Snowplow Lights - LED vs. Halogen

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Report Title

LED Snowplow Lights - Evaluation Report

NHDOT Highway Maintenance

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Report Link

https://www.nh.gov/dot/org/projectdevelopment/materials/research/projects/26962x.htm

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Why was it studied?

The NHDOT snowplow fleet currently uses halogen lights mounted on the push frame for nighttime and low-light snowplowing operations. Light-emitting diodes (LEDs) are less susceptible to failure from vibrations and could reduce long-term maintenance cost. Plow drivers have suggested that LED lighting improves their visibility while operating as well as reducing the fatigue experienced during extended hours of plowing. As NHDOT did not have a firm policy on the use of LED headlamps, this research determined if the fleet would experience benefits by using LED bulbs.

What was done?

The project compared the use of heated LED bulbs with halogen bulbs in headlights installed on NHDOT-owned plow trucks. 72 heated LED headlights were purchased and installed on 34 plow trucks. Plow truck operators were chosen based on their particular route to assess a variety of weather and traffic conditions. The operators monitored maintenance of the equipment and completed surveys relating their experience using the LED lights. Supervisors completed surveys relating their experience when encountering the plow trucks on the road to assess visibility and how LED headlights affected oncoming traffic.

What did we learn?

Feedback from the plow operators surveyed indicated that:

- 98.5% reported better or much better visibility.
- 97.8% reported better or much better peripheral visibility.
- 70.4% reported less eye fatigue.

No LED bulbs required replacement during the study period in comparison to halogen bulbs that typically require replacement one to two times per storm event. A cost benefit comparison that considered initial bulb price, replacement, and associated labor indicated that the long-term cost of LED bulbs is substantially less than halogen.

The results indicated that converting from halogen to LED lights will:

- Improve operator visibility for safer snowplow operations.
- Result in an increased service life reducing maintenance requirements.

How can we use it?

As the study has shown that the LED bulbs reduce maintenance costs and are preferred by the operators due to improved visibility and reduced fatigue, NHDOT will use the results when considering transitioning from halogen to LED snowplow lights.