

ANALYSIS OF RISK MANAGEMENT IN CONTROL OF VEHICLE ROADWORTHINESS IN PERIOD 2015-2017 IN THE FEDERATION OF BOSNIA AND HERZEGOVINA

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ABSTRACT

The paper will present a brief analysis of the work, compare the data and schedule of technical inspection stations in the period 2015/2017 in the entity of Federation of BiH. In order to emphasize the role of technical inspection stations, an important factor in improving traffic safety is a critical overview of the different criteria for the opening of technical inspection stations that lead to unfair competition. The contribution to the overall level of traffic safety on the roads in Bosnia and Herzegovina is illustrated by risk management related to the control of vehicle safety.

Keywords: technical inspection station, professional staff, professional institutions, risk management

1. TECHNICAL INSPECTION STATIONS AND TRAFFIC SAFETY

Road motor vehicles as complex technical systems present a serious traffic problem with all their advantages and disadvantages. But due to their technical and exploitation characteristics, they have a great importance in the development of the transport of all types of cargo and passengers.

Traffic has become one of the most important factors determining the pace of progress of each state, but also the main problems of today. The consequences are observed at every step whether it's global warming, acid rain, an increase in the ozone hole, a lack of drinking water, the construction of roads where about 20 million hectares of fertile soil are lost annually.

By exploitation, vehicles lose their original characteristics, which after certain period of time do not meet the permissible limits of deviation. Vehicles, as complex technical systems, which are constantly improving and thus upgraded, become the subject of numerous analyses and research.

Professional or administrative supervision over the operation of technical inspection stations (TIS) must produce positive results in order to ensure the implementation of positive legal regulations in that field, ensuring the quality of the station's operation and its financial sustainability. Vehicle inspection stations must ensure that only technically correct vehicles are in traffic. TIS, as a form of preventive maintenance of vehicles, demonstrate the need for a higher level of education.

2. INSTITUTIONS –SUPERVISION OF TECHNICAL INSPECTION STATIONS

According to the Agreement between the Federal Ministry of Transport and Communications of Bosnia and Herzegovina and professional institutions [2] regarding transferred tasks related to work of technical inspection stations, the work of professional institutions is consisted of: professional training of controllers and head of technical inspection station, periodic check of the knowledge of the controller and the technical safety instructors, control of the performed calibration of the equipment, which controls the technical safety of the vehicle, data processing and analysis in the field of vehicle inspection, production of written instructions and information and expert publications in the field of vehicle inspection, linking stations for technical inspection of vehicles into a single information system, monitoring regulations in the area of vehicle safety of neighbouring countries, the EU and other organizations, cooperation with professional, scientific organizations, institutes, companies in the field of vehicle inspection, education and monitoring of the field of tachograph, establishing an eco-testing information system and monitoring it.

Staff at technical inspection stations is a control factor because it directly affects traffic safety. The task of checking the correctness of the vehicle is to ensure safe road traffic with as least consequence as possible.

2.1 TERRITORIAL ARRANGEMENT OF TECHNICAL INSPECTION STATIONS IN BiH

The criterion for opening new TISs is not uniformed, so TISs in the RS entity and the Brčko District of BiH are almost on the verge of existence in relation to the entity FBiH. In Table 1. there are two different systems of TIS opening, in the FBiH entity according to the criteria of every 5000 vehicles or 35 kilometres, one TIS, and in the entity RS and the Brčko District the so-called commercial mode, what causes large number of TISs, where they cannot financially survive by strict adherence to all prescribed conditions and requirements of the Law on Road Traffic Safety in BiH (Official Gazette 06/06) and the Rulebook on Technical Inspections of Vehicles.

Since 2007 in FBiH as a professional institution for monitoring the work of TIS has begun its work, since 2008 we have a unique information system, and since May 2009 video surveillance system operating in real time as well as eTP certificates on technical safety of vehicles at the state level.

Table 1. Number of performed technical inspections and TIS in BiH in 2017 [3]

BiH	Number of certified TISs	Number of technical inspections of vehicles	Number of vehicles per TIS (2./1.)	Criteria for TIS exist YES/NO
	1.	2.	3.	4.
Entity FBiH	172	694.725	4.006	DA
Entity RS	218	361.350	1.657	NE
Brčko District of BiH	18	31.730	1.762	NE

Table 2. Statistical data on technical inspections of vehicles in FBiH during the period 2015-2017 [3]

Year	2015	2016	2017
Total number of technical inspections of vehicles in FBiH	657.103	680.182	694.725
Total number of malfunctions in FBiH	25.984	17.596	22.697
Number of defective vehicles	13.346	8.300	15.241
Average age of vehicles (M1 category)	17,07	17,14	17,19

The data from Table 2. and 3. are devastating, both from a safe and economic point of view. In relation to the available data from TISs in the Republic of Croatia, other EU countries (as well as the other RS entity) very common cause of technical faults of the vehicles are a very low number of returned defective vehicles, the age of vehicles and insufficient maintenance which are also the direct impacts on safety of vehicles in traffic. According to the data from the Table 3. for the period 2015-2017, the average age of vehicles in the territory of the Federation of Bosnia and Herzegovina is alarming and amounts 17,19 years for passenger vehicles and 18,35 years for buses. Checking the correctness of the vehicle on TISs becomes more important when taking into account the age structure and maintenance of the vehicles.

Table 3. Average age of vehicles in FBiH during the period 2015-2017 according to the type of vehicles [3]

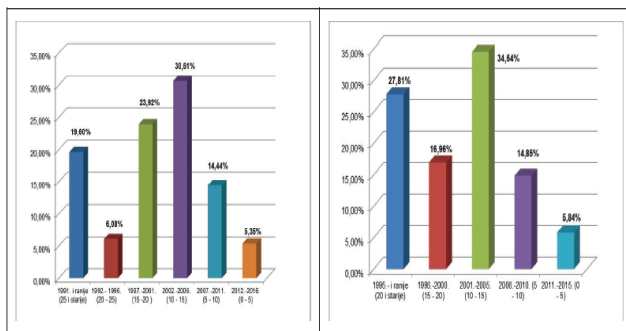
Type of vehicles	Average age			Type of vehicles	Average age		
	2015	2016	2017		2015	2016	2017
L1 - MOPED	10,09	10,78	11,2	O1 - TRAILER	12,04	12,48	12,56
L2 - MOPED	10,51	11,64	12,48	O2 - TRAILER	15,18	15,31	15,7
L3 - MOTORBIKE	13,92	14,42	14,92	O3 - TRAILER	23,42	24,32	24,81
L4 - MOTORBIKE	45,67	46,67	39,5	O4 - TRAILER	14,25	14,18	14,34
L5 - MOTOR TRICIKL	16,08	14,67	13,21	WORK MACHINE	17,37	17,98	17,01
L6 - LIGHT FOURCYCLE	9	10,33	8,09	T1 - TRACTOR	26,98	27,96	28,96
L7 - FOURCYCLE	6,66	6,29	7,02	T2 - TRACTOR	28,24	28,41	29,38
M1 - PASSENGER VEHICLE	17,07	17,14	17,19	T3 - TRACTOR	25,95	27,91	27,22
M2 - BUS	15,02	14,94	15	T4 - TRACTOR	23,28	23,36	27,06
M3 - BUS	17,71	17,34	16,83	T5 - TRACTOR	18,08	14,36	14,98
N1 - TRUCK	13,63	13,67	13,63				
N2 - TRUCK	20,34	20,29	20,42				
N3 - TRUCK	15,85	15,67	15,75				

On the initiative of the Ministry of Transport and Communications of Bosnia and Herzegovina from April 10, 2016 The decree of the Council of Ministers of Bosnia and Herzegovina [4] is in force. This decree is consisted on the need and obligation of importing vehicles that meet the EURO 4 standard, ie vehicles produced from 2006 to 2013. According to official indicators for the period from January 1st until December 31th in 2016 - 57,177 vehicles were imported into Bosnia and Herzegovina.

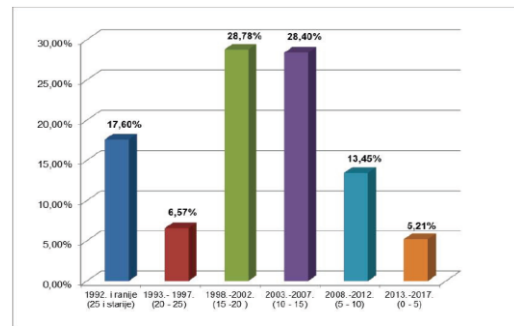
Number of new vehicles is 9.001 or 6,236 passenger vehicles and 2,765 trucks and buses.

It shows that, in this period, a total of 48,176 used vehicles were imported.

The age structure of vehicles is given in Pictures 1. and 2. Indicators of vehicles in the Federation of BiH are devastating. A large percentage of vehicles are older than 20 years (1995 and earlier)- 24.17%.



Picture 1. Age structure of the vehicle fleet in FBiH in 2015 and 2016, depending on year of vehicle production [3]



Picture 2. Age structure of the vehicle fleet in FBiH in 2017, depending on year of vehicle production [3]

Table 4. Average age structure of the vehicles in FBiH during the period 2015 - 2017, depending on year of vehicle production [3]

Year	2015		2016		2017	
	Checked vehicles		Checked vehicles		Checked vehicles	
	657.103		680.182		694.725	
	defect.	[%]	defect.	[%]	defect.	[%]
	25.984	3,95	27.847	4.09	22.697	3.27
	Number of malfunctions		Number of malfunctions		Number of malfunctions	
	number	[%]	number	[%]	number	[%]
1	715	2,75	628	2.25	439	1.93
2	15.976	61,48	16.351	58.71	13.547	59.68
3	3.009	11,58	3.331	11.96	3.006	13.24
4	928	3,57	990	3.56	757	3.33
5	218	0,84	269	0.97	303	1.33
6	3.074	11,83	3.151	11.31	2.391	10.53
7	2.064	7,94	3.123	11.21	2.693	9.93
Total	25.984	100,00	27.847	100,00	22.697	100,00

Note: 1-Control device; 2-Braking device; 3-Lighting device and light signalization; 4-Devices allowing normal visibility; 5-Self-supporting body and chassis with cab and upgrade; 6-Elements of suspension, shafts, wheels; 7-Other circuits (11 circuits).

The indicators from Table 4., for the period from 2015 to 2017 show that the number of performed inspections is increased by 5.74%. In the system were registered less than 18.5% malfunctions. In 2017 less than 5,150 defects were recorded in relation to 2016.

According to the data from Table 4., the participation of vehicles by age in the total fleet as well as the number of defective vehicles in relation to the total number of vehicles checked at all TISs in the FBiH in the period 2015-2017 which was entered by TIS certified personnel into a unified database on vehicle technical inspections through a statistical method of comparative analysis and the reduction of faults in 20 essential systems and devices, a serious suspicion of the proper operation of the personnel is confirmed. The technical inspection of the vehicles is most likely performed in a shortened procedure. The data in Table 4. showed that it is subject to the most common cancellation

on the vehicle, and was noticed by the authorized staff at TISs in FBiH. By comparing the data on the age of the vehicle, the number of registered malfunctions and the condition of the road infrastructure in Bosnia and Herzegovina, the development of the vehicle maintenance system, the service network and the existing state of the imported spare parts, it is concluded that there is a negative impact of the staff at the stations on traffic safety.

3. RISK MANAGEMENT IN CONTROL OF TECHNICAL CORRECTNESS OF VEHICLES

Statistical data are inarguable in presenting the real conditions of age of vehicles, number of car accidents, but also a major shift in the twenty-year stagnation of our country in this area, which is best seen through statistical indicators taken from the BiH environment. Professional institutions in the Federation of BiH entity in order to manage the risks in the field of control intensified cooperation with the competent state bodies and other professional organizations and individuals. It is also planned to computerize the devices at the technical inspection stations, which would enable data to be collected directly from the measuring devices, thus avoiding the bad influence of the human factor. There is an idea of informatization of TISs and performing all the work on registration of vehicles on them, as part of civil, not police affairs. Work around the recording of the tachograph and the introduction of the so-called The ECO Test in the examination of combustion products produced by the engine operation already gives the meaning of TISs which belongs to them according to the law.

In this way, the problem, which has been pointed out so far, will be solved, that is, the authorized staff at the technical inspection stations in the entity FBiH (integral information system) so as in the RS entity and in the Brčko District of BiH, occasionally, brings in inadvertent and incorrect entries, and for these reasons a series of reports are not purposeful and cannot be properly analysed. This would lead to the idea that technical inspections would not be carried out in any "shortened procedure" and that all defective vehicles would be recorded.

The same is the situation with information systems and/or traffic accidents bases i.e. they depend on the human factor, the one who serves the IS. The problem are also statistical indicators of the causes of traffic accidents in Bosnia and Herzegovina, both in developed countries, which are either not or difficult to reach.

4. CONCLUSION

Based on the data for the period 2015–2017 and years of experience certain procedures can be introduced to improve the work of TISs and to highlight the conclusions from point 3 on risk management, with executives in charge of their implementation, which are: Ministry of Transport and Communication of Bosnia and Herzegovina with competent entity ministries, Entities Inspectorates, as well as Cantonal, professional institutions for monitoring TIS's work by entities, MIAs and the Agency for Supervising the Work of Insurance Companies. Adopt the Rulebook on the norms of time spent for technical inspections (in the RS entity it exists). Eliminate the negative role of insurance companies and intermediary vehicle registration agencies. Carry out the control of vehicle safety on the road via mobile STPV integrated in the IS, introduce the mandatory application of the video surveillance system in other parts of the country.

5. REFERENCES

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