

AASHTO Innovation Initiative

[Proposed] Nomination of Innovation Ready for Implementation

Sponsor

Nominations must be submitted by an AASHTO member DOT willing to help promote the innovation. If selected, the sponsoring DOT will be asked to promote the innovation to other states by participating on a Lead States Team supported by the AASHTO Innovation Initiative.

1. Sponsoring DOT (State): TxDOT
2. Name and Title: Theresa Poer, P.E., Director of Transportation Operations

Organization: TxDOT Fort Worth

Street Address: 2501 SW Loop 820

City: Fort Worth

State: Texas

Zip Code: 76132

Email: Theresa.Poer@txdot.gov

Phone: 817-370-6615

Fax: [Click or tap here to enter text.](#)

Innovation Description (10 points)

The term “innovation” may include processes, products, techniques, procedures, and practices.

3. Name of the innovation:

Illumination Outage Monitoring System and App

4. Please describe the innovation.

The illumination monitoring system is a box that is attached to an existing service pole. No new foundations or upgrades to the service are needed. It monitors amperage flow and sends text alerts

through an application when the amperage drops below a threshold that we have set for that circuit. The flow tells us if a line has been completely cut (either because of theft or contractor hit) or if just some heads are out. If it's a cut, we can use our Traffic Management Center cameras immediately if we have any in the area. If it does appear to be a theft attempt, we can alert law enforcement. This has helped in many ways. It has allowed us to immediately know when something has been cut so that we can respond and repair a lot quicker. It helps the technician have an idea of what materials are needed to bring, saving drive times. The app used allows us to remotely turn on and off circuits without getting out of a vehicle and has an all-clear feature that our techs must reply to before turning on a circuit. This prevents the possibility of them ever working on a live line.

5. What is the existing baseline practice that the innovation intends to replace/improve?

Before this system and application was used, we would eventually receive calls from the public telling us that lights were out, or they would be discovered during nighttime inspections. We may not have been made aware of copper theft issues until days later. We would then dispatch technicians out to troubleshoot the problems and repairs.

6. What problems associated with the baseline practice does the innovation propose to solve?

We relied on others to call and let us know when illumination was not working. Because we would not immediately know about copper theft or cuts to our system, this would delay response time with repairs. We would also have to dispatch employees to troubleshoot the location. We also could not immediately contact law enforcement.

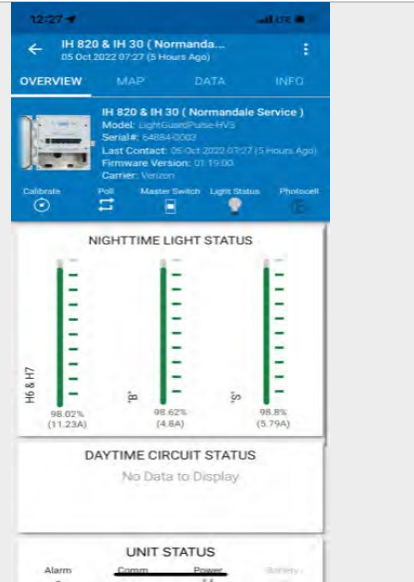
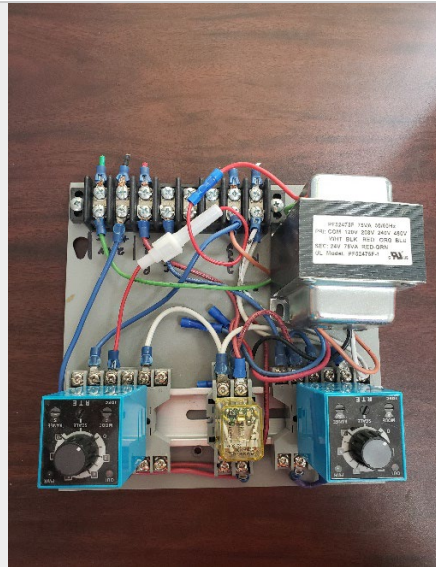
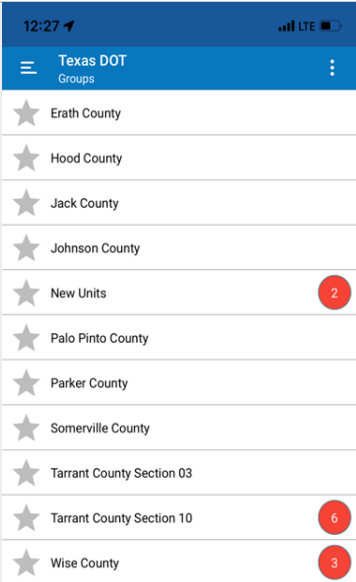
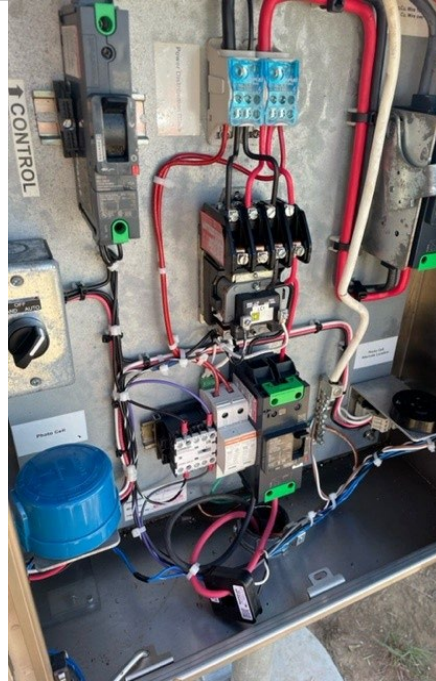
7. Briefly describe the history of its development.

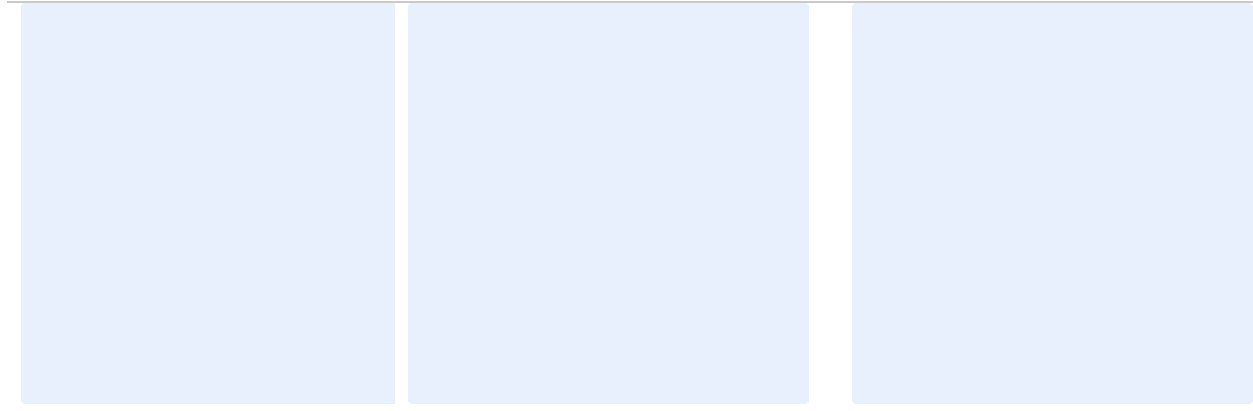
Several years ago, our District had a big issue with copper theft. During this time period, the Fort Worth District spent over 1.1 million dollars to investigate and continually repair these issues. One of our electricians came up with the idea of remotely monitoring our circuits so that we would know as soon as a cut was made. A prototype of a box that could remotely monitor the amps per circuit was developed. Once an amp threshold was reached, an alert would be sent to our technicians. Several versions were tested and then we worked with the company Elecsys on the final version and application that we use today.

8. What resources—such as technical specifications, training materials, and user guides—have you developed to assist with the deployment effort? If appropriate, please attach or provide weblinks to reports, videos, photographs, diagrams, or other images illustrating the appearance or functionality of the innovation (if electronic, please provide a separate file). Please list your attachments or weblinks here.

No training materials were needed. The application that the technicians use is very user friendly.

Attach photographs, diagrams, or other images here. If images are of larger resolution size, please provide as separate files.





State of Development (40 points)

Innovations must be successfully deployed in at least one State DOT. The All selection process will favor innovations that have advanced beyond the research stage, at least to the pilot deployment stage, and preferably into routine use.

9. How ready is this innovation for implementation in an operational environment? Please select from the following options. Please describe.

- Prototype is fully functional and yet to be piloted
- Prototype has been piloted successfully in an operational environment
- Technology has been deployed multiple times in an operational environment
- Technology is ready for full-scale implementation

We currently have this system on approximately half of our illumination services in the Fort Worth District.

10. What additional development is necessary to enable implementation of the innovation for routine use?

Nothing known at this time.

11. Are other organizations using, currently developing, or have they shown interest in this innovation or of similar technology?? No, although other TxDOT Districts have expressed interest in using the same system.

If so, please list organization names and contacts. Please identify the source of this information.

Organization	Name	Phone	Email
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

Potential Payoff (30 points)

Payoff is defined as the combination of broad applicability and significant benefit or advantage over baseline practice .

12. How does the innovation meet customer or stakeholder needs in your State DOT or other organizations that have used it?

The illumination monitoring application has helped us to bring our active lighting from around 75% to 90%. This directly impacts the safety of the travelling public. Our technicians can respond more quickly to cuts to our illumination systems, as we immediately know when something has been cut. The monitoring app also alerts them to the health of our system and allows them to have a better idea of the equipment that may be needed for repairs. This saves drive time for them, which is another safety benefit. The application also allows circuits to be remotely turned on or off. There is an “all-clear” feature that is used that prevents the possibility of anyone ever working on a live circuit.

13. Identify the top three benefit types your DOT has realized from using this innovation. Describe the type and scale of benefits of using this innovation over baseline practice. Provide additional information, if available, using quantitative metrics, to describe the benefits.

Benefit Types	Please describe:
Safety of the Public	The system has allowed us to more actively monitor our system and respond, thus keeping our illumination uptime to approximately 90% in the District
Safety of our workers	The remote ability to turn circuits on and off prevents our technicians from having to exit the vehicle. The all-clear feature in the app ensures that no one will be working on a live circuit.
Response times	The application allows our technicians to know right away when something is wrong with a circuit and what equipment may be needed, increasing our response times. If theft is

	determined, we also have a quicker response time in alerting law enforcement.
--	---

Provide any additional description, if necessary:

[Click or tap here to enter text.](#)

14 How broadly might this innovation be deployed for other applications. in the transportation industry (including other disciplines of a DOT, other transportation modes, and private industry)?

Remote monitoring systems such as this could be used for other transportation assets, including traffic signals or Intelligent Transportation Systems field devices.

Market Readiness (20 points)

The All selection process will favor innovations that can be adopted with a reasonable amount of effort and cost, commensurate with the payoff potential.

15. What specific actions would another organization need to take along each of the following dimensions to adopt this innovation?

Check boxes that apply	Dimensions	Please describe:
<input type="checkbox"/>	Gaining executive leadership support	Click or tap here to enter text.
X	Communicating benefits	It would be important to be able to share the benefit of this system to gain buy-in.
<input type="checkbox"/>	Overcoming funding constraints	Click or tap here to enter text.
<input type="checkbox"/>	Acquiring in-house capabilities	Click or tap here to enter text.
<input type="checkbox"/>	Addressing legal issues (if applicable) (e.g., liability and intellectual property)	Click or tap here to enter text.
<input type="checkbox"/>	Resolving conflicts with existing national/state regulations and standards	Click or tap here to enter text.
X	Other challenges	There could be internal IT issues to address, since this system is cloud based.

16. Please provide details of cost, effort, and length of time expended to deploy the innovation in your organization.

Cost: Each unit (per electric service) is approximately \$2750, with a \$10/month fee.

Level of Effort: The biggest level of effort was the testing and finding and developing a system that could successfully monitor the circuits.

Time: The overall time of research and testing before the system was deployed was approximately two years.

17. To what extent might implementation of this innovation require the involvement of third parties, including vendors, contractors, and consultants? If so, please describe. List the type of expertise required for implementation.

We did have to work with several third party vendors to expand upon our prototype and develop the application. The expertise of our electricians and technicians in the signal shop was heavily relied upon during the testing of this system.