

**Summary:**

# **Choice of Safety Indicators in Road Traffic**

Safety management of road traffic is a project that is part of the Norwegian Public Roads Administration project – Vision Zero. The Institute of Transport Economics is engaged in the project to select the 3-5 most important safety performance indicators within the fields of road user behaviour and vehicle condition. The main purpose is to gain better understanding of which states in road traffic one should be able to influence to improve traffic safety.

In the selection of indicators we have used the following main criteria:

- The indicator should have a clear correlation with the number of killed or severely injured traffic victims;
- The larger the associated risk is, in terms of the total number of killed or severely injured traffic victims, the more important the indicator is;
- It should be possible to measure changes in the states with a sufficient degree of quality.

We have examined all existing and some potential performance indicators. We have selected the following four indicators as being particularly important:

- Indicator of the compliance with speed limits;
- Indicator of the use of seat belts;
- Indicator on driving under the influence of drink or drugs;
- Indicator of car drivers respect for pedestrians in or nearby zebra crossings.

None of the indicators on vehicle condition is important enough compared to these. Regarding drink-driving, it is more than 20 years since the last national roadside study was carried out. For other types of intoxication, such a study has never been accomplished. To measure the incidence of drink- or drug-driving, one has to rely on controls made by the police road patrols. Through the usual accident investigation, it is possible to estimate the percentage of car drivers under influence of alcohol, to some degree also other types of intoxication, among car drivers involved in accidents with personal injuries. We recommend that initiative is taken to have a national roadside study carried out, a study that includes both alcohol and drugs. Furthermore we recommend that the accident investigation is improved, and that the use of drugs is incorporated among those factors that are routinely measured. When these data are available an indicator can be established.

### **The quality of the studies of safety indicators in road traffic**

At the present time the Norwegian Public Road Authorities carries out 17 surveys regarding safety indicators in road traffic within the fields of road user behaviour and vehicle condition. These periodical studies are the main source of information about the associated indicators. The survey on the use of seat belts is a well-known example. From this survey the percentage use of seat belts is estimated among car drivers, among passengers, outside or inside rural areas, for the country as a whole, for regions and for local areas.

Due to the importance of being able to measure changes in the states with a sufficient degree of quality, the Public Road Authorities wanted a thorough investigation of the quality in all of the safety indicator surveys.

Our investigation shows that the scheme being used in collecting relevant data is well-founded and documented. It is, however, a problem that the scheme not always is followed up in practice. We consider this to be the main reason for the inexplicable variations in estimates between different geographical areas and from one year to another.

The following main points of improvement are detailed in the report:

- Development of a model for the indicators that is consistent with what we want the indicators to tell us. The most important sources of variation in behaviour in road traffic must be accounted for. The model is hierarchical in its nature, since the indicators are defined at local, regional and national level.
- A sampling plan that ensures the samples to be representative.
- The sampling plan must be complied with in order to obtain comparable results.
- Estimation of the indicator values should be based on the same model as the sampling of the indicators. This means that estimates must be weighted together to form estimates for larger and larger geographical areas.
- In the estimation traffic volume (measured in million vehicle kilometres) has to be included. That is undoubtedly the most important weight. Estimates that are pooled together to make an estimate for a larger area, should be weighted by traffic volume.
- The analysis can be based on mean values that are assumed to be normally distributed, which makes it easy to deal with the weighting of estimates. The uncertainty of the estimates, in terms of confidence intervals, also is quite simple to calculate.