From Dark Streets to Smart Streets

Case Study: How to Prevent Copper Wire Theft in Streetlight Systems with Light Guard Pulse™ (Dallas / Fort Worth, TX DOT)

Light Guard Pulse™

CASE STUDY: HOW TO PREVENT COPPER WIRE THEFT IN STREETLIGHT SYSTEMS WITH LIGHT GUARD PULSE™ (DALLAS / FORT WORTH, TX DOT)

Fighting Copper Theft and Lowering Costs

Street lighting is essential to roadway safety, urban mobility, and public security. However, maintaining a city's illumination infrastructure presents major challenges, especially for districts spread across large geographical areas with limited resources. One of the most persistent and costly threats to lighting systems is copper wire theft, which can disable entire lighting circuits, increase safety risks, and strain city budgets due to repeated repairs.

To address these challenges, the Fort Worth district implemented Light Guard Pulse, a remote lighting monitoring system designed to detect outages, provide real-time diagnostics, and help prevent copper theft through early alerting and active system oversight.

This innovative IoT-based solution allows cities to monitor the condition of their lighting infrastructure remotely, reducing the need for manual site visits, accelerating response times, and improving coordination among city staff and contractors.

In this white paper, we will explore the technical features and benefits of Light Guard Pulse, how it supports theft prevention and system optimization, and share direct insights from the Fort Worth district's experience with the system. Their feedback reveals measurable improvements in response time, cost savings, communication, and overall system performance—providing a compelling case for municipalities considering smarter streetlight management.

What is Light Guard Pulse? How does it work and how is this different than other solutions?

Light Guard Pulse™ is an innovative, cost-effective system designed to remotely monitor and control street lighting infrastructure while also helping prevent copper wire theft—one of the most persistent and expensive threats to public lighting systems. Unlike traditional solutions that require hardware installation on every individual light, Light Guard Pulse uses a centralized, pedestal-based configuration that can oversee up to six lighting circuits and hundreds of lights at once. This scalable design dramatically reduces installation time, maintenance costs, and the need for road closures. It also works with existing lighting infrastructure, supporting LED, HPS, and mixed systems, which allows for seamless integration without the need for expensive system overhauls.

At the core of the system is the RoadConnect Progressive Web App, an intuitive web-based platform that allows DOT personnel to view lighting status in real-time, receive outage alerts, remotely switch circuits on or off, and even diagnose issues before sending out crews. Key components such as incoming AC sensors, current transformers, and optional door alarms enable the system to detect power fluctuations, unauthorized access, and suspicious activity—providing early warnings that can prevent copper theft before it happens. With cellular connectivity and battery backup, each unit functions independently, offering increased reliability over mesh network systems that can fail if a central node goes offline.

What sets Light Guard Pulse apart from existing market alternatives is its ability to directly address how copper theft occurs. Thieves typically cut wires during the day when lights are off, then return at night to extract the cable. With Light Guard Pulse, DOT teams can disrupt theft attempts before major damage occurs. Combined with cost savings, improved response times, and reduced need for night patrols, Light Guard Pulse transforms how cities manage and protect their roadway lighting—making it a modern, scalable solution for smarter, safer streets.

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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

RON HOWELL, TEXAS DOT – FORT WORTH SIGNAL SHOP:

What factors or reasons prompted the Fort Worth district to consider implementing Light Guard Pulse?

***Howell**: We were looking for a system to monitor the condition of our illumination and to mitigate the copper theft problem everyone is dealing with. Our illumination is spread out over nine counties and with limited staff it is difficult to get to every location on a regular basis. With the LGP we can see real time numbers on the condition of the lighting. The LGP also gives us the ability to remotely turn on the lights when we are in the area to physically drive the lighting or perform troubleshooting without having to drive to the electrical service. It also allows us to respond to issues as they come up faster instead of waiting on public complaints.*

How easy or difficult was it for your department to implement and use the Light Guard Pulse during the pilot study?

***Howell**: I felt that this was a process, mainly on our side, because it was difficult to secure funding and gain buy-in from our department to try something that hadn’t yet been proven at the time.*

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What are some of the early challenges faced by your team is deployment of Light Guard Pulse? How was it rectified?

***Howell**: There are growing pains and bugs with any electronic system, every time an issue has came up Lindsay has made it a priority to address the problem.*

How did receiving timely incident notifications through the ElecsysConnect platform impact the city's response time?

***Howell**: With this system our response to outages is a lot quicker. We no longer have to depend on the public making a complaint about an outage or hope that a technician sees the outage while in the field. We actually look at the website almost every morning to determine where the technician needs to focus the days task.*

Prior to using Light Guard Pulse, how long did it typically take to assess damage and authorize repairs? How does that compare to the timeline with the new system?

***Howell**: In the past, it was a long process, sometimes taking weeks or more just to identify an issue. Now, we can typically respond the next day and begin the repair process.*

Did Light Guard Pulse improve communication between city authorities, contractors, and other stakeholders involved in the maintenance and repair process? If so, how?

***Howell**: I have actually given my maintenance contractor access to the system. It speeds up there troubleshooting and repair times by not having to drive to the service to energize the system.*

Did the use of Light Guard Pulse result in any noticeable time or cost savings for the city? If so, can you share any specific examples or metrics?

***Howell**: There have been multiple times that the system alerted us to a suspicious issue and because of the fast response we were able to repair and secure our wiring from vandals or thieves. It also saves time by the technician's ability to turn it on remotely for troubleshooting which may not sound like much but it is a huge time saver and that in turn is saving money.*

What impact did Light Guard Pulse have on reducing delays in repair authorization and maintenance work?

***Howell**: The main impact is the response time to the issue. Because we now know when the issue happens, we can quickly respond and address the problem whether it be thieves or a normal maintenance issue.*

From your perspective, how effective has Light Guard Pulse been in accurately and promptly identifying and reporting lighting outages?

***Howell**: The system is very effective; it provides us with all sorts of information on all our locations without having to physically be at the location. I have discovered all sorts of issues that I didn't even know I had such as "Over current issues" which usually is a bad connection, or a damaged conductor and the fault shows up as overcurrent. This gives you a heads up that you may need to spend more time inspecting the location for issues. On these alarms we have found rodent issues or maybe just a bad connection even though the lights may be working and appear to be normal. This is an example of a problem that you would never find until the lights quit if it were not for monitoring.*

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Did the system lead to any improvements in safety or help reduce disruptions for the public?

***Howell**: Absolutely, the faster we can respond and get the lights working again the safer the public is. Our goal is to have all our illumination always working and that is extremely difficult. Light Guard Pulse system is the only way we are able to make that happen. Without the Light Guard Pulse we would be simply driving around blind when we could be focusing our time and resources in other locations.*

How satisfied are you with the overall performance of Light Guard Pulse?

***Howell**: I am very satisfied with the whole system.*

Would you recommend Light Guard Pulse for new or future lighting monitoring projects?

***Howell**: I would definitely recommend the Light Guard Pulse to anyone who maintains illumination. Once you get used to the system you will not want to go without it. It is a game changer.*

In what ways do you think Light Guard Pulse has helped streamline your operations and decision-making after an outage?

***Howell**: Simply by letting us know where the technician needs to focus the attention.*

What long-term benefits do you anticipate from continuing to use Light Guard Pulse for monitoring lighting circuits and systems?

***Howell**: The main long-term benefit is that our illumination system is working as it is designed to do, making the roadway safer for the public by simply knowing what is going on in the field.*

Conclusion

The implementation of Light Guard Pulse in Fort Worth represents a significant step forward in how municipalities can proactively manage street lighting infrastructure and combat the growing threat of copper wire theft. By combining centralized, cost-effective monitoring with real-time alerts and remote-control capabilities, Light Guard Pulse empowers transportation departments to respond to outages more quickly, prevent costly theft attempts, and extend the life of existing lighting systems without extensive upgrades.

As shared through the firsthand experience of Ron Howell from the Texas DOT Fort Worth Signal Shop, the system has not only improved operational efficiency and reduced downtime but also strengthened public safety by keeping streets better illuminated and technicians better informed. With its scalability, compatibility with existing infrastructure, and practical tools for modern lighting management, Light Guard Pulse is proving to be more than just a monitoring solution, it's a transformative platform for smarter, safer, and more sustainable cities.

For more information about Light Guard Pulse, please contact:

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