Available online at www.sciencedirect.com

ScienceDirect

Transportation Research Procedia 20 (2017) 311 – 315

Transportation Research Procedia

www.elsevier.com/locate/procedia

12th International Conference "Organization and Traffic Safety Management in large cities", SPbOTSIC-2016, 28-30 September 2016, St. Petersburg, Russia

The Assessment Model for Economic Efficiency of Traffic Safety Improvements

Tatiana Konovalova [1a]*, Larisa Zarovnaya [2b]

[1] *Kuban State University of Technology, 2, Moskovskaya Str., 650072, Krasnodar, Russia*
[2] *Moscow State Automobile and Road Technical University, Sochi branch, 5, Chekmenev Street 354024, Sochi, Russia*

Abstract

Traffic safety improvement activities demand considerable financial resources which are not accessible in today's economic conditions; therefore, attraction of investments into projects associated with traffic safety improvements has great importance today.

Elaboration of scientific measures associated with improvement of traffic safety/road traffic organization in current conditions demands not only economic studies aiming to define their efficiency but also financial estimates allowing to determine potential investors.

This paper presents a mathematic model elaborated to determine expedient investor's shares and probable profits which may be earned from projects associated with improvements of road traffic safety.

Peer-review under responsibility of the organizing committee of the 12th International Conference "Organization and Traffic Safety Management in large cities"

Keywords: Traffic safety, improvement of road traffic organization, economic efficiency, financial resources, investors, profit.

* Corresponding author. Tel.: +0-000-000-0000 ; fax: +0-000-000-0000 .
E-mail address: tan_kon@mail.ru [a], zls66@mail.ru [b]

Peer-review under responsibility of the organizing committee of the 12th International Conference "Organization and Traffic Safety Management in large cities"
doi:10.1016/j.trpro.2017.01.029

1. Introduction

Recent years have been characterized by steady tendency for road accidents (RA) rate increase both at highways and within street and road networks of cities inflicting considerable damage to national economy. The said trend is particularly characteristic for large cities.

Currently the economic situation is characterized by limited financial resources, all traffic safety improvement measures are being planned and implemented mainly in RA concentration areas.

Traffic safety improvement activities demand considerable financial resources which are not accessible in today's economic conditions; therefore, attraction of investments into projects associated with traffic safety improvements has great importance today.

Elaboration of scientific measures associated with improvement of traffic safety/road traffic organization in current conditions demands not only economic studies aiming to define their efficiency but also financial estimates allowing to determine potential investors [State Committee for Construction RF, Ministry of Economy RF, Ministry of Finance RF, State Committee for Industry RF (1994)].

This paper presents a mathematic model elaborated to determine expedient investor’s shares and probable profits which may be earned from projects associated with improvements of road traffic safety.

2. Main Text

Steady increase of road accident rate (RA rate) may be explained by a number of factors:

- increase of road traffic intensity (caused by relative stabilization of national economy) with almost unchanged throughput of street and road networks;
- presence of non-eliminated (in due time) defects of (i) road surfaces and road shoulders, (ii) road traffic organization facilities and (iii) engineering equipment (for roads and town streets) enabling road traffic safety improvement;
- poor level of roads and town streets technical maintenance;
- absence of properly equipped crosswalks (in appropriate places) resulting in sudden appearance of pedestrians within the roadways;
- absence of (or defective) proper engineering equipment on railway-crossings;
- insufficient financing of traffic safety improvement activities;
- other unfavorable factors [Konovalova (2013)].

These factors not only aggravate RA rate but also generate RA concentration areas where influence of aforementioned factors has longtime character.

In today's economic situation characterized by limited financial resources all traffic safety improvement measures are being planned and implemented mainly in RA concentration areas. Before the year 2015 RA concentration areas in RF were detected in compliance with [Federal Road Service (1998)], while today they are assigned in compliance with [Federal Road Agency (2009)]. According to RA rate analysis performed with reference to data gathered during the years 2014 & 2015 (Krasnodar and Sochi) modification undertaken in RA analysis and record regulations resulted in actual decrease of RA concentration areas by 32–37 %. At that, quantitative RA rate indices for the same period increased by 3–5 %.

Selection of priority measures targeting (i) elimination of RA concentration areas and (ii) improvement of traffic safety is performed, as a rule, in accordance with [Federal Road Transport Agency (2009)]. Methods of assessment of traffic safety improvement measures in RA concentration areas presented in [Federal Road Transport Agency (2009)] is based on RA evaluation from costs viewpoint which accidents will probably not occur upon safety measures implementation.

Elimination of RA concentration areas is the principal part of federal, regional and local programs targeting traffic safety improvement elaborated on the basis of [State Duma (1995)] and aiming to completely resolve the problem of RA rate reduction.