

# THE AGE STRUCTURE AND ENVIRONMENTAL ACCEPTABILITY OF ROAD FREIGHT TRANSPORT VEHICLES IN THE SLOVAK REPUBLIC

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*Summary: Technical and technological progress affect the area of road freight transport. The age of vehicles is an indicator of "modernity", acceptability to the environment and competitiveness, as well as the state of road freight transport. The article deals with the analysis of the age structure and environmental friendliness of freight vehicles registered in the Slovak Republic.*

*Key words: road freight transport, age of vehicle, emission limits*

## INTRODUCTION

A modern and "young" fleet is one of the prerequisites for the implementation of transportation services to the required quality level. What is the situation at the Slovak republic and in abroad?

In general, larger carriers have more modern and younger vehicles compared with small carriers. In the Slovak market there are dominated small companies, which increases the average age of operated vehicles. With regards to categories of the vehicles, more favorable age of trucks and semi-trailers like a solo freight vehicles is categories N2 and N3.

## 1. THE ANALYSIS OF THE AGE STRUCTURE OF VEHICLES

### 1.1 The age structure of vehicles registered in the Slovak republic

The age structure analysis was prepared on basis of the first registration date of vehicles from database of Presidium of the Police Force of the Slovak Republic (PPZ SR). In the past, the vehicle's year of manufacture was monitored but this indicator has not been necessary for vehicle registration since 1. 3. 2005. The analysis of the age of vehicles confirms that carriers are more interested of vehicle fleet renewal in international transport on the European market, where carriers are operating with more capacitive trucks. Part of vehicle categories N2 and N3 are operated in national transport, those vehicles perform significantly higher mean age compared to trucks and semi trailers operated in the articulated vehicles. Part of vehicle categories N2 and N3 are operated only for own needs as support of main business activities,

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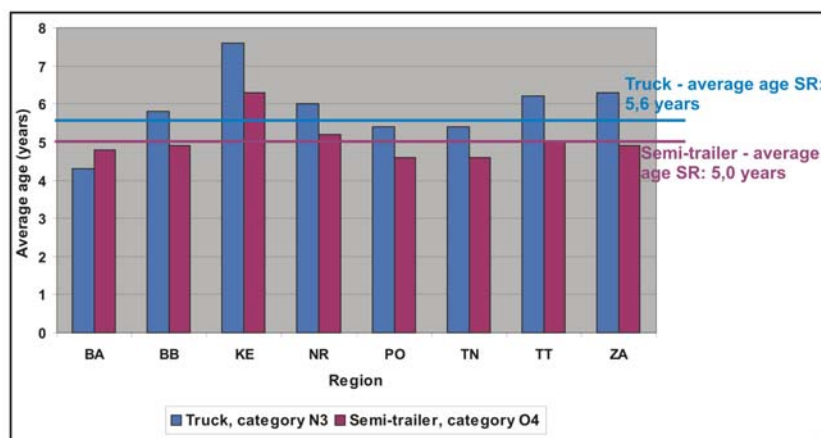
which is not transport. The average age of the vehicles of categories N2 and N3 are more than double compared to age of articulated vehicles.

These facts have also confirmed the analysis of the average age of registered vehicles in the conditions of the Slovak republic at the date of 31.12.2011. Trucks have average age 5,6 years, semi trailers have average age 5 years, vehicles of category N2 have average age 15,2 years and category N3 have average age 17,2 years in the Slovak republic. These are average values so the age of some registered vehicles are significantly higher plus values have more pronounced ecological impacts on the environment and economic impacts on cost carriers. The age of the vehicles also shows significant interregional differences. The lowest average age of the registered vehicles is in Bratislava region, the oldest vehicles are registered in Košice (trucks, semi trailers, N2, N3), Nitra region (N3) and Banská Bystrica region (N2, N3). Bratislava region achieves the greatest growth of the number of vehicles in the records PPZ SR in recent years, which is also reflected in the decreasing average age of registered vehicles.

Tab. 1 - Comparison of average age of selected registered vehicles at the date of 31.12.2011 in self- governing regions of the Slovak Republic (years)

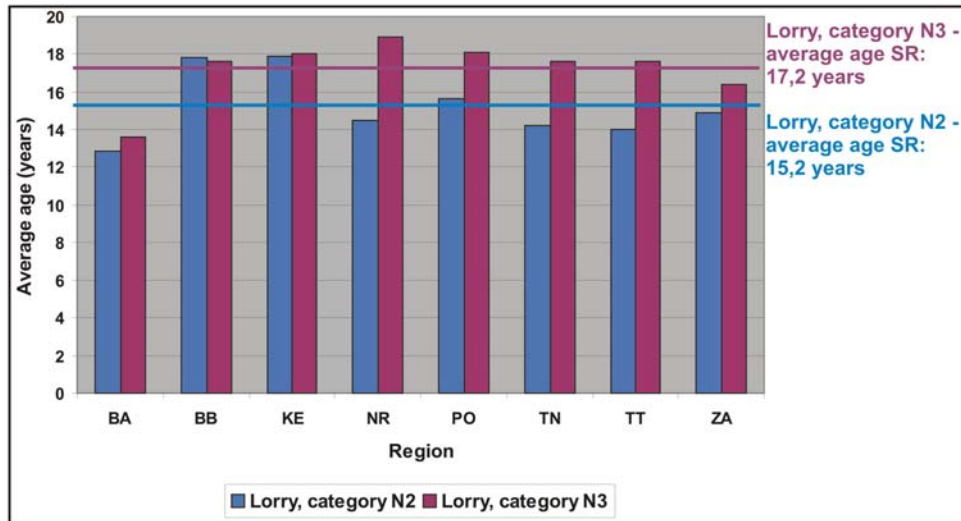
	Region								SR average
	Bratislava (BA)	Banská Bystrica (BB)	Košice (KE)	Nitra (NR)	Prešov (PO)	Trenčín (TN)	Trnava (TT)	Žilina (ZA)	
<b>Truck, category N3</b>	4,3	5,8	7,6	6,0	5,4	5,4	6,2	6,3	<b>5,6</b>
<b>Semi-trailer, category O4</b>	4,8	4,9	6,3	5,2	4,6	4,6	5,0	4,9	<b>5,0</b>
<b>Lorry, category N2</b>	12,8	17,8	17,9	14,5	15,6	14,2	14,0	14,9	<b>15,2</b>
<b>Lorry, category N3</b>	13,6	17,6	18,0	18,9	18,1	17,6	17,6	16,4	<b>17,2</b>

Source: Processing of authors based on data of Presidium of the Police Force of the Slovak Republic



Source: Processing of authors based on data of Presidium of the Police Force of the Slovak Republic, state at the date of 31.12.2011

Fig. 1 - Average age of trucks and semi- trailers in Slovak regions



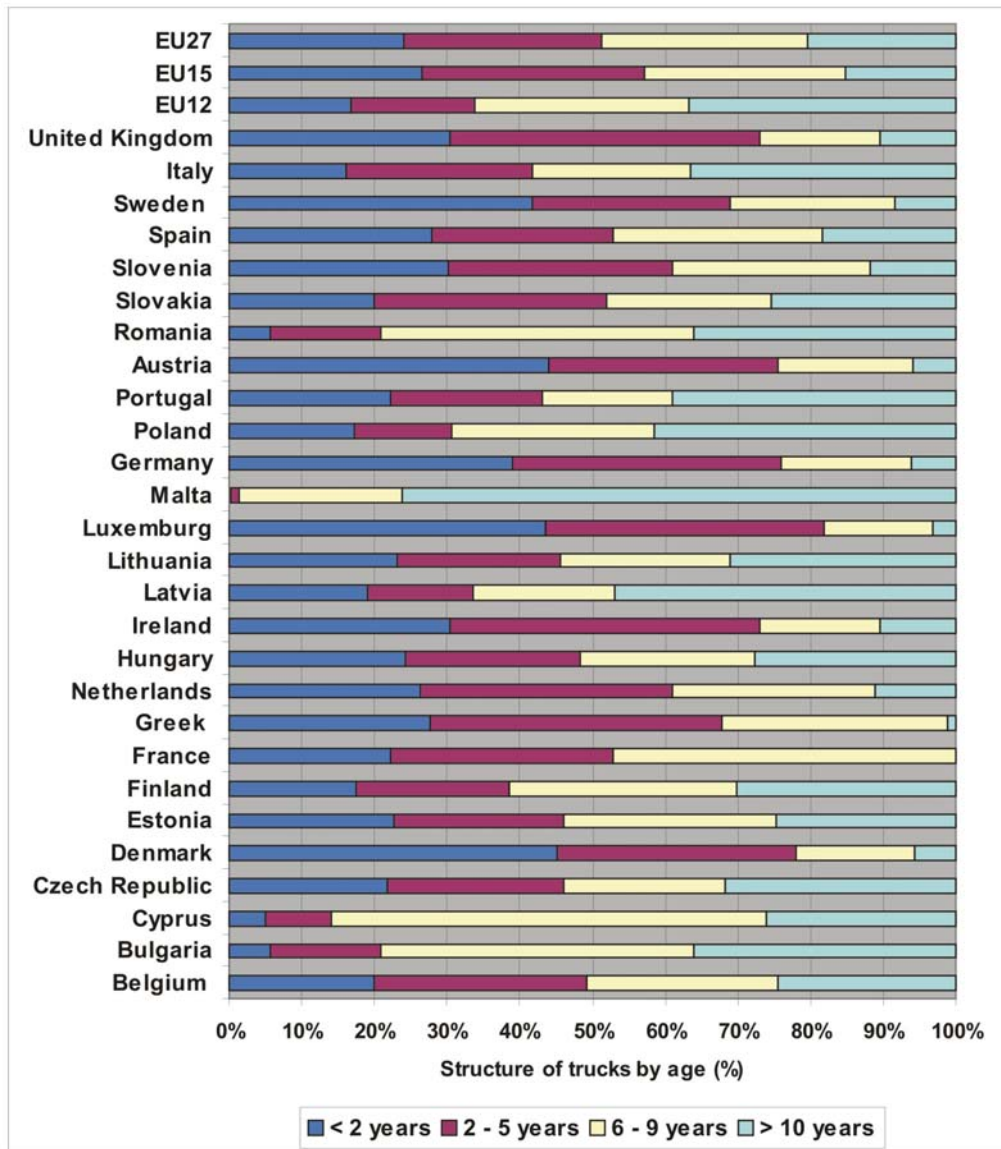
Source: Processing of authors based on data of Presidium of the Police Force of the Slovak Republic, state at the date of 31.12.2011

Fig. 2 - Average age of N2 and N3 in Slovak regions

## 1.2 Age structure of registered vehicles in countries of European Union

Differences in the economic advancement countries of European Union have manifested in the freight market. Carriers of southern and eastern Europe operate older vehicles compared to countries of western Europe, where there is higher pressure exerted on the renewal and modernization of the vehicle fleet for ecological and economic reasons, figure 3.

In terms of countries of the Visegrad group (V4) in the Central- European region the age structure of vehicles of the Slovak carriers is comparable with vehicles of Czech carriers. The age of vehicle in the Slovak Republic is more favorable than in Poland and Hungary.



Source: Processing of authors based on data of Eurostat 2010

Fig. 3 - Age structure of trucks in countries of European Union

## 2. THE ANALYSIS OF ENVIRONMENTAL ACCEPTABILITY OF ROAD TRANSPORT

The analysis of environmental acceptability of the road transport was realized based on data of registered vehicles and date of the validity of specific emission limits.

The number and structure of selected commercial vehicles by emission limits within in the whole Slovak Republic are summarized in Table 3. The most environmentally friendly vehicles are trucks of category N3, the least environmentally friendly vehicles are freight vehicles of category N3.

Tab. 2 - Emission classes and date of the validity

Emission limits	Valid prescription till the date
Euro 5	1.10.2009
Euro 4	1.10.2006
Euro 3	1.1.2000
Euro 2	1.10.1996

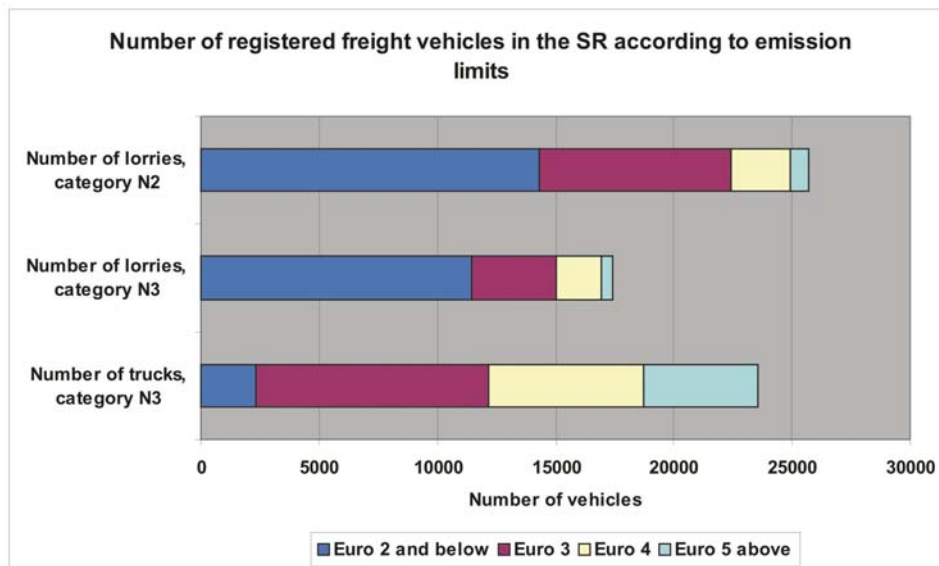
Source: Ministry of transport, construction and regional development of the Slovak Republic

Tab. 3 - The number and structure of selected commercial vehicles in the Slovak Republic by emission limits

	Euro 2 and below	Euro 3	Euro 4	Euro 5 above
<b>Number of trucks, category N3</b>	2 341	9 807	6 567	4 840
<b>% share</b>	9,9	41,6	27,9	20,5
<b>Number of lorries, category N3</b>	11 478	3 574	1 871	521
<b>% share</b>	65,8	20,5	10,7	3,0
<b>Number of lorries, category N2</b>	14 290	8 141	2 475	823
<b>% share</b>	55,5	31,6	9,6	3,2

Source: Processing of authors based on data of Presidium of the Police Force of the Slovak Republic

Emission limits of Euro 2 and below represent a significant part of categories N2 and N3. The share of category N2 is 55,5% and share of category N3 is 65,8%, Figure 4.



Source: Processing of authors based on data of Presidium of the Police Force of the Slovak Republic, state at the date of 31.12.2011

Fig. 4 - Selected registered vehicles of road freight transport in the Slovak Republic at the date of 31.12.2011 according to emission limits

The data about the number and the structure of a selected group of vehicles are analyzed by date of first registration is shown in Table 4.

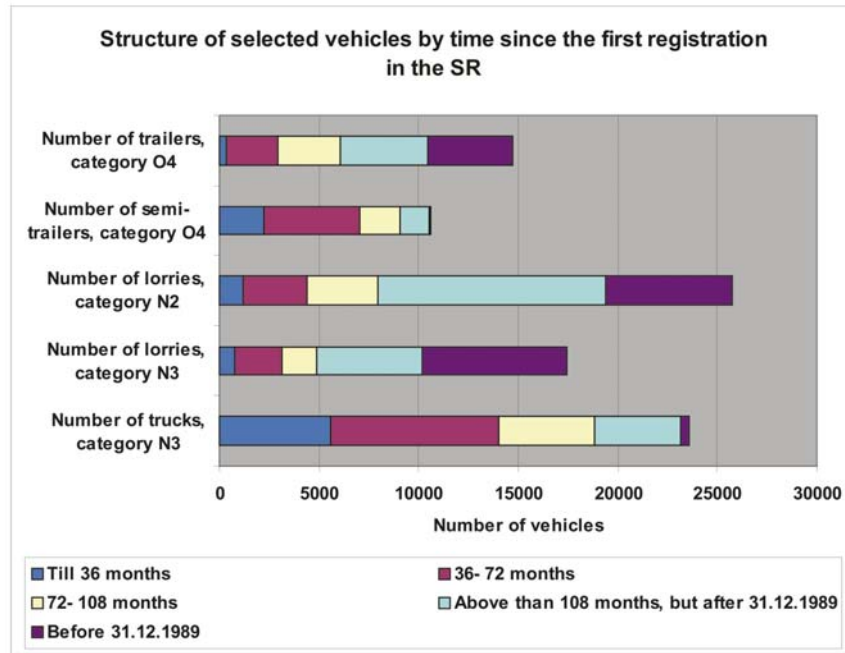
Tab. 4 - The number and the structure of selected freight vehicles registered in the Slovak Republic by an elapsed time from the first registration at the date of 31.12.2011

	Time since 1. registration of vehicle				
	Till 36 months	36- 72 months	72- 108 months	Above than 108 months, but after 31.12.1989	Before 31.12.1989
<b>Number of trucks, category N3</b>	5 568	8 437	4 850	4 324	376
<b>% share</b>	23,6	35,8	20,6	18,4	1,6
<b>Number of lorries, category N3</b>	773	2 397	1 698	5 317	7 259
<b>% share</b>	4,4	13,7	9,7	30,5	41,6
<b>Number of lorries, category N2</b>	1 187	3 213	3 568	11 394	6 367
<b>% share</b>	4,6	12,5	13,9	44,3	24,7
<b>Number of semi- trailers, category O4</b>	2 201	4 870	2 005	1 446	94
<b>% share</b>	20,7	45,9	18,9	13,6	0,9
<b>Number of trailers, category O4</b>	354	2 564	3 118	4 408	4 302
<b>% share</b>	2,4	17,4	21,1	29,9	29,2

Source: Processing of authors based on data PPZ SR

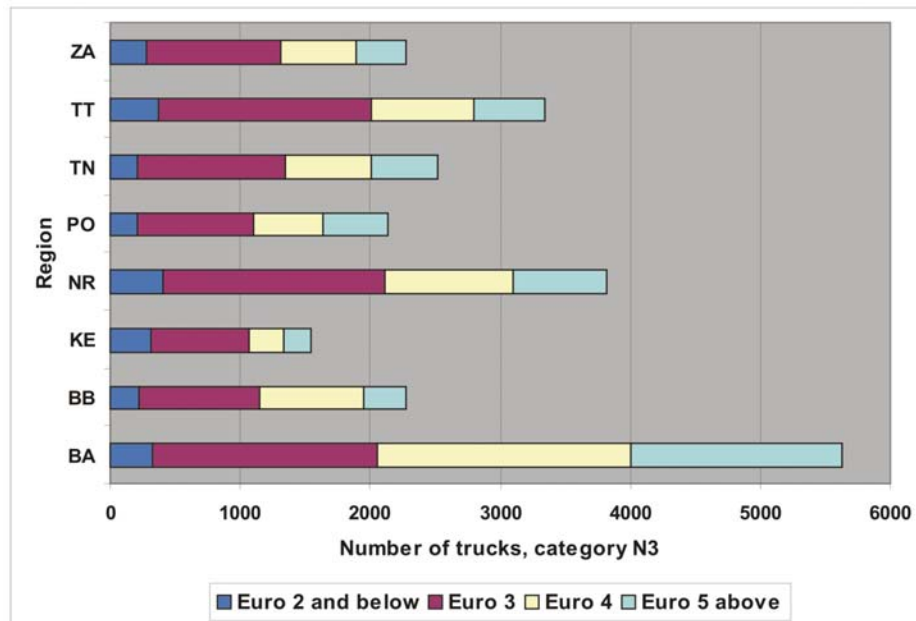
The significant part of categories N2 and N3 and also of category O4 are vehicles registered the first time before 31.12.1989. The significant part of groups of vehicles and also trucks is a group of vehicles the first time registered in 1990- 2002 years. This fact also worsens the average age of these categories of vehicles, Figure 5.

Trucks represent the significant group of vehicles in terms of international transport. The environmentally friendliness of vehicles is an important criterion of quality and competitiveness. Also some cost items are affected such as an electronic toll rates in selected countries (for example in the Slovak Republic and Czech Republic, fees for access to the low-emission zones, motor vehicle tax etc.). In figure 6 is the structure of registered trucks in the Slovak Republic by adherence to emission limits.



Source: Processing of authors based on data of Presidium of the Police Force of the Slovak Republic, state at the date of 31.12.2011

Fig. 5 - Comparison of structure of selected freight vehicles registered in the Slovak Republic by an elapsed time from the first registration at the date of 31.12.2011



Source: Processing of authors based on data PPZ SR, state at the date of 31.12.2011

Fig. 6 - The number of registered trucks by adherence to emission limits in the Slovak Republic at the date of 31.12.2011

## CONCLUSION

### Motor vehicle tax like a motivation to renew?

The tax burden affects the competitiveness of Slovak carriers to the foreign carriers. The tax rates of motor vehicles in the Slovak Republic are two to three times higher than in most



European countries. The rate of favoritism of younger and also more environmentally friendly vehicles is a negligible compared to other countries. The average tax benefit in the Slovak Republic is -5% for Euro 3 against the base of the tax rate and -9% for vehicles of categories Euro 4 a Euro 5.

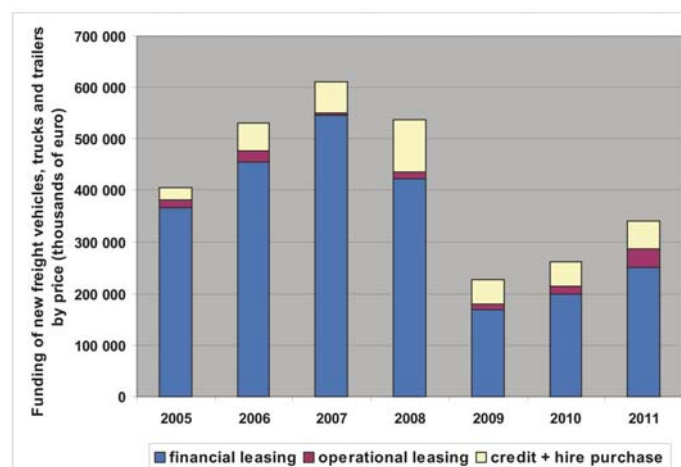
Two regions (Bratislava and Prešov) still do not give preference to more eco-friendly vehicles in form of lower tax rates of motor vehicles. The analysis has verified that in those two regions are registered the youngest and the most eco- friendly vehicles within the Slovak Republic. If those regions were to give carriers with eco-friendly vehicles some benefits, the regions would have lost money from them. Is it just intention of those regions or it is a coincidence?

Banská Bystrica region provides the highest rate of tax benefit, it is -10 % for vehicles of Euro 3 and – 20 % for vehicles of Euro 4 and Euro 5. But the region still has the oldest and the least ecological vehicles within whole Slovakia.

Apparently the tax relief is not a motivation to renewal vehicle fleet enough. The current situation creates unequal conditions of the business in terms of tax burden of carriers. For example in the Czech Republic there are tax rates set centrally, the rate of relief reaches - 48 % for younger vehicles till 36 months from the first registration against tax base, - 40 % from 36 to 72 months since the first registration and - 25 % from 72 to 108 months since the first registration of vehicle. Hungary has a similar benefit for younger and more ecological vehicles.

### Carriers put off buying new vehicles

Carriers prefer buying used vehicles to buying the brand new vehicles. The age of vehicles has an influence on the customer demand for services in freight transport, what also has impact on buying new vehicles. The demand of customers has impact on performance of the freight transport, what has dropped after 2008. In 2010 there was the drop more than 28 % compared to 2008. For transport performance (tkm) the drop is milder, in 2009 it has represented decrease of 5,5 % and in 2010 of 5,8 % against of 2008.



Source: Processing of authors based on data of Association of Leasing Companies of the Slovak Republic  
 Fig. 7 - The development of funding for new freight vehicles from foreign sources in the Slovak Republic



The selling of vehicles was decreased after 2008 because of the financial and economic crisis, what is also confirmed by the statistics of a financing of new vehicles from foreign sources. In 2011 the volume of financed vehicles reached more than half of the volume before the crisis. The benefit is gradual growth since 2009. This development is characteristic for the Slovak Republic, for countries of the European Union but also for the U.S.

Growth of carriers' cost reduces the potential accumulation of resources for fleet renewal and the development of transport companies.

The slowdown of buying new vehicles as well as buying used vehicles in recent years, and lengthening the life of new vehicles significantly affect the age structure of vehicles.

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