Administrative Policy

SIGN RETROREFLECTIVITY

Public Works – A-106

Effective Date:

12-1-2011

Revised Date:

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Summary

The purpose of traffic control devices and the principles for their use is for the promotion of roadway safety and efficiency by providing for the orderly movement of all roadway users. Those devices notify road users of regulations, provide warnings, and give guidance needed for safe, uniform, and efficient operation of all elements of the traffic stream. The Town of Payson is responsible for all roadway signage within the Town boundaries on public roads, except Highway 87 and highway 260.

The Town is responsible to maintain the signs at a minimum level of retroreflectivity. Retroreflectivity is the ability of a sign to redirect incident light (i.e. from vehicle headlights) back to its source. In the case of roadway applications, traffic signs are made with retroreflective sign sheeting material that redirects headlamp illumination back toward the vehicle, thereby making the sign visible at nighttime to the vehicle driver. The reflective properties of all sign sheeting materials degrade over time making signs less visible at night. Environmental conditions, such as UV-radiation, moisture, pollutants and human vandalism can cause a substantial amount of deterioration in retroreflective performance.

As signs degrade and become less retroreflective, their effectiveness in communicating regulatory, warning and guidance messages to road users at nighttime is reduced 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.

In 1993 Congress mandated that the Federal Highway Administration (FHWA) was to come up with a standard of minimum retroreflectivity for signage and pavement markings. Following years of testing and evaluation, the Final Rule was published in the 2009 Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD is the national standard for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel. The rule in Section 2A.08 of the MUTCD provides the minimum standards for manufacture of sign sheeting materials and compliance dates by which all signage would have to meet the minimum requirements.

The first deadline is January 22, 2012. The MUTCD states that by this date “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.” Meeting this requirement means that the Town needs to complete two items: (1) Complete a sign inventory of all regulatory, warning, guide signs, and object markers along roads owned by the Town; and

(2) Create a policy for upgrading all existing signs to meet the minimum retroreflectivity requirements and an ongoing policy to maintain all signs at a minimum retroreflectivity level.

Initially, the Final Rules also included deadlines for replacing all existing regulatory and warning signs by January, 2015 and all street name signs by January, 2018. It now appears that these two deadlines will be eliminated. However, any signs not meeting minimum reflectivity levels still need to be replaced but there would be no specific date to replace them.

Assessment Methods

A program must be incorporated that will bring Town signage into conformance with the MUTCD requirements. The FHWA has outlined approved maintenance methods that are intended to provide agencies with a flexible means of conformance with the MUTCD requirements for minimum retroreflectivity of traffic signs. The establishment of minimum maintained sign retroreflectivity levels in the MUTCD requires that agencies incorporate one or more acceptable methods. There are two general categories for the maintenance methods: (1) Assessment Methods; (2) Management Methods. Evaluation methods involve some type of assessment of the night time visibility of individual signs. Management methods are based on the expected retroreflective life of the overall sign inventory, based on factors such as warranties, demonstrated performance or control sign assessments. Each method has its pluses and minuses.

A brief description of the various accepted methods is as follows:

Assessment-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.

Assessment-Measured Sign Retroreflectivity: Sign retroreflectivity is measured using a retroreflectometer. Signs with retroreflectivity below the minimum levels should be replaced.

Management-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 experience of sign retroreflectivity degradation in a geographic area. Signs older than the expected life should be replaced.

Management-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 tract

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.

Management-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 combination of two or more methods may be used to create an overall method that best fits an agency's needs and budget. The intent is to provide a systematic means 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. 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 chosen by an agency, documentation of the sign management process is important in assisting agencies to achieve conformance with the MUTCD standards of minimum retroreflectivity levels of traffic signs.

This policy will bring the Town into compliance with the requirement to create a policy for upgrading all existing signs to meet the minimum retroreflectivity requirements and an ongoing policy to maintain all signs at a minimum retroreflectivity level.

The Town of Payson completed a sign inventory of all Town signs in early 2011. This inventory is GIS based and is updated monthly as signs are modified and/or replaced in the field. This inventory fulfills the sign inventory requirement for Payson.

The Town of Payson currently has an Intergovernmental Agreement with the Arizona Department of Transportation (ADOT) to replace all regulatory signs and approximately ½ of the warning signs. This agreement allows the use of Federal 2011 Highway Safety Improvement Program (HSIP) funds to purchase the replacement signs. All new signs purchased with the HSIP funds will be made from High Intensity Prismatic reflective sheeting meeting the minimum requirements of ASTM D4956-09 Class IV. Town forces will then install the new signs. The new replacement signs are tentatively scheduled to be purchased by ADOT and delivered to Payson in early 2012.

The Town is also has been approved to receive a 2011 HSIP grant to replace the remaining warning signs and all of the street name signs. These signs should be received in late 2012 or early 2013. Again, all new signs purchased with the HSIP funds will be made from High Intensity Prismatic reflective sheeting meeting the minimum requirements of ASTM D4956-09 Class IV and town forces will install the new signs.

The completion of the town wide sign inventory and creation of a policy for obtaining and maintaining minimum sign retroreflectivity by January, 2012 puts the Town in compliance with the retroreflectivity requirements set forth in the 2009 MUTCD.

Policy

This policy is based on the following criteria:

(1) The Town of Payson has a town wide sign inventory in place;

(2) All regulatory and approximately ½ of the warning signs will be replaced with highly reflective signage in 2012 using an HSIP grant; and,

(3) The remaining warning signs and all of the street name signs will be replaced with highly reflective signage in 2013 using an HSIP grant.

Any new sign installed on a public road in the Town of Payson shall be made from High Intensity reflective sheeting meeting the minimum requirements of ASTM D4956-09 Class III.

Any new sign purchased for installation on a public road in the Town of Payson shall be made from High Intensity Prismatic reflective sheeting meeting the minimum requirements of ASTM D4956-09 Class IV. This includes any signage purchased by private entities for use on a public roadway as part of a development.

After reviewing the various potential methods for proposed sign maintenance, the Town of Payson has chosen a combined Expected Sign Life-Blanket Replacement method. This requires that all signs within an identified geographic area within the Town shall be replaced within a specific time frame consistent with the anticipated sign life. The general detailed replacement schedule and areas are identified in Table 1. This table does not apply to any new signs installed in addition to those replaced with the HSIP grants due to growth, new roads, vandalism, etc.

The Town's sign inventory shall be updated on a monthly basis to incorporate any signage changes, additions, or upgrades. Any new signs installed in addition to those replaced with the HSIP grants due to growth, new roads, vandalism, etc. shall be replaced every ten (10) years.

Table 1 – Area Replacement Schedule

YEAR	AREA REPLACED	YEAR	AREA REPLACED
2022	1 & 3	2038	4
2023	6 & 8	2039	2
2024	7 & 5	2042	3
2025	2 & 4	2043	1
2032	3	2044	8
2033	1	2045	6
2034	8	2046	7
2035	6	2047	5
2036	7	2048	4
2037	5	2049	2

Beginning in 2050 all signs will be replaced every 10 years. The map on the following page identifies the 8 sign replacement areas. Any sign face still meeting the minimum retroreflectivity properties after ten years of service may be left in place. However, these signs must be monitored annually to determine an appropriate time for replacement.

This policy may be modified as needed due to changing requirements and conditions.

References

1. *Manual on Uniform Traffic Control Devices*. U.S. Department of Transportation, Federal Highway Administration, Washington, D.C., 2003 & 2009.

2. *Sign Retroreflectivity Guidebook*. U.S. Department of Transportation, Federal Highway Administration, Washington, D.C., 2009.

3. *Methods for Maintaining Traffic Sign Retroreflectivity*. U.S. Department of Transportation, Federal Highway Administration, Washington, D.C., 2007.

4. Arizona Milepost, Arizona LTAP Electronic News Bulletin, Vol. 1, No. 2, 2011

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