

Research Need for Operations and Maintenance Technical Advisory Group

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1. Issue Identified:

Uninterruptible Power Supply System Operations

2. Summary of Problem:

This research would examine the operation of uninterruptible power supply systems at traffic signals during power outages. The study would evaluate typical power outage durations in Illinois and assess current practices for managing the battery capacity of uninterruptible power supply systems during extended outages.

A key consideration is whether traffic signals should remain in normal color operation until the batteries are depleted or whether alternative strategies, such as transitioning portions of the signal system to flashing red or all-red flash operation, could better conserve battery capacity while maintaining a safe intersection condition. The research would also evaluate whether a dark signal condition presents a greater safety risk compared to flashing red operation during prolonged power outages.

Additionally, the study would examine various battery technologies to determine their suitability for traffic signal applications based on performance, reliability, lifespan and maintenance requirements. Alternative backup power systems would also be reviewed, along with practices used by other states and jurisdictions, to identify approaches for managing traffic signal operations during extended power interruptions.

3. Desired Results/Outcome:

The anticipated outcome of this research is to identify best practices for optimizing the use of uninterruptible power supply systems at traffic signals during power outages. The study would evaluate strategies to maximize battery runtime, improve system efficiency and prolong safe signal operation during extended power interruptions.