- How does background complexity affect driver sign detection and reading performance?

B. Data of guide sign evaluation measures need to be gathered nationally so there are standards or norms for interpreting results obtained at the local level.

Considerable research on the human factors aspects of guide signs has been conducted. There are many questions still to be answered and benefits to be derived by the driving public from future research.

Reference

1. F. R. Manscom, and W. G. Berger, Motorist Response to Highway Guide Signing, Volume 1, Field Evaluation of Measures, BioTechnology, Inc. for NCHRP, January 1976.

REELECTORIZATION OF CURVES

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The driver's use of roadway delineation for guidance and control information along curved paths is addressed in this presentation. The driver needs strong curvature cues for positive guidance, although the critical components of curvature cues are still not completely understood. Godthelp and Riemersma (1) make a strong case for perceiving curvature in perspective, which is most strongly presented by delineation at or near the road surface as opposed to higher post-mounted information. Brummelaar (2) discusses various features of the perspective road picture that may result in curvature cues for the driver. The primary thesis of this presentation is that all information on reflectorization of curves (e.g., raised pavement markers (RPMs), markings, curvature alignment signs, post-mounted reflectors) should be integrated and evaluated for its overall collective ability to give the driver strong curvature cues on which to base steering and speed guidance commands.

The effect of curvature information on steering performance has previously been demonstrated in simulator and field experiements (3). Steering performance improves under reduced visibility conditions such as night driving, in the presence of road surface delineation with characteristics such as small gaps, long dashes, and short repetition cycle lengths. The extent to which chevron alignment signs and other post-mounted devices contribute to curvature cue perception is not known, although they certainly have an important alerting and warning function that is critical for speed control.

Several perspective scene slides of a table top model of a delineated road were shown to illustrate how various delineation elements contribute to curvature cue perception. Past research has shown that curvature perception is strong with increased eye height above delineation. Road surface markings give the strongest curvature cues, while chevron designs on post-mounted panels give the strongest guidance cues (1). Other work with drunk drivers has shown that chevron alignment signs are best for long-range guidance, while wide edge lines are best for providing short-range steering control commands (4).

The requirement for integrating road surface, elevated guard rail, and post-mounted delineation and advance warning signs is not well understood. Issues that should be addressed for information on elevation include placement relative to curves and spacing between individual elements. For road surface information, retroreflector spacing and edge line width should also be considered. These issues should be addressed from the point of view of optimizing the overall delineation system at given curve locations.

References

1. H. Godthelp, and J. B. J. Riemersma, Perception of Delineation Devices in Road Work Zones During Nighttime, SAE Paper 820413 presented at the International Congress and Exposition, Detroit, Michigan, February 1982, pp. 22-26.

2. T. tenBrummelaar, The Reversal Point in the Perspective Road Picture, Australian Road Research, Volume 13, Number 2, June 1983, pp. 123-127.

3. R. W. Allen, and J. F. O'Hanlon, Driver Steering Performance Effects of Roadway Delineation and Visibility Conditions, Driver Performance, Passenger Safety Devices, and the Bicyclist, in Transportation Research Record 739, TRB, National Research Council, Washington, D.C., 1979, pp. 5-8.

4. I. R. Johnston, The Effects of Roadway Delineation on Curve Negotiation by Both Sober and Drinking Drivers, Australian Road Research Board, Volume 13, Number 3, Research Report ARR Number 128, September 1983, p. 243.

GUIDERAIL DELINEATION

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In New Jersey, state traffic engineers have become interested in guiderail delineation. There has been increasing construction of guiderails on roadsides. Like the New Jersey concrete median barriers, of which hundreds of miles have been installed, hundreds of miles of guiderails are now being installed. More thought needs to be given to letting drivers know that guiderails are there, because they are fixed objects and colliding with them can cause some damage to both the vehicle and the guiderail itself. Of course guiderails are designed to cause less damage than colliding with trees, poles, abutments, and many other fixed objects.

In few, if any, states, there are no detail standards, warrants, or criteria to help traffic engineers determine when and how guiderails should be delineated. Guiderails are lower than 4 ft., so there is a question about whether a guiderail-mounted reflector can substitute for a 4-ft. delineator.

The compatibility between guiderail-mounted reflectors and other roadsides or even roadway reflectors has not been determined. If a large number of reflectors are installed at a curve or another critical driver decision location, the scene can be visually chaotic unless these reflectors are carefully organized according to the