Improving the self-explaining performance of Czech national roads

Jiří Ambros, Veronika Valentová, Ondřej Gogolín, Richard Andrášik, Jan Kubeček, Michal Bíl
CDV – Transport Research Centre, Brno, Czech Republic

INTRODUCTION

– Self-explaining is such traffic environment which elicits safe behavior by its design. Improving the road network according to self-explaining principles is a promising way to increase the level of safety.
– There are no universal definitions or guidelines on how to measure and improve the self-explaining performance of the existing roads.
... The research project focused on improving the self-explaining performance of rural sections of Czech national roads.

THE STUDY

1) Automated segmentation

into tangents and curves
(min. length 200 m)

2) Speed

– from floating car data (FCD)
– at frequency 4 Hz
– collected for 8 months from approx. 1000-vehicle fleet
– estimation of free-flow speed from at least 100 drives / segment

3) Speed models

– regression models, using AADT, geometry, cross-section, etc.
– separately for tangents and curves
– difference = consistency
– successfully validated against crashes

4) Network-wide application

– models predicted consistency of tangent-curve pairs
– ranking based on speed, radii, curvature
– assessment of both single elements and relation design (tangent-curve pairs or 2-curve sequences)

CONCLUSIONS:

– Guideline to increase safety of rural curves and improve the self-explaining performance
– From data collection and processing to final categorization and optimization proposal
– Certified for practical use and to be applied by Czech national road agency

ACKNOWLEDGMENTS

Floating car data provided by Princíp a.s.
Additional data collected by Vojtěch Cicha, Stanislav Řehák, Jiří Sedoník.

Supported by Technology Agency of the Czech Republic project TB0200MD062.
Supported by the research infrastructure of Transport R&D Centre (CZ.1.05/2.1.00/03.0064).