RESEARCH
Oregon Department of Transportation

Research Notes

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In the Glare of Headlights

Major construction projects present many hazards for drivers to negotiate. Detours, lane shifts, and confusing curves present unique challenges to all drivers. At night, the difficulties in negotiating these obstacles are amplified due to reduced visibility. Over the past several years, the Oregon Department of Transportation (ODOT) has been particularly interested in evaluating concrete barrier marking products that improve the delineation of lane shifts, sharp turns, and detours within highway work zones. Recently, 3M™ Scotchlite™ Linear Delineation System (LDS) panels were installed and monitored on three different ODOT construction projects.

Two of the installations were on Interstate 5 bridge construction projects at Coast Fork Willamette River and Medford Viaduct. The third was on HWY 101 at Bob Creek.

ODOT hoped to enhance safety and driver awareness by improving delineation of the curve especially at night.

LDS Panels

The LDS panel is a thin gauge aluminum substrate laminated with 3M™ Scotchlite™ Diamond Grade™ Reflective Sheeting. The panels are edge hemmed to protect the sheeting from delaminating while in use and during cleaning. The unique "crimped wave" shape makes the LDS panels highly visible, even in areas with high entrance angles.

Installation

The installation of the LDS panels proved to be more challenging then envisioned, primarily because installation is a time intensive process. Users need to be aware that productivity rates for installation range from 30 panels per hour for a two person crew to 60 panels per hour for a four person crew. Panels are individually attached to the barrier with anchor bolts after leveling with a chalk line and drilling holes into the barrier. At the end of construction, panels can be removed from the barrier and reused on future ODOT projects. The procedure for installation is detailed in the published evaluation report.

Maintenance

One of the keys to successful implementation of the LDS panels is proper installation and maintenance. The tendency for temporary installations, such as work zones, is to use minimal time and effort in attaching the panels to the concrete barrier. This can lead to problems in the weeks and months that follow initial installation.

At the Coast Fork Willamette River, some of the panels were installed with as few as two anchors making them prone to detaching from the face of the concrete barrier due to debris and wind stirred up by passing vehicles. Another maintenance concern is keeping the panels relatively clean from dirt and road grime to maintain an optimal level of retroreflectivity.

In Summary

In the twelve months that the LDS panels were monitored, they proved to be effective in guiding motorists through difficult detours and lane shifts on the three construction projects. During their time in-service, the LDS panels were evaluated for their effects on vehicle speeds, crashes, and driver perceptions.

Most observers agreed that the LDS panels provided better concrete barrier delineation than traditional barrier markers and drivers seemed more attentive when traveling through the work zone.

The success of these three projects have led ODOT to further implement LDS panels on additional construction projects and consider permanent installations where crash histories warrant additional safety measures.

Request a copy of the report *"Evaluation of 3M™ Scotchlite™ Linear Delineation System"* from the Research Unit by phone, e-mail, or in person or view the report on the Research web page listed below.

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For more information on ODOT's Research Program and Projects, check the website at
http://www.odot.state.or.us/tddresearch/