THE DEVELOPMENT OF THE SWEDISH TRAFFIC CONFLICT
TECHNIQUE

by

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The Development of the Swedish Traffic Conflict Technique

Presented at the seminar on "Traffic conflicts and other intermediate measures in safety evaluation", Budapest September 8-10, 1986.

The work at our department to develop a traffic conflict technique started in 1973 and a technique for operational use was specified in 1974. Since then, the technique has been modified in different aspects and is still under further development. My purpose is to present some of the essential motives for the steps we have taken in the past, and those that we necessarily have to take in the future.

Dévelopment of the definition of a serious conflict.

To find the first definition we looked for a limit where even a well trained road-user had no other choice than doing his best to avoid the accident by braking or swerving (the point of no return).

This limit was found to be 1,5 seconds from the starting of an evasive manoeuvre until the accident would have occurred, if there had been no evasive actions.

For this criterion limit, we looked at critical situations in which skilful drivers (viz. taxi drivers) performed evasive manoeuvres. Here we found the time limit 1.5 seconds. Below this limit the manoeuvres no longer were examples of "tough" or "tactical" driving, but were made only to avoid an accident.

Most serious conflicts according to this definition take place with a certain suddenness, which makes it possible to use human observers for registering conflicts in the field.

Our definition was afterwards confirmed in a study where we did interviews with the involved road-users just after the conflict occurred. If the Time to Accident (TA) was more than 1.5 seconds, then few of the interviewed persons could remind themselves of that specific situation as a risk situation. This definition worked very good for several years in many research projects and in our first validation project. During these years we only worked at intersections with a very homogeneous speed distribution. When taking the step out to the highways, we immediately found that the limit between serious conflicts and other situations needed to be related to the Conflict Speed (CS). The distribution we chose was the distribution of a personal car braking on wet asphalt.
This means that we have broadened the definition rather than changing it.

Development of Validation

Since conflicts techniques often are very pretentious we need to show a valid correlation between conflicts and accidents. Other behavioural techniques with more farfetched definitions do not need to show its relation to accident even if they are used as a accident predicting method.

If you think that your conflict data are more reliable than accident data, at least in some aspects, then it’s a great problem if you are constrained to use police reported accidents as the key.

Our second big validation project, still ongoing, shows that conflicts gives a better estimation (smaller variance) of the accident ratio than police reported accident data do, if the accident frequency is low. In Car-Pedestrian situations e.g. conflict studies of one day give better estimation than one year of accident data as long as the frequency is below five accidents per year.

This indicates that we need better accident data before any radical improvement in this area is possible.
From a theoretical point of view we believe that the best conversion factors will be obtained through a determination in two steps:

1) to determine the probability of each conflict leading to an accident

2) to determine the probability of each accident leading to personal injury.

This means that we need to have information about every collision in the intersection during a long time. This in turn calls for some kind of automatic data-collecting method that can be running for weeks.

Development of the use of our conflict technique:

In the beginning we used conflict studies only as an accident substitute using only the advantage of quick result and a high number of data. We worked in intersections with lots of conflicts and then it was good enough just to count the conflicts without describing each conflict in detail.

Another very important use of conflicts is when doing before and after studies since you can avoid the problem with regression to the mean, a problem that always occur if you use accidents both for selection and for the evaluation of an effect of a rebuilding.

While working in areas with few conflicts per day, we found that the observer was capable to record more details about each conflict. This increased the quality of the diagnostical part of the conflict studies. This is an area where we have great expectations of success. We might even get the same or better results than you get from "traffic accident case-studies". For this reason we need to do further development on systematization of the causes of each conflict and what countermeasures that could hinder this conflict to occur. We also need to develop the technique of interviewing the involved road-users in a conflict.

Development of the technique in the future

Next big step for the conflict technique will probably be when the image-processing by computer is capable to work in real time. Then we will be able to select situations that should be analyzed afterwards. We should also use image-processing as the key for manual observation.