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A Study on Establishing Criteria for Installation of Small Road Signs

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Abstract : This study attempts to reduce the wind load of road signs, improve roadside landscaping, and enhance the safety of road users by establishing criteria for the installation of small road signs. First, we derive the minimum font size that can be used on road signs according to the road's design speed by considering the visibility and legibility of such road signs. We classify road junctions into eight types based on junction type (intersection, interchange, and expressway) and on the number of road lanes. Furthermore, we propose small sign alternatives, to which the minimum font size is applied, to be placed by each road junction. To verify the effects of the small signs, we implemented a 3D simulation road environment, to which the small road signs were applied, and performed experiments using the driving simulator targeting 50 drivers. The experiments compared and analyzed the effects, whether the driver proceeds to the desired exit and the average driving time, between the existing large road signs and the improved small road signs under the same road conditions and intersection type. We conducted a survey with the participants of the simulation experiment on the preference between graphical signs (large road signs) and exit-centric signs (small road signs). The results show that the participants prefer the exit-centric signs (60%) to the graphical signs (40%). We propose installation criteria for small road signs for intersections, interchanges, and expressways based on the results of the experiment and the survey.

Keywords : 3D simulation, driving simulator, legibility distance, minimum font size, small road signs
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