



# The Computerworld Honors Program

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## Final Copy of Case Study

**LOCATION:**  
*Washington, DC, US*

**ORGANIZATION:**  
City of San Antonio, Texas

**YEAR:**  
*2011*

**ORGANIZATION URL:**  
<http://www.sanantonio.gov/>

**STATUS:**  
*Laureate*

**PROJECT NAME:**  
Traffic Signal System Modernization/Synchronization (TSSM) Program

**CATEGORY:**  
*Emerging Technology*

### PROJECT OVERVIEW

City of San Antonio, Texas officials were determined to create an intelligent traffic signal communication network in an effort to help traffic flow, and alleviate traffic problems associated with large cities and dense populations. The original traffic signal system in place was equipped with outdated controllers that did not allow for remote management. City technicians had to travel to the actual traffic signals across the city in order to investigate reported issues. Sending city staff to the reported site was both costly and time consuming. In turn, addressing the reported issues became slow and inefficient. The only way San Antonio was made aware of faulty traffic signals and/or issues with traffic flow was through citizen calls, most of which were false or inaccurate. Traffic Signal System Modernization/Synchronization (TSSM) program. This city-wide integrated structure allows staff to communicate remotely with the entire traffic signal system directly from the city's traffic management center. Through the program, the City's Traffic Operations located at the Texas Department of Transportation TransGuide is able to monitor traffic flow and remotely manage the traffic signals and lane directional changes. This has improved the traffic signal timing, increased traffic flow, reduced gas emissions, and alleviate citizens' commute time. Additionally, the city's intersections can be viewed via closed-circuit television cameras and respond immediately to recurring daily congestion patterns or an incident that is diverting traffic. The TSSM program allows city officials to keep traffic moving as smoothly as possible, reduce traffic congestion and delays, and keep motorists' frustrations at the lowest possible level. Through the program, the City's Traffic Operations located at the Texas Department of Transportation TransGuide is able to monitor traffic flow and remotely manage the traffic signals and lane directional changes. This has improved the traffic signal timing, increased traffic flow, reduced gas emissions, and alleviate citizens' commute time. Additionally, the city's intersections can be viewed via closed-circuit television cameras and respond immediately to recurring daily congestion patterns or an incident that is diverting traffic.



## **SOCIETAL BENEFITS**

This project not only saves the government money, but improves the safety of the city's constituents because it reduces congestion and allows for emergency vehicles to pass through the city easier. The TSSM program allows the city to reduce the quantity of roads you have to widen and do construction.

## **PROJECT BENEFIT EXAMPLE**

The City of San Antonio has seen several benefits as a result of the implementation of the Wireless Mesh Solution and the TSSM program. City traffic technicians are now able to address transportation issues in real time. If a complaint is received through the 311 non-emergency call system, it can be investigated immediately, and city staff can assess whether the problem can be fixed remotely or if a technician needs to physically travel to the intersection. This convenience gives the city technicians more time to address preventive maintenance issues, which in turn, reduces the number of complaints that are received. Additionally, the new system has built in alarms that automatically notify staff when there is a problem. The ability for TransGuide to view the city's intersections via closed-circuit television cameras allows engineers to make timing adjustments to better accommodate traffic flow. These adjustments can be in response to either recurring daily congestion patterns or an incident that is diverting traffic. "Our new wireless system and TSSM program give us the capacity to remotely and efficiently address changes in traffic demands," says Mulcahy. "There is no question that we are better able to keep San Antonio's traffic moving as smoothly as possible, reduce traffic congestion and delays, and keep motorists' frustrations at the lowest possible level.

## **IS THIS PROJECT AN INNOVATION, BEST PRACTICE?** Yes

## **ADDITIONAL PROJECT INFORMATION**

The City of San Antonio deployed a wireless mesh networking solution to centralize the management of the traffic signals and video cameras at the 1,200 intersections. This enables them to more effectively management the lights and traffic flows in case of an emergency across the 425 square mile city. The wireless mesh solution is a single, integrated, secure, and high-speed network that is ideally suited for metropolitan networks, such as San Antonio, because it is easily installed on building and streetlight posts, and is designed to scale large outdoor deployments. The solution includes the Cisco Aironet 1500 Series lightweight outdoor mesh access points that can be deployed with zero-touch configuration. The Cisco solution synergized all communication projects between the public works and traffic departments, ranging from radio to network and voice systems. Additionally, closed-circuit television cameras were installed at several intersections with video feeds being observed at TransGuide by the city's Public Works Traffic Operations Division. The city also deployed a wireless backhaul to the city's radio towers, affecting approximately 1300 traffic signals and 150 facilities throughout the city. The mesh deployments were installed along the street corridors with no more than three "hops" from the mesh access points to the rooftop access points. The rooftop access points were connected either via fiber or high-speed bridges to the nearest city facility or tower. The combination of the current intersection status with views of the roadway network from both CCTV cameras and video detection cameras will allow engineers to make timing adjustments to better accommodate the traffic flow. These adjustments can be in response to either recurring daily congestion patterns or an incident that is diverting traffic. The system will provide the ability to address changes in traffic demands to keep traffic moving as smoothly as possible. As a result



of the traffic signals communicating with the Traffic Management Center, timing patterns that have been programmed at each traffic signal will operate as intended. The Traffic Management Center sets the clocks at each intersection to exactly the same time; better synchronization of the traffic lights is now being achieved.

