INTRODUCTION.

In Holland great efforts are made to improve the safety of residential area's. In the past, townplanners gave too much priority to fast-moving traffic in residential area's and payed less or no attention to pedestrians. One consequence of this one-sided thinking of the townplanners was an increase of accidents that involved pedestrians. To mention some figures: the number of pedestrians hurt or killed in traffic increased from 5000 in 1950 to 8000 in 1971. One half of these victims being children under 15 years; and about three-quarters of the accidents involving children occur within 500 metres of the child's home.

With this concern about the unsafety of pedestrians, especially children, in residential area's, our research on the conflict observation techniques began.

Although pedestrian unsafety, as indicated, is a big problem, accidents in residential areas still are rare. The time needed to collect enough accident data for statistical processing is too long in these situations. Likewise, on short-term nothing can be said about the effects of measures taken to improve the safety of residential areas.

For this reason we turned to the conflict observation techniques. Some of the advantages of these techniques seemed to be:

1. Many measurements can be made in a short time.
2. Measures for improving road safety can be taken quicker on the basis of information from conflict methods provided the method is valid.
3. The conflict method is applicable with low-traffic densities where the accident level is likewise low.
4. Reduction of conflicts as the consequence of measures can be demonstrated quickly by means of before and after studies.
5. The supply of information to the authorities (police, traffic experts) and to road users themselves; it often happens that residents ask for action to be taken and the authorities cannot evaluate the traffic situation.

At the moment we started in 1974 with the conflict observation technique the few techniques that existed seemed to be strongly subjective.
as regards conflict scoring, especially as regards the severity of the conflict and the techniques had too little (or inadequately researched) correlation with accidents to be used as an alternative criterion to accidents.

Our first aim was to develop a reliable conflict-observation technique, reliability being the primary requirement for a measuring instrument. This implied that if we succeeded in developing a reliable instrument we could only use this technique to obtain information or to express opinions regarding road safety under the assumption of its validity. In fact we only would be able to express our opinions about measures in residential areas, in terms of conflicts.

**THE CONCEPT "SERIOUS CONFLICT" and ITS OPERATIONALISATION**

We defined a serious conflict or near-accident as: a sudden motor reaction by a party or both parties involved in a traffic situation, towards the other, with a distance of about 1 metre or less between those involved.

Two variables are important: the motor reaction and distance.

Beside this concept "serious conflict" we distinguished 5 other possible combinations of the two variables mentioned.

For instance: a conflict: a sudden motor reaction by a party or both of the parties involved in a traffic situation towards the other with a distance of about 2 metres or more (maximum 20 metres) between those involved.

a contact: a non-sudden motor reaction by a party, or both of the parties in a traffic situation towards the other, with a distance of about 2 metres or more (maximum 20 metres) between those involved.

All together we called these six types of combinations of the two variables (motor-reaction and distances):

an encounter: a motor reaction by a party or both of the parties involved in a traffic situation towards the other, with a distance of 20 metres or less between those involved.

One should realize that any definition has its limitations. This research has tried to give a definition of a serious conflict, which would on the one hand be as close as possible to a traffic
accident and be measurable, and on the other hand would provide sufficient number of serious conflicts to enable the problem to be investigated.

One might ask whether operationalisation of serious conflicts with the aid of a sudden motor reaction is really the correct approach for a serious conflict, since sudden motor reactions do not always necessarily take place in order to avoid an accident!

The point of departure in this research was the idea that an accident is the result of a reaction that was too late by one or more road users and not of no reaction at all. If accidents are the result of the wanting of reactions of the parties involved in a traffic situation, there is nothing to investigate with the conflict technique. The criterion of "sudden" has been determined empirically. With the aid of 27 video-recordings of encounters between pedestrians and other traffic, ten observers had to score reactions on a seven-point scale ranging from more to less sudden. A discussion resulted in a detailed list of criteria that could be used to identify three types of reactions (of different kinds of road users) sudden- in between - not sudden. Next the same ten observers evaluated the 27 video recordings on this three points scale, using the list of criteria.

A second group of ten observers were given the same instruction as the first group for the second task, that is scoring on a three-point scale. In total, they scored the 27 video recordings three times each in a random sequence.

As regards the observers' external reliability (that is the reliability between the observers) with respect to pedestrians' reactions the average correlation between the observers in the 2nd group varied (over the three sessions) from .86 to .87. The average internal reliability (that is the reliability of the same observer for different sessions) was .95.

As regards the observers reliability with respect to other traffic, the average correlations for external and internal reliability are respectively .75 and .85.

It is noteworthy to mention that these results were based on the observations of onselected and untrained observers.

In later research with observers who passed a selection and then were trained, we found correlation for the external reliability of .94 for the pedestrians reactions, and .93 for the traffic reactions.
SOME REMARKS ON THE PRACTICAL APPLICATION OF THE DUTCH CONFLICT OBSERVATION

About the practical application of this conflict observation technique in field research we will be very short. We used the technique in a comparative study of two neighbourhoods desiged according to a totally different point of view. One area designed according to the principle that gives all priority to wheeled traffic; the other one designed according to a new approach in Holland that gives pedestrians priority although traffic is allowed to enter this area. The aim of the latter type of design - we speak of residential yards - is both to give pedestrians, especially children more (play) facilities and at the same time reduce conflicts between pedestrians and wheeled traffic.

With respect to this latter aim: our research indicated that in contrast to the expectations the residential yard approach does not lead to fewer serious conflicts than the conventionally designed area. As mentioned earlier in this stage of our research we cannot express our opinions in terms of road safety.

In the light of this seminar more interesting than the results of this field study, perhaps, is the way we used the conflict observation techniques.

Female observers (students in social sciences) were trained in judging reactions of traffic and child pedestrians and in judging traffic situations.

In both neighbourhoods these observers made direct observations in two ways: by following children while moving through the area and by making observations of specially interesting areas, as, for example, the entries of elementary and infants schools.

The reasons we choose for direct observation instead of using film or video recordings are:

- cameras have to be moved frequently in order to obtain a proper idea of the entire area; there were no opportunities for good situating.
- following children with cameras would disturb their natural behaviour too much. Disturbances caused by the presence of an observer are less and according to our experience in the past, disappears after a few days.
- estimation of distance between the parties involved in a traffic situation from video or film recordings is difficult.
- the least important reason we choose for direct observations is that the costs of the field work would be twice as high.
when using video or film recordings: first you have to make the recordings and after that make the observations.

Of course the big advantage of film or video recordings is that you can run and rerun the recordings which gives the possibility to more profound reliability research.

FINAL REMARKS.

At this stage the following can be said:
(a) our research has demonstrated that with the technique developed, an amount of information can be collected within a fairly short period, which gives a good idea of what happens in a residential area.

The reliability of the technique will have to be improved further both experimentally and in the field.

(b) Since the research concentrated on developing a reliable technique, little can be said at present as regards its validity, i.e. whether serious conflicts can also be suitably used to predict traffic accidents. Any expression of opinion regarding road safety is not therefore appropriate at this point.

(c) Instead of expressing any opinion on road safety, this research does give a number of indications regarding certain types of encounters in residential areas. This will enable town planners to obtain more insight into the effect upon the various road users. They can modify their plans quickly and endeavour to improve undesirable traffic situations.

The validity of our conflict observation techniques and complementary reliability tests are the subject of our ongoing research. At this very moment observations are made on 26 locations. The locations - parts of road in residential areas - are selected on base of the accident reports over the past 5 years.

However, we must realize that this research has still the character of a pilot study. There are severe limitations to profound validity research.
- the selection of the locations is based on accident reports. In the Netherlands however approximately two-third of the road accidents are not reported. Although we try to meet this problem by interviewing the people in the surrounding neighbourhoods, we do not have the hope to get the exact accident figures.
- the accident data that exist are, as we noticed, not always reliable. For instance the exact place of the accident, the situation in which the accident took place, are sometimes badly recorded.

- and last but not least to get enough accident-data we have to work with figures based on a period of 5 years. Although we took into account changes that might have happened in these past 5 years (for instance locations where changes evidently took place in this period were not selected) we cannot take account for all possible changes: the socio-economic level of the population living in the neighbourhoods of the selected locations might have changed, or the number of children, not even mentioning changes in traffic-densities.

These are some direct problems we are facing at this very moment.

More fundamental questions are:

- Is our starting point in defining a serious conflict correct? Our basic assumption is that an accident is the result of a reaction that was too late. If however accidents happen because of the wanting of reactions of the parties involved, we better forget our approach. Simple: if accidents happen because one party saw the other party too late: then our approach can be correct. If accidents happen because both parties did not see each other; then our approach must be wrong. Perhaps both types of accidents do exist. And if so in what ratio?

- With our method we hope to be able - in the future - to predict changes in accident rates, in case measures are taken to improve road safety. What are the chances to predict the magnitude of the accident rate with the conflict methods? Even the estimation of the magnitude of experimental accident rate made from actual accident-reports seems to be doubtfull.

- Is there a need for different conflict observation techniques for different type of road users. That is: do we need a different type of method for vehicle/vehicle conflicts, for pedestrian/vehicle conflicts etc. etc.

- Is conflict observation possible in case of what you might call "one-sided" accidents, that is, collisions of traffic with objects.

Of course there are only a few basical problems we have to face in this research area.

I sincerely hope that this seminar will contribute to an answer to some of those questions.