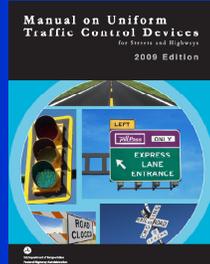


Notice of Proposed Amendment: Maintaining Minimum Retroreflectivity of Longitudinal Pavement Markings

FHWA Office of Safety
Retroreflectivity Team

June 17th, 2010



Webinar Questions

- Please use the “Chat” Pod to ask questions
- Phone questions will be answered at the end
- Answers may be “limited” by rulemaking process “rules”

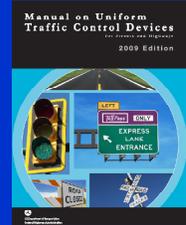


FHWA Retroreflectivity Team

- FHWA Members:
 - Greg Schertz
 - Cathy Satterfield
 - George Merritt
 - Tim Taylor
 - Carl Andersen
 - Scott Wainwright
 - Jennifer Outhouse
 - Barbara Burke
- Technical Support:
 - Paul Carlson (TTI)
 - Gene Hawkins (TTI)
 - Kathy Falk (Kimley-Horn & Associates)

Manual on Uniform Traffic Control Devices

MUTCD is the national standard for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel.



Notice of Proposed Amendment (NPA)

- Federal Register – April 22, 2010
- 2009 MUTCD Proposed Revision 1
- Maintaining Minimum Retroreflectivity of Longitudinal Pavement Markings
- Request for public comment within 120 days
 - Deadline: August 20, 2010

Why is Retroreflectivity Important?

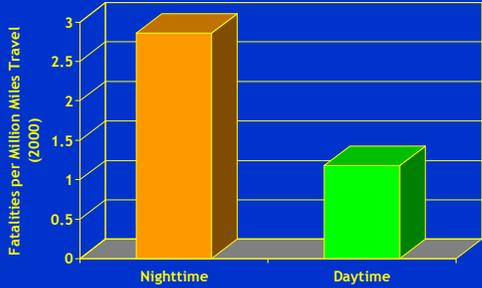
Visibility is critical for nighttime driving

Daytime - many cues available

Nighttime - few cues remain
Driver's task more difficult



Nighttime vs. Daytime Fatality Rates



Source: National Safety Council

Safety of Pavement Markings

- Adding center lines and/or edge lines has been consistently shown to reduce fatal and injury crashes
 - Adding center lines → 12% decrease in nighttime fatal and serious injury crashes
 - Adding edge lines → 16% decrease in nighttime fatal and serious injury crashes

Key Issue: Older Drivers

- 18.9 million drivers age 70+ in 2000
- 20.6 million drivers age 70+ in 2006
 - 48% increase from 1990 to 2006
 - 1990 — 8% of drivers were 70+
 - 2006 — 10.2% of drivers were 70+
- “Older” driver population will continue to grow as baby-boomers age

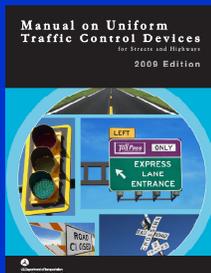


DOT Appropriations Act



“The Secretary of Transportation shall revise the MUTCD to include a standard for a minimum level of retroreflectivity that must be maintained for traffic signs and pavement markings which apply to all roads open to public travel.”

Proposed Amendment: Maintaining Minimum Retroreflectivity of Longitudinal Pavement Markings



Proposed Amendment

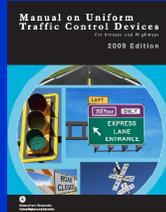
- Section 1A.11
 - Relation to Other Documents
- Section 3A.03
 - Maintaining Minimum Retroreflectivity of Longitudinal Pavement Markings
- <http://mutcd.fhwa.dot.gov>



**Proposed Amendment to MUTCD Section 3A.03
Maintaining Minimum Retroreflectivity of
Longitudinal Pavement Markings**

(STANDARD)

- Establish and use a method designed to maintain retroreflectivity of:
 - white and yellow longitudinal pavement markings
 - at or above the minimum levels in Table 3A-1



**Proposed Amendment to
MUTCD Section 3A.03**

- Centerlines:
 - Where required or recommended by Section 3B.01, such as
 - no-passing zone markings,
 - longitudinal two-way left-turn lane (TWLTL) markings
 - yellow markings used to form flush medians

**Required or Recommended
Centerline Markings**

- Urban arterials/collectors
 - 20 ft or more in traveled way width, and
 - ADT \geq 4,000
- Rural arterials and collectors
 - \geq 18 ft in traveled way width, and
 - ADT \geq 3,000
- Two-way streets/highways
 - three or more lanes for moving motor vehicle traffic
- Other traveled ways where an engineering study indicated a need for a centerline

**Proposed Amendment to
MUTCD Section 3A.03**

- Lane line markings
 - Where required or recommended by Section 3B.04, including
 - solid lines
 - broken lines
 - dotted lane lines
 - lane drop markings, and
 - longitudinal preferential lane markings

**Required or Recommended
Lane Lines**

- Freeways and Interstate highways
- Roadways with two or more lanes in same direction



**Proposed Amendment to
MUTCD Section 3A.03**

- Edge line markings
 - Where required or recommended by Section 3B.07, including
 - left and right edge lines
 - channelizing lines delineating
 - gores,
 - divergences,
 - obstructions on such roads



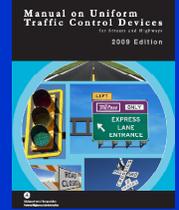
Required or Recommended Edge Lines

- Freeways and expressways
- Rural arterials and collectors
 - ≥ 20 ft traveled way width, and
 - ADT ≥ 3,000
- Other paved streets and highways where an engineering study indicated a need for edge line markings

Proposed Amendment to MUTCD Section 3A.03 Maintaining Minimum Retroreflectivity of Longitudinal Pavement Markings

(STANDARD)

- Establish and use a method designed to maintain retroreflectivity of:
 - white and yellow longitudinal pavement markings
 - at or above the minimum levels in Table 3A-1



Proposed Minimum Retro Levels

(*mod/m²/lux*)

Posted Speed (mph)	≤ 30	35 - 50	≥ 55
2-lane roadways with only centerline	n/a	100	250
All other roadways	n/a	50	100

Exceptions:
 - When at least 3 RRPMS are visible from any position along a line at night
 - When continuous roadway lighting assures that markings are visible

Posted Speed (mph)	≤ 30	35 - 50	≥ 55
2-lane roadways with only centerline	n/a	100	250
All other roadways	n/a	50	100

Proposed Amendment to MUTCD Section 3A.03

Support:

Compliance with the above Standard is achieved by having a method in place and using the method to maintain the minimum levels established in Table 3A-1. Provided that a method is being used, an agency or official having jurisdiction would be in compliance with the above Standard even if there are pavement markings that do not meet the minimum retroreflectivity levels at a particular location or at a particular point in time.

Proposed Amendment to MUTCD Section 3A.03

Support:

There are many factors for agencies to consider in developing a method of maintaining minimum pavement marking retroreflectivity including, but not limited to, winter weather, environmental conditions and pavement resurfacing.

What do the numbers look like?



Proposed Methods for Maintaining Retroreflectivity of Longitudinal Pavement Markings

- A. Calibrated Visual Nighttime Inspection
- B. Consistent Parameters Visual Nighttime Inspection
- C. Measured Retroreflectivity
- D. Service Life based on Monitored Markings
- E. Blanket Replacement
- F. Other Methods



Method A: Calibrated Visual Nighttime Inspection

- “Calibrate” eyes with calibration markings
- Calibration markings are measured and near minimum retro levels
- Evaluate markings compared to calibration markings



Method B: Consistent Parameters Visual Nighttime Inspection

- Tie to minimum values by using consistent parameters as used to develop the minimum levels
 - Inspector – older driver (60+)
 - Sedan type vehicle
 - Low beam headlamps (properly aimed)



Method C: Measured Retroreflectivity

- Measure markings with standard retroreflectometer (handheld or mobile)
- Compare measured values with minimum values
- Markings below minimum values are replaced



Method D: Service Life based on Monitored Markings

- End of life based on similar in-service markings that are monitored through periodic inspections or measurements
- All markings in the “similar group” are replaced when the monitored control markings are near or at the minimum levels



Method E: Blanket Replacement

- All markings in an area or corridor are replaced at specific intervals
- No need to track individual markings
- Intervals based on the expected life of material



Example: Expected Life

- Engineered Approach
- Data and factors to consider:
 - Edge line, lane line, center line?
 - Pavement Marking Type
 - Road Surface Type
 - Traffic
 - Environmental Factors
 - Installation variables (mil thickness etc)
 - Substantial time & data
- Historical performance → Expected Life

Proposed Exclusions

Option:

...agencies...may exclude the following markings from their...retroreflectivity maintenance method(s)... but not from any requirements in Section 3A.02 to be retroreflective.

Proposed Exclusions

- Words, symbols, and arrows
- Crosswalks and other transverse markings
- Black markings used to enhance the contrast of pavement markings on a light colored pavement
- Diagonal or chevron markings within a neutral area of a flush median, shoulder, gore, divergence, or approach to an obstruction

Proposed Exclusions

- Dotted extension lines that extend a longitudinal line through an intersection or interchange area
- Curb markings
- Parking space markings
- Shared use path markings



Cost

Estimated to be less than \$100 million per year nationally



Proposed Compliance Date

4 years:

For implementation and continued use of a maintenance method that is designed to maintain pavement marking retroreflectivity at or above the established minimum levels

6 years:

For replacement of pavement markings that are identified using the maintenance method as failing to meet the established minimum levels.

Summary

- Notice of Proposed Amendment
- Requires using methods to maintain minimum retroreflectivity of longitudinal pavement markings
- Minimum levels established by research

Rule Making Process

- Notice of Proposed Amendment published in *Federal Register* April 22, 2010
75 Fed. Reg. 20935
- Public comment (120 days – **August 20, 2010**)
- Review comments
- Revisions
- Final Rule



Resources

- FHWA Division Office:
– <http://www.fhwa.dot.gov/field.html>
- Local Technical Assistance Program Office:
– <http://www.ltapt2.org/centers/>
- FHWA Nighttime Visibility Website:
– www.fhwa.dot.gov/retro

Comments:

- Review & Comment:
www.regulations.gov
– Search: "FHWA-2009-0139-0002"
- [August 20, 2010 deadline](#)



Questions

(limited to clarification)

