

SOME NOTES ABOUT THE USE OF THE TRAFFIC CONFLICTS METHOD

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Introduction

Why is it thought better to use conflicts in studying road safety than accidents?

The drawbacks of accident analysis are the following:

1. Accident statistics only contain information on recorded accidents and consequently not on the unrecorded ones. However, only part of all accidents is recorded.
2. Since accidents are relatively rare, it is often impossible to obtain reliable accident data.

The time needed to collect an adequate number of accidents for statistical processing is, as a rule, too long. Furthermore, different conditions and circumstances may occur during a lengthy period of collecting accident data.

3. The present standard records do not comprise detailed information about manoeuvres.

Some possibilities of analysis based on conflicts techniques are the following:

1. A great number of measurements can be made in a short time.
2. Conflicts can be classified according to manoeuvring behaviour.
3. A reduction of conflicts as the result of measures can be demonstrated quickly by means of before and after studies.
4. The supply of information both to the authorities (police, traffic experts) and to road users themselves; it often happens that residents in a given area ask for action to be taken and the authorities cannot evaluate the traffic situation.

1. What are the tasks of the traffic conflicts technique?

We want to use the traffic conflicts technique in specific situations for studying the safety of locations where no sufficient accident data are available. Traffic unsafety of a specific location can be defined as the average number of accidents per year. But since (only) few traffic accidents occur at specific locations, e.g. junctions,

and in different kind of areas, e.g. residential areas, in a year, it is impossible to use this criterion in short term research.

Task 1

In studying traffic safety, conflict-behaviour may be a predictor of accidents and/or the causes of accidents.

In this respect the traffic conflicts technique can be used particularly at low-volume locations, where the accident reporting level is likewise low:

- as a diagnostic tool to determine unsafe locations, and to study the features in depth.
- for evaluating countermeasures in terms of traffic safety based on before and after studies; however, for a reliable evaluation sometimes more after studies are needed (3 months after and again 6 months after).
- as a priority ranking criterion for programming the order of the implementation of spot improvements.

There is an argument that locations can be classified by using traffic volume measures as well.

But ranking locations can also be done by using in areas and on road stretches the conflicts technique and on intersections the traffic volumes. It is possible to apply both measures together.

Task 2

Conflicts are an indicator for the road user's well-being, or from another viewpoint, road user's discomfort. In this way the technique concerns the subjective and not the objective unsafety. The feeling of unsafety is mostly based on conflicts and not on accidents.

In this way there is no direct relation between conflicts and accidents, only an indirect one. For example, parents are convinced of traffic safety, because there happen very few serious conflicts in their streets, consequently they accompany their children to school less frequently than before, and as a result the children become more often involved in traffic accidents.

Task 3

The conflicts technique can be used in solving problems of the quality of traffic flows, for example, to study operational problems like traffic congestions.

An additional argument to use the conflicts technique is an ethical one: there is no need to wait for accidents to happen before the hazards are pointed out.

What is not the task of a traffic conflicts technique?

The traffic conflicts technique does not necessarily concern traffic law violations. Traffic law violations are, as a rule, not included among conflicts, because they do not always indicate potential accidents. Some violations are related to accidents and some are not.

2. The definition of conflicts

1. The basis of the definition is, that a conflict is a situation or sequence of events which has a finite expectation (a probability p) of developing into an accident in all situations which are investigated. But different probabilities may exist for different kinds of road user's and for different groups of situations. Which elements are common to all situations, to which the conflicts technique can be applied?

2. There are many definitions in use. The elements of these definitions are:

- the kind of manoeuvres
- the estimated times of arrival of vehicles
- the proximity in time and in distance
- the speed of vehicles and speed changes
- the direction and changes in direction
- environmental elements
- the different traffic participants (also pedestrians)
- the traffic mode

(and combinations of these elements).

In most studies the conflicts are classified on the basis of severity, from slight to severe.

These are the common elements and type of conflicts. The foregoing means that the aim is to find a good definition for different conflict types with observable events.

In the future we have to achieve agreement in using definitions.

3. Techniques of conflicts measurement, the reliability

1. The most useful techniques are often still strongly subjective as regards conflict scoring, especially as regards the severity of the conflict.

2. The different techniques of measuring conflicts are:
at locations

- by means of film
 - by means of video
 - by means of automatic detection
of vehicle proximities
 - by means of observers.
- } objective measures

in areas

- by means of observers, following persons through an area.

Using observers, is an excepted technique.

3. In spite of the mentioned subjectivity the internal and external reliability of observers seems to be rather good (an agreement of about 80-90 percent can be achieved). But this reliability research has been carried out only on a very limited scale.

Training of selected observers with video recordings and in the field can improve the reliability of measuring the severity of conflicts. Only a few countries have manuals for training observers.

4. Study design and measurement accuracy; the validity

To establish the absolute level of safety, an accident-to-conflict ratio must be obtained (for example, one accident per thousand conflicts) in order to estimate the magnitude of the safety problems. Therefore, even with a totally reliable conflicts measurement the absolute level of safety can only be estimated by conflicts. Of

course the ratio between conflicts and accidents may vary for different classes of conflict. Some kinds of conflict are rather good correlated to the same kind of accidents. But so far research into this problem has been carried out to a limited extent only.

To know the relative level of safety, the ratio of expected accidents must be calculated.

Some problems of correlating conflicts to accidents are summarized below.

1. In the predictive validation one choose situations with many accidents. The question is: is it possible to estimate expected accidents on the basis of actual accidents? Some studies show, that this is possible.

But if we want to use the conflicts technique in situations where there are very few accidents, the question arises: can conflicts be used to make an accurate estimate of expected accidents?

A possibility is that we assume that the same relationship exists in heavy and in low accident situations.

Another problem is the reliability-validity relationship. When is the validity of a reliable conflicts technique high enough to predict accidents better than the unreliable accident data?

Beside these main problems there are other ones as well.

2. In most studies analysis showed that serious conflicts correlated better to accidents than conflict definitions, including those of a less serious nature. Even with significant correlations it is reasonable to suppose that both accidents and conflicts are positively correlated to traffic volume.

3. Conflicts are related to the reported accidents (mostly injury accidents) and it is well known that only one-third of all accidents are reported.

4. Conflicts studies are carried out mostly under normal conditions. What to do with variations in seasons, in speed, in weather conditions, in traffic flows, etc.? As yet there are no correction figures available in this respect.

5. Sample size. How many accidents are needed in order to obtain a representative picture of, e.g. an intersection, such that every type of accident that may happen at such an intersection, has occurred. The same problem applies to conflicts. The answer is not known.
6. In cases in which only serious conflicts are considered, the information about the validity is scarce as compared to studies which take into account all conflicts.
7. Conflicts do not explain all of the accident variability. There is evidence that not all accidents are preceded by conflicts.
8. The fundamental question beyond all these problems still is: should a conflict be regarded as an alternative to the road accident indicator, or is it a different or supplementary indicator of the concept of traffic safety or should it be regarded as a useful measure for the road user's well-being.