



retroreflectivity  
what's

# Are you Ready?

From “Effective” Date of Final Rule (January 22, 2008):

**Jan 22, 2012**

(4 years from 2008)

Identify and begin using method(s)

**Jan 22, 2015**

(7 years from 2008)

Replace identified regulatory, warning, and ground mounted guide signs

**Jan 22, 2018**

(10 years from 2008)

Replace identified street name and overhead guide signs

# Compliance Dates such an issue with local and State governments that members of Congress started asking FHWA - WHY?

- **Nov 30, 2010** - In Federal Register, FHWA asked for comments regarding 7 Compliance Dates in 2009 MUTCD
  - 3 on *Maintaining Minimum Sign Retroreflectivity*
  - 4 new in the 2009 MUTCD  
(One Way Signs; Horizontal Alignment Warning Signs; Yellow Change / Red Clearance Intervals; and Pedestrian Intervals / Signal Phases)
- **Jan 11, 2011** - FHWA Administrator Mendez asked 36 members of the NCUTCD for their opinion
- **Jan 14, 2011** - Comment period ended, FHWA received over 600 sets of comments
- **June, 2011** – Congressional legislation submitted under bill **S.1216**

# National Committee on Uniform Traffic Control Devices (NCUTCD)

- Expressed major concerns with 2009 MUTCD to FHWA
  - Change in letter size on Street Name Signs
  - Compliance dates for retroreflectivity
  - The change in definition of the term “Standard”
    - Added text: “*Standard statements **shall not** be modified or compromised based on engineering judgment or engineering study.*”

# Proposed Revisions to Compliance Dates

- **August 31, 2011** – FR Notice of Proposed Amendments
- Proposes to revise MUTCD **Table I-2** and *eliminate, extend* **OR** *revise* many of the 58 target compliance dates.
  - Eliminate compliance dates of 46 items  
(but NOT the *requirements* in the MUTCD)
  - Extend and/or revise the dates of 4 items  
(under which establishing a retro maintenance method falls)
  - No change in dates for the other 8 items

# Proposed Revisions to Compliance Dates

- **BE AWARE** - The NPA does not say it will *eliminate* any regulations or *all* the compliance dates
- Compliance dates are not for new installations or replacements – they affect replacement of deficient in-service TCDs *currently in the field* that don't meet new requirements.
- *Standard and Guidance* requirements in MUTCD 2A-08 **have not changed**

# How does this affect Retroreflectivity?

- Jan 2012 compliance date to implement an assessment or management method MAY be *extended* 2 years, and would affect *Regulatory & Warning* signs
- *Proposed* not to have specific date to implement the method for guide & other signs
- Jan 2015 and Jan 2018 compliance dates for replacement of *deficient in-service* signs are *proposed* for elimination
  - **BUT any sign a jurisdiction identifies as not meeting established min retro levels would STILL need to be replaced.**
  - **Essentially the NPA will *eliminate any latitude* agencies had in replacing deficient devices by some point in the future!**

# How does this affect Retroreflectivity?

- Agencies should be prepared to defend their replacement scheduling decisions if liability issues arise.
- **Reminder:** agencies are *still* required to meet ALL MUTCD requirements regarding Min Retro Levels, Street Name Letter Heights, Crashworthy Supports, etc **NOW** for all *new installations and replacements*.
- **COMMENT NOW!**  
**60-day comment period for this NPA ends October 31, 2011**

<http://mutcd.fhwa.dot.gov/>



# Exempt Signs

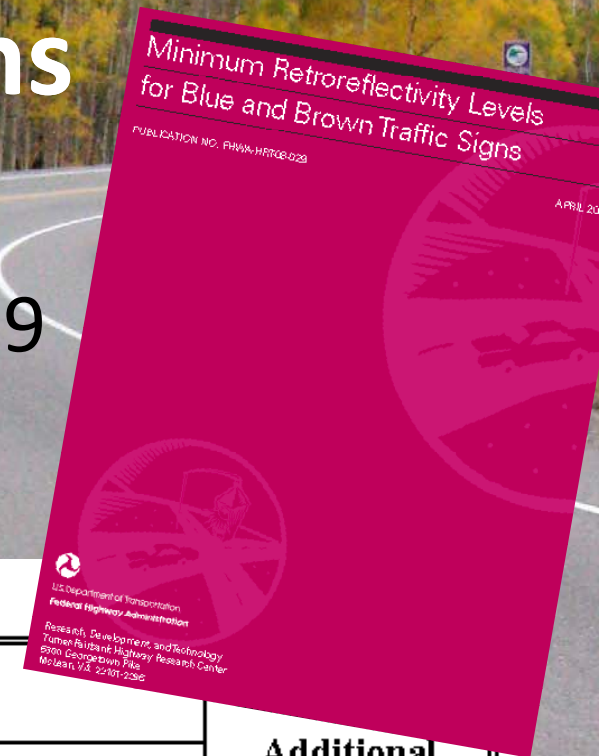
- Parking/Standing/Stopping
- Walking/Hitchhiking
- Adopt-A-Highway
- **Blue or Brown Backgrounds**
- Exclusive Use of Bikes or Peds

Note: Must still meet other requirements in MUTCD (inspections, retroreflective, etc,)



# Minimum Retroreflectivity Levels for Blue and Brown Traffic Signs

- Publication No. FHWA-HRT-08-029
- April 2008



**Table 17. Minimum MR levels.**

Sign Color	Sheeting Type (ASTM D4956-04)				Additional Criteria
	Beaded Sheeting			Prismatic Sheeting	
	I	II	III	III, IV, VI, VII, VIII, IX, X	
White on green or white on blue	W*; G ≥ 7	W*; G ≥ 15	W*; G ≥ 25	W ≥ 250; G ≥ 25	Overhead
	W*; G ≥ 7	W ≥ 120; G ≥ 15			Ground mounted
White on brown	W*; Br ≥ 7	W*; Br ≥ 15	W*; Br ≥ 20	W ≥ 350; Br ≥ 20	Overhead
	W*; Br ≥ 7	W ≥ 150; Br ≥ 15			Ground mounted

# Retro Increases for Complex Visual Conditions or Roadways With Glare

***ALSO IN Publication No. FHWA-HRT-08-029***

- Current values represent ***dark rural environments***.
- Complex visual conditions (roadways with glare) ***require twice as much retroreflectivity***
- If ***fixed roadway lighting*** is added, retro need increases **15%**

# NEW Sheeting Identification Guide

## FHWA-SA-11-14

### 2011 Traffic Sign Retroreflective Sheeting Identification Guide



This document is intended to help identify sign sheeting materials for rigid signs and their common specification designations. It is not a qualified product list. FHWA does not endorse or approve sign sheeting materials. Many other sheeting materials not listed here are available for delineation and construction/work zone uses.

#### Retroreflective Sheeting Materials Made with Glass Beads

Example of Sheeting (Shown to scale)											
ASTM D4956-04	I	II	II	III	III	III	III	III	III	III	III
ASTM D4956-09	I	II	II	III	III	III	III	III	III	III	III
AASHTO M268-10	(1)	(1)	(1)	A	A	A	A	A	A	A	A
Manufacturer	Several companies	Avery Dennison®	Nippon Carbide	3M™	ATSM, Inc.	Avery Dennison®	Nippon Carbide	Oracal			
Brand Name	Engineer Grade	Super Engr Grade	Super Engr Grade	High Intensity	High Intensity	High Intensity	High Intensity	High Intensity	High Intensity		
Series	Several	T-2000	15000	2800 3800	ATSM HI	T-5500	N500	5800			
NOTES:	(2)	(3) (4)	(4)	(3) (4)	(4)	(4)	(4)	(4)	(4)		
<p>(1) – Sheeting material does not meet minimum AASHTO classification criteria.                      (2) – Glass Bead Engineer Grade sheeting is uniform without any patterns or identifying marks. Section 2A.08 of the 2009 MUTCD (<a href="http://mutcd.fhwa.dot.gov">http://mutcd.fhwa.dot.gov</a>) does not allow this sheeting type to be used for new yellow or orange signs, or new legends on green signs.                      (3) – Material no longer sold in the United States as of the date of this publication.                      (4) – Section 2A.08 of the 2009 MUTCD (<a href="http://mutcd.fhwa.dot.gov">http://mutcd.fhwa.dot.gov</a>) does not allow this sheeting type to be used for new legends on green overhead signs.</p>											

- ASTM D4956-04 is referenced in Table 2A-3 of the 2009 MUTCD.
- ASTM D4956-09 is the most current ASTM sign sheeting specification (the 2009 version is designated by "-09").
- AASHTO M268-10 Types for this Guide are based only on retroreflective properties and not other unique AASHTO requirements such as color.

#### Manufacturer Contact Information

3M - <http://www.3M.com/tss>  
 Avery Dennison - <http://www.reflectives.averydennison.com>  
 Oracal - <http://www.oracal.com>

ATSM, Inc. - <http://www.atsminc.com>  
 Nippon Carbide - <http://www.nikkalite.com>  
 Reflexite - <http://www.reflexite.com>

er 2005	
ations.	
eads	
III	III
G Lite	Nippon Carbide
High Intensity	High Intensity
18000	N500
18100	N800
S	
X	Unassigned
Nippon Carbide	3M™
al Grade	Diamond Grade™ DG3
3000	4000
C	
Sheeting is uniform (grades).	



# Compliance Kits





# Compliance Kits

## Calibration Signs and Comparison Panels

- Kit consists of a full set of **8 *Calibration Sign Standards*** and **12 *Comparison Panel Standards***
- NOT actual traffic signs – but designed to engineering standards, precisely manufactured to MUTCD minimum levels of retroreflectivity (guaranteed for 2 years)
- Reliably measured per ASTM E 810 and certified accurate
- Will conduct formal engineering study evaluating this as a *daytime technique* and submit to FHWA for review

[www.reflectives.averydennison.com](http://www.reflectives.averydennison.com)

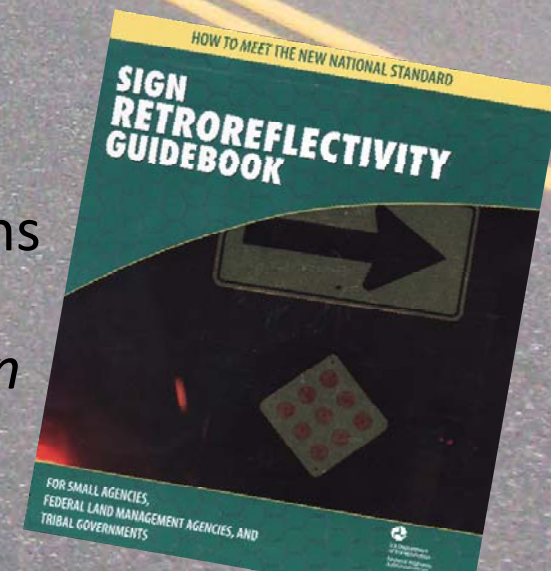
# Sign Management Software



- **Signs Plugin, UT LTAP** – Safety Software Suite, FREE GIS plugins for Crash Analysis, SIMS, Intersection Analysis, RSAs, ADA Ramps, etc
- **SimpleSigns, Rowekamp** – Iowa based co, specifically designed for small communities, maintain signs, track sign age, orientation, etc
- **SignProx, Eric Green, KY LTAP** – Efficient inventory, manage, and maintain signs, GPS integration, designed to ensure compliance with new retroreflectivity regulations.
- **SignWorks, PubWorks** – GIS Asset Mgmt, Fleet Maint, Signs, Service Requests, Work Orders, Mapviewer, Data Collector, etc
- **RoadSoft GIS/Signs, MI LTAP** – Asset Mgmt/Inventory, Safety Analysis, Workflow Mgmt, Mapping, Data Collection, Proj. Estimator

# Retro Management Tools

- MN Sign Maintenance/Management Handbook
  - Rules, Maintenance Methods, Financial Budgeting, Policy Development/Implementation, Effectiveness of Traffic Signs
  - Section on *How to Remove Unnecessary and Ineffective Signs*
- *Pavement Marking Management Systems, IA & MN*
  - FHWA Nighttime Visibility Website
- Sign Retroreflectivity Guidebook/CD
  - Designed to help small agencies make decisions on Retro requirements. Includes: Steps to Implementation, *Interactive Budget Estimation Tool, Sample Forms and Letters*, and Funding and Technical Resources.





# Minimum Pavement Marking Retroreflectivity



- **New MUTCD Section 3A-03**
- FHWA proposed first-ever standards for maintaining minimum levels of reflectivity of *pavement markings*.
- Federal Register Notice of Proposed Rulemaking, April 22, 2010
- 120 day public comment period ended August 20, 2010
- *(Originally it was proposed that...)* agencies would have:
  - 4 years to establish & implement a PM maintenance method
  - 6 years to replace PM that fail to meet the new regulations

# Minimum Pavement Marking Retroreflectivity

- **Table 3A-1** Minimum Maintained Retroreflectivity Levels for Longitudinal Pavement Markings

	Posted Speed Limit (mph)		
	< = 30	35 - 50	> = 55
Two lane roads with centerline markings only	Not applicable	100	250
All other roads	Not applicable	50	100

# Minimum Pavement Marking Retroreflectivity

**MUTCD Section 3A-03** includes subtle but important distinctions that categorize PM into 3 general types:

- **Not required to be retroreflective** - PM where ambient illumination assures adequate visibility, or only needed in the daytime.
- **Required to be retroreflective, but *not* subject to min levels** – Some examples of exceptions include crosswalk markings, other transverse markings, words, symbols, arrows, etc.
  - Some are exempt under certain conditions, such as presence of continuous *roadway lighting* or *raised retro pavement markers*.\*\*
- **Subject to minimum retroreflectivity levels** – WHITE and YELLOW longitudinal PM that are required by the MUTCD – center lines, edge lines, lane lines, and channelizing lines.

# Requirements of *Center Line* Pavement Markings



- **MUTCD Section 3B-01**

*Standard* –

- Center Line Markings *shall* be placed on all paved urban arterials & collectors w/traveled way of 20ft or more, and an **ADT of 6,000** vehicles per day or greater.

*Guidance* –

- Center Line Markings *should* be placed on paved urban arterials & collectors w/traveled way of 20ft or more, and an **ADT of 4,000** vehicles per day or greater.
- Center Line Markings *should also* be placed on all rural arterials & collectors w/traveled way of 20ft or more, and an **ADT of 3,000** vehicles per day or greater.

# Retroreflectivity Websites

- ATSSA Retroreflectivity Clearinghouse  
[www.retroreflectivity.net](http://www.retroreflectivity.net)
  - Primer on retroreflectivity
  - Common questions & resources
- FHWA Nighttime Visibility Website  
[http://safety.fhwa.dot.gov/roadway\\_dept/night\\_visib/](http://safety.fhwa.dot.gov/roadway_dept/night_visib/)
  - Summary Brochure & Final Rule
  - Power Point Presentations
  - Local Agency Retro Toolkit
  - Frequently Asked Questions
  - *Pavement Marking* Retro Updates
- <http://www.minimumreflectivity.org>



**?? Questions ??**

\ enée \  
Colorado LTAP  
cltap@colorado.edu