

BEAUFORT COUNTY, SOUTH CAROLINA

Intelligent Transportation System Helps Beaufort County Increase Traffic Safety on SC 170, one of South Carolina's Most Hazardous Highways

With a year round population of 36,000, nearly tripling during peak summer months when tourists flock to Hilton Head Island to golf, swim, and enjoy the local culture, Beaufort County, South Carolina has its share of traffic woes. Adding to that challenge are seasonal hurricanes—including Hurricane Floyd, which caused “the great exodus” from Beaufort County on September 14, 1999. More than two million people were forced to evacuate that day to seek shelter. For those reasons, highway safety and the efficient flow of traffic are Beaufort County’s primary objective in updating its existing traffic management system.

BACKGROUND

Prior to 2000, when Beaufort County installed its original traffic management system, public safety and emergency personnel depended on calls made from the public to alert them of accidents and other traffic incidents. In 2000, county administrator John Kachmar Jr. established the Beaufort County traffic management system, working with the county sheriff’s office and the South Carolina Department of Transportation.

The team was charged with identifying and implementing an updated traffic management system that would enable:

- Real-time information to motorists that allowed them to adjust for traffic conditions
- Faster response to traffic accidents with decreased impact on traffic flow
- More intelligent routing of emergency equipment
- Traveler assistance
- Increased ability to manage and direct hurricane evacuations

They contacted Cisco Systems® to help design, build, and install the new traffic management system. Working with fiber-optic architecture, the Cisco® solution provides remote video, a technology that transfers a digital signal back to their command center from video cameras strategically located throughout eight sites along SC 170.

CHALLENGE

The new system enabled public safety personnel to remotely monitor the highway between the city of Beaufort and Hilton Head and respond to calls more quickly than they were able to before. However, the system was highly susceptible to the lightning strikes.

“The fiber went from pole to pole, so it was serial,” says William Winn, director of emergency management. “If there was a power outage, the power would go out on the switches and the cameras, which meant that we had no way to remotely see what was going on or monitor traffic.” Although the system was backed by an uninterruptible power supply, generators were able to furnish power for a maximum of 45 minutes.

“Thunderstorms in this part of the country cause a lot of power outages,” says Ken Sundby, Cisco account manager. “Our solution uses a daisy chain setup from cabinet to cabinet, which started with eight cabinets, each powered using an Ethernet switch. In the past, if one cabinet lost power, all cabinets beyond that one lost connectivity as well.”

SOLUTION

To address the power outages and isolate multiple sites to limit the chain reaction, the Beaufort County and Cisco team implemented coarse wave division multiplexing (CWDM), an optical technology that limits outages by grouping Ethernet switches on separate optical wavelengths. Now, a power outage impacts only the switches connected by the same wavelength instead of the entire system.

“At the data center, we installed a Cisco Catalyst® 6500 Series switch using Cisco CWDM technology to the different cabinet switches,” Sundby says. “That limits the number of cameras that are not functioning at any one point in time.” While the Traffic Management Center (TMC) may lose some visibility, it will not lose all and will get significant coverage of the expressway.

Cameras mounted on top of poles now tie back down to the video decoder using a transport mechanism to the Cisco switch. This puts the video directly onto the fiber that brings the video back to the Control Center—a simple, cost-effective solution that prevents one site outage from affecting all of the others.

RESULTS

The 8 roadside traffic cameras on SC 170 and another 18 on US 278 provide real-time views of traffic flow, enabling the county’s traffic monitoring technicians to monitor traffic and dispatch emergency vehicles to the site as soon as they see an accident, rather than waiting for a call.

“Just imagine the implications of this system,” Winn says. “In the old world, victims who have been seriously hurt in a one-car accident may be dependent upon another car to come by and call it in. With our new monitoring capability, we can immediately dispatch emergency personnel to the site, potentially saving lives.”

Overall, the county’s new traffic management system has provided the following benefits:

- Faster response to traffic accidents with decreased impact on traffic flow
- Better information to motorists, allowing them to adjust to traffic conditions
- More intelligent routing of emergency equipment

CUSTOMER VIEW

“This system has been tremendously received by the citizens of Beaufort County. Several more sites are in the planning stage. There could be as many as 35 or 40 cameras on Beaufort County roads by 2005.”

—William Winn, director of emergency management

- Faster and more efficient traveler assistance
- Increased ability to manage and direct hurricane evacuations
- Ability to check traffic prior to starting a trip
- Overall positive impact on traffic as a result of drivers using the new tools (Web site and message boards)

Drivers can log onto the county's Web site (www.co.beaufort.sc.us) before leaving home to access live video at major intersections so that they can plan their routes and avoid traffic difficulties. In addition, four message boards, programmed from Beaufort County's TMC, provide regular traffic updates and enable drivers to react to changing road and traffic conditions.

Next Steps

The positive impact on the county's ability to manage traffic and favorable feedback from drivers has led to an expansion of the original 8 cameras, for a total of 26 sites. Future plans include installing wireless access at each of the video points so that police officers can receive video signals using mobile data terminals in their squad cars. "They'll be able to switch from camera to camera and see what our TMC is seeing," Winn says. "This will give them the ability to arrive on the scene of an accident or incident fully informed of the situation and knowing what to expect."



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