

November 29, 2011

## **City of Milwaukee Traffic Sign Retroreflectivity Policy**

### **1.0 General:**

This policy establishes the program to be followed in order to meet Federal Highway Administration standards for sign retroreflectivity as set forth in the 2009 Manual on Uniform Traffic Control Devices – Section 2A.09 and Table 2A-3 as well as all subsequent updates to the MUTCD. The comprehensive policy will consist of two programs. The first program will be established for maintaining reflectivity standards for traffic signs already in service. The second program will be established for maintaining reflectivity standards for future traffic sign installations. Each program will rely on a method for maintaining a sign inventory, a method for sign management and an assessment method. While the primary objective of this policy is to comply with Federal Highway Administration standards, the specific methods adopted are selected to reach this goal by the most economical means possible.

### **2.0 Sign Inventory Program:**

The Traffic Sign Section will continue to maintain its current and ongoing electronic inventory program to track traffic signs in a database format. A similar inventory program will be created for the tracking of alley signs. All traffic signs in service will have a record of its address, location within right of way or alley, direction of orientation, sign code, size, mounting, description, date of initial installation and most recent replacement date stored in a database.

### **2.1 Sources of Data:**

The two sources of sign inventory data are work orders and daily reports. A work order is issued for the initial installation of traffic signs and a daily report documents the replacement of traffic signs.

#### **2.1.1 Work Orders:**

All work orders issued by the Traffic Sign Section, Traffic Operations Section, or Parking Operations for the installation of permanent traffic signs will include the sign address, location within right of way, direction of orientation, mounting, size, and description. All work orders will be returned to the Traffic Sign Section upon completion and will include the installation date of each traffic sign for entry into the sign inventory database.

### **2.1.2 Daily Reports:**

Sign crews will complete daily report sheets logging all activities related to the maintenance of traffic signs in the field. Each log entry will have a record of the sign address, location within right of way, direction of orientation, mounting, size, description, reason for replacement (knocked down or damaged, missing, vandalism or age), job order number and date and time that the work is completed. All daily reports will be forwarded to the Traffic Sign Section for entry into the sign inventory database.

## **2.2 Sign Inventory Reports:**

The sign inventory database will be used to generate reports which will be used to document and track the age of all traffic signs.

### **2.2.1 Sign Engineering Report:**

The sign engineering report will be an annual report generated by the Traffic Sign Section at the end of each year. It will include the address, location within right of way, direction of orientation, sign code, size, mounting, description, date of initial installation and most recent replacement date for all traffic signs in the field as of December 31<sup>st</sup>. The sign engineering report will also contain all the traffic signs taken out of service during the year. An electronic copy of this report will be archived and kept as long as necessary.

### **2.2.2 Non-Conforming Signs Report:**

The non-conforming signs report will compile a list of all traffic signs of a specific age and older that are in service. The non-conforming signs report will include the address, location within right of way, direction of orientation, code and size, mounting, description, the date of initial installation or most recent replacement date of the traffic signs.

## **2.3 Date Stickers:**

All traffic signs in service will have a sticker attached to the back of the sign showing the month and year that the sign was installed to further document the sign's age.

## **3.0 Management of Existing Traffic Signs:**

The Traffic Sign Section will implement and maintain a program of sign management by testing signs currently in service to determine their expected sign life. Testing will be done for a specific sign type.

### **3.0. 1 Sign Type**

The sign type is the sign color plus ink or overlay film manufacturer, sheeting manufacturer and grade and age. The following are the sign colors listed in the 2009 MUTCD Table 2A-3:

White on Green  
Black on Yellow  
Black on Orange  
White on Red  
Black on White

### **3.1 Statistically Significant Sample Size:**

In lieu of testing all the signs of a given sign type, a statistically significant sample size will be used. The sample size will be determined using a 90% confidence level and a confidence interval of 10%.

### **4.0 Assessment of Existing Traffic Signs:**

Sign assessment will be done by measuring the retroreflectivity of the signs with a retroreflectometer. The signs will be tested by the Traffic Sign Section and the data recorded in a field log book. The collected data will then be stored electronically.

#### **4.0.1 Measured Retroreflectivity Values:**

A sign's measured retroreflectivity value is the average of four retroreflectometer readings. The four readings are taken from four different places on the sign surface.

#### **4.1 Field Log Book:**

The data recorded in the field log book from testing each of the signs will include, date of test, location, sign type, sign sheeting grade and color, direction of orientation, estimated exposure, date of installation or last replacement, date on sticker, at least four retroreflectometer readings and any relevant comments. The collected data will then be stored electronically by the Traffic Sign Section.

### **5.0 Evaluation of Sign Types:**

The measured retroreflectivity values of the tested sample traffic signs will be compared to the minimum values set forth in Table 2A-3 of the Manual on Uniform Traffic Control Devices. If a sign does not meet the minimum retroreflectivity level, then that sign type is thrown out and the next younger age sign type will be tested. Testing will continue until no signs of a particular sign type fail a retroreflectometer test for a specific age. That age is established then, as the expected sign life for that sign type.

#### **5.1 Annual Evaluation of Sign Types:**

The procedures detailed in Sections 3.1, 4.0, 4.1 and 5.0 of this document will be performed annually for each sign type's expected sign life age.

## **6.0 Existing Traffic Sign Replacement:**

All traffic signs in service matching the manufacturer, sheeting grade and color, ink color, overlay film color, and the established expected sign life age will be replaced. A list of the locations of the traffic signs in service to be replaced will be compiled by the Traffic Sign Section using the non-conforming signs report. The replacement information will be given to sign crew(s) in a timely manner to complete the work.

## **6.1 Existing Traffic Sign Replacement Deadlines:**

There are two target dates that must be met to be in order to meet the compliance requirements as set forth in the Manual on Uniform Traffic Control Devices. The first target date is January 1, 2015. All regulatory, warning and ground mounted guide signs (except street name signs) will be in compliance by that date. The second target date is January 1, 2018 and all street name signs and overhead guide signs will be in compliance by that date.

## **7.0 Management of Future Traffic Signs:**

The Traffic Sign Section will implement and maintain a program of sign management using control samples. The control samples will be used to represent all of the traffic signs in service.

### **7.1 Control Samples:**

The control samples will consist of each combination of each manufacturer's sheeting grade and color, ink color and overlay film that is used on traffic signs that are in service. The samples will be applied to a 4" x 9" aluminum sign blank that will be mounted on a test rack.

### **7.2 Sample Test Rack:**

The Traffic Sign Section will maintain a test rack for testing the retroreflectivity of the control samples. The site of the test rack will be the Water Department's facility located at S. 6<sup>th</sup> St. and W. Howard Av. The sign test rack will be constructed in such a manner that test samples can be mounted to it at a 90 degree vertical angle and also at a 45 degree angle. A sign test rack will be erected to provide the control samples north, south, east and west exposure.

## **8.0 Control Sample Assessment:**

Sign assessment will be done by measuring the reflectivity of the control samples with a retroreflectometer. The control samples will be tested by the Traffic Sign Section on an annual basis and the data recorded in a field log book. The collected data will then be stored electronically.

### **8.1 Field Log Book:**

The data recorded in the field log book from testing each of the control samples will include, date of test, sample code, sign material, direction of exposure, four retroreflectometer readings and any relevant comments.

### **9.0 Evaluation of Control Samples:**

The measured retroreflectivity results of the control sample traffic signs will be compared to the minimum values set forth in Table 2A-3 of the Manual on Uniform Traffic Control Devices. As the retroreflective properties of the control sample traffic signs degrade and approach the minimum acceptable levels, the corresponding traffic signs in service will be scheduled for replacement.

### **10.0 Traffic Sign Replacement:**

All traffic signs in service matching the manufacturer, sheeting grade and color, ink color, overlay film color; direction of orientation and age of the control sample will be replaced. A list of the locations of the traffic signs in service to be replaced will be compiled by the Traffic Sign Section using the non-conforming signs report. The replacement information will be given to sign crew(s) in a timely manner to complete the work.