

Mississippi Multiplan ITS Component

Statewide ITS Vision

Overview of Mississippi's Statewide ITS Vision

Mississippi is one of the first states to incorporate a strategic plan for Intelligent Transportation Systems (ITS) fully within the framework of its long range multimodal transportation plan. To this end, the Mississippi Department of Transportation (MDOT) is focused on applying ITS technology where such applications contribute to statewide goals and objectives and support the State's other non-ITS policies, investments, and initiatives. While MDOT realizes the importance of continuing to expand its capital infrastructure (e.g. roadways, intermodal ports, airports and transit facilities), the State views ITS as a tool to better operate and manage these capital assets. Thus the State believes that the success of its capital program will be closely linked with the technology and management (including ITS) strategies it adopts.

Accordingly, MDOT is working to increase the participation of non-traditional stakeholders, such as emergency service providers, port operators, tourism industry representatives, the media, and others in the transportation decision making processes throughout the State. MDOT also recognizes that the State's transportation challenges vary from region to region and that locally tailored ITS solutions must be developed. As such, the State will continue to work with MPO's and other local agencies and transportation providers to plan, design, and implement flexible and scaleable ITS strategies. At the same time, MDOT realizes that ITS solutions are most effective when systems are integrated, information is shared, and regional strategies are coordinated at the statewide level. Such coordination will minimize duplication of effort, help local agencies achieve economies of scale when procuring technologies, and lower the risk of deploying incompatible components by promoting the use of established ITS standards. Since few ITS applications have been deployed in Mississippi to date, the State recognizes the opportunity to think strategically since we are starting with a relative "blank slate" and thus the complexities of retrofitting existing equipment is not a significant challenge.

Development of the ITS Vision: Using Stakeholder Issue Statements to Define ITS Objectives

The Mississippi ITS Vision was formulated after consulting MDOT and meeting with transportation stakeholders representing the State and the Jackson, Gulf Coast, Hattiesburg, and Desoto County metropolitan areas in April and May 2001. These workshops explored the key transportation issues and challenges in the regions and resulted in the development of 178 issue statements. To better understand and prioritize the overarching transportation concerns throughout the State, several high-level ITS objectives were identified that were representative of the issue statements received. All the issues could be mapped to one or more of the following objectives:

- Improve traveler information services
- Improve incident and emergency management operations
- Better manage and mitigate congestion
- Promote and improve transit service and travel demand management alternatives

Improve the efficiency and safety of goods movement and intermodal operations

Improve arterial traffic management and signal operations

Provide for locally specific goals/needs

In addition to these high-level ITS objectives that were synthesized from the full set of recorded issue statements, two additional priorities were revealed. While these (as well as several of the specific local concerns) may not be readily addressed through ITS, they were voiced frequently enough to warrant inclusion in this Vision. MDOT will develop recommendations for these objectives as the Multiplan effort evolves. The two additional “non-ITS” objectives identified are:

Improve interagency / interjurisdictional coordination, cooperation, and information sharing

Increase driver education, compliance with traffic laws, and driver performance

To gain some perspective on the relative importance stakeholders assigned to the various objectives, a tabulation of the number of issue statements related to each of the objectives was performed. Figure 1 shows the frequency distribution of the results of this tabulation. Note that since one issue statement could be mapped to several objectives, the total frequency of all the objectives exceeds the total number of issue statements (178). The data in Figure 1 should be viewed with some caution for a couple of reasons. First, most issues cut across functional areas. For example, while the need to improve traffic signal operations most naturally addresses the “Arterial Operations” objective, it can also support the congestion management, incident management, and other objectives. Although an attempt was made to appropriately map the issues to objectives, this process is somewhat subjective and thus some margin of variability should be assumed in the final numerical “scores” shown.

Second, to a large extent, the priorities that emerged from the stakeholder workshops were reflective of the particular stakeholders who participated. Thus the relatively low tally of intermodal/goods related issue statements is probably indicative of the fact that this community was not strongly represented in the workshops. Notwithstanding these statistical considerations, the figure does provide some clues as to the types of ITS strategies that appear to have broad support among Multiplan constituents. This information will help set the priorities for future Multiplan tasks, such as identifying candidates for early-start projects and determining the central functions of the Statewide ITS Architecture.

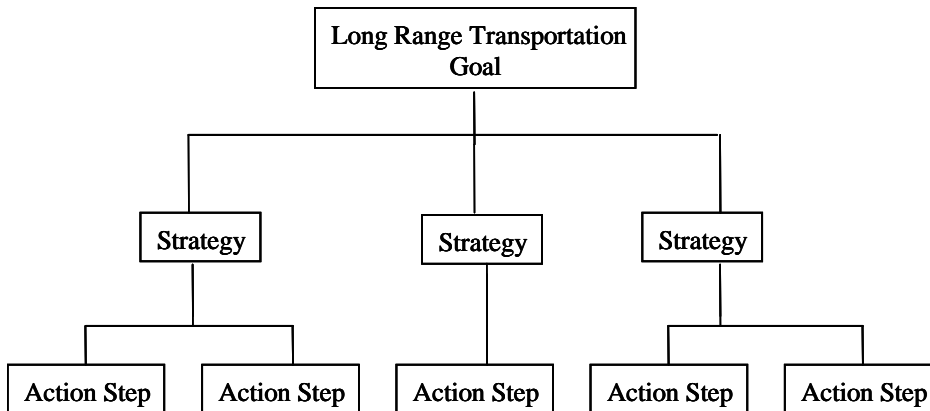


Figure 1. Breakdown of Mississippi Stakeholder Transportation Issues

Definition of Mississippi ITS Vision

Mission Statement

Unlike other States whose metropolitan (and in some cases even non-metropolitan) regions suffer from extreme traffic congestion on a regular basis, the general view from the stakeholders interviewed throughout Mississippi was that, with the exception of some localized areas, regularly occurring traffic congestion was not one of the most pressing challenges in the State. Rather, themes such as providing more timely and useful traveler information, improving hurricane evacuation coordination, improving the perception of public transit, and providing more effective incident management were touted to be the critical needs for improving transportation services. Based on the themes represented in the individual issue statements, the following unifying Mississippi Statewide ITS Mission Statement was formulated:

It is the Mission of the Mississippi Department of Transportation to use ITS technologies to improve the quality of life for State residents and visitors by providing more reliable, informative, safer, and flexible passenger and freight multi-modal transportation services.

Linking Stakeholder Issue Statements to User Services and Multiplan Goals

To facilitate the mapping of stakeholder issue statements to ITS User Services and to ensure that the ITS Vision is consistent with the overall framework of Multiplan, the full set of issues was distilled down into 14 representative ITS strategies that will support the problems and concerns reflected in the issue statements. As shown in Figure 2, Multiplan identifies long range transportation goals, strategies to achieve these goals, and action steps to implement the strategies.

Figure 2. Multiplan Goal Framework

The following nine long range transportation goals are defined in Multiplan:

1. Improve mobility for Mississippi's people, commerce, and industry
2. Ensure high standards of safety in the transportation system.
3. Provide a transportation system that encourages and support Mississippi's economic development.
4. Improve intermodal efficiency and connectivity in transportation systems.
5. Establish and maintain effective transportation system management processes.
6. Maintain and preserve Mississippi's transportation system
7. Ensure that transportation system development is sensitive to environmental and energy conservation concerns.
8. Provide a sound financial basis for the transportation system.

For each goal, a set of strategies and action steps are defined to achieve the goals envisioned. Thus the formulated ITS strategies can be directly incorporated into the Multiplan goal framework. Using the same goals for the ITS strategies and those developed for the overall transportation plan will further promote the mainstreaming of ITS initiatives in Mississippi. The ITS action steps will be represented by the prioritized Market Packages identified in subsequent tasks.

The *National ITS Program Plan* describes 31 ITS User Services that identify particular needs that

can be addressed by ITS. The User Services represent the inputs to the National ITS Architecture, and by extension, the State and regional ITS architectures developed throughout the country. Table 1 lists the ITS strategies derived from stakeholder comments, the User Services that can fully or partially address the strategy, and the Multiplan goal that is supported by the strategy (numbered according to the list above) and User Service. As shown in Table 1, 19 User Services have been identified. One of these, *Disaster Response and Evacuation* is not a User Service defined in the National ITS Program Plan. As such, it represents a locally (i.e. Mississippi) defined User Service.

As noted earlier, several of the individual issue statements focused on issues that, to a large degree, cannot be directly addressed through ITS. Three consolidated issue statements for these non-ITS needs were defined as follows:

- Politicians / decision-makers place emphasis on local/parochial concerns and have less enthusiasm for overall regional needs
- More stringent driver education and law enforcement activities are needed
- Roadway and / or parking infrastructure capacity is inadequate (e.g. two lane roads, parking garage space limitations).

Table 1. Mississippi ITS Strategies, Related ITS User Services, and Multiplan Goals Supported by the Strategy

ITS STRATEGY	MULTIPLAN GOALS SUPPORTED BY STRATEGY	RELATED USER SERVICE(S)
Provide travelers with better, more accurate information such as construction, alternative routes, transit, tourism, airport, HRI lane closures, and parking.	1,3	1. En-route driver information 2. Route guidance traveler services information 3. En-route transit information pre-trip travel information 4. Pre-trip travel information 5. Regional Parking Management 6. Parking Facility Management
Improved incident and event multi-jurisdictional management, procedures, coordination, telecommunications, and information exchange.	1,2,5	7. Incident management 8. Traffic control 9. Emergency notification and personal security 10. Regional Parking Management

Improve interagency coordination on signal and system operations.	1,5	11. Traffic control
Make transit a more viable transportation option by improving public perception, improving transit traveler information, and operations (e.g. signal priority).	1,4,5,7	12. Public transportation management 13. Personalized public transit
Improve highway-rail intersection operations to reduce accident risks and make arterial traffic operations more efficient.	1,2,4,5	14. Highway rail intersection
Improve commercial vehicle information/routing/management better efficiency and improved safety.	1,2,3,4,7	15. Commercial fleet management 16. Commercial vehicle administrative processes 17. En-route driver information 18. Pre-trip travel information 19. Route guidance
Optimize signal timing, operations, and coordination at the interface between neighboring jurisdictions.	5	20. Traffic control
Collect better, more complete historic traffic and travel data to improve planning and analysis.	6	21. Archived data function
Provide emergency responders with real time traffic data, easier accessibility to scenes (e.g. around grade crossings), and better route guidance capabilities.	1,2,5	22. Incident management 23. Emergency vehicle management 24. Route Guidance

Expand travel demand management (e.g. ridesharing) opportunities	1,7	25. Travel demand management 26. Public transportation management 27. Traffic control
Establish better information and coordination among agencies during disasters and weather emergencies	1,2,5	28. Disaster response and evacuation*
Utilize lane and speed control strategies in certain situations (e.g. evacuations, severe weather).	1,2,5	29. Traffic control 30. Disaster response and evacuation*
Improve the management of hazardous materials shipments and consider additional HAZMAT route restrictions.	2	31. Hazardous material incident response 32. Commercial vehicle administrative processes
Develop comprehensive and well-coordinated evacuation plans.	1,2,5	33. Natural disaster response and evacuation*
Improve the efficiency of inspections and container-tracking processes at intermodal terminals.	3,4	34. Commercial vehicle electronic clearance 35. Commercial vehicle administrative processes

**This User Service must be locally defined. No such service exists in the National ITS Program Plan*

Relationship between Statewide and Regional ITS Planning and Operations

MDOT will play a leading role in providing the strategic direction and coordination for ITS within the State. This will help ensure that the benefits of compatibility, consistency, and statewide systems integration are realized. MDOT will oversee the development and implementation of guidelines for statewide project development and resource allocation. MDOT will focus on statewide and multi-regional functions and priorities, while facilitating consistent program implementation by local operators. The statewide stakeholder workshop participants provided several broad recommendations to help guide MDOT's ITS program. Many of these recommendations are reflected in the ITS strategies and User Services previously identified and are generally applicable throughout the State. Other observations, including some non-ITS considerations, raised by the statewide constituents are as follows:

Statewide

The "distance learning" concept was provided as an example of how specific needs could be addressed without requiring travel. Opportunities for using the Internet to support tourists (e.g. information on State traffic laws, real-time conditions, and other travel services information)

should also be explored.

Much can be gained by educating the public so that they can make more informed travel decisions. The "GO MDOT" website should be as comprehensive and complete as possible and that travelers should be educated in its information and functions.

Better incident detection and notification is needed in rural areas.

The focus of ITS initiatives should not be centered on technology, but rather ITS should be promoted as a tool to improve operations and management and to provide improved customer service.

Many drivers lack fundamental driving skills and understanding and/or are unwilling to abide by the "rules of the road". As such, education must be a part of the strategies that are generated as part of Multiplan.

The media is a potentially valuable outlet for both delivering traveler information and for educating the public. Thus far, however, they have not been sufficiently utilized.

Fatal / injury accident investigations at crash sites should be completed more quickly and result in less of traffic disturbance.

Telematics applications (e.g., in-vehicle navigation and communications services using Wireless Internet or similar technologies) were not found appealing due to their perceived adverse safety implications. It is noted these are largely being developed by the private sector and the major implication to the public sector would be the desire for a standard information interface accessible by the various service providers.

A statewide geo-reference standard is needed to achieve effective agency coordination opportunities.

Despite the importance of statewide consistency, MDOT recognizes the unique needs, challenges, and circumstances of various regions. As such the issue statements collected that have particular regional or local implications need to be considered. The following statements represent the major locally specific concerns raised during the workshops:

Gulf Coast

- There is inadequate advance information on specific weather conditions (flooding, smoke, fog).
- Casino industry interest in providing door-to-door delivery of passengers is not compatible with Coast Transit Authority operations.
- There is inadequate cooperation from other states in emergency management. One cause of the difficulty is that Louisiana is in a different FEMA region.
- Current fixed route transit services do not adequately address casino employee shift changes and lunch-time travel of CBD workers.
- Coast Transit believes they are often not invited to participate in local planning (such as event planning) activities.
- There is a need to provide improved guidance to available parking at the airport, casinos, and CBD attractions.

Jackson

- Travelers to special events, especially at the Fairgrounds, are not provided with adequate guidance and parking information.
- Parking capacity at the airport is not sufficient to meet demand especially for holidays.
- Remote areas (e.g. parts of Hinds County) have unreliable and incomplete communications coverage.
- In some areas of the region, insufficient transportation capacity is provided to accommodate new development (basic planning is lacking).
- Predicting train arrivals at grade crossings is difficult due to the high number of non-scheduled train service in Jackson.
- Parking capacity at airport is not sufficient to meet demand.
- The mix of commuter traffic and airport ingress/egress traffic results in heavy congestion and a significant number of flow conflicts.
- Improved information needs to be provided to the public related to the status of flights at the airport.
- The increased number of travelers during college breaks (e.g., Spring Break) increases traffic congestion and overwhelms the airport parking facilities.

Hattiesburg

- High truck volumes through downtown area negatively affects traffic flow
- US 49 is subject to flash flooding. Improved flood warning systems are needed
- Roadway capacity in east-west direction is not sufficient
- There is insufficient parking capacity.
- Despite traffic signal timing improvements, many arterials in Lamar County do not adequately handle congestion because they are only two-lane facilities.
- Emergency evacuation plans needs to be formulated for unanticipated events, such as a potential leakage or fire at the gas plant in Petal.

Desoto County

- Although interagency coordination is a general statewide concern, the issue is especially acute in Desoto County which needs use and funding agreements to address issues such as procurement, staffing, control issues concerning systems that cross *state* boundaries.
- Increasing truck distribution centers off US 78 will increase the intensity of truck activity.
- Air quality concerns are increasing.
- Road capacity expansion has not kept pace with development.
- Traffic volume growth and change in vehicle composition has exceeded capacity of current interchanges.

Incorporating ITS into Traditional Project Development Activities

Although almost universal support for ITS was expressed by the stakeholders interviewed throughout Mississippi, all the regions noted that expanded transportation infrastructure would be needed. That is while ITS can serve as an important tool for improving transportation services, basic capacity constraints dictate that ITS can not substitute for traditional improvements, such as road building, parking facility construction, and transit expansion.

Given that traditional transportation construction and maintenance will continue to be a top priority for the State and local jurisdictions, strategies for including ITS equipment/technologies into these programs and projects need to be developed. MDOT will work to establish guidelines to assist in “mainstreaming” ITS in this manner. Some ways ITS infrastructure can be matched to traditional

capital projects include:

1. Installing fiber optic cable, CCTV cameras, variable message, and highway advisory radio equipment during roadway and bridge reconstruction/rehabilitation
2. Installing loop and video detection, CCTV cameras, fiber optic and twisted pair infrastructure during intersection / interchange improvements
3. Installing “smart parking” equipment, transit information signs, and information kiosks during parking facility / garage construction
4. Procuring transit vehicle priority, automatic vehicle location technology, and electronic payment equipment as part of the specifications for new buses to be purchased.

Next Steps

This Vision Statement will be used to as the foundation to begin identifying ITS market packages, which represent deployment-oriented ITS architecture elements. The market packages, in turn will be used as the building blocks for development of the Statewide ITS Architecture and for defining the early start ITS project(s). These market packages will form the basis for development of a preliminary concept of operations for ITS in Mississippi, including statewide and regional functions.