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Road Safety Audit

Yuha Huvarinen ^{1a}, Elena Svatkova ^{2b}, Elena Oleshchenko ^{3c*}, Svetlana Pushchina ^{3c}

¹ *Traficon OY, 4 Lansiportti, 02210 Espoo, Finland*

² *"Avtodorozhny Konsalting", 23-5, Chumbarova-Luchinskogo prosp., Arkhangelsk, 163000, Russia*

³ *Saint Petersburg State University of Architecture and Civil Engineering, 4 2nd Krasnoarmeyskaya str., Saint Petersburg, 190005, Russia*

Abstract

The article shows that observance of automobile roads design and construction standards does not guarantee safety of traffic. The focus is put on the weakest component of the traffic system – “a person” in the context of growing motorization and psychological stresses and increase of accidents risks. Substantiation is provided for the conclusion about the necessity for using additional tools capable of minimizing accidents risks stipulated by the human factor. We have examined the world road industry experience 3 decades long and the results of its continuous methodical improvement. The main tool is the traffic safety audit. The article studies the experience of the leading countries in the field of the traffic safety audit integration into technological processes of roads lifecycle [Elviv et al. (2004), Wilson and Hildebrand (2001)]. The Russian practice results are shown in the course of respective research and development projects devoted to diminishing accidents risks and methods for adaptation of the audit to Russian conditions.

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1. Main text

Traffic accidents risks signalize about the problems in functioning of the traffic system. The price paid by the Russian community for accidents risks problems is about 30 thous. fatalities and hundreds of thousands injured

* Corresponding author. Tel.: +0-000-000-0000 ; fax: +0-000-000-0000 .

E-mail address: juha.hyvarinen@traficon.fi^a, svatkova@mail.ru^b, obdd2008@mail.ru^{c*}

annually, ensuing humanitarian and economic consequences undermining the well-being of the nation [Lipinski and Wilson (2004)].

In 2010 (Geneve, Switzerland) the International Road Federation announced the ambitious goal to decrease accidents risks by 50% by 2020 in EU countries, and by 2050 push it closer to zero! The future work aimed at reaching such goals, including priority ones, will be focused on safe roads design (i.e. first of all on accidents prevention), training of engineers and road builders how to implement and use new technologies.

The Russian federal special purpose program for traffic safety enhancement also has an ambitious goal — reduction of the accidents risks rate by 30% by 2020 compared to 2010. This demonstrates the necessity of introducing additional tools capable of minimizing accidents risks [Federal Highway Administration (2007), NHTSA (2005)].

The world studies show that about 27% of accidents in the system “person — vehicle — road environment” are caused by the problem of interaction between the elements “person — road environment”. This is the area of research of the tool which is a new one for Russia — traffic safety audit.

The article gives the main features of the traffic safety audit methods and the model of its application in terms of the Russia/Finland project for the development of a long-run special purpose program for enhancing traffic safety in the Leningrad Oblast by the experts from “Traficon OY” (Finland), “Avtdorozhny Konsalting” (Arkhangelsk) and Automobile Road Department (Saint Petersburg State University of Architecture and Civil Engineering) [Harkey and Zegeer (2004), Mitani (2002)].

The traffic safety audit expands the idea of the human and road factors interaction in the course of the deep study of accidents and interaction between experts in various disciplines and research fields. The ordering customers of the traffic safety audit are represented by road administrations owning roads and responsible for road networks and maintaining them useful for the community.

The analysis of fundamental distinctions between the traditional practice used for the assessment of the automobile roads maintenance level for safety provision and the traffic safety audit method are given in Table 1.

Table 1. The fundamental distinctions between the basic provisions of the methodology “Assessment of the automobile roads maintenance level” and the methodology “Traffic safety audit”.

“Assessment of the automobile roads maintenance level”	Traffic safety audit
1. During inspections, the experts focus on the automobile roads maintenance level – the index reflecting the definite state of structural elements of automobile roads in close relation to the conditions created for vehicles movement. The road perception by some categories of road users, e.g., pedestrians or bicyclists is excluded from the assessment focus.	1. In the course of the audit, the experts focus on the assessment of the road perception by all the road users including pedestrians and bicyclists considering limitation of physical and physiological capabilities (elderly people, children).
2. In the course of inspections, the experts’ task is to define the completeness and quality of contracts conditions execution, compliance with manuals requirements, codes and standards for structural road elements maintenance including those influencing the automobile traffic safety on the part of contractors.	2. The auditors’ task is to determine the dangerous and potentially dangerous road elements for the users regardless the degree of their conformity to the applicable codes and standards. The road perception by the users is assessed in different situations and conditions (night time, blinding by the sun being near to the horizon), also considering the influence of objects located close to the road, etc. If any factor creates ambiguity in the perception of road situation by road users which may lead to erroneous actions and an accident, the auditors are to propose economically grounded solutions for prevention of dangerous situations.
3. As a rule, the inspections are conducted in the daytime at satisfactory weather conditions (no rain or snow) to see the road surface in all details, perform detailed measurements, etc.	3. To more specifically determine the factors of accident risk, the traffic safety audit is to be performed in the daytime as well as at nighttime, at any weather conditions for it is in difficult conditions when the users’

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