Light Guard Pulse™

Case Study: Monitoring & Controlling Street Light Systems

Light Guard Pulse™

MONITORING & CONTROLLING
STREET LIGHT SYSTEMS

The most cost-effective solution yet for monitoring and controlling street light systems–while also helping prevent copper wire theft.

Copper wire theft leads not only to dark, unsafe roads for pedestrians and drivers—putting pressure on DOT personnel's time and resources—but also places a significant financial burden on society. The damages go far beyond the value of the stolen wire, encompassing the costs of repairing infrastructure. The U.S. Department of Energy estimates that metal theft costs the U.S. economy approximately $1 billion annually.

According to Caltrans, potential solutions implemented by DOT personnel include placing pull boxes in visible areas, burying or locking them, adding extra load centers, installing video surveillance, using alarm wire, and increasing public awareness. However, no single method has proven 100% effective in all situations.

Typical copper theft operation involves two key steps:

1. ***Daytime Cable Cutting***: Thieves cut the copper wire during daylight hours, taking advantage of a non-energized systems (since lights are typically off during the day). This reduces the risk of electrocution and avoids drawing public attention by preventing the sudden blackout that would occur if cables were cut at night.
2. ***Nighttime Extraction***: Under the cover of darkness, thieves return to forcibly extract the wire. This second stage often results in significant system damage, costing tens of thousands of dollars in repairs and replacements per incident.

In partnership with DOT professionals, Lindsay Corporation has developed a new, cost-effective alternative to existing market solutions: Light Guard Pulse. This system offers a radically different approach to copper theft prevention and streetlight monitoring.

KEY FEATURES OF LIGHT GUARD PULSE

Pedestal-Based Installation & Cost-Effective Hardware

Light Guard Pulse does not require installation on each individual light. Its pedestal-based configuration avoids road closures and the need for repetitive hardware setup. One Light Guard Pulse system can monitor and control dozens of lights—up to 6 circuits and any number of lights per circuit.

For the cost of a few dozen traditional 7- and 9-pin node systems, Light Guard Pulse can monitor hundreds of lights—resulting in substantial cost savings.

Compatibility with LED, HPS, and Mixed Lighting Circuits

Unlike traditional solutions (e.g., 7- and 9-pin nodes) that only support LED systems, Light Guard Pulse is compatible with LED, HPS (High Pressure Sodium), and mixed lighting circuits. This allows for immediate integration with existing infrastructure, eliminating the need for expensive upgrades or conversions to LED.

Reliable Cellular Communication & Backup Power

Each Light Guard Pulse unit is equipped with its own modem and can connect via major cellular networks (Verizon or AT&T) for broad coverage. Unlike mesh networks—which depend on a single gateway node and are vulnerable to cascading failures—each unit operates independently. If one unit or circuit fails, the rest remain fully functional.

Additionally, each unit features a backup battery, ensuring continued operation and communication even if power to the system is lost. This guarantees alert functionality during outages or potential theft events.

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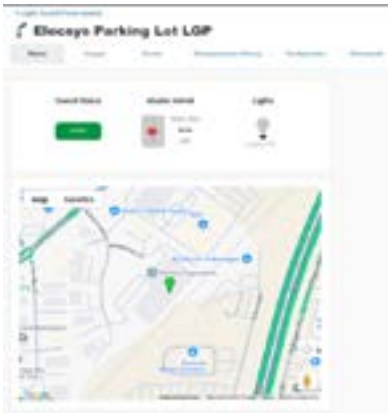
System Components & Operation

POWERED BY ROADCONNECT PWA

Light Guard Pulse operates through RoadConnect, a powerful yet user-friendly platform for monitoring and control. Accessible at https://app.roadconnect.net, the Progressive Web App (PWA) works across all web-enabled devices—smartphones (iOS and Android), PCs, Macs, Chromebooks, and tablets.

INCOMING AC SENSOR

This sensor monitors power from the electrical grid. If there's a loss of power, users can determine whether it stems from a broader utility issue or a potential instance of copper wire theft.



REMOTE ON / OFF SWITCH

DOT personnel can remotely test circuits and isolate failures via RoadConnect—without needing to physically access control boxes, particularly useful in dark or unsafe conditions.

CURRENT TRANSFORMERS (CT COILS)

Light Guard Pulse can connect up to six CT coils, monitoring the amperage of each lighting circuit. Once the system is energized, if the CT coils detect a drop in the amperage normally measured in that circuit, the system sends alerts via text or email—potentially identifying theft attempts. In addition to the six channels available for CT coils, Light Guard Pulse's terminal block includes an additional channel for connecting other sensors, such as a door lock alarm, which can trigger alerts when the door is opened.

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What Light Guard Pulse Provides

- Real-time alerts for light and power outages (for DOT personnel or other authorized entities like law enforcement)
- Photocell control and failure detection.
- Improves operational efficiency
- Eliminates “night rides”: keep DOT staff safe by avoiding manual nighttime inspections
- Customize light schedules for energy savings or additional illumination in shaded or high-risk areas
- Saves time and money

What Customers Are Saying About Light Guard Pulse

OHIO DEPARTMENT OF TRANSPORTATION’S TRAFFIC ENGINEERING MANUAL (TEM):

“For agencies experiencing significant theft of copper wiring from outdoor lighting circuits and wish to apply a technological treatment, ODOT recommends the use of pulse-based monitoring systems that place a loading device at the end of each branch circuit and monitoring equipment in the Lighting Control Center (LCC). Typically, up to six branch circuits may be monitored at each LCC. The loading device reflects a pulse originating at the monitoring equipment. Any break in the branch circuit due to theft, an accidental cut, or other event, will cause the monitoring system to generate an email alert to system users (…)

In addition to monitoring the integrity of the branch-circuit wiring, these systems can also monitor the branch-circuit current, allowing the operator to program a current threshold that generates an email alert informing the maintaining agency that some of the luminaires in the branch circuit are not operational. This allows for remote monitoring of luminaire outages and facilitates the dispatching of maintenance crews.

(…) The system is proprietary (…). If this item is used, designers should specify the (…) Light Guard Pulse model.”

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What Customers Are Saying About Light Guard Pulse

BRANDON CLARK, UTAH DEPARTMENT OF TRANSPORTATION TESTIMONIAL:

How easy or difficult was it for your department to implement and use the system?
Utah DOT employee*: The Light Guard Pulse was very easy to install, I believe we could get a system fully wired and online in about 45 minutes.*

How did receiving timely notifications of incidents through the Light Guard Pulse system affect the city's response time to incidents?
Utah DOT employee*: Receiving an immediate notification via text or email is really nice. We can pull up that site and see exactly what's happening. From power outages to a tripped breaker, or just a light fixture or two going out.*

Prior to using Light Guard Pulse, how long did it typically take to find out about the potential outages and authorize repairs? How did this compare with the new system's timeline?
Utah DOT employee*: With a crew of two electricians, maintaining the entire state, it was very difficult for us to find the issues. We'd rely on the public to notify us of outages. Sometimes an area could be out for months before we get a complaint about it. With the light guard pulses notifications, we can now fix the issues before the public has a chance to notify us of the outages.*

Did the use of Light Guard Pulse lead to any noticeable time or cost savings for the city?
Utah DOT employee: *Being able to turn the system "on" from an app on your phone to troubleshoot and to see what lights are working has saved us hours and hours of driving around. We have a lot of power sources in locations that would require a lot of driving to shut the breakers off to troubleshoot.*

What impact did the system have on reducing delays in repair authorization and maintenance work?
Utah DOT employee*: Again, being a half a mile or more away from our power source and turning the system on to be able to check voltages has saved so much time and money.*

From your perspective, how effective was the system in identifying and reporting problems accurately and promptly?
Utah DOT employee*: To be honest we were a little skeptical when we received our first two units, but that skepticism went away immediately. We've had Light Guard Pulse systems out there for years now, in the extreme heat and winter, with ZERO issues.*

How satisfied were you with the overall performance of Light Guard Pulse?
Utah DOT employee*: Extremely satisfied. We've never had any major issues with the system, and if we did your techs are extremely knowledgeable about getting the little bugs fixed.*

What long-term benefits do you anticipate as a result of continuing to use Light Guard Pulse for monitoring street lighting systems?
Utah DOT employee*: Quicker response to lighting being out. And being able to tell if it's just one or two lights out or a power outage.*

For more information about Light Guard Pulse, please contact:

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