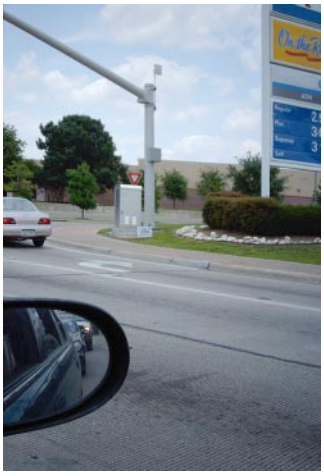
Deep in the Heart of Texas, Motorola Helps Keep Drivers Safe

Dallas, Texas



In cities across the U.S., traffic zooms out of control. Even red lights no longer deter some drivers. The cost – in life, in healthcare and in municipal response – is also out of control. But the City of Dallas, deep in the heart of the second-biggest state in the United States, decided to call a halt to the madness. With help from Motorola, the city can now track drivers who ignore red lights, further enforcing traffic safety.

Customer

In 2006, the City of Dallas began installation of a new photo traffic safety system at select intersections throughout the city. The system is part of an initiative designed to increase public safety and reduce the number of collisions caused by motorists running red lights. Called "SafeLight, Dallas stops on Red," the goal of the new city-wide Digital Automated Red Light Enforcement Program is to put a halt to red-light infractions. By leveraging modern technology, the City hopes to improve traffic safety, maximize the Dallas Police Department's efficiency and ultimately save lives. Each year, red-light runners cause as many as 218,000 traffic collisions in the United States, costing the public some $14 billion annually, according to the Federal Highway Administration. Unfortunately, Texas has the fourth highest number of red light running fatalities per capita in the nation. However, cities across the country that have implemented red-light cameras have experienced a decrease in vehicular accidents.

Solution Provider

The red-light cameras are managed under police supervision by Affiliated Computer Services (ACS), Inc., which has a national reputation in red-light photo traffic safety systems. ACS is responsible for the camera installation and maintenance, violation and payment processing, and adjudication support. ACS has deployed photo enforcement solutions in Atlanta, Detroit, Phoenix, Cleveland, Washington, DC, as well as other major metropolitan areas. Motorola wi4 Fixed Point-to-Point Solutions Provider WAI-WIZE I,LP, a telecommunication systems integrator established to serve commercial, civil and military clients at both the domestic and international levels, is a subcontractor to ACS and responsible for the maintenance and installation of the communications network as well as providing the all the bandwidth.

The Situation and Challenge

ACS needed to deploy a secure, reliable network for its new photo enforcement solution. Plus, city officials wanted the project to be completed in a matter of months. The new system would interconnect video surveillance cameras installed at intersections throughout the city that had a history of accidents or red-light violations. In addition, each approach into the intersections would be monitored. Initially, officials decided to install 60 cameras at 40 intersections in order to monitor a total of 60 approaches across the entire landscape of the city, which covers 225 square miles.

As part of the "SafeLight, Dallas stops on Red" program, red-light violation information was transmitted from the network of cameras and stored at a processing facility on a daily basis. As a result, a backbone to backhaul all the data traffic was needed. Furthermore, the city mandated that any communications equipment used to support the deployment would have to be installed on existing traffic control poles and towers. Another challenge for the city was that the locations of the intersections were dispersed across the city, and connections needed to be made amidst many obstructions, such as trees and buildings, and over one long-distance link of 10 miles. Traditionally, ACS would recommend using Digital Subscriber Lines (DSL) to interconnect all the cameras, but this technology wasn't available in parts of the city. Furthermore, DSL would prohibit ACS from completing the project on time.

Technical Requirements

- Secure, reliable connectivity in a highly-congested city environment
- High-bandwidth data rates of up to 30 Mbps each way
- Rapidly deployable with minimal disruption to traffic and infrastructure
- Interference mitigation in a mostly non-line-of-sight (NLoS) cityscape
- Reliable backhaul of all data traffic from a network of 60 cameras
- Leveraging of existing infrastructure for communications installation

Deployment Detail and Interoperability

Given the tight deadline, ACS decided to deploy a broadband wireless network instead of DSL, recognizing that fixed wireless provided a more reliable infrastructure, required less time to implement and cost less to purchase and deploy. To handle the data communications element of the new red-light enforcement program, the City of Dallas deployed 140 of Motorola's wi4 Fixed Point-to-Point (PTP) 58400 Ethernet bridges with integrated antennae.

The first order of business was to establish a communications backbone in order to manage all the traffic from the 60-camera system. To do this effectively, a ring topology was built around the city to handle the backhaul. Happily, the Motorola wireless topology met the city's requirement to minimize the distance to and from each intersection and the nearest communications tower, which ranged from three to seven miles (5 to 11 km).

Since the City of Dallas required that all equipment used for the red-light enforcement program be installed on existing traffic control poles in the City, the Motorola Ethernet Bridges were deployed on seven water and three communications towers already in place. Due to the lightweight and small form factor of the Motorola Ethernet bridges, there was no need to do a load analysis, so the installation didn't require the assistance of special crews on the water towers. This allowed for the deployment to be completed in three to four hours per tower. Despite the fact that the City asked that special crews handle the installation on the three communications towers, the deployment was done in four to five hours. To accomplish this feat, WAI-WIZE did much of the path engineering and pre-assembly work prior to the deployment. As a result, the crews only needed to affix the radio to the existing tower structure and point it in the right direction.

After the backbone was established, the team started to bring each of the intersections online and linked the towers together, some of which were about 10 miles (16 km) apart. In fact, the Motorola bridges on the water towers were linked together to provide redundancy for the wireless network. All of the intersections were dispersed throughout the City and the signal had to overcome high-rise buildings and tree obstructions that were prevalent across this congested metropolis. As a result, the radios needed to be positioned at least 25 feet (nearly seven meters) above the intersections. Given the height of the radios and the common occurrence of storms in the Dallas region, WAI-WIZE installed lightning arrestors to further ensure connectivity even in inclement weather.

WiFi "hot spots" are becoming more commonplace in the country, and Dallas is no exception. Motorola's wi4 Fixed Point-to-Point Ethernet Bridges were easily readjusted to navigate around these hot spots (once they were discovered) in order to further mitigate interference.

Each intersection comprises a server, a router, radar detection and a camera network to record data from each approach. To ensure all the data from one intersection could easily be retrieved, a VLAN was created to help monitor each of the paths. After the Motorola bridges transmit the data from all the intersections out to the wireless network, switches are used to route the data to the headend at the Univision building downtown for storage and analysis.

"The implementation of red-light cameras in the city is affording the City of Dallas with an additional measure of traffic control and enforcement, making our citizens safer. The Motorola point-to-point wireless technology has enabled us to meet our goals, while keeping costs low. We were also quite impressed with how fast the network was up and running and have already begun to see the results of such a secure, reliable system in an environment full of connectivity challenges."

— Zaida Basora, Assistant Director of Public Works

Results

The City of Dallas was able to leverage wireless technology to accomplish community goals, while keeping costs low. The Motorola PTP 58400 bridges have been able to interconnect all the cameras in the City's red-light violation system as well as overcome areas of high interference and obstruction to deliver the data to the main processing facility downtown. Furthermore, the reliable backbone that was built to handle the data backhaul traffic is operating flawlessly. To date, 40 of the 1,300 intersections in the greater Dallas area now have red-light photo monitoring.

Why Motorola:

- Broadband wireless was the best solution on the market to establish reliable connections across a busy cityscape full of high-interference areas as well as building and tree obstructions
- The Motorola PTP 58400 radios easily navigate around "hot spots" and within an almost exclusively non-line-of-sight link environment
- Motorola radios fit easily on existing water and communications towers in the city, speeding installation and meeting a project requirement
- A Motorola wireless ring topology backbone handles heavy-duty backhaul traffic with ease
- With the Motorola solution, the service provider was able to get the entire network up and running in five-and-a-half months – meeting the city's deadline

MOTOwi4™

The wi4 Fixed Point-to-Point Wireless Ethernet Bridges are part of Motorola's MOTOwi4 portfolio of wireless broadband solutions and services that help customers improve communications, increase efficiency, and enhance customer and public service. Delivering IP coverage to virtually all spaces, the MOTOwi4 portfolio includes Fixed Broadband, WiMAX, Mesh and Broadband-over-Powerline solutions for high-speed connectivity over private and public networks.

About Motorola

Motorola is known around the world for innovation and leadership in wireless and broadband communications. Inspired by our vision of seamless mobility, the people of Motorola are committed to helping you connect simply and seamlessly to the people, information, and entertainment that you want and need. We do this by designing and delivering "must have" products, "must do" experiences and powerful networks – along with a full complement of support services. A Fortune 100 company with global presence and impact, Motorola had sales of US $42.9 billion in 2006. For more information about our company, our people and our innovations, please visit www.motorola.com.

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