



MINNESOTA DEPARTMENT OF TRANSPORTATION
Engineering Services Division
Technical Memorandum No. 11-09-M-01
April 19, 2011

To: Electronic Distribution Recipients
From: Jon M. Chiglo, P.E.
Division Director, Engineering Services
Subject: Vehicle Warning Light Guidelines

Expiration

This is a new Technical Memorandum and shall remain in effect until April 19, 2016 unless superseded prior to that date.

Implementation

The guidelines in the Technical Memo shall be used immediately.

Introduction

LED (light emitting diode) warning lights have made huge strides in the past several years. Mn/DOT Maintenance Research has entertained numerous requests to install these lighting systems on plow trucks and other vehicles (e.g. light and medium duty trucks) both from vendors and Mn/DOT Employees.

Purpose

LED Lights

In 2009, the Maintenance Research Unit conducted an evaluation of LED vehicle lights at Mn/ROAD. Four LED lights were compared to our current incandescent double rotator vehicle lighting package at distances ranging from 250' to 3000' and various angles/heights. It was determined that the LED lights were as good as the incandescent double rotator in all tests and far superior to them in overall brightness. We compared the evaluator's written results and comments, and the Maintenance Research Unit's final recommendation is that incandescent double rotator vehicle lights be replaced with LED vehicle lights as soon as practical and LED vehicle lights are acceptable for use on MN/DOT light and medium duty trucks. In addition, any light or medium duty truck being retrofitted from double rotators, beacons or another form of incandescent lighting have new LED vehicle lights installed. LED lights also comply with idle/emissions standards and reduce Mn/DOT's environmental footprint. Because of their low energy draw vehicles can be shut off while the LED vehicle lights remain on without draining the vehicle's battery. LED lights will also reduce fuel costs, premature alternator replace and increase employee safety on state highways. As a reminder, vehicles should always be shut off when not needed.

Blue Lights

Recently there have been requests to install blue lights on light and medium duty maintenance vehicles in order to improve conspicuity and safety. In Minnesota, we have a statute regarding the use of blue lights on vehicles. [Minnesota Statute §169.64, Subd. 4](#) states the following:

Subd. 4. Blue light.

(a) Except as provided in paragraphs (b) to (d), blue lights are prohibited on all vehicles except road maintenance equipment and snow removal equipment operated by or under contract to the state or a political subdivision thereof.

(b) Authorized emergency vehicles may display flashing blue lights to the rear of the vehicle as a warning signal in combination with other lights permitted or required by this chapter. In addition, authorized emergency vehicles may display, mounted on the passenger side only, flashing blue lights to the front of the vehicle as a warning signal in combination with other lights permitted or required by this chapter.

(c) A motorcycle may display a blue light of up to one-inch diameter as part of the motorcycle's rear brake light.

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(d) A motor vehicle may display a blue light of up to one-inch diameter as part of the vehicle's rear brake light if:

- (1) the vehicle is a collector vehicle, as described in section [168.10](#); or
- (2) the vehicle is eligible to display a collector plate under section [168.10](#).

Guidelines

LED lights

The goal is to have Mn/DOT's fleet of vehicles equipped with LED warning lights.

- o Phase out incandescent vehicle warning lights as existing inventory is used up
- o Portable lights can remain as an incandescent double rotator.

Blue Lights

The following defines on which maintenance vehicles blue lights may be used in addition to amber lights. Blue lights must be mounted on the passenger side only.

Blue lights shall not be used on the following vehicles, they shall use amber lights only:

- o Signing, Bridge, Guardrail, Traffic Control, Surveys, Inspection, Materials, Construction and Roadside Maintenance Vehicles/Equipment such as Mowers, Herbicide applicators, etc.

Blue lights may be used on the following vehicles, in addition to amber lights:

- o Maintenance Supervisor or Superintendent's vehicle that is frequently used to respond to unscheduled incidents on the roadway or roadway shoulder (high exposure vehicle).
- o A dedicated vehicle utilized for area wide debris patrol only
- o FIRST vehicle
- o Snow Removal Equipment

- o At this time, no more than 50% of the light bar may be blue. See attached recommended installations.
- o Contact the Area Maintenance Engineer in your district for guidance on the use of blue lights. Any variances from the above must be reviewed and approved by MBMT.
- o Blue lights are not be overused.
- o Vehicles that are not listed above and currently have blue lights, shall have them removed immediately.

General

As of December 1, 2010, Mn/DOT is only approving LED lights that meet the California Code of Regulations, Title 13, Motor Vehicle Lighting Equipment Requirements.

Approved vehicle lights (non-LED and LED) can be found on the Qualified Products List under Vehicle Safety Lights at: <http://www.dot.state.mn.us/products/index.html#>

Questions

For information on the technical contents of this memorandum, please contact **Sue Lodahl**, Mn/DOT's Assistant State Maintenance Engineer at **(651) 366-3549** or Mn/DOT's Maintenance Research Project Manager at **(651) 366-3585**.

Any questions regarding publication of this Technical Memorandum should be referred to the Design Standards unit, DesignStandards.DOT@state.mn.us. A link to all active and historical Technical Memoranda can be found at <http://techmemos.dot.state.mn.us/techmemo.aspx>.

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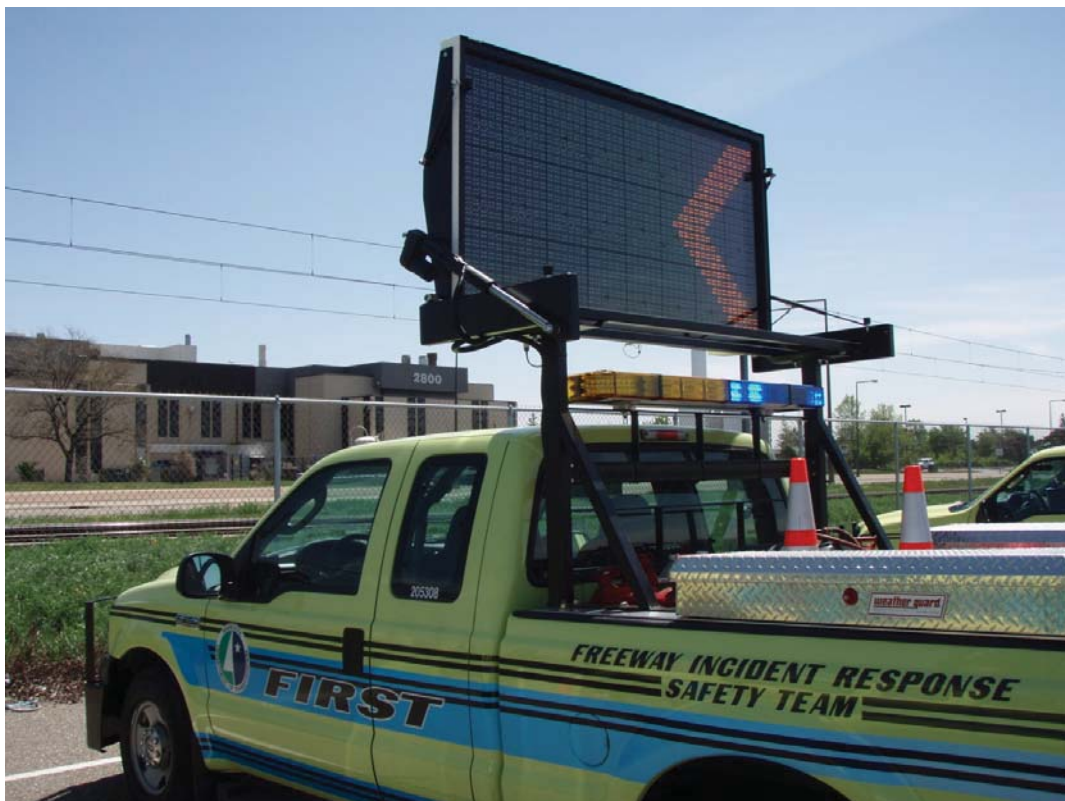
Attachments: Recommended Installations

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Recommended Installations



Maintenance Supervisor or Superintendent Vehicle/Area Wide Debris Patrol (less than 10%)



FIRST vehicle (50%)