Dimensions of road safety problems and their measurement

Rune Elvik, Institute of Transport Economics, PO Box 6110 Etterstad, N-0602 Oslo, Norway
E-mail: re@toi.no

ABSTRACT
This paper suggests that road safety problems have several dimensions, and that a complete analysis of road safety problems should include an explicit treatment of all dimensions. More specifically, the following dimensions of road safety problems and numerical measures indicating the dimensions are identified:

1. Magnitude, which is measured in terms of population-attributable risk.
2. Severity, which is measured by the gradient of the relative risk associated with a risk factor with respect to injury severity.
3. Externality, which is measured by the extent to which a risk is imposed by one group of road users upon another.
4. Complexity, which is measured by the presence of multiple and correlated risk factors contributing to a problem.
5. Inequity, which is measured by the degree of inequality in the distribution of risk and its deviation from the difference principle of John Rawls.
6. Spatial dispersion, which is measured by the spatial distance between problems of a given magnitude.
7. Dynamics, which is measured by changes over time in the risk attributable to a problem.
8. Perceived urgency, which is measured by the strength of popular support for stronger interventions to reduce a problem.
9. Amenability to treatment, which is a function of complexity, perceived urgency and knowledge regarding effective preventive measures.

Examples are given of all these dimensions and their measurement.