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# Mapping Traffic Sign Retroreflectivity with Trimble Handhelds

## Meeting Federal Regulations and Saving Lives

*To ensure traffic signs are equally visible to drivers both day and night, the U.S. Federal Highway Administration adopted new rules in 2008. The Manual on Uniform Traffic Control Devices (MUTC) Section 2A.08 established minimum standards for regulatory sign visibility, referred to as 'retroreflectivity.'*

Retroreflectivity is a quantitative measure of a sign's ability to reflect light directly back to its source of illumination, typically vehicle headlights. Higher retroreflectivity means the sign is more visible to drivers at night. By June 2014, government entities responsible for regulatory and warning signs on public roads are required to implement a management method to maintain retroreflectivity of their signs above the minimum standards. The final compliance date is January 2015.

### Measuring and Mapping Signs

Kendallville, Ind., has 1,700 regulatory signs but hadn't mapped them in 15 years, a manual project that took three months. Faced with the prospect of re-mapping all of its signs and assessing the visibility of each one, the Kendallville Engineering Department automated much of the process with a Trimble® GeoXH™ GNSS unit and a RoadVista 922 retroreflectometer. The field work took just two weeks.

Using MUTC standards as his guide, the Engineering Department's Rick Kiersey customized a sign data dictionary in Trimble TerraSync™ data collection software for fast and simple mapping in the field. Then he built an equipment frame to facilitate data collection. The top end held threads to mount a Trimble Zephyr™ antenna, and the bottom had a holder to secure the GeoXH. A hook allowed the frame to be hung on a sign to get a precise location point without offset.

### One-Stop Measuring and Mapping

Kiersey and a colleague needed 30 seconds to collect data at each sign. After hanging the frame on the sign, he used the GeoXH touch screen to enter attributes in response to menu prompts: Sign Type (STOP, YIELD, etc.), Height, Color, Material, Post Type, Face Direction, and Road Offset. Notes on condition or damage could be entered. The GeoXH collected a location point for each sign.

Meanwhile, his colleague held the retroreflectometer against the sign and took three measurements each for its background and lettering. The device calculated an average for each surface, which the colleague called out to Kiersey for entry into the TerraSync data dictionary. Lastly, a digital photo was taken.

Back at the office, Kiersey downloaded the field data into Trimble GPS Pathfinder® Office where he post-processed the points to 10-centimeter accuracy. The data was then exported to a Microsoft® Access database so that signs could be grouped by their retroreflectivity scores. Those below the mandated threshold were scheduled for immediate replacement, while those with marginal measurements were slated for upgrading in two to five years, depending on their scores.

To generate work orders for maintenance crews, Kiersey exported the sign data to AutoCAD Map. He provides printed maps to the crews so they know what type of sign to replace and exactly where it's located. More importantly, the Engineering Department


now has a sign upgrade budget for the next several years.

By combining state-of-the-art retroreflectivity measurement with Trimble TerraSync data collection, Kendallville quickly, inexpensively and accurately inventoried its traffic sign inventory, ensuring they will meet safety standards for years to come.

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Learn more about the Trimble solutions: www.trimble.com/mappingGIS

Learn more about MUTC and Sign Retroreflectivity: http://safety.fhwa.dot.gov/roadway_dept/night_visib/sign_visib/pps_signreqs0708/pps_signreqs0708.pdf

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