

NEWSLETTER

MDOT's Video Migration: The Cleaner, Cheaper, Greener Alternative

MDOT has developed and begun implementation of a new hybrid, real-time video distribution system utilizing the latest compression technologies. The system, which leverages H.264 technology and media servers, allows MDOT to provide live streaming video of its cameras statewide, across multiple platforms, both internally and externally, and on demand, reducing network bandwidth, equipment needs, costs, and system complexity along with power and energy consumption. The use of this technology supports efforts to create a more sustainable environment for the future.

The need to share video has increased as the ITS industry has grown; however, limitations have surfaced as the technologies evolved. MDOT and its integration team used lessons learned to develop a video distribution solution for the on demand environment. Through this effort, a solution was found that would limit the number of video streams on the network and provide them in formats readily useable on both the internal MDOT ITS network as well as externally, for distribution to partner agencies, emergency responders, and the public.



Incorporating both aspects of multi-cast and unicast transport types, the new system is now easily able to distribute video in a multi-cast manner, while using only unicast streams packaged with real-time header information. Using H.264 video format, MDOT is now capable of distributing video over varying network topologies and to external viewers while delivering the content in real-time.

MDOT was able to replicate the costly traditional multicast transport method with off-the-shelf software capable of mimicking the job of the switch or router in the multicast operation. The new method allows for video to traverse any

- "Migration" continued on page 3

MDOT Working to Establish Traffic Incident Management Program in Jackson Metro

Efforts are currently underway to establish a Traffic Incident Management (TIM) program in the Jackson metro area to increase coordination and information sharing among emergency response agencies for traffic incidents. Supporting the goals of the National Traffic Incident Management Coalition, the focus of the TIM program is to increase safety of motorists and responders and reduce incident response and clearance times through effective communication and information exchange among interoperable agencies. Composed of a committee of first responders, such as law enforcement, fire and rescue, and emergency medical services personnel, members can share valuable information, lessons learned, and input to help improve future traffic incident management procedures.

Effective communications, information exchange, and shared use of supporting technologies are vital for an effective TIM program. MDOT plans to use ITS technologies to assist TIM partners, and leverage the mstraffic network and Statewide Traffic Management Center (TMC) to support information exchange and promote safety on Mississippi roads.

Meetings will be held May 25 and 26 to introduce the TIM program to the Jackson metro emergency response agencies. The first meeting on the 25th will be for senior leadership of the Jackson metro emergency response agencies and the second meeting on the 26th will include individuals working at the

- "TIM Program" continued on page 4

MDOT's Smart Roadside Project

The Mississippi Department of Transportation has recently implemented a Smart Roadside System as part of its Smart Roadside Project. The System provides an integrated multi-sensor electronic screening solution, allowing MDOT enforcement the ability to check commercial vehicles' compliance with safety regulations while avoiding interference with the flow of commerce. Funded by \$3.5 million in Commercial Vehicle System and Network (CVISN) grants from the Federal Motor Carrier Safety Administration, MDOT's Smart Roadside Project is the first in the nation to utilize three smart roadside applications.

Applications in the project include upgrades to fixed weigh stations, virtual weigh stations and an Infrared Inspection System (IRIS) Van. Components in the project include Weigh-in-Motion equipment, automated license plate recognition, automated US DOT number recognition, cameras, and an integrated electronic screening software suite. This screening software utilizes user-friendly interfaces and back-end database query functionality, enabling access to various national databases for information on specific commercial vehicles.



DEMONSTRATION OF MDOT'S RECENTLY INSTALLED SMART ROADSIDE ELECTRONIC SCREENING SYSTEMS AT THE ORANGE GROVE WEIGH STATION

fixed weigh station uses WIM sensors for their first sorting process," explained Nan Tarlton, MDOT CVISN Project Director. "The WIM weighs the vehicle at highway speed, and the cameras capture the license plate and the USDOT number. The system then determines if the commercial vehicle is overweight and has proper credentials."

Adding to the Projects' applications, the IRIS Van is equipped with infrared thermal imaging technology and provides MDOT enforcement the mobility and versatility to ensure brakes are working properly on commercial vehicles without physically stopping and inspecting the vehicle. As pressure is applied to properly functioning brakes, heat is generated and glows bright white on the thermal imaging screen. Enforcement officers will monitor the imaging screens to check for underinflated or blown tires, as inoperable brakes will show little or no white light at all. Similarly, officials can also monitor for

leaky exhaust via the thermal imaging displays. The Van also houses overhead cameras, license plate and DOT number readers, and can link to the central database. In addition, the advantage of its mobility allows travel to remote areas or secondary roads which do not have fixed weigh stations.

Virtual weigh stations using Weigh-in-Motion sensors have also been employed to monitor secondary roads. The sensors, initially deployed by the MDOT Planning division for data collection and project planning, have proven additionally useful for MDOT's Enforcement division in checking passing commercial vehicles. Like with IRIS Van, the virtual weigh stations are outfitted with overhead cameras, license plate and DOT number readers, and a link to the database. There are currently two virtual weigh stations installed in Mississippi, one on Highway 27 in Warren County and the other on Highway 51 in Desoto County.

"The integration of this project has been important to all involved within MDOT as well as other traffic management agencies," said Nan Tarlton, MDOT CVISN Project Director. "This collaboration has made the overall system stronger and ultimately, the road safer. The Smart Roadside System is an efficient and cost effective way to keep commercial vehicles traveling safer on Mississippi highways."

Along with the versatility, mobility and collaborative benefits that have been realized from the system are cost and time savings that are associated with it. Studies show it costs the trucking industry \$100 and 45 minutes every time a truck is stopped and inspected. While officials were previously forced to randomly choose trucks to stop and inspect, they now have the ability to use the data and applications deployed on MDOT's Smart Roadside Project to monitor vehicles and only stop those that require further inspection. In addition, the IRIS Van cost was \$498,000 and the virtual weigh stations costs ranged from \$500,000 to \$800,000. In comparison, it costs anywhere from \$7-12 million to place a permanent weigh station, a true testament to the savings of the technology deployed in this project over the traditional approach.



SERGEANT JASON RICKMAN CHECKS THE BRAKES AND LICENSE PLATES OF TRACTOR-TRAILERS AS THEY PASS THE MDOT'S NEW SMART ROADSIDE INSPECTION SYSTEM MOBILE VAN. PHOTO BY JB CLARK

- "Migration" continued

network that can handle standard IP packets, regardless of the network topology or multicast capabilities. The media server can supply thousands of simultaneous users while only receiving a single stream from the source encoder, drastically reducing the load on the server. The media server, at the same time, also repackages the video from different transport types required by various platforms, such as iPhone and Adobe Flash, allowing for a reduction in duplicated hardware and distribution delay.

With the new system in place, the amount of hardware, heat and power consumption in the equipment room of the Statewide TMC will be greatly reduced. Prior to the upgrades to the system, MDOT was using 37 high end servers to recompress analog video to Windows Media Format for display

MDOT's video distribution system to reduce carbon footprint by about 260 Metric tons of CO2 per year, equivalent to 65 round trip flights from Jackson, MS to Tokyo, Japan.



Southaven equipment cabinet after conversion

on the msTraffic.com website. The computers, along with other supporting equipment, are being replaced with a single media server and three encoder chassis. Once the migration is complete the footprint will be reduced by approximately 6 - 96" equipment racks in Jackson. The power consumption of the video distribution equipment will also be reduced from roughly 39,000 to 3,000 watts and the heat from 123,000 BTU to 8,400 BTU. This will result in an estimated savings of more than \$35,000 in electricity costs per year.

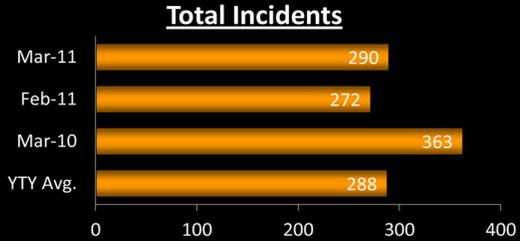
The reductions in heat and electricity not only translate to the yearly electricity cost savings but also to the environment. Through this migration effort, the Carbon Footprint caused by MDOT's video distribution system will be reduced by about 260 Metric tons of CO2 per year, equivalent to the carbon footprint of about 30 Ford F 150 Pick up trucks driven in a year or 65 round trip flights from Jackson, MS to Tokyo, Japan.

In this migration effort, MDOT has created a solution for distributing video across networks, systems, and multiple platforms easier, cheaper, more efficient, and better for the environment.

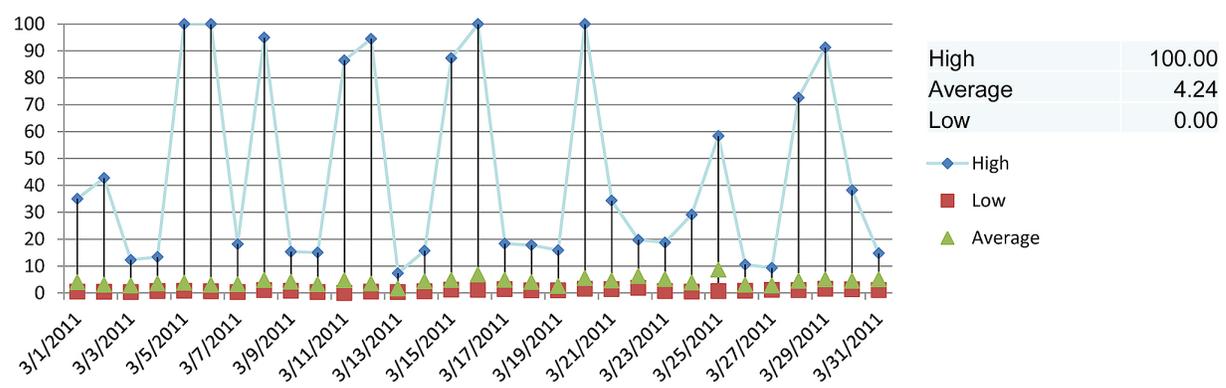
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TRANSPORTATION MANAGEMENT CENTER

March 2011 Performance Measures



Internet Bandwidth Traffic



- "TIM Program" continued

operational level. Gary Millsaps, Delcan Incident Management Specialist, will be a guest speaker to educate attendees on the importance of a TIM program and its success in the metro Atlanta area.

"The meetings will be introductory briefings to help response agencies become familiar with the concept of a TIM program and work initially to increase information sharing," said John Gilligan, Statewide TMC Manager.

The TIM program is an initiative to ensure the safety and mobility of all travelers while taking the necessary steps to restore normal traffic

flow as quickly and safely as possible after an incident occurs. Working cooperatively to safely and efficiently manage traffic incidents, MDOT and identified TIM partners will be able to develop and maintain a sustainable, dedicated, and active TIM program to keep motorists in Mississippi moving forward.

DID YOU KNOW?

- 50%** of traffic delay is caused by incidents
- 25%** of these incidents are non-recurring incidents
- 20%** of incidents are secondary crashes
- 20%** of secondary crashes involve fatalities

Percentages are according to the 2010 Traffic Incident Management Handbook published by the U.S. DOT and FHWA.

Ask Mike

Q&A with Mike Stokes, MDOT ITS Program Director

Question: What are the MDOT AM radio station signs for that I have seen around Hattiesburg?

Answer: We have installed Highway Advisory Radio (HAR) and a number of flashing beacon signs as part of the Hattiesburg Incident Management/ Hurricane Response Project. HAR are used by MDOT to provide roadway information during major incidents or events. When the signs are flashing it means that drivers should tune their car radios to the frequency shown on the signs to receive information about current roadway conditions, incidents, road closures, construction, emergency events, or weather alerts. The project marks the first HAR system to be deployed by MDOT.



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