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Managing Your Streetlighting Assets
Advancements in Street and Roadway Lighting

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When was the last time that your streetlights called to tell you that they were not functioning properly? Were you aware that on any given night, up to 10% of streetlighting luminaires are not functioning? The public counts on the reliability of utility and municipal street lighting systems for safety, security and visual acuity.

Generally, most provincial and municipal utilities rely on call-ins from irate customers, or local politicians to customer care centres to complain of a street light outage. If the outage is in an industrial area this call may not come for weeks. Call-ins from property owners are often non-specific, requiring the service truck to take time to locate, inspect and repair a non-operative luminaire. Unless a specific pole is identified by location and the actual description of the luminaire by wattage, lamp type and manufacturer is provided by the caller, valuable time can be wasted. System owners and operators simply are not able to provide the level of service expected by the public.

Some utilities, that have the budgets, rely on night patrols to inspect their streetlights at night. This function may be contracted out to a local electrical contractor or it may be performed by the utility's own service personnel. Even when this is done, only certain areas may be patrolled on any particular night. High Pressure Sodium (HPS) lamps that are cycling are hard to detect since they are far more likely to be functioning than not when the patrol vehicle is passing. It may take several trips over a period of weeks before a cycling HPS lamp is detected and days more before it is actually replaced.

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The Illuminating Engineering Society of North America (IESNA), in its American National Standard Practice for Roadway Lighting (RP-8-05) lists among the reasons for lighting roadways the provision for safety and comfortable visibility for both pedestrians and drivers who use the streets after daylight hours. Safety for pedestrians involves not only a degree of protection from vehicular accidents, but also from criminal activity. Designers of street and roadway lighting typically use the IESNA RP-8-05 tables of illuminance or luminance (tables 2 or 3) as the criteria for design. These tables list not only the minimum maintained lighting levels that are required, but also the minimum requirements for lighting uniformity and glare.

With the emphasis on controlling both energy usage and fixed capital costs, streetlighting poles are typically spaced as far apart as possible while still meeting RP-8-05 lighting criteria. When a luminaire is not operating properly, not only is the light level decreased, but the uniformity and glare ratios are changed drastically. The human eye can adapt well to minor changes in luminance levels, but when the luminance uniformity changes dramatically due to a missing light source, the eye does not adapt as well. Objects on or adjacent to the roadway are not as readily detected and incidents may occur.

Being able to detect objects on or adjacent to the roadway is often critical to avoiding accidents. From the point of view of the pedestrian, it is as important to be seen as it is to be able to see approaching objects. Dark areas on or adjacent to the roadway can be a cause of concern therefore, to both a driver and a pedestrian. Efforts have been made by utilities to maintain streetlighting luminaires as efficiently and effectively as possible. Some municipalities have written contracts specifying that inoperative luminaires must be made operative within a short period of time; often within 72 hours of being reported. The means of doing this has not been readily available ----- until now.

Recently, several North American manufacturers have introduced monitoring equipment that will make it far easier to locate and repair inoperative luminaires. Several existing technologies in solid state monitoring, wireless transmission and computer operating systems have been blended to provide seamless reporting to a central control location. Wireless monitoring devices that are attached directly to each luminaire will detect outages, describe the outage condition and provide information to the lighting system operator via a secure web portal. GPS locations of these devices, captured on installation, enable the system operator to send a repair crew directly to the site with the materials needed to make the repair the day following the outage. Speedy and accurate repair not only reduces critical resource usage, but also provides the public with a much safer and reliable streetlighting system.

A wireless remote asset management system can greatly reduce operation and maintenance costs for the system owner and operator. It will reduce or eliminate streetlight outage call-ins and unnecessary repair visits. It will reduce service truck windshield time by directing the crew directly to the inoperative luminaire even in the daytime. It will eliminate night patrols and may even eliminate group relamping programs that can result in early scrapping of partially used lamps.

In addition to the fiscal benefits that can be realized, a remote asset management system can provide the system owner and operator improved asset management. By establishing a lighting system asset database at the time of installation and activation of the monitoring system, the owner is able to capture business critical system attributes including fixture type and wattage, pole type and configuration, and pole location with GPS co-ordinates. This in turn will enable the owner to develop trend analysis on equipment performance, service efficiencies and warranty claims.

You can now take the guesswork out of streetlighting maintenance. A wireless remote asset management system provides automated outage reporting with precise information regarding the location of outages. It provides the service crew with accurate information regarding the failure mode and the materials required to repair the inoperative luminaire. Finally, outage data can be imported into a customer work management system.

Of course, the bottom line for any streetlighting system is that the general public will be provided with improved safety and enjoyment of the night while significantly reducing the total cost of ownership of the streetlighting asset.

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