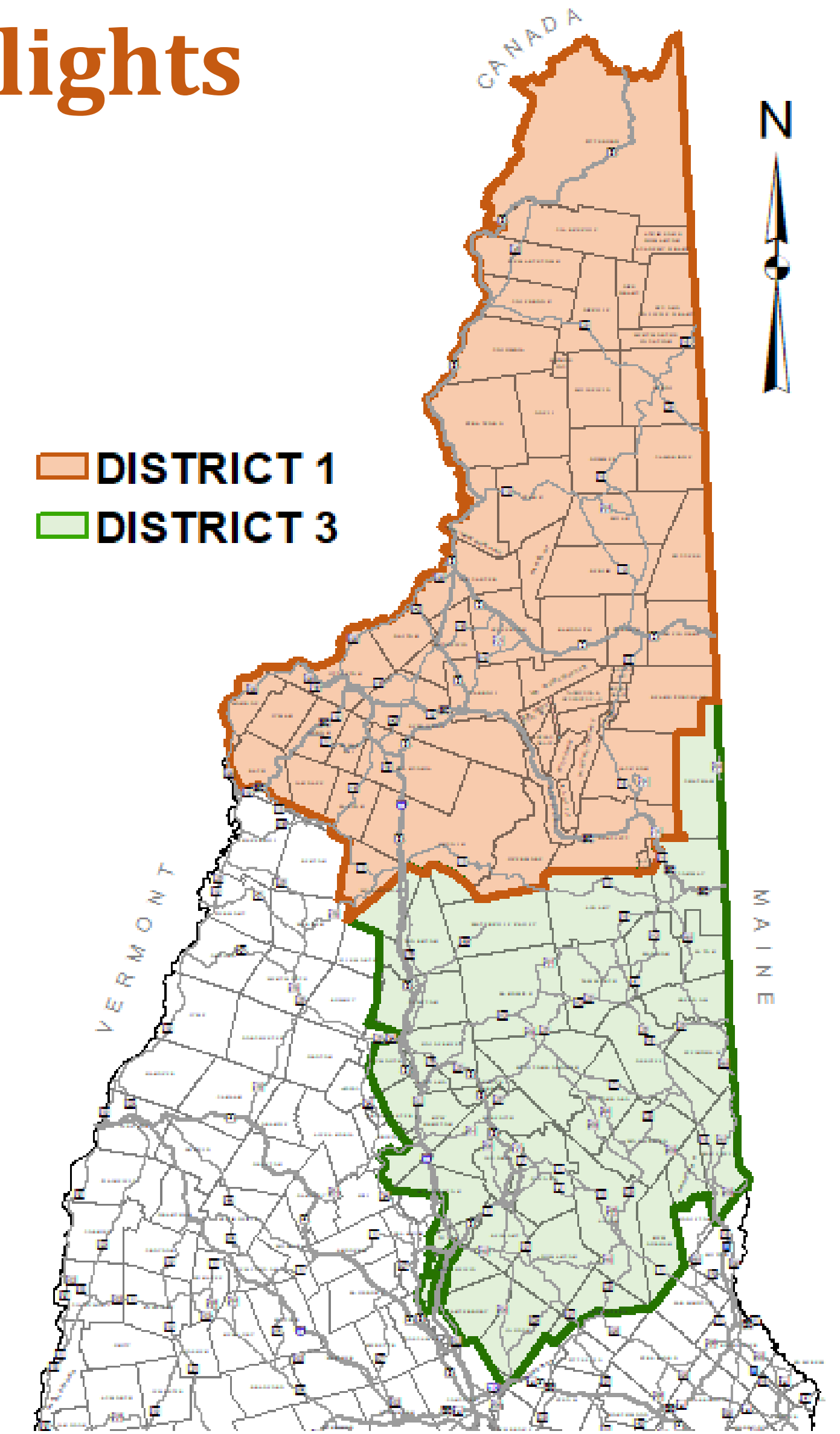




New Hampshire DOT performs evaluation of snowplow frame lights Light-Emitting Diode (LED) versus Halogen



PROBLEM STATEMENT

The NHDOT snowplow fleet currently uses halogen lights mounted on the push frame for nighttime and low-light snowplowing operations. Light-emitting diode (LED) bulbs 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.

PROJECT OBJECTIVES

The project compared the use of heated LED bulbs with halogen bulbs in headlights installed on NHDOT-owned plow trucks. The in-house research project targeted NHDOT Highway Maintenance District 1 and District 3 because of available interstate and rural routes. 72 heated LED headlights were purchased and installed on 17 plow trucks per district.

PROJECT RESEARCHERS

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Link to NHDOT Research Project Page:

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



Source: New Hampshire Department of Transportation

	Better Visibility	Less Visibility	Better Peripheral Visibility	Less Peripheral Visibility	More Eye Fatigue	Less Eye Fatigue	Blinding Oncoming Traffic	Blinded by Oncoming Plow
District 1 Supervisor Surveys:	26	0	22	0	0	17	0	1
District 3 Supervisor Surveys:	27	0	20	1	0	18	1	1
Totals:	53	0	42	1	0	35	1	2

	Much Better Visibility	Better Visibility	Same Visibility	Less Visibility	Much Better Peripheral Visibility	Better Peripheral Visibility	Same Peripheral Visibility	Less Peripheral Visibility	Worse Eye Fatigue	Same Eye Fatigue	Less Eye Fatigue
District 1 Operator Surveys:	49	13	0	0	50	12	0	0	0	22	40
District 3 Operator Surveys:	48	23	0	0	43	27	0	1	0	15	55
Totals:	97	36	0	0	93	39	0	1	0	37	95

District 1 Operators Flashed by Oncoming Vehicles:	3
District 3 Operators Flashed by Oncoming Vehicles:	9

METHODS

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.

PROJECT OUTCOMES

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 required replacement one to two times per storm event. A cost benefit comparison that considered initial bulb cost, replacement, and associated labor indicated that the long-term cost of LED bulbs is substantially less than halogen bulbs.

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 time and expenses