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MAIN METHODS OF LEGAL STRUCTURE EFFICIENCY INCREASE IN THE FIELD OF ROAD ACTIVITY

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Abstract.

In this paper the analytical study of normative legal act effect was performed within the field of traffic in Russian Federation. The main problem areas in this field of road safety were determined, the examples of traffic police action non-compliance to the requirements of normative and legal documents in this field. The research of these areas was performed, the positive and negative aspects of their interactions were determined, the basic ways of their performance enhancement were proposed, calculated for a long-term and for a short-term. Based on the performed analysis and the activities and recommendations proposed on its basis the training complex was developed which allows to increase the efficiency of the legal frameworks in the field of road activities. The economic efficiency is determined using the example of one of the developed actions implementation, reflected in the educational complex. The expediency of the complex use and the ways of normative and legal documents further development in this area were substantiated.

Keywords: road activity, legal structures, functioning efficiency, defined parameters, improvement methods.

Introduction

A road transport accident is one of the most pressing socio-economic problems in most countries. The problem of road traffic injuries in Russia is a significant threat to the security of citizens and a state. The compliance with traffic rules, as well as the regulatory improvement of public roads is the key to road traffic safety.

In 2014, 1,302 accidents were registered in Belgorod region in which 270 people died and 1462 were injured. In comparison with 2013 the number of road accidents increased by 0.6%, the number of deaths increased by 5.5%, the number of wounded decreased by 3.1% [1].

At the end of 2014 a major problem in the field of road safety was solved in Belgorod region - the implementation of the federal target program concerning the road safety improvement in 2013 - 2020 [2-4]. 270 dead were registered in Belgorod region, the task of the federal target program is to avoid the exceeding of 277. In 2015 the task was no more than 273 dead men (Figure 1).

The normative development and the maintenance of a road network provides safety, while administrative control measures concerning the activities of road and communal organizations and the owners of a road network is one form of legislation implementation in the field of road activities.

Practice shows that the failure to comply with the regulations and state standards in the field of road activity, results in adverse effects, which affects the growth of accidents as a subject, and the overall road accident statistics in Russian Federation.

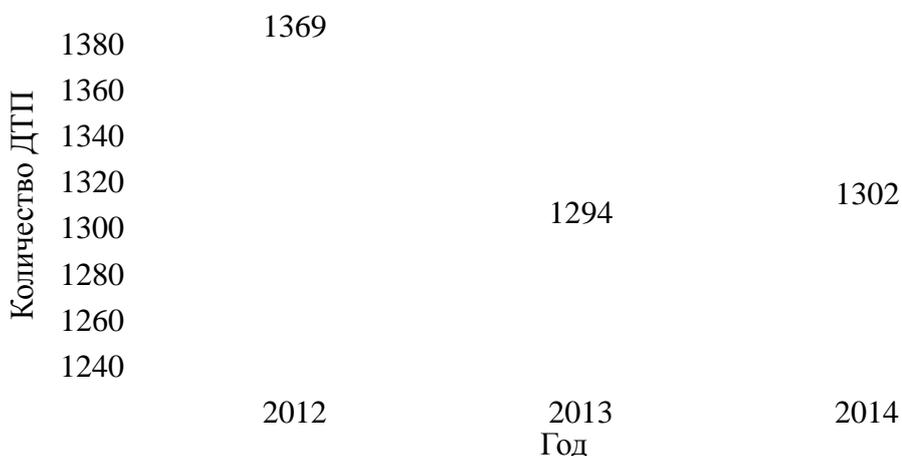


Figure 1 – Road accident statistics during 2012-2014.

Количество ДТП – The amount of road accidents

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Methods

As practice shows that failure to comply with the regulations and state standards in the field of road activity, results in adverse effects, thereby affecting the growth of road accidents as a subject, and the overall statistics of accidents in Russian Federation.

On September 1, 2013 the amendments to the Russian Federation Code on administrative offences [5] (hereinafter - AOC), provide the increase of fine for legal entities in respect of violations, the responsibility for which is provided

by the art. 12.34 of Russian Federation AOC, from 30 to 300 thousand rubles (before the change the amount of fine for legal persons under this article amounted to 20 - 30 thousand rubles). The increase of penalties reflected substantially on the number of administrative materials appealed in the courts.

In 2013 (prior to the introduction of changes) 14 administrative materials were appealed in the courts among 42 of composed materials on legal entities, 6 of administrative materials were canceled. In 2014, among 40 materials drawn up in respect of legal persons for the violations in the field of road activity, 24 administrative materials were appealed in the courts of different instances (Belgorod region, the cities of Voronezh and Moscow). 7 materials were canceled by courts.

This trend is a natural one, the increase of fine amount motivate entities to defend their interests in courts. At that the denial of the offense is reduced more not to the violation fact in the area of road activity but to procedural violations at the consideration of a case about an administrative offense. In this regard, the police officers must always act within the law, using the most effective measures for law enforcement, which, ultimately, are the most effective ones.

According to Figure 2, we can conclude that since 2012, the upward growth trend is observed concerning the number of accidents due to poor road conditions (PRC). This indicates that an unfair operation is carried out in the field of road activity.

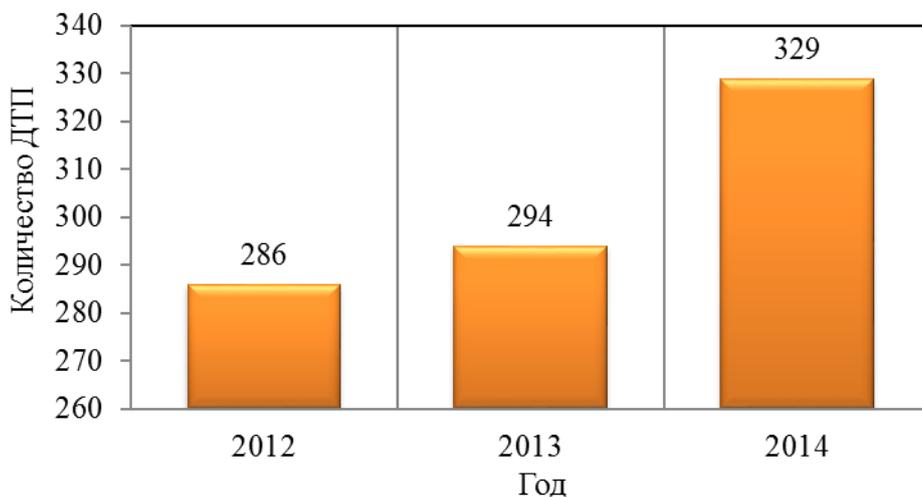


Figure 2 – Road accidents with unfavorable road conditions.

At the end of 2014 329 traffic accidents were recorded in Belgorod region, which marked poor road conditions. 89 people died and 364 were injured in these accidents. The number of such traffic accidents increased by 11.9%, the number of dead increased by 21.9% and the number of injured increased by 4.9%.

As part of the supervisory functions the employees of regional road supervision body made up 40 administrative materials concerning legal entities in 2014 under the art. 12.34 of AOC RF - 27 administrative materials under the part 1

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of the art. 19.5 of AOC RF - 11 administrative materials according to 19.7 of AOC RF - 1 administrative material,
under the part 1 of the art. 20.25 - 1 administrative material and also according to the article 12.34 of AOC RF. 6 ad-
ministrative protocols were drawn up due to the absence or poor legibility of road marking composed of 6 administra-
tive materials [5].

At the same time 10 materials were canceled among 40 ones (20% of the total amount). At that 7 materials is can-
celed by the court, 3 materials were canceled by DN state inspectors. As of 03.01.2015 five materials were appealed
in court.

Basically, the reason for the cancellation of the material by the court, was not the quality of its training, violation of
AOC RF norms [5], as well as a trivial negligence during the drawing up of procedural documents. The performed
detailed analysis for the bringing of entities to administrative liability during 2014, suggests that the practice of ad-
ministrative investigations on the facts of the identified shortcomings is not fully implemented. Mistakes as well as
the involvement of persons not responsible for road maintenance are allowed during the record and the drawing up of
procedural documents. Then it is proposed to consider the typical drawbacks which were the reason for the cancella-
tion of traffic police regulations by the courts in 2014.

Main Part

Due to the increase of accidents it is necessary to continue the activities on the maintenance of roads, as well as to
improve the monitoring concerning the normative content of a road network and to enhance the requirements for the
application of technical means concerning the organization of traffic management and a roadway state. It is worth
noting that the increase of accidents is preserved in the field of poor road conditions.

To improve the quality of job description performance and the qualification of supervision staff from the traffic po-
lice of Internal Affairs of Russia in Belgorod region the following manual was developed: "Implementation of control
and supervisory functions by the road traffic police of Internal Affairs of Russia in Belgorod region in relation to le-
gal persons engaged in road work" [6].

The tutorial describes how to monitor the work of officials and legal entities, the methods of deficiency testing and
record concerning the development of roads, the information both on legal and on the engineering component was
collected in the field of road activity, the methods of control over the normative content of the street and road net-
work were described and summarized, the necessary requirements are provided for the application of technical means

*Novikov Ivan Alexeyevich*et al. /International Journal of Pharmacy & Technology* concerning traffic management and a roadway state, as well as is the list of key terms and concepts is applied. The publication is intended for traffic police officers.

A comprehensive check of roads and streets is performed. This comprehensive check is conducted once a year during the spring and summer period from the 1-st of April till the 1-st of July.

Specific terms of the check beginning depend on the climatic conditions of a Russian Federation subject. The duration of road check (including the preparation of an inspection act) shall not exceed thirty days.

The comprehensive testing is conducted by the commission, appointed by the relevant executive authorities of Russian Federation subjects and local authorities on the initiative and on the basis of department (division) of traffic police, the Ministry of Internal Affairs, Police, MDIA, Internal Affairs Department of Russian Federation, as well as the departments (offices) of traffic police at the regions, cities, counties and districts and in the closed administrative-territorial areas and at especially important restricted access facilities in accordance with their competence (Figure 3).



Figure 3: The check of RN.

Control checks. During the performance of control checks the implementation of measures determined by complex and special audits, the implementation of previously issued instructions, the current operational state of roads and streets, road constructions and other objects and railway crossings, as well as the compliance with technical standards during their construction, reconstruction or repair are determined. According to the results of control checks the officials who violated the rules of road repair and maintenance, road structures and railway crossings, have the prescription signed by the chief state inspector of traffic safety with the deadlines of identified shortcomings removal, corresponding to GOST R 50597-93 [7]. In the case of a prescription non-performance, the protocol on administrative offense is drawn up provided by the part 1, of the Art. 19.5 of AOC.

Timely and safe execution of complex and routine works will help the traffic police to monitor qualitatively the status of technical means concerning the organization of traffic and the operational condition of roads and engineering structures.

The normative technical condition, the methods of control and inspection of technical means for the organization of traffic are regulated by Russian Federation GOSTs.

GOST R 52289-2004 - "Technical means of traffic organization. The rules of road signs, markings, traffic lights, road barriers and guiding devices use" [8].

One of the parameters concerning the normative content of road marking is its retroreflectivity.

Control performance procedure. At the moment of retroreflection ratio determination in respect of horizontal road marking it is necessary to eliminate the influence of ambient light on the instrument readings.

The measurements are not performed in the locations where the test sections of road marking have separate defects and pollutions (destructions, oil product stains) (Figure 4).



Figure 4– The appearance of retroreflectometer Zehntner ZRM 6014.

The retroreflectometer Zehntner ZRM 6014 is a portable device for precise measurements of retroreflectivity ratios for road markings at night (RL and RW) and/or during daytime (Qd), powered by a battery.

The geometric features and the rules of traffic sign (RS) installation are regulated by the GOST R 52289-2004 [8].

The geometric characteristics and a proper installation of RS make an impact on the perception of one or another symbol shown on a roadbed. The height of a RS is measured by a measuring tape and a ruler. There are instruments to measure the retroreflectivity of road signs and the method which allows you to check the brightness of RS.

The retroreflectometer ZRS 6060 is a precision instrument for the determination of the night visibility (retroreflectivity coefficients RA and R) for road signs and protective clothing with simultaneous measurement at three different viewing angles (Figure 5).



Figure 5– The appearance of retroreflector ZRS 6060.

The measured indicators are compared with the normative values given in GOST R 52289-2004. [8]

The adhesion ratio of tires with a road surface plays a considerable role in road safety. GOST 30413-96 "Highways. The method for the determination of a car wheel and road surface adhesion ratio" [9]. One should use the car device of PKRS-2 type (figure 6) as the test equipment within KP-514 MP mobile laboratory (Figure 7).



Figure 6 – The appearance of PKRS-2.



Figure 7 –mobile laboratory of KP-514 MP type.

Testing. Tests should be conducted at a test wheel movement on the rolling lane of left wheels of vehicles that use this lane for operated roads and streets, and across the entire width of the lane on the roads and streets with a newly arranged road bed.

The obtained results are provided to a mobile laboratory and are compared then with standard values.

Rut is one of durable road pavement defects as an smooth change of a cross profile, located on rolling lanes. Rut is characterized by rather significant (sometimes up to several tens of kilometers) length. The foreign experience of rut measurements showed the existence of different methods for its measurement [10-16].

Rut measurement method. The measurement of rut parameters and depth is performed on the roads with non-rigid pavements, coated with asphalt concrete or the materials treated by organic binders.

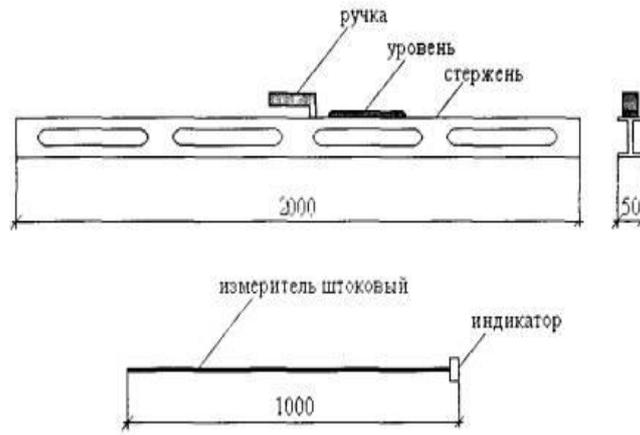


Figure 8 – Shortened rake and probe to measure the state of transverse evenness (rut).

The measured rut is recorded in the measurement record. The simplified method is recommended for use in the process of general diagnosis for road conditions to perform a preliminary assessment of rut development nature, to identify the areas which require a rut removal, the setting of a work type and the determination of their approximate volumes.

Cracks and subsidence also influence the occurrence of a road accident.

GOST R 50597-93 - "Highways and streets. The requirements for an operational state, permissible under the terms of the road safety provision" [7].

The covering of a roadway should not have subsidence, potholes and other damages, hindering the movement of vehicles with the speed permitted by traffic regulations.

The maximum sizes of individual subsidence, potholes, etc. should not exceed 15 cm by length, 60 cm by width and 5 cm by depth. The metal rulers are used as measuring devices. The measured performances are compared with the normative ones.

Summary

The effectiveness of a methodical complex development will reduce the severity and the number of road accidents by 20% approximately (Table 1) [17-21].

Table 1. The cost of damage depending on a road accident severity.

Road accident severity	Damage cost, mln. rub.
	2010
Adult death	9,952
Adult injury	0,304

The losses in current conditions are calculated according to the following formula:

$$C_{\text{ДТП}} = \sum (n * \Pi) \quad (1)$$

Where n the number of injured people affected according to the i-th type of injury (death, injury); Π - the losses per person with the i-th trauma, mln. rub.;

$$C_{\text{ДТП 2014}} = (89*9,952)+(364*0,304)= 996,384 \text{ mln. rub.}$$

CONCLUSIONS

Due to the development of the methodical system for law enforcement measures efficiency improvement in the field of road activity the losses will be reduced by 20% approximately.

$$C_{\text{ДТП прог.}} = 996,384 * 0,20 = 199,276 \text{ mln. rub.}$$

The methodical complex developed at its application in practice will reduce the losses from road accidents by about 20%, which will result in cost reduction for the restoration of road network elements. This will increase the knowledge level among traffic police inspectors in the field of road activity.

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References

1. Road safety Indicators [electronic resource]. Traffic police website. Free access mode: <http://www.gibdd.ru/stat/>.
2. Federal target program "Traffic safety increase in 2013-2020" approved by the Decree of Russian Federation government on October 3, 2013 № 864, 99 p. [Electronic resource] / Russian Government website. Free access mode: <http://government.ru/media/files/41d494b8c5e15981c833.pdf>.
3. The prediction of scientific and technological development of Russia, 2030. Transport and space systems edited by M.Ya. Blinkin, L.M. Gokhberg. Moscow. The Russian Federation Ministry of Education and Science, the National Research University "Higher School of Economics", 2014. 40 p.
4. Transport strategy of Russian Federation until 2030: Russian Government resolution № 1032-p issued on June 11, 2014, 110 p. [Electronic resource]. The site of Russian Federation Ministry of Transport. Free access mode: http://www.mintrans.ru/documents/#document_22371.
5. The Russian Federation Code on administrative offences N 195-FL issued on 30 December 2001 (CAO RF) (as amended on 10.30.2015).

6. Smolyakov N.V., 2015. The implementation of the control and supervisory functions by traffic police officers from Internal Affairs of Russia in Belgorod region concerning the legal persons engaged in road activity: Text-book. Belgorod: BGTU publishing house 139 p.
7. GOST R 50597 - 93. Highways and streets. Requirements for operational state allowed by the terms of traffic safety provision. M. Publishing house of standards, 1993. [Electronic resource] <http://www.consultant.ru/>. 11 p.
8. GOST R 52289-2004. Technical means of traffic management. Rules of road signs, markings, traffic lights, road barriers and guiding devices application. Moscow. Standartinform 2005 [electronic resource] <http://www.consultant.ru/>. 101 p.
9. GOST 30413-96 «Highways. Determination method for car wheel and road surface adhesion ratio».
10. Gide for the evaluation of humans exposure to whole body vibration ISO (TC 108) WG, 1969. 146. Gillespie J.S. Transportation Research Record: Journal of the Transportation Research Board. Transportation Research Board of the National Academies. - 180 Washington, D.C., 2007. No. 1990: 32-39.
11. International Symposium on Highway Geometric Design Practices. August 30. September 1, 1995. Boston, Massachusetts. Texas Transportation Institute, 1998: 151.
12. Leisch, J., J.P., Leisch, 1977. New Concepts in Design-Speed Application. Transportation Research Record. 631: 5-14.
13. McLean, J. 1979. An Alternative to the Design Speed Concept for Low Speed Alignment Design. Transportation Research Record. 702: 55-63.
14. Lamm, R., M. Choueiri, J. Hayward, A. Paluri, 1988. Possible Design Procedure to Promote Design Consistency in Highway Geometric Design on Two-Lane Rural Roads. Transportation Research Record. 1195: 111-121.
15. Fitzpatrick, K., L. Elefteriadou, D. Harwood, J. Collins, J. McFadden, I. Anderson, R. Krammes, N. Irizarry, K. Parma, K. Bauer and K. Passetti, 2000. Speed Prediction for Two- Lane Rural Highways. Federal Highway Administration. Report FHWARD-99. pp 171: Washington, D.C.
16. Revised from the Original Submission for Presentation at the 4 International Symposium on Highway Geometric Design, June 2010.
17. Novikov I.A., Shevtsova A.G. Transport logistics. Textbook: Belgorod publishing house of the BSTU, 2014. 116 p.

18. A.I. Shutov, Borovskoy A.E., Novikov I.A., I.A. Shchetinina, 2006. Security of vehicles: Textbook. Belgorod: BSTU publishing house named after V.G. Shukhov. 47 p.
19. Volya P.A., 2010. The organization of traffic. Textbook compilation. Belgorod. BSTU publishing house named after V.G. Shukhov. 202 p.
20. Shevtsova A.G., Kushchenko L.E., Zakharov V.M., 2015. The overview of different types of traffic organization at an intersection. Tula State University news. Engineering, 6-1: 39-44.
21. A.I. Shutov, Novikov I.A., Shchetinina I.A., I.A. Shutov, 2005. General technological progress and the development of the global automotive industry. Bulletin of BSTU named after V.G. Shukhov, 9: 429-432. Special issue. The materials of intern. scientific-practical conference "Modern technologies in PSM".