

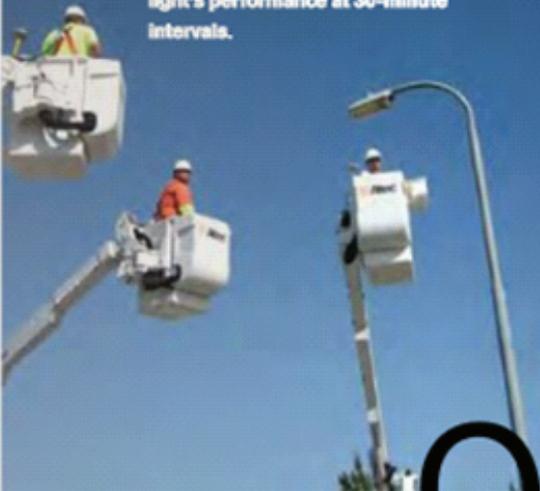
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Photocontrols were installed on approximately 20,000 streetlights. They cause the lights to turn on and off appropriately, and record the light's performance at 30-minute intervals.



THE 99 PERCENT SOLUTION

Glendale, AZ, becomes the first municipality in the nation to implement a fully automated streetlight monitoring system, reducing its streetlight outages to a mere 1 percent

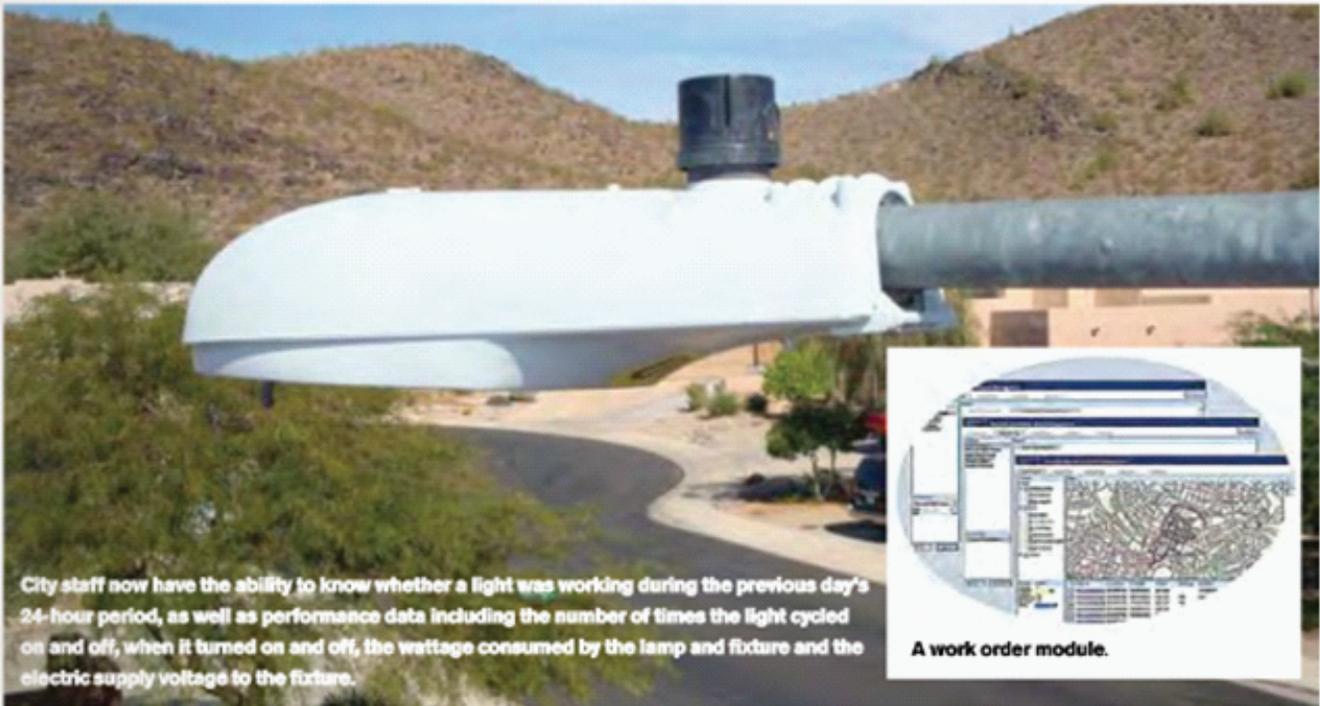
**BY MICHAEL SILLS-TRAUSCH AND
KIMBERLY NEASE**

Streetlights. Pretty cut-and-dried, right? You would think so, but consider the thousands of streetlights in a city and all of the work that goes into maintaining those lights on a daily basis.

The city of Glendale, AZ, recently tackled this problem with a new approach. With nearly 20,000 lights on its streets, during the last year, 650 simultaneous outages on arterial streets created a backlog of more than 500 streetlight repair requests from citizens. Staff estimated more than 10 percent of the city's streetlights were not functioning properly, and received an estimated 20 calls a day reporting outages from residents. Even City Council members were getting calls from constituents on this issue.

Glendale's Transportation and Engineering departments worked together to implement a new technology-based monitoring system that provides managers the ability to monitor the functionality of the lights on the street level, thus allowing Glendale to drive the number of outages down to less than 1 percent of total streetlights.

The technology does more than facilitate individual streetlight repairs. It offers the city an unprecedented level of up-to-the-minute detailed reporting for an entire streetlight system for a large metropolitan area.



City staff now have the ability to know whether a light was working during the previous day's 24-hour period, as well as performance data including the number of times the light cycled on and off, when it turned on and off, the wattage consumed by the lamp and fixture and the electric supply voltage to the fixture.

A work order module.

TOUGH TO MANAGE

Obviously, streetlights are critical for the safety of drivers, bicyclists and pedestrians, and people want to feel secure by having their neighborhoods well-illuminated. Neighborhood outages posed a huge challenge of helping meet that goal. That being said, a community's streetlight system represents a significant investment in public funds.

Managing a streetlight network, however, poses four challenges. First, streetlights are not on during the day when city crews are working, so staff cannot identify outages without time-consuming bi-annual nighttime inspections, driving all over the city. Second, staff is removed from the actual light locations, so individual monitoring is difficult. Third, streetlights are subject to aging, the natural elements and even vandalism, therefore lights working normally one night may malfunction the next. Finally, when residents would report an outage, they would frequently provide an unclear location, which resulted in repair crews going to the wrong light. Without the ability to assess the performance of each light daily, staff is constantly playing catch-up, reacting to information reported by residents that may be days—or even weeks—old.

Another challenge for municipal governments is managing and reducing community risk and legal lia-

bility. When a streetlight network is initially designed, lights are placed to provide sufficient lighting for vehicular traffic, as well as pedestrians. Ongoing and widespread outages reduce this safety element, placing a government agency at higher risk of liability. Not only would there be the possibility of a person being injured, but the city's liability may be substantial if streetlight outages are found to contribute to an incident. Keeping outages to a minimum helps meet the goals of proper lighting and, in turn, public safety and reduced exposure to liability.

CITY-WIDE SYSTEM

After considering myriad options available in the marketplace, the Glendale City Council agreed in 2007 to address these issues by becoming the first municipality in the nation to implement a comprehensive city-wide streetlight monitoring system. Other communities have adopted such a system, but only in a limited geographic area. Glendale decided to be an innovator in this area of technology by implementing it throughout the city's 55 square miles.

The city partnered with Acuity Brands Lighting Group Inc./Holophane, developer of a system called ROAM (Remote Operations Asset Management), to assist with these street lighting issues. The ROAM system



Under the ROAM concept, streetlight data is transmitted via the Internet to the ROAM office in Atlanta.

monitors the daily performance of each streetlight. As part of this partnership, customized photocontrols were installed on each city streetlight. Not only do these photocontrols cause the lights to turn on and off appropriately, but they also record the light's performance at 50-minute intervals. This is achieved by using wireless technology to transmit Glendale's streetlight data via the Internet to the ROAM office in Atlanta. This data is then sent to Glendale through a secure website. As a result, city staff now have the ability to know whether a light was working during the previous day's 24-hour period, as well as performance data including the number of times the light cycled on and off, when it turned on and off, the wattage consumed by the lamp and fixture and the electric supply voltage to the fixture.

The ROAM system also contains a module that provides reporting of work orders to service technicians and the tracking of these orders until the repair is completed. Finally, the system uses mapping software that overlays the GPS coordinate location of every streetlight on a street network map. Not only will workers know which streetlights are malfunctioning, but their exact locations are easily identifiable.

As the city continues to grow, adding new streetlights to the system is a fairly simple process, taking only a few minutes for a technician to use a bar code scanner and reference template to document the GPS location, pole attributes and fixture type.

SYSTEM IN ACTION

From April through December 2007, the photocontrols were installed throughout the city. In January 2008, ROAM reported the city had 1,272 (6.7 percent) malfunctioning streetlights. Through the transition to ROAM reporting and coordination with the repair contractor, streetlight outages have gradually come down to 200 (1 percent) as of September 2008. With the accountability the system provides, it is possible to reduce streetlight outages to nearly zero. However, in actuality, zero outages will not be realistic, due to street development projects that temporarily relocate lights and the normal failure of lighting components.

The integration of the ROAM system with existing streetlight repair operations has resulted in a dramatic reduction of resident reports of outages. As a result,

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customer satisfaction improves and the city benefits because staff, contractors and utility companies are more easily held accountable for performance as measured through ROAM reports.

In Glendale, shining a spotlight on customer service and rapid response to outages has brought about brighter streets. 📍



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