



Project Summary

Texas Department of Transportation

0-5656: Serviceable Pavement Marking Retroreflectivity Levels

Background

With impending rulemaking on minimum pavement marking retroreflectivity, the ability of state agencies to accurately measure, monitor, and maintain the retroreflectivity of their pavement markings is going to be essential. Properly maintained pavement markings provide drivers with various forms of information and create a safer driving environment both during the day and at night. The measurement of the quality of a pavement marking can be conducted in several ways with various factors affecting each technique. As part of this project researchers evaluated the effects of major variables on mobile retroreflectivity readings, retroreflectivity sampling techniques, subjective versus quantitative evaluation techniques, and pavement marking management systems.

What the Researchers Did

Over a two-year period, researchers completed the following tasks:

- Researchers compiled information on current practices of pavement marking evaluation methods and the use of mobile retroreflectometers from all 25 TxDOT districts.
- Researchers conducted two night field tests to quantify the effectiveness of subjective rating techniques used to evaluate pavement markings.
- Researchers compared retroreflectivity data measured with a handheld and a mobile retroreflectometer for the same pavement markings to determine how well the measurement devices compare (Figure 1).
- Researchers developed a framework for TxDOT districts to sample pavement marking sites for data collection based on age of markings, volume, type of making material, and other criteria.



Figure 1. Mobile retroreflectivity unit mounted to vehicle.

- Researchers evaluated the effects of several major variables on mobile retroreflectometer measurements. These variables included temperature, measurement position, ambient light, and others.
- Researchers demonstrated automation of pavement marking management systems as an efficient means of handling large amounts of retroreflectivity data. Geographic information system (GIS) procedures were developed to map mobile retroreflectivity data along a district roadway map.
- Researchers developed a “best practices” guide for planning, collecting, and displaying retroreflectivity information.

Research Performed by:

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What They Found

A few key findings from the research project are :

- Measurements made with handheld and mobile retroreflectometers utilizing best practices showed very close correlation, with less than 5 percent variation.
- Measurement distance, temperature, and position across the measurement window had a significant influence on mobile readings. Software compensation provided good results in accounting for these variables.
- Visual inspection can be used to identify segments for measurement, but, depending on the observer, ratings can vary. Utilization of a simple reference guide of what “good” and “bad” markings look like can bring some consistency to visual inspections (Figure 2).
- Straightforward methods of displaying the retroreflectivity data are possible using GIS. The number of data points is not the most challenging aspect; it is the number of roadway segments that are measured. Automation can effectively solve those challenges.

What This Means

- Properly conducted mobile retroreflectivity data collection is an effective means of gathering pavement marking retroreflectivity values.
- Development of a pavement marking management system to track the retroreflectivity of the pavement markings would be beneficial in monitoring and evaluating the pavement marking asset.



Figure 2. Example of a reference guide used in the second night test.

For More Information:

0-5656-1 Serviceable Pavement Marking Retroreflectivity Levels: Technical Report

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