United Nations ECE/TRANS/WP.1/2013/1

Economic and Social Council

Distr.: General
24 December 2012

Original: English

Economic Commission for Europe

Inland Transport Committee

Working Party on Road Traffic Safety

Sixty-fifth session
Geneva, 18–21 March 2013
Item 5 (c) of the provisional agenda
Convention on Road Traffic (1968):
A Safe System Approach

Convention on Road Traffic (1968)

A Safe System Approach

Submitted by Sweden

This document outlines the Safe System approach. The document proposes ways to modify the 1968 Conventions on Road Traffic and on Road Signs and Signals as well as the Consolidated Resolutions on Road Traffic and on Road Signs and Signals to reflect this approach a greater extent.

Road safety and transport system design principles

I. Background

1. The development of road safety is undergoing major changes now and most certainly in the next ten years. The global community has reacted strongly on the predictions of the impact of poor safety and the growth of road traffic, on the society and the health of the population. It has been estimated that death through traffic accidents will become the third or fourth most common source of death within 10-20 years, unless major and effective actions are taken. The United Nations has declared 2011-2020 as "the Decade of Action" asking for contributions from all countries and stakeholders to diminish a world epidemic of road casualties that not only impact on health but also on economy and economic growth in particular in low and middle income countries. The concern is related to safety, but the overall aim of the future is to develop a sustainable transport system where safety, environment, energy and accessibility are integrated. Such integration is complex and system design necessary as a tool to find synergies and limitations.

2. Current traffic safety approach in large parts of the world is "Vision Zero" or "Safe System Approach" (SSA), two expressions of an identical policy. Recently, in the white paper on transport "road map to a single European transport area —Towards a competitive and resource efficient transport system "— the European Commission has adopted Vision Zero, with the target that by 2050, the number of fatalities due to road traffic crashes should be close to zero. Also the guiding principles underlying the global Plan for the Decade of Action are those included in the SSA. The forthcoming ISO 39001 management standard for traffic safety specifies that the standard is only relevant for organizations that wish to eliminate death or serious injury in road traffic crashes. OECD has recommended that the SSA should be used to manage traffic safety (OECD/ITF[1]-report: "Towards Zero: Ambitious Road Safety Targets and the Safe System Approach"). In the private sector, Volvo Cars has set a target of zero deaths and serious injury in or by a Volvo 2020. Other car manufacturers have expressed zero as their vision, but not specified when this is supposed to be fulfilled. All these examples have one thing in common, except from explicitly aiming for elimination of death as a result of road traffic crashes, and that is the system's perspective.

3. Hence it is a challenge of utmost importance for UNECE WP.1 to adopt the SSA in its work with the purpose to make the Vienna Convention and the Consolidated Resolutions on Road Traffic (R.E.1) and Road Signs and Signals (R.E.2) reflect this approach to a greater extent.

II. Design principles of the Safe System Approach

A. The design of the road transport system should guide the road user to a safe behaviour and mitigate the consequences of common human errors

4. The human being has capabilities and limitations which to a great extent must be taken into consideration when designing the road transport system. Road users will always make errors and mistakes for various reasons. These errors and mistakes in many cases originate from the interaction between the road user and the complex social, organisational and technical context in which the road user´s behaviour take place. They hence may be

[1] International Transport Forum.

reduced by understanding these interactions and designing the road transport system from these conditions in order to guide the road user to an as safe as possible behaviour. However, since human errors and mistakes cannot fully be eradicated the infrastructure components and vehicles of the road transport system must be designed to mitigate the consequences of common human errors and mistakes. While this may be clear and logic, the road transport system has not been designed from ground with the aim to absorb or mitigate common human error.

B. The setting of speed limits must be in accordance to the safety standard of the infrastructure and the type of vehicle in such way that normal and common human errors and mistakes can be managed as to eliminate the risk of serious injuries

5. The preconditions for designing a safe road transport system are twofold; the biomechanical tolerance to mechanical force and the possible crash scenarios that can be foreseen. In working out possible scenarios, the human behavior is the key for understanding what might lead to a crash with energy enough to harm the human. A high risk of human error can be matched by reduced kinetic energy or less harmful contact surfaces. The balancing act is to maintain accessibility and mobility of the road transport system, but limitations in safety should be counteracted by reduced kinetic energy, which in most cases mean reduce speed. The alternative to reduce speed is an investment into the system that leads to maintained or even increased speed. This is why progressing in safety in the end is an investment in mobility.

C. New rules and regulations with the purpose to change human behavior must be developed from a Human Factors perspective taking into account the limitations and capabilities of the human being

6. There is still a fairly widespread belief that accidents are caused by human errors and that these could be significantly reduced by introducing additional regulations and procedures to ensure a "correct" behaviour and punish an "improper" behaviour of those who "violate" the rules. This approach presupposes that human errors are intentional violations, i.e. that the road user in all situations can make a deliberate or conscious decision to act right or wrong. Running a red light or trying to cross an intersection despite there is conflicting traffic are typical examples of serious traffic offences that might have no intention behind. Forgetting to put on the seat belt, not turning on headlamps, losing control on a road with invisible ice are other such examples of violating the traffic rules with no real intention behind, but possibly leading to lethal consequences.

7. On a general level human error in road traffic hence can be divided into unintentional errors (mistakes, slips, lapses etc.) and intentional violations. Contemporary Human Factors research clearly shows that regulating human behaviour and making the individual accountable for accidents will only have marginal effect on unintentional errors. In depth analyses of road traffic accidents show that such errors are a common contributing factor. When it comes to intentional violations research shows that such regulating activities will have an effect but it varies considerably with the risk of being caught and the level of sanctions. Speeding, driving under influence of alcohol or other drugs, not using restraint systems or not using protective equipment are in many cases serious intentional violations but in some cases unintentional errors (especially when it comes to speeding, not using restraint systems and protective equipment). These violations and errors may lower the effects of the system design and must be met with special attention.

D. Design solutions of the road transport system and rules and regulations with the purpose to change human behavior must be evidence based and based on an integrated systems approach.

8. The development of road safety should and must be based on scientific evidence and best evidence from experience. This should apply to all stages of the development, from target setting and management to detailed design solutions and regulating efforts to diminish or eradicate trauma. In doing so, it is necessary to integrate safety solutions to all factors of an accident and injury prevention process. This is a general trend in the automotive sector since a few years back, but needs to be broadened to the entire road transport system. To seriously reduce e.g. pedestrian casualties, road user rules and behaviour, road and traffic environment, speed management, systems to brake a car automatically and "pedestrian friendly" front ends cars must be combined in an optimised way. In isolation, the effect of each component may have some effect, but as they give each other preconditions to maximise benefit, the whole combination might give more effect than the sum of each component.

III. The challenge for WP.1

9. In the capacity of an distinguished international road safety body with powerful legal instruments it is a challenge of utmost importance for UNECE WP.1 to adopt the SSA in its work with the purpose to make the Conventions of Road Traffic and Road Signs and Signals but also and the Consolidated Resolution on Road Traffic (R.E.1) and Road Signs and Signals (R.E.2) to a greater extent reflect the design principles of SSA.

10. A first step could be to introduce the design principles of the SSA into R.E.1.