

Pirkko Rämä, Anna Schirokoff, Riikka Rajamäki: Muuttuvien nopeusrajoitusjärjestelmien turvallisuus. [Safety effects of variable speed limit systems] Helsinki 2003. Finnish Road Administration, Planning Process. Finnra Reports 54/2003. 46 p. + app. 8 p. ISSN 1457-9871, ISBN 951-803-154-1, TIEH 3200841

Keywords: variable message signs, speed limits, accident risk, impact evaluation
Category: 20, 22, 81

SUMMARY

The main purpose of this study was to investigate the effects of weather controlled speed limits on traffic safety. In addition, the variable speed limit systems on public roads in Finland were described; and when necessary, suggestions were made to improve the control policies from the traffic safety point of view. The report describes deployments implemented before the summer of 2003, reasons for the implementations, control policies and control systems and the technology used in signs.

The analysis was based on comparison of the injury accident risk on the road sections before and after implementation of the variable speed limits. Same types of roads with fixed speed limits were used to control the general trend in the injury accident risk. The effects on injury risk were studied separately for winter and summer seasons. The follow up period was from the summer 1990 to the winter season 2001–2002.

The evaluation study included eight two-lane road sections. The length of the equipped sections varied from 8 to 41 km. In the main analysis, eight VMS systems were divided into two groups (four deployments in each) based on sign technology, degree of automation and use of variable warning signs.

The variation in the accident data was considerable compared with the size of the data. Therefore, the results were not statistically significant. The suggestive results showed that speed limit systems which use fibre optic or LED signs, base the control on automatic classification of road condition situations, and include variable slippery warning signs, seem to decrease the injury accident risk by 13% in winter and by 2% in summer. The other four systems used electromechanical signs, had no automatic classification system for the control of the speed limits, and did not include any variable warning signs. In this group, the safety was reduced, the effect on injury accident risk being +8% in winter and +21% in summer.

It is suggested that the control policy and degree of automation should be developed for those systems which did not improve traffic safety. However, the suggestive results showed that the high quality systems with elaborate control system seemed to decrease the injury accident risk especially in winter. These systems seemed to increase traffic safety even though they also improve the fluency of traffic flow under good conditions. Lastly, it is suggested to continue the data collection to get significant results. In the future, more care should be taken to the documentation of the properties and the use of the systems.

The project has been granted European Community financial support in the field of Trans-European Networks – Transport.