

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

Working Party on Road Traffic Safety

Sixty-second-session

Geneva, 26–29 September 2011

Item 8 (a) of the provisional agenda

Consolidated Resolution on Road Traffic

Multidisciplinary crash investigation (MDCI)

Submitted by Sweden

This informal document, submitted by the Government of Sweden, outlines a possible "way forward" for WP.1 to promote a multidisciplinary crash investigation (MDCI) mechanism.

Background

1. According to WHO (2009) over 1.2 million people are killed in road traffic crashes annually and between 20 and 50 millions suffer non-fatal injuries. There is an obvious risk that these figures will increase substantially without strengthened efforts and new initiatives, especially if the increasing traffic in the developing countries is taken into account (WHO, 2004). One approach to road safety is mainly based on a premise where individual road-users are solely responsible when crashes occur. This view has been enabled by, and is in turn constitutive of, findings claiming that human error is the cause of approximately 95% of road crashes (WHO, 2004).

2. One important contribution to these findings is that accident investigations historically have followed a model based on the assumption that "human error" caused the mishap. Investigators have been instructed to focus on the personnel closest to the mishap and to find "causal and contributing factors and ultimately the root cause of the accident" (Pupulidy, 2009). As a further consequence remedies has primarily been sought in persuading road-users to adopt error-free behaviour. Such remedies often consist of information, education, legislation and police surveillance (Amalberti, 2001).

3. Zein and Navin (2003) conclude that the "simplistic representations of traffic safety disregard the dynamic interactions among the road environment, the vehicle, and the road-user". According to them these simplistic representations are a result of police reports that attribute more than 90% of all road traffic accidents to driver error and leads to the incorrect conclusion that improving driver behavior is the only effective road safety strategy. They further claim that a systems approach in road safety acknowledges the more complex nature of road traffic accidents where multiple factors interact resulting in an accident.

4. In other hazardous complex socio-technical systems, e.g. nuclear power safety, software safety and aviation safety, systems theory is considered as a promising way to better understand and manage safety (Leveson, 2002). According to Leveson (2002) systems theory provides the theoretical foundation for systems engineering, which views each system as an integrated whole even if it is composed of diverse individual and specialized components. A basic and important assumption of systems engineering is according to Leveson (2002) "that optimization of individual components or subsystems will not in general lead to a system optimum; in fact improvement of a particular subsystem may actually worsen the overall system performance because of complex, non-linear actions among the components". This means e. g. that safety cannot be optimized through the optimization of the safety performance of the individual components and according to Leveson (2002) "attempts to improve long-term safety in complex systems by analyzing and changing individual components have often proven to be unsuccessful over the long term."

5. One important conclusion from the findings described is that road safety crash investigation are important but must be improved in order to be a valuable tool to improve road safety.

MDCI in UNECE WP.1

6. UNECE WP.1 has decided to look further into the concept of Multidisciplinary Crash Investigation (MDCI). This is a concept approaching a road accident in a broader, more systemic way.

7. The representatives of Norway, USA and Sweden have agreed to lead the work to develop a framework of MDCI which could be incorporated in e.g. the Consolidated Resolution on Road Traffic.

Proposal

8. Our proposal is that the guidelines should not go into detail when it comes to e.g. which data that should be collected, how it should be collected etc. We believe that WP.1 should create some kind of guidelines of MDCI on a general level where we identify different "modules" that should be included in MDCI. For each module we can identify important prerequisites, general "requirements" and models for the work carried out in each module. We also think that it's important to identify and discuss problems and obstacles that may occur based on e.g. experiences from different countries. We should also show good examples.

9. We propose the following modules partly based on ESReDA:s (European Safety Reliability and Data Association) Guidelines for Safety Investigations of Accidents. The different subjects for each module are just examples which have to be discussed further.

1. General principles and approaches for MDCI

- Underlying accident models
- Different aims for MDCI
- General models and methods for MDCI
- In-case-studies or generic studies
- ?

2. General procedures and preparedness

- Access to data sources
- Legal aspects
- Choice of approach and methodology
- Composition of investigation teams
- ?

3. Conducting MDCI

- Data collection
- Generating hypothesis
- Formulate findings
- ?

4. Learning from MDCI

- Turning findings into recommendations
- Applying recommendations
- Following up recommendations

- Some barriers to learning
- ?

References

Amalberti, R. (2001). The paradoxes of almost totally safe transportation systems. *Safety Science*, 37, 109-126.

Leveson, N. G. (2002). *System Safety Engineering: Back To The Future*. Retrieved 2006-10-18 from <http://sunnyday.mit.edu/book2.pdf>.

Pupulidy, I. A. (2009). Operationalization of a Systemic and Human Performance Analysis for Serious Accident Investigation – US Forest Service Panther Fire Fatality Investigation. Master Degree Thesis. Lund University. Lund, Sweden.

World Health Organization (2009). Global Status Report on Road Safety. WHO Library Cataloguing-in-Publication Data.

World Health Organization (2004). World Report on Road Traffic Injury Prevention. WHO Library Cataloguing-in-Publication Data.

Zein, S. R. and Navin, F. P. D. (2003). Improving Traffic Safety: A New System Approach. *Journal of Transportation Research Board*, No. 1830. Washington, D.C., USA.