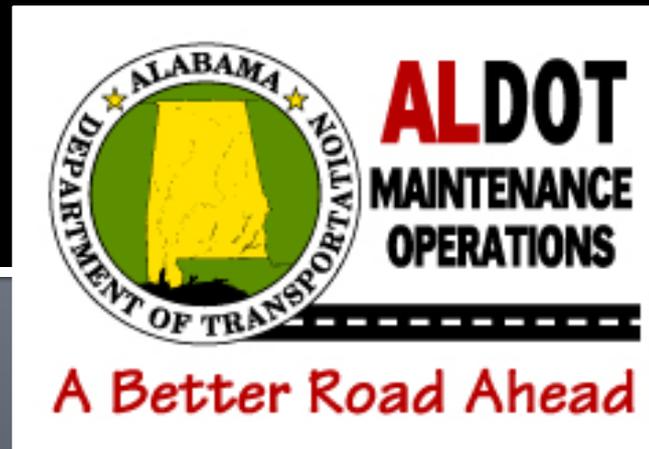


Alabama DOT Sign Inspection PROGRAM

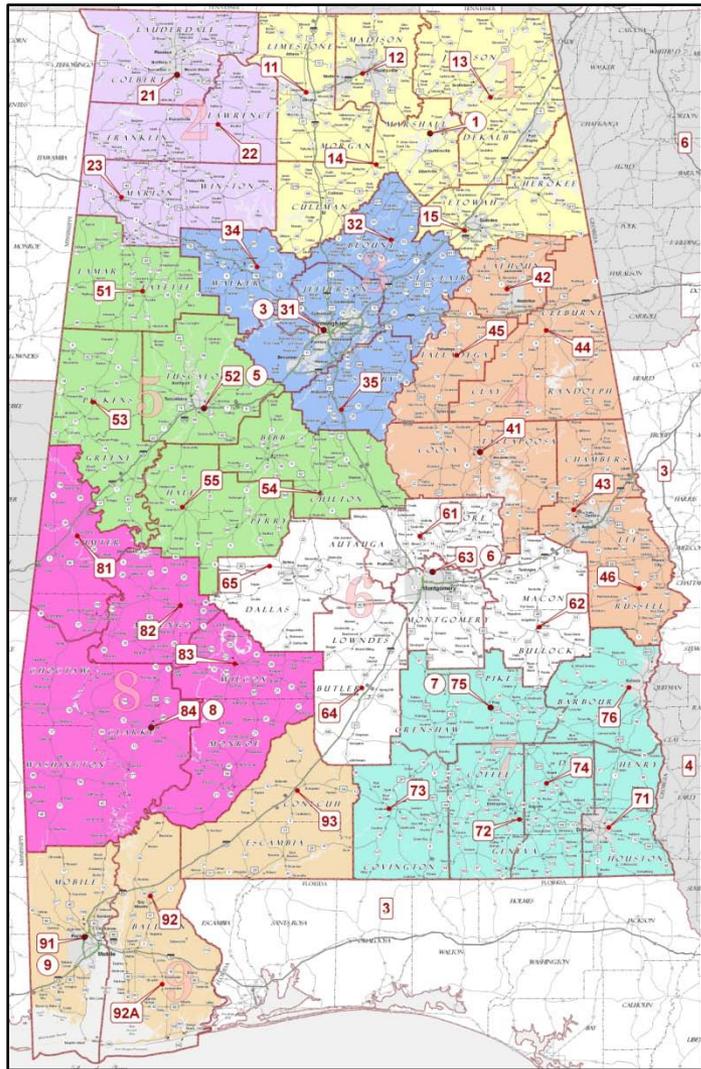
SASHTO 2011
Louisville, KY



Topics

- Introduction
- MUTCD Revisions
- MUTCD Sign Inspection Methods
- ALDOT Sign Inspection Methods
- ALDOT Sign Inspection Documentation

ALDOT Organization



- 67 Counties
- 41 Districts
 - Partial County (Dist 31)
 - Three Counties (Dist 44, Dist 84)
 - In-between
- Nine Divisions
 - Range between 3 and 6 Districts

2003 MUTCD Final Rule



Federal Register

- Sign Retroreflectivity Minimum
Published on Dec 21, 2007
 - Vol 72, No. 245
- Revision #2 of the 2003 Edition
of the MUTCD
- Effective Jan 22, 2008

2003 MUTCD – Revised Portions

- Introduction
- Compliance dates
- Part 1
 - 1A.11 - relation to other publications
- Chapter 2A
 - **2A.09 - minimum sign retroreflectivity**
 - 2A.22 - sign maintenance
- Minor editorial changes to cross-references
 - 2A, 2B, and 6F

Sign Retroreflectivity in 2003 MUTCD

- Section 2A.09
 - Maintaining Minimum Retroreflectivity
 - “Standard: Public Agencies or officials having jurisdiction shall use an assessment or management method that is designed to maintain sign retroreflectivity at or above the minimum levels in Table 2A-3 ”

Sign Retroreflectivity in 2003 MUTCD

- Section 2A.09
 - Maintaining Minimum Retroreflectivity
 - “Support: Compliance... is achieved by having a method in place and using the method to maintain the minimum levels established in Table 2A-3. Provided that... a method is being used, an agency would be in compliance... even if there are some individual signs that do not meet the... levels at a particular point in time. ”

Inspection Methods

- “...One or more of the following assessment or management methods should be used...”
 - Visual Nighttime Inspection
 - Measured Sign Retroreflectivity
 - Expected Sign Life
 - Blanket Replacement
 - Control Signs
 - Future Methods Based on Engineering Studies
 - Combination Of Above Methods

New MUTCD Table 2A.3 Minimum Maintained Retroreflectivity Levels

**New MUTCD Table 2A.3
Minimum Maintained Retroreflectivity Levels**

Sign Color	Sheeting Type (ASTM D4956-04) ①				Additional Criteria
	Beaded Sheeting			Prismatic Sheeting	
	I	II	III	III, IV, VI, VII, VIII, IX, X	
White on Green	W* G ≥ 7	W* G ≥ 15	W* G ≥ 25	W ≥ 250; G ≥ 25	Overhead
	W* G ≥ 7	W ≥ 120; G ≥ 15			Ground-mounted
Black on Yellow or Black on Orange	Y*; O*	Y ≥ 50; O ≥ 50			②
	Y*; O*	Y ≥ 75; O ≥ 75			③
White on Red	W ≥ 35; R ≥ 7				④
Black on White	W ≥ 50				—

① The minimum maintained retroreflectivity levels shown in this table are in units of cd/lx/m² measured at an observation angle of 0.2° and an entrance angle of -4.0°.

② For text and fine symbol signs measuring at least 1200 mm (48 in) and for all sizes of bold symbol signs

③ For text and fine symbol signs measuring less than 1200 mm (48 in)

④ Minimum Sign Contrast Ratio ≥ 3:1 (white retroreflectivity ÷ red retroreflectivity)

* This sheeting type should not be used for this color for this application.

Sign Retroreflectivity Mandates

- **January 2012**

- All agencies will have a sign maintenance program in place

- **January 2015**

- All agencies must comply with the new retroreflectivity requirements for “regulatory”, “warning”, and “guide” signs

- **January 2018**

- All agencies must comply with the new retroreflectivity requirements for overhead guide signs and all street name signs

ALDOT Visual Nighttime Sign Inspection Methods

- Calibration Signs Procedure
 - Use of calibration panels to train the eye to recognize minimum sign retroreflectivity levels
- Consistent Parameters Procedure
 - A trained Inspector
 - Sixty years of age or older
 - Uses a sports-utility or pick-up truck, model year 2000 or newer

Calibration Signs Method Overview

- Any vehicle, any inspector age is OK.
- Before leaving the maintenance yard, the inspectors visually inspect a set of representative signs in an effort to calibrate their eyes before starting the nighttime inspections.
- Use low beams
- Vehicle located on travel lane, not shoulder
- The inspections occur at highway speeds

Calibration Signs

- Calibration signs must have a retroreflectivity level at least equal to that designated in the MUTCD
- The calibration and the inspection are performed at night
- Sign Inspections are typically performed during the Fall and Winter months, when it gets darker earlier in the day



Source of Calibration Signs

- With a retroreflectometer, an agency can find in-service signs near the minimum levels. These signs can be removed from service and stored until nighttime sign inspections commence.
- An agency can also look through their scrap yard for representative signs.
- ALDOT is not aware of any sources for ordering calibrated signs.

ALDOT Calibration Signs

- Signs are at minimum retroreflectivity
- Used to Conduct Visual Night Time Inspections
- Each set consist of a Red/White, White/Black, Yellow/Black and Green/White sign



Calibration Signs

- ALDOT maintains 41 Calibration Sign sets (one for each District)
- These calibration signs are inspected once a year by the ALDOT State Sign Shop to ensure the calibration signs are still at the minimum retroreflectivity level

Calibration Sign Checkout Form

- Checkout form is used to keep track of calibration sign sets



Alabama Department of Transportation
Maintenance Bureau
1409 COLISEUM BOULEVARD, MONTGOMERY, ALABAMA 36110



Bob Riley
GOVERNOR

Joe McInnes
TRANSPORTATION DIRECTOR

Retroreflectivity Sign Checkout Form

Division _____

District _____

Name _____

Inventory # _____

Inspection Date _____

Check Out Date _____

Check In Date _____

Calibration Signs Field Procedure



These signs have retroreflectivity levels equal to those specified in the MUTCD minimum retroreflectivity table

Calibration Signs Nighttime Inspection Checklist

- Be well rested
- Select inspection vehicle and have headlamps aimed
- Select inspection routes (both directions)
- Prepare inspection forms
- Have sign list if available (for each inspection route, a list of signs you expect to see, in order of the direction of travel)
- Two person crew: Driver and Inspector

Calibration Signs Nighttime Inspection Checklist

- Cannot start in earnest until complete darkness
- View calibration signs before starting your inspection routes
- Consider reviewing calibration signs after extended period or when questions arise

Visual Night Time Inspection Method: Consistent Parameter Procedure



Consistent Parameters Overview

- With this method, a SUV or truck has to be used with specific headlamps and the inspector needs to be at least 60 years old.
- The inspection occurs at highway speeds.
- No calibration signs or comparison panels are needed.
- This method simulates the conditions of the research which FHWA used as a foundation for the minimum retroreflectivity levels.

Benefits to Night Time Inspection (Either Method)

- Replace only Signs that fail inspection
- Allow Districts to budget for replacement
- More efficient than some of the other sign inspection methods (less labor intensive)
- In Alabama it has been the Districts' responsibility to conduct Night Time Sign Inspections for many years – it is a familiar process
- Sign Asset Inventory constantly updated

Inspection Method(s) Used in Alabama

- Currently all 41 Districts are using the Calibration Sign Procedure in the State of Alabama

ALDOT Inventory System



RoadMAP

ALDOT Maintenance
Management System

A Better Road Ahead

Sign Record Page

Main		Additional Information		UDF	
AssetID	SF-IN0065-0176.720-5-R-01	Description	SPEED LIMIT 70		
Add Info	<input type="text"/>	Location	<input type="text"/>		
Div/Dist	610 <input type="text"/>	DISTRICT 1 - SPEIGNER			
Road Class	INT <input type="text"/>	Interstate Roadways			
Build Date	8/6/2002 <input type="text"/>	Priority	Medium <input type="text"/>		
MUTCD Code	R2-1-70 <input type="text"/>	70 MPH SPEED LIMIT			
Picture	<input type="text"/>	Cost by Activity		Cost Trend	
No image data					

Sign Record Page (con't)

Main			Additional Information			UDF			
Original Value	\$0.00	Life in Yrs	0	Accrued Depr	\$0.00				
Balance	\$0.00								
Condition	A	Last Inspection	<input type="text" value=""/>	Interval	0	Months			
Det Rate	0	Next Inspection							
Related Pavement	<input type="text" value=""/>								
Related Asset(s)	SI-IN0065-0176.720-S-R								
Billable Cust(s)	<input type="text" value=""/>								
Feature	ALUMINUM			State No	<input type="text" value=""/>				
Structure Type	HIGH INTENSITY								
Location	<input type="text" value=""/>			Address	LRS				
	<input type="text" value=""/>			Start Position	0	176.72			
	<input type="text" value=""/>			End Position	0	176.72			
Co. Elmore ; Route IN0065 ; Dir. S; From 176.72; To 176.72; Loc. Roadside ; Offset 20; Side R									
Inventory Qty	1	each	Depth	<input type="text" value=""/>	Height	48			
Length	0	Width	60						
Notes	<input type="text" value=""/>								
More	<input type="text" value=""/>								

Sign Inspection Form



RoadMAP

ALDOT Maintenance Management System

A Better Road Ahead

Sign Inspection Form

AssetID	Description	Retroreflectivity		
		0	1	2
SF-IN0085-0178.688-N-R-01	SPEED LIMIT 70	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0177.110-N-R-01	TOW AWAY ZONE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0177.110-N-R-02	NO PARKING BETWEEN SIGNS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0177.167-N-R-01	CONTROLLED ACCESS FACILITY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0177.356-N-R-01	NO PARKING BETWEEN SIGNS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0177.356-N-R-02	TOW AWAY ZONE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0177.453-N-R-01	MILE POST 178	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0177.705-N-R-01	EXIT 179 MILLBRK PRATT 1 MILE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0177.855-N-R-01	NO PARKING BETWEEN SIGNS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0177.873-N-R-01	CAMPING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0178.024-N-R-01	FOOD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0178.057-N-R-01	CAUTION ICE ON BRIDGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0178.176-N-R-01	GAS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0178.482-N-R-01	ROBERT TRENT JONES GOLF TRAIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0178.482-N-R-02	ROBERT TRENT JONES GOLF TRAIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SF-IN0085-0178.637-N-O-01	NORTH I-65 B'HAM 2 LANES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Retro Factor Setup

CitiTech Management Software - [Inspection Factors LOS]

File Daily Operations Assets Resources Reports Window Help

Navigator

- Work Orders
- Work Reporting / Plans
- Inventory
- Personnel/Eqpt
- Inspections
- Assets
- Accounting
- Alert Reminders

Open Windows

- Inspection Factors LOS
- Inventory
- Startup Screen

Description | Level of Service

Maintenance Element: ROADWAY FEATURES-SIGNS - W & R: RETROREFLECTIVY

Level of Service

Level of Service	A/1		B/2		C/3		D/4		F/5
Values	Min	Max	Min	Max	Min	Max	Min	Max	Min
each per each	0.00	1.25	1.25	1.50	1.50	2.50	2.50	2.75	2.75

Target Grade:

Target Value:

Retro Factor Setup (con't)

CitiTech Management Software - [Inspection Factors LOS]

File Daily Operations Assets Resources Reports Window Help

Navigator

- Work Orders
- Work Reporting / Plans
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- Personnel/Eqpt
- Inspections
- Assets
- Accounting
- Alert Reminders

Open Windows

- Inspection Factors LOS
- Inventory
- Startup Screen

Description Level of Service

Asset Type: ROADWAY FEATURES - SIGNS - W & R Maintenance Element: RETROREFLECTIVIY

Level Of Service

Description: Warning & Regulatory Signs - retroreflectivity inspected during Night-time sign inspections

Procedure: 0 = Good/New
1 = Fair
2 = Fall

Unit of Measure: each per each

Related Activity (s)

*Activity	Activity Desc	Activity Pct	Activity Total	Distribution Pct	Conversion Factor	Units	Cyclic?
6351	6351: Sign Installation, Replacement ...	20	100	100	1		<input type="checkbox"/>

Sign Inspection Screen

CitiTech Management Software - [Inspection Reporting]

File Daily Operations Assets Resources Reports Window Help

Main UDF

Inspector: McBrayer

Description: Nighttime Sign Inspection

Update Asset List

*Asset ID	Description	*Distressors	*Qty	Unit of Measure	Notes	Work Or...
SF-IN0065-0176.688-N-R-01	SPEED LIMIT 70	RETROREFLECTIVIY	2	each per each		
SF-IN0065-0177.110-N-R-01	TOW AWAY ZONE					
SF-IN0065-0177.110-N-R-02	NO PARKING BETWEEN SIGNS					
SF-IN0065-0177.167-N-R-01	CONTROLLED ACCESS FACILITY					
SF-IN0065-0177.356-N-R-01	NO PARKING BETWEEN SIGNS					
SF-IN0065-0177.356-N-R-02	TOW AWAY ZONE					
SF-IN0065-0177.453-N-R-01	MILE POST 178					
SF-IN0065-0177.705-N-R-01	EXIT 179 MILLBRK PRATT 1 MILE					
SF-IN0065-0177.855-N-R-01	NO PARKING BETWEEN SIGNS					
SF-IN0065-0177.873-N-R-01	CAMPING					

Questions

