

Enhanced Reference Location Signs Have Clear Benefits for Mobility and Incident Response; Drawbacks Include Cost, Lack of Standardization

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KEY SEARCH TERMS:

Mileposts

Milestones

Traffic Signs

Incident Management

Road Markings

Research Synthesis Bibliography No. 6

Research Synthesis Bibliographies (RSBs) are distillations of relevant transportation research on current topics of interest to researchers, engineers, and policy/decision makers. Sources cited are available for loan (or available through Interlibrary Loan) to VDOT employees through the VDOT Research Library.

Enhanced Reference Location Signs (RLS) are Effective, But are They Affordable?

Often referred to as a mile-marker signs, Reference Location Signs (RLS) allow motorists to reference their location in an emergency, and to pinpoint their location for emergency response or safety service. Since the 1990s, state DOTs have been experimenting with the placement, color, and spacing of "Enhanced Reference Location Signs (Enhanced RLS), markers that show location to a decimal distance, and which feature a colorized route shield and the direction of travel. States using Enhanced RLS today include: Ohio, Tennessee, Kentucky, Indiana, Virginia, Pennsylvania, and New York.

Potential benefits of Enhanced RLS extend to emergency responders, maintenance crews, and ordinary motorists. Key advantages of Enhanced RLS fall into several categories: incident response/management, motorist knowledge and safety, roadway maintenance, and intelligent transportation systems coordination. Benefits must be weighted against costs, however, and states carefully select areas of highest effectiveness for Enhanced RLS placement, starting with urban placement and moving outward. One recent report indicated the following costs for materials, construction, and installation:

- Ohio DOT spent \$800,000 installing 10,000 Enhanced RLS on 700 miles of highway: **\$1,140/ mile**
- Tennessee's DOT spent \$429,000 installing Enhanced RLS for 226 miles of highway: **\$1,902/mile**
- Indiana DOT spent \$182,000 installing 1,190 Enhanced RLS over 120 miles of highway **\$1,530/mile.**

Source: www.deldot.gov/static/projects/tmt/pdfs/ref_loc_signs_rpt.pdf

It might be useful to contact the following research scientist, who has written extensively on this topic:

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--- Ken Winter, MLIS

OVERVIEW

Research Synthesis Bibliographies (RSBs) are selected lists of resources on current topics of interest to VDOT employees or divisions. When available, links to online documents are provided.

RSBs are "selective listings," organized and distilled from the larger universe of materials to save the researcher's time. Selection criteria used by library staff include authority, relevance, and timeliness.

GETTING RESOURCES LISTED HERE

Copies of most resources listed in this document are available in the VDOT Research Library's collections, or through Interlibrary loan. Library staff is available Monday-Friday 8:00-5:00. Please contact us if you have a reference question, a question about our lending policies, or need any other kind of help.

Reference Questions:

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RECOMMENDED INITIAL READING

Intermediate Reference Location Signs

CITATION: Delaware Department of Transportation. , 2005, Pg. 16.

ABSTRACT: Finding the location of an accident on a roadway can be difficult, especially on roadways with few points of reference. To aid with incident location and management, many states have installed reference signs every 1/10th mile along roadways. The Manual for Uniform Traffic Control Devices (MUTCD) defines these 1/10th mile markers as Intermediate Reference Location Signs. This report provides information for developing a RLS system by describing: The benefits of having a RLS System; Existing designs and standards for RLS; The costs of establishing and maintaining a RLS system; and Adapting a RLS to Delaware's roadways.

ACCESS: http://www.deldot.gov/static/projects/tmt/pdfs/ref_loc_signs_rpt.pdf

Use Of Reference Location Markers In Incident Management

CITATION: D. M. Valdes-Diaz, D. L. Fisher and Y. M. Baucage-Bou. , ITE 2001 Annual Meeting and Exhibit , 2001. Pg. 17p.

ABSTRACT: To improve the accuracy on incident location reporting, several states have designed special reference marker signs to provide information to drivers indicating their precise location. These signs are intended to improve mobility by reducing the incident detection time, and simultaneously the response time. Reference marker signs are currently used in eleven different locations nationwide. The characteristics of the reference marker signs implemented in these places vary in spacing, background color, dimensions, letter type, and information provided to the motorists. These differences affect drivers understanding of the sign, and their ability to inform the correct location. Reference markers have been experimentally implemented in various cities. However, their design characteristics are not uniform around the country, causing confusion and discontinuity. This paper reports on research that investigates the differences among these signs in order to find the characteristics that should be included in a uniform location marker to fulfill the objective of improving accuracy on incident location.

ACCESS: VDOT Research Library, Call number CD-ROM TA 1005 .153

Evaluation of Tennessee Reference Markers

CITATION: Jerry G. Pigman, University of Kentucky Transportation Center, Tennessee, et al. , 2002. Note: Note(s): "June 2001"--Tech. report doc. page./ "April 2002"--Cover./ Includes bibliographical references (leaf 6).

ABSTRACT: Reference markers were installed on sections of interstates and freeways in Tennessee in 1999 and 2000. An evaluation was conducted to determine if the use of reference markers at spacings of 0.2-mile intervals could improve the effectiveness of emergency response and incident management processes. The evaluation included a general observational survey, meetings with emergency response personnel, and an opinion survey of the application, placement, color, and overall benefits of the reference markers. The condition of the markers was found to be very good and there appeared to be only minor problems within the relatively short period of time since installation. Interview and surveys of participants in the emergency response process and others involved in traffic management systems indicate nearly unanimous endorsement of the reference markers. Dispatch personnel indicate that drivers are using the markers for identification of locations where incidents occur, with the resultant effect of a more efficient process for responding to incidents and crashes. Results indicate highway agency

and emergency response personnel generally feel that spacing of the reference markers at 0.2-mile intervals was satisfactory. Responses also indicated increased benefit related to the distinguishable color of blue for the reference markers, specifically related to the consistency with motorists service signs. The increased size of the signs over that used for standard milepost signs did not appear to be an issue with any of those offering opinions and the 18 by 48-inch size is recommended for future use.

ACCESS: <http://www.tdot.state.tn.us/longrange/reports/Res-1183.pdf>

Evaluation of Reference Markers

CITATION: J. G. Pigman. , University of Kentucky, Lexington; Kentucky Transportation Cabinet, 2001. Pg. 45 p.

ABSTRACT: The objective of this research evaluation was to evaluate the reference markers which were installed on sections of interstates and freeways in the Cincinnati-northern Kentucky area, the Lexington-Fayette Urban County area, the Louisville-southern Indiana area, and the Indianapolis area. The evaluation was conducted to determine if the use of reference markers at spacings of 0.1 or 0.2-mile intervals could improve the effectiveness of the emergency response and incident management processes. Also evaluated were color of the markers and the placement location within the right-of-way. Both "white on blue" and "white on green" markers were installed on various projects, with some installed on the median barrier wall and some on grass medians or shoulders. Included were condition surveys of the marker installations and opinion surveys of those involved in the incident or emergency management process. Nearly unanimous endorsement of the reference markers was received from interviews and surveys of highway agency personnel and participants in the emergency management process. Recommendations were made for spacing of the markers at 0.2-mile intervals, with exceptions in curved sections to allow for placement of the markers at 0.1-mile intervals. Based on what appears to be slightly increased conspicuity of the "white on blue" marker as compared to the "white on green" marker, it was recommended that a standardized reference marker be developed and incorporated in the Manual on Uniform Traffic Control Devices with white letters on blue background. Because of reduced exposure to mowing operations and errant vehicles, it was recommended that reference markers be placed on median barrier walls where practical. Recommendations were also made for a standard sign size and message content consistent with the reference markers evaluated in the three states. ACCESS: http://www.ktc.uky.edu/Reports/KTC_01_16_FH94_3F.pdf
<http://ntl.bts.gov/lib/18000/18700/18755/PB2002101776.pdf>

Evaluation Of Reference Markers

CITATION: J. G. Pigman. , University of Kentucky, Lexington; Kentucky Transportation Cabinet; 1998. Pg. 33 p.

ABSTRACT: The objective of this research evaluation was to evaluate the reference markers which were installed on sections of interstates and freeways in the Cincinnati-northern Kentucky area, the Lexington-Fayette Urban County area, the Louisville-southern Indiana area, and the Indianapolis area. The evaluation was conducted to determine if the use of reference markers at spacings of 0.1-mi (0.16-km) or 0.2-mi (0.32-km) intervals could improve the effectiveness of the emergency response and incident management processes. Also evaluated were color of the markers and the placement location within the right-of-way. Both "white on blue" and "white on green" markers were installed on various projects, with some installed on the median barrier wall and some on grass "eyes of those involved in the incident or emergency management process. Nearly unanimous

endorsement of the reference markers was received from interviews and surveys of highway agency personnel and participants in the emergency management process. Recommendations were made for spacing of the markers at 0.2-mi (0.32-km) intervals, with exceptions in curved sections to allow for placement of the markers at 0.1-mi (0.16-km) intervals. Based on what appears to be slightly increased conspicuity of the "white on blue" marker as compared to the "white on green" marker, it was recommended that a standardized reference marker be developed with white letters on blue background. Because of reduced exposure to mowing operations and errant vehicles, it was recommended that reference markers be placed on median barrier walls where practical. ACCESS: <http://ntl.bts.gov/lib/21000/21900/21923/PB99148926.pdf>

Highway Mileage Reference Marker Policy Manual

CITATION: South Dakota. Dept. of Transportation, United States and Federal Highway Administration. , 1991. Note: Responsibility: prepared by the South Dakota Department of Transportation, Division of Planning, Data Inventory ; in cooperation with the U.S. Department of Transportation, Federal Highway Administration. ACCESS: Available to VDOT employees through Interlibrary Loan.

Integrating Traffic Management Data Via An Enterprise LRS

CITATION: Tom Ries., GeoAnalytics, 2000. ABSTRACT: A Geographic Information System for Transportation (GIS-T) can be a powerful tool to integrate traffic data with other data and help analyze results for transportation decision-making (e.g., program, traffic, or safety management). For successful GIS implementation, an organization must define a location reference system (LRS). The LRS manages and integrates an organization's formal location methods (e.g., maps, global positioning systems (GPS), mileposts). Without a proper LRS design, the GIS can create islands of data that are not integrated as part of an organization's main workflows and master data resources. This presentation will explain the different location methods necessary to the LRS, how these methods are structured within an LRS, and how traffic management staff are part of the LRS. 17 p. Note: NATMEC 2000 Conference, Middleton, Wisconsin. ACCESS: <http://ntl.bts.gov/lib/10000/10900/10985/027ppr.pdf>

Milepost Instructions And Controls

CITATION: Wyoming. Dept. of Transportation. Planning Branch. , 1992. Note: Note(s): "January 1, 1992."/ A guide for the installation of mileposts and provisions for keeping the basic milepost system current./ Individual county maps and listings begin on leaf 17.; Other Titles: Wyoming milepost system, planning, 1992; Responsibility: Wyoming Transportation Department, Planning Program [sic]. ABSTRACT: N/A ACCESS: Available to VDOT employees through Interlibrary loans.

New Markers "Key To The Highway" In Texas

CITATION: R. Polson. , AASHTO Quarterly Magazine, 1990. Vol. 69, No. 4, Pg. p. 16-17. ABSTRACT: The article describes the new Texas Reference Marker system which will include a reference marker on every farm-to-market and ranch road, state highway loop, spur, park road, U.S. highway and business route: 37,000 3- by 10-inch markers. The elements of the key include highway system, number, and suffix; reference number; and a number that specifies the distance from the nearest marker in miles and thousandths of

a mile. This allows precise identification of any point. The markers, which will be placed approximately every 2 miles, will mark a specific physical location, not a specific distance between markers. The reference marker numbers are determined by a grid system with the northernmost and westernmost points in the state designated as 010.

ACCESS: VDOT Research Library, periodicals section.

Preliminary Evaluation: Artemis Reference Signs

CITATION: J. G. Pigman. , 1995. Pg. 9 p.

ABSTRACT: The objectives of the preliminary evaluation were to determine if the installation of reference signs at intervals more frequent than 1-mi (1.6-km) increments would improve the ability of emergency personnel to respond to incidents or accidents on the freeway system in the Cincinnati-northern Kentucky area. A short-term evaluation was conducted of white on blue and white on green reference signs on a 3-mi (4.8-km) section of I-275 in Cincinnati. Based on field observations and supplemented with subjective opinions of emergency response personnel, the reference signs were determined to be a beneficial addition to the location information available to the driving public. The blue signs placed in the median appeared to be more prominent than the green signs placed on the shoulders. Spacing of the signs did not create an impression of unnecessary clutter and 8-in. (20-cm) number size was appropriate. A recommendation was made to install the white on blue reference signs in the median at 0.10-mi (0.16-km) intervals on all interstates in the ARTIMIS Project.

ACCESS: Available to VDOT employees through Interlibrary loan.

RECOMMENDED SECONDARY READING

Highway Location Reference Methods

CITATION: National Research Council (U.S.). Highway Research Board. , 1974. Note:

Note(s): Bibliography: p. 30.

ABSTRACT: N/A.

ACCESS: VDOT Research Library, call number TA 1001.5 .N34 no.21

ALSO OF INTEREST

Highway Signs Help Motorists Navigate Indiana Interstates

ACCESS: https://test.secure.in.gov/dot/motoristinfo/trafficwise/about_milemarker.html

New Signs Save Lives, Reduce Freeway Congestion

ACCESS: <http://www.dot.state.oh.us/news/2003/05-22-03Signs.htm>

PA Turnpike Interchange Renumbering

ACCESS: <http://www.paturndpike.com/geninfo/intrenum/intrenum.aspx>

Empire State Roads, Little Green Signs

ACCESS: <http://www.empirestateroads.com/rm/>

Maryland Highway Location Reference

ACCESS:

http://www.sha.state.md.us/keepingcurrent/performtrafficstudies/dataandstats/hwylocationref/oppe/hlr_hist.asp