INTRODUCTION SPEECH AND CLOSING REMARKS AT THE PREPARATORY ICTCT-MEETING FOR THE JOINT INTERNATIONAL CALIBRATION STUDY OF TRAFFIC CONFLICT TECHNIQUES 1983, COPENHAGEN, 25-27 MAY 1983

Prof. Erik Asmussen, Director Institute for Road Safety Research SWOV

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Institute for Road Safety Research SWOV, The Netherlands

INTRODUCTION SPEECH

Ladies and Gentlemen,

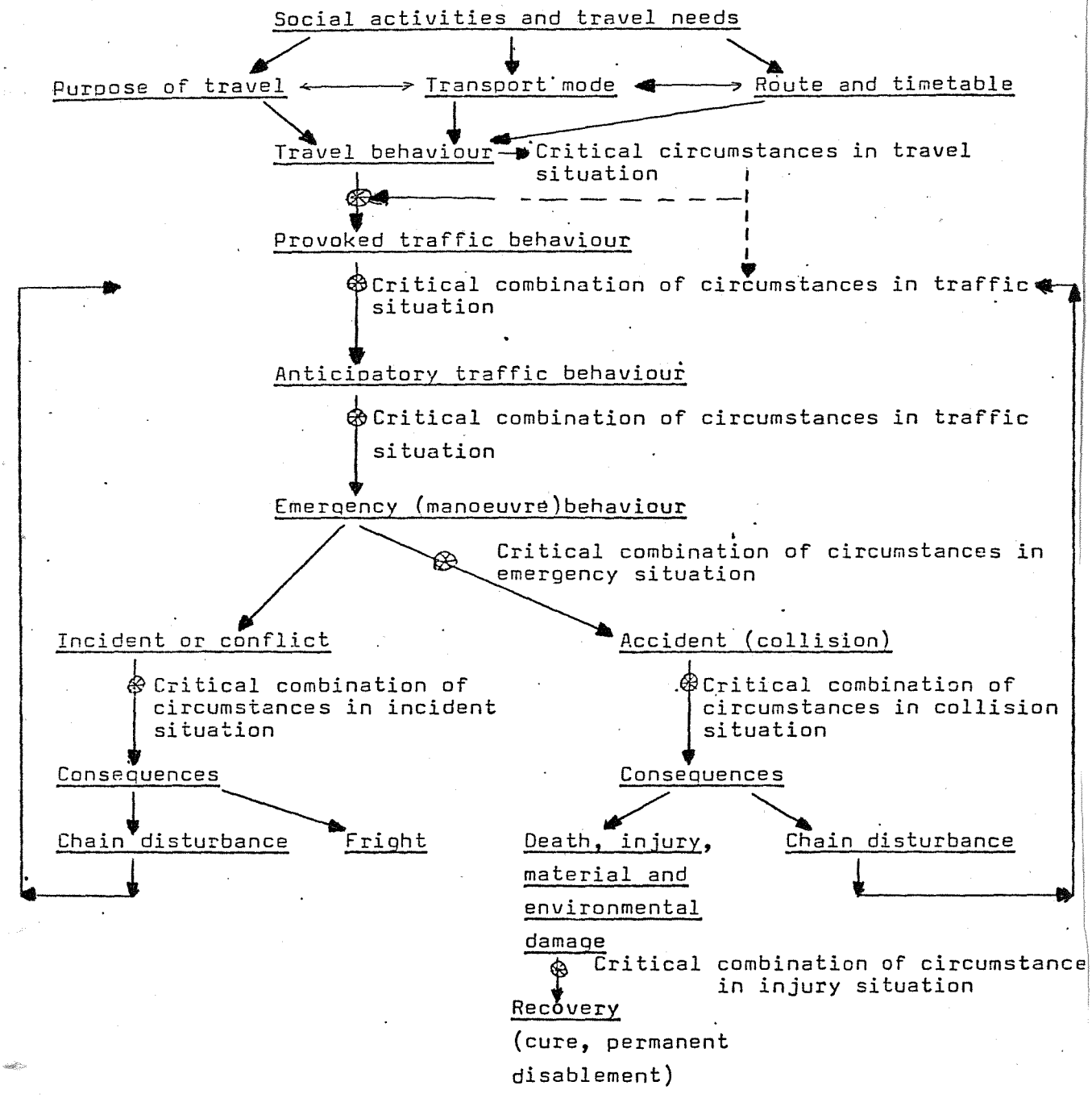
Traffic unsafety can be regarded as the whole of existing and potential critical combinations of circumstances, incidents (conflicts) and accidents in traffic and the individual and social consequences (damages) caused by them.
The main feature of incidents and accidents is that they are always preceded by a critical combination of circumstances in traffic. Such critical combination of circumstances for example in a situation can be described as a situation wherein, with unchanged traffic behaviour and/or unchanged traffic situation, the interaction between man, vehicle, road traffic and environment leads to accidents (see Figure).

Without taking into account the emotional content of the word, we could simply speak here of a coincidence of circumstances.
Such a combination or coincidence of circumstances in a traffic situation is always preceded by decisions, which are jointly determining whether the combination of circumstances becomes critical or not. Such decisions may refer to the purpose and scheme of travel, the mode of transport, the speed of the car and the alertness of the road user (provoked traffic behaviour).

If in the situation of a critical combination of circumstances, anticipating or "normal" change of behaviour is possible, because the road user recognises the critical (combination of) circumstances in time, there is no problem at all.
If there is no anticipating behaviour, or this is not sufficient, an emergency manoeuvre is needed, for instance emergency braking or evasive action.
If the emergency manoeuvre is successful, an incident or conflict is the result.
If the emergency manoeuvre fails an accident or collision arises.

Both in the "anticipating" phase and in the "emergency" phase critical combinations of circumstances can affect the outcome.

Figure 1. Model of the accident process



I show you this phase model of the accident process, because we have to make clear to each other about which part of the process we are speaking if we use the word "conflict".

Before I shall speak about the importance and usefulness of traffic conflicts techniques, I want to make a comparison between the control of (the unsafety of) the transportation system and the steering of a fully loaded mammoth tanker.
If the wheel of such a vessel is swung right round, the effect (the output) will not become noticeable for some time. The slow response by the tanker is comparable with the slowness of accident registration.
The limitation of human perception abilities in noting slow (slight) changes is comparable with the limitations of statistical analysis methods for disclosing changes in the pattern of accidents.
The moment the changes in output are observed, it is often too late both on the tanker and in the transportation system to make effective corrective action.

Masters of giant tankers therefore do not respond so much to changes in the vessel's course (output variable; cf. accident statistics), but predict changes in output by responding to data on input and intermediate processes (input and process indicators), such as position of helm, speed, direction and speed of currents, etc. This is possible because they have sufficient knowledge and comprehension of the relationship between control variables and process variables, and the influence this has on changes in output. They do not wait, therefore, until the moment the output (change in course) manifests itself; they certainly do not wait till an accident has happened.
In research concerning shipping traffic, as well as in aerial traffic, the so called incidents or conflicts or near misses play an important role.
Of course that is also because accidents seldom happen, and if they happen, result in tremendous damage. But the main reason is that incidents or conflicts tell us about the critical combinations of circumstances in this traffic. In shipping and aerial systems, they even use this knowledge for training purposes. In research it is the most important source of information.

The challenge of this experiment that we are all concerned with, regarding the calibration of traffic conflicts techniques (TCT's), is to make clear the importance and usefulness of these techniques for the improvement of traffic safety. If we do not succeed in this, then we will fail regardless the interesting technical results. In many countries we find examples of the application of the TCT. However, the applicability is restricted and often restricted to experimental use. In various countries, however, there is a need for operational use on a larger and more general scale.

Sweden is one example of this. Mr. Mattson will give us a description of the background of this need. His problem as he states it in his paper is not so much the detection of dangerous locations but the analysis of the safety problem. The accident data are too scarce for a detailed analysis and the information stored in the accident report often misses the relevant cues to reconstruct what exactly did happen.

The Swedish conflict technique will be used to collect more information about the safety problems at specific locations. In The Netherlands, but I think also in many other countries, we feel the same need for additional information in order to make an analysis of traffic safety, and also in our country we look for a technique that is systematic and easy to use. In the USA, as can be seen from the paper of Mr. Migletz and Mr. Glauz, one is a little bit dissatisfied about the applicability of the TCT for safety analysis purposes. They lowered their aims and made the technique applicable in order to detect "operational deficiencies" as they call it. A concept that is related to discomfort and feelings of unsafety that also can be regarded as negative aspects of transportation. But also in the United States there is a need for such an easy-to-use technique to solve safety problems.

This brings us to the very heart of the problem: How relevant is the analysis of traffic conflicts for the analysis of traffic safety?

So far I mentioned two kinds of usage of the conflict analysis technique: The detection of dangerous locations and the diagnosis of the safety problem. An administrator, however, who is in charge of the safety of a road network, is primarily interested in the application of the technique with regard to the solution of the safety problem he has detected and analysed. He wants to know how to control safety. If the diagnosis leads to a conclusion about what is wrong at a particular location, then this

does not lead directly to a solution of this safety problem. Various safety measures can be taken in order to solve the safety problem. It is not necessary that the application of these measures leads to a definite solution of the problem at hand. Measures often have side-effects. They may influence the situation in more than one way. Road surface improvements may attract traffic, traffic signals may cause changes in routes, etc. The improvement of road safety is a dynamic process that asks for constant evaluation of results.

Conflict analysis technique as a technique for quick evaluation of safety measures seems to me a very efficient tool to improve traffic safety in a dynamic way. This evaluation of safety measures is also urgent, because the diagnosis will always be uncertain and result in a hypothesis rather than an irresistable fact. Together with the uncertainty about the effectiveness of safety measures, this seems to ask for a short term evaluation of the effects.
Only behavourial studies and especially systematic observation as can be found in a well "articulated" conflict analysis technique seem to give us a way out of this problem.
In practice, accident studies can hardly be used for this purpose.
The only justification for the use of TCT for the purposes mentioned can be found in a well-established theory about traffic safety. How do traffic accidents take place? Under what circumstances do traffic situations escalate into such a way that correction is not possible any more and an accident results.
Most of the conflict teams that are present to-day and will join us in the experiment, work on the basis of a more or less specific theory about this escalation. Elements of this theory can be found in their definitions of a conflict. Many teams use time as a basis to define the severity of a conflict. The less time there is left to react to a critical combination of circumstances, the more dangerous the situation is. But time is not enough. Manoeuvering space is also needed. And if we are primarily concerned with injuries or fatalities then also the kind of road-usage is very important.
As stated before, there is a need for a general technique that can be easily applied in various situations. Many techniques are rather specific, dealing with car-car conflicts only or car-pedestrians conflicts,

conflicts at intersections with dense traffic, etc. Especially in this experiment the confrontation of many different points of view of various experts can lead to a fruitful discussion about the characteristics of traffic situations that lead to danger. In itself a conflict need not to be dangerous. Almost all conflicts can be dealt with adequately. It is important to find out which conditions are responsible for the loss of control in the rare cases the result is not a conflict, but an accident. In this respect, the conflict analysis technique can be regarded as a part of a general theory about traffic safety. We will not be able to solve all traffic safety problems at once with a magic formula called conflict analysis but if we look at it as part of a general theory about traffic safety, then, may be, this kind of systematic observation may help us to get more insight in safety problems.

Calibration and the discussion of the results is the first step in the development of a technique that is soundly based on a well-established theory. Confirmation of the theory by means of validation studies is a necessary second step that I hope will not be ignored. But also for this second step the calibration of techniques is valuable. It will give us a basis for comparison and discussion of results.

CLOSING REMARKS

Ladies and Gentlemen,

During the preparation of these closing remarks when Siem Oppe and Joop Kraay discussed to give me an overall impression of the first two days of this meeting, I suddenly got an association. The famous Einstein once said, and I quote not exactly: what we as scientists or researchers see or observe from the real world is depending on the characteristics of our measuring instruments. But these instruments are designed in correspondence with the "a priory" theories we have. So, what we finally observe from the real world is strongly depending on the knowledge we already have, the theories we have at our disposal.
For outsiders this may give the impression that research is not more than a selffulfilling prophecy, biased by the way of thinking of the researcher.
Happily, this is not true because the most important characteristic of the researcher is "his doubt" concerning the validity of his own findings and the findings of other researchers.
In order to cope with this doubt, the researcher has developed methods to verify, to falsify or to confirm findings, theories and methods.
One even can think that researchers are overcompensating their fear for the personal bias.

Safety research is mostly an applied, interdisciplinary kind of research. Its function is to give decision makers the information they need to select their strategies and countermeasures to improve road safety.
Most of the decision makers in the western world are of opinion that the time is over now for general or structural countermeasures, like safety belts, crash helmets and also large scale infrastructural reconstructions. In their opinion further improvements of road safety could be realised mainly by optimalisation of a great number of location or situations and by optimalisation of existing countermeasures, especially those with the aim of influencing the road users' travel and traffic behaviour.
In order to do that they need an easy-to use technique to detect hazardous situations and to carry out short term evaluation of countermeasures.

In some countries, f.i. in Holland they have gone so far that they use subjective risk assessment of road users not only to detect hazardous situations, but also to evaluate the result of countermeasures.
However, as you all know there hardly is a correlation between verbal expressions and traffic behaviour, nor between the so called subjective (un)safety and the actual accident rates of situations.
I think that the topic of this meeting, the development of conflict observation techniques, can give the decision makers a better alternative if they need more (and faster) information about traffic safety than accident figures.
And to be honest, how long ago we already gave the decision makers the impression that the very promising conflict technique could meet their needs for small-scale and short term decision making and evaluation?
In the last five years they have only noticed little progression in the development of this technique, and above all they have noticed the lack of agreement between the researchers about which technique is the most appropriate to solve what problems. The researchers working on this matter, were so fascinated by the new questions arroused by their own research that they became more or less isolated from their environment.
This environment, the decision makers, we must realise, have also the power to influence decisions about the money that is allocated for research.

Looking backward on this meeting and looking forward to the Malmö experiment in the context of the words I started with, I consider this as a very good initiative both for researchers and decision makers.
I would like to congratulate all the members of the organising committee and particularly Christen Hydén. Not only because he is the chairman of the ICTCT but also he was the "engine" behind both the meeting and the experiment.
I think that this meeting, as a preparation for the experiment, was a successful one. There were enthousiastic discussions, that have lead to a better understanding of the differences of the several techniques and especially of the thought behind them. However, in practice the Malmö experiment will give the real advantages and disadvantages of the different techniques.
The aim of both the meeting and the experiment is in fact to convince the

participants that they have developed not only reliable observation techniques relevant for the traffic safety problems, but also techniques applicable for operational use in the field for traffic engineers and local authorities.

If we also want to convince the decision makers we need more than the proceedings of this meeting and the research of the experiment.

Both should be integrated in a more comprehensive state of the art report and transmitted to all the decision makers concerned in this issue.

I am therefore very greatful that not only researchers attended this meeting. On behalf of all the participants I whish to thank the members of the organising committee and I wish you all a very successful field study in Malmö.