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REVIEW PAPER

ANALYSIS OF THE CURRENT LOGISTICS AND TRANSPORT CHALLENGES IN THE CONTEXT OF THE CHANGING ENVIRONMENT

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Abstract. The rapidly changing world determines changes in the business processes. Logistics and transport are the areas facing constant changes. Therefore, an important point is to analyse the current problems of logistics and transport within the context of the changing environment. For many years, the experts of the Dept of Logistics and Transport Management of the Faculty of Transport Engineering from Vilnius Gediminas Technical University have been pursuing research both, in the Baltic Sea Region (BSR) in Lithuania and foreign countries. This research has been directed toward improvements to logistics and the entire supply chain in pursuit of economic, social and ecological competitiveness, an increase in the competitiveness and attractiveness of the transport system in the context of sustainable development, the impact of this system on the economic and social welfare of society, an increase in the competitiveness and attractiveness of the transport sector of improving the legal framework and the application of innovative technologies (including IT) in the transport sector aimed at implementing economic and social cohesion goals. The article deals with some of the key issues of the above introduced research.

Keywords: transport safety; Baltic Sea Region; logistics; green logistics; intelligent transport systems; railway transport; dangerous goods; transport management specialists.

Introduction

An effective and reliable national transport system plays a decisive role in sustainable economic growth (Mačiulis *et al.* 2009). This depends not only on the national policy in the area of transport infrastructure development but also on the ability of transport and logistics companies to effectively use available resources (Economic Effects of… 2002).

According to Esper *et al.* (2007), Sandberg and Abrahamsson (2011), economic growth in separate economy sectors is impossible without transport and logistics companies. Their effective operations generate not only economic but also social benefits that allow shortening travel time, increasing security and safety and reducing pollution volumes (Samimi *et al.* 2011).

The current EU transport policy is directed toward two major strategic trends: the promotion of liberalisation and the competitiveness of the transport sector. The latter is related to the assurance of quality and the safety of transport services and to a reduction in a negative environmental impact of transport. It is obvious that the implementation of this strategic trend will greatly depend on the quality of services provided by transport and logistics companies. This is also confirmed by scientific works (Brah, Lim 2006; Carmignani 2009; Hoang *et al.* 2010; Juga *et al.* 2010; Rafiq, Jaafar 2007; Wong, Karia 2010) analysing the problems of the quality of services provided by transport and logistics companies as well as by the best ways and measures for gaining competitive advantage.

According to Xie *et al.* (2011), Hays and Hill (2006), Balachandran and Radhakrishnan (2005), the quality of services is a key condition for successful competition in the market of transport and logistics services. Besides, global changes/processes raise an issue of search for competitive advantage tools by Lithuanian transport and logistics companies (Meidutė *et al.* 2012).

However, quite often the use of traditional tools for pursuing long-term competitive advantages (in case of transport and logistics companies) is not effective. The above companies are usually not aware of various innovative tools facilitating achievements in the long-lasting competitive advantage.

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The activities of the Dept of Logistics and Transport Management from Vilnius Gediminas Technical University and its research trends are directed toward investigation into the following issues: improvements on the operations of logistics and the entire supply chain aimed at enhancing economic, social and environmental competitiveness, an increase in the competitiveness and attractiveness of the transport system in the context of sustainable development and its impact on the economic and social welfare of society, an increase in the competitiveness and attractiveness of the transport sector improving the legal framework and the application of innovative technologies (including IT) in the transport sector aimed at achieving economic and social cohesion goals.

The article focuses on carrying out the analysis of the current problems of logistics and transport in the context of the changing environment.

The following tasks have been set to achieve the above purpose:

- to evaluate the problems of road transport safety in the context of the Baltic Sea Region (BSR);
- to provide an overview of peculiarities with respect to the safe transportation of dangerous goods;
- to analyse possible solutions to transport problems applying Intelligent Transport Systems (ITS);
- to evaluate the perspectives of rail freight transport in the context of the changing environment;
- to review demand for the experts of logistics and transport management in the market;
- to analyse opportunities of green *logistics* in promoting the competitiveness of companies.

1. Problems of Road Transport Safety in the BSR

More than 100 thousand carriers in the BSR transport more than 600 million tons of freight annually. Dangerous goods account for up to 10%. Their amounts have been increasing and have already exceeded the level of 2008. At the same time, the number of carriers, vehicles and drivers from the non-EU countries is rapidly increasing on the EU roads. The Project C.A.S.H. (Connecting Authorities for Safer Heavy Goods Traffic in the BSR) initiated in Finland and aimed at developing recommendations on the safety of heavy freight transport traffic for European institutions has been also implemented in Lithuania. The staff members of the Dept of Logistics and Transport Management from Vilnius Gediminas Technical University have been engaged in the implementation of the above project (Aušra 2012; Palšaitis, Bazaras 2012).

The idea of the project was born when a decision about focus on one specific indicator recurring in transport and on the analysis of relevant problems via close cooperation of all stakeholders was made. The conducted research identified key factors in the BSR and their impact on drivers, the security of vehicles carrying heavy goods and the goods in general. It should be noted that the major goal of the research was to encourage institutional and cross-sector cooperation, as well as to eliminate the emerging problems.

During C.A.S.H research in 2012, more than 200 transport police officers from eight BSR countries were interviewed. The general roadworthiness of heavy good vehicles registered in the EU received 3.5 points on a scale from 1 to 5, whereas a respective indicator of the non-EU states amounted to 2.8 points. Compared to 2007, the quality of roads improved, yet only slight improvements were expected by 2014. The research divided the states into four categories (Aušra 2012; Palšaitis, Bazaras 2012):

- Lithuania;
- Latvia, Estonia and Poland;
- other BSR countries;
- Belarus and Russia.

The performed research revealed that carriers (except Russia and Belarus) were evaluated equally in terms of competitiveness and profitability: 'neither bad nor good'. At the end of 2010, business competitiveness was related to lower transportation costs and higher quality. In this respect, the worst situation is in Western European countries and Belarus. The carriers of Belarus loose competitiveness due to bad quality while Western countries because of high prices. The problem of cabotage is also a relevant issue in the BSR. Today, no cabotage restrictions are imposed, but this might become a problem soon, since the carriers of other states have an impact on the transport market of other European countries. This topic is not yet relevant but the situation might change soon for the present as the carriers of any country might enter the market of a cheaper state (Aušra 2012).

BSR is different with respect to requirements and duties of officials. For instance, the storage of goods is officially regulated in Lithuania, but it is not clear who is responsible for preparing them. This has been one of the most important issues of the research. Theoretically, the storage of goods should be a responsibility of the State Road Transport Inspectorate (SRTI); however, these functions could also be carried out by the road police. In principle, we could see more police officers than SRTI officials on our roads. Most of transit car flows in Lithuania are under control, but local transportation still raises doubts. The above two institutions have been merged in Latvia, and during the first stage of reorganisation, the situation was rather chaotic. Thus, on-going training on this issue is instrumental. The constantly changing EU and national regulations related to vehicles carrying heavy goods, driving times/rest periods, storage rules for vehicles, documentation, permits and driver/vehicle/good licences determine the necessity to upgrade professional skills, provide training and motivate the workers of competent institutions. This is especially important in the area of transporting dangerous goods since this field requires specific skills and well-prepared specialists capable of reducing risks to people, their property and the environment. Therefore, in order to ensure compatibility, transparency and effective work of law enforcement institutions, it is necessary to establish strong or-

ganizational units in competent institutions with highly qualified and motivated staff. These principles are also applied with respect to federal states; their autonomic units have to work at the national level and complement the operations of relevant federal competent institutions (Aušra 2012; Palšaitis, Bazaras 2012).

2. Characteristics of Safe Transportation of Dangerous Goods

The transportation of dangerous goods is one of the most complicated transport technologies imposing major security requirements. In order to avoid accidents, the carriage of dangerous goods should be subject to control and regulation. The consequences of accidents related to transporting dangerous substances can cause serious damage. In view of this, it is especially important to ensure the safe process of transporting dangerous goods from the producer to the consumer, including the utilisation of unused raw materials.

Dangerous goods account for about 8% of the total amount of goods transported in the EU. The total amount of dangerous goods varied from year to year: about 58% of dangerous goods were transported by roads, 25% by railways and 17% by maritime transport. Therefore, in order to ensure the safety of population, environment and property, it is necessary to pay significant attention to transporting goods by all transport modes (Eurostat 2013).

The transportation of dangerous goods involves the risk of traffic accidents caused by other traffic participants, climate conditions and inappropriate containers/packing materials or by vehicle breakdowns. It is impossible to avoid risk in dangerous goods transportation but it is possible to control risk or maximally reduce risk factors.

Today, the focus on organizing the transportation of dangerous goods is given to the environmental aspect, traffic safety and negative consequences of accidents to people, infrastructure and nature. One of the main criteria are to minimise a negative impact of accidents caused by the transportation of dangerous goods. This topic is relevant not only to Lithuania but also to foreign countries. The National Highway Traffic Security Administration (NHTSA) and Michigan University Transport Research Institute (UMTRI) carried out research aimed at analyzing the impact of a careless attitude of Heavy Goods Vehicle (HGV) drivers.

The EU Directive 2008/68/EC is especially important for reducing the number of road accidents related to the transportation of dangerous goods. According to this Directive, the EU Member States may, on the grounds of transport safety, apply more stringent provisions concerning the transportation of dangerous goods. However, exemptions should not be applied to the requirements regulating constructions.

In their scientific articles, foreign and Lithuanian researchers highlight that particular attention should be given to the carriage of dangerous goods at all transportation stages (from loading to delivery). According to Najib *et al.* (2010), inappropriate transportation of dangerous goods such as chemical substances impose threat to the environment and human health. Dangerous substances are used in agriculture, medicine, scientific research and other areas. More than 500 thousand products imposing threat to human health could be treated as dangerous substances. Every year, more than 1000 new synthetic hazardous substances are produced in the world; they are carried by various transport modes and impose threat to the environment and human beings.

According to Chakrabarti *et al.* (2011), when carrying dangerous goods by road transport, the likelihood of road accidents depends on various risks. The authors substantiate risk estimations by the probability of traffic accidents and an in-depth analysis of implications. The present article highlights that the assessment of risk imposed by dangerous substances depends on three factors:

- the number of accidents;
- 24-hour traffic intensity and the density of residential areas;
- the length of the route.

Tomasoni *et al.* (2010) described the system of risk assessment in real-time, which was used in Italy for transporting dangerous goods. This system has a number of functions: the observation of transporting dangerous substances on the roads, data collection in real time, etc. Digital sensors 'watch' not only the state of vehicles but also the condition of transported dangerous substances as well as pressure and other physical qualities. Besides, this system can accumulate and analyse various data further transferred to the emergency response unit in case of an accident that may occur while transporting dangerous substances.

The increasing demand for dangerous substances determines an increase in dangerous goods flows. After assessing the threat imposed by these substances to the environment, individuals and the entire transport infrastructure, it is necessary to guarantee the security of the above processes. According to Diernhofer *et al.* (2010), traffic accidents related to the transportation of dangerous goods usually happen not because of the characteristics of dangerous substances, but due to human mistakes during production and transportation processes.

Bouissou *et al.* (2011) described the QRA (Quantitative Risk Assessment) model applied in France. The goal of this model is to assess risk in transporting dangerous goods by road transport. The model can simultaneously evaluate consequences and various possible probabilities for traffic accidents. In order to obtain extensive data on risk assessment, it is necessary to evaluate the factors like weather conditions, partial/full truck load with dangerous goods, the state of a possible road surface and other factors affecting traffic accidents.

In order to ensure a safe process of dangerous goods transportation, it is necessary to merge various supervising institutions responsible for possible safe transportation of dangerous goods. Tomasoni *et al.* (2010) identified the measures to be taken in order to ensure the possible safe transportation process: road

control, speed restrictions for vehicles carrying dangerous goods, mechanism for traffic control, security measures on cross-roads and upgraded infrastructure.

For transporting dangerous goods, the responsibility rests more on the ones involved in good loading, packing, labelling, documentation, reception and storage. The above logistics chain faces the risk of probable traffic accidents (Blanco 2011).

After establishing the single EU transportation market, it is necessary to continuously improve preventive measures aimed at ensuring the safe organization of dangerous goods. Before starting the dangerous goods transportation process, it is necessary to create conditions that could eliminate human failures in the processes like packing, labelling, documentation and transportation. Appropriate packing is one of the main safety measures for dangerous goods transportation. The right packing of dangerous substances can protect not only workers but also the environment.

For organizing dangerous goods transportation, the factors such as technologies for transportation process management, interface with other transport modes, routing, transportation control and the elimination of events and accidents should be taken into account.

3. Solutions to Transport Problems via ITS

The present transportation system faces major global challenges: traffic jams in urban areas, environmental pollution and noise, traffic accidents in rural and suburban areas, freight flow congestions in freight terminals, etc. The transport system has not been on a sustainable path yet; it is anticipated that comparing the situation in 2005 and the period over the next 40 years, freight transport volumes will have increased by about 40% by 2030, and by more than 80% in 2050. Passenger transportation volumes will increase even more: by 34% in 2030 and by 51% in 2050. According to estimations, compared to 1990, the emissions of CO_2 caused by the transport sector will increase by one third, the cost of traffic congestion – by about 50%, and social accident/noise costs will also increase (EC 2011). It is expected to solve the above problems via the following measures: the construction of urban and suburban by-passes aimed at reducing traffic jams and environmental pollution, infrastructure upgrade, traffic restrictions on city centres, the implementation of various technical security measures for ensuring more effective freight movement in terminals and the upgrade of access roads. However, the so-called hard measures are only a temporary solution to the above problems. The increasing number and age of vehicles are the main reasons for the existing problems. In order to reduce road traffic congestions, the European Commission decided to shift road freight to alternative transport modes: railway and waterborne transport (EU 2011).

An integrated and effective solution to the above challenges could be the implementation of ITS. It has been proven that the application of ITS in road transport and in its interface with other transport modes enhances the overall environmental performance (Grant-Muller, Usher 2014; Costabile, Allegrini 2008), including energy consumption (Kolosz *et al.* 2013), road safety/security (Kulmala 2010), public security and the movement of passengers and goods. Besides, the application of ITS contributes to improvement in the quality of public transport services (Jakubauskas 2009) and logistics services (Coronado Mondragon *et al.* 2012a, 2012b). Moreover, multiple studies demonstrated social and economic benefits of ITS and investment return (Juan *et al.* 2006).

For realising the importance and benefits of ITS, a number of countries have been implementing these technologies in the road transport sector. However, the analysis of the current situation has revealed that ITS implementation is scattered, not coordinated between separate countries and unable to ensure the geographic coverage of ITS services. In order to avoid these problems, specifications (in separate cases standards) are being developed with the aim to define the provisions and procedures for the implementation of ITS.

4. Perspectives on Railway Freight Transport in the Context of the Changing Environment

In order to develop a modern and well-balance multimodal transport system complying with the level of other EU Member States by technical parameters and service quality in Lithuania and effectively interacting with transport systems of neighbouring countries providing for successful development in the business sector, the railway sector must pursue high goals and specific modernization tasks. Despite continuous efforts, business success, to a large extent, depends on the fluctuation of foreign markets. During nine months of 2013, JSC 'Lithuanian Railways' carried 35.5 million tons of freight or 3.3% less compared to the same period of 2012. During the above period, local transportation increased by 11.7% and totalled to 11.5 tons, whereas international transportation decreased by 9% (nearly 24 million tons of goods). The main freight flows of the company were transported via international routes accounting for 68.5% of the total flows in 2013 (AB „Lietuvos geležinkeliai" 2014).

For implementing strategic goals of the railway sector, JSC 'Lithuanian Railways' has set a task to define transportation perspectives under conditions of changing economy and specified railway transport trends aimed at increasing the potential for the national railway carrier JSC 'Lithuanian Railways'. Moreover, after evaluating the impact of external factors on the development of the company, it was decided to define prospective freight transportation volumes (EC 2007; AB „Lietuvos geležinkeliai" 2010).

For evaluating the key factors and assumptions, it is appropriate to relate them to market opportunities:

- increasing demand for local and international freight transportation determined by the recovery and growth of the economy of Lithuanian and neighbouring countries;

– interest in the companies from Belarus, Kazakhstan, Caucasian countries, China, Turkey and other states to use Klaipėda Seaport;
– a rapid increase in freight flows on the North-South axis that is currently causing motor vehicle congestions on the border with Russia;
– intermodal services in the transport market;
– the development of Klaipėda Seaport and the enhancement of the capacities of port handling companies;
– the construction of a product pipeline from Mažeikiai oil refinery to Klaipėda Seaport;
– insufficient Kaliningrad Port capacities and the rapid development of other Russian ports.

The following key internal factors in forecasting the volumes of railway freight transport are recommended:

– the formation of business potential aimed at developing company's operations;
– a positive attitude to local market participants and export growth;
– increasing international freight volumes under conditions of emerging economies;
– the development of cooperation with foreign countries.

For a small country like Lithuania, it would be appropriate to evaluate the impact of economic relations with neighbouring countries. This impact highly depends on their successful developments, good neighbourhood relations and the consequences of economic processes in international trade. On the other hand, Lithuania itself is interested in participating in the development of international business and trade and joint international economic projects, and in seeking benefit and better results by joining new markets or new segments of the already existing markets (JSC 'Lithuanian Railways' 2008; VGTU TRI 2008).

The company is recommended to consider more restrained and realistic railway freight forecasts up to the year 2040 referring to the projects of other countries with respect to freight transportation via Lithuania. Because of the uneven loading of the current railway network of 1767.6 km in length, it would be appropriate to consider four prospective freight flows:

– freight (international and local) carriage in Klaipėda Seaport direction;
– freight transit toward Kaliningrad;
– freight transportation toward Poland (Rail Baltica);
– freight transportation toward the Baltic States.

Regarding freight transportation, it is necessary to evaluate local import and export, transit and total freight flows toward different directions and states (AB „Lietuvos geležinkeliai" 2010).

Three scenarios regarding the perspectives of JSC 'Lithuanian Railways' have been developed. According to the main scenario, by 2020, freight volumes transported by Trans-European Corridor I will have increased slightly (up to 5.6 million tons); by 2040, they will have amounted to 13.4 million tons. By 2020, the volumes of freight carried by Corridor IX will have increased to 42.4 million tons, and by 2040 will have totalled to 66.7 million tons (AB „Lietuvos geležinkeliai" 2010). It should be noted that both, the optimistic and pessimistic scenario will require significant investment in infrastructure and rolling-stock fleet upgraded in JSC 'Lithuanian Railways', including the modernization of stations and the establishment/development of logistics centres.

5. Insights about Demand for the Experts in Logistics/Transport Management in the Market

Contemporary society is often referred to as knowledge society. This demonstrates that the aspects of professionalism have become especially important, i.e. the ways developing the structure of knowledge and opportunities to use the acquired knowledge. The quality of contemporary trends towards public development and the realisation of social expectations highly depend on the settlement of the above issues.

Work is a factor of production in the sound competition market. However, the labour market in a perfect competition model is only a theoretical model. Bilateral monopoly prevails in the labour market, i.e. the monopolisation of both labour supply and demand. In this case, the interests of the employer and employee are coordinated (Palčiauskienė, Garšvinė 2005).

We must also not forget that the key elements of European knowledge society include well-educated people, the development of the lifelong learning system, the development and dissemination of new knowledge and technologies and international cooperation via different information networks. In view of this, it is necessary to enhance the abilities related to employment and entrepreneurship competences not only to ensure jobs for graduates, but also to retain jobs or change workplaces in response to increasing labour force mobility in the EU labour market (Janiūnienė 2005; Ledauskaitė, Bazaras 2008; Ledauskaitė 2008).

The gap between demand for experts, the level of their training, the organisation of the study process and the systematic promotion of training programmes are the major problems faced by both business companies and higher education institutions (Jaskelevičius 2005; Ledauskaitė, Bazaras 2008; Ledauskaitė 2008). Taking into account changing work nature in the transport market (e.g. carriers are more interested in logistics/operations and the establishment of logistics centres), it is necessary to analyse demand for experts in logistics and transport management in the market.

The majority of experts working in the sector of transport and logistics have higher education. They operate as managers, forwarders and logistics experts, whereas the ones with secondary and vocational education are drivers or auxiliary staff. Thus, the larger is the transport/logistics company/organisation, the lower is the number of workers having higher education. It could be assumed that small enterprises where experts having higher education are in the majority, besides vocational training, should be concerned about subject, econom-

ics, financial accounting, management and other knowledge and skills relevant to business operations. As for large enterprises and organisations, a small number of workers having higher education might mean that they performed the central role and should have to focus on professional management as well as on psychological and other staff-related knowledge.

The conducted research has revealed that theoretical knowledge is not enough for students. University teachers and the heads of transport companies realise and agree that cooperation between enterprises and universities in identifying the needs of employers, future employees and educators is very important. Employers are rather critical toward the readiness of the graduates of higher education institutions to work under conditions of contemporary market economy and highlight the lack of practical skills. Practical readiness for the labour market is quite an issue for both employers and graduates. Thus, for recruiting new workers, employers intend to give more attention to their experience rather than to the diploma of higher education.

However, the graduates of higher education institutions need time for acquiring practical skills. Contemporary business companies need managers able to cope with the professional adaptation of obstacles, analyse practical cases and make decisions.

A successful professional career highly depends on the ability of graduates to evaluate the situation of a specific enterprise or workplace and to make optimal decisions. The research carried out in Lithuania revealed that the major problem of training experts in transport management is lack of practical knowledge and individual skills. This has a direct impact on the activity of transport/logistics companies, i.e. their experts are not able to identify, analyse and solve the emerging problems.

Business requirements, with respect to preparing university graduates, are expressed via quality indicators. The managers of enterprises are mostly concerned about the following professional training criteria: professional skills, personal suitability and computer literacy. The key competences of transport managers and logistics experts in the competitive market include job skills (experience) in relevant areas, foreign languages, IT skills and personal qualities (fairness, commitment, spirit of initiative, etc.).

6. *Green Logistics*: Guarantee Promoting Business Competitiveness

The concept of *green logistics* has become one of the main issues. The implementation of the goals of *green logistics* in an enterprise is one of the ways to retain and increase business competitiveness (Vasilis Vasiliauskas *et al.* 2013).

The analysis of the current situation in the sector of transport and logistics services in Lithuania has revealed that society is not yet aware of the importance of *green logistics* and that there is lack of relevant operational models for transport and logistics companies. There are no specific measures for how to realise the concept of *green logistics*. Transport companies have no clear operational guidelines on investment in projects and measures for solving performance improvement, public welfare and environmental problems.

The analysis of works by foreign and Lithuanian authors (Rodrigue *et al.* 2001; Srivastava 2007; Cherrett *et al.* 2009; McKinnon 2010; Bagdonienė *et al.* 2009; Kutkaitis, Župerkienė 2011; Hunke, Prause 2013; Prause 2014) has indicated that the concept of implementing *green logistics* in transport companies should be based on the principles (levels) of economic, environmental and corporate responsibility. These levels are inter-related and supplement each other. The goals of each level are different and their impact on implementing the concept of *green logistics* is different. In view of this, companies should develop their own strategies on implementing *green logistics* taking account external and internal factors affecting their operations. The process of implementing *green logistics* in transport and logistics companies is complicated and multidimensional, as it requires close cooperation of national authorities, public and business entities. Specific actions to be taken by each company seeking the implementation of *green logistics* in practice include:

- the reorganisation of the elements of the logistics system taking account environmental and social factors;
- the refusal of suppliers ignoring environmental problems;
- staff training/competence upgrading;
- cooperation with authorities considering problematic issues;
- public reports declaring corporate efforts and achievements in solving environmental problems;
- environmental control;
- cooperation with foreign countries considering environmental issues;
- the promotion of worker's social responsibility (Murphy, Poist 2003).

In conclusion, it could be stated that the implementation of the concept of *green logistics* in Lithuanian transport and logistics companies is an innovative and voluntary decision. The strategy for implementing *green logistics* should be grounded on responsibility for the results obtained in the process and corporate commitments by changing behaviour toward stakeholders, as well as on activity based on the principles of economic, environmental and corporate responsibility.

Conclusions

1. The analysis of the problems of road transport safety in the BSR has revealed a similar character of the issues of road transport safety; however, due to differences in legal, political and management areas, solutions to these problems may also differ.
2. In order to safely carry dangerous goods, the following main aspects, including a technical base and the types of transport, the length of the road, shipment cost, chemical properties of the substance and

its quantity, the preparedness and knowledge base of the staff, a route, climate conditions and the level of probable damage, must be taken into account and estimated.

3. The carried out research has disclosed it is necessary to apply prevention measures and inform all traffic participants about the danger of transporting dangerous goods. The persons being aware of that would try to keep safer distance and adequately assess the risk of danger. This could reduce the number of accidents and incidents in the process of transporting dangerous goods.
4. As for changing logistics and transport environment, the application of intelligent transport tools is one of alternatives ensuring the consistent and safe organisation of operations.
5. After the accession of Lithuania to the EU, demand for the opportunities of railway business development has increased. Therefore, in order to ensure growing cargo transportation, it is important to perform timely evaluation and take the required perspective measures to increase intention in cargo transportation by rail. According to reasonable forecasts, it is possible to assume that the volumes of cargo transportation by JSC 'Lithuanian Railways' through Trans-European Corridor IX will have reached 42.4 million tons by 2020 and 66.7 million tons by 2040.
6. Demand for experts in logistics and transport management in the market will not decrease in the near future, but high qualification requirements will not change. Hence, in order to ensure competitiveness in the labour market, first of all, it is necessary to ensure close cooperation between higher education institutions and the business sector.
7. The process of implementing *green logistics* in transport and logistics companies is complicated and multidimensional; it also requires close cooperation between authorities, public and business entities. However, the application of *green logistics* in the changing business environment might be one of the successful guarantees ensuring competitive advantage.

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