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## Economic Aspects of Traffic Safety Administration

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### Abstract

This paper presents tasks solutions targeting sustainable development of transport systems in condition of structural reforms from safety viewpoint. The paper defines economic aspects of road transport traffic safety management comprising three groups: (i) economic evaluation of risk and damage factors caused in road accident (RA) - and economic mechanisms of road traffic safety management, (ii) optimization of admissible RA-occurrence risks and (iii) selection of most efficient road traffic safety improvement activities.

The paper examines economic development impact on road traffic safety and presents the process of selecting the road traffic safety effectiveness indices. Implementation of safety system efficiency indices enables transport system development, improves road conditions and social-economic development.

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*Keywords:* Transport systems, system of indices, road accident (RA), economic development, road traffic safety.

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### 1. Introduction

Road traffic safety is the main aspect of road transport planning activities. Economic aspect of road traffic safety measurement is very important because RAs constitute considerable burden for the state economy. In such conditions, it is important to economically substantiate selection of road traffic safety improvement measures. It should be marked that these activities require considerable financial constituent. Basic task here consists in determination of indices

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characterizing the road traffic safety level. That is why, it is necessary (while developing road traffic safety improvements) to reveal most crucial indices and to unite them into one general system of road traffic safety indices. Condition of indices system operation consists in definition of their ultimate values (indicators) affecting the safety with consideration of economic constituent allowing to numerically evaluate their functioning.

## 2. Interconnection between economic development and traffic safety

Reduction of accident rate is one of the priority issues regarding transport costs on the national level. This point may be confirmed via the analysis of economic indices, namely, gross domestic product (GDP) or gross national income (GNI) per capita ("per capita GNI") and number of deaths due to road accidents. Relation between economic indices and death rate was investigated in different papers [Bishai et al. (2006), Kopits and Cropper (2005), Koornstra (2007), Sakhapov et al. (2015)].

Research suggests that, firstly, there is a positive relation between the GNI per capita and the automobilization rate; due to this fact, correlation between per capita GNI and RA-caused deaths is observed. Secondly, there is a negative relation between per capita GNI and transport risk (number of deaths per vehicle) because GNI growth enables the state to invest more in road traffic safety.

Figure 1 gives records relating to the Republic of Tatarstan (RF) showing the relations between number of road accidents and average number of employees in republican economy.

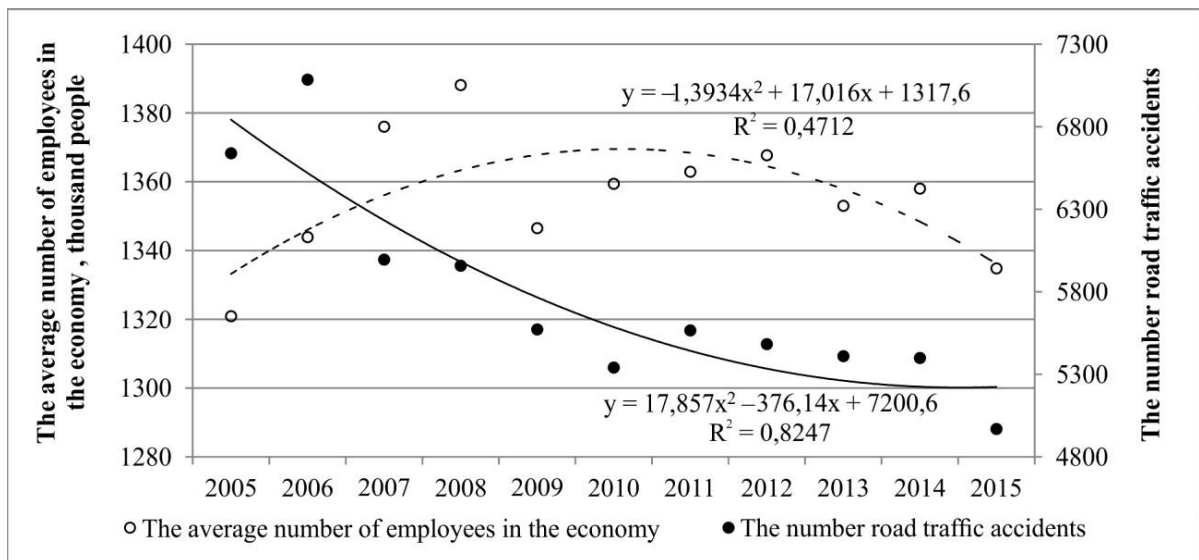


Fig. 1. Correlation between the number of road accidents and average number of employees in republican economy of Tatarstan.

We could point out three mechanisms reflecting the correlation between economic development of the country and road traffic safety which is measured by number of accidents (personal injuries and deaths) (Elvik (2014)). Firstly, economic development may influence traffic intensity and, therefore, cause risks and increase of number of road accidents. Secondly, economic development may influence traffic composition causing variation of "risky kilometers" share. Thirdly, road users may adapt their behavior within the given economic situation. We could also analyze the fourth mechanism: economic development may influence state's road traffic safety investments. For instance, during economic downfalls governments prefer to invest lesser amounts in road traffic safety while consumers and companies delay purchasing of new vehicles and prefer to buy cheaper ones.

All aforementioned four mechanisms are correlated and should not be scrutinized separately.

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