
Hattiesburg Region Intelligent Transportation System Architecture

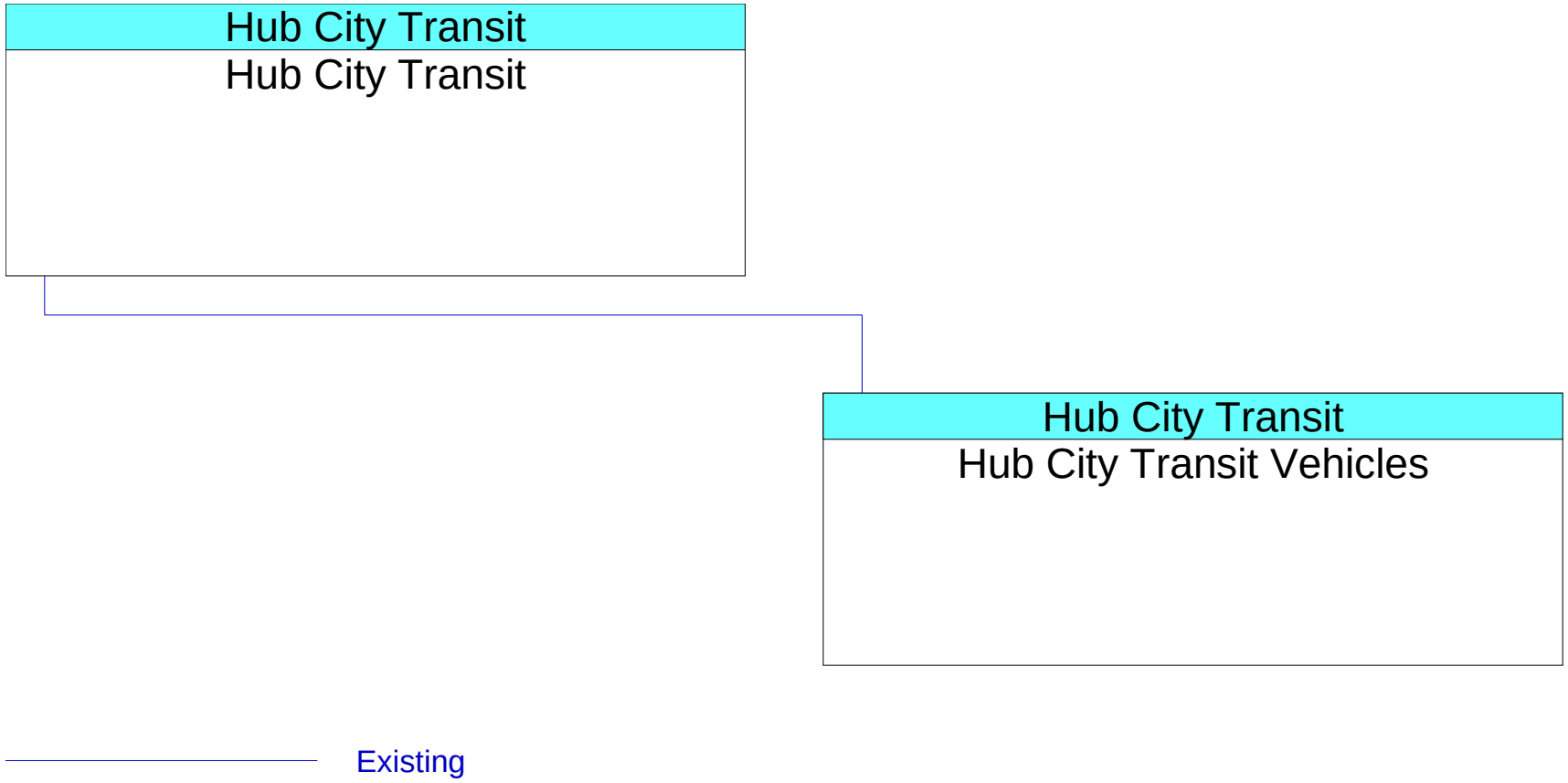


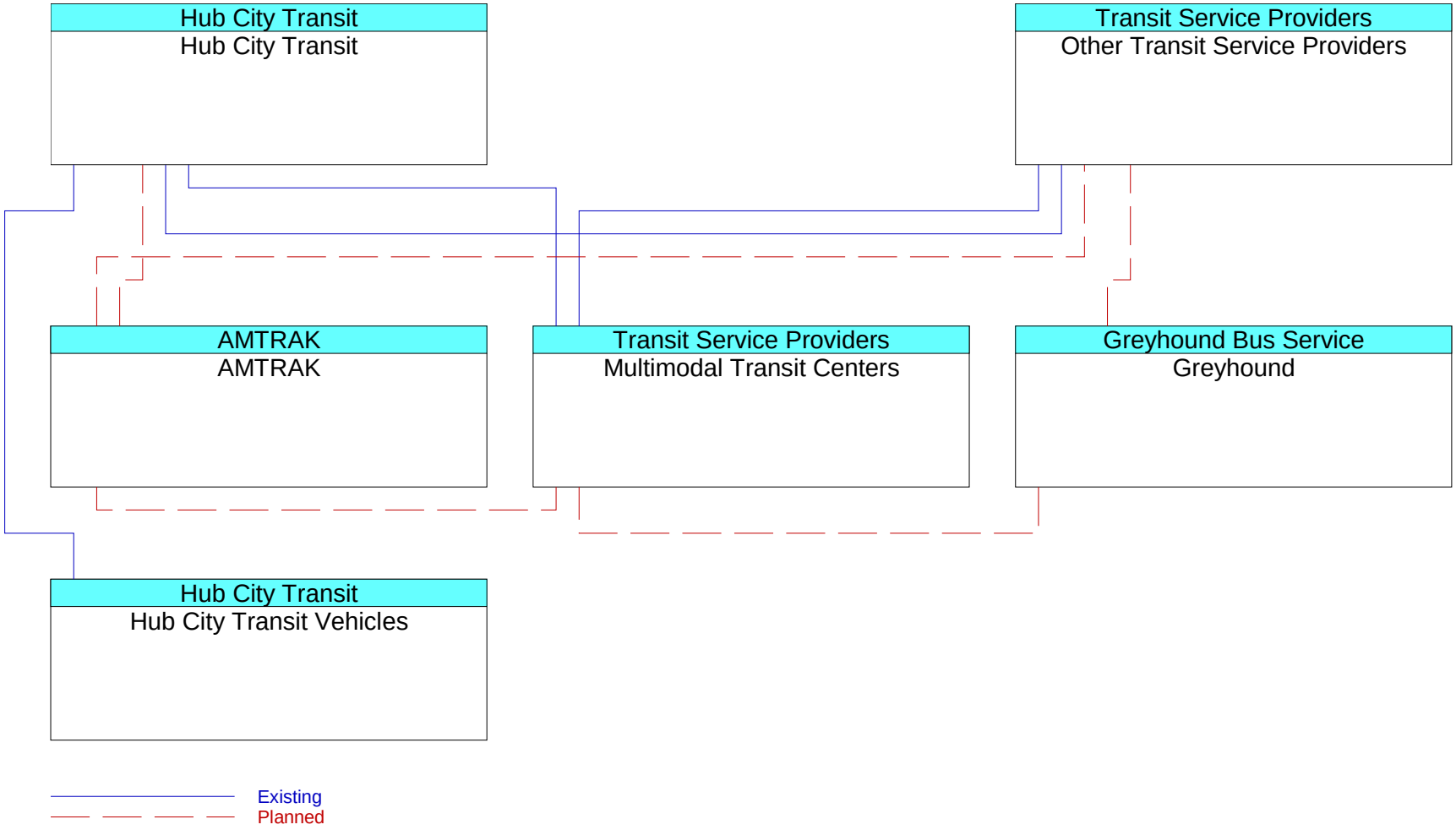

Hub City Transit
Hub City Transit
Hub City Transit
Hub City Transit Vehicles
Existing

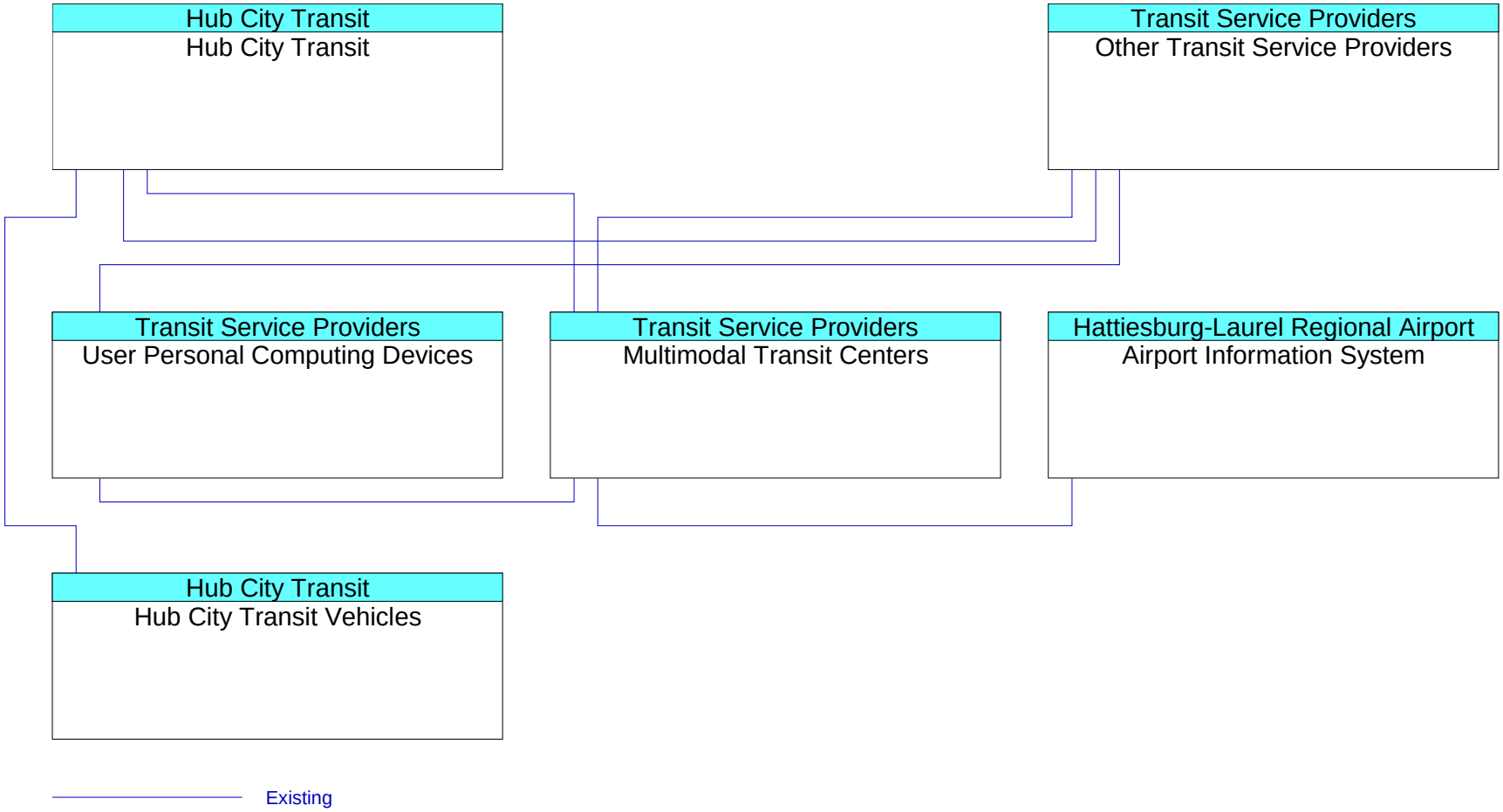

Hub City Transit
Hub City Transit
Hub City Transit
Hub City Transit Vehicles
Existing

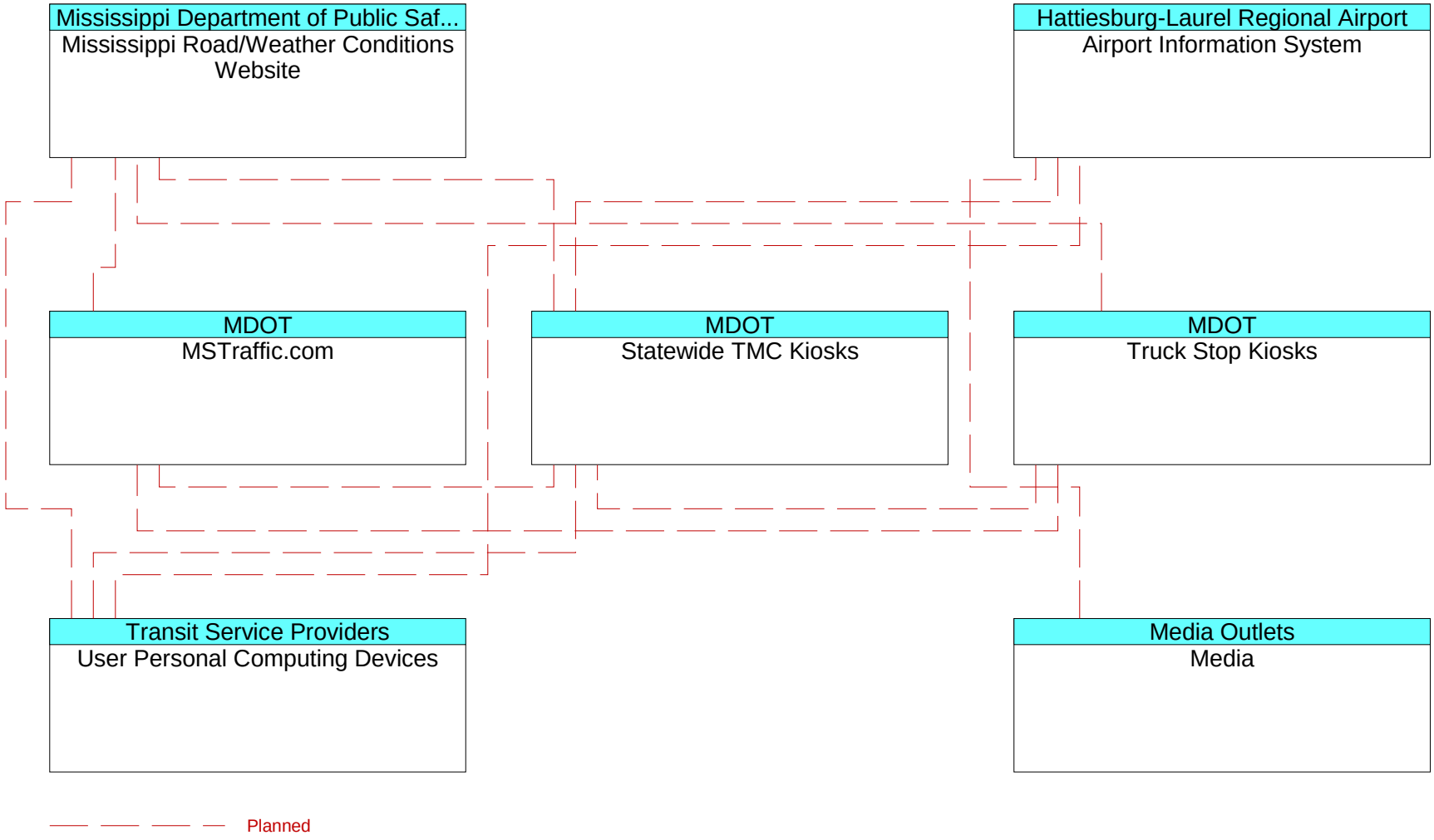

Hub City Transit
Hub City Transit
Hub City Transit
Hub City Transit Vehicles
Existing

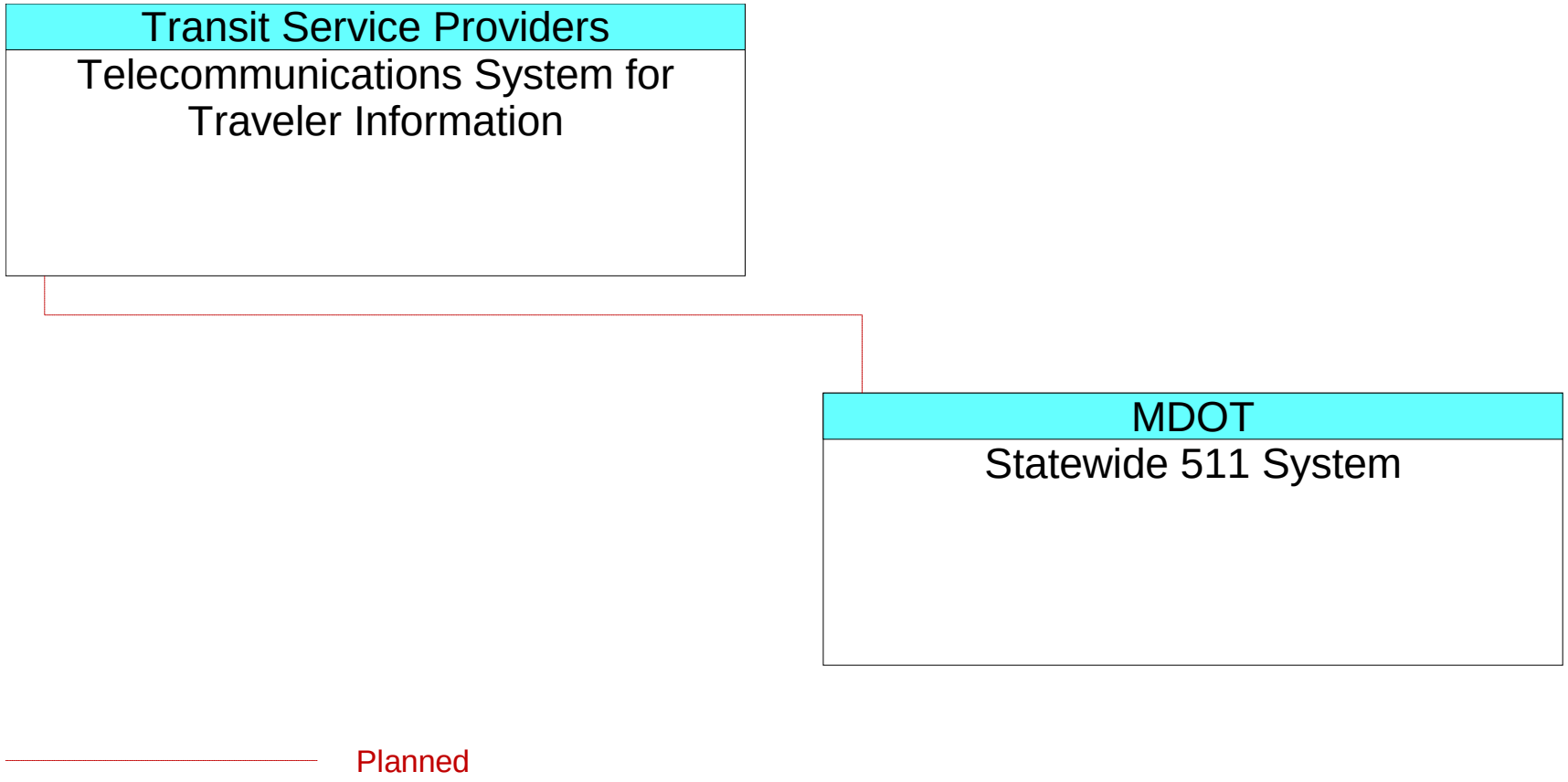

Hub City Transit
Hub City Transit
City/County 911 Dispatch Centers
City/County 911 Dispatch Centers
Hub City Transit
Hub City Transit Vehicles
City of Hattiesburg
City of Hattiesburg Police
Existing
Planned

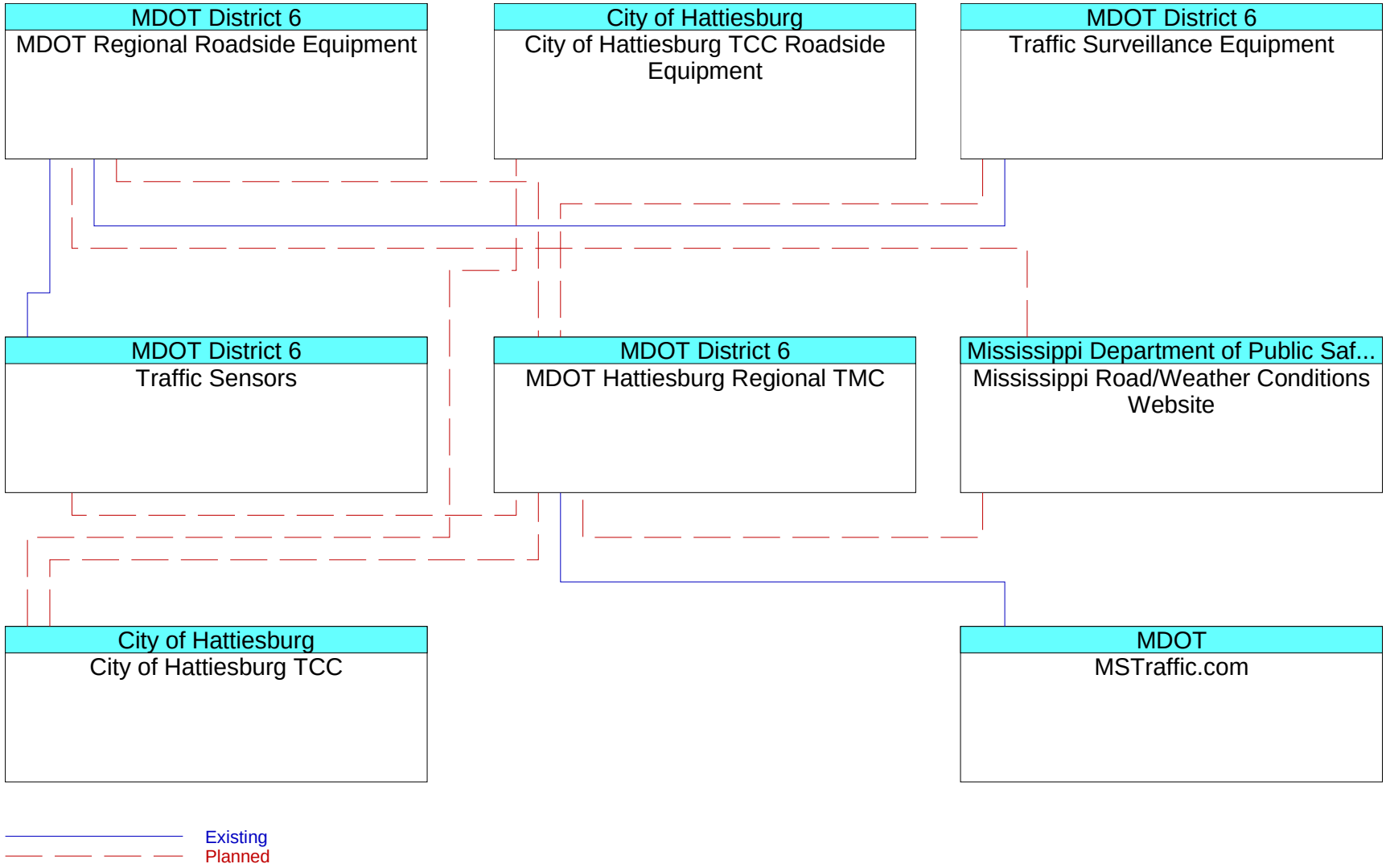

Hub City Transit
Hub City Transit
Hub City Transit
Hub City Transit Vehicles
Existing

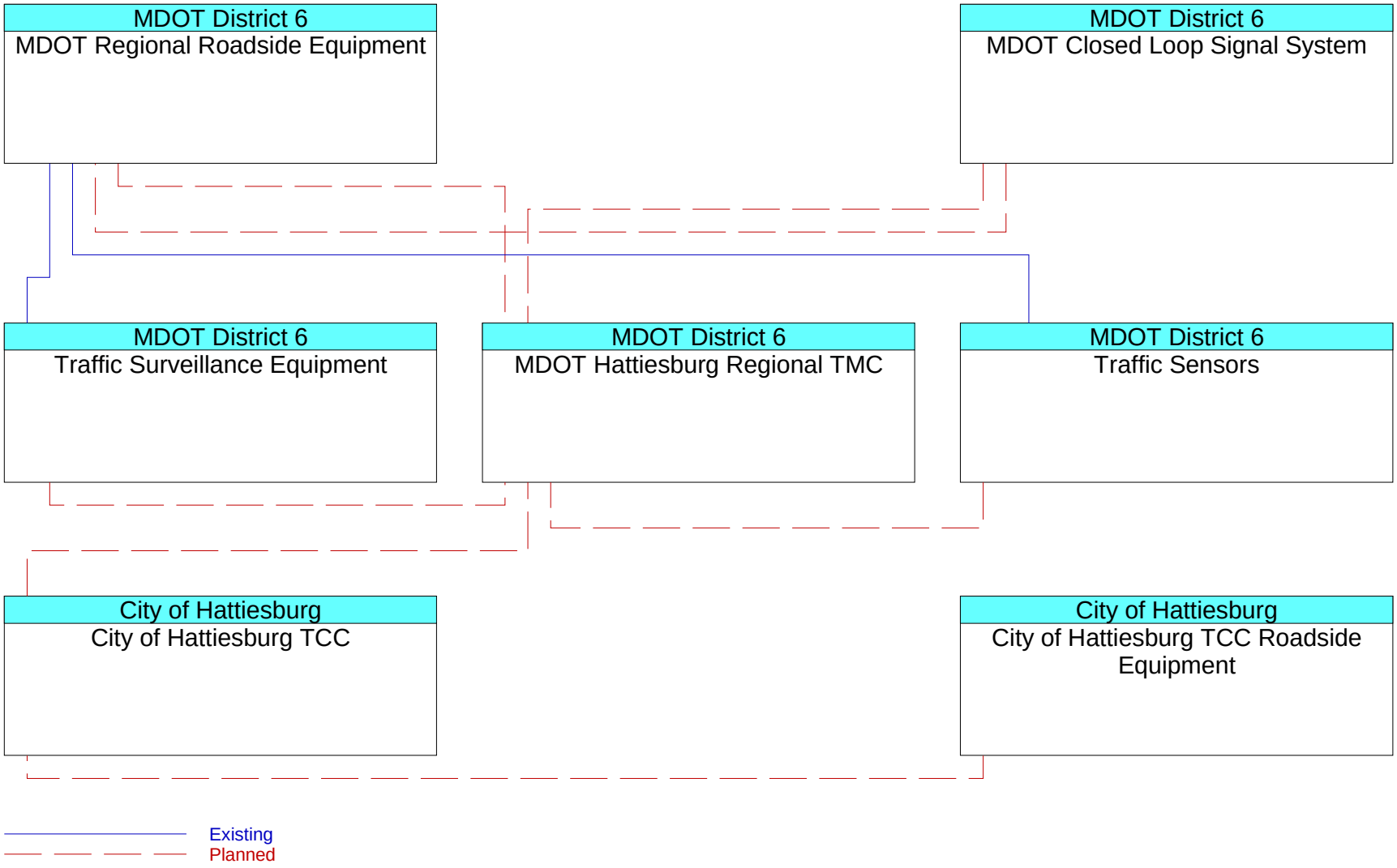

Hub City Transit
Hub City Transit
Transit Service Providers
Other Transit Service Providers
AMTRAK
AMTRAK
Transit Service Providers
Multimodal Transit Centers
Greyhound Bus Service
Greyhound
Hub City Transit
Hub City Transit Vehicles
Existing
Planned

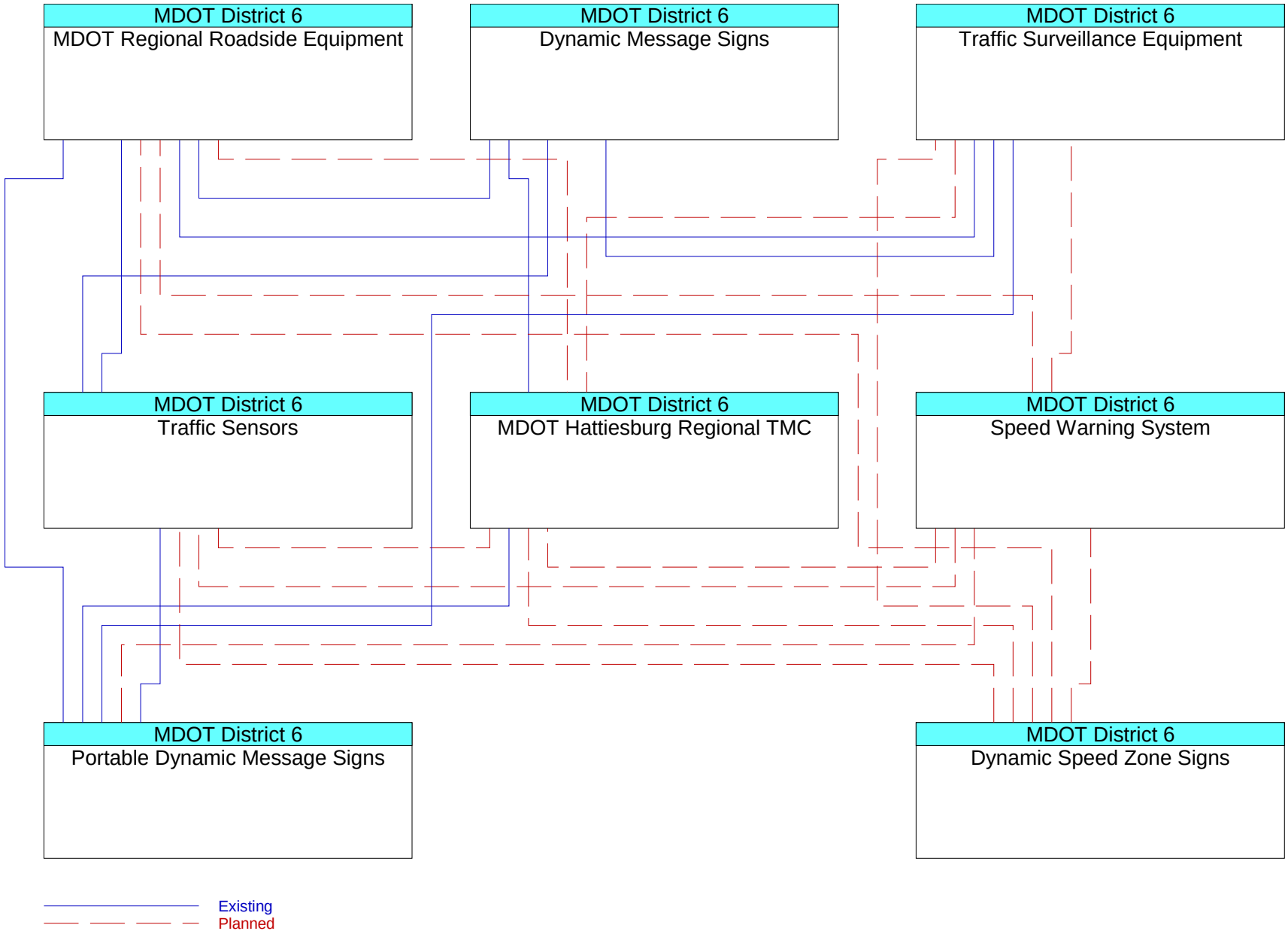

Hub City Transit
Hub City Transit
Transit Service Providers
Other Transit Service Providers
Transit Service Providers
User Personal Computing Devices
Transit Service Providers
Multimodal Transit Centers
Hattiesburg-Laurel Regional Airport
Airport Information System
Hub City Transit
Hub City Transit Vehicles
Existing


Mississippi Department of Public Saf...
Mississippi Road/Weather Conditions Website
Hattiesburg-Laurel Regional Airport
Airport Information System
MDOT
MSTraffic.com
MDOT
Statewide TMC Kiosks
MDOT
Truck Stop Kiosks
Transit Service Providers
User Personal Computing Devices
Media Outlets
Media
Planned

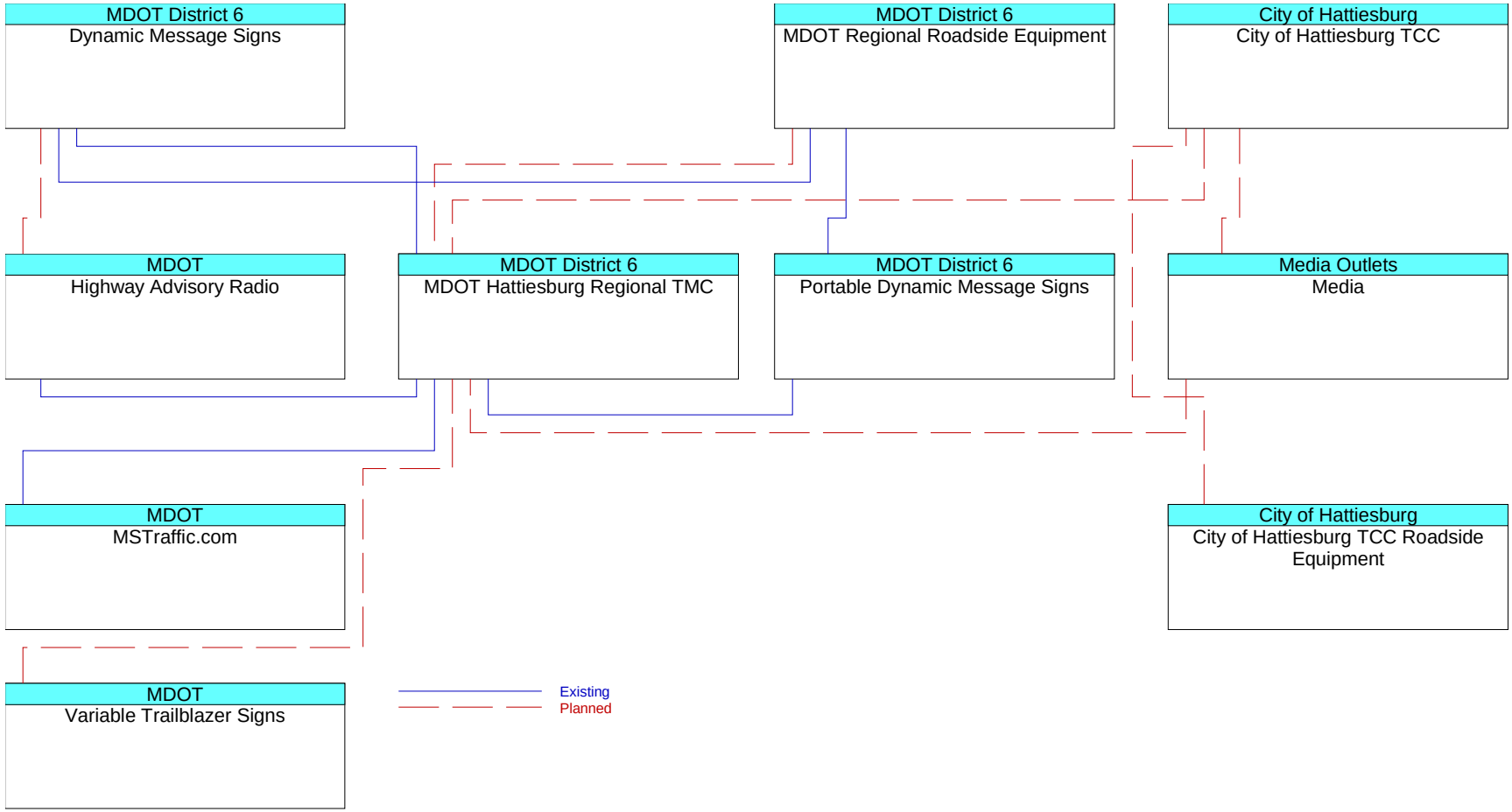

Transit Service Providers
Telecommunications System for Traveler Information
MDOT
Statewide 511 System
Planned

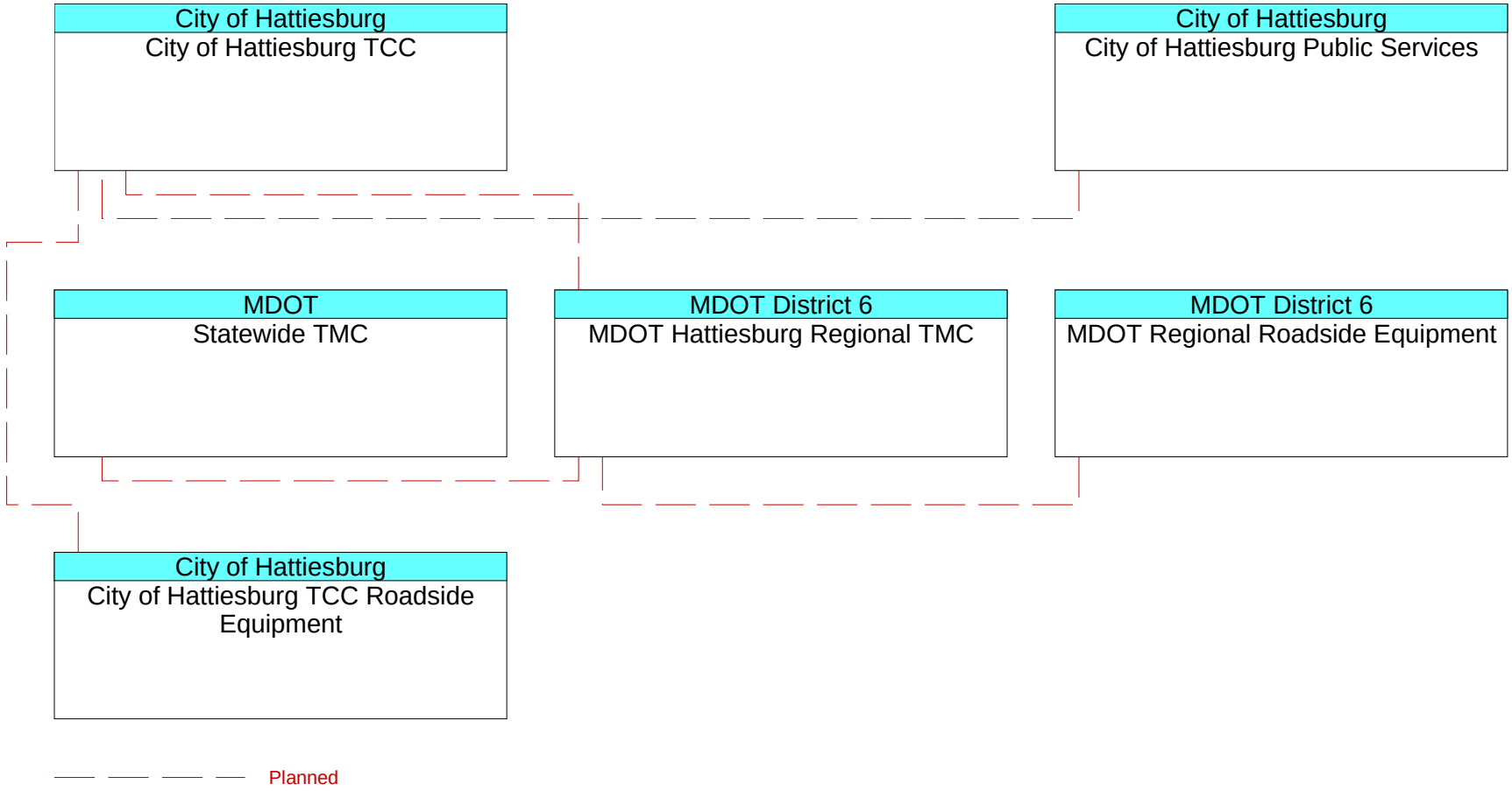

MDOT District 6
MDOT Regional Roadside Equipment
City of Hattiesburg
City of Hattiesburg TCC Roadside Equipment
MDOT District 6
Traffic Surveillance Equipment
MDOT District 6
Traffic Sensors
MDOT District 6
MDOT Hattiesburg Regional TMC
Mississippi Department of Public Saf...
Mississippi Road/Weather Conditions Website
City of Hattiesburg
City of Hattiesburg TCC
MDOT
MSTraffic.com
Existing
Planned


MDOT District 6
MDOT Regional Roadside Equipment
MDOT District 6
MDOT Closed Loop Signal System
MDOT District 6
Traffic Surveillance Equipment
MDOT District 6
MDOT Hattiesburg Regional TMC
MDOT District 6
Traffic Sensors
City of Hattiesburg
City of Hattiesburg TCC
City of Hattiesburg
City of Hattiesburg TCC Roadside Equipment
Existing
Planned

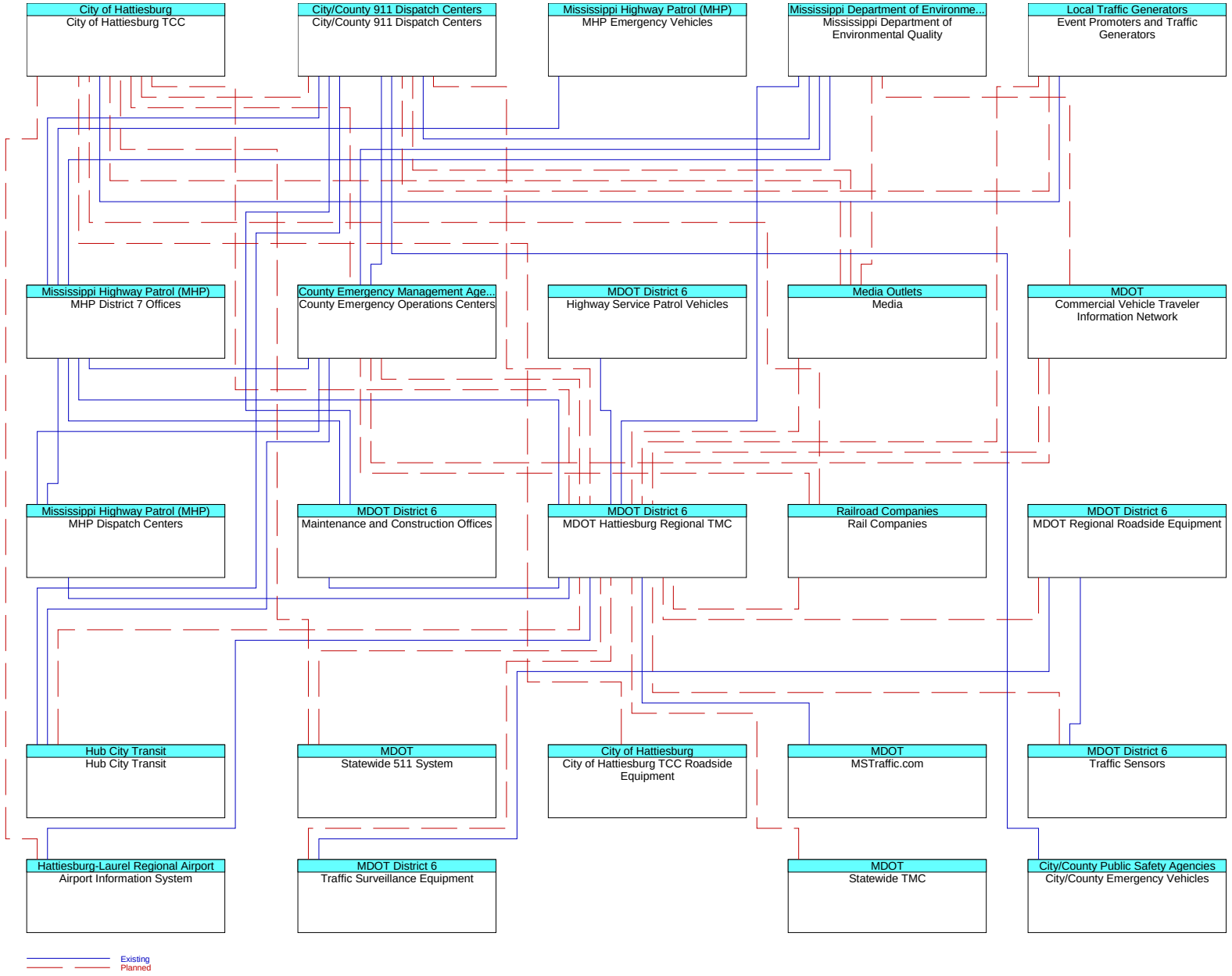

MDOT District 6
MDOT Regional Roadside Equipment
MDOT District 6
Dynamic Message Signs
MDOT District 6
Traffic Surveillance Equipment
MDOT District 6
Traffic Sensors
MDOT District 6
MDOT Hattiesburg Regional TMC
MDOT District 6
Speed Warning System
MDOT District 6
Portable Dynamic Message Signs
MDOT District 6
Dynamic Speed Zone Signs
Existing
Planned

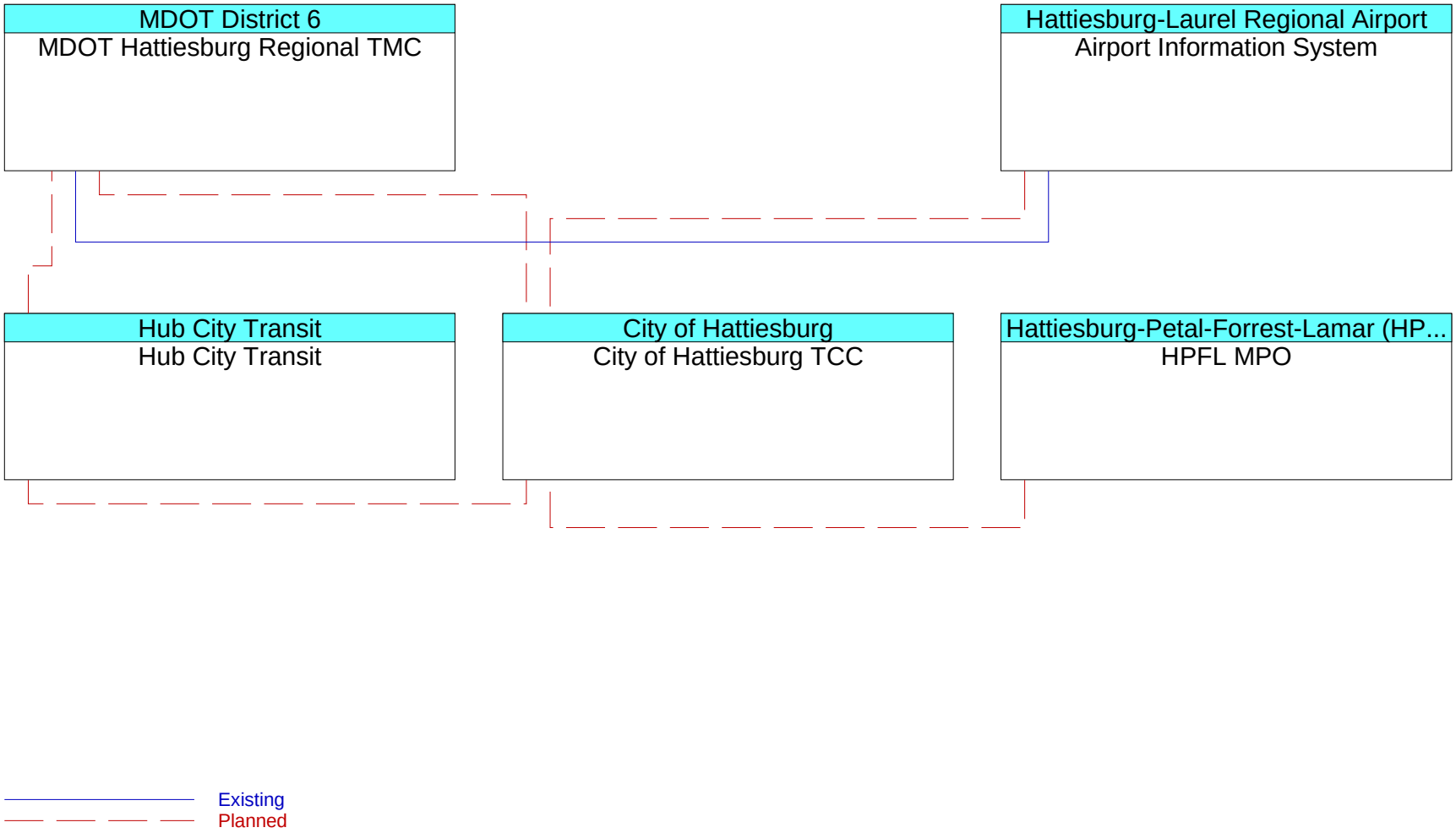
Hattiesburg Region Intelligent Transportation System Architecture

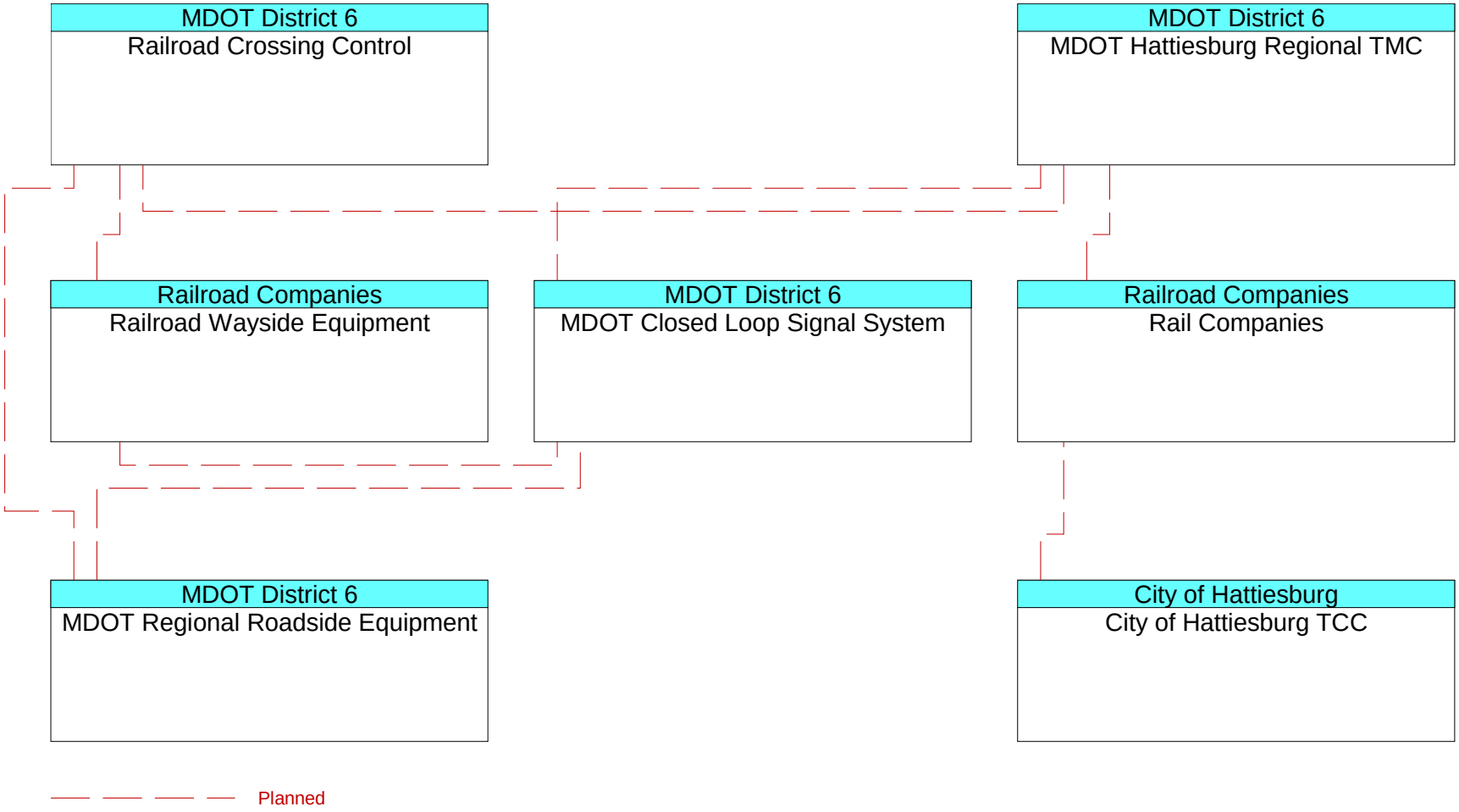


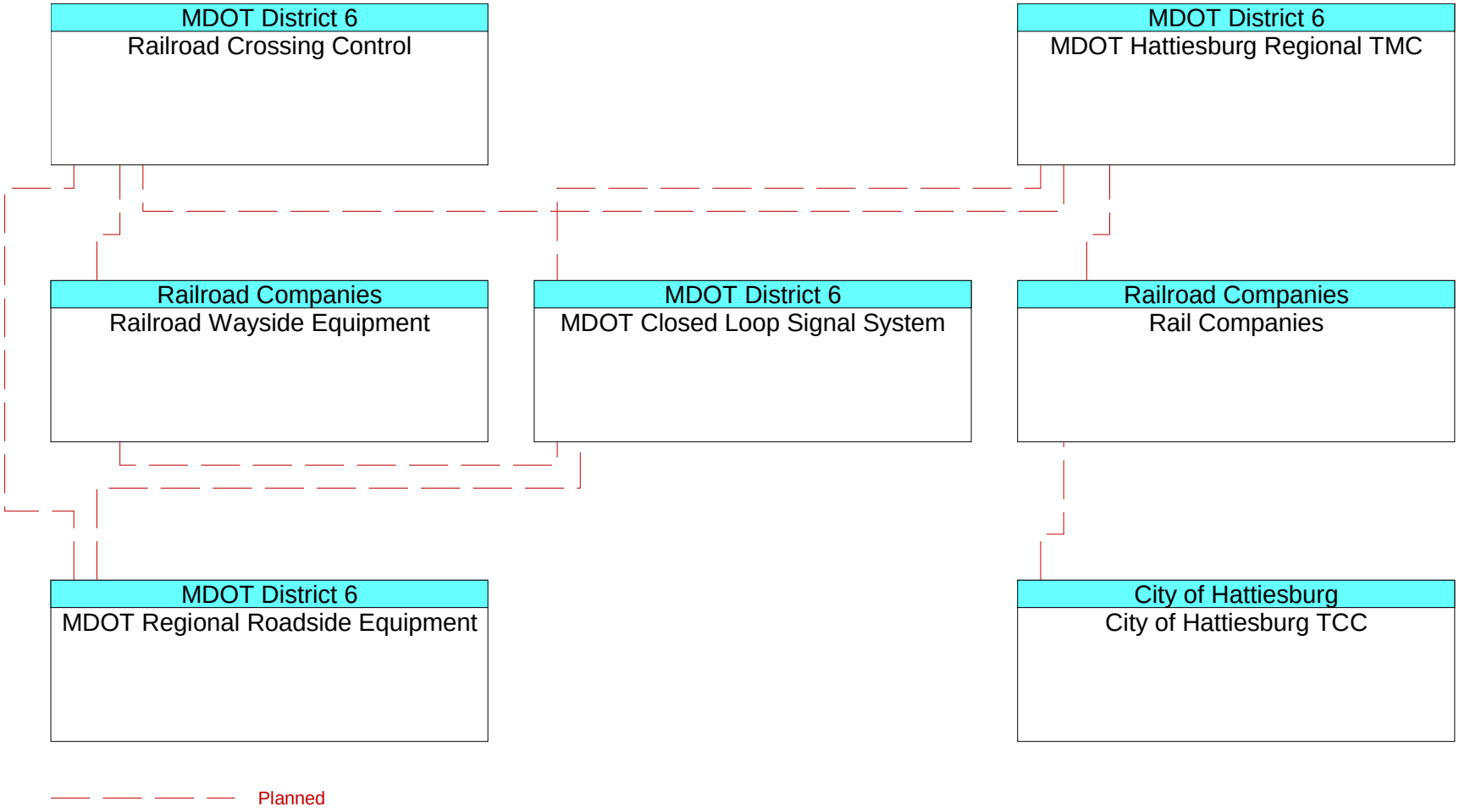

City of Hattiesburg
City of Hattiesburg TCC
City of Hattiesburg
City of Hattiesburg Public Services
MDOT
Statewide TMC
MDOT District 6
MDOT Hattiesburg Regional TMC
MDOT District 6
MDOT Regional Roadside Equipment
City of Hattiesburg
City of Hattiesburg TCC Roadside Equipment
Planned

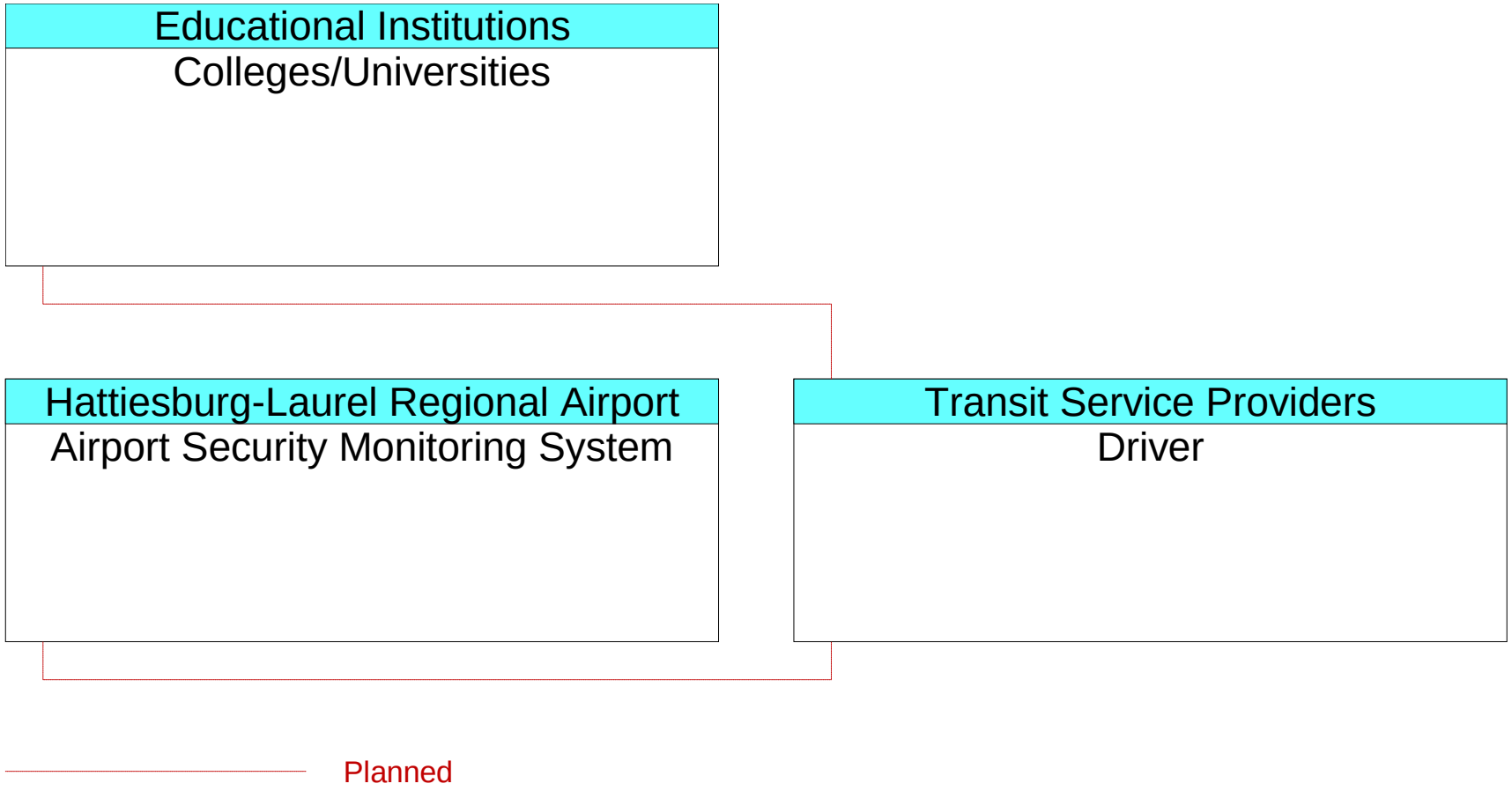
Hattiesburg Region Intelligent Transportation System Architecture

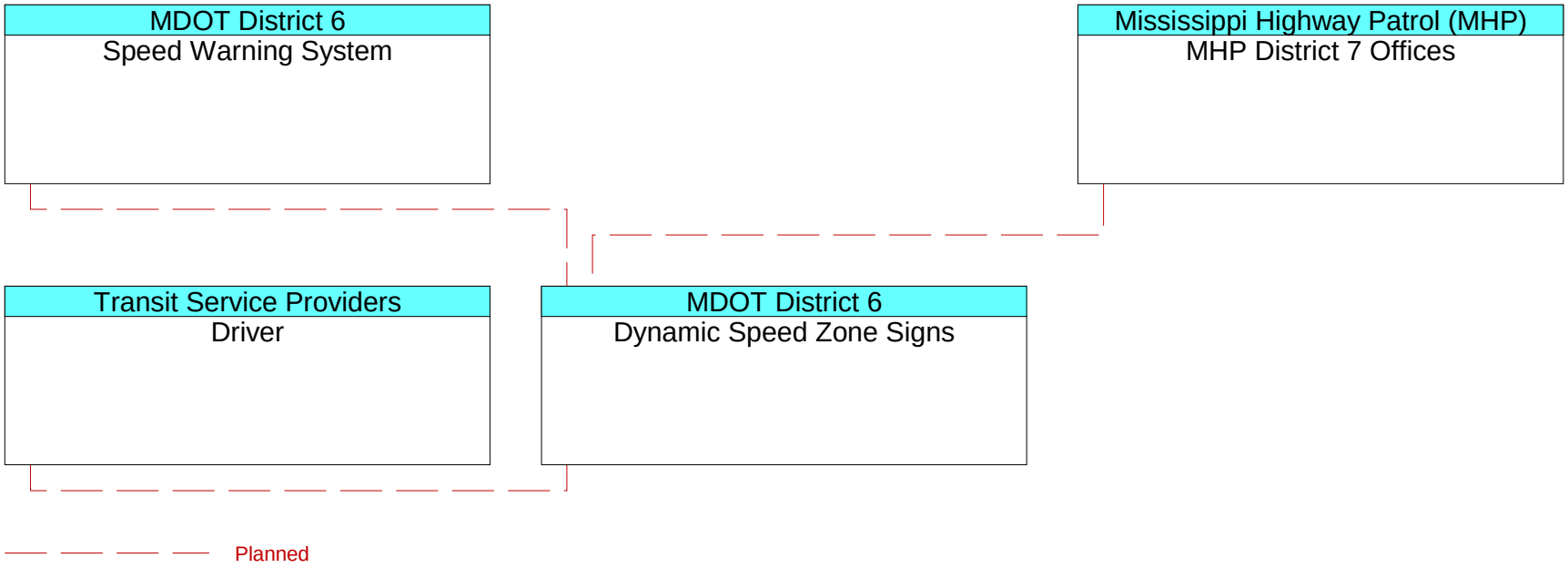



MDOT District 6
MDOT Hattiesburg Regional TMC
Hattiesburg-Laurel Regional Airport
Airport Information System
Hub City Transit
Hub City Transit
City of Hattiesburg
City of Hattiesburg TCC
Hattiesburg-Petal-Forrest-Lamar (HP...
HPFL MPO
Existing
Planned

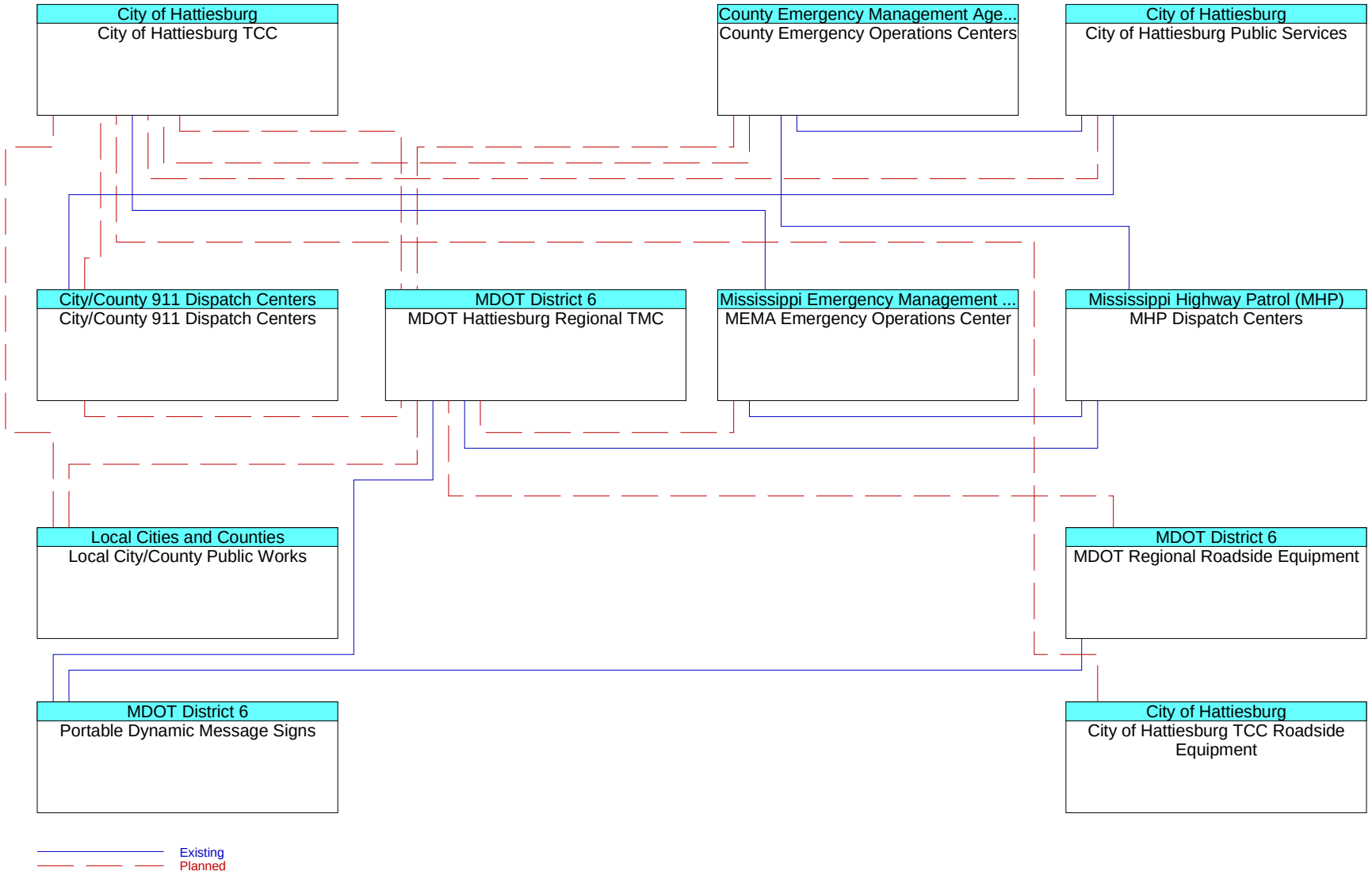

MDOT District 6
Railroad Crossing Control
MDOT District 6
MDOT Hattiesburg Regional TMC
Railroad Companies
Railroad Wayside Equipment
MDOT District 6
MDOT Closed Loop Signal System
Railroad Companies
Rail Companies
MDOT District 6
MDOT Regional Roadside Equipment
City of Hattiesburg
City of Hattiesburg TCC
Planned

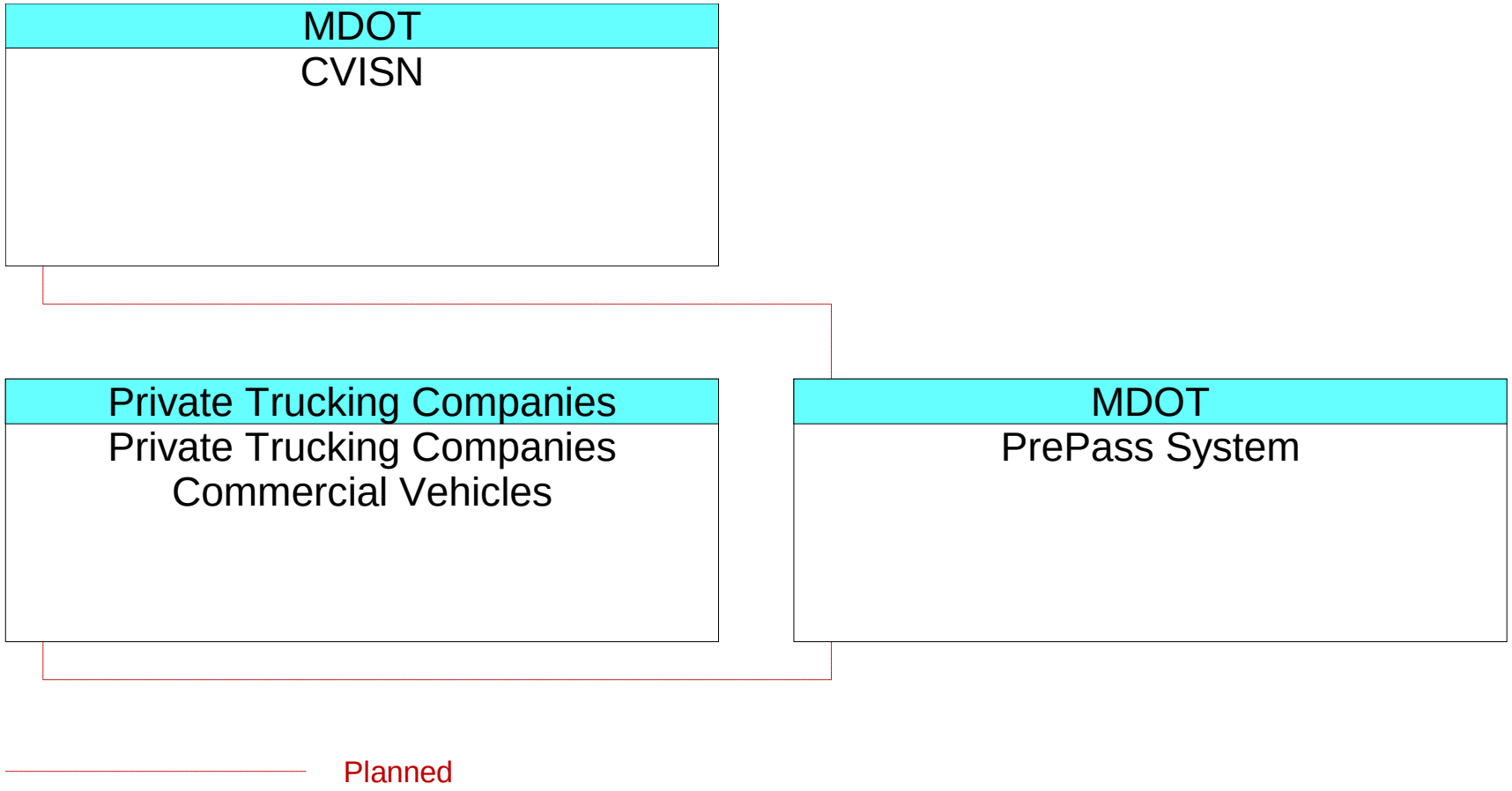

MDOT District 6
Railroad Crossing Control
MDOT District 6
MDOT Hattiesburg Regional TMC
Railroad Companies
Railroad Wayside Equipment
MDOT District 6
MDOT Closed Loop Signal System
Railroad Companies
Rail Companies
MDOT District 6
MDOT Regional Roadside Equipment
City of Hattiesburg
City of Hattiesburg TCC
Planned

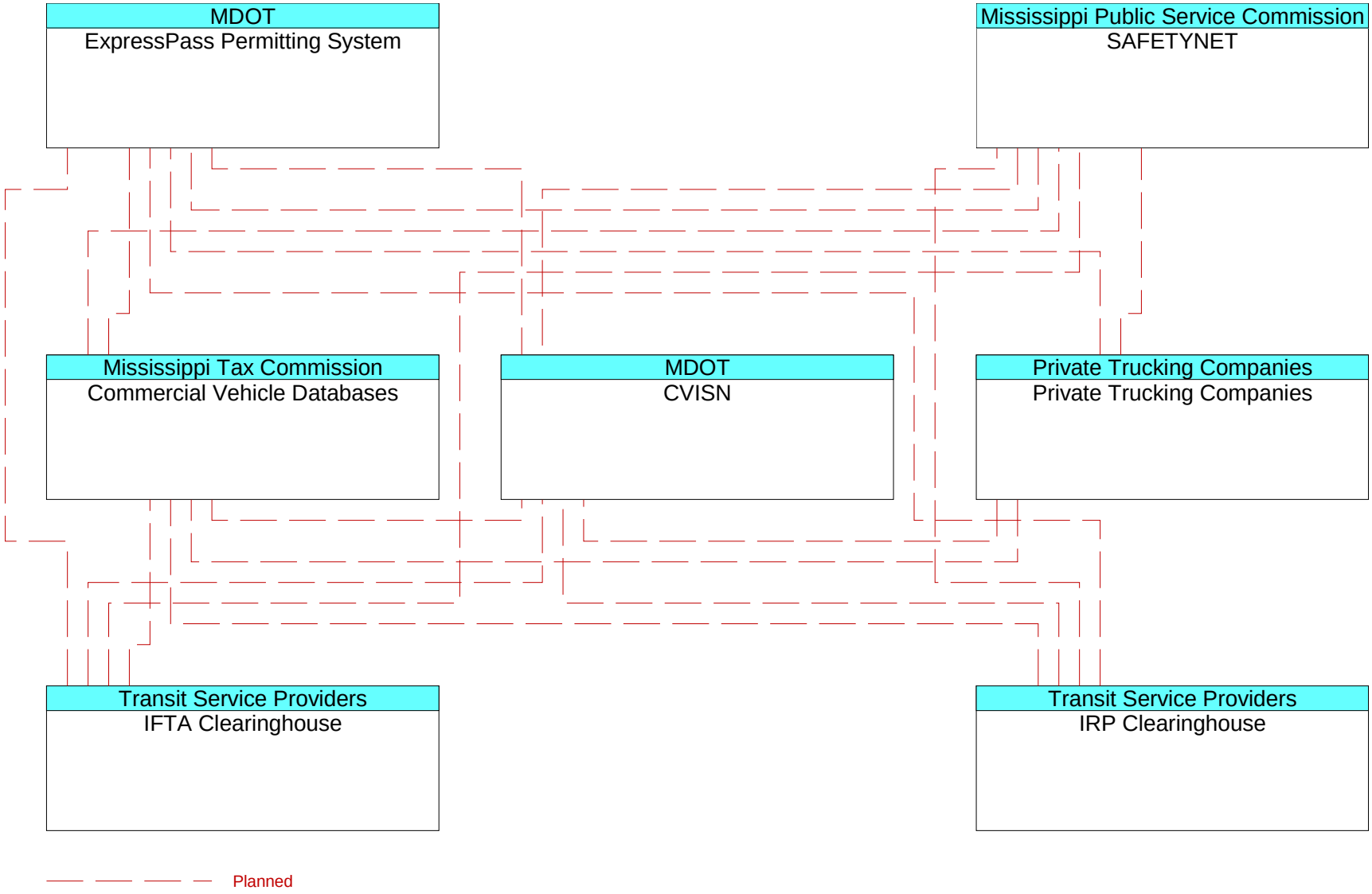

Educational Institutions
Colleges/Universities
Hattiesburg-Laurel Regional Airport
Airport Security Monitoring System
Transit Service Providers
Driver
Planned

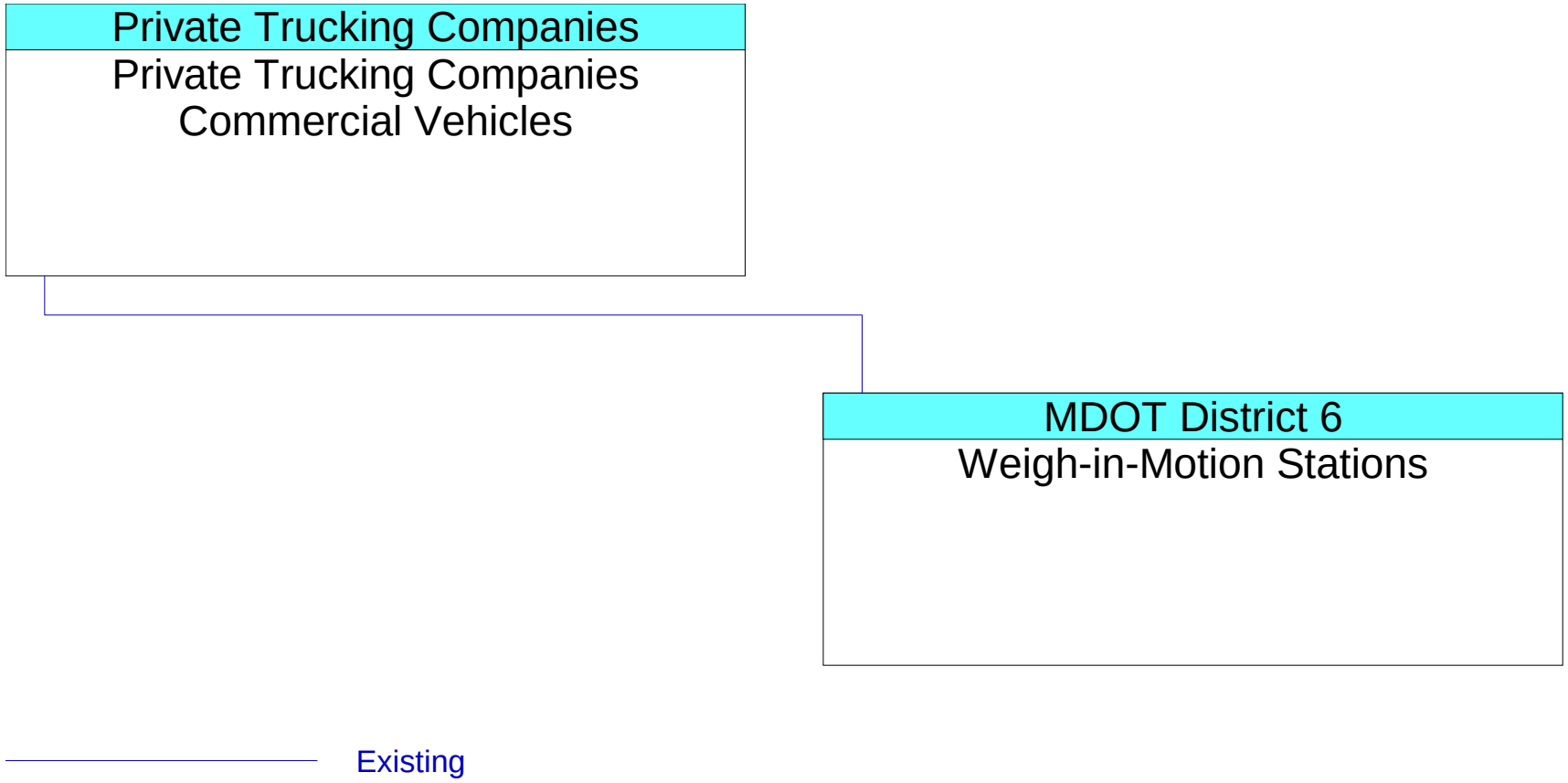

MDOT District 6
Speed Warning System
Mississippi Highway Patrol (MHP)
MHP District 7 Offices
Transit Service Providers
Driver
MDOT District 6
Dynamic Speed Zone Signs
Planned

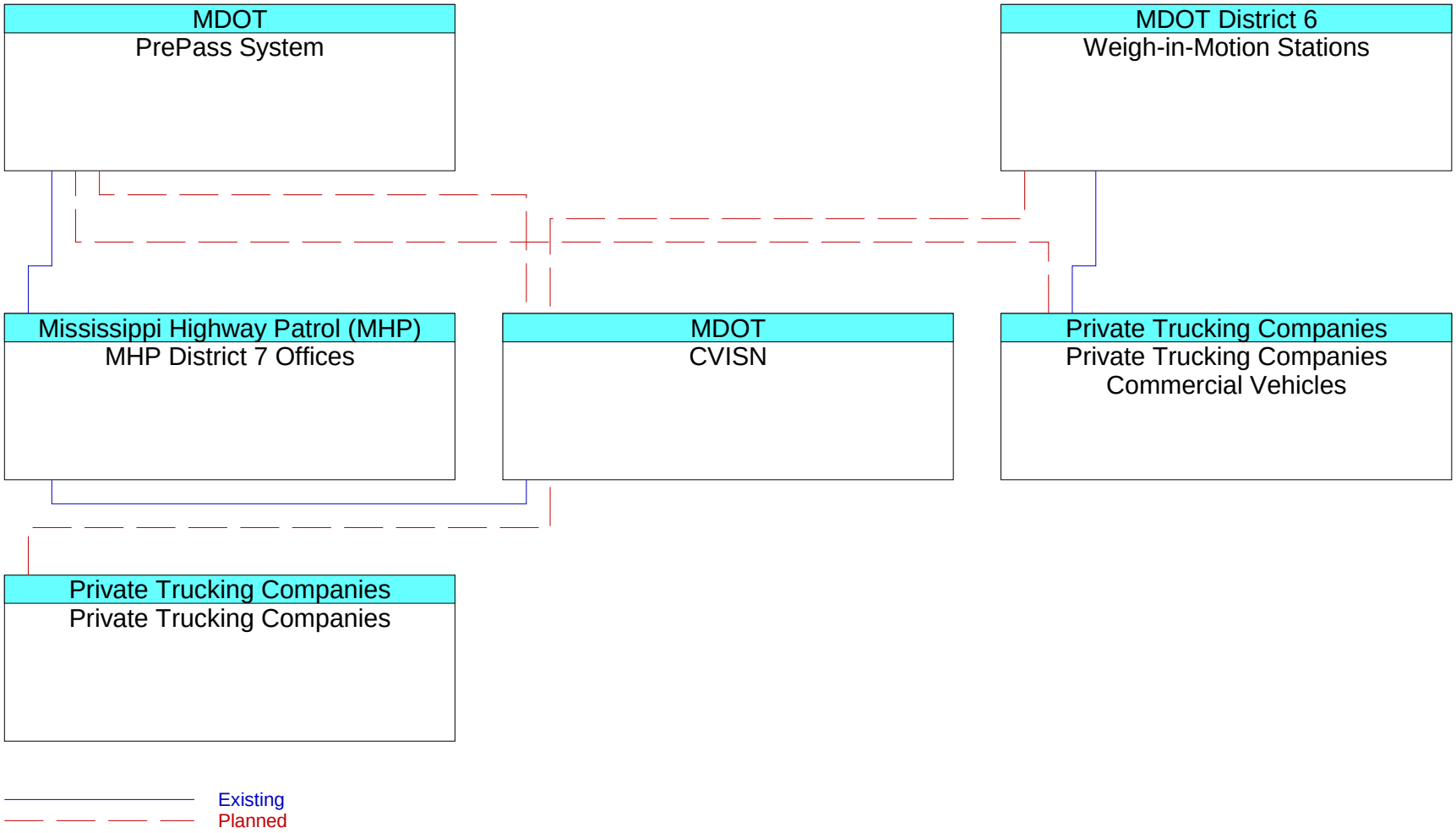
Hattiesburg Region Intelligent Transportation System Architecture

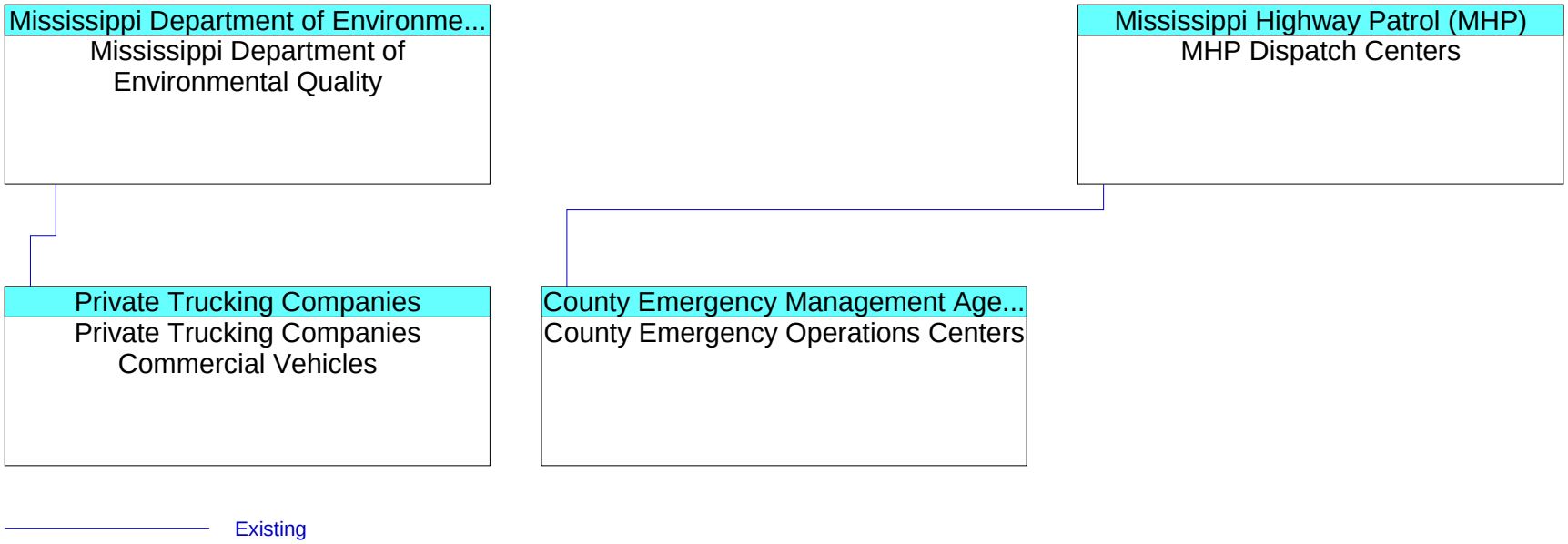



MDOT
CVISN
Private Trucking Companies
Private Trucking Companies
Commercial Vehicles
MDOT
PrePass System
Planned

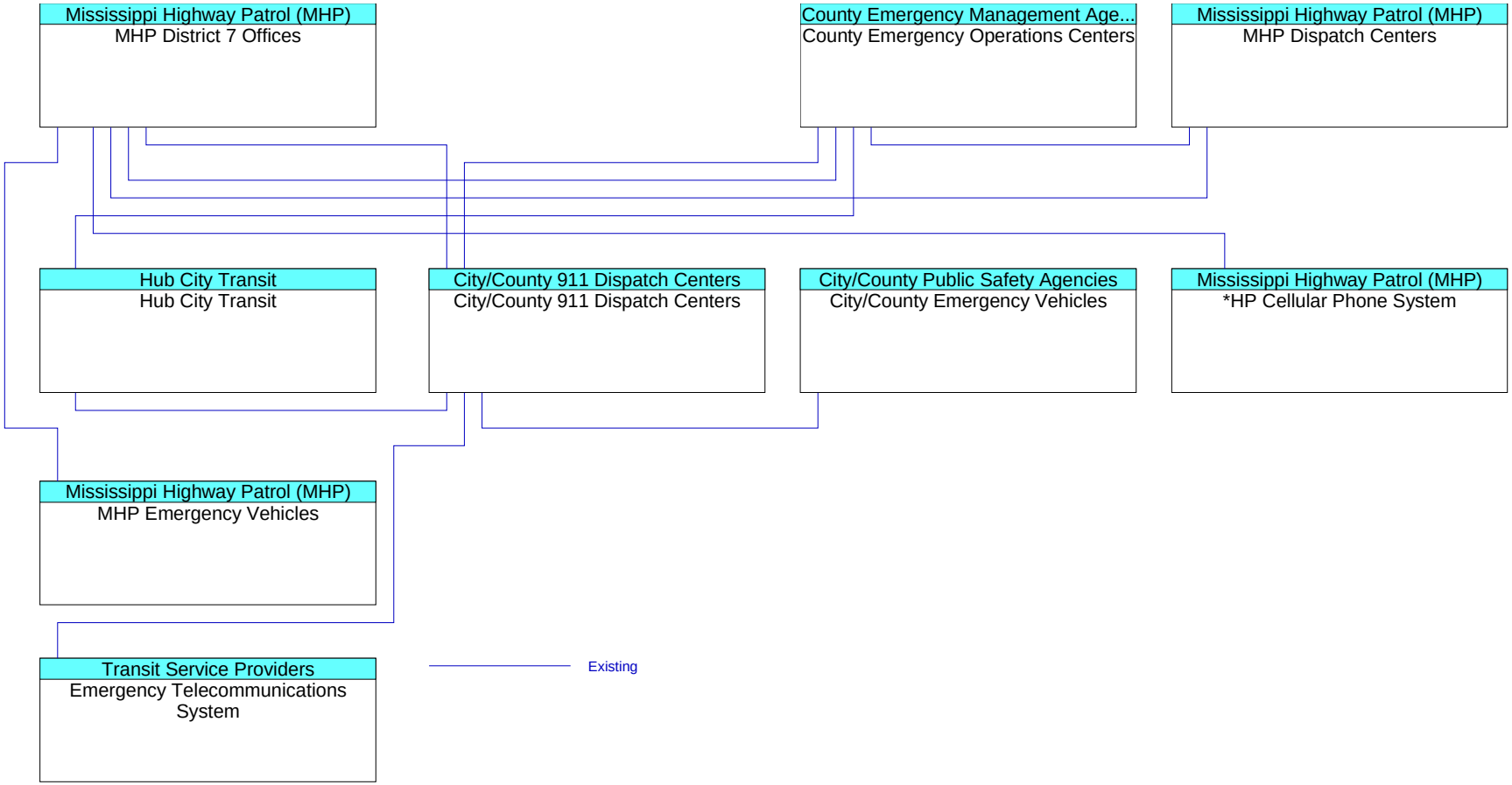

MDOT
ExpressPass Permitting System
Mississippi Public Service Commission
SAFETYNET
Mississippi Tax Commission
Commercial Vehicle Databases
MDOT
CVISN
Private Trucking Companies
Private Trucking Companies
Transit Service Providers
IFTA Clearinghouse
Transit Service Providers
IRP Clearinghouse
Planned

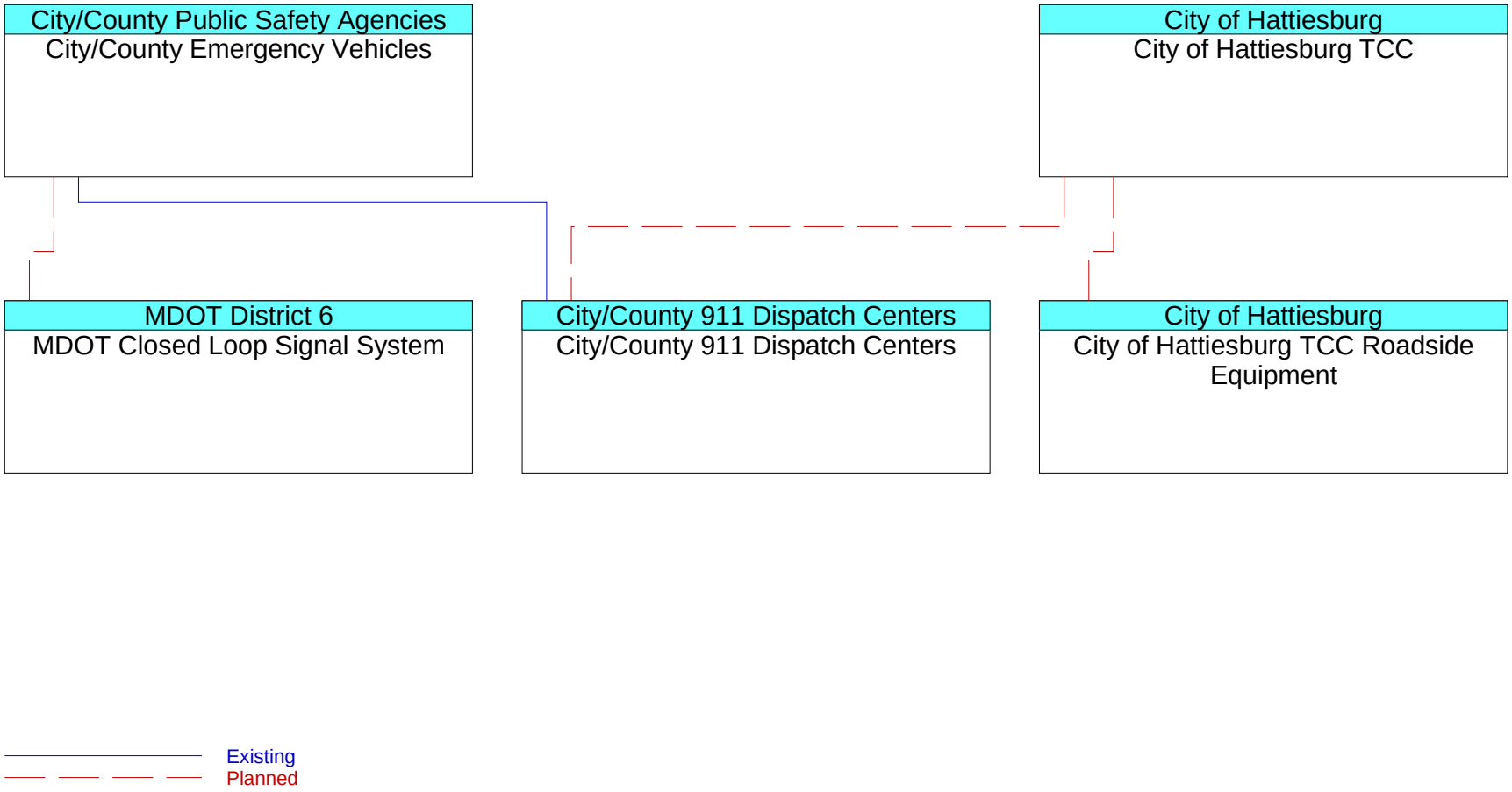

Private Trucking Companies
Private Trucking Companies
Commercial Vehicles
MDOT District 6
Weigh-in-Motion Stations
Existing

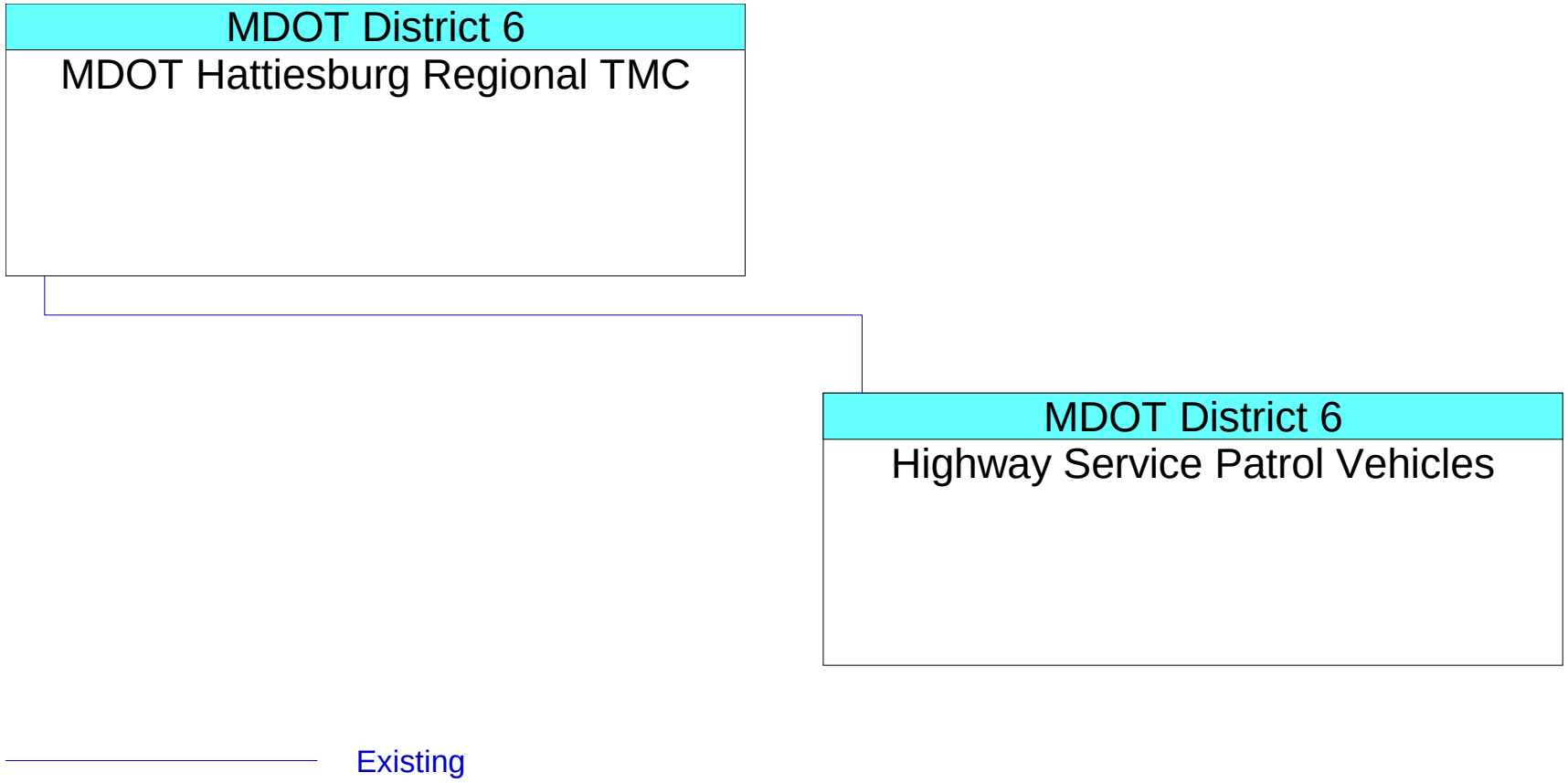

MDOT
PrePass System
MDOT District 6
Weigh-in-Motion Stations
Mississippi Highway Patrol (MHP)
MHP District 7 Offices
MDOT
CVISN
Private Trucking Companies
Private Trucking Companies
Commercial Vehicles
Private Trucking Companies
Private Trucking Companies
Existing
Planned


Mississippi Department of Environme...
Mississippi Department of Environmental Quality
Mississippi Highway Patrol (MHP)
MHP Dispatch Centers
Private Trucking Companies
Private Trucking Companies Commercial Vehicles
County Emergency Management Age...
County Emergency Operations Centers
Existing

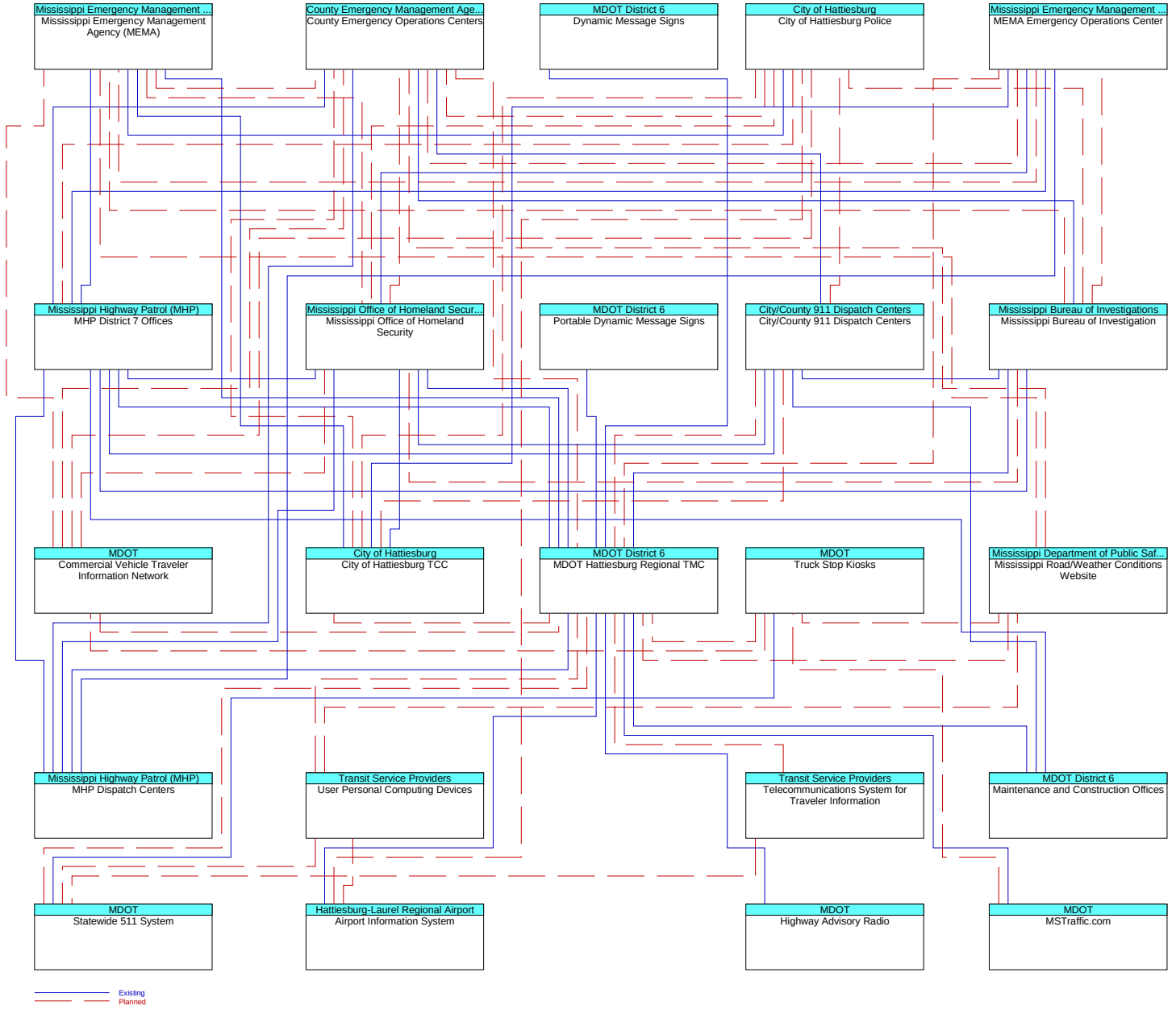
Hattiesburg Region Intelligent Transportation System Architecture



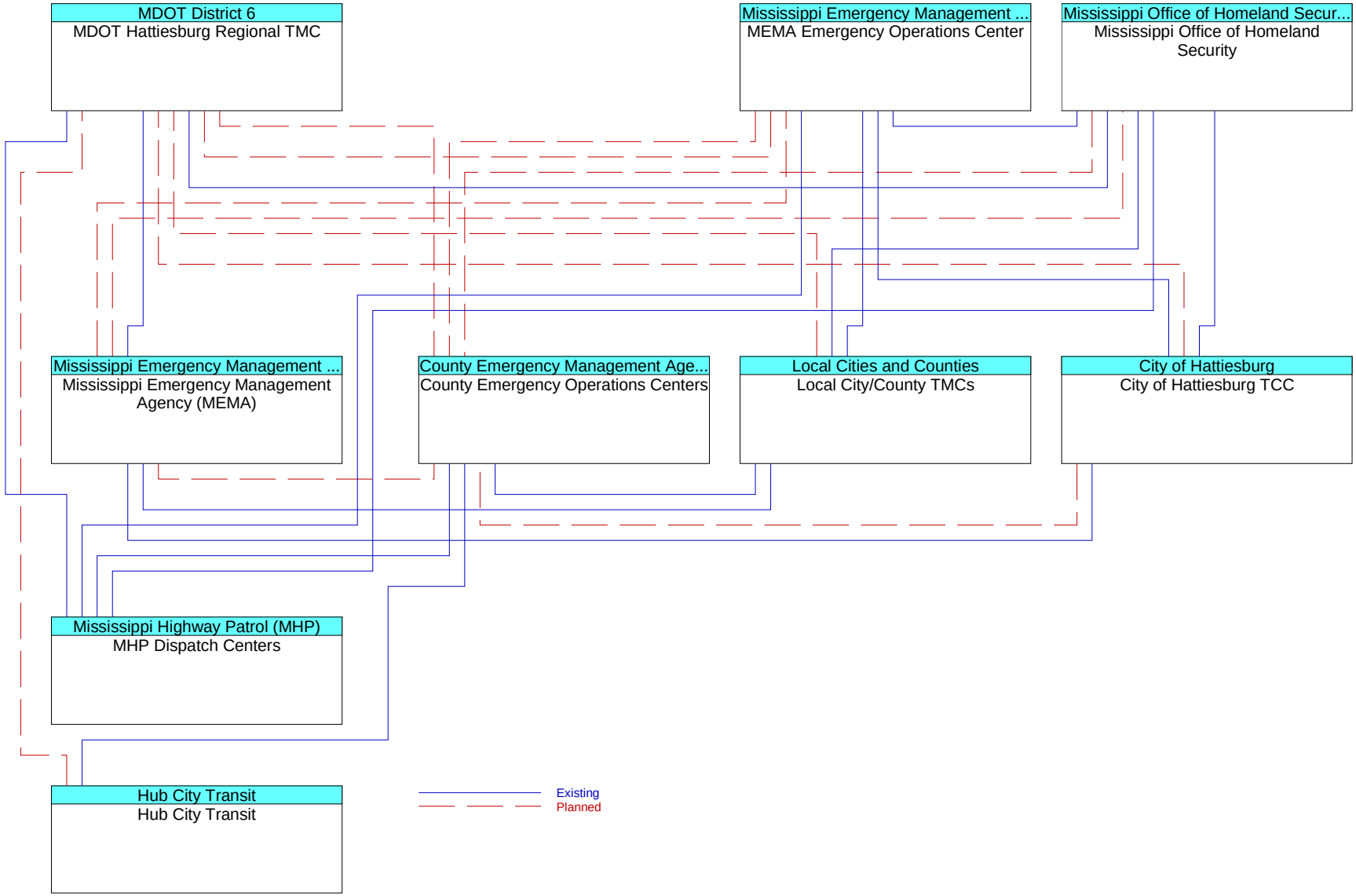

City/County Public Safety Agencies
City/County Emergency Vehicles
City of Hattiesburg
City of Hattiesburg TCC
MDOT District 6
MDOT Closed Loop Signal System
City/County 911 Dispatch Centers
City/County 911 Dispatch Centers
City of Hattiesburg
City of Hattiesburg TCC Roadside Equipment
Existing
Planned


MDOT District 6
MDOT Hattiesburg Regional TMC
MDOT District 6
Highway Service Patrol Vehicles
Existing

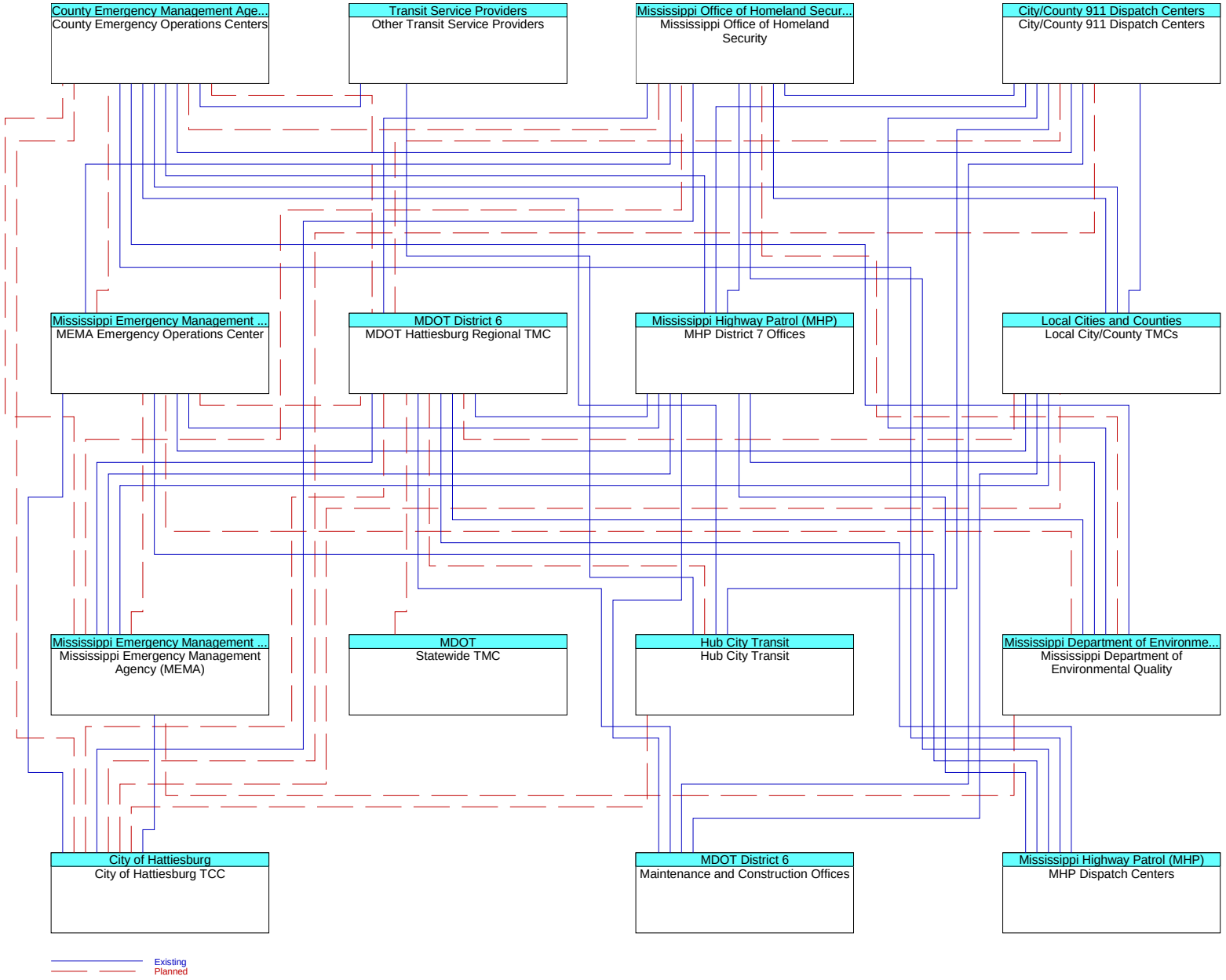
Hattiesburg Region Intelligent Transportation System Architecture



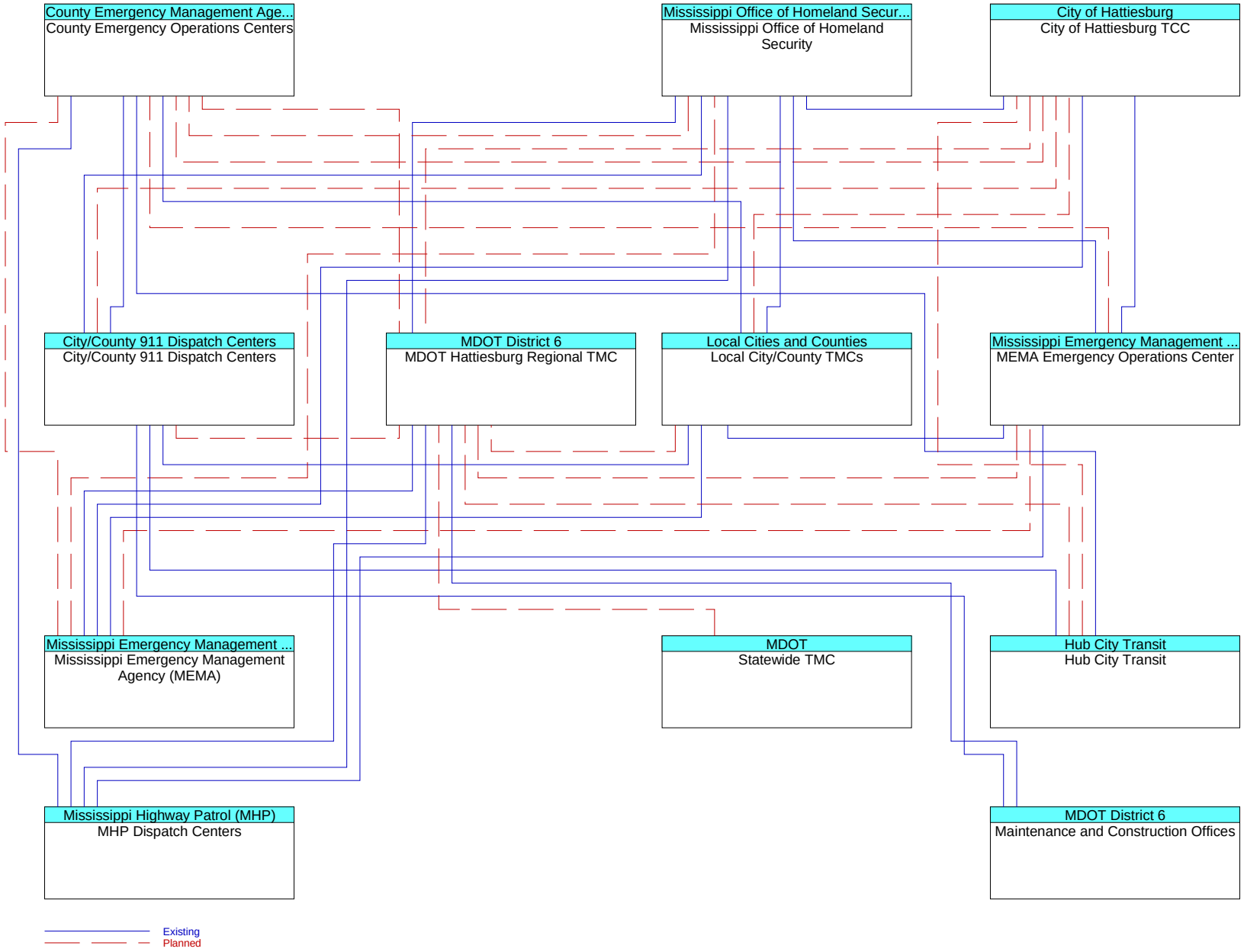
Hattiesburg Region Intelligent Transportation System Architecture



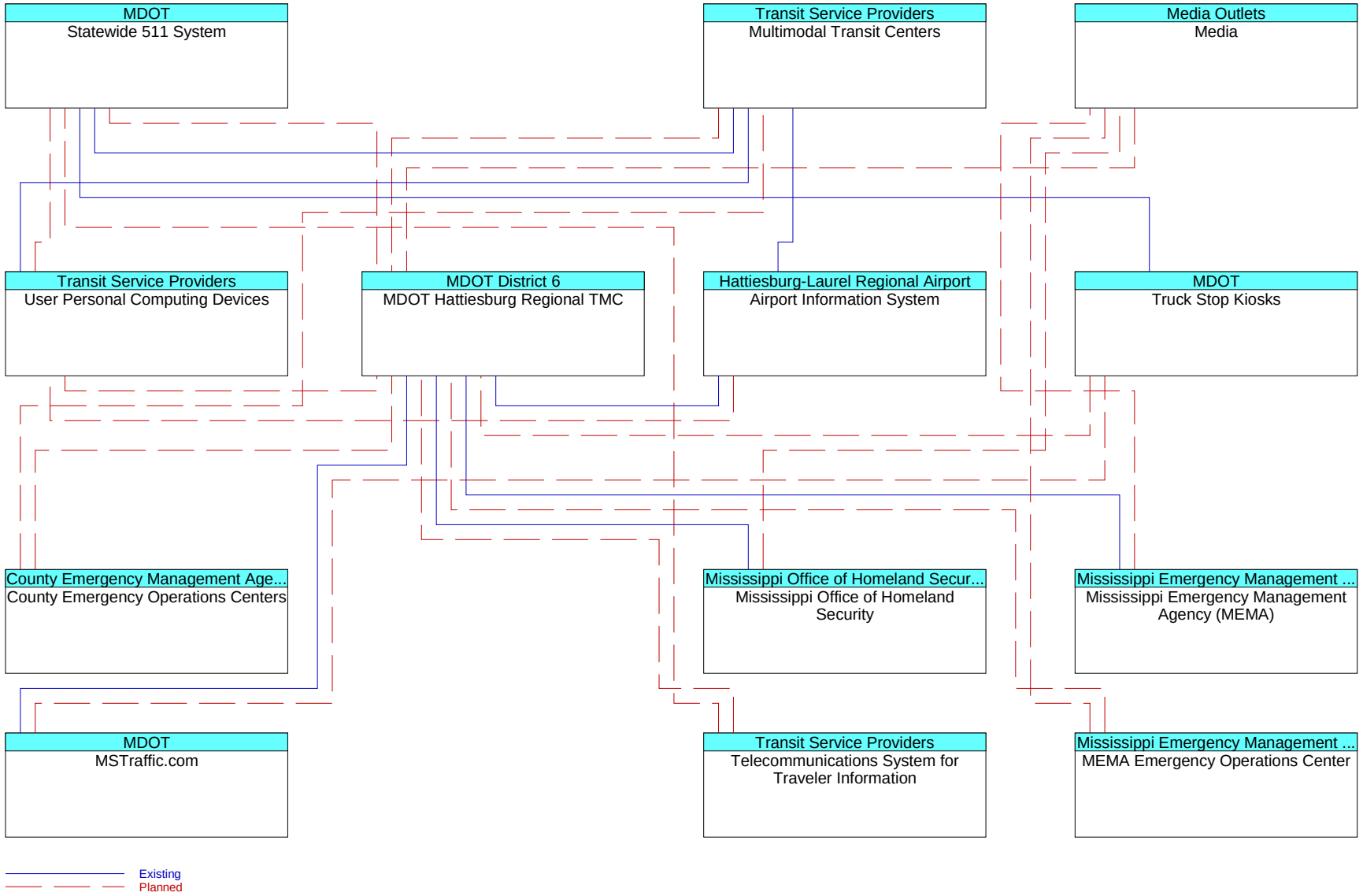
Hattiesburg Region Intelligent Transportation System Architecture

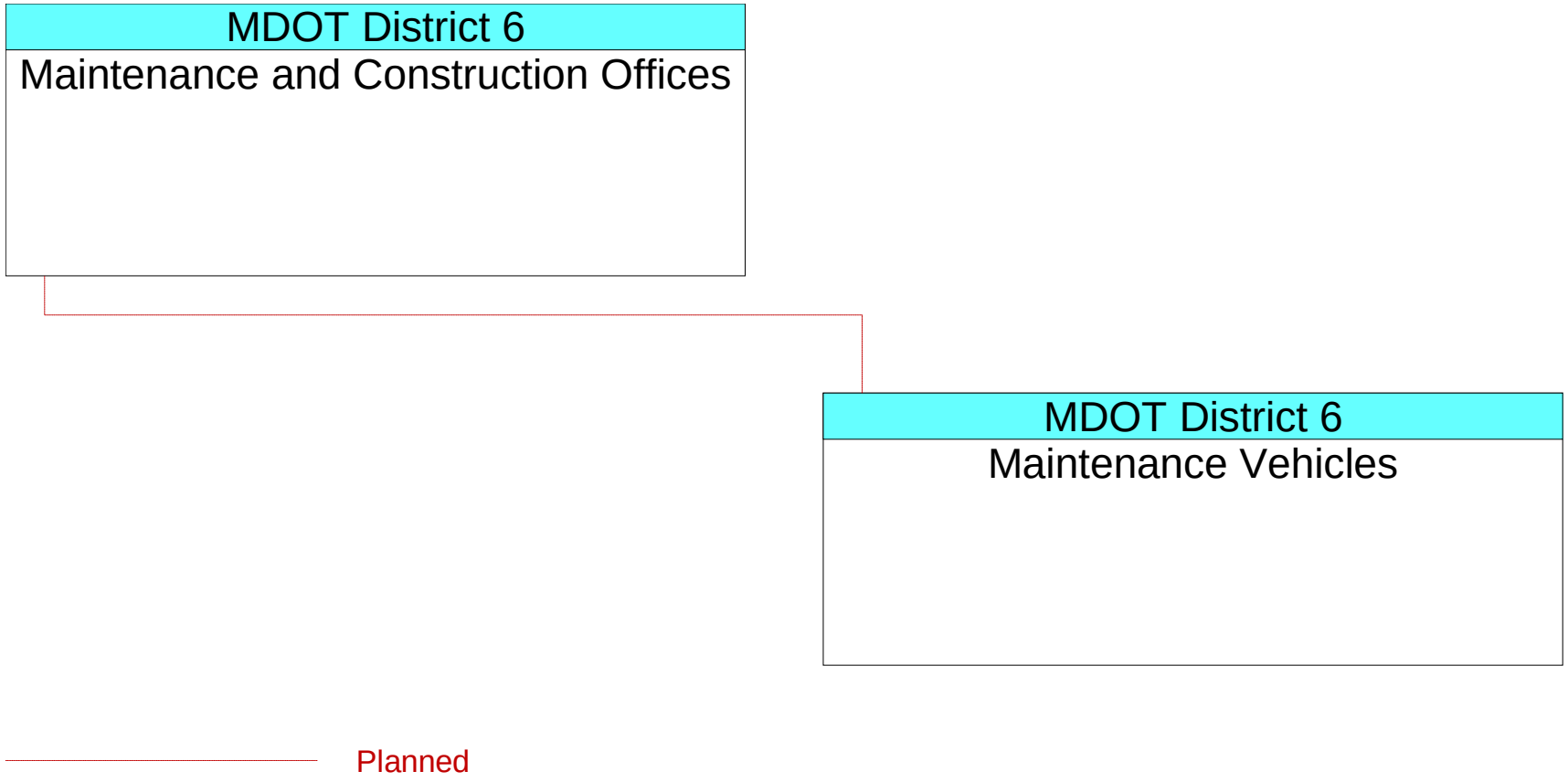


Hattiesburg Region Intelligent Transportation System Architecture

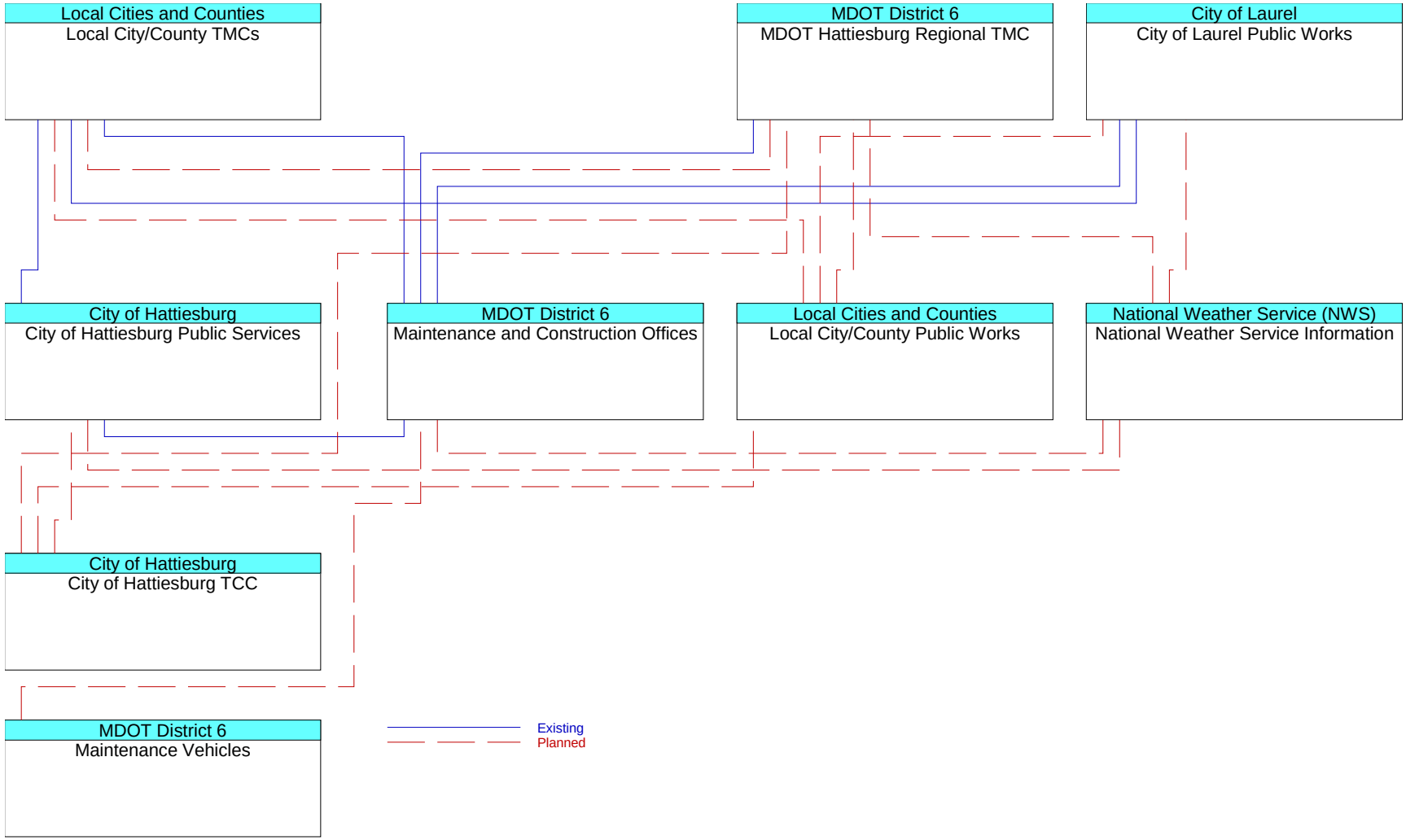


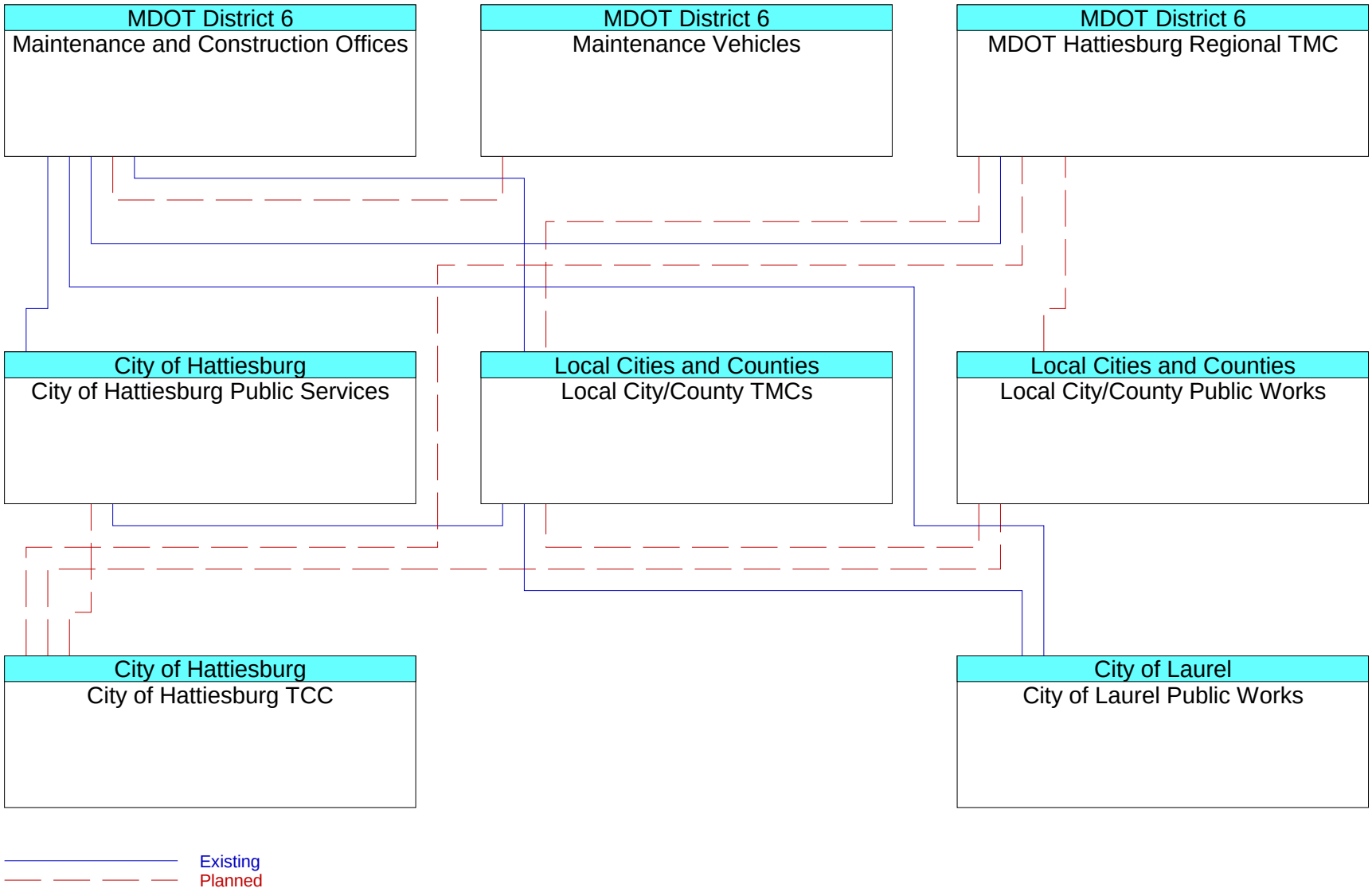
Hattiesburg Region Intelligent Transportation System Architecture



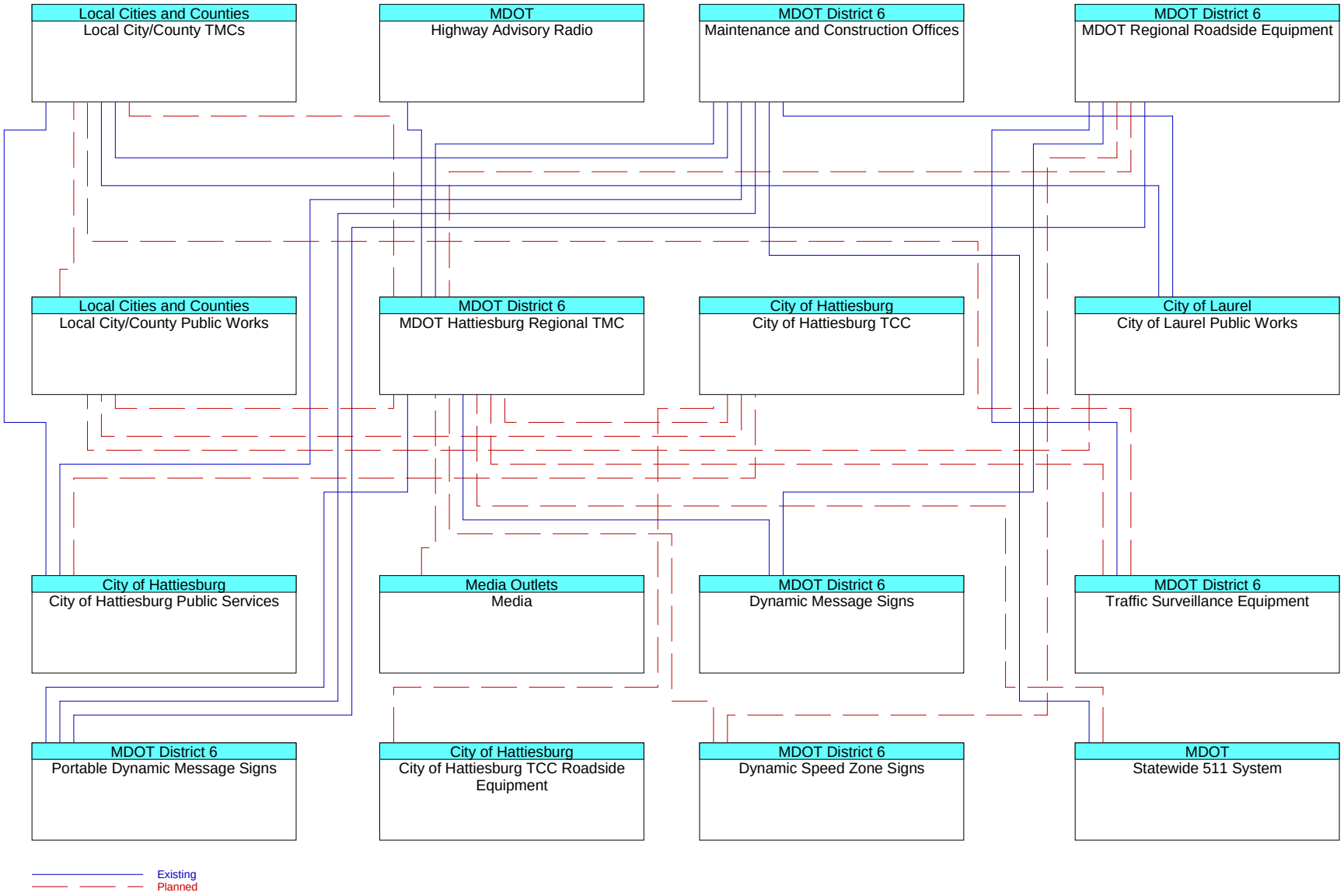

MDOT District 6
Maintenance and Construction Offices
MDOT District 6
Maintenance Vehicles
Planned

Hattiesburg Region Intelligent Transportation System Architecture

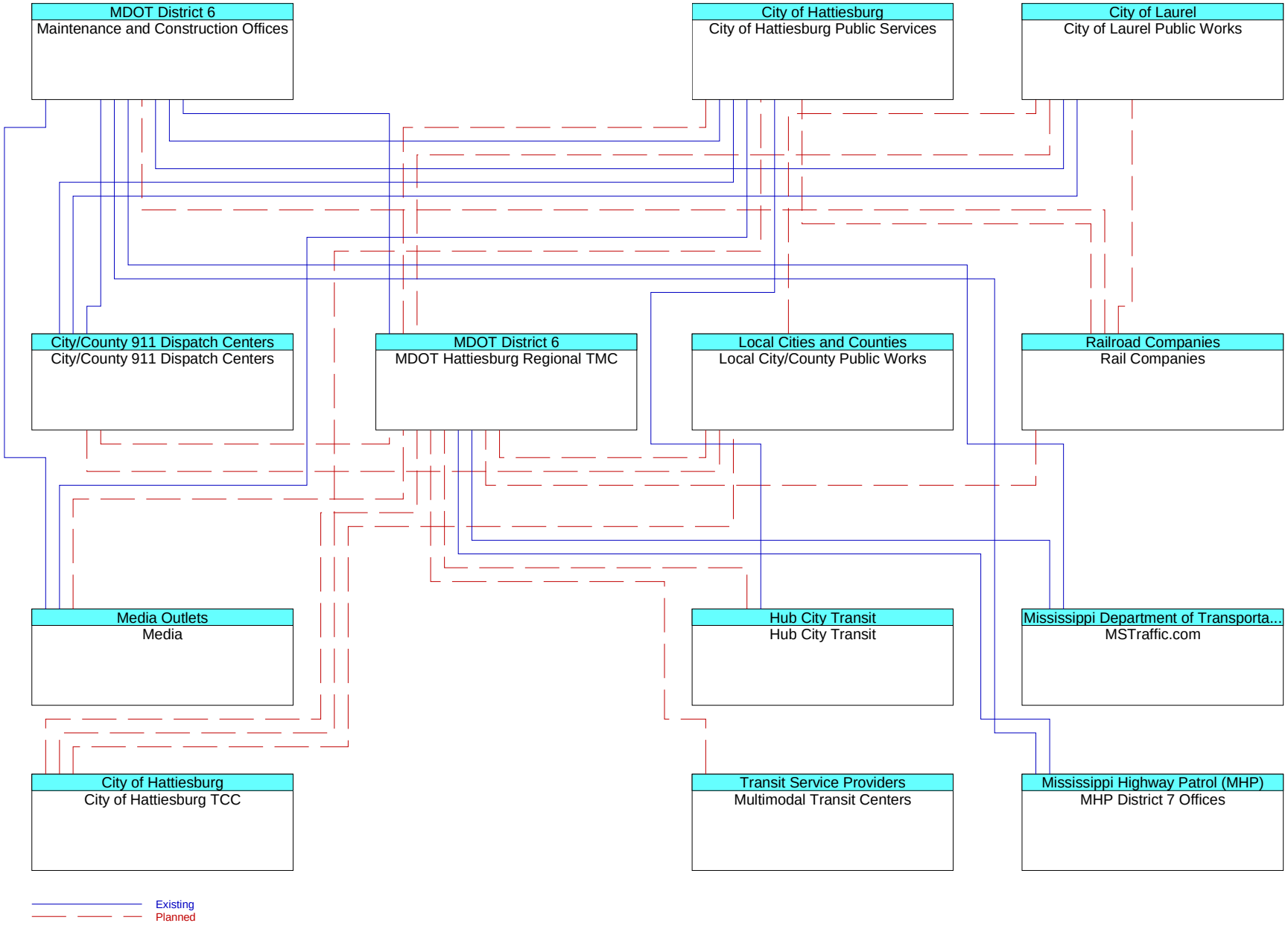



MDOT District 6
Maintenance and Construction Offices
MDOT District 6
Maintenance Vehicles
MDOT District 6
MDOT Hattiesburg Regional TMC
City of Hattiesburg
City of Hattiesburg Public Services
Local Cities and Counties
Local City/County TMCs
Local Cities and Counties
Local City/County Public Works
City of Hattiesburg
City of Hattiesburg TCC
City of Laurel
City of Laurel Public Works
Existing
Planned

Hattiesburg Region Intelligent Transportation System Architecture

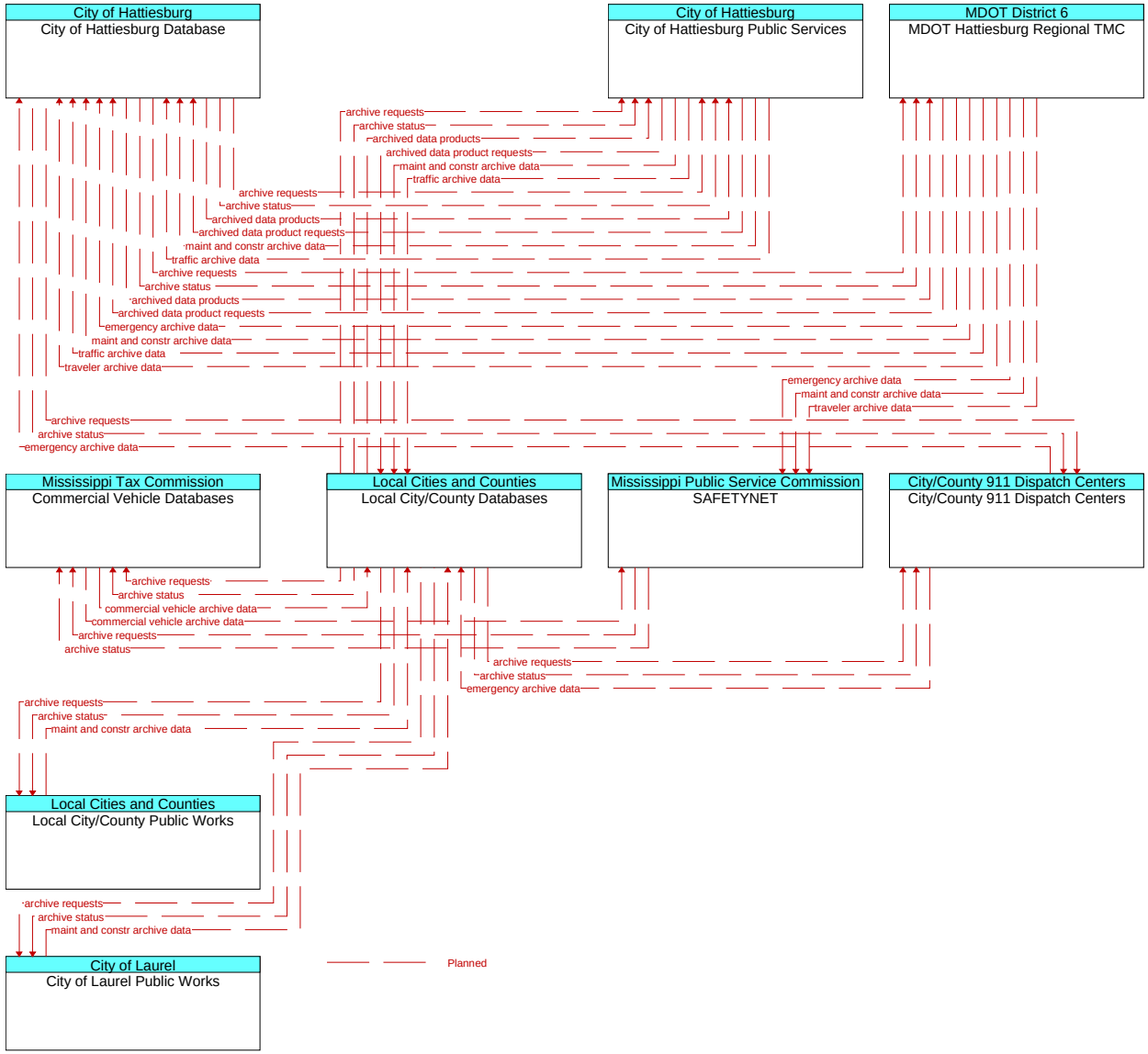


Hattiesburg Region Intelligent Transportation System Architecture

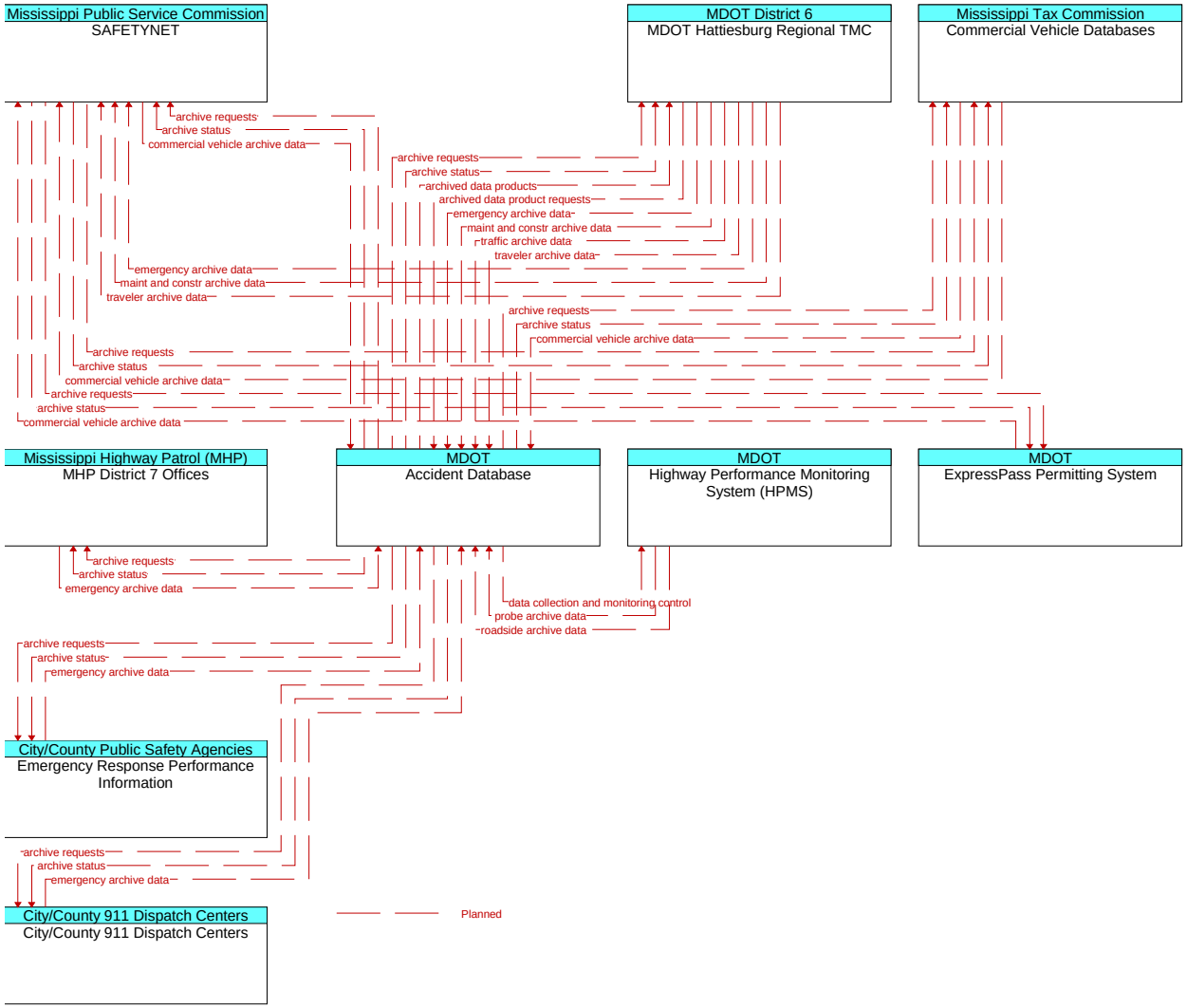


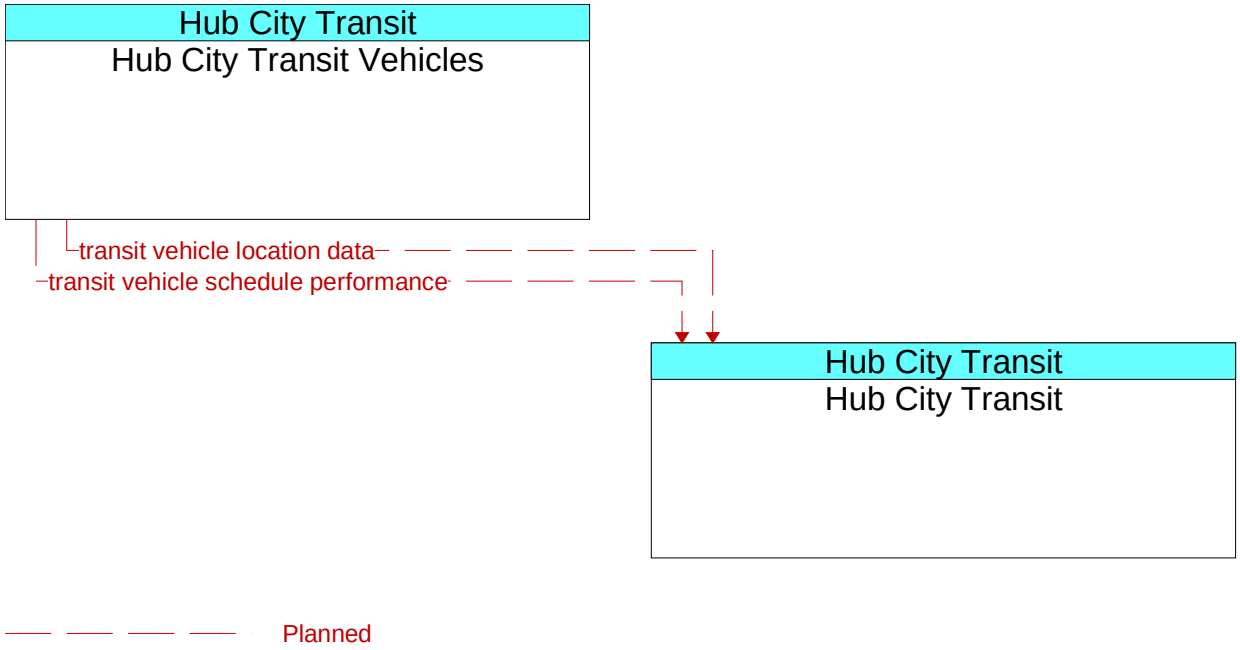
Appendix D: Architecture Flows

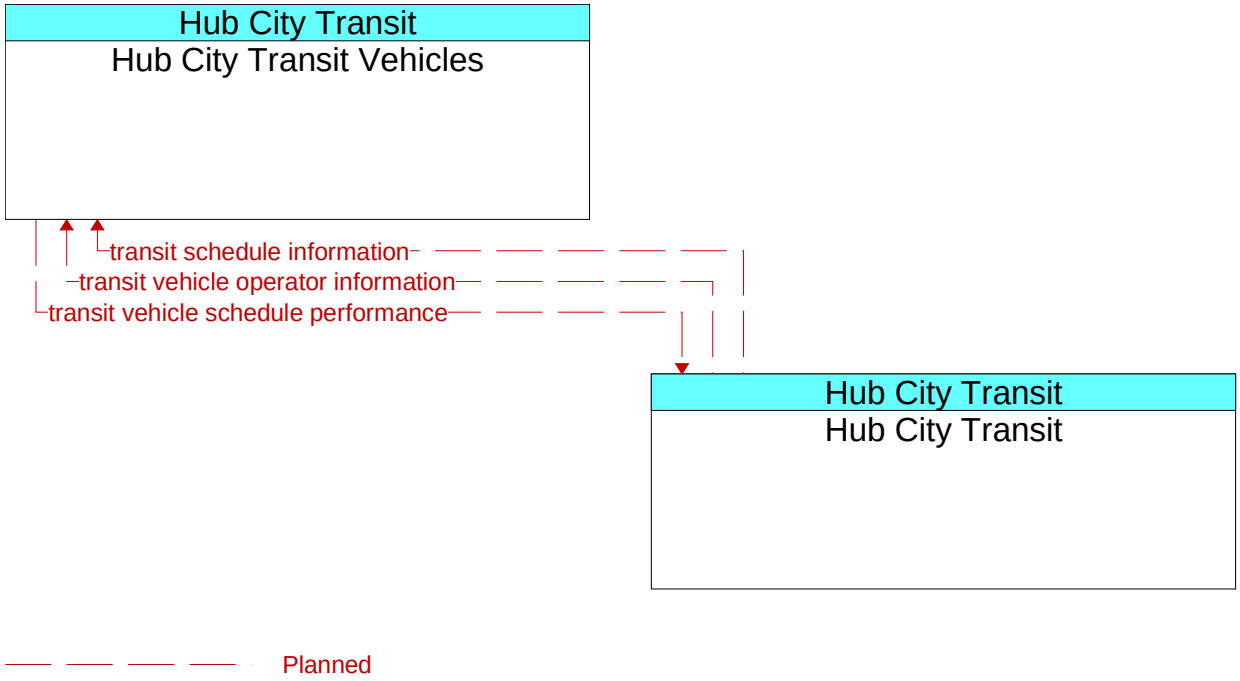
Hattiesburg Region Intelligent Transportation System Architecture

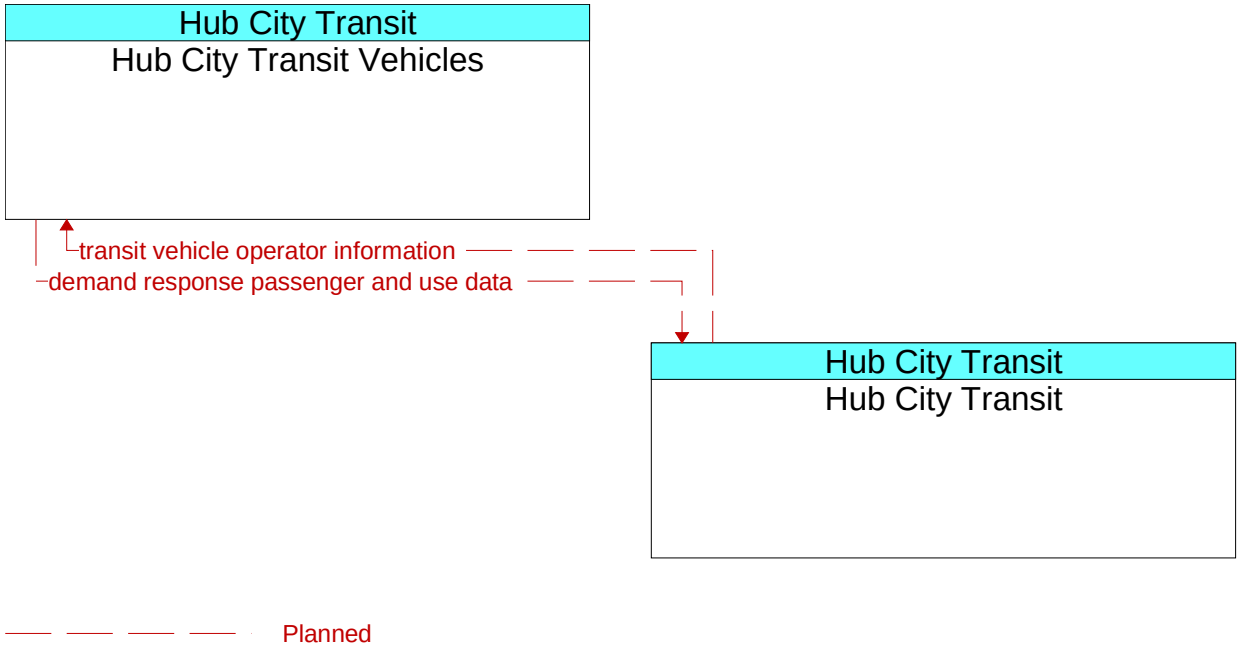


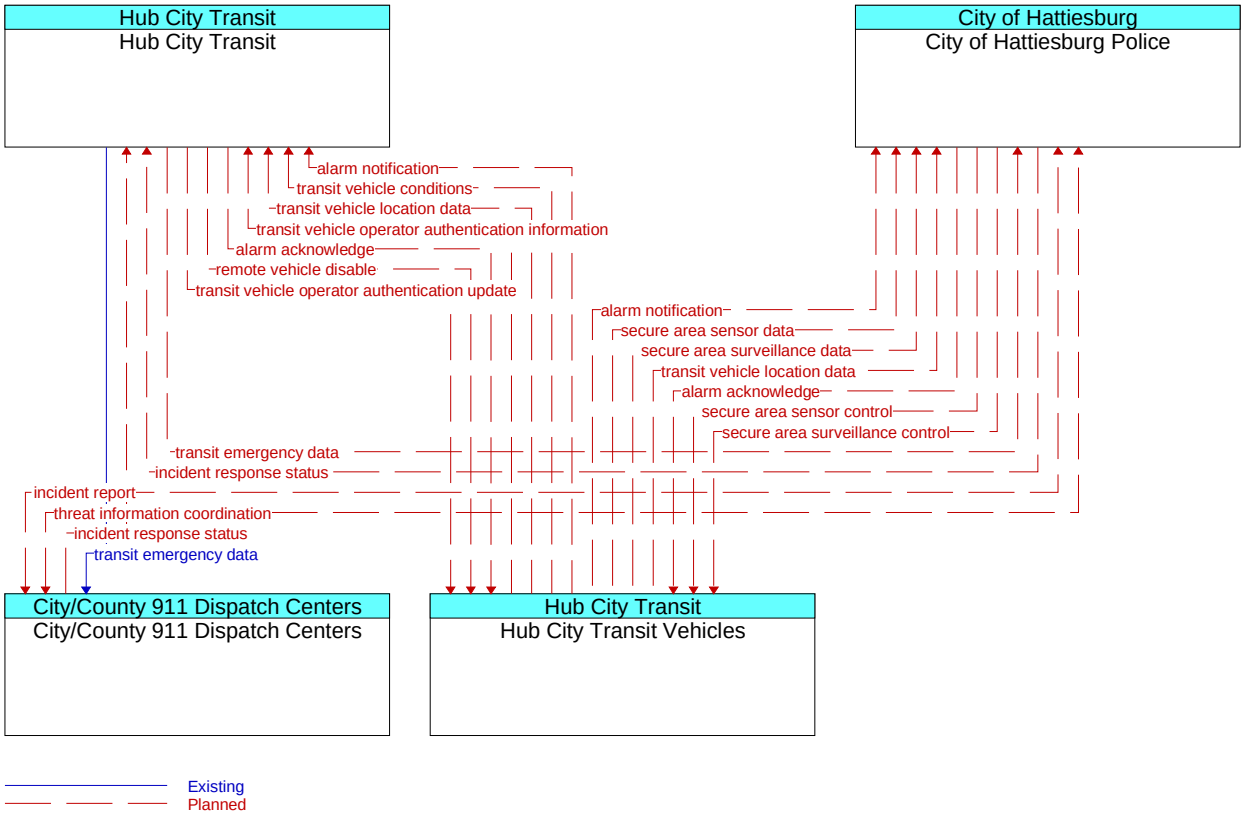
Hattiesburg Region Intelligent Transportation System Architecture

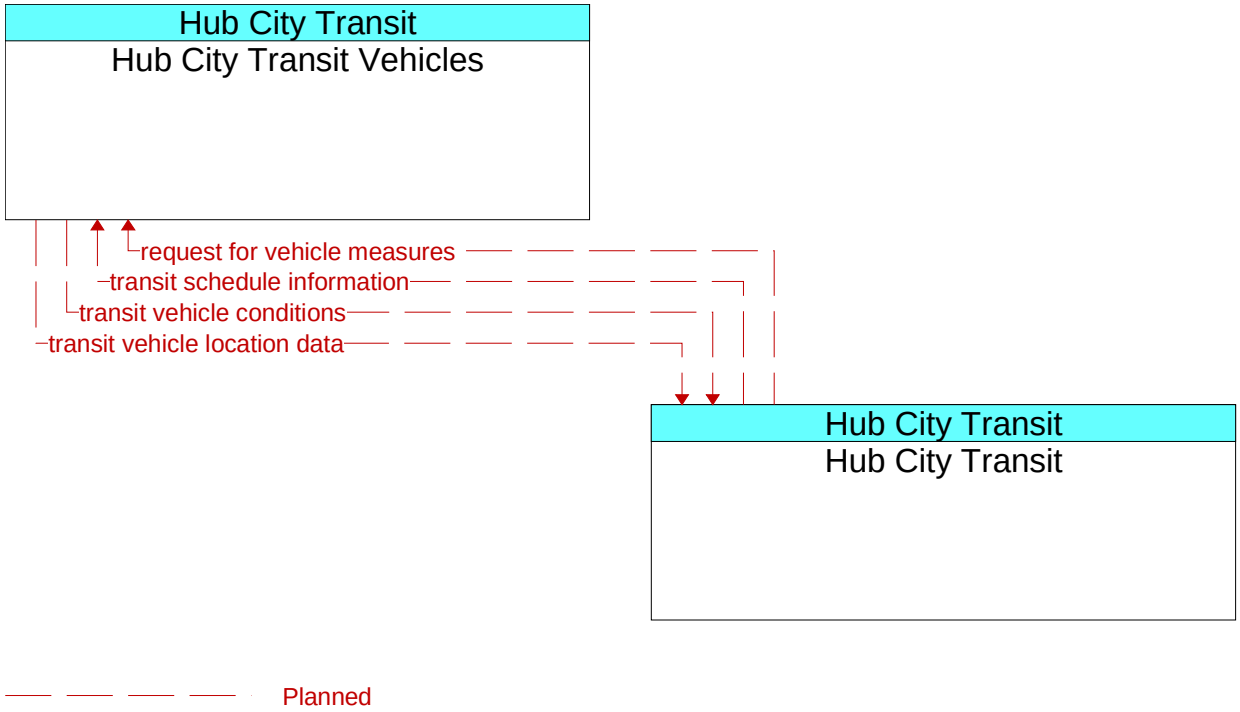


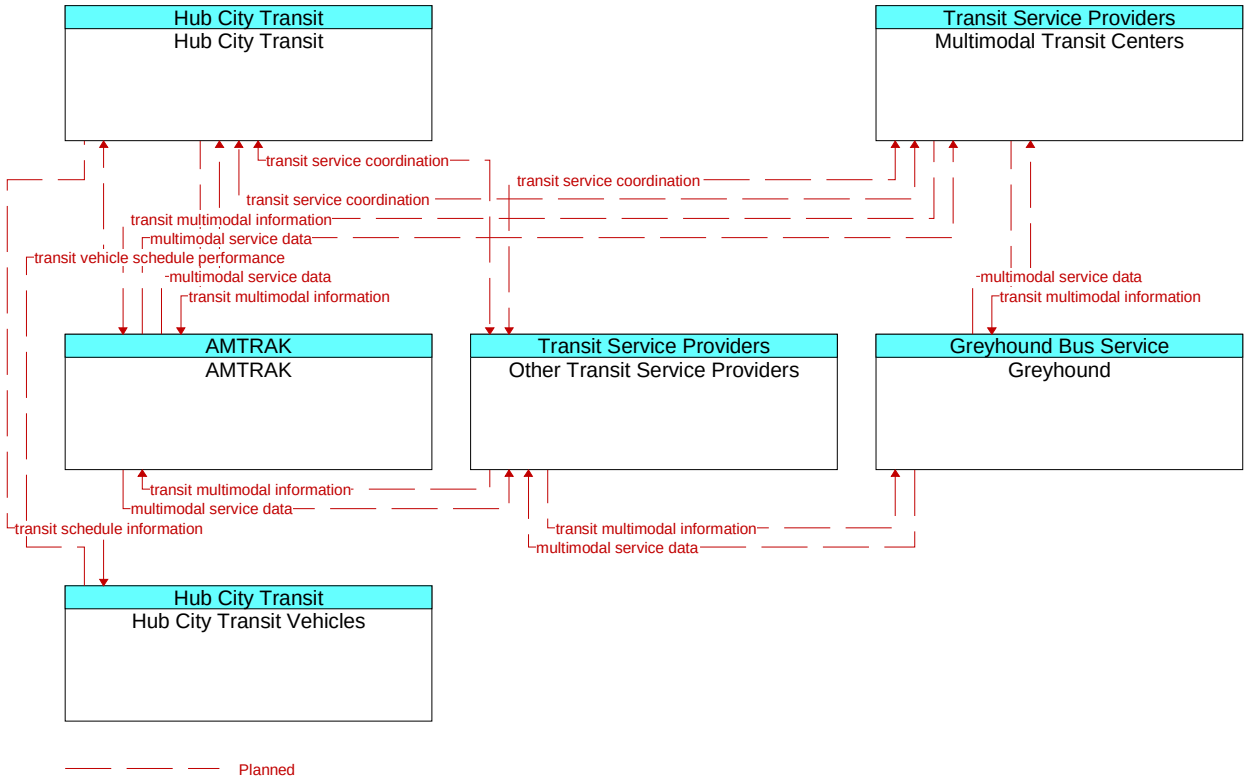

Hub City Transit
Hub City Transit Vehicles
transit vehicle location data
transit vehicle schedule performance
Hub City Transit
Hub City Transit
Planned

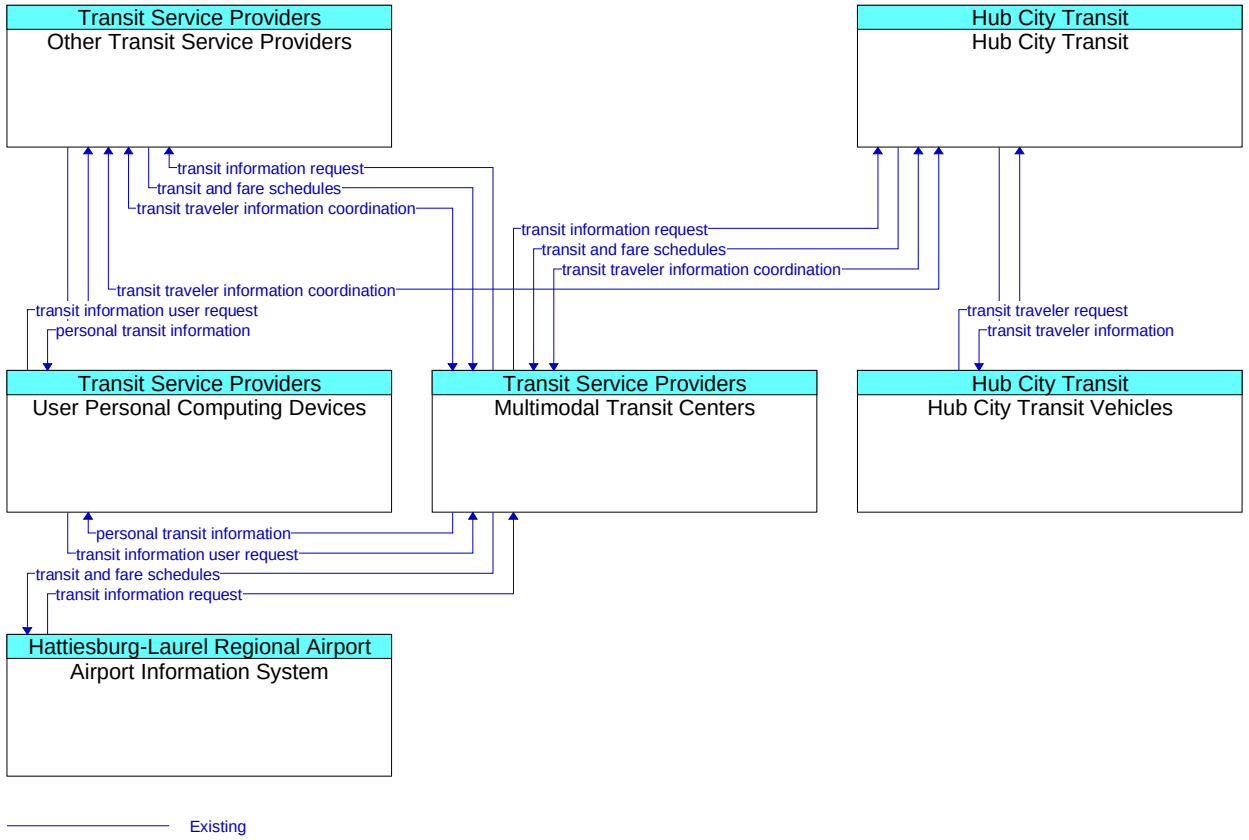

Hub City Transit
Hub City Transit Vehicles
transit schedule information
transit vehicle operator information
transit vehicle schedule performance
Hub City Transit
Hub City Transit
Planned

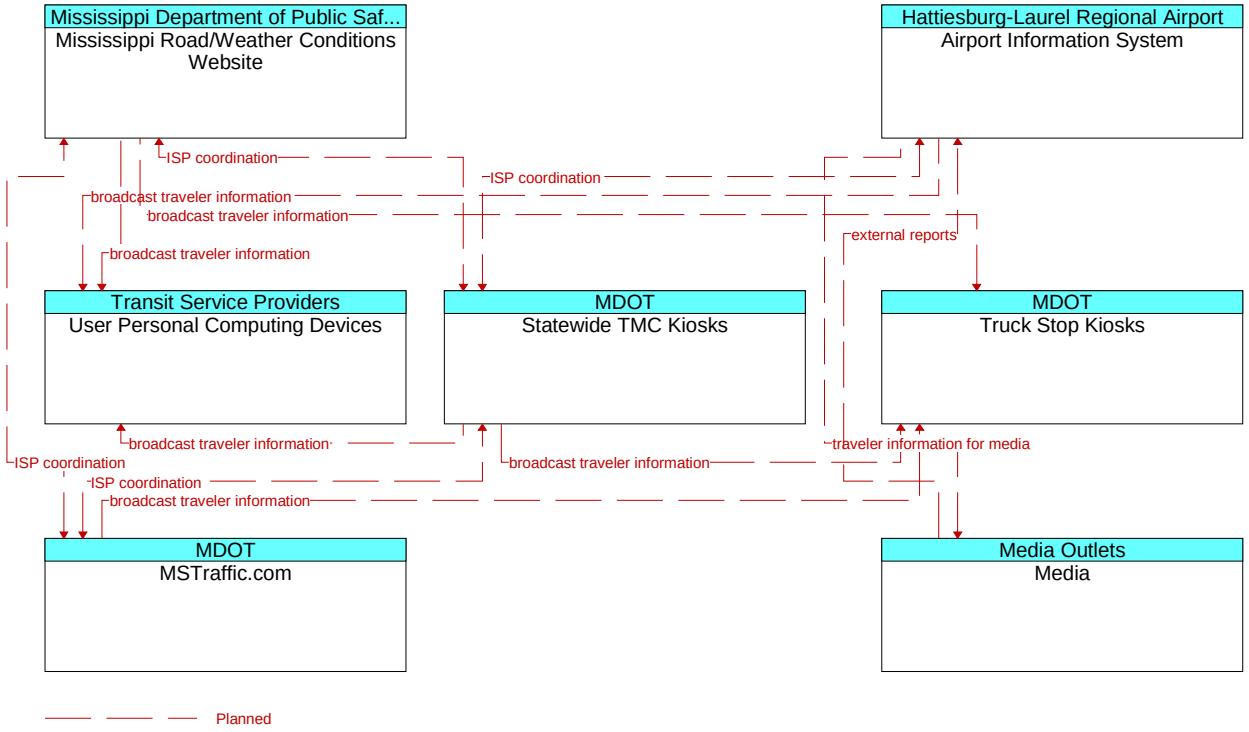

Hub City Transit
Hub City Transit Vehicles
transit vehicle operator information
demand response passenger and use data
Hub City Transit
Hub City Transit
Planned

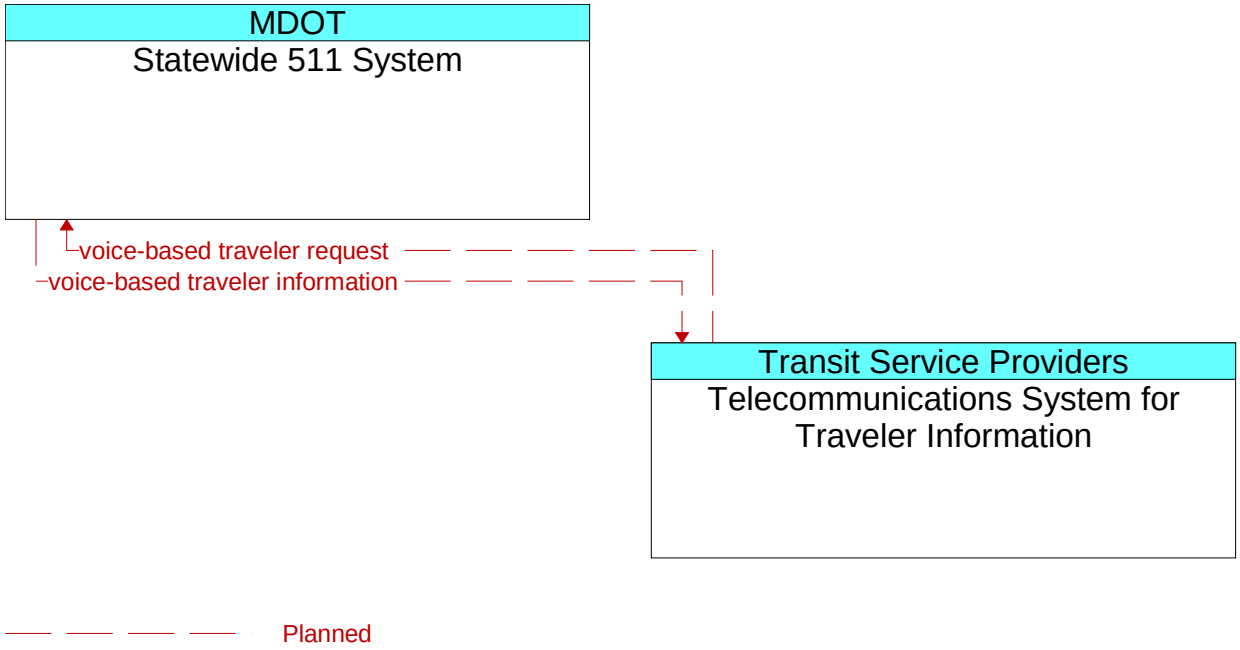

Hub City Transit
Hub City Transit
City of Hattiesburg
City of Hattiesburg Police
alarm notification
transit vehicle conditions
transit vehicle location data
transit vehicle operator authentication information
alarm acknowledge
remote vehicle disable
transit vehicle operator authentication update
alarm notification
secure area sensor data
secure area surveillance data
transit vehicle location data
alarm acknowledge
secure area sensor control
secure area surveillance control
transit emergency data
incident response status
incident report
threat information coordination
incident response status
transit emergency data
City/County 911 Dispatch Centers
City/County 911 Dispatch Centers
Hub City Transit
Hub City Transit Vehicles
Existing
Planned


Hub City Transit
Hub City Transit Vehicles
request for vehicle measures
transit schedule information
transit vehicle conditions
transit vehicle location data
Hub City Transit
Hub City Transit
Planned

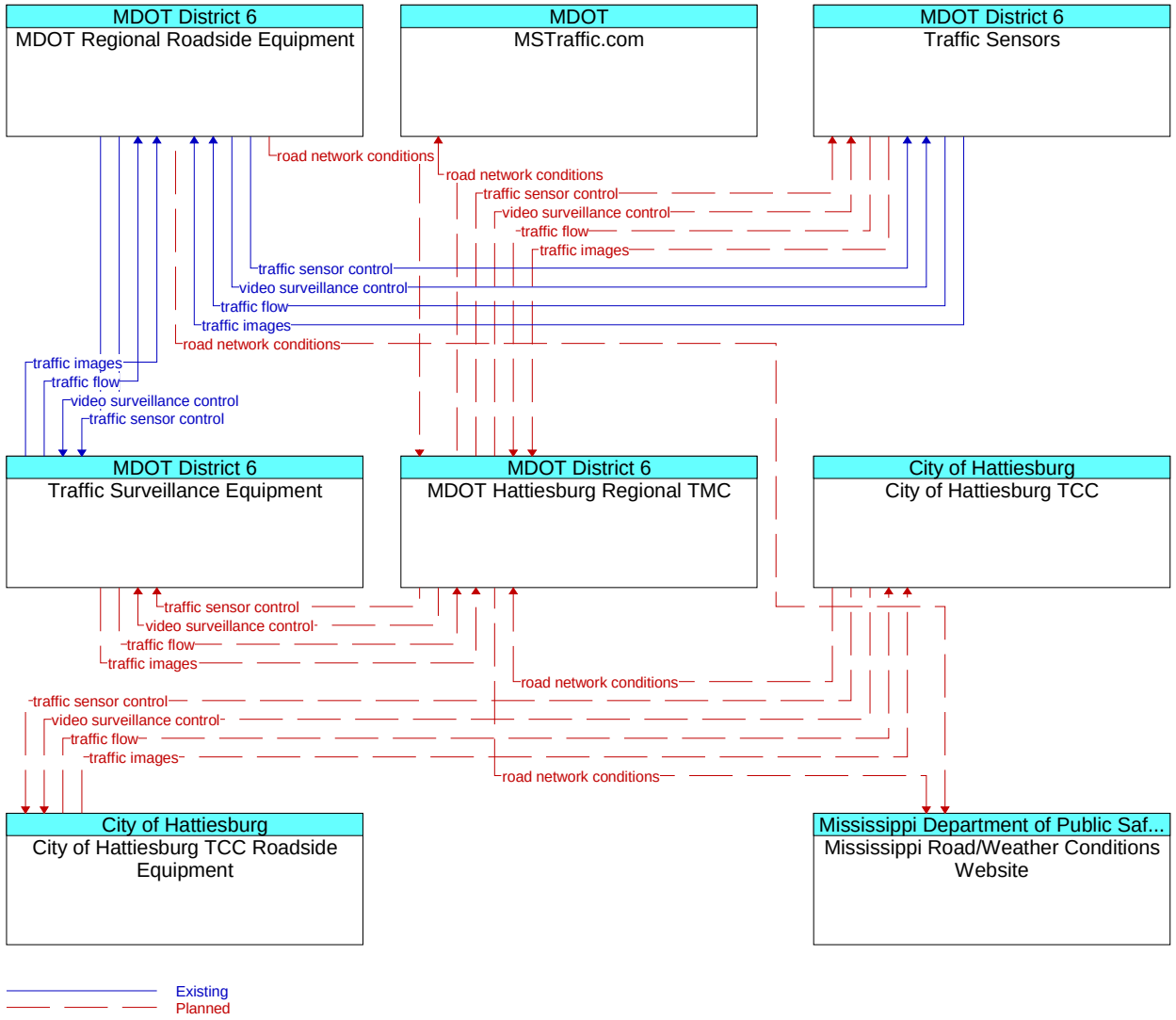

Hub City Transit
Hub City Transit
Transit Service Providers
Multimodal Transit Centers
transit service coordination
transit service coordination
transit service coordination
transit multimodal information
multimodal service data
transit vehicle schedule performance
multimodal service data
transit multimodal information
multimodal service data
transit multimodal information
AMTRAK
AMTRAK
Transit Service Providers
Other Transit Service Providers
Greyhound Bus Service
Greyhound
transit multimodal information
multimodal service data
transit schedule information
transit multimodal information
multimodal service data
Hub City Transit
Hub City Transit Vehicles
Planned


Transit Service Providers
Other Transit Service Providers
Hub City Transit
Hub City Transit
transit information request
transit and fare schedules
transit traveler information coordination
transit information request
transit and fare schedules
transit traveler information coordination
transit traveler information coordination
transit information user request
personal transit information
transit traveler request
transit traveler information
Transit Service Providers
User Personal Computing Devices
Transit Service Providers
Multimodal Transit Centers
Hub City Transit
Hub City Transit Vehicles
personal transit information
transit information user request
transit and fare schedules
transit information request
Hattiesburg-Laurel Regional Airport
Airport Information System
Existing

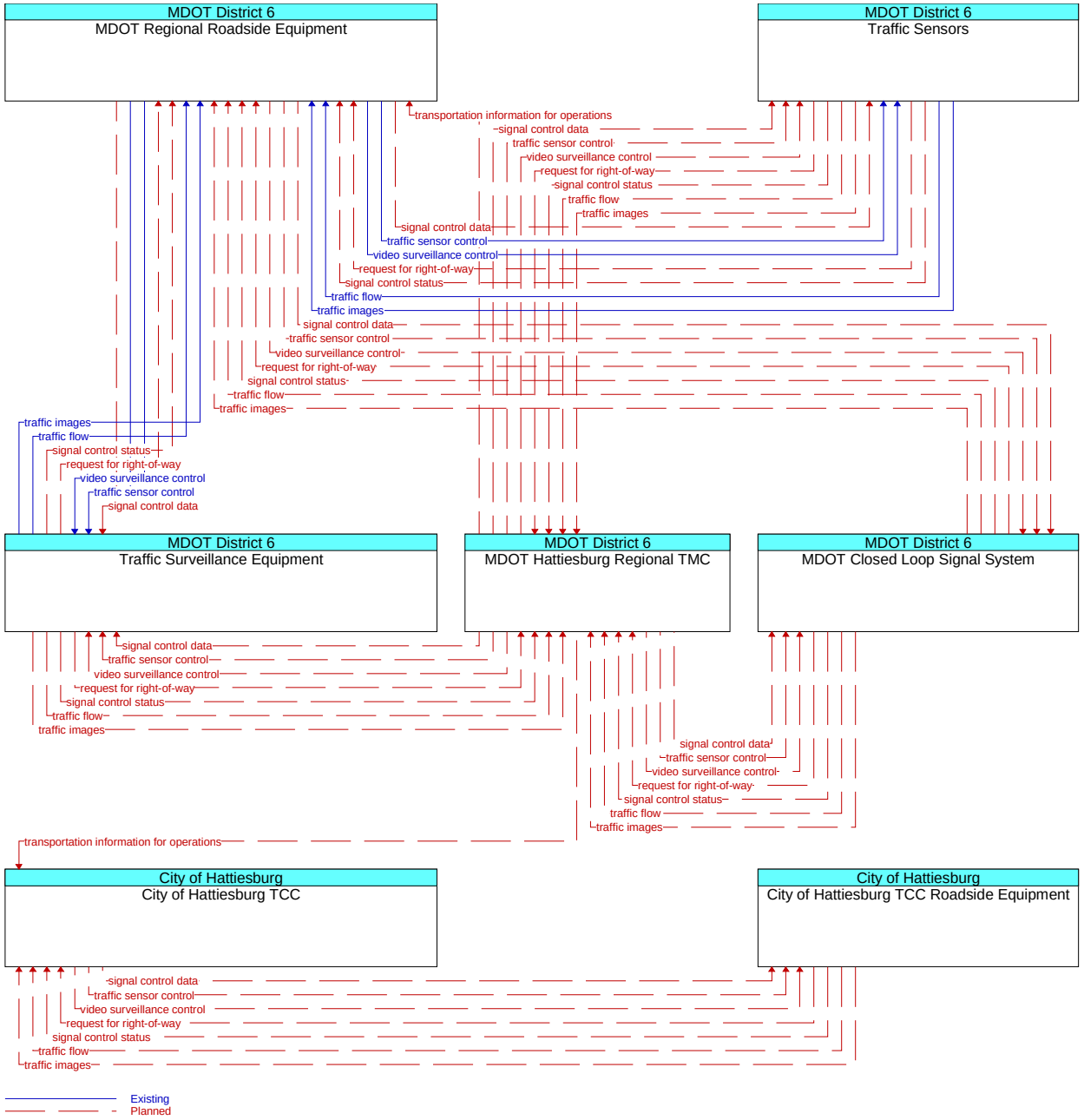

Mississippi Department of Public Saf...
Mississippi Road/Weather Conditions Website
Hattiesburg-Laurel Regional Airport
Airport Information System
ISP coordination
ISP coordination
broadcast traveler information
broadcast traveler information
broadcast traveler information
external reports
Transit Service Providers
User Personal Computing Devices
MDOT
Statewide TMC Kiosks
MDOT
Truck Stop Kiosks
broadcast traveler information
traveler information for media
ISP coordination
broadcast traveler information
ISP coordination
broadcast traveler information
MDOT
MSTraffic.com
Media Outlets
Media
Planned


MDOT
Statewide 511 System
voice-based traveler request
voice-based traveler information
Transit Service Providers
Telecommunications System for Traveler Information
Planned

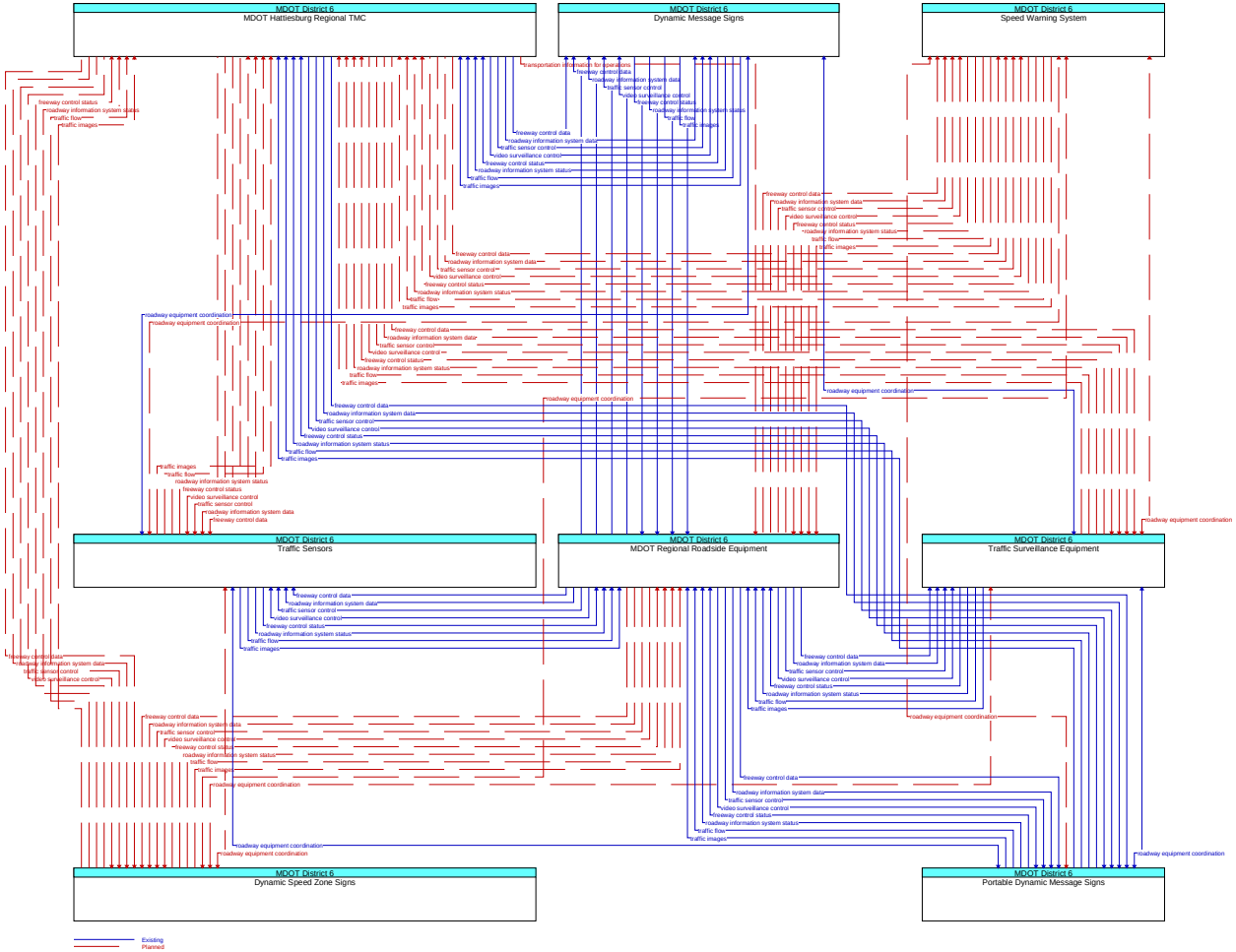
Hattiesburg Region Intelligent Transportation System Architecture



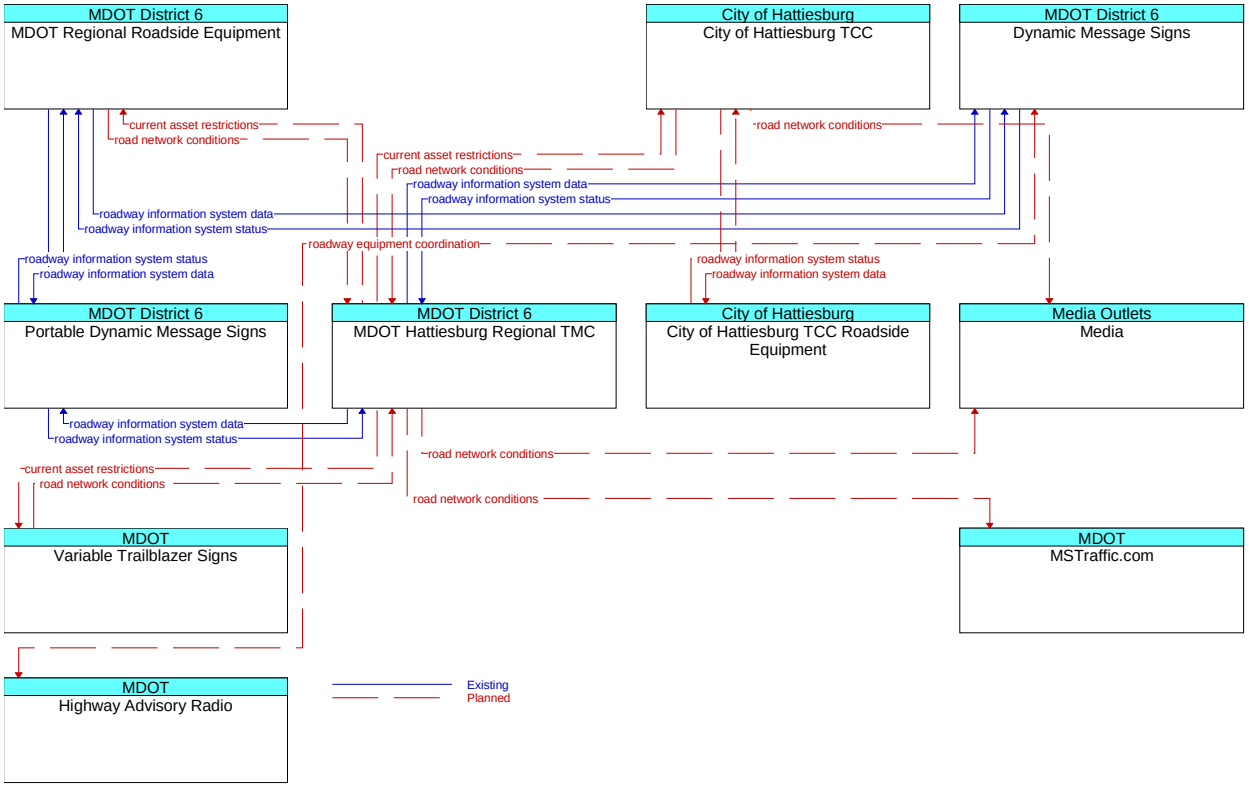
Hattiesburg Region Intelligent Transportation System Architecture



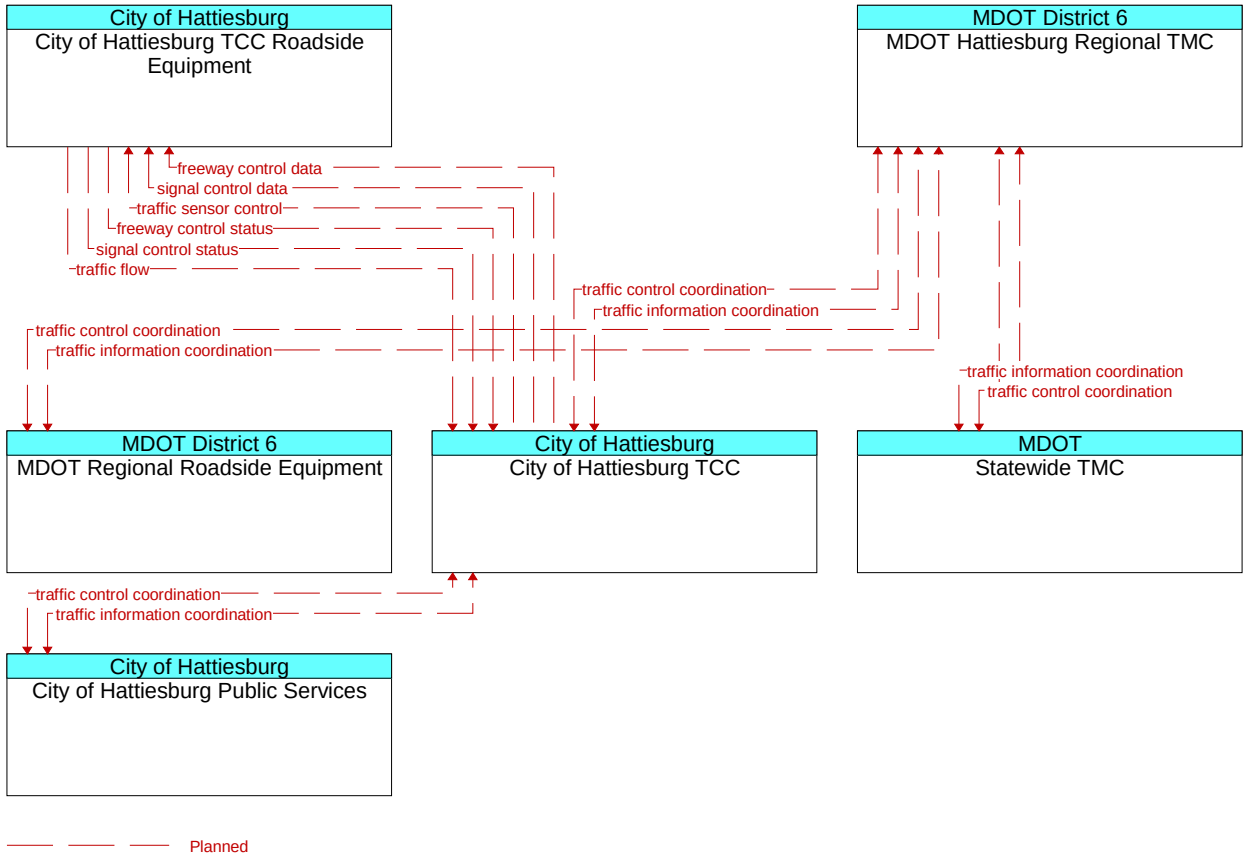
Hattiesburg Region Intelligent Transportation System Architecture

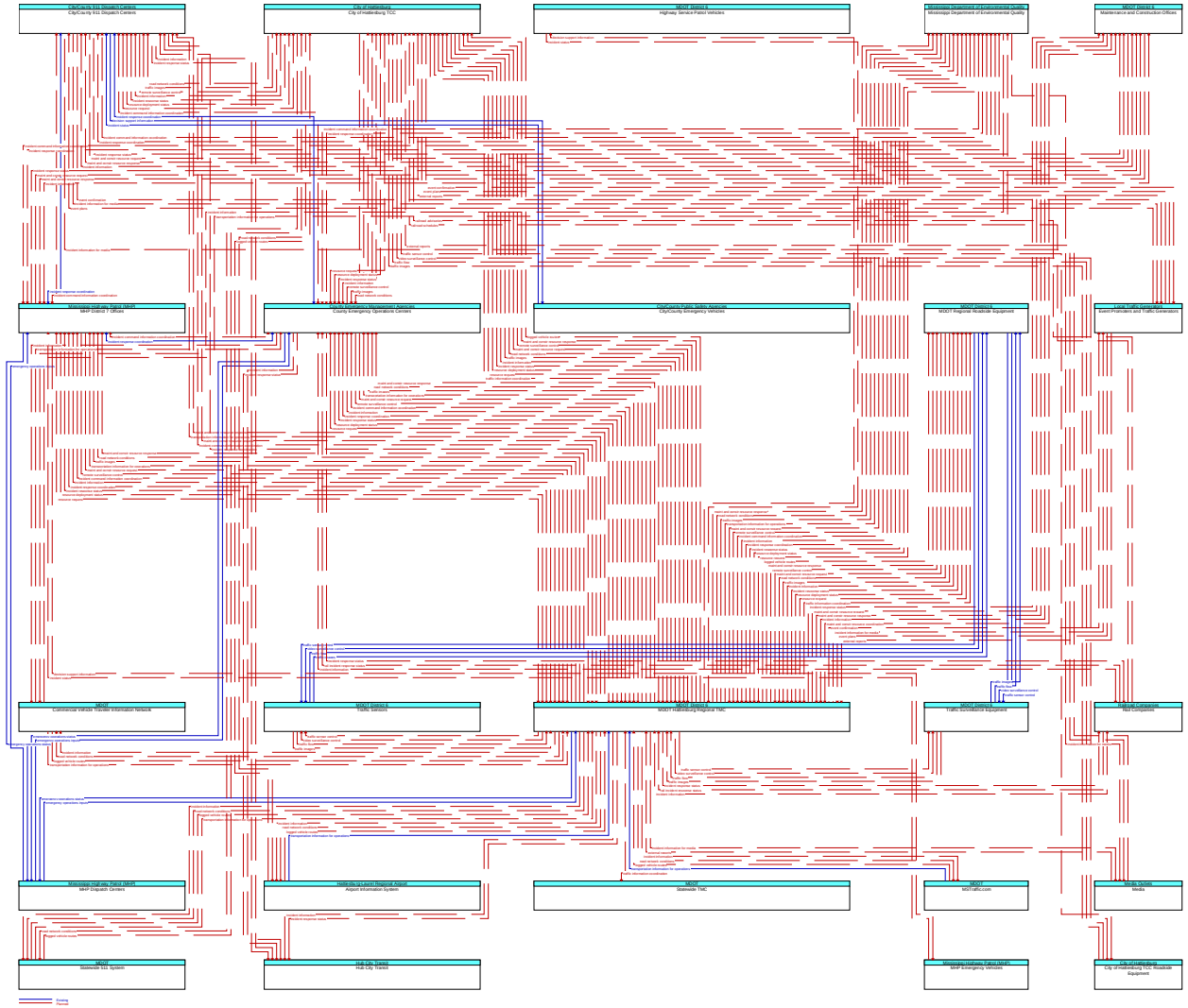


Hattiesburg Region Intelligent Transportation System Architecture

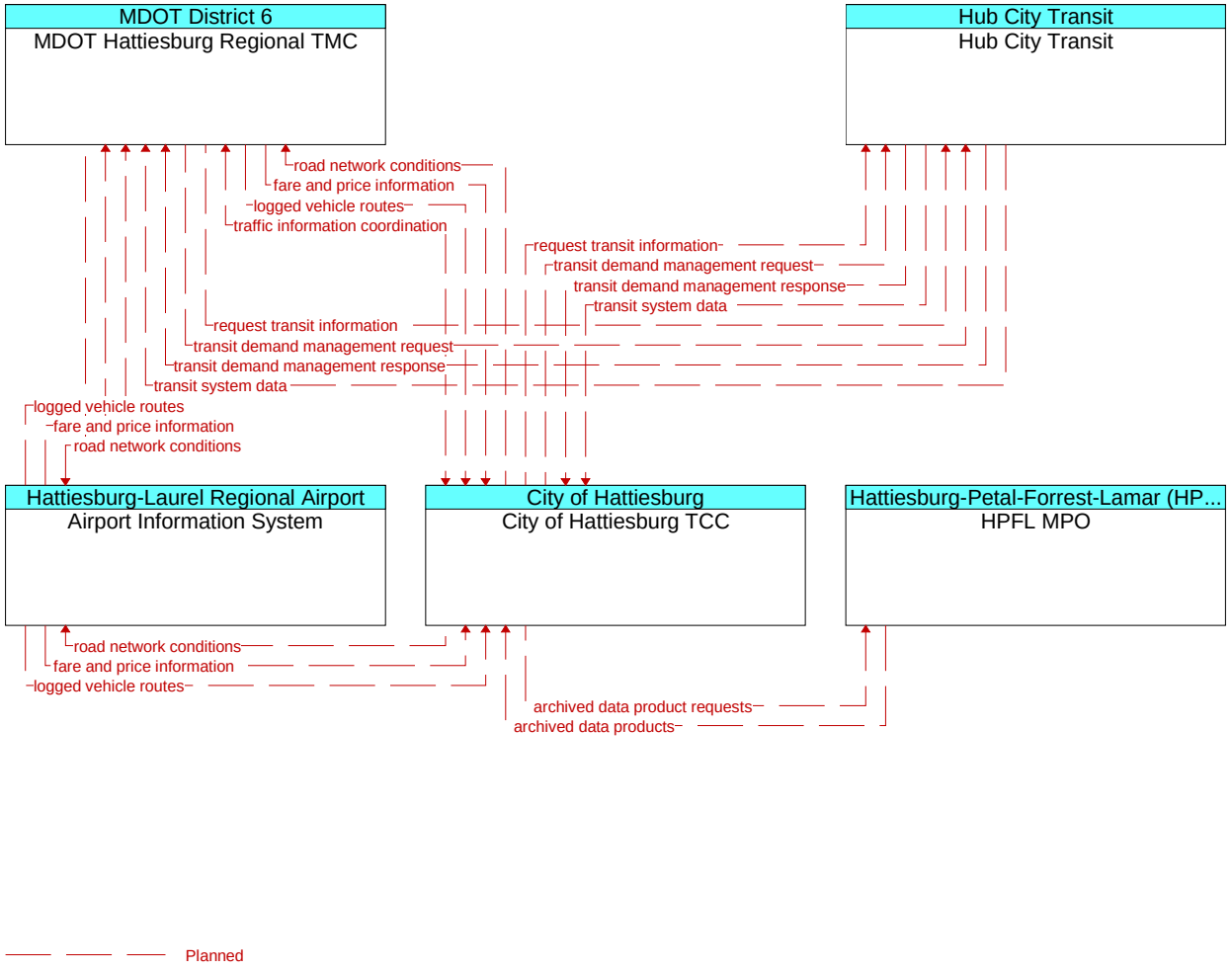


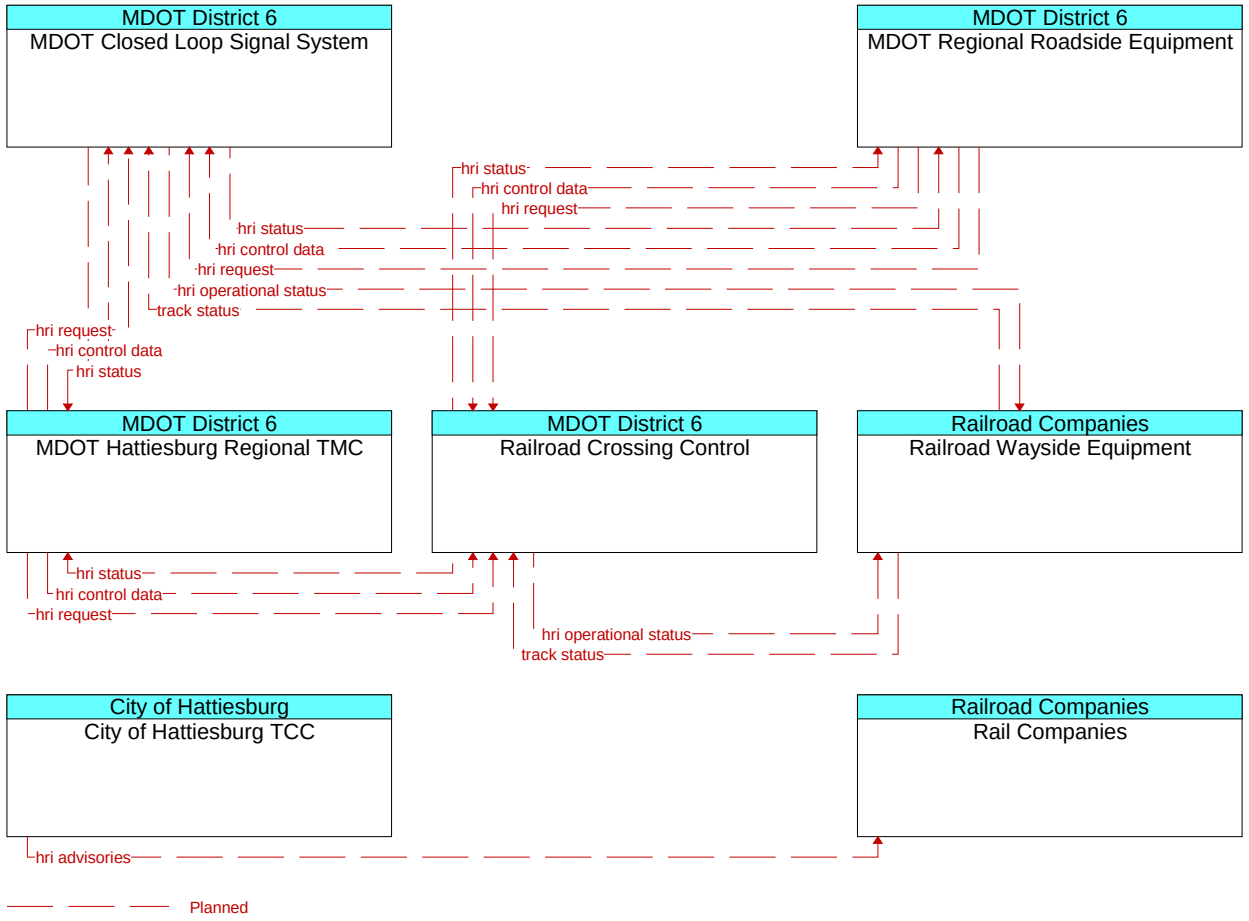
Hattiesburg Region Intelligent Transportation System Architecture

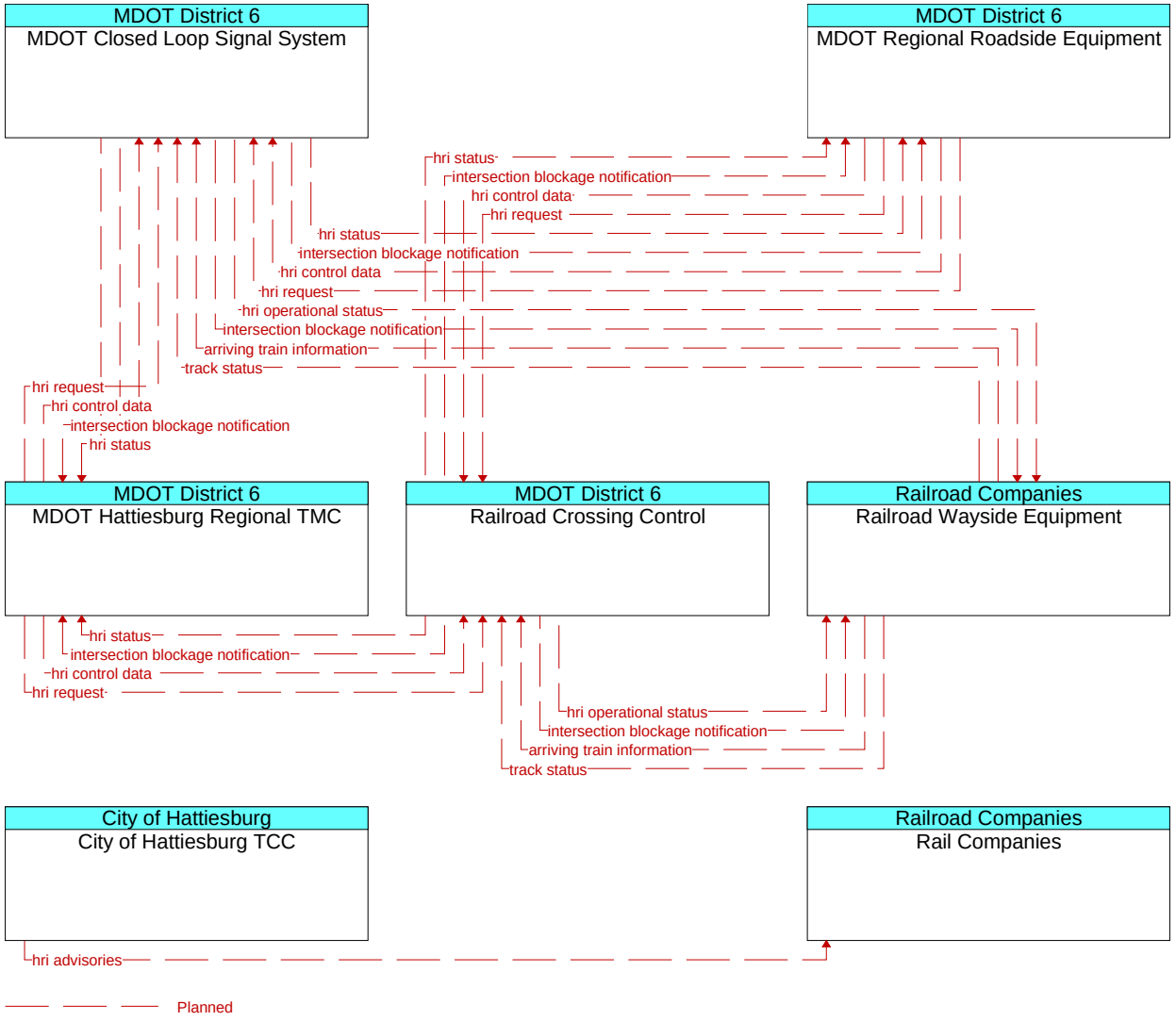


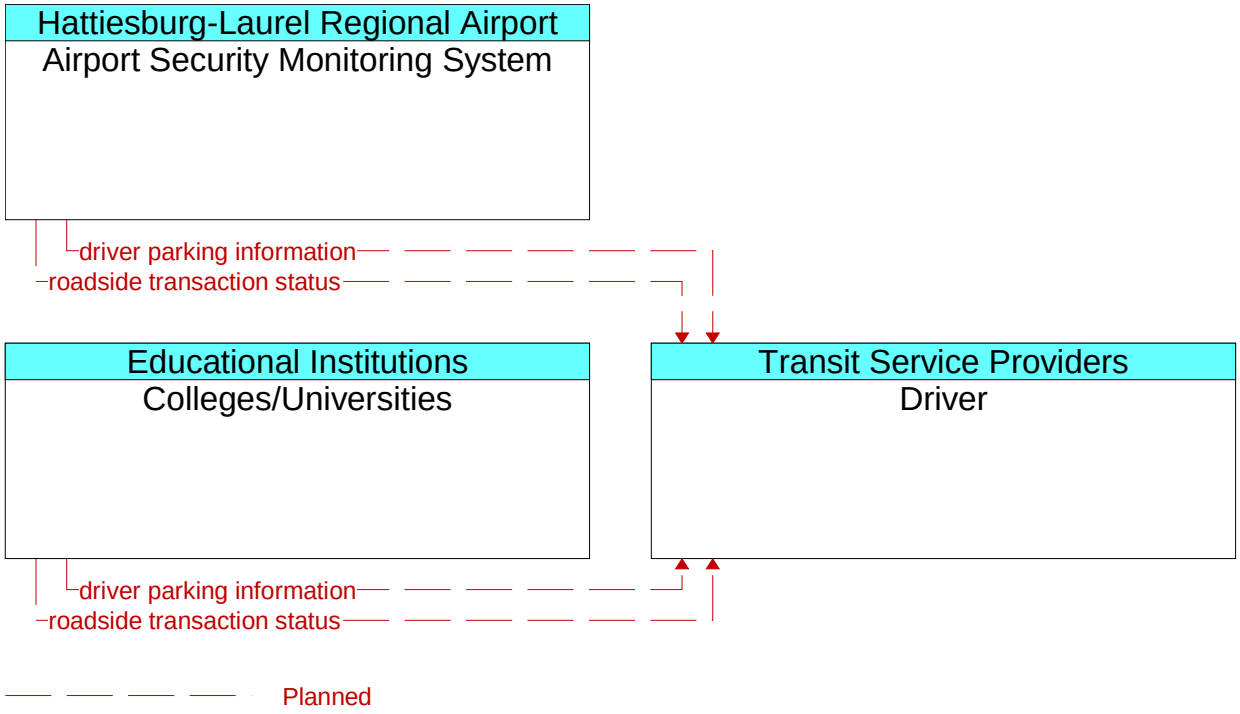

City/County 911 Dispatch Centers
City/County 911 Dispatch Centers
City of Hattiesburg
City of Hattiesburg TCC
MDOT District 6
Highway Service Patrol Vehicles
Mississippi Department of Environmental Quality
Mississippi Department of Environmental Quality
MDOT District 6
Maintenance and Construction Offices
Mississippi Highway Patrol (MHP)
MHP District 7 Offices
County Emergency Management Agencies
County Emergency Operations Centers
Police/Sheriff/Public Safety (Multiple)
City/County Emergency Vehicles
MDOT District 6
MDOT Regional Roadside equipment
Local Traffic Management
Event Promoters and Traffic Generators
MDOT
Commercial Vehicle Traveler Information Network
MDOT District 6
Traffic sensors
MDOT District 6
WSCH Hattiesburg Regional TMC
MDOT District 6
Traffic surveillance equipment
Transit Management
Rail Companies
Mississippi Highway Patrol (MHP)
MHP Dispatch Centers
Hattiesburg-Laurel Regional Airport
Airport Information System
MDOT
Statewide TMC
MDOT
MDOTtraffic.com
Media Owners
Media
MDOT
Statewide 511 system
Hub City Transit
Hub City Transit
Mississippi Highway Patrol (MHP)
MHP Emergency Vehicles
City of Hattiesburg
City of Hattiesburg TCC Roadside Equipment
Existing
Planned

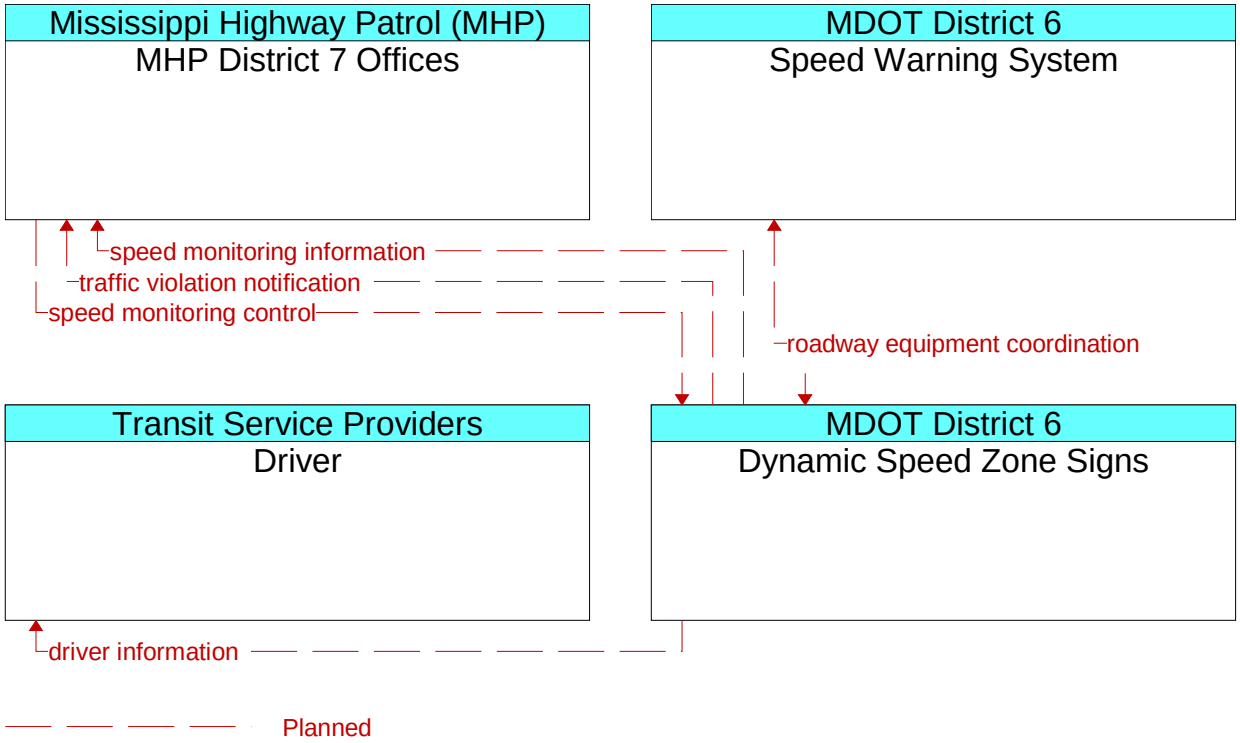
Hattiesburg Region Intelligent Transportation System Architecture



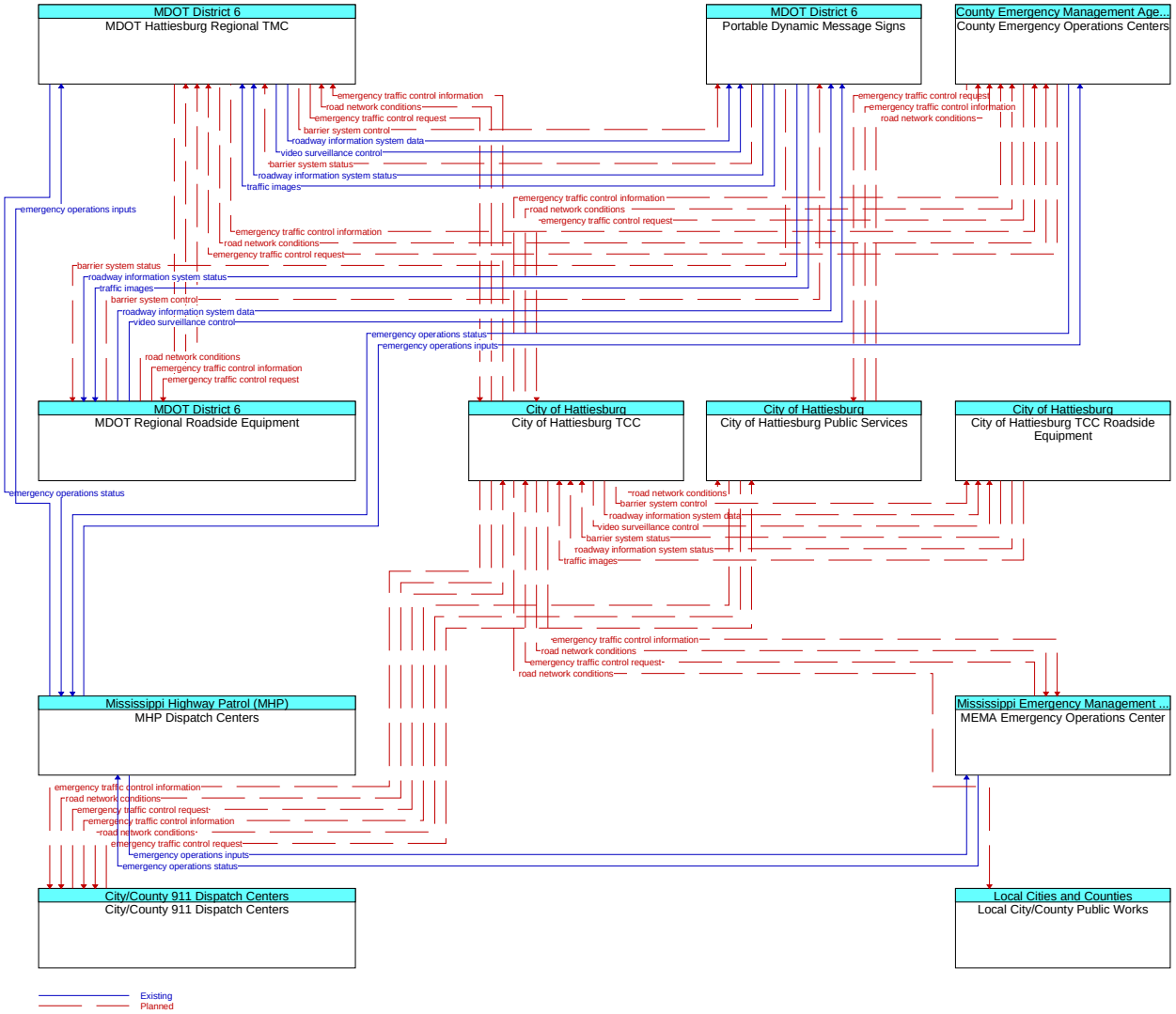

MDOT District 6
MDOT Closed Loop Signal System
MDOT District 6
MDOT Regional Roadside Equipment
hri status
hri control data
hri request
hri status
hri control data
hri request
hri operational status
track status
hri request
hri control data
hri status
MDOT District 6
MDOT Hattiesburg Regional TMC
MDOT District 6
Railroad Crossing Control
Railroad Companies
Railroad Wayside Equipment
hri status
hri control data
hri request
hri operational status
track status
City of Hattiesburg
City of Hattiesburg TCC
Railroad Companies
Rail Companies
hri advisories
Planned

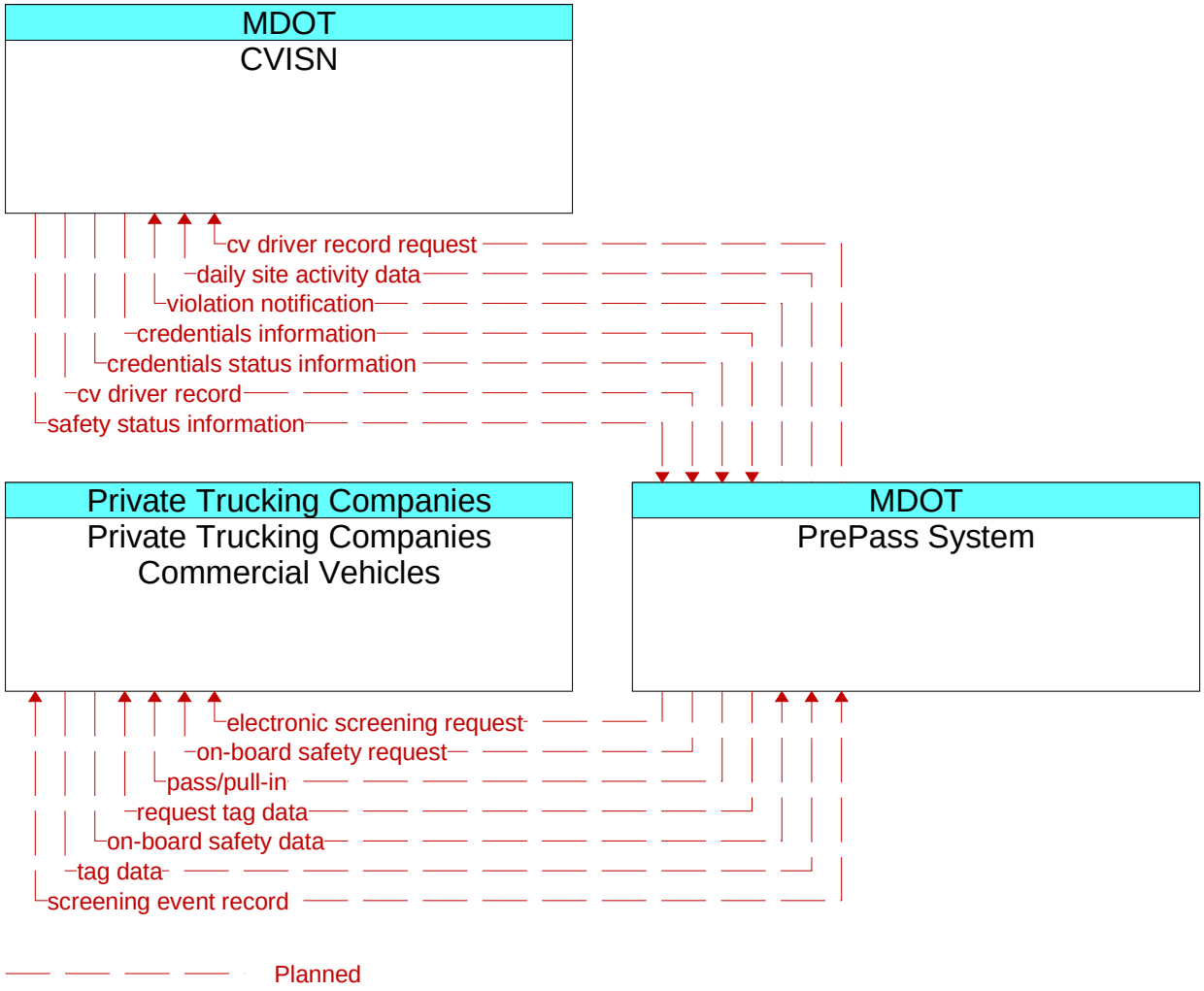

MDOT District 6
MDOT Closed Loop Signal System
MDOT District 6
MDOT Regional Roadside Equipment
hri status
intersection blockage notification
hri control data
hri request
hri status
intersection blockage notification
hri control data
hri request
hri operational status
intersection blockage notification
arriving train information
track status
hri request
hri control data
intersection blockage notification
hri status
MDOT District 6
MDOT Hattiesburg Regional TMC
MDOT District 6
Railroad Crossing Control
Railroad Companies
Railroad Wayside Equipment
hri status
intersection blockage notification
hri control data
hri request
hri operational status
intersection blockage notification
arriving train information
track status
City of Hattiesburg
City of Hattiesburg TCC
Railroad Companies
Rail Companies
hri advisories
Planned

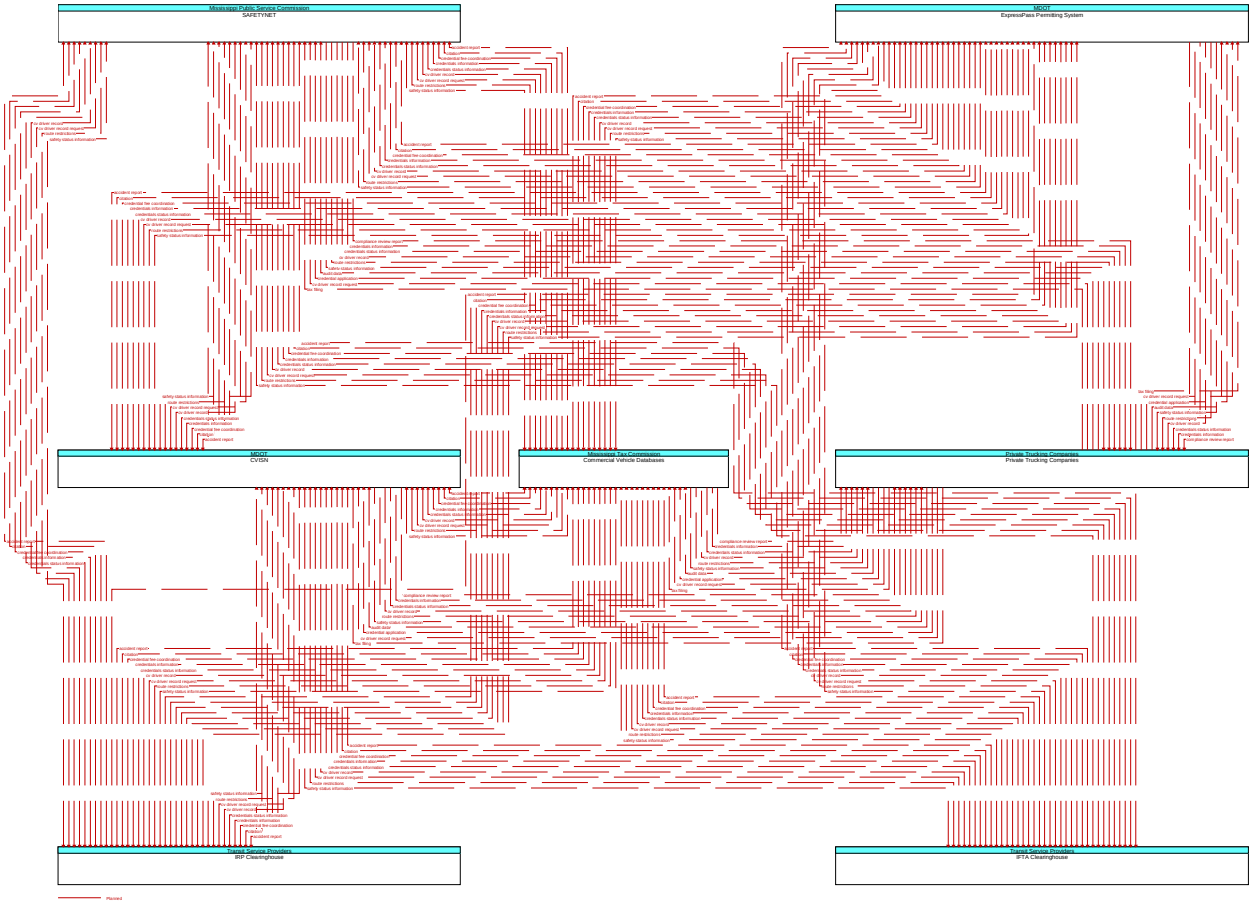

Hattiesburg-Laurel Regional Airport
Airport Security Monitoring System
driver parking information
roadside transaction status
Educational Institutions
Colleges/Universities
Transit Service Providers
Driver
driver parking information
roadside transaction status
Planned

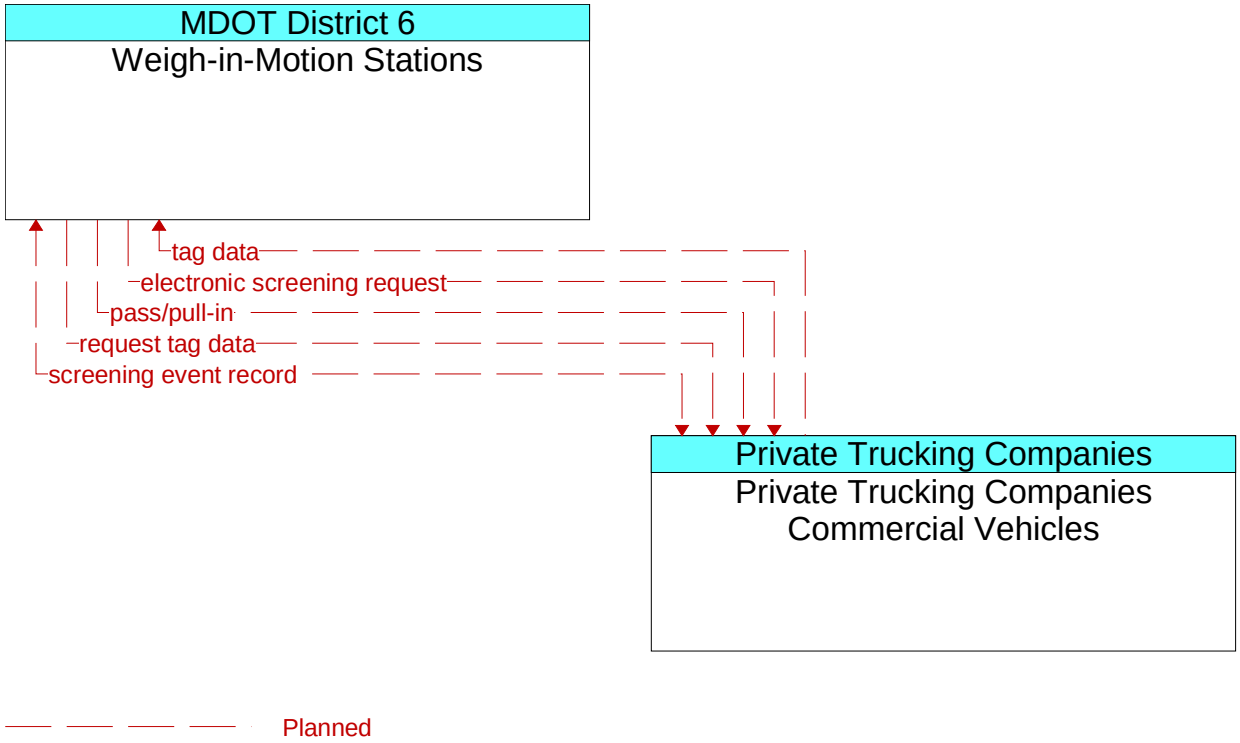

Mississippi Highway Patrol (MHP)
MHP District 7 Offices
MDOT District 6
Speed Warning System
speed monitoring information
traffic violation notification
speed monitoring control
roadway equipment coordination
Transit Service Providers
Driver
MDOT District 6
Dynamic Speed Zone Signs
driver information
Planned

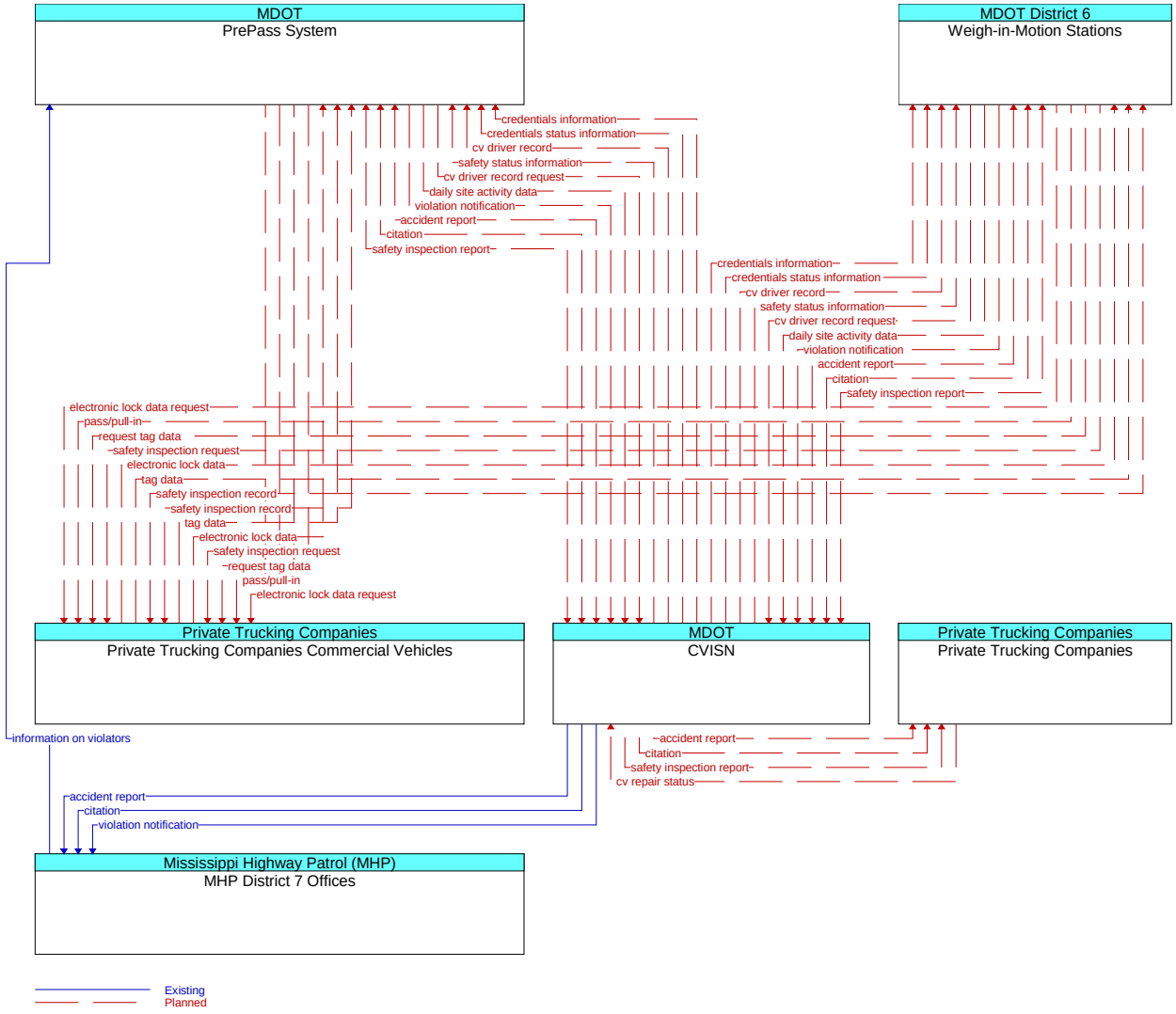
Hattiesburg Region Intelligent Transportation System Architecture




MDOT
CVISN
cv driver record request
daily site activity data
violation notification
credentials information
credentials status information
cv driver record
safety status information
Private Trucking Companies
Private Trucking Companies
Commercial Vehicles
MDOT
PrePass System
electronic screening request
on-board safety request
pass/pull-in
request tag data
on-board safety data
tag data
screening event record
Planned


Mississippi Public Service Commission
SAFETYNET
MDOT
ExpressPass Permitting System
MDOT
CVISN
Mississippi Tax Commission
Commercial Vehicle Databases
Private Trucking Companies
Private Trucking Companies
Transit Service Providers
IRP Clearinghouse
Transit Service Providers
IFTA Clearinghouse
Planned


MDOT District 6
Weigh-in-Motion Stations
tag data
electronic screening request
pass/pull-in
request tag data
screening event record
Private Trucking Companies
Private Trucking Companies
Commercial Vehicles
Planned


MDOT
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Weigh-in-Motion Stations
credentials information
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cv driver record
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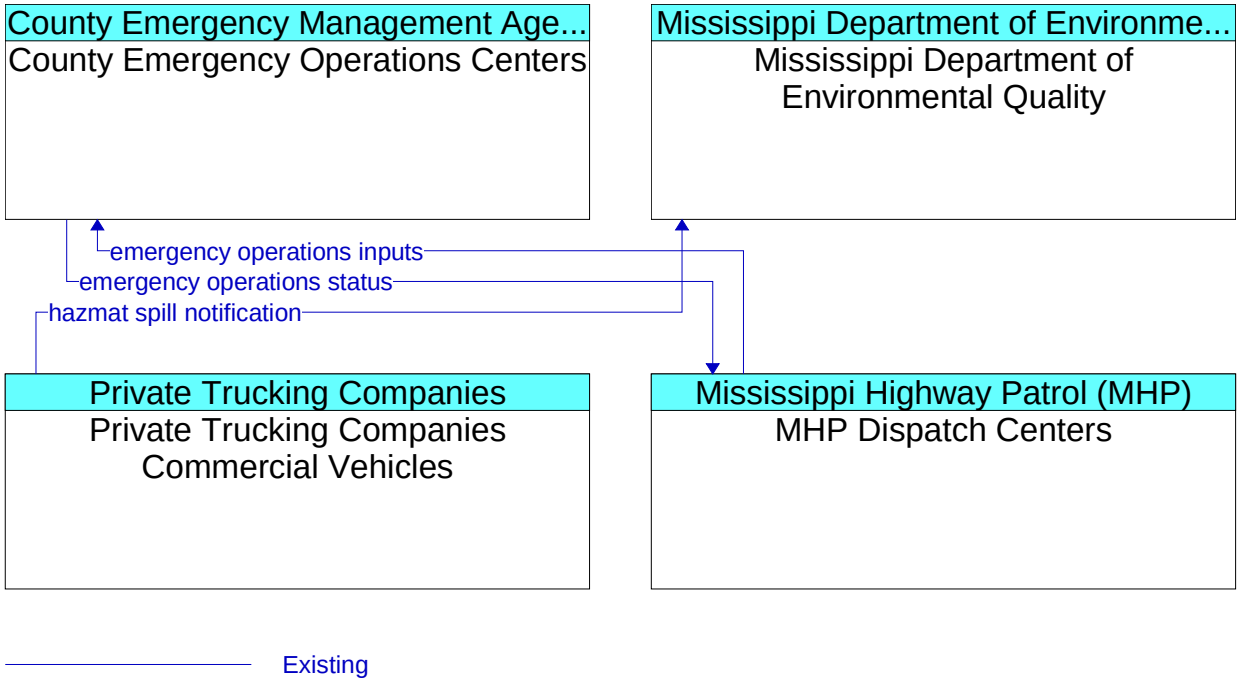
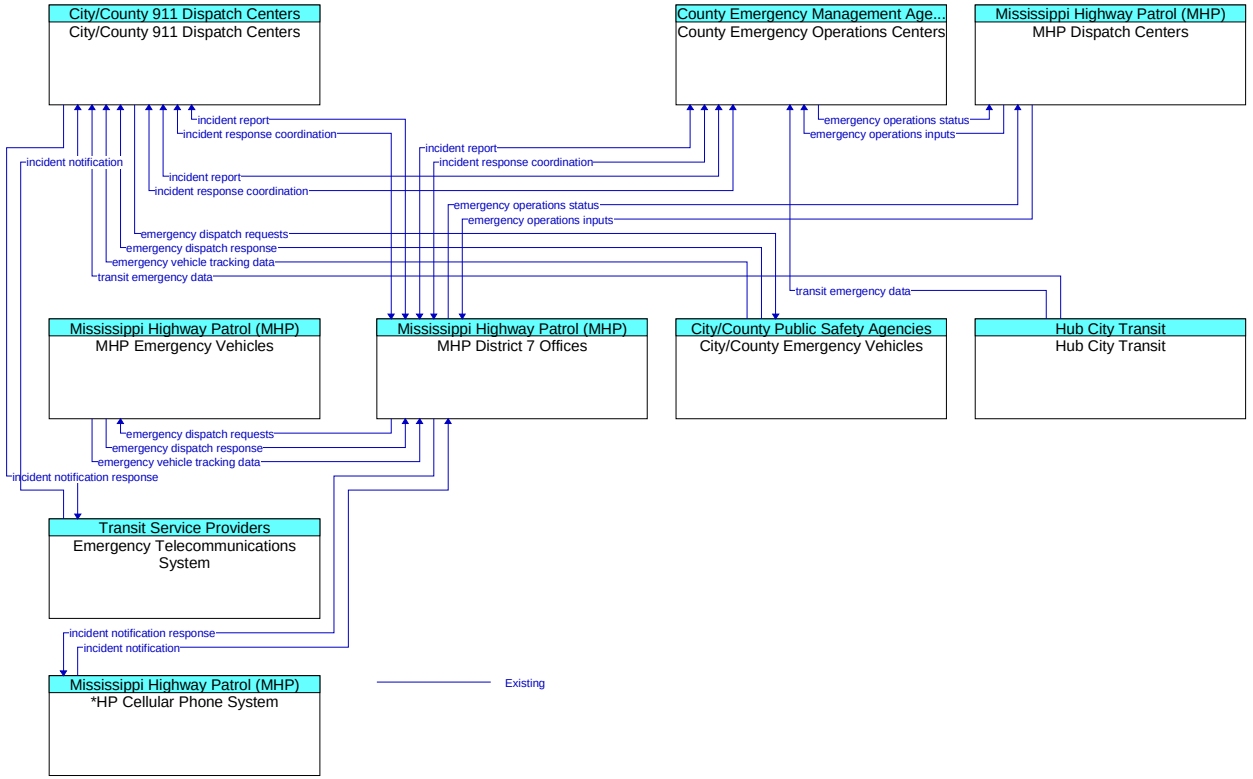
daily site activity data
violation notification
accident report
citation
safety inspection report
credentials information
credentials status information
cv driver record
safety status information
cv driver record request
daily site activity data
violation notification
accident report
citation
safety inspection report
electronic lock data request
pass/pull-in
request tag data
safety inspection request
electronic lock data
tag data
safety inspection record
safety inspection record
tag data
electronic lock data
safety inspection request
request tag data
pass/pull-in
electronic lock data request
Private Trucking Companies
Private Trucking Companies Commercial Vehicles
MDOT
CVISN
Private Trucking Companies
Private Trucking Companies
information on violators
accident report
citation
safety inspection report
cv repair status
accident report
citation
violation notification
Mississippi Highway Patrol (MHP)
MHP District 7 Offices
Existing
Planned


County Emergency Management Age...
County Emergency Operations Centers
Mississippi Department of Environme...
Mississippi Department of Environmental Quality
emergency operations inputs
emergency operations status
hazmat spill notification
Private Trucking Companies
Private Trucking Companies
Commercial Vehicles
Mississippi Highway Patrol (MHP)
MHP Dispatch Centers
Existing


City/County 911 Dispatch Centers
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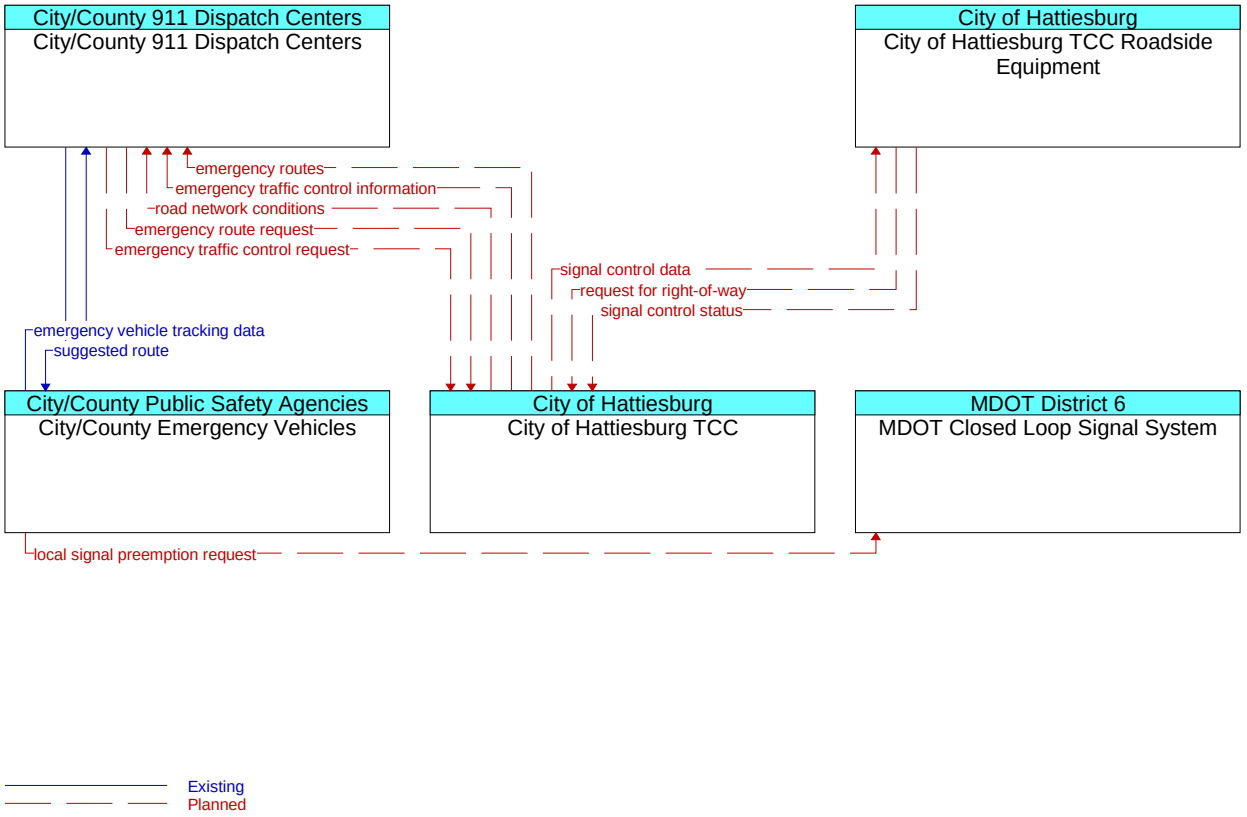
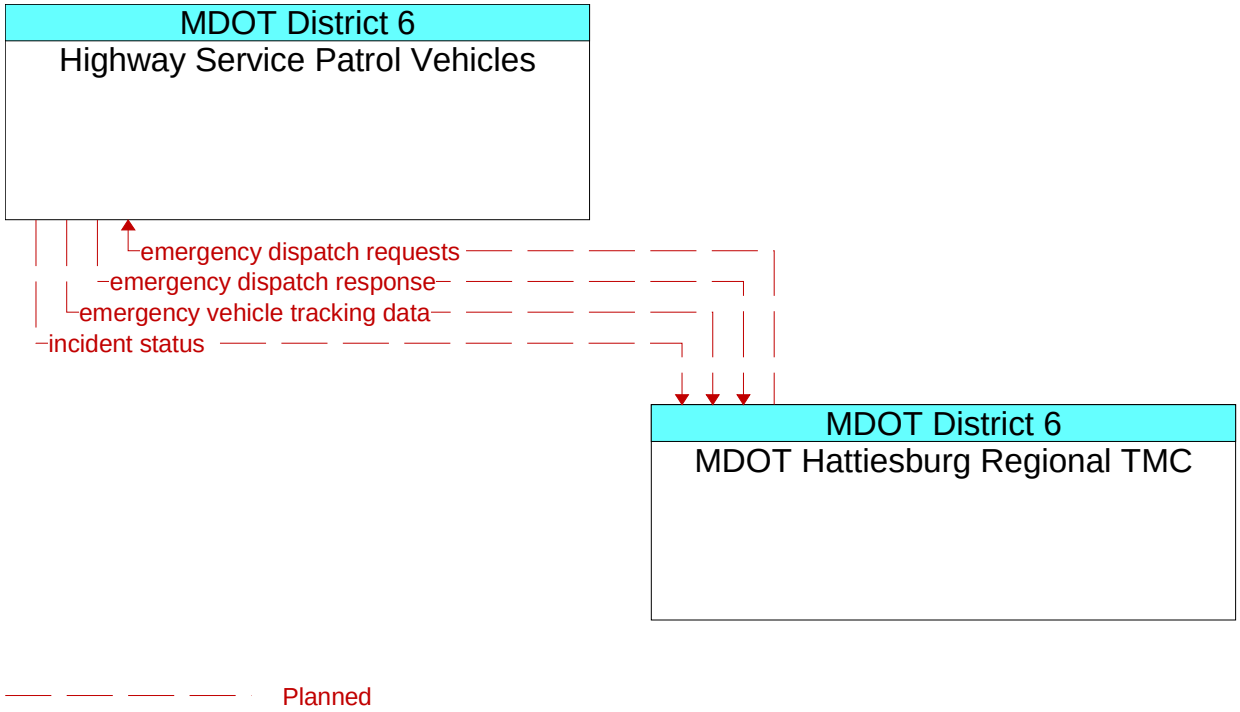
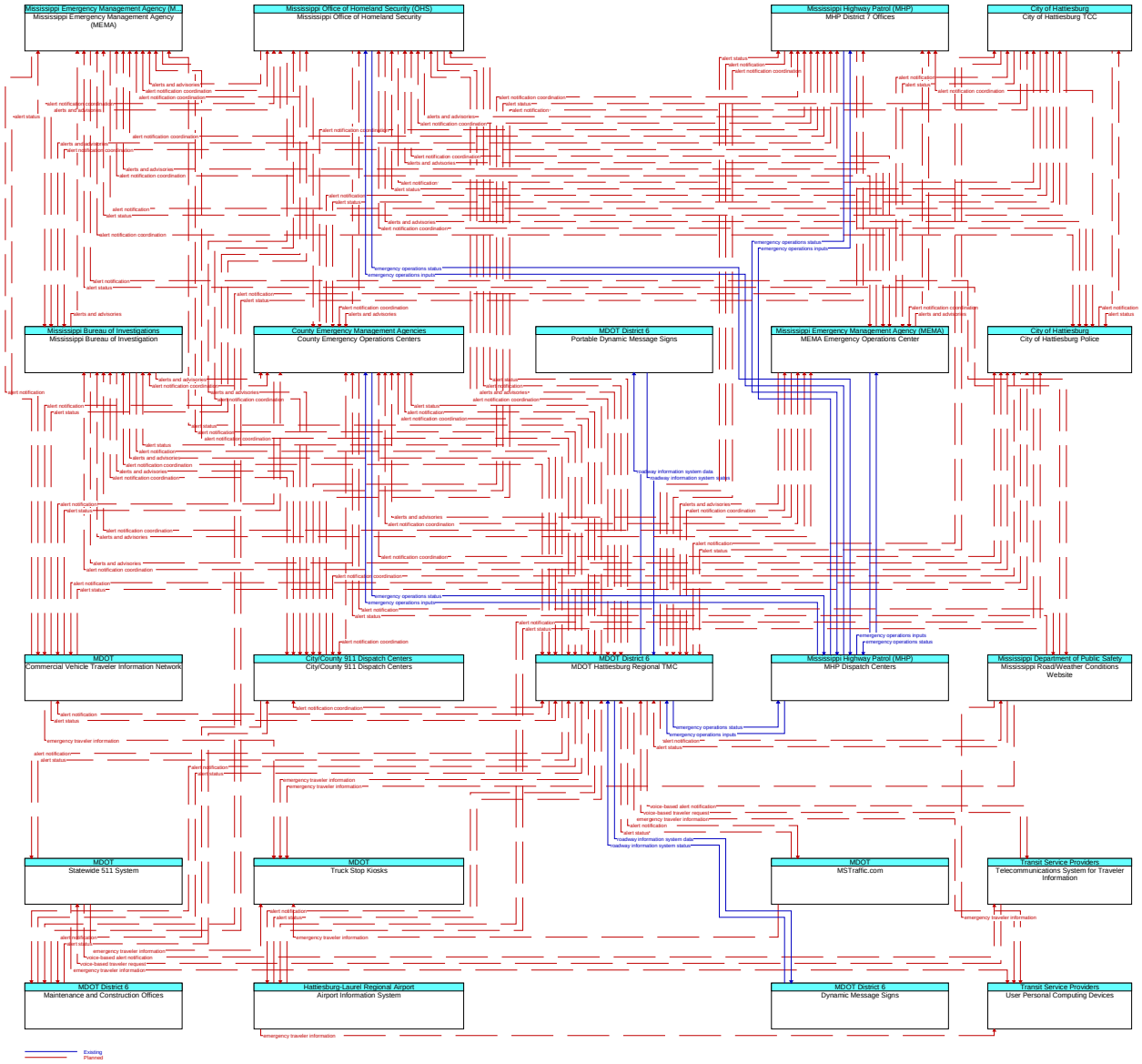
County Emergency Management Age...
County Emergency Operations Centers
Mississippi Highway Patrol (MHP)
MHP Dispatch Centers
incident report
incident response coordination
incident notification
incident report
incident response coordination
incident report
incident response coordination
emergency operations status
emergency operations inputs
emergency operations status
emergency operations inputs
emergency dispatch requests
emergency dispatch response
emergency vehicle tracking data
transit emergency data
transit emergency data
Mississippi Highway Patrol (MHP)
MHP Emergency Vehicles
Mississippi Highway Patrol (MHP)
MHP District 7 Offices
City/County Public Safety Agencies
City/County Emergency Vehicles
Hub City Transit
Hub City Transit
emergency dispatch requests
emergency dispatch response
emergency vehicle tracking data
incident notification response
Transit Service Providers
Emergency Telecommunications System
incident notification response
incident notification
Mississippi Highway Patrol (MHP)
*HP Cellular Phone System
Existing


City/County 911 Dispatch Centers
City/County 911 Dispatch Centers
City of Hattiesburg
City of Hattiesburg TCC Roadside Equipment
emergency routes
emergency traffic control information
road network conditions
emergency route request
emergency traffic control request
signal control data
request for right-of-way
signal control status
emergency vehicle tracking data
suggested route
City/County Public Safety Agencies
City/County Emergency Vehicles
City of Hattiesburg
City of Hattiesburg TCC
MDOT District 6
MDOT Closed Loop Signal System
local signal preemption request
Existing
Planned


MDOT District 6
Highway Service Patrol Vehicles
emergency dispatch requests
emergency dispatch response
emergency vehicle tracking data
incident status
MDOT District 6
MDOT Hattiesburg Regional TMC
Planned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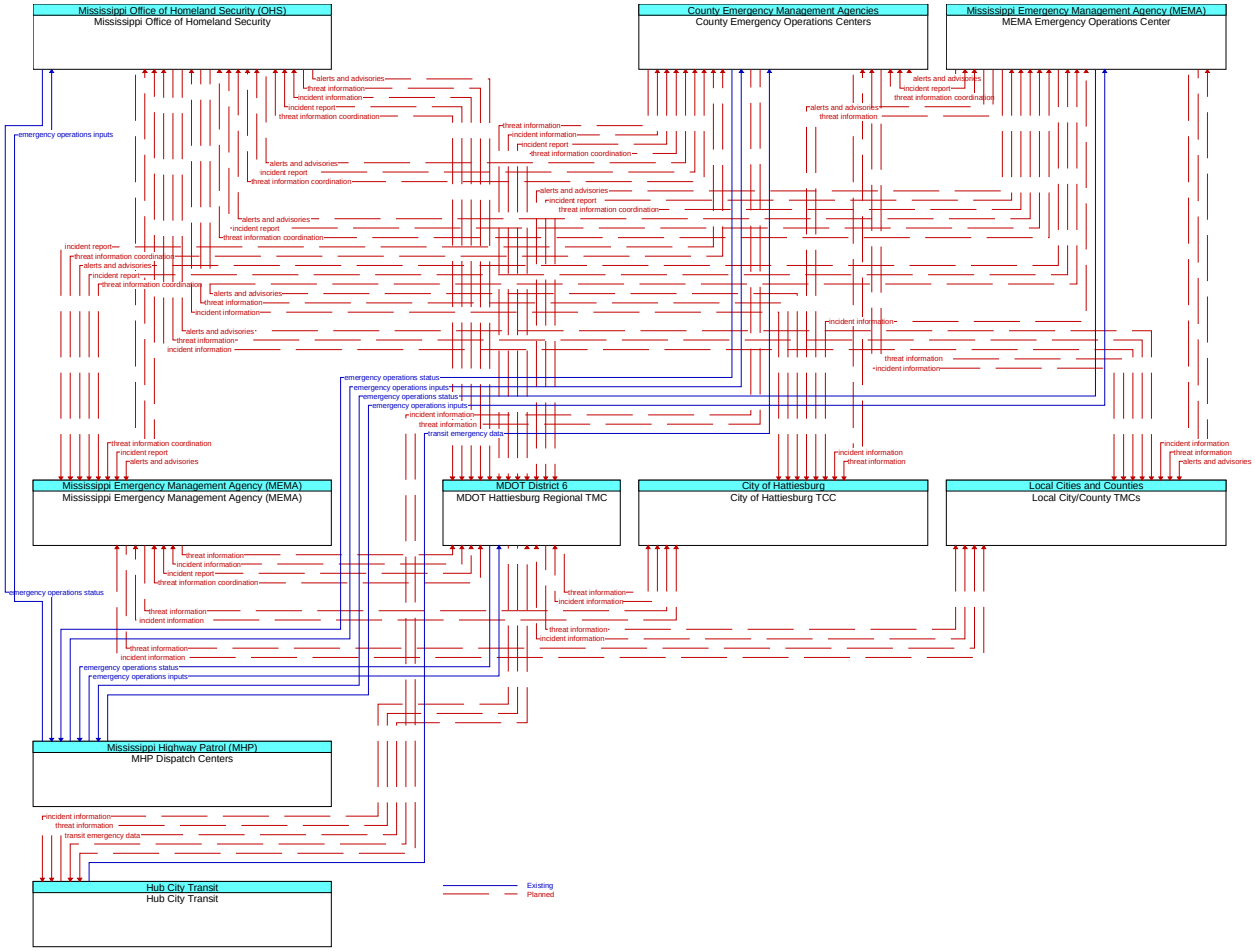
Mississippi Office of Homeland Security
Mississippi Highway Patrol (MHP)
MHP District 7 Offices
City of Hattiesburg
City of Hattiesburg TCC
Mississippi Bureau of Investigations
Mississippi Bureau of Investigation
County Emergency Management Agencies
County Emergency Operations Centers
MDOT District 6
Portable Dynamic Message Signs
Mississippi Emergency Management Agency (MEMA)
MEMA Emergency Operations Center
City of Hattiesburg
City of Hattiesburg Police
MDOT
Commercial Vehicle Traveler Information Network
City/County 911 Dispatch Centers
City/County 911 Dispatch Centers
MDOT District 6
MDOT Hattiesburg Regional TMC
Mississippi Highway Patrol (MHP)
MHP Dispatch Centers
Mississippi Department of Public Safety
Mississippi Road/Weather Conditions Website
MDOT
Statewide 511 System
MDOT
Truck Stop Kiosks
MDOT
MSTraffic.com
Transit Service Providers
Telecommunications System for Traveler Information
MDOT District 6
Maintenance and Construction Offices
Hattiesburg-Laurel Regional Airport
Airport Information System
MDOT District 6
Dynamic Message Signs
Transit Service Providers
User Personal Computing Devices
Existing
Planned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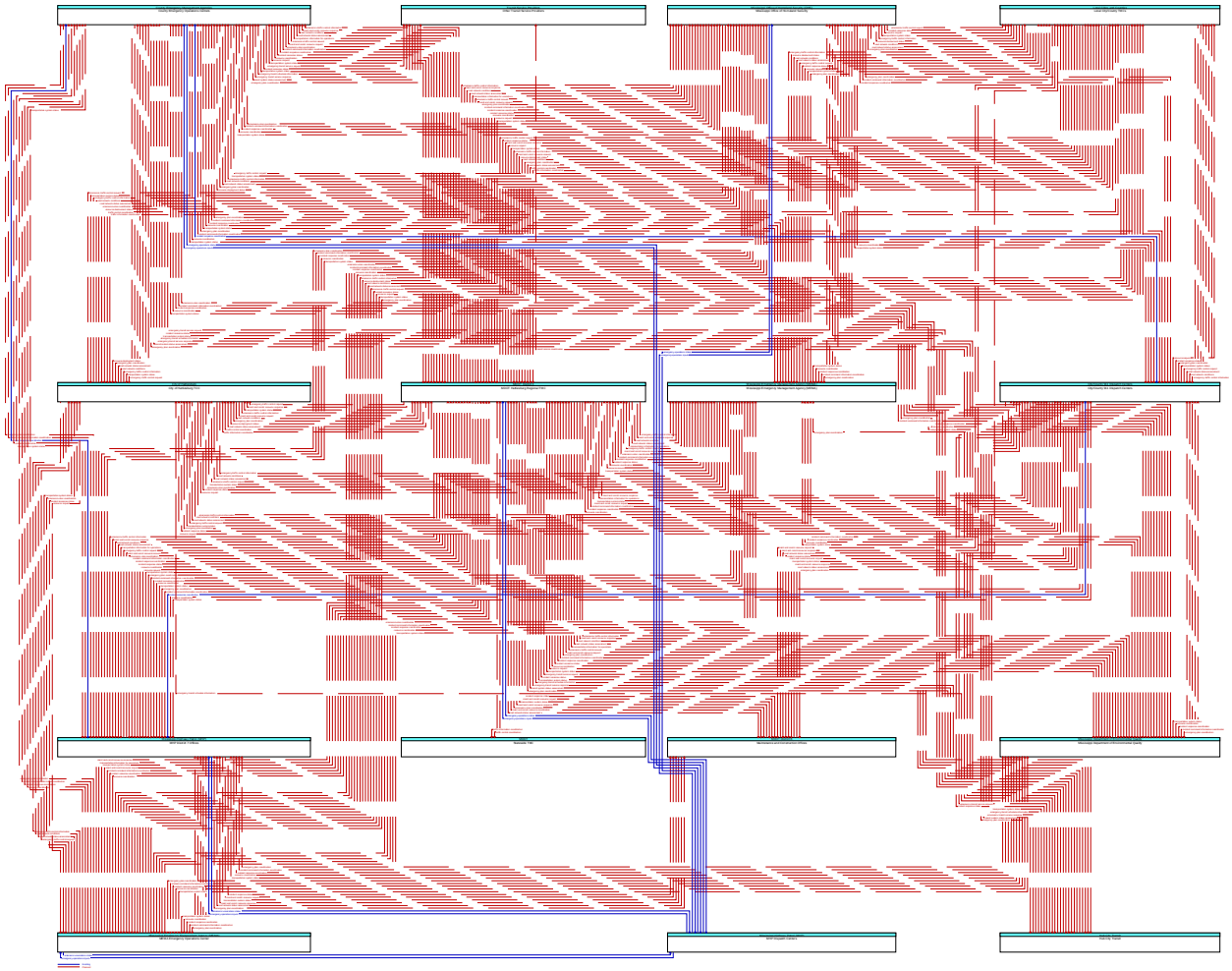
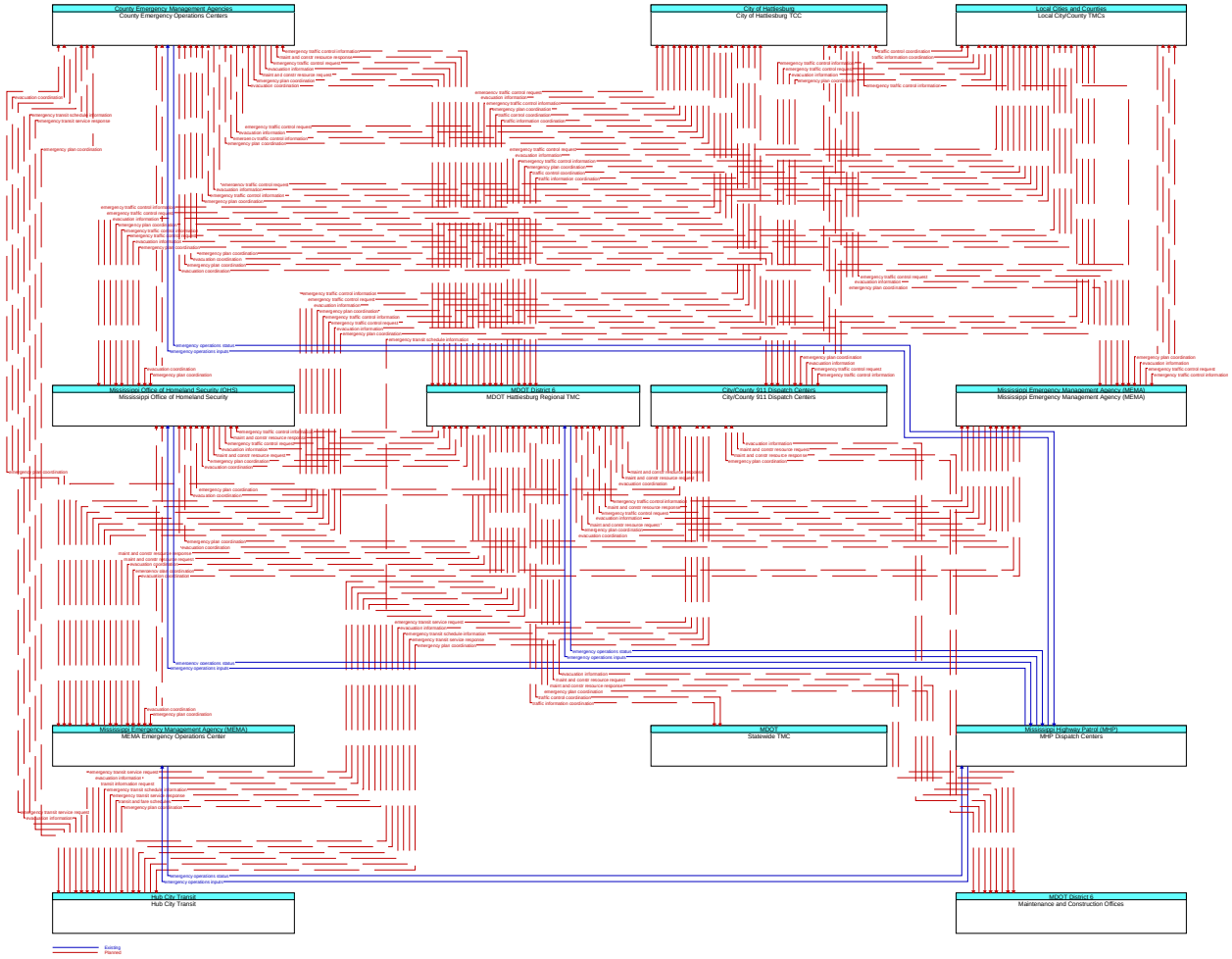
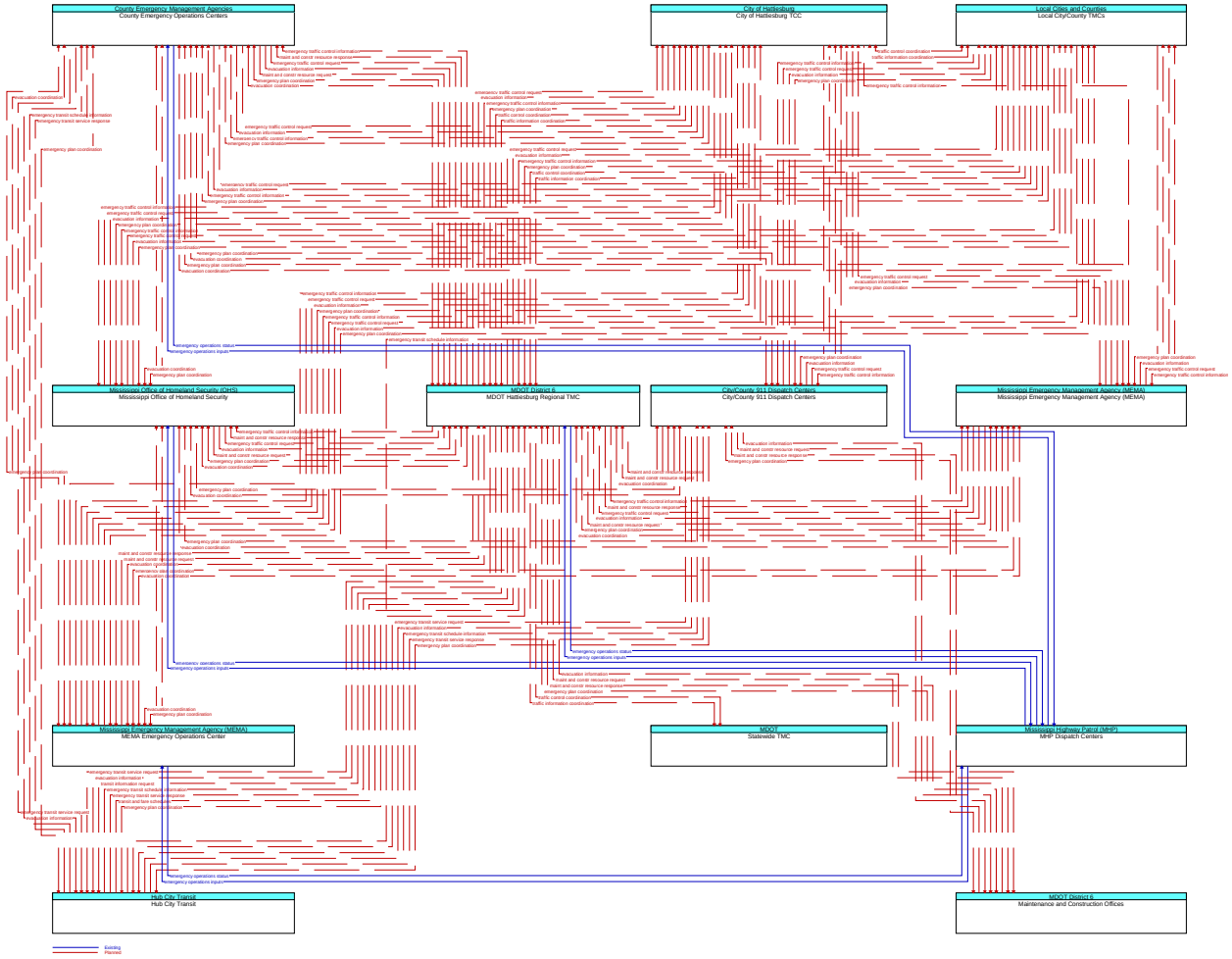
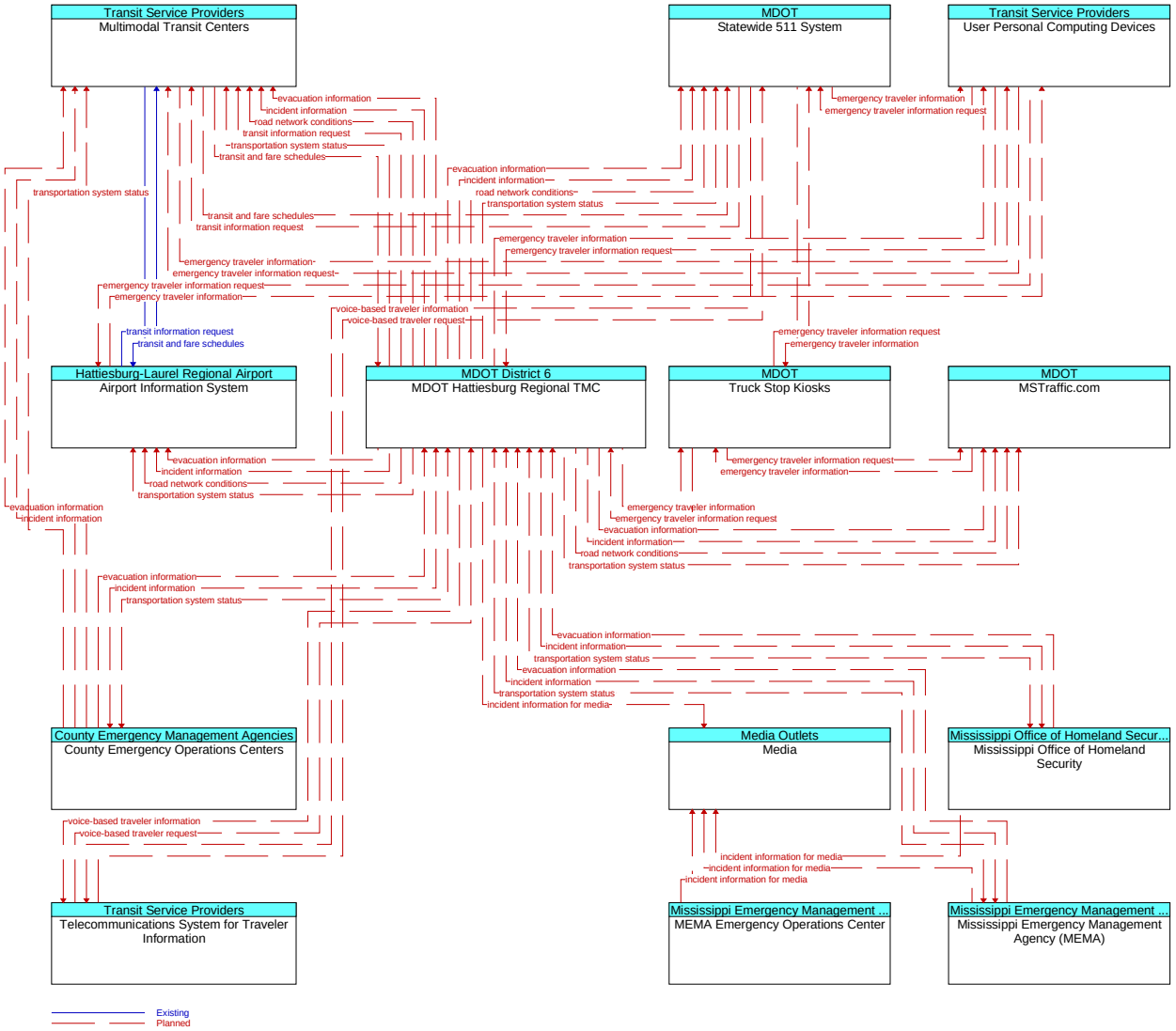
Mississippi Emergency Management Agency (MEMA)
MEMA Emergency Operations Center
Mississippi Emergency Management Agency (MEMA)
Mississippi Emergency Management Agency (MEMA)
MDOT District 6
MDOT Hattiesburg Regional TMC
City of Hattiesburg
City of Hattiesburg TCC
Local Cities and Counties
Local City/County TMCs
Mississippi Highway Patrol (MHP)
MHP Dispatch Centers
Hub City Transit
Hub City Transit
Existing
Planned

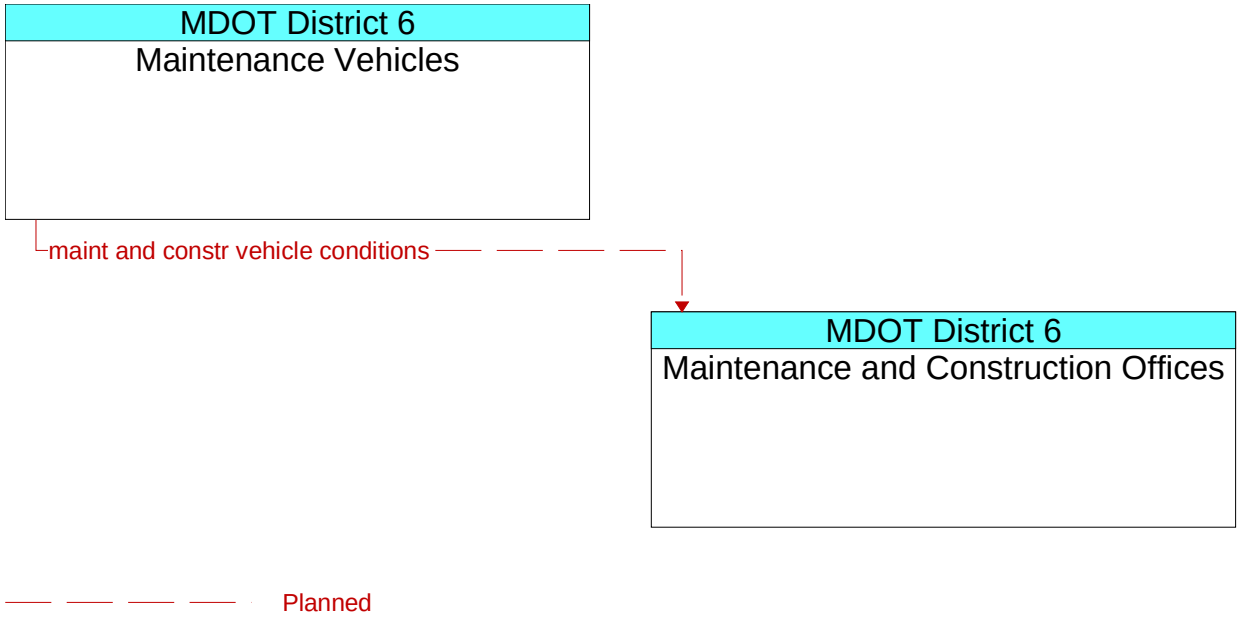



County Emergency Management Agencies
County Emergency Operations Centers
City of Hattiesburg
City of Hattiesburg TCC
Local Cities and Counties
Local City/County TMCs
Mississippi Office of Homeland Security (OHS)
Mississippi Office of Homeland Security
MDOT District 6
MDOT Hattiesburg Regional TMC
City/County 911 Dispatch Centers
City/County 911 Dispatch Centers
Mississippi Emergency Management Agency (MEMA)
Mississippi Emergency Management Agency (MEMA)
Mississippi Emergency Management Agency (MEMA)
MEMA Emergency Operations Center
MDOT
Statewide TMC
Mississippi Highway Patrol (MHP)
MHP Dispatch Centers
Hub City Transit
Hub City Transit
MDOT District 6
Maintenance and Construction Offices
Existing
Planned

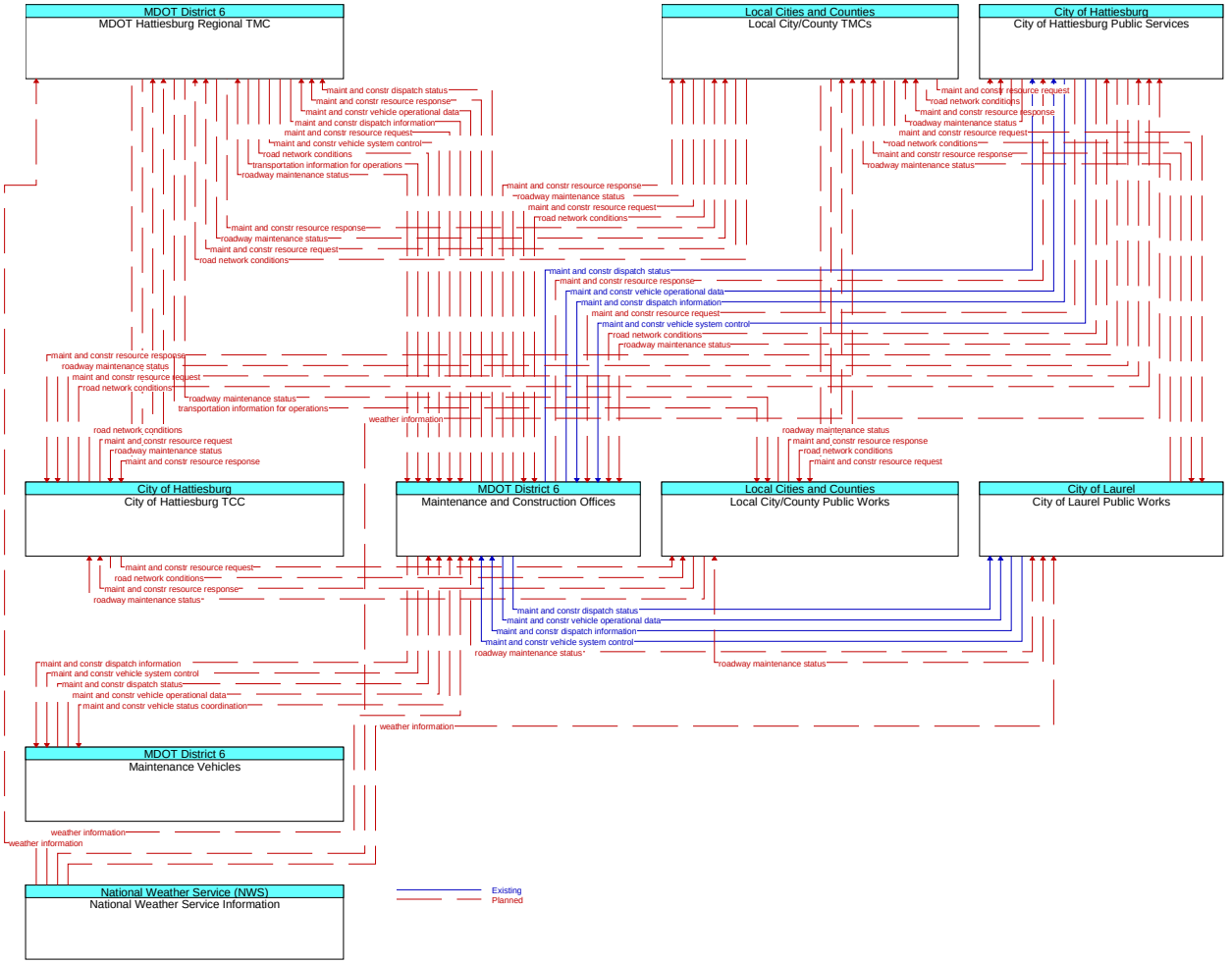

County Emergency Management Agencies
County Emergency Operations Centers
City of Hattiesburg
City of Hattiesburg TCC
Local Cities and Counties
Local City/County TMCs
Mississippi Office of Homeland Security (OHS)
Mississippi Office of Homeland Security
MDOT District 6
MDOT Hattiesburg Regional TMC
City/County 911 Dispatch Centers
City/County 911 Dispatch Centers
Mississippi Emergency Management Agency (MEMA)
Mississippi Emergency Management Agency (MEMA)
Mississippi Emergency Management Agency (MEMA)
MEMA Emergency Operations Center
MDOT
Statewide TMC
Mississippi Highway Patrol (MHP)
MHP Dispatch Centers
Hub City Transit
Hub City Transit
MDOT District 6
Maintenance and Construction Offices
Existing
Planned

Hattiesburg Region Intelligent Transportation System Architecture

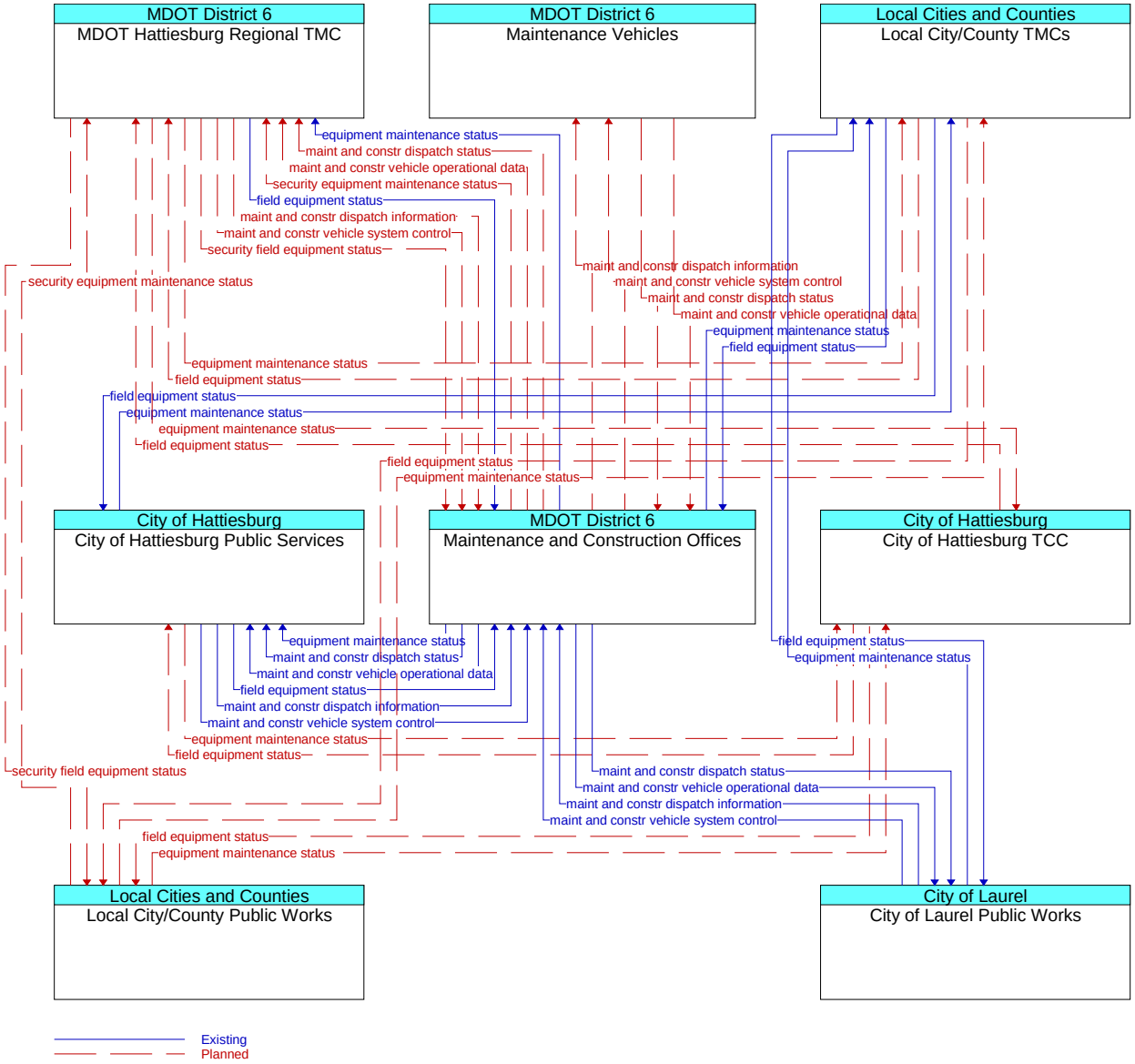



MDOT District 6
Maintenance Vehicles
maint and constr vehicle conditions
MDOT District 6
Maintenance and Construction Offices
Planned

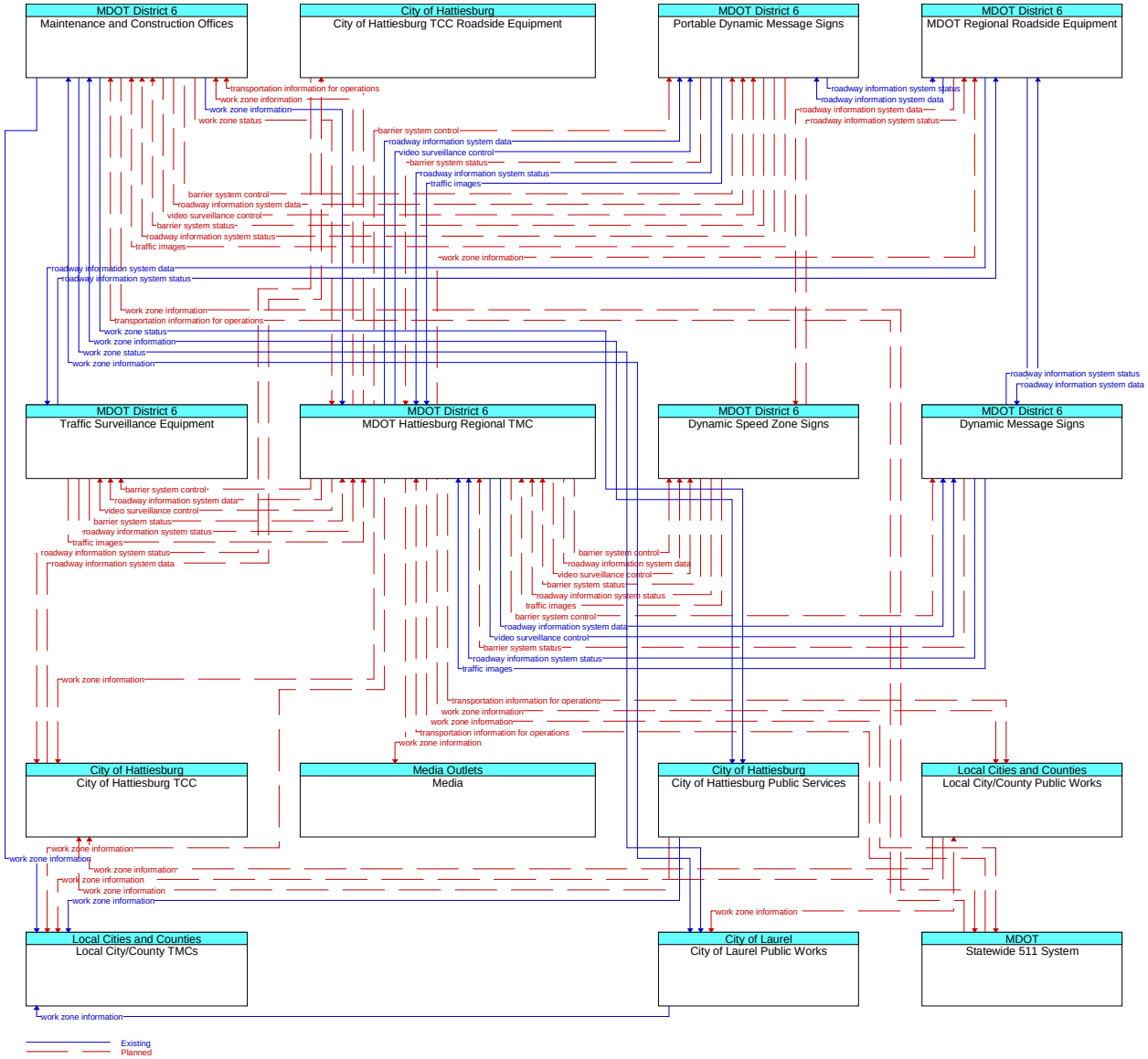
Hattiesburg Region Intelligent Transportation System Architecture



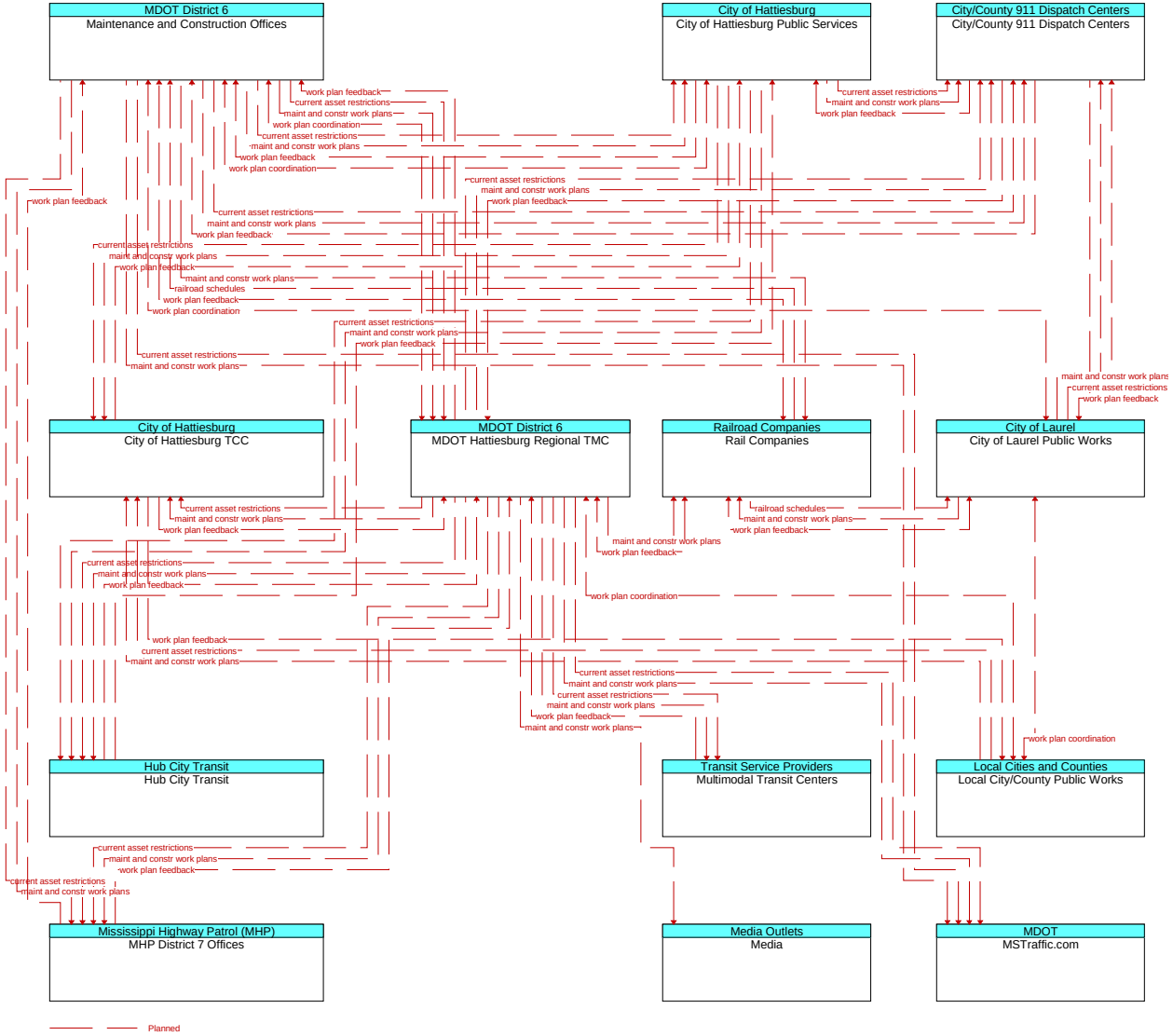
Hattiesburg Region Intelligent Transportation System Architecture



Hattiesburg Region Intelligent Transportation System Architecture



Hattiesburg Region Intelligent Transportation System Architecture



Appendix E: Stakeholder Meeting Minutes

MINUTES
Hattiesburg Regional ITS Architecture
Stakeholder Meeting #1

Cultural Center, Hattiesburg, MS
February 21, 2008

Meeting Participants:

Name	Organization	Phone	Email
Larry Joe Daughtry	Camp Shelby	601-558-2011	larry.joe.daughtry@us.army.mil
Bennie J. Sellers	City of Hattiesburg	601-545-4540	bsellers@hattiesburgms.com
Richard Thompson	City of Hattiesburg	601-545-4626	rthompson@hattiesburgms.com
Johnny Dupree	City of Hattiesburg	601-545-4501	mayor@hattiesburgms.com
Franklyn Tate	City of Hattiesburg	601-545-4541	ftate@hattiesburgms.com
V Wayne Landers	Forrest General Hospital	601-288-1005	wlanders@forrestgeneral.com
Ranzy Whiticker	GSP – Jackson, MS office	601-366-1845	ranzy_whiticker@gspnet.com
Laura Evans	GSP – Jackson, MS office	601-366-1845	laura_evans@gspnet.com
Audrae D. Barnes	Hattiesburg Public Schools	601-297-2181	audrae.barnes@hpsd.k12.ms.us
Vincent Nelms	Hub City Transit (Hattiesburg)	601-545-4670	vnelms@hattiesburgms.com
Lukeith Ridgeway	Laurel City Schools	601-649-6392	lukeith4@aol.com
Mike Essary	Neel-Schaeffer	601-545-1565	michael.essary@neel-schaeffer.com
Mike Stokes	MDOT	601-359-9710	mstokes@mdot.state.ms.us
Suzanne Dees	MDOT – District 6	601-544-6511	sdees@mdot.satte.ms.us
Kyle Wallace	Shows, Dearman & Daits	601-544-1821	kyle@sd-w.com
Jeff Smith	Temple Inc.	601-467-6840	jeffsmith@temple-inc.com
Bayne Smith	URS – Atlanta, GA office	678-808-8800	bayne_smith@urscorp.com
Joe Gillis	URS – Atlanta, GA office	678-808-8800	joe_gillis@urscorp.com
Bob Blevins	William Carey University	601-318-6155	bblevins@wmcarey.edu

ACTION ITEMS

Description	Responsible	Due Date
Submit stakeholder ITS surveys to Joe at joe_gillis@urscorp.com or via fax 678-808-8400	All	03/10/08

MEETING PURPOSE

The purpose of the meeting was to meet with and solicit input from the Hattiesburg Regional ITS Architecture stakeholders and explain the overall architecture process.

MEETING DISCUSSION

Mike Stokes gave an overview of the project to the group and Bayne Smith led the PowerPoint presentation. There was a good mix of stakeholder types; however most of the attendees were from in and around Hattiesburg. Lamar and Perry Counties had no representation. Throughout the presentation, there was significant stakeholder input. The following is a summary of the topics addressed and the discussion that ensued

The stakeholders were asked to list some of the surface transportation-related issue they see in the Hattiesburg Region

- Need to improve traffic flow efficiency – Would help to have traffic signals interconnected to the Regional and/or Local TMC and to have dynamic message signs (DMS) to notify the public when problems arise.

- Incident management – Quick response is hindered by the lack of a bypass loop around Hattiesburg; incident response must usually pass through local streets. The railroad tracks with at-grade crossings create route blockages- an alert system for oncoming trains was discussed.

- Camp Shelby – The presence of a large military training facility southeast of Hattiesburg creates a few challenges. There is congestion at the entrance on US 49 and a new entrance on US 98 is being promoted as an alternative. In the spring and summer, military vehicle convoys travel to and from the installation from other parts of the country. Being able to notify drivers in the area of the convoy locations would be helpful.

- Emergency management - The ability for the police, fire and EMS to more effectively route responses was mentioned. In addition, the ability for each agency to use ITS tools, especially CCTV for incident detection, validation and monitoring was also addressed. MDOT noted that using ITS in this manner, specifically recording video for later analysis, was not part of MDOT's policy. However it was recognized that other agencies that access ITS data would use real-time data for their own purposes. The group noted that emergency management agencies depend on real-time data being available and accurate.

- Special events – University (Southern Miss) and Convention events were mentioned as candidates for ITS solutions. One specific solution noted was adjusting signal timing in the vicinity of event traffic entering major thoroughfares. Also mentioned, was placing relevant messages on DMS to notify drivers of nearby events and parking information. Highway Advisory Radio (HAR) was also mentioned as a tool to help notify drivers of special events as well as in advance of Camp Shelby military vehicle convoy traffic.

- Public transit – Hub City Transit was mentioned as a solution to take vehicles off the roads by offering park-and-ride service into the city. MDOT has investigated ITS transit solutions across the state. Dr. Li Zhang from Mississippi State University has recently completed a bus preemption study that may be relevant to the needs of the region.

- Schools – Transportation to and from school is affected mainly by inclimate weather but could also be affected by other emergency situations that require evacuating the schools early on any given day. Being able to communicate information to the schools, buses and parents through all available means was discussed. One particular area along Hardy Street is reported to have 21 school buses entering at 2:45 p.m. each school day. For school evacuations, for ITS to be an effective tool, the appropriate plans first need to be developed. The use of AVL on school buses was mentioned as an available option for tracking bus location.

- Maintenance and construction – When roads are having major maintenance or construction performed that impedes traffic flows or a complete closure, ITS was mentioned as a tool to notify the public, the school system and the public safety community (police, fire EMS).

- Trailblazing – In the event of a closure on Interstate 59, ITS tools, such as portable DMS and HAR, in conjunction with an appropriate detour implementation plan, was discussed as a means to route traffic off the freeway through the main thoroughfares through Hattiesburg.

The group was also questioned as to what ITS projects had been completed or were planned. The following items were mentioned:

- Fiber optic cabling – four projects are planned or underway which traverse the main thoroughfares in Hattiesburg – US 98, US 49, US 11, Hardy Street and 4th Street. The group recognized that the laying of a fiber infrastructure is needed before ITS can begin to be implemented in full. The City of Hattiesburg alone is approaching 100 traffic signals of which many are along state routes and would be managed by the proposed Regional TMC.

- Fiber optic expansion to neighboring cities – Neighboring Petal could be connected to the Hattiesburg fiber optic network along Hardy Street, old State Route 42 and the Evelyn Gandy Parkway (new State Route 42) via Interstate 59. Such a connection could benefit the Petal Police Department and City Hall.

- Camp Shelby security system – Camp Shelby is responsible for monitoring a 50-100 acre area for performing tactical training. They employ a series of CCTV which are monitored during training operations. Such a system was mentioned as a possible model for other ITS operations in the area.

NEXT STEPS

- Stakeholders to return surveys and comments by Monday, March 10th
- Consultant steps
    - Consolidate Stakeholder input
    - Prepare Draft Regional ITS Architecture (Chapters 1-8)
    - Hold Second Stakeholder meeting to review draft and discuss the remaining chapters to be completed

MINUTES
Hattiesburg Regional ITS Architecture
Stakeholder Meeting #2

Sherrill Community Center, Hattiesburg, MS
May 21, 2008

Meeting Participants:

Name	Organization	Phone	Email
Bennie J. Sellers	City of Hattiesburg	601-545-4540	bsellers@hattiesburgms.com
Richard Thompson	City of Hattiesburg	601-545-4626	rthompson@hattiesburgms.com
Ranzy Whiticker	GS&P – Jackson, MS	601-366-1845	ranzy_whiticker@gspnet.com
Laura Evans	GS&P – Jackson, MS	601-366-1845	laura_evans@gspnet.com
Rodney Chester	GS&P – Atlanta	678-518-3891	rodney_chester@gspnet.com
Eddie Daniels	Hattiesburg Public Schools	601-585-7325	656 W. 4th St; Hattiesburg, MS 39401
Mike Essary	Neel-Schaffer	601-545-1565	michael.essary@neel-schaffer.com
Mike Stokes	MDOT	601-359-9710	mstokes@mdot.state.ms.us
Suzanne Dees	MDOT – District 6	601-544-6511	sdees@mdot.state.ms.us
Kyle Wallace	Shows, Dearman & Daits	601-544-1821	kyle@sd-w.com
Jeff Smith	Temple Inc.	601-467-6840	jeffsmith@temple-inc.com
Bayne Smith	URS – Atlanta, GA	678-808-8800	bayne_smith@urscorp.com
Joe Gillis	URS – Atlanta, GA	678-808-8800	joe_gillis@urscorp.com
Bob Blevins	William Carey Univ.	601-318-6155	bblevins@wmcarey.edu
Acey Roberts	MDOT – Traffic Eng.	601-359-1454	aroberts@mdot.state.ms.us
Jeff May	USM	601-266-6203	jeffery.may@usm.edu
Robert Hedgepeth	USM	601-266-6320	robert.hedgepeth@usm.edu
Homer Coffman	USM	601-266-4190	homer.coffman@usm.edu
Valerie Craig	USM	601-266-5010	valerie.craig@usm.edu
Christopher Carr	Hattiesburg MPO	601-545-6220	ccarr@hattiesburgms.com
Billy Lane	Hattiesburg Police	601-545-4966	blane@hattiesburgms.com
Andy Cartilidge	Hattiesburg Fire	601-545-6678	acartlidge@hattiesburgms.com

MEETING PURPOSE

The purpose of the meeting was to meet with the Northwest Regional ITS Architecture stakeholders to go over the draft Chapters 1 thru 8 of the Architecture document and to obtain feedback on issues that remain to be written in Chapters 9 thru 12 of the document.

MEETING DISCUSSION

Mike Stokes gave an introduction to the meeting by summarizing the overall purpose of holding ITS Stakeholder meetings and how they relate to developing a regional ITS architecture. Bayne Smith and Joe Gillis presented the PowerPoint explaining the status of the ITS Architecture development process. Also as part of the presentation, for the benefit of the first timers, an

overview of ITS and Regional ITS Architectures was presented. The following topics were introduced and discussed over the course of the meeting:

- Real-World application of ITS: The group discussion was directed by talking about specific ways that stakeholders could implement ITS for their needs. Issues discussed in the first stakeholder meeting were reviewed and confirmed. Some of these issues included hurricane evacuation and communication to school buses.

- Communications infrastructure: The group talked about the laying of Fiber Optics in the region and the USM group indicated an interest in working with MDOT in establishing a communication network across the State that would connect the major universities and colleges. This network would have some bandwidth to share with MDOT ITS communications.

- Event management: USM has established a Center for Spectator Sports Security Management: http://www.sporteventsecurity.com/contact.php. Research being done would include ITS as part of their end solution. USM would be a natural test location for such a system once developed.

- Interagency cooperation: One topic that was discussed among the group was interagency cooperation. Such cooperation was heralded as a key to a successful regional ITS implementation. Cooperation between the transportation/planning and the public safety sectors was highlighted and specific examples of such cooperation were enumerated.

A group exercise was completed by the group. This exercise asked each participant to review a list of ITS User Services and indicate those which were a priority – high, medium or low. For each survey, services given 'high' priority were given 2 points and those given 'medium' priority were given one point. Totals were tallied and the following was the outcome:

Highest Scores (20-25):
- Incident Management
- Hazardous Materials Security and Incident Response
- Emergency Notification and Personal Security
- Emergency Vehicle Management
- Disaster Response and Evacuation
- Maintenance and Construction Operations

Next Highest Scores (15-19):
- En-Route Driver Information
- Route Guidance
- Traffic Control
- Public Transportation Management
- Public Travel Security
- Intersection Collision Avoidance
- Vision Enhancement for Crash Avoidance

Each participant was given a copy of the meeting PowerPoint slides and a copy of the minutes from the first meeting.

NEXT STEPS

- Consolidate Meeting notes
- Revise Chapters 1-8
- Draft Chapters 9-12
- Stakeholder review by July 11, 2008
- Revise Final Report by July 25, 2008
- Present Final Report by August 1, 2008