

Project Title: “Effects of Ground Mounted Diagrammatic Entrance Ramp Approach Signs”

Report No. FHWA/OH-2000/018
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State Job #14674(0)

Executive Summary

The effectiveness of ground mounted diagrammatic signs in the context of urban multi-lane arterials leading to a freeway was evaluated. This type of guide sign provides much needed information well in advance of the interchange entrance, thus giving drivers more time to change lanes, if needed. Six highway-freeway interchanges were selected in the Greater Columbus, Ohio, area to determine the effectiveness of ground mounted diagrammatic signs in the field. Traffic flow video footage was collected at the selected sites before the diagrammatic signs were installed. The finalized ground mounted diagrammatic sign designs were then installed and the traffic flow videotaping was repeated. The collected video footage was automatically analyzed with Mobilizer PC. The resulting vehicle count, speed, and headway data was used as input to a closed form analytical model to determine the probability that drivers could successfully change lanes as needed, prior to reaching the gore of the freeway entrance. The theoretical analysis indicated a much higher probability that an unfamiliar driver could execute a required lane change when diagrammatic signs are used. The model was tested with data obtained from additional interchange evaluations with unfamiliar test drivers. This data corroborated the findings of the theoretical model analysis, in that drivers were able to execute a needed lane change much earlier when ground mounted diagrammatic signs were provided. Eye movement recordings were performed at night at the six sites in order to determine if the presence of these diagrammatic signs was distracting. The results of the eye movement analysis indicate that ground mounted diagrammatic signs are not looked at excessively often or excessively long. The overall median first look distance to these signs was found to be 125m. ODOT/FHWA evaluators visited the six interchange sites and provided their input and opinions as to the use of ground mounted diagrammatic signs. The vast majority of the evaluators fully embraced the idea of ground mounted diagrammatic signs.

A set of application guidelines for ground mounted diagrammatic signs is provided.

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