

Mississippi River bridges ITS Tiger III Project Incident Management, Freight Movement and Security Project

Primary Author: Micheal Stokes, Mississippi Department of Transportation

Secondary Author(s): None Listed

The Mississippi River is the major north-south waterway for river cargo vessels and forms the border between Mississippi and its neighboring states of Arkansas and Louisiana to the west. It transports almost 200 million tons of materials, grain, freight, and manufactured goods through this section every year. Because of its broad width and wide flood plains, it is also a significant barrier to east-west ground transportation. The number of roadway and rail crossings over the Mississippi River is limited and all are critical links in the regional and national transportation network. There are only four highway river crossings in Mississippi, all of which are US or Interstate Highway routes.

This innovative Intelligent Transportation System (ITS) project was recently awarded \$9.8 Million in the TIGER III program for the design and construction of an integrated bridge, highway and river monitoring and information dissemination system at and around the four Mississippi River crossings. Once constructed, the three partner states will collaboratively operate and manage this system to the benefit of all transportation users in the region. All of these locations are critical parts of the region's surface and marine transportation network, serving multi-modal interstate commerce and east-west travel that, when disrupted, creates strain on other parts of the network with significant economic, safety and mobility impacts to the region.

When these bridges are restricted or closed due to either planned or unplanned incidents, such as traffic crashes, lane closures, flooding, or strikes from passing barges, motorists and river traffic may both experience extended and costly delays. Each of the four bridges serves as a detour route for the other bridges and this project will help to both prevent potential closures as well as better manage them when a closure does occur. The bridge crossing locations include the following specific facilities: US 49 bridge in Helena, Arkansas, US 82 bridge in Greenville, Mississippi, I-20 bridge in Vicksburg, Mississippi, and US 84 bridge in Natchez, Mississippi.

The project implements comprehensive ITS technologies (CCTV surveillance cameras both above and below the bridge, vehicle detection devices, dynamic message signs, highway advisory radio, and fiber optic communications) to allow for better management and traveler information dissemination of traffic, security, construction or maintenance incidents that require traffic to be restricted or diverted. These devices will also be strategically located at the eastbound and westbound approaches to the bridges, and along designated detour / diversion routes to provide direction and confirmation to motorists.

In addition, Real Time River Current (RTRC) data sensors will be installed to measure both the flow rate and water levels to alert watercraft, ports and maritime officials of dangerous currents before they reach the bridges. This type of critical real-time current information will be able to reduce the potential for barge crashes with bridge piers that have occurred in the past due to swift and unexpected currents.

The placement of Road Weather Information Systems (RWIS) on the bridges enhances the opportunity for the operating agencies to keep the bridges open during severe weather events. Knowing the roadway conditions provides added protection for emergency workers and enables timely /earliest re-opening of the bridges based on accurate real-time conditions. Each river crossing will function as a discrete subsystem with integrated devices connected with a fiber optic communications backbone. The project includes the necessary software and integration of the system to local transportation management centers (TMCs) and emergency operations centers (EOCs) to provide for real-time incident

response and traffic management to monitor conditions on the bridges and actively route motorists to avoid congestion, incidents, emergencies, and scheduled maintenance activities.

The monitored information will also be aggregated and transmitted to the TMCs in Jackson, Mississippi, Little Rock, Arkansas and Baton Rouge, Louisiana, and shared via existing communications links with system managers in Memphis, Tennessee. Connection to the statewide TMC's provides and enhances the opportunities for connection to other Emergency Operations Centers run by the Corps of Engineers, state and local emergency management agencies as well as local law enforcement, state police/patrol and other emergency responders. The information from this system will also be transmitted to the travelling public through the 511 traveler information systems, traffic management websites and other traveler information dissemination techniques.

The project's surveillance, detection, communications, information dissemination, and weigh-in motion systems support CVISN program goals, providing stakeholders with critical safety information, automated inspection, and hazardous materials response enhancements. The operational components of this project will also include the formation of a tri-state Traffic Incident Management (TIM) coalition to implement unified, multi-disciplinary policies, procedures and practices that will dramatically improve the way highway traffic and river related incidents are detected and managed along the highway corridors and the river.