

**Summary:**

# **Improving Road Safety in Sweden**

This reports presents an analysis of the potential for improving road safety in Sweden. Three main problems have been studied:

- What is the maximum potential for improving road safety in Sweden by applying all known road safety measures to the maximum conceivable extent?
- Which are the most cost-effective road safety measures, that is measures that can prevent the greatest number of killed or seriously injured road users in relation to the costs of implementing the measures?
- Which are the road safety measures whose total benefits, expressed in monetary terms, exceed their costs? Total benefits include improvements with regard to safety, mobility and the environment.

This is a short summary of the main results of the analyses. A more extensive summary is given in a summary report (TØI report 489/2000).

## **Road safety problems in Sweden**

The Swedish government has prepared a list of the most important road safety problems. An attempt was made to determine the relative importance of each problem, by estimating the risk attributable to the problem. Attributable risk denotes the size of the reduction in the number of killed or injured road users that could be attained by eliminating the added risk associated with a certain risk factor. The analysis shows that violations of speed limits is the most important road safety problem in Sweden today. About 50% of all driving exceeds the speed limit. If perfect compliance could be attained, the number of fatalities could be reduced by 38%, and the total number of road users injured could be reduced by 21%. Other important road safety problems include the mixture of unprotected and protected road users, and the mixture of cars of different mass and different performance with respect to crashworthiness. The term protected road users denotes all car occupants, the term unprotected denotes all other road users.

It has been estimated that by eliminating all road safety problems from a list of 20 problems, the number of road accident fatalities could be reduced by 89% and the total number of injured road users by 73%. To eliminate a road safety problem means to remove the entire risk attributable to it.

## Road safety targets and current road safety policy

Vision Zero has been officially adopted as the basis for road safety policy in Sweden. Vision Zero is a long-term ideal, stating that nobody shall be killed or injured in road traffic, provided they comply with road traffic law. Quantified road safety targets have been set for 2000 and 2007. The target for 2000 is not more than 400 fatalities. The target for 2007 is not more than 270 fatalities. A road safety programme, still in force, was passed in 1994. In addition to this programme, a special traffic safety plan was presented in 1999. Estimates made by the Swedish government, show that the current road safety programmes are insufficient to realise the target of 270 fatalities set for 2007. Between 1994 and 2000, the number of road accident fatalities in Sweden was not reduced.

## Alternative road safety programmes and their effects

In order to estimate the potential for improving road safety in Sweden, a survey was made of 139 road safety measures. 77 of these were, for various reasons, omitted from further consideration. A formal analysis of maximum potentials for contributing to safety, cost-effectiveness and cost-benefit ratio was made for the remaining 62 measures. Four alternative road safety programmes were developed by combining the measures. These programmes applied to the ten year period 2002-2011. The alternative road safety programmes were:

- Business-as-usual, meaning that current road safety policy is continued until 2012
- Cost-benefit strategy, consisting of those measures whose benefits are greater than their costs
- Vision Zero strategy, designed to implement the main principles of Vision Zero
- Maximum safety potentials strategy, in which all measures are applied to the maximum conceivable extent.

This report does not recommend any of these strategies. They have been developed solely for the purpose of indicating the opportunities for improving road safety, and the range of choices for road safety policy.

The maximum potential for improving road safety has been estimated to a reduction of more than 75% in the current number of fatalities and more than 55% in the current total number of injured road users. If current road safety policy in Sweden is continued until 2011, there will be only a minor reduction of the number of killed road users by 2012. The mean annual number of road accident fatalities during 1994-1998 was 554. The mean annual number of people injured was 21,721. The predicted number of road accident fatalities for 2012, if current road safety policy goes on, and there is a traffic growth of 1% per year, is about 530. It has been assumed that, *ceteris paribus*, the number of fatalities increases by 0.64% for each 1% increase in traffic volume.

By adopting the cost-benefit strategy, the number of killed road users can be reduced to 316 by 2011. the Vision Zero strategy gives a predicted number of fatalities of 230 by

2011. The maximum safety potentials strategy gives a predicted number of 180 fatalities in 2011.

The target set of a maximum of 270 fatalities in 2007 cannot be realised, no matter which strategy is chosen. The only way of realising this target is to considerably increase the use of measures that have effects in the short term, before the year 2007. Increasing police enforcement is an example of a measure that has short term effects.

### **Predicting the number of killed or injured road users is difficult**

It is important to stress the fact that the estimates are highly uncertain. If, for example, current road safety policy is continued, and traffic grows by 1% per year, the predicted number of fatalities in 2011 is between 473 and 587. Corresponding lower and upper limits are 215 and 467 for the cost-benefit strategy, 135 and 396 for the Vision Zero strategy, and 72 and 337 for the maximum safety potentials strategy.

Based on these results it seems clear, despite the considerable uncertainty involved, that a continuation of current road safety policy in Sweden is not sufficient to realise the targets that have been set for this policy.