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A Monitoring System for the Effects of Activities of Transport Inspectorate Netherlands on Traffic Safety

Final report

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Summary

In this report, proposals have been presented for a number of new monitoring and evaluation tools for road traffic safety in The Netherlands:

- *A tactical tool that can be used for selecting unsafe road freight transport firms* for:
  - compliance reviews and
  - roadside inspections.

  This tool calculates a safety score for every Dutch firm (carriers and shippers with own account transport) operating trucks for freights transport on the Dutch territory (either domestic transport or the Dutch parts of international transport). It is similar to SafeStat developed in the US. By focussing on the unsafe firms, the compliance reviews and roadside inspections can be done more effectively. This tool uses data from different sources:
  - the accident statistics from the Transport research Centre AVV-BG
  - data from the registration of IVW on the roadside inspections and the compliance reviews (BIC)
  - identifiers of vehicles and firms and information on the vehicle ownership per firm.

  This new tool distinguishes five areas of safety evaluation:
  - accidents
  - the driver
  - the vehicle/load
  - safety management
  - hazardous materials.

  Within each safety evaluation area, one or more measures are calculated which express safety (or rather unsafety) features of the firm. These measures are then converted into percentile scores (indicators). The indicators can be aggregated for each of the five areas and into an overall safety score for each firm, by weighting the various indicators according to their importance.

- *A strategic tool for the ex post evaluation of the effectiveness of the compliance reviews* (similar to the CRIAM –compliance review impact assessment model- developed in the US).

  We recommend that a subsample of the firms operating trucks that will receive a compliance review (CR) in some year will receive a questionnaire, both before and after the CR, with questions about the transport volume and accidents they were involved in. The same before and after survey should be done for a control group,

to separate the effects of the CR from other developments that might take place between the before-and-after survey.

If the tactical selection tool described above would be used to select unsafe carriers for compliance review, we recommend that not all firms are selected this way. For both the group of unsafe firms (selected using the tool) and for randomly selected firms, the before-and-after survey should then be carried out, for a subgroup of firms that received a CR and a control group, giving four groups in total.

- *A strategic tool for the ex post evaluation of the effectiveness of roadside inspections* (similar to the Intervention Model developed in the US).

  In the roadside inspections, deficiencies (e.g. overload, driving too long) are detected and also corrected. The heart of this tool would be a database of probabilities that a crash would occur if a deficiency had not been corrected. This database needs to be compiled in a number of expert sessions on truck safety.

  Once the risk probabilities per violation have been determined, the rest of the work would consist of:

  - Combining the numbers of violations observed with the risk probabilities to get numbers of crashes avoided.
  - Calculate the number of fatalities, injuries and damage-only-accidents for the avoided crashes, using average Dutch figures from the AVV-BG data.
  - Place a monetary value on fatalities, injuries and damage only accidents; these values might come from the national or international literature
  - Compare the monetary value of crashes avoided with the monetary cost of carrying out the inspections from IVW data in a cost-benefit analysis.

- *Methods for the strategic ex ante evaluation of actions* (continuation of current activities, introduction of new activities) of the IVW.

  The first three tools proposed above, all relate to ex post evaluation: determining the effectiveness of activities carried out by IVW in the past (or at present) or the present safety score of a firm. Some proposals have also been developed on ex ante evaluation: forecasting the effectiveness of activities of the IVW to increase road traffic safety in the future. These proposals are summarised below.

  The tools mentioned above for measuring the effectiveness of current activities of the IVW (such as compliance reviews and roadside inspections) can also be extrapolated into the future to give the expected impact of the continuation of such activities. This also applies to different ways of carrying out the compliance reviews and roadside inspections (e.g. on the basis of a tool selecting unsafe carriers for review and inspection versus the present selection of firms and vehicles without such a tool). The differences in effectiveness of two ways of selecting firms can be measured ex post by using both methods at the same time and interviewing firms selected using both methods. The ex post differences in effectiveness can be extrapolated into the future.

If one wants to evaluate (ex ante) the effects of continuing activities currently carried out (compliance reviews, roadside inspections) against effects of possible new activities (e.g. more emphasis on safety promotion campaigns, self-regulation in the transport sector, introduction of new technologies), then estimates of the effect of these new activities need to be made available. These could come from small-scale ('pilot') studies of such activities, results of research on the effects of such activities carried out elsewhere or expert opinions.

Another way to carry out ex ante evaluation, both for activities presently carried out and new ones, would be to develop an integrated causal model of accidents per firm. The above recommendations are all related to separate measurements of the effects on safety of individual activities. Developing a forecasting model of the number of accidents (by severity) of firms, that would include both external factors and policy variables would be a very ambitious effort. It has not been done in previous studies on road traffic safety in the Netherlands. The data to be used would consist of the AVV-BG accidents statistics linked to the data from the compliance reviews and roadside inspections from IVW.