

Village of Los Lunas Retroreflectivity Sign Policy



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Summary

New MUTCD retroreflectivity standards require agencies to replace non-compliant signs within seven to ten years.

Local agency action will soon be required

Federally-mandated sign retroreflectivity standards became final on January 22, 2008. Federal Highway Administration (FHWA) changes to the Manual on Uniform Traffic Control Devices (MUTCD) are designed to improve the night visibility of traffic signs. This mandate requires state and local agencies to:

- Asses the signs on their roads and develop a replacement plan within four (4) years of the final ruling.
- Replace non-compliant warning and regulatory signs within seven (7) years of the final ruling.
- Replace guidance and street name signs within ten (10) years of the final ruling.

Nighttime Fatalities

The FHWA reports that although about one-quarter of all travel occurs at night, one-half of all fatalities occur during those hours. "It is well known that darkness reduces the visual cues available to the driver and that traffic control devices are harder to see at night."

About 42,000 adults and children are killed on U.S. roads each year.

- Rural roads are the most dangerous roads in the nations, accounting for about 60% of all fatal crashes.
- Less than one-third (28%) of all vehicle miles travel occurs on rural, non-interstate roads, yet more than one-half (52%) of all fatalities occur there.
- For every 100 vehicle miles traveled, fatalities are 2.75 times higher on rural roads than on other roads.

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CHAPTER 1. INTRODUCTION

Background

The purpose of traffic control devices and the principles for their use is for the promotion of highway safety and efficiency by providing for the orderly movement of all road users. Those devices notify road users of regulations, provide warning, and give guidance needed for safe, uniform, and efficient operation of all elements of the traffic stream.

The Village of Los Lunas has been tasked with actively managing its traffic signs and ensuring that its traffic signs are performing as they are intended. Nighttime performance of traffic signs can be more difficult to maintain for a variety of reasons. One of the primary differences between daytime and nighttime sign performance is a material property called retroreflection. Retroreflection is a special type of reflection that redirects incident light (i.e., from headlights) back toward the source. The nighttime visibility of traffic signs that is provided through retroreflective sign sheeting materials is difficult to assess during daytime conditions using visual inspection methods. Furthermore, the retroreflective properties of all sign sheeting materials degrade over time, making signs progressively less visible (i.e., less bright) at night. Environmental conditions, such as UV-radiation from the sun, moisture, and pollutants cause a substantial amount of the deterioration in retroreflective performance. However, loss of retroreflectivity can also occur due to vandalism, such as paint ball shots, gunshots, and spray paint.

As signs degrade and become less retroreflective, their effectiveness in communicating regulatory, warning and guidance messages to road users at nighttime diminishes to the point that they cannot be seen or read in time for a driver to react properly. Thus, to maintain nighttime effectiveness, signs must be replaced before they reach the end of their useful retroreflective life. Research has led to the development of recommended minimum maintained levels of traffic retroreflectivity for regulatory, warning, and guide signs for currently available materials, vehicle fleet characteristics, and capabilities of the driving population.

The Federal Highway Administration (FHWA) developed minimum maintained traffic sign retroreflectivity levels in response to a Congressional directive in the Department of Transportation and Related Agencies Appropriations Act, 1993 (public law 102-388; October 6, 1992). Section 406 of this Act directed the Secretary of Transportation to revise the Manual on Uniform Traffic Control Devices (MUTCD) to include a standard for minimum levels of retroreflectivity that must be maintained for traffic signs and pavement markings, which apply to all roads open to public travel.

By January 2012, government agencies must establish and implement a sign assessment or management method to maintain the minimum sign retroreflectivity levels. January 2015 is the compliance date for regulatory, warning, and ground-mounted guide signs.

As a result of rulemaking, The Village of Los Lunas will need to implement sign maintenance methods that incorporate the consideration of minimum retroreflectivity levels to provide for

nighttime visibility of signs. This document provides general information on methods for maintaining minimum traffic sign retroreflectivity levels.

CHAPTER 2. RETROREFLECTIVITY MAINTENANCE METHODS

The FHWA has outlined maintenance methods that are intended to provide agencies, with a flexible means of conformance with the MUTCD requirements for minimum retroreflectivity of traffic signs and provide protection from potential tort claims.

The establishment of minimum maintained sign retroreflectivity levels in the MUTCD requires that agencies adopt one or more acceptable methods. This provision was intended to assure that agencies use methods that will be effective in maintaining nighttime visibility for their deployed traffic signs.

In order to minimize the risk to an agency of being found negligent in meeting the requirements for minimum traffic sign retroreflectivity, a sign maintenance program must be provided in order to ensure the nighttime visibility of signs.

Definitions of Maintenance Methods

The following accepted methods are described in greater detail in this report.

- **Nighttime Visual Inspection.** The retroreflectivity of an existing sign is assessed by a trained sign inspector following a formal visual inspection procedure from a moving vehicle during nighttime conditions. Signs that are visually identified by the inspector to have retroreflectivity below the minimum levels should be replaced.
- **Measured Sign Retroreflectivity.** Sign retroreflectivity is measured using a retroreflectometer. Signs with retroreflectivity below the minimum levels should be replaced.
- **Expected Sign Life.** The installation date is labeled or recorded when a sign is installed, so that the age of any given sign is known. The age of the sign is compared to the expected sign life. The expected sign life is based on the retroreflectivity degradation in a geographic area. Signs older than the expected life should be replaced.
- **Blanket Replacement.** All signs in an area/corridor or of a given type are replaced at specified intervals. This eliminates the need to assess retroreflectivity or track the life of individual signs. The replacement interval is based on the expected sign life for the shortest-life material used in the area/corridor or on a given sign type.
- **Control Signs.** Replacement of signs in the field is based on the performance of a sample set of signs. The control signs might be a small sample located in a maintenance yard or a selection of signs in the field. The control signs are monitored to determine the end of retroreflective life for the associated signs. All signs represented by a specific set of control signs should be replaced before the retroreflectivity levels of the control signs reach the minimum retroreflectivity levels.

A sign management system could also be used as one of the evaluation methods. However, an evaluation method is a tool that supports a sign management system. A sign management system does not provide a means for evaluating nighttime sign visibility; it provides a means of managing information from one or more evaluation systems used to predict when a sign should be replaced.

The sign retroreflectivity maintenance methods described above are divided into two groups, assessment methods and management methods, as noted in the following table. Agencies have flexibility to adapt these methods for maintaining sign retroreflectivity into existing sign management processes or may upgrade their sign management process by incorporating an approved maintenance method.

Retroreflectivity Maintenance Methods

Assessment Methods	Management Methods
Nighttime Visual Inspections Retroreflectivity Measurements	Expected Sign Life Blanket Replacement Control Signs

Combining Maintenance Methods

The Village of Los Lunas will employ the combinations of two or more methods in maintaining a retroreflectivity sign policy.

One possible combination is the use of a management method with both daytime and nighttime visual inspections. The expected life of a sign is a management method and is based on the age and degradation of the sheeting types used. This management method in combination with daytime visual inspections may allow an agency to track how many signs they have, how old they are, and where they are located. It also provides field crews with a list or summary of deployed signs that can be easily used to note for sign replacements or repairs when conducting nighttime visual inspections. Combining the expected sign life management method with both daytime and nighttime visual inspections is one example of adapting methods that meet an agency's needs.

Objective of Sign Retroreflectivity Maintenance Methods

The intent of the methods is to provide a systematic means for agencies to maintain traffic sign retroreflectivity at or above the minimum levels. The FHWA has determined that agencies that use an approved method to maintain traffic sign retroreflectivity are in conformance with the minimum maintained retroreflectivity requirements established in the MUTCD.

Substantial conformance with the MUTCD Section 2A.09 is achieved by having a method in place to maintain the minimum retroreflectivity levels. Conformance does not require or guarantee that every individual sign will meet or exceed the minimum retroreflectivity levels at every point in time.

Regardless of which maintenance method is adopted by an agency, documentation of the sign management process is important in assisting agencies to achieve conformance with the MUTCD

standard to maintain minimum retroreflectivity levels of traffic signs. Written procedures ensure that agency personnel properly follow the selected method, while maintenance records provide the agency with a systematic process for sign replacements and justification for the allocation of limited resources. As long as an agency has a reasonable method in place to manage or assess its signs and establishes a reasonable schedule for sign replacement as needed, the agency will be deemed to be in conformance.

CHAPTER 3. VILLAGE OF LOS LUNAS RETROREFLECTIVITY MAINTENANCE METHOD

Nighttime Visual Inspection, Expected Sign Life, Blanket Replacement, Control Signs and Measured Sign Retroreflectivity.

After review of the various methods proposed for sign maintenance, The Village of Los Lunas will incorporate the various methods of sign replacement and inspections as approved by need, age and road construction basis. This method is the easiest method to implement, and allows for the least amount of judgmental input and provides flexibility within department budget.

Specifications

- Currently, the two most commonly used sheeting for signs (that meet the retroreflectivity standards) are the High Intensity Prismatic (HIP) reflective sheeting and the Diamond Grade quality. It appears that the extra cost of the Diamond Grade does not significantly increase the expected life of the sign. Therefore, The Village of Los Lunas will purchase HIP grade signs.
- It is expected that each sign will have a date attached to the back of the sign to mark the date placed in service.

Timeline

- It is expected that sign replacement will begin in the 2012 calendar year and that all signs in the Village will be updated prior to the 2015 deadline.
- The expected life of HIP signs is 10 years. Therefore, it would be expected that signs would again be replaced, on a quadrant basis, in 2024, etc.

REFEREFCES

Dunn Township's Retroreflectivity Sign Policy

U.S. Department of Transportation, Federal Highway Administration and in many cases quotes that publication verbatim.

New Mexico Department of Transportation