

## **Abstract**

This study was designed to investigate driver acceptance and visual demand of variable message signs (VMS) displaying bilingual messages. The VMS displayed text message in Finnish and Swedish by turns (2.0 s in each language).

In the first part of the study 350 drivers were interviewed regarding driver acceptance of bilingual variable message signs. Most of the drivers (80 %) indicated that manner of representation did not have any negative effect on reading the text message. In addition, the results showed that about 90% of the interviewed drivers considered the time they had for reading the message in their own native language as being appropriate. However, older drivers were more likely to report that the presentation duration was too short.

The second part of the study examined driver visual behaviour while encountering VMS including bilingual messages. Two VMS types were compared: a sign displaying messages by turns and a sign displaying messages simultaneously. The data were collected by recording the eye movements of 38 drivers. The manner of representation (by turns vs. simultaneously) did not have statistically significant effects on visual demand. However, the overall fixation durations for the variable message signs were much higher than for the fixed signs obtained in previous studies. In addition, there was a tendency for longer fixation durations for older drivers than for younger subjects.

The implication of the study is that most drivers accepted the VMS displaying bilingual messages by turns and the manner of representation did not have statistically significant effects on visual demand. However, the visual demand of variable message signs seems to be higher compared to visual demand of fixed signs. In addition, older drivers need more time to obtain information from variable message signs than young drivers. These aspects should be taken into account in the design of the variable message signs in order to ensure that the drivers receive traffic information without any decrease of the traffic safety.