TxDOT Innovations and Technology Deployment Briefs

Illumination Outage Application

PROBLEM

Monitoring and ensuring the illumination of roadways to ensure the safety of the traveling public is an important function of TxDOT. In one year, over 2 million dollars' worth of copper wiring was stolen statewide from illumination system, resulting in an outage of 40% of TxDOT managed illumination. This loss of illumination creates a major safety hazard for the traveling public. Additionally, replacing stolen copper results in a substantial cost for the State of Texas. Illumination outages on roadways are typically found during monthly night rides or by notifications received from the public. Additional night rides require an increase in man-hours, and the process to identify and repair the outages is not timely.

SOLUTION

A TxDOT electrician designed prototype device to remotely read the voltage on a particular circuit. A low voltage reading indicates an issue with the illumination.

The district collaborated with a vendor to further develop this low voltage detection system to include an illumination outage application. The application detects if the voltage drops below an established level, which indicates how many LEDs have gone out or if the whole circuit is down. Alerts are then sent to district maintenance enabling personnel to respond with the correct equipment. TxDOT staff also has the option of contacting the Traffic Management Center for a visual camera check to identify if an LED is out or if someone can be seen actively stealing copper wiring. This outage detection innovation was developed due to issues of copper theft from roadside illumination. In many cases, testing of issues can be performed remotely, reducing the time TxDOT staff has to spend to physically access the affected section of the roadway lighting.

BENEFITS

Once these detection systems were put into place, along with other measures, the District increased its active lighting up-time to 89 percent. This is a huge benefit for the safety of the traveling public as well as improving public perception and efficiency of operations within the District. The District has also cut its lighting

PROJECT DELIVERY

CUSTOMER FOCUS

FOSTER STEWARDSHIP

PRESERVE ASSETS

OPTIMIZE PERFORMANCE

PROMOTE SAFETY

VALUE EMPLOYEES

Texas Department of Transportation

District: Fort Worth **December 2022**

repair expenses by approximately 40 percent, while increasing active roadway lighting. Finally, the District realizes safety benefits by reducing the need for technicians to travel to a site for testing.

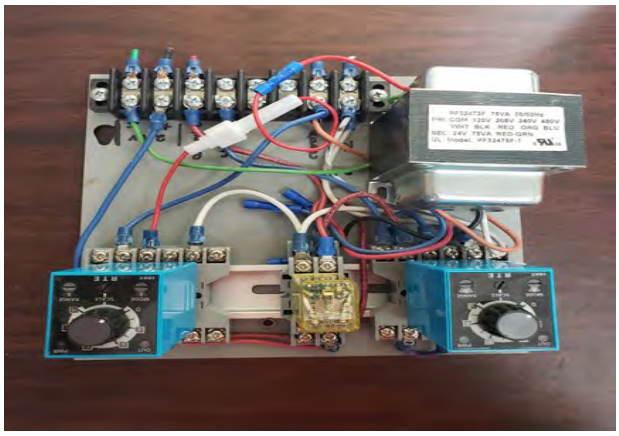
KEY TASKS

- Purchase equipment.
- Install all in house.
- Complete monthly service to ensure all is functioning optimally.

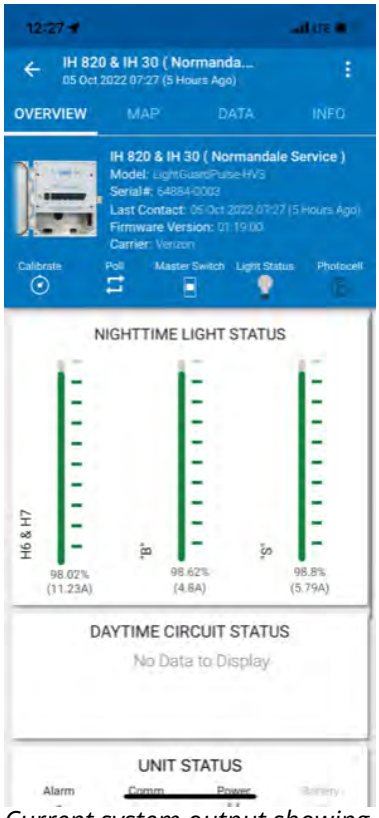
PROACTIVE APPROACH

This initially reactive response to illumination outages has become a proactive solution allowing for faster and safer response. The productivity of technicians and equipment is enhanced by reducing travel time, troubleshooting time, and repair time. Furthermore, the illumination system is now operating at an increased capacity, which is a proactive method of improving roadway safety, while decreasing cost to TxDOT and taxpayers.

System adapted and installed on existing service. Services do not need upgrading to install.



Original prototype developed by TxDOT staff. (Ron Howell, Fort Worth District Master Electrician).



Current system output showing completed circuit usage.

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