

# ROAD FREIGHT MARKET IN THE EUROPEAN UNION

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## **Abstract**

*Road transport has crucial role all around world whether it is about passenger or freight transport. As freight transport has higher share, in this paper it will be analysed only that segment of transport. Road transport has crucial role in market integration and it ensures that products are delivered to final destination. It is vital for economy welfare, trade and tourism. Even though it provides a lot of advantages, there are some negative characteristics such as high empty run ratio, negative impact on environment and inadequate value of average loading weight, which will be analysed in the paper. Due to all mentioned above, the aim of this paper is to analyse road freight market in the European Union to reflect its importance for development of Member economies and for effective functioning of industrial sectors.*

**Keywords:** empty runs, European Union, road freight transport, traffic

## **1. INTRODUCTION**

If it is only to observe transport by land, in most countries, the leading role occupies the road transport. Road transportation dominates freight operations all around the world (Tob-Ogu et al., 2018). In all European Union countries, not only Croatia, the transport of freight by land plays an important role in almost all economic activities, especially those crucial for infrastructural and socio-economic welfare. Usage of road freight transport ensures delivery of products to consumers (Engström, 2016). A well-established road infrastructure is one of the key prerequisites of economic growth, and road transport is seen as crucial for the development of any society (Ivanova and Masarova, 2013: 263). The importance of road transport to every economic system lies within its essential role in connecting production and final consumers. Nevertheless, it is important to note that road transport, besides common benefit to society, also implies certain costs regarding pollution.

Due to crucial role that road transport plays in the freight transport, the aim of this paper is to analyse road freight market in the European Union. The paper is divided into four chapters. After the introduction, in the second chapter the importance of road transport in the economic development is analysed. Main characteristics of road freight market in the European Union will be presented in the third chapter. As the impact of road transport on society and environment cannot be ignored, negative impact of road freight transport on environment will also be addressed within the third chapter. Conclusions are presented in the fourth chapter.

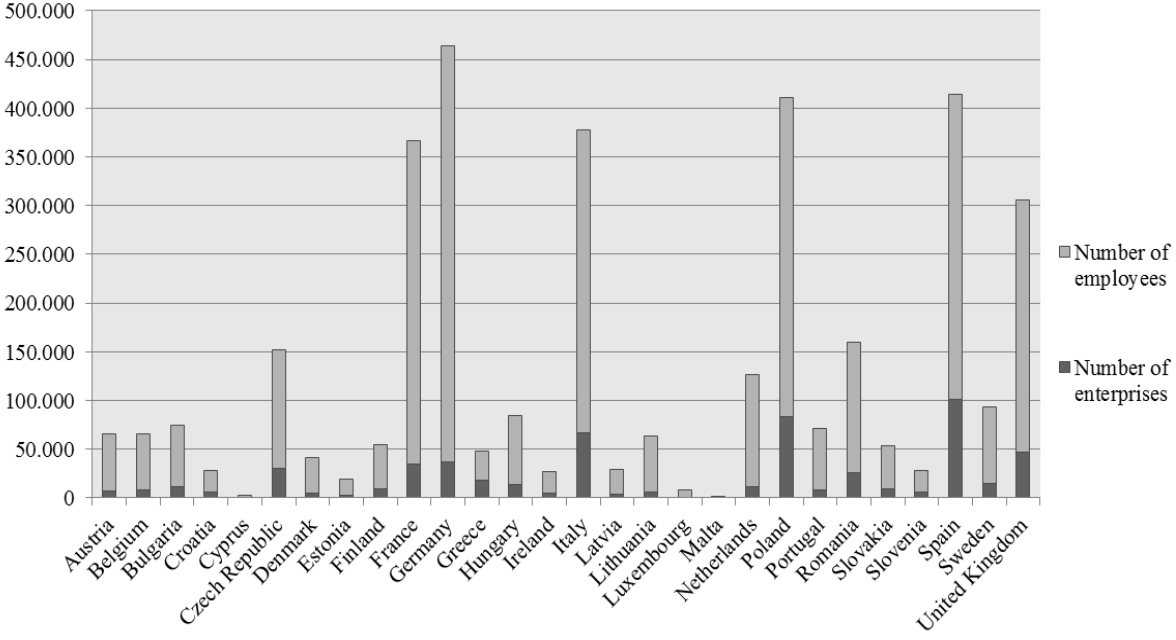
## **2. THE IMPORTANCE OF ROAD TRANSPORT IN ECONOMIC DEVELOPMENT**

The traffic system directly contributes to the activation of all economic potentials in a country, and it is becoming a prerequisite of the successful economic growth. Road

infrastructure is the key sector and an influential factor in gross domestic product and employment (European Union Road Federation, 2013). Road transport plays an important role in all economic activities, especially those crucial for the infrastructure and socio-economic welfare. It is an important economic component which influences the entire growth and benefits the population (Khan, 2013). Transport development implies the development of other industries and commerce. Transport is essential for economic life of any community, and its role has been long growing and recognized in the modern world. Entire industries rely on transport, where raw materials or finished products are easily sent from one point to another (Fenelon, 2017: 10).

Road industry represents an extremely important sector in the European Union. In road freight transport industry alone, there are 3.07 million employees, without taking into account those working in vehicle production, insurance, services, road building and maintenance and traffic control. Those employees are divided among 571.046 enterprises that are registered for road freight transport (European Commission, 2018). Most of those companies provide this service as their main business activity (European Commission DG for Mobility and Transport, 2017: 8). Chart 1 shows that Germany, with 427.100 employed, is the leading country in employing workers in the road freight transport industry. Road transport has a leading role in almost all EU members if the modal split of freight transport on land is observed. In 2016, the average share of road freight transport for EU-28 was 72.8%. On the individual level, the lowest share (21.8%) was in Latvia, while in Cyprus and Malta the share was equal to 100%. In Croatia, road transport also has crucial role in freight transport, so, in 2016, its share was 65.6%.

Chart 1. Number of employees and enterprises in the road freight transport industry in the EU members in 2015



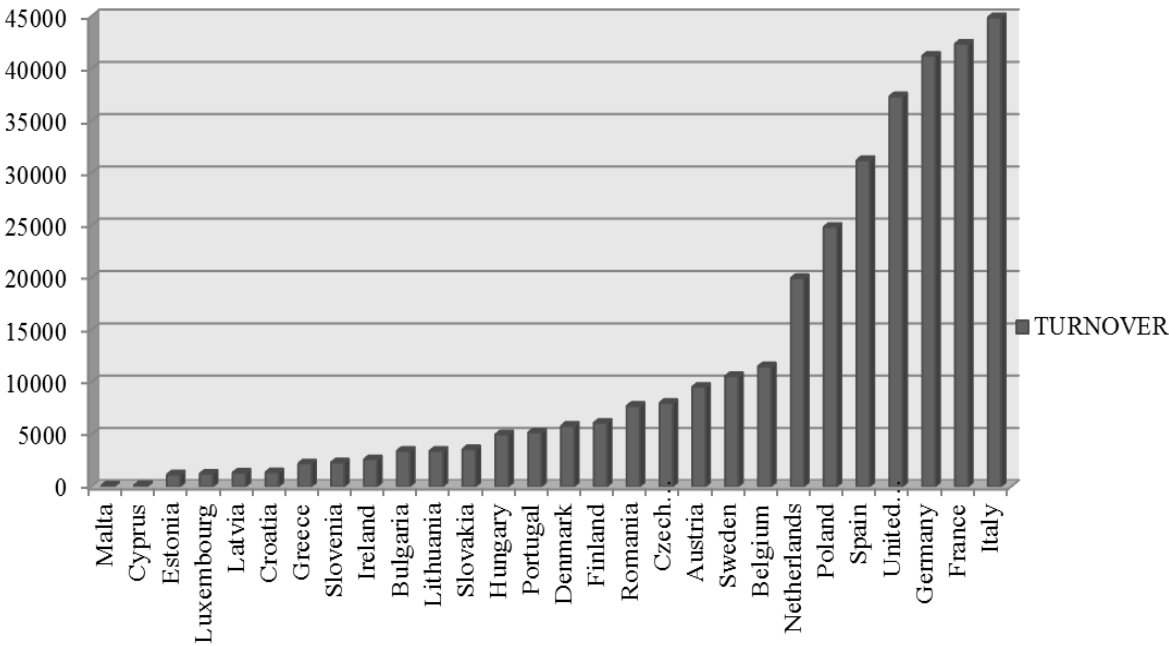
Source: compiled by the author based on the data from European Commission (2018). *EU transport figures. Statistical pocketbook 2018*, Luxembourg: Publications Office of the European Union, p. 24-25.

The main purpose of the trade development is creating wealth, reducing poverty and maintaining growth. All types of transports are crucial here, but the road transport has the

most direct influence on poverty, for it employs millions of people and generates a significant portion of the gross domestic product, especially in the underdeveloped and developing countries. In the globalized economy, road freight transport has a key role in production and distribution of goods, and in encouraging economic, social and ecological progress. In short, road freight transport is the backbone of the economy worldwide (Londoño-Kent, 2009). It enables the delivery of goods throughout Europe quickly and efficiently (European Commission, 2012).

Road transport is a vital economic sector which generates approximately 2% of the gross domestic production of the European Union (European Commission, 2015). The importance of road transport is also reflected in the value of its total turnover, which, in 2015, equalled 334 billion of Euros in the EU-28. Road freight transport had a share of 22.40% in turnover of all transport modes, while the higher share (35.70%) was only achieved by the warehousing activities. In Chart 2, it can be seen that Croatia, with the turnover of just 1,373 million of Euros is almost at the very bottom, if compared to other Members based on the total income in the road freight transport industry. The highest turnover in this industry in the last few years belongs to Italy, which had the turnover of 44.862 million of Euros in 2015.

Chart 2. Turnover in road freight transport industry in the EU members in 2015 (mil. €)



Source: author compiled according to the data from European Commission (2018). *EU*

Source: compiled by the author based on the data from European Commission (2018). *EU transport figures. Statistical pocketbook 2018*, Luxembourg: Publications Office of the European Union, p. 26.

A well-established road network is an important precondition for economic growth (Demurger, 2001). Road freight transport in urban areas is crucial for the development of society (Bouhouras and Basbas, 2012). The value of road transport is best seen in its contribution to the gross domestic product and employment (Sulaiman, 1997). The share of railway transport has been declining over the last thirty years on behalf of road transport. This

is the case in most countries in Europe and Asia – road transport is dominant in the transportation of goods (Santos, Behrendt and Teytelboym, 2010).

Most countries consider traffic as a vital activity of general social interest, for traffic, and especially its infrastructure, form a physical basis of society and it is also a prerequisite for its development. For this reason, government wants to keep as much control as possible over the development of traffic, which is evident through (Padjen, 1996):

1. Administrative regulation of certain traffic branches;
2. Government measures for encouraging growth and development of traffic branches;
3. Investments and operation monitoring;
4. Taxation of certain transport vehicles and
5. Different forms of regulations which protect public interests.

Boylaud and Nicoletti (2001: 231) have remarked that road freight transport is the key sector in almost all world economies and that it plays a crucial role in market integration. Road freight transport occupies a unique socio-economic position by connecting supply and demand and many industrial sectors. As a type of transport which delivers the most goods to their final destination, it is vital for tourism, trade and any economy's welfare (Londoño-Kent, 2009). Exactly for this reason, road infrastructure is being used more and more and there is often the case of traffic congestion. In order to prevent this, the use of intelligent transport systems, i. e. control with informational and communicational system upgrade of the classical traffic system, should be applied. The use of transport systems shortens the duration of the transporting process and thereby reduces negative environmental influence (European Commission, 2011).

The impact of road transport on society and environment cannot be discarded or ignored. We can differentiate direct and indirect influences of the road transport on economy. Direct influences relate to the availability of changes with which traffic provides a simple access to larger markets within a short period of time. Thus, seen in ways of time and money, it ensures advantage. Indirect influences can be connected with the fluctuation of prices of goods and services (Khan, 2013). Investing in road infrastructure is the key element of the economic growth in the developing countries (Santos, Behrendt and Teytelboym, 2010).

### **3. CHARACTERISTICS OF ROAD FREIGHT MARKET IN THE EUROPEAN UNION**

Road freight industry includes transportation of freight between companies and between companies and consumers (Boylaud and Nicoletti, 2001: 230). When freight transportation by the mode of transport in EU-28 is observed, it can be seen that road transport plays the leading role. Table 1 shows that in 2016, of the total 3,661 billion of tonne kilometres<sup>1</sup>, 1,804 billion of tkm have been transported by road, equalling 49.27%. Its role is even more dominant if sea transportation is excluded; then, it increases to 72.8%.

Engström (2016) implies that road transportation constitutes a fundamental part of transportation system, be it passenger or freight transport. Importance of road transportation is very high as road transportation is involved in almost all freight transportations that are a part

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<sup>1</sup> tonne-kilometre (tkm) is a unit of measure of freight transport which represents the transport of one tonne of goods by given transport mode (road, rail, air, sea, inland waterways, pipeline etc.) over a distance of one kilometre.

of door-to-door freight chains. The significance of this industry has been increasing in the last four decades. Its importance is best reflected in the fact that in 2016, in the EU-28, road freight transport had the output of 1,804 billion of tonne-kilometres (European Commission, 2018). The major part of this is transported by companies that offer road haulage services for hire and reward. In 2015, just 14% of all tonne-kilometres have been transported by companies that were carrying their own goods. Situation is different if observed on the individual level by a Member State. For example, in Luxembourg, Cyprus and Greece more than a third of all tonne-km has been transported by the own-account transporters. Just 6% of the total tonne kilometres have been transported by the own-account companies in Estonia, Latvia, Lithuania, Spain and Slovakia (European Commission DG for Mobility and Transport, 2017: 7).

Table 1. Freight transport in EU-28 by mode of transport, 2010-2016 (billion tkm)

	<b>Road</b>	<b>Railway</b>	<b>Inland waterways</b>	<b>Pipelines</b>	<b>Sea</b>	<b>Air</b>	<b>TOTAL</b>
<b>2010</b>	1710	394	156	121	1079	2	3462
<b>2011</b>	1699	422	142	118	1104	2	3488
<b>2012</b>	1645	407	150	115	1075	2	3394
<b>2013</b>	1671	407	153	112	1089	2	3434
<b>2014</b>	1677	411	151	111	1128	3	3480
<b>2015</b>	1714	415	147	114	1110	3	3504
<b>2016</b>	1804	412	147	115	1181	3	3661

Source: European Commission (2018). *EU transport figures. Statistical pocketbook 2018*, Luxembourg: Publications Office of the European Union, p. 36.

Table 2 shows the annual growth rates in EU-28 for passenger and freight transport during the period from 1995 - 2016. It can be seen that passenger and freight transport had equal annual average growth rate of 1.2% for the period. In 2016, freight transportation, compared to 2015, achieved much higher growth rate which was equal to 4.5%.

Table 2. Annual growth rates in EU-28, 1995-2016

	<b>1995 – 2016 annual percentage</b>	<b>2000 - 2016 annual percentage</b>	<b>2015 - 2016</b>
<b>GDP at year 2005 prices and exchange rates</b>	1.7%	1.3%	1.9%
<b>Passenger transport (pkm<sup>2</sup>)</b>	1.2%	0.9%	3.2%
<b>Freight transport (tkm)</b>	1.2%	0.8%	4.5%

Source: European Commission (2018). *EU transport figures. Statistical pocketbook 2018*, Luxembourg: Publications Office of the European Union, p. 21.

Road freight market in the European Union is characterized by small enterprises that have usually less than 10 employees. The average number of employees in 2016 in EU-28 was 5.36 persons. In Croatia that number is lower, 4.03 persons. The highest average number of employees had Germany, where the average number of employees in road freight enterprises in 2016 was 11.56 persons. The lowest value had Greece, with just 1.65 persons.

<sup>2</sup> **passenger-kilometre (pkm)** is the unit of measurement representing the transport of one passenger by a defined [mode of transport](#) (road, rail, air, sea, inland waterways etc.) over one kilometre.

National haulage in EU-28 in 2016 counted 1.173,6 billion of tonne-kilometres and international haulage 657.2 billion of tonne-kilometres (European Commission, 2018: 38-39). National and international haulage increased compared to 2015, but international haulage had higher growth of 6.2%. The trend of the EU road transportation market becoming more international has continued. In 2005, the share of international road haulage activities was 31% (European Commission DG for Mobility and Transport, 2017: 8), while in 2016, it was 35.9% (European Commission, 2018: 39). If it is observed the haulage performed within the territory of each Member, conducted by any vehicle, than it can be seen that Germany, with 447.7 billion of tonne-kilometres is the leader. That reflects that almost a quarter of all tonne-kilometres was realised in Germany. In the second place there is France with 258.1 billion tkm (European Commission DG for Mobility and Transport, 2017: 41).

Table 3. Average loading weight by type of operation and type of operator, 2015 (tonne)

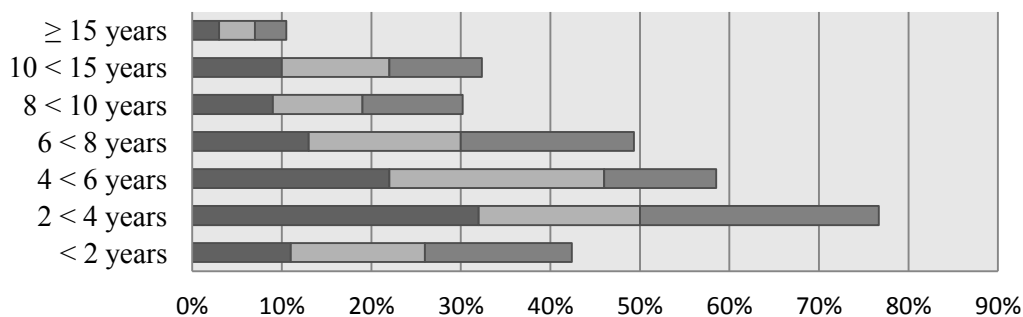
	<b>Own-account</b>	<b>For hire and reward</b>	<b>Total</b>
<b>NATIONAL</b>	8.6	14.4	12.7
<b>INTERNATIONAL</b>	13.0	16.1	15.9
<b>TOTAL</b>	8.9	15.0	13.7

Source: European Commission DG for Mobility and Transport (2017), An Overview of the Road Transport Market in 2015. Available at: <https://ec.europa.eu/transport/sites/transport/files/mobility-package-overview-of-the-eu-road-transport-market-in-2015.pdf> (accessed 22.10.2018.), p. 16.

The average loading weight in road transportation in 2015 was 13.7 tonnes (see Table 3). But if it is observed by the type of operator, then it is evident that hauliers that operate for hire and reward are trying to use their full capacity. Due to that, their average load weight in 2015 was 15.0 tonnes, while own-account operators had, on average, 8.9 tonnes of the loaded capacity (European Commission DG for Mobility and Transport, 2017: 16). In the following years, through different measures, the increase of the average load weight factor should be ensured. On the other hand, the EU has been trying to reduce the number of empty runs. Empty runs represent the waste of resources and it also has unwanted negative impact on environment. During 2005 and 2015, empty runs were reduced from 23% to 21% (European Commission DG for Mobility and Transport, 2017: 17). 21% of empty runs is still a high percentage, as it reflects that more than a fifth of all vehicle-kilometres was achieved by empty vehicles.

Chart 3 displays the structure of road freight transport by age of the vehicles in EU-28 in 2010, 2013 and 2017. It can be seen that only 13.86% of the freight vehicles is older than 10 years. If it is compared the structure in 2010 and in 2017, significant reduction in share of the vehicles between 2 and 4 and 4 and 6 years of age is evident. But, it is also evident that the share of vehicles between 6 and 8 years increased. Their share grew from 13% in 2010 to 19.33% in 2017. If we are to compare the value of a vehicle fleet which is less than 2 years old, it can be seen that in 2017, their share increased by 5.39 percentage points. That can also be the result of the age structure of vehicles of the new Member states. For instance, in Croatia, which became the Member of the Union on 1<sup>st</sup> July 2013, the average age of vehicles in 2012 was 12.9 years (Vukadinovic, Tomasovic, Kolak, 2014: 63). Positively, in 2017, compared to 2016, the number of new registered freight vehicles increased by 3.1%. On the individual level, the highest increase was in Spain, where the number of new registered freight vehicles in 2017 was higher by 17.8% than in 2016, while Ireland had the highest decrease of 13.8%. Croatia achieved a slight increase of 1.8%, as in 2017, there were 8,500 new freight vehicles registered, and in 2016, 8,316 (European Commission, 2018: 93).

Chart 3. Structure of road freight transport by age of the vehicle in EU-28



	< 2 years	2 < 4 years	4 < 6 years	6 < 8 years	8 < 10 years	10 < 15 years	≥ 15 years
■ 2010	11%	32%	22%	13%	9%	10%	3%
■ 2013	15%	18%	24%	17%	10%	12%	4%
■ 2017	16,39%	26,68%	12,53%	19,33%	11,21%	10,36%	3,50%

Source: author-compiled according to the European Commission data (2018) Road freight transport by age of vehicle, EU 28, 2013-2017. Available at: [https://ec.europa.eu/eurostat/statistics-explained/images/5/53/Road\\_freight\\_transport\\_by\\_age\\_of\\_vehicle%2C\\_EU-28%2C\\_2013-2017\\_%28million\\_tonne-kilometres%29.png](https://ec.europa.eu/eurostat/statistics-explained/images/5/53/Road_freight_transport_by_age_of_vehicle%2C_EU-28%2C_2013-2017_%28million_tonne-kilometres%29.png) (22.10.2018.); European Commission DG for Mobility and Transport (2011). Road freight transport vademecum 2010 Report, p. 18.

Road transporters within the EU use newer vehicles more in the international than domestic freight transporting. Newer vehicles pay much lower tolls for having reduced environmental impact (European Commission, 2014: 22). In order for the transporters even to consider the decisions about the fuel cost rationalization, they need to have a good method of tracking the vehicle fleet's activities, along with filing all necessary reports. Objectively, the bigger the transporting company, the bigger the possibility of inhomogeneous vehicle fleet based on several parameters (type of the vehicles, shape of the vehicles' body, set bearing capacity, age of the vehicles, the level of ecological quality), which further makes harder the decision-making regarding the fuel costs (Banelli, Kolak and Vukadinović, 2009).

Table 4. Greenhouse gas emissions<sup>3</sup> and CO<sub>2</sub> emissions from transport, by mode, in 2016 (%)

	Green house gas emissions	CO <sub>2</sub> emissions
<b>Civil aviation</b>	13.3%	13.38%
<b>Road transport</b>	72.0%	72.00%
<b>Railways</b>	0.5%	0.51%
<b>Navigation</b>	13.6%	13.63%
<b>Other transportation</b>	0.5%	0.48%

Source: author-compiled according to European Commission (2018). *EU transport figures. Statistical pocketbook 2018*, Luxembourg: Publications Office of the European Union, p. 137 & 150.

<sup>3</sup> the emission of any of various gases into the Earth's atmosphere, esp carbon dioxide, that contribute to the greenhouse effect

Besides empty runs and low value of average loaded weight, the main disadvantage of road freight transportation is its negative impact on environment, which is reflected through greenhouse gas emissions. In 2016, the transport sector had the share of 26.7% in total greenhouse gas emissions in EU-28. The major transport pollutant is the road transport, which held the share of 72% (see Table 4).

The EU plays the dominant role in reducing negative effects of the road transport through formulating policies and stimulations for research, development and implementation of the activities, especially through these four key areas (Winder and Morin, 2009):

- Competitiveness and road transport efficiency;
- Interconnection, availability and road transport quality;
- Road safety;
- Environmental influence, including greenhouse gas emissions.

The influence of road freight transport on the environment can entail costs for the society in many ways, through the noise, exhaust gases and greenhouse gas emissions (Sulaiman, 1997). The monitoring of environmental pollution caused by the road freight transport is an important element of most national and European development policies over the last years (Litschke and Knitschky, 2012). Streimikine, Baležentis and Baležentiene (2013) state several main approaches for reducing greenhouse gas emission caused by the road freight transport:

- Improving fuel consumption by the use of hybrid electric vehicles.
- The use of fuel low in carbon, like bio ethanol or biodiesel.
- Substituting one part of the oil with electrical energy used for power supplying the plug-in hybrid vehicles.
- Upgrading road infrastructure, better traffic management, smart transportation behaviour or eco-friendly driving.

The goal of the European Union is to create conditions where road transport sector will be able to be efficient, safe and have minimal impact on environment. Road transport sector in the EU faces numerous challenges. The drivers deal with more and more traffic congestion and as mentioned before, one in five road freight vehicles drives empty. The pollution does not represent an obstacle only for those involved in the traffic, but it also causes the loss of large quantities of fuel and drop of productivity. Pollution costs take 1% of the GDP in the European Union. Traffic safety, safe rest stops and good working conditions are also of great importance. Europe needs transport that is cleaner and less dependant on oil, whose prices will apparently remain high in the medium and long run (European Commission, 2012).

Governments worldwide persist in implementing policies that will establish sustainability in various areas (from energy to urban planning, transport etc.). Reduction and elimination of pollution with CO<sub>2</sub> in the transporting sector requires a broad implementation of sustainable transporting policies, including economic instruments, technological innovations, but without endangering the mobility of people and goods (Santos, Behrendt and Teytelboym, 2010).

Decision-makers have been lately more and more aware how significant it is to connect ecological and health policies with the transport (Stead, 2008). Information systems have a growing role of practical application in the road freight of goods, regarding they contribute to the optimization of the transporting process and higher levels of environment protection (Banelli, Kolak and Vukadinović, 2009). Many studies have shown that physical road maintenance has a positive (descending) influence on greenhouse gas emissions. First and



foremost, fiscal measures play an important role in securing the stability of public finances, but they can also significantly impact the emission of CO<sub>2</sub> in traffic. Likewise, they can lead to reduction of CO<sub>2</sub>, for example, through stimulation of the production and purchase of eco-friendly vehicles, and through encouraging more efficient fuel consumption (Streimikine, Baležentis and Baležentiene, 2013).

#### 4. CONCLUSION

Under the influence of globalization, the importance of road freight transport is growing, regarding the fact that it plays a crucial role in production and distribution. Road freight transport connects supply and demand and many industrial sectors and it is hard to imagine any economy functioning without it. In almost all the Member countries it plays a major role in freight transportation. Bearing in mind that road freight transport represents a more significant part of road transport, this research has focused on this segment alone.

The purpose of this paper was to, based on the analysis of the secondary data, highlight the importance of the road freight industry in the European Union, along with its most important characteristics. Road freight transport employs over 3 million people and generates around 2% of the GDP in the European Union. Road freight transport industry in the EU is highly fragmented; the market consists of a large number of small companies (the average number of employees is 5.36), where neither one influences the industry's profitability on a larger scale. Road industry brings many advantages in relation to other forms of transportation, but it is also characterized by an extremely negative influence on the environment. The paper displays the GHG emission according to types of transport, and it is evident that road freight transport, with the share of 72% is dominant. On the other hand, one limiting factor, besides inadequate height of the average load weight freight vehicles, is the empty-run criteria, which shows that almost one in every five freight vehicles drives empty. In the future, it is crucial that empty-runs are brought to minimum, and to influence the reduction of harmful gases from road freight transport with appropriate innovative measures.

The European Union has already recognized the significance of the necessary improvements of energy efficiency of road freight transport, but it is also important that those who make decisions within the Member states recognize the importance of the above-mentioned facts. Many newer Member states possess considerably older vehicle fleets in relation to older Members. Older vehicles pollute more and for this reason pay more tolls in some countries. Stimulations would definitely encourage companies to renew their vehicle fleets with more acceptable, eco-friendly vehicles.

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