Improvement of cargo transportation system

UAB "Transporto vystymo grupė"

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Description

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Abstract

Transportation is an important part of the world infrastructure ensuring the functioning of the economic and social needs in all kinds of transportation. Transport system is divided into the following main categories: rail, water, road, air, pipelines. In Europe and Lithuania road transport takes the biggest part in the common transport structure. It is widespread in all sectors of the economy. The advantages of road transport: increased speed of delivery, the possibility of "door to door" delivery without overloads, mobility.
Although, a current Lithuanian road transport sector is developed in a quantitative and technical point of view, but managerial - organisational point of view is still fairly weak and inefficiently organised, as modern logistics management techniques are not applied effectively. In order to gain an effective managerial processes control in road transport sector logistics methods, models and systems for business optimisation and consolidating elements of the overall system should be applied. It ensures not only the necessary amount of goods but in the right place, at the right time and at optimal cost.
The object of the work – road freight transportation system.
The aim of the work - to prepare a road freight transportation system improvement complex plan at UAB Transporto vystymo grupe.
Objectives of the work:
1.Analyze and reveal the theoretical aspects of transport logistics;
2.Investigate logistics systems and models applied in the freight transportation;
3.Analyze the theoretical road transport logistics system optimization techniques and opportunities;
4.Carry out a freight transportation activity survey at UAB Transporto vystymo grupe;
5.Substantiate and submit freight transportation system improvement integrated plan at UAB Transporto vystymo grupe.
Main results of the work: the theoretical part of the work consists of two sections: the transport logistics importance and role in the freight transportation, transport logistics system optimisation. Transport logistics essence and significance, freight transportation process, elements and importance, the role of transport in the national economy are analysed in the first chapter. The following aspects in the second chapter are discussed: road transport logistics system and its components, modern transport and cargo management systems and transport logistics optimisation methods and opportunities.
Theoretical analysis has shown that the transport sector is one of the largest basic industries, the most important part of production and social infrastructure in Europe and Lithuania. Lithuania has developed water, railway, road and air transport, but the transport system is not as integrated as in Europe. The most notable is road transport in Lithuania. As a result, optimisation and modernisation of this industry branch takes leading positions not only in general, but also within each transport company. A process of transportation is a very complex activity, comprising many stages and in order to effectively manage this activity is necessary to apply logistics principles and use systems, which allow optimise and integrate the entire transportation process.

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The practical part of the work consists of two chapters: a survey of freight transportation system at UAB Transporto vystymo grupe and freight transportation system improvement complex plan. The first chapter revealed company freight transportation system strengths, weaknesses, problems and suggestions on how to solve them. On the basis of the survey, freight transport systems improvement complex plan was consisted which will help to optimise the entire freight transportation process.

Keywords/tags (subjects)

Transportation industry, freight forwarding, haulage system.

Miscellaneous (Confidential information)

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1 Introduction

The transport sector is becoming increasingly important in the context of globalisation processes, which inevitably affect the internationalisation of countries. This is due to the evolving trade relations between all countries of the world. Transport plays an important role in hauling material goods and meeting the transport needs of the world's population. Shipping is an important part of the world's infrastructure, which ensures the functioning of the economy and the needs of society in all modes of carrying. The transport system is divided into the following main modes: rail, water, road, air and pipeline. Modern transport has evolved into a complex global system linking all modes of transport, the road network, the technical means of transport, the transport companies, and the economic links between these interactions. The transport system has become an important component of the productive infrastructure. The global transport architecture identifies road and maritime transport as the most efficiently integrated modes of transport.

According to European statistics, in Lithuania, as in other developed European countries, the transport sector is one of the largest basic sectors of the economy and a key part of the production and social infrastructure. Transport systems connect all regions of the country, which is a prerequisite for its territorial integrity and the unity of the economic space. Transport in Lithuania is an exceptional importance, as Lithuania is a particularly favourable country for the development of transport due to its profitable geographical location for transit (the country's territory is crossed by two recognised transport corridors of continental importance), the non-freezing Klaipėda seaport, the well-developed network of roads and their high quality maintenance, good political and economic relations with the neighbouring countries, the qualified scientific and professional potential of the transport sector, and the high degree of automobilization. The transport process usually involves several modes, and the interaction and integration of the different modes of transport is therefore crucial. Nowadays, this interaction is very weak and inefficient in Lithuania. There are different modes of transport in Lithuania, such as road, rail, air and sea transport, but in developed countries they are more closely integrated. In contrast, in Lithuania the transport system is not so strongly integrated because road transport services are provided by the private sector, while rail and sea transport remain public, with air transport being a mixed mode of transport.

According to Eurostat and European Commission statistics, road transport is the most important mode of transport in Europe. It is widely used in all sectors of the economy. The advantages of road transport are higher speed, door-to-door delivery without congestion, and mobility. Road transport is used to transport goods to railway stations, seaports and river piers.

In Lithuania, the private road transport sector plays a key role in the country's economy. According to the annual report of the Ministry of Transport and Communications of the Republic of Lithuania and the data of the Statistics Department, road transport is a significant element of Lithuania's infrastructure. Its main task is to meet the needs of society and enterprises by transporting passengers and goods. Lithuanian road transport has a direct impact on the country's economic growth through international and domestic trade, tourism and maintaining the basic principles of the single market, such as the free movement of people, goods and services. Despite the development of road transport in Lithuania from a technical and quantitative point of view, the management of this sector remains insufficiently effective from an organisational and managerial perspective. Modern methods of logistics management are not used efficiently enough. Today, effective management of human and managerial processes in the road transport sector requires the application of logistics methods, models and systems to optimise activities and integrate elements into a single system ensuring not only the delivery of goods in the right volume, but also to the right place, at the right time and at the best price.

In order to efficiently manage and execute the activities and meet the expectations of each customer, the application of modern logistics systems, methods and models is also relevant to UAB "Transporto vystymo grupė", therefore it is necessary to analyse the company's activities and to present a plan for the improvement of the whole freight transportation system

The subject of this paper is the road haulage system.

The aim of the work is to prepare a complex plan for the improvement of the road haulage system in UAB "Transporto vystymo grupė".

Objectives:

1. To analyse and highlight the theoretical aspects of transport logistics;
2. Examine the transport logistics systems and models used in freight transport in Lithuania;
3. Analyse the theoretical methods and possibilities for optimising the road transport logistics system;
4. To carry out a study of the road haulage activities of UAB "Transporto vystymo grupė";
5. Justify and present a comprehensive plan for the improvement of the road haulage system at UAB "Transporto vystymo grupė".

1.1 Research Methods

Research methods:

1. Descriptive analysis of scientific literature and articles on road freight transport system and its improvement,
2. Qualitative research on the basis of SWOT analysis,
3. Quantitative and descriptive analysis of survey results.

1.2 Research questions

Research questions:

1. How do different transport logistics systems and models affect freight transport efficiency and what are the key factors influencing their successful implementation in the industry?
2. What theoretical methods and possibilities exist for optimising road transport logistics systems and how can they be practically applied to improve efficiency and sustainability?
3. What conclusions can be drawn from a detailed study of the road transport activities of UAB "Transporto vystymo grupė" and how do these conclusions contribute to a broader understanding of road transport logistics?

4. How can a comprehensive plan for improving the road transport system of UAB "Transporto vystymo grupė" be justified and what specific recommendations can be proposed based on the analysis of current activities and best industry practices?

1.3 The importance and role of transport logistics in freight transport

Transport logistics is a type of logistics that manages a set of operations that takes care of the physical movement of material goods to the right place, along the optimal route, in the right time and at the lowest possible cost. (Еремеева, 2013, p. 30).

1.4 The nature and importance of transport logistics

Modern companies cannot function without transport logistics, as many of them are located in geographically remote locations from sources of raw materials, resources and markets. Transport logistics is responsible for planning, organising, managing, controlling and executing freight movements in the supply chain. This field includes all processes and operations related to the movement of goods by different modes of transport. (Grabara, Kolcun, Kot, 2014, p. 2).

In terms of transport logistics system, it is divided into several types: water, rail, road, air, pipeline and combined.

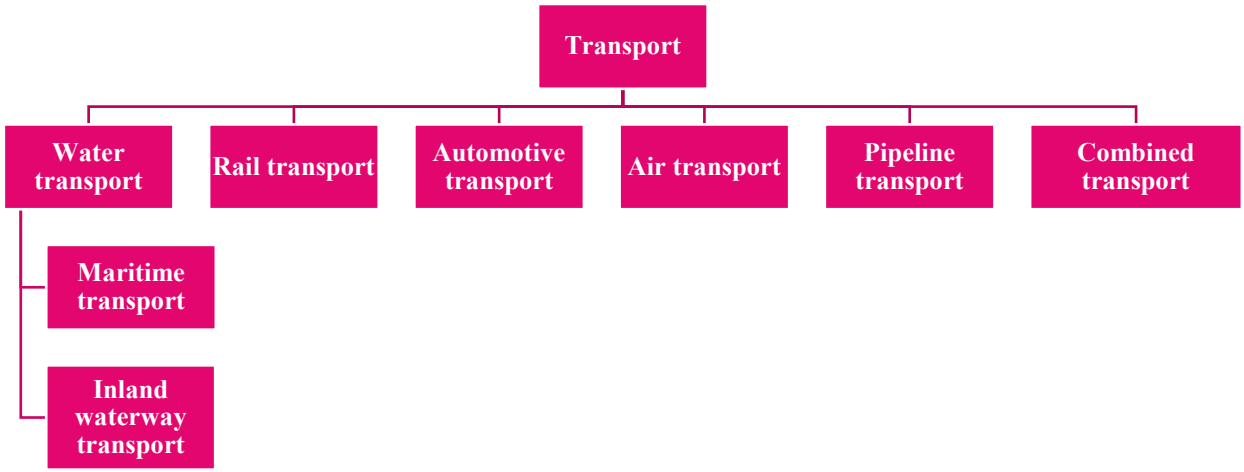

Figure 1: Main modes of transport

Maritime transport is one of the most popular and cost-effective modes of transport.

It is characterised by low freight rates due to its ability to carry large cargo volumes and has relatively low unit costs. Sea containers greatly simplify the transport of exported goods, reducing loading and unloading time and reducing the risk of cargo damage. Sea transport is also characterised by high labour productivity due to the mechanisation of loading and unloading operations. Heavy and bulky cargoes can be efficiently moved and unloaded onto a ship in a short time and this process is not affected by natural factors, except during periods of severe storms. (Lapadusi, 2007, p. 234).

Maritime transport has the advantage of mobility, as it is not constrained by the directions of the routes. A ship can take cargo to any port anywhere in the world. Ferries create a common maritime, rail and road transport system. The advantage of maritime transport over other modes of transport is particularly pronounced for long-distance transport of large volumes of goods (Rodrigue, 2010, p. 15).

Disadvantages of maritime transport:

- cargo must be securely packed, as cargo at sea is subject to intense natural forces;
- the relatively low frequency of voyages (i.e. the ship must be full);
- relatively low speed of movement;
- the cargo cannot be delivered by ship from the producer directly to the consumer (Rodrigue, 2010, p. 16).

Inland waterway transport is most efficient for transporting bulk cargo that does not need to be delivered in a short time. The large volume of goods transported also results in low transport costs, which is useful in regions where there is no rail or road network. River transport is very efficient when combined with maritime transport. Cargo from the interior of the continent brought by river barges is transhipped unloaded with the barges at sea ports and transported to foreign ports (Эглит, Галин, 2014, p. 2).

Disadvantages of inland waterway transport:

- the direction of transport is limited by the direction of the river flow;
- rivers freeze in the cold season, disrupting the delivery of goods;
- water levels in rivers vary from season to season and dams and locks have to be built, which are expensive (Milewski, 2011, p. 7).

Rail transport is a relatively economical mode of transport, especially over long distances, and has other advantages such as reduced time and delays in customs procedures. Rail transport is

little affected by natural conditions and natural disasters. It is capable of transporting a variety of goods, from small bulk materials and liquids to bulky goods. However, its main limitation is the need to combine it with road transport in cases where it is not possible to deliver goods directly to their final destination by rail.

Disadvantages of rail transport:

- Not all regions have a rail network;
- time wasted in re-arranging trainsets, increasing storage costs;
- train sets have to be reshaped at stations, which can damage the cargo;
- fragile goods require additional packaging, which increases the cost of transporting the goods (Dincer, 2015, p. 15).

According to the annual report of Lithuanian Railways for 2014, Russia has been the main destination of Lithuanian Railways so far, but for several years now the main strategic objectives of Lithuanian Railways are:

- ✓ To accelerate the integration of rail transport into a single European system with maritime transport and other modes of transport;
- ✓ To extend the integration of the whole region, covering the territories of different countries;
- ✓ Promote the economic development of the regions along the corridor;
- ✓ Strengthen the metropolitan regions (Berlin-Warsaw-Caunas/Vilnius-Riga-Tallinn).

Automobile transport evolved from the combined transport of horses and carts. Later, the internal combustion engine was developed and these articulated vehicles were displaced by cars. Road transport is the most common mode of transport and the most cost-effective for transporting small and medium loads over short and medium distances. Goods are transported by car at relatively high speeds. Road transport is particularly useful when goods need to be delivered in a rhythmic manner, i.e. when goods need to be delivered according to a schedule. The main advantage of road transport is that goods are delivered directly from the point of dispatch to the destination (Lingaitienė, 2006, p. 22).

Disadvantages of car transport:

- The relatively low carrying capacity of cars.
- Relatively high freight rates (Smyk, 2010, p. 30).

Air transport offers several advantages such as high speed, the need for minimal packaging, and reduced risk of damage or loss of goods. It does not require special man-made routes other than runways and landing strips at airports. Air transport includes various means such as aeroplanes, airships, balloons, helicopters and so on. However, the cost of air transport is higher than other modes of transport and this method is usually used to deliver perishable products, flowers, medical equipment and other valuable goods. Air transport effectively solves the problem of delivering high-value cargoes with small weight and volume in the shortest possible time. (The International Bank for Reconstruction and Development / The World Bank, 2012, p. 87).

Disadvantages of air transport:

- High transport rates due to low freight volumes and high transport costs, as well as the need for special infrastructure;
- The regularity of cargo transport depends on atmospheric conditions and there is no guarantee of punctual delivery (Ambrazevičius, 2008, p. 10).

Pipeline transport - used to transport oil and its products, gas, water and steam.

The choice of which mode of transport will be used for the transport of goods takes into account the main factors that determine the optimal mode of transport:

- The cost of the transport, payment terms;
- The transport conditions, the transport terms, the transport conditions, the transport terms and the transport costs, and the security of the cargo;
- Speed of delivery;
- Timeliness of delivery;
- Flexibility;
- Transport organisation system (Скрипников, 2015, p. 1) (see Figure 2).

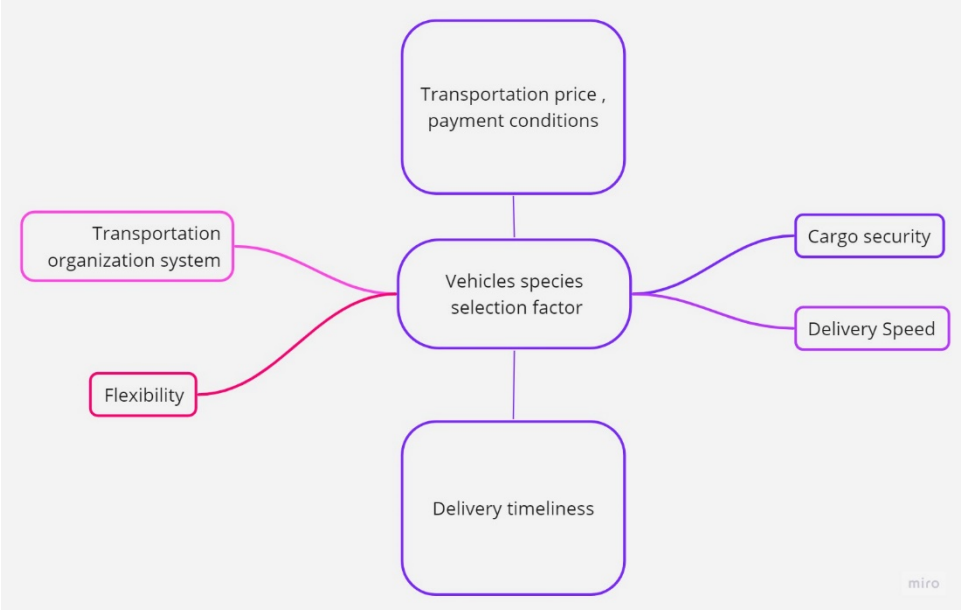

Figure 2: Factors influencing the choice of transport mode (Скрипников, 2015, p. 1)

Goods can move from one place to another using a single mode of transport (monomodal transport) or different means of transport (polymodal transport). The choice can be made from the following options: road, rail, air, sea or pipeline transport. These means of transport can be used individually or in combination with each other (e.g. road and rail, road and water, rail and sea, and so on). (see Figures 3 and 4)

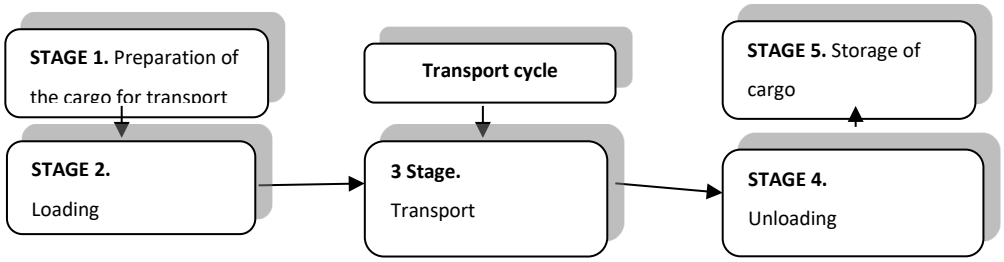

Figure 3: Transport scheme using one mode of transport (Еремеева, 2013, p. 39)

Monomodal transport, as shown in Figure 3, is a more simplified process as it involves fewer movement steps and is not accompanied by one of the key elements of multimodal transport - the transhipment of goods from one vehicle to another.

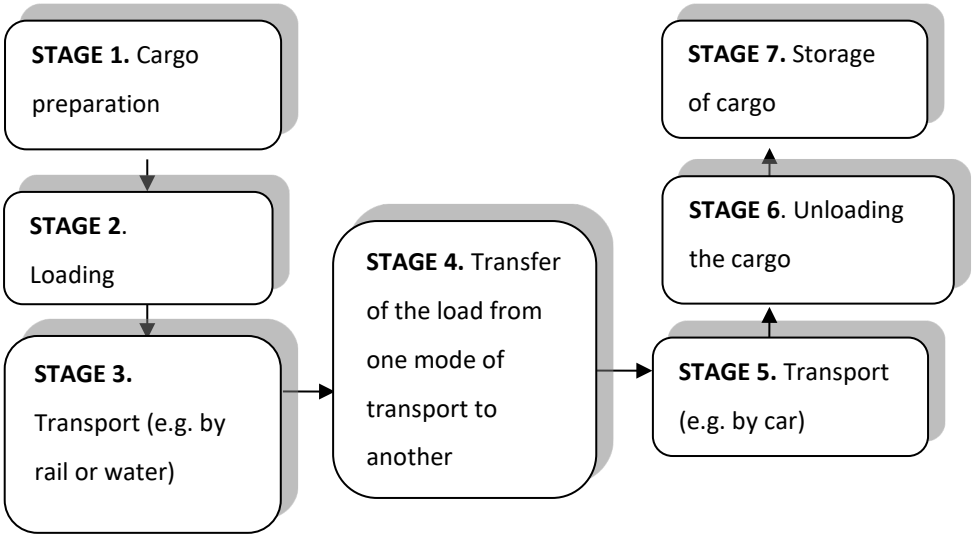

Figure 4: Transport scheme using different modes of transport (Eremeeva, 2013, p. 39)

Illustration 4 shows the scheme of polymodal transport. The process of polymodal transport includes the following stages: preparation of cargo for delivery, its bulk loading, movement of cargo by various means of transport, transfer of cargo from one transport unit to another, transport, unloading and temporary storage of cargo.

1.5 The process, elements and importance of road freight transport

The transport process is a set of operations performed at loading and unloading points, during transport, as well as in the process of delivery and transfer of goods. Each stage of the road transport process includes the following elements: the transport itself, the goods being transported and the vehicles used. The efficiency of this process depends on the level of technical equipment, technologies used, organisation and management methods. The characteristics and capabilities of the vehicles used are usually assessed in terms of their potential. However, the achievement of transport objectives requires not only an appropriate technical level, but also an appropriate level of organisation and management system of the transport process. The term "technology" refers to the processes of specific operations and includes aspects such as the sequence of activities, their continuity, the tools and equipment used, and the inputs of materials and labour. Examples of technological aspects are the processes of installing and maintaining equipment, carrying out repairs, loading and unloading operations. Transport process organisation refers to the system of rules, methods and structural arrangements aimed at coordinating the activities of the different actors in the transport chain. (Горев, 2010, p. 80).

There are three main stages in the transport of freight by road:

- Loading;
- Transportation;
- Unloading (Большедворская, 2007, p. 42).

Each step in the process is followed by a series of operations and activities in the course of preparing, organising and executing the transport of goods (see Figure 5).

Figure 5: Stages of the road transport process (based on Большедворская, 2007, p. 42)

The transport process is a set of loading operations at loading and reloading points, transport operations, unloading operations at reloading points, unloading point and vehicle delivery for loading. Each road transport process includes: transport process, transported cargo, vehicles. The quality of the process depends on the level of engineering, technology, organisation and management. The technical level and functional capabilities of transport are usually defined in terms of the potential of a particular mode of transport. However, the technical level alone does not guarantee the fulfilment of transport tasks. It requires an appropriate level of technology, organisation and management system for the transport process. Technology refers to the order in which certain operations are carried out in terms of: sequence, continuity, equipment and tools used, material and labour inputs. For example, technology of technical installations, repair, loading works, service maintenance. The organisation of the transport process is understood as a set of

provisions, methods, structural schemes aimed at coordinating the activities of individual transport links.

Without the presence of cargo, the transport operation would not be possible. Cargoes are subdivided into general and specific cargoes depending on the requirements for their transport and storage. General cargoes are those that can be transported, handled and stored without the need for special means or equipment. Specific cargoes, on the other hand, require special conditions for transport, handling and storage. Among them, the following categories can be distinguished: goods with sanitary requirements, perishable, heavy, oversized, long, oversized and dangerous goods (see fig 6).

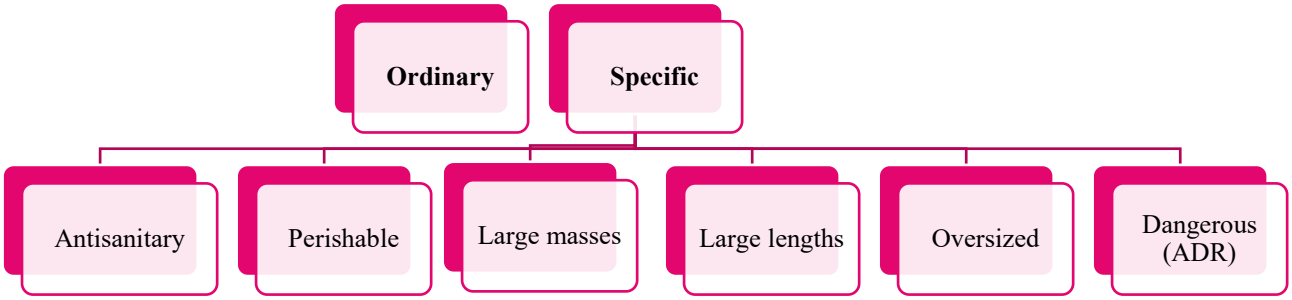

Figure 6: Types of freight according to conditions of carriage

A vehicle plays a crucial role in the transport system and it is impossible to do without it. According to the study of A.V. Vasiliausko (2013), freight vehicles include: trucks, trailers and semi-trailers. Trucks are divided into two main categories: standard (where the tractor and the cargo container are united into a single unit) and decoupled, where the tractor and the cargo container are separated from each other. Within these two main classes, there are also several sub-categories that are differentiated by their purpose (body type), such as flatbed (open-top), covered flatbed, tipper, tanker, van, multi-purpose and specialised vans such as refrigerated vans.
Freight vehicles are divided into:

- extra-low load - up to 0.5 t;
- low-loaders - 0.5 to 2 t;
- medium-duty - from 2 to 8 t;
- high load - 8 to 16 t;
- extra-high load: more than 16 t (an example of an Australian truck is a truck weighing more than 150 t).

In Lithuania, the most relevant today is road transport with a payload of more than 16 t. Any transport is based on a specific route. The main elements of the route are:

- The length of the route, i.e. the distance covered by the vehicle from the first to the last point on the route,
- The idling length, which is the distance travelled by the vehicle without load,
- Turning (complete movement cycle), which is the movement from the initial to the last point and back,
- Driving (transport process cycle), which is the movement from the initial to the final point (see Figure 7) (Большедворская, 2007, p. 42).

There are 3 transport route schemes:

- The pendulum shuttle scheme (see Figure 7);
- Circular shuttle scheme (see Figure 8);
- Zonal-circular shuttle scheme (see Figure 9) (Užkurytė, 2010, p. 16).

Figure 7: Pendulum transport scheme

In a shuttle scheme, equal flows of freight are carried between two points. In this case, large consignments are transported. The optimum use of the carrying capacity of the vehicle is a very important aspect of this route.

Figure 8: Circular transport scheme

In contrast, the circular scheme is used to dispatch several fixed points at once, where the amount of material loaded into the vehicle meets the needs of several users and can be moved

sequentially from one point to another. The journey is made in a predetermined sequential direction from one company to another until the entire load is unloaded.

Figure 9: Zonal-circular transport scheme

A cluster freight transport system is used to group customers together and supply them at the same time.

Compliance with legislation and international agreements is an integral part of any transport process. At international and national level, there are regulations to regulate international freight transport. At the national level, road transport is subject to the Road Transport Code. The Rules for Domestic Road Transport of Goods determine the conditions and procedures for the carriage of goods, as well as the interaction between consignors, carriers and consignees and their mutual responsibility. Lithuania is also a party to major international agreements, including:

- Geneva Convention concerning International Carriage by Road (CMR Convention) 1956;
- Geneva Convention concerning International Carriage of Goods by International Road (TIR Convention), 1975.

The CMR Convention, also known as the international road consignment note, sets standards for the carriage of goods by road. It applies in cases where the point of departure and the place of delivery are in different countries. The CMR also regulates liability for damage incurred during carriage. It applies only to goods carried by road. The CMR consignment note contains the following data: information on the consignor, consignee, accompanying documents, nature and volume of the goods transported, vehicle registration number and information on the carrier of the goods (according to the CMR Convention on International Carriage by Road).

The Geneva Convention concerning the International Transport of Goods under cover of TIR Carnets (TIR Convention) was signed on 14 November 1975 to simplify and harmonise the administrative formalities for the transport of goods by international road. The TIR Convention establishes an international system of customs transit and equipment requirements for the transport of goods: goods are transported only in sealed vehicles or containers, the points of departure and arrival are specifically known, the formalities at intermediate border crossing points are reduced, cost-effective prices are established, and the carriers of the goods comply with the security and guarantees required by customs. The TIR system not only covers customs transit by road, but also other modes of transport (e.g. rail, inland waterways, and even maritime transport), as long as at least one part is carried out by road (The International Road Transport Union).

In general, when goods are transported internationally, the documents accompanying them can be divided into four broad groups:

1. customs documents (e.g. customs declaration of value of goods, general administration document, TIR carnet);
2. trade or commercial documents (e.g. contracts, orders, invoices);
3. transport documents (e.g. waybills for different modes of transport, bills of lading, cargo manifest, CMR consignment note)
4. other documents (e.g. permits, licences, certificates) (Morkeliūnaitė, 2007, p. 10) (see Figure 10).

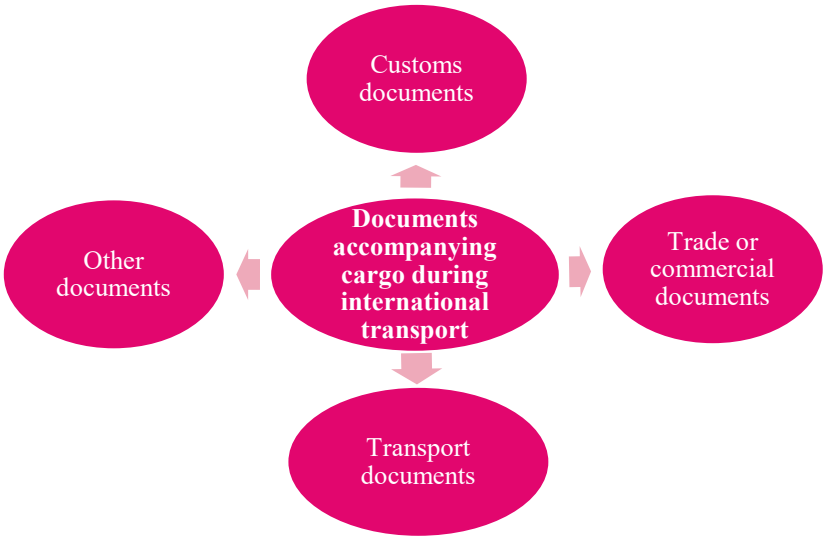

Figure 10: Documents accompanying cargo during international transport

Freight transport is a complex process consisting of many elements, involving a multitude of operations and activities in the course of preparing, planning, organising, executing, managing,

coordinating and controlling the movement of freight, and which is strictly regulated at national and international level.

1.6 The role of transport in the national economy

Successful business activity in virtually all areas of the economy requires an efficient transport infrastructure. Transport is a set of activities related to the movement of both people and goods. It plays an important role in organising the logistics of moving goods and providing various services. Transport ensures the circulation of goods and services in the national economy (according to the study of Grabara, Kolcun, Kot, 2014, p. 2).

According to experts and scientists, modern transport is a socially important sector of the economy, which plays a key role in the successful functioning of almost all socio-economic spheres of society and is an indispensable condition for the development of the state. Transport becomes the most important component of the infrastructure of modern society and a tool for realising the national interests of the state and strengthening its position in the global economic system. Effective functioning of transport is an indispensable condition for stabilisation, growth and structural changes in the economy, ensuring national security, as well as improving the quality of life of the population. At present, transport is becoming an increasingly integral part of people's daily lives. It is seen not only as an industry engaged in the movement of goods and passengers, but also as a multifaceted system that provides conditions for life and economic activity (according to the study "Transport and Mobility: Keys to Sustainability").

At all stages of economic development, transport plays a key role in meeting the needs of both economic sectors and the population by providing rapid transport of goods and passengers. Transport is the instrument through which both productive and non-productive sectors of the economy function to meet the needs of the population, and at the same time transport provides a variety of services (according to the study by Fransman, 2015, p. 3).

Transport also plays a critical role in increasing GDP and industrial efficiency. This function is manifested in the timely delivery of necessary products from producer to consumer, reducing losses and risk of damage to finished products and raw materials, and improving the mobility of the population through fast and quality transport (according to the Operational Programme for Economic Growth 2007-2013, 2013).

The political role of transport promotes state integrity and ensures effective resource management, including the management of emergencies. Transport also plays an important role in strengthening international economic linkages. The cultural impact of transport cannot be underestimated either. Through transport, cultural ties between countries have increased, cultural exchanges have increased and the number of tourist trips has grown. Transport itself has become an integral part of culture, with museums dedicated to different modes of transport and exhibitions showcasing the achievements of the transport industry. The social importance of transport lies in saving time, improving working conditions and increasing productivity. It is also important to note the military significance of transport, as it is the reason for the rapid mobilisation of population, armed forces and production resources (Ивуть, Стефанович, Косовский, 2009, p. 7).

Consequently, transport contributes to the advancement of society as it is an important economic base. Transport is the only means that enables the movement of material resources and people (Stanevičiūtė, 2013, p. 31).

Road infrastructure forms a significant part of the driving force of the European economy and the single market. It ensures efficient, flexible and cost-effective delivery of goods across Europe. Approximately 45% of all freight transport in the EU is carried out by road. Road transport is a vital segment of the European economy (Dejax, Fullerer, 2007, p. 3). The development of the road transport sector in the EU has been ongoing for many years and has been a consequence of freedom of movement and the development of trade. In some cases this growth has been excessive and has caused new problems such as traffic congestion and pollution. The EU is therefore focusing its efforts on improving efficiency, developing open markets and common technical standards, as well as improving integrated European transport networks and applying intelligent transport management systems (Road Transport: A change of gear, 2012).

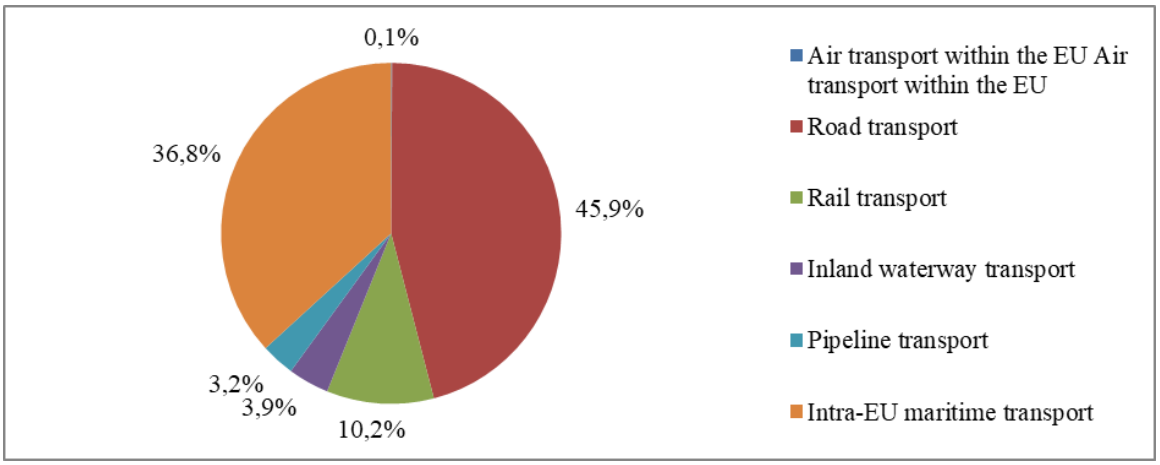

Figure 11: Distribution of freight transport mode choice in the EU in 2014 (Road Transport: A change of gear, 2012)

Figure 11 confirms that the largest share of transport in the EU is by road transport at 45.9%. This is because most freight transport has an optimal distance for road transport. It is followed by maritime transport across Europe, which accounts for 36.8%. In Europe, sea freight is the preferred option for transporting bulky goods and goods that do not require fast delivery. Rail transport also accounts for a notable share of freight transport in Europe, at 10.2%. Similar shares of freight are transported by inland waterways and pipelines (3.9% and 3.2% respectively). The smallest share of freight in Europe is transported by air, due to the small territory of Europe and the high cost of short-distance air transport.

In Lithuania, similarly to other developed countries, the transport sector is one of the largest basic sectors of the economy and a key component of the production and social infrastructure. Transport systems connect all regions of the country, which is an indispensable condition for its territorial integrity and unity of economic space. These systems also link the country to the world community, representing the material basis for maintaining external economic relations and integration into the world economic system. Lithuania's transport sector is one of the most interconnected economic sectors in the European market. The share of the transport sector in total value added averages 10 per cent, and the share of exports of transport services in the country's GDP is about 7 per cent. Moreover, exports of transport services account for about 60 per cent of the country's total exports of services (Jaržemskis, Jakubauskas, Mačiulis, 2012, p. 78).

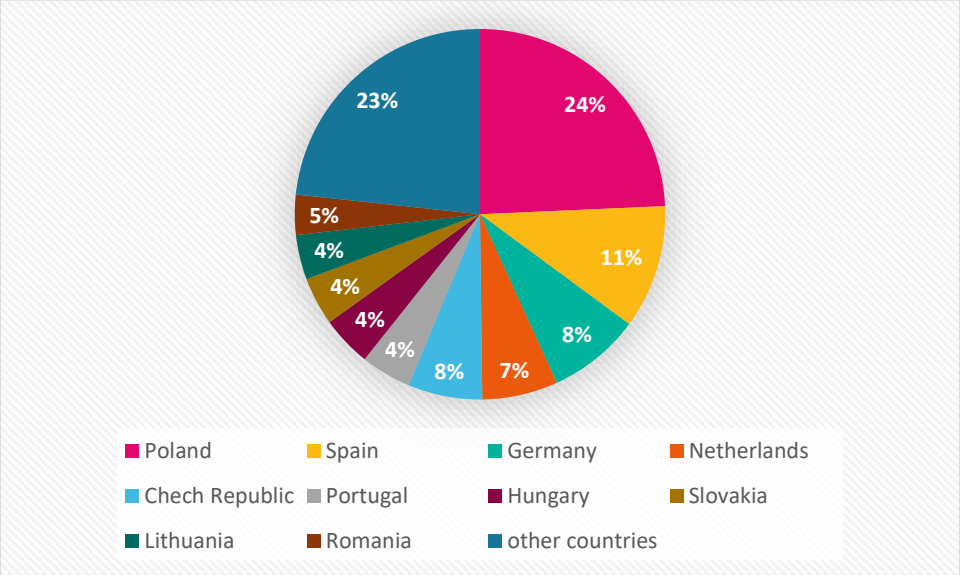

Figure 12Figure 12: Market share of international road transport in Europe, % (source: Eurostat)

The graph in Figure 12 shows the distribution of the international transportation market, and here Lithuania has about 4% share, while Poland clearly dominates. Poland continues to

strengthen its position in international transportation and the success of new EU countries is also observed. The Czech Republic, Hungary, Slovakia and Romania make up the top ten. Countries such as Spain, the Netherlands and Portugal are gradually losing ground.

In Lithuania, the transportation and logistics services sector plays a key role in the gross domestic product (GDP), which makes policy in this area very important. According to Lithuanian statistics, the transport and logistics services sector employs 7% of Lithuania's population and accounts for 13% of the total GDP (Statistics Lithuania). Compared to the European Union, where the average employment in this sector is 5% and the share of GDP is 4.5%, the transport and logistics services sector in Lithuania is twice as large as the average of the 28 EU member states.

Figure 13 shows the distribution of the transport sector by mode of transportation in Lithuania. It is obvious that road transport is the most numerous sector in Lithuania in terms of the number of enterprises, while the other modes of transport are characterized by a much smaller number of enterprises.

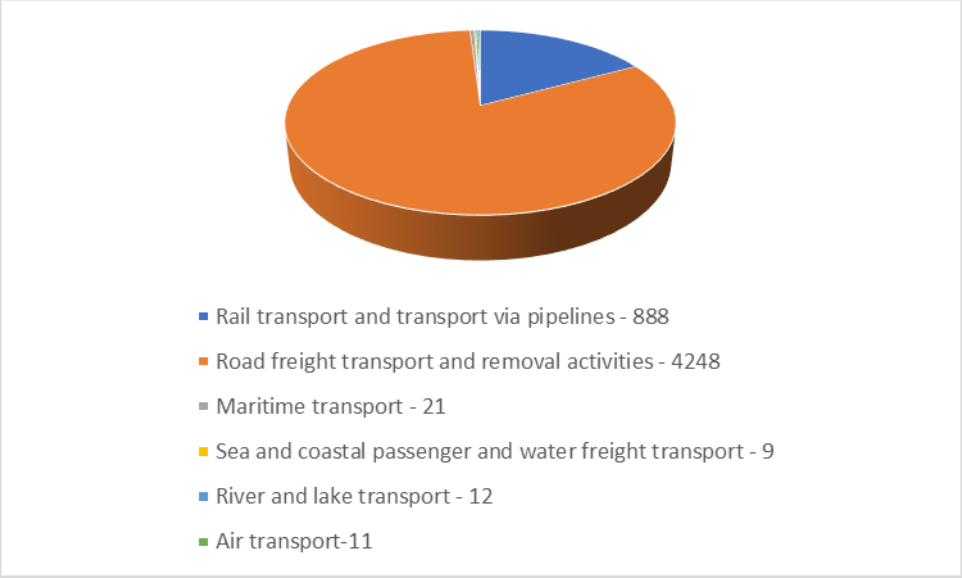

Figure 13: Distribution of transport enterprises in Lithuania by mode of transport in 2014 (compiled by the author based on the data of the Statistics Department)

Transport plays a key role in Lithuania, as the country has optimal conditions for the development of this sector due to its favourable geographical location, the presence of two recognized continental transport corridors on its territory, the Klaipeda seaport, well-developed road infrastructure and its quality maintenance, stable political and economic relations with neighbouring countries, as well as the availability of qualified professionals and scientific potential in the field of transport.

Data from the statistical office show that the largest volume of freight traffic is transported by rail and road. Railroad transport has a higher carrying capacity due to its high cross-country ability, while road transport allows for shorter delivery times. A significant part of cargo is also transported by water and pipeline routes. Air transport in Lithuania has the lowest volume of cargo transportation and utilization (see Figure 14).

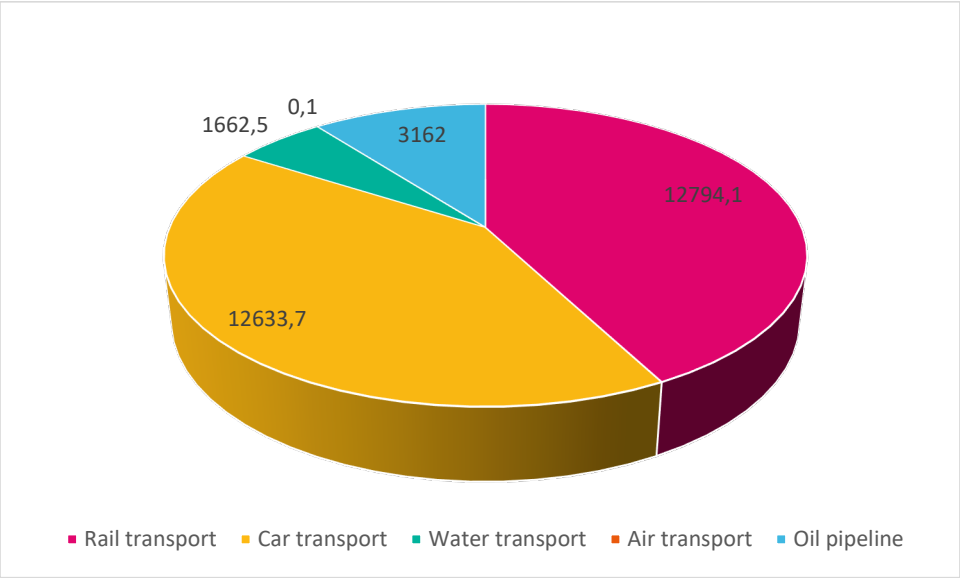

Figure 14: Freight transport by all modes of transport in Lithuania in 2015, thous. tonnes (compiled by the author on the basis of data from the Statistical Department)

Increasing the efficiency of the transport system remains one of the main priorities of transport infrastructure development both in the European Union and in Lithuania. The following tasks are set within the national interests of Lithuanian transport policy and infrastructure development: creation of a cross-border trans-European transport network, which will ensure convenience and minimum time costs for the Lithuanian population when connecting with cultural, tourist and business centres of other EU countries; modernization and development of transport infrastructure in the West-East direction; sustainable integration with trans-European networks of countries, such as Denmark, Sweden, Germany, through the Baltic Sea highways; and development of transport infrastructure in the Baltic Sea region. Also in light of climate change and its consequences, special attention is paid to the reduction of greenhouse gas emissions, including CO2. Reduction of CO2 emissions can be achieved in two main ways: by tightening the requirements at the technology level in the transport sector (in terms of powertrains and engines) and by optimizing fuel efficiency (Jaržemskis, Jakubauskas, Mačiulis, 2012, p. 79).

Thus, the transport sector represents one of the most important basic industries in both the European and Lithuanian economies and plays a key role in the production and social infrastructure. At the moment, various modes of transportation, including water, rail, road and air, are actively developing in Lithuania. However, some of them operate separately, without full integration, as is the case in Europe. For example, road transport services are provided by the private sector, while rail and maritime transport are controlled by the state and air transport is a mixed sector. In Lithuania, road transport stands out as the most visible and important sector, therefore optimization and modernization of this sector is a priority task both for the country as a whole and for each transport company. Transport processes are complex operations consisting of many stages, and their effective management requires the use of logistic principles and systems that facilitate the optimization and integration of the entire transport process.

2 Improvment the transport logistics system

Transportation infrastructure is a complex system complex, where efficiency depends on the optimal operation of all its components. Achieving this optimality requires the use of modern methods of optimizing logistics processes and advanced technologies.

2.1 The road transport logistics system and its components

To date, there are many different interpretations of the concept of "system", which are applied depending on the context, field of knowledge and research objectives. Table 1 presents sample definitions of the concept "system".

Table 1: Examples of definitions of "system" (based on Gleissner, Femerling, 2013, p. 2; Чернышов, Чернышов, 2008, p. 6; Сурмин, 2003, p. 3; Laszlo, Krippner, 1998, p. 2)Table 1.

Author	**Definition**
Gleissner, Femerling, 2013	The term "system" is very widely used, but many people are not able to define it in a tangible way. Basically, a "system" is an arrangement, order, totality of something
Чернышов, Чернышов, 2008	A system is a certain set of interrelated elements that form a unified system, characterised by integral properties and laws.
Сурмин, 2003	A system is an order characterised by correctly arranged parts and relationships.
Laszlo, Krippner, 1998	A system can be described as a collection of interacting components.

The concept of "system" is characterized by the following attributes:

1) Only one element is not enough to form a system; it is necessary to have at least two elements united into a system.
2) Manifestation of synergy - in order for a set of objects to become a system, it is required that its elements be organized in a certain structure or interact with each other, forming specific relationships between elements or their characteristics. This gives the system integrity, making it not just a set of elements, but an integral entity that can be viewed as an independent object with its own properties.
3) There is completeness - the system is an abstract entity that has well-defined boundaries and completeness.
4) Hierarchical - each element of a system can be considered as a system; the system itself can also be considered as an element of a subsystem (Ladyman, Lambert, 2012, p. 36).

A system can include many components and can be broken down into a number of subsystems. A subsystem is a set of components that function autonomously within a system, such as economic, organizational and technical subsystems. In simple terms, a subsystem is a system that is part of another, larger system. A system may include many such subsystems, depending on their primary functions: internal and external (Skali siene, 2012, p. 10).

The structure of a system is determined by the relationships between the components, which may exist either between individual components of the system or between the system and external elements or subsystems. Relationships are key elements of the definition of a system and ensure its functioning as a whole organism. A system exists because of the relationships between its components. There are different types of relationships including forward and backward relationships. Direct links are designed to transfer various types of information or energy from one component to another in the direction of the underlying processes. Feedback links fulfill an informational role and reflect changes in the state of the system. Control, adaptation, self-regulation, and system development cannot do without the use of feedbacks. When there are discrepancies between the actual and expected state of the system, measures are taken to eliminate them. Feedback plays an important role in comparing input and output data (Чернышов, Чернышов, 2008, p. 9).

According to Garaglio (2003), a logistics system is a feedback system capable of adapting to changes in the environment, performing specific logistics functions, including several subsystems and having extensive links with the external environment. Characteristic features of a logistics system are: the presence of process flows and consistency within the system. A logistics system is

a set of elements interacting with each other. These elements have different characteristics, but they are in harmony with each other. The following components of logistics systems can be distinguished:

- procurement (guarantees the arrival of materials in the logistics system),
- storage facilities (premises, facilities, etc. where goods and materials are temporarily stored and where material flows are redistributed),
- stocks (reserves of materials, which ensure prompt response to changes in demand, ensure continuity of transportation and solve other tasks of the logistics system),
- transportation (includes transportation equipment necessary for the transportation of goods, as well as the infrastructure that ensures its functioning),
- personnel (qualified specialists who carry out logistics operations),
- realisation (ensures the movement of material flow out of the system).

Without a well-developed transport infrastructure, logistics cannot function efficiently. Transport infrastructure combines transport companies, vehicles and a system for managing it all. A well-established transport infrastructure in a logistics system can ensure the best logistics efficiency, reduce costs and improve service quality. Improving transport infrastructure requires a joint effort from both the government and the private sector. An efficient logistics system can improve the competitiveness of both government and enterprises. Transport infrastructure represents one of the most important elements in economic activity among the components of an enterprise's logistics system. Between one and two-thirds of the logistics costs of enterprises are transport costs. Then come warehousing, packaging and management costs. Thus, transport plays a critical role in logistics and improvements in this area can lead to significant reductions in logistics costs. Transport infrastructure facilitates the movement of goods and products, timely delivery and regional efficiency, which contributes to value creation through the principle of economy. Transport affects the efficiency of logistics companies and of course has an impact on production and sales (Tseng, Taylor, Yue, 2005, p. 1660).

According to European statistics, road transport is one of the most important modes of transport in the overall transport system. The road freight transport system includes:

1. Social component - an association of workers ahead of work in the organisation with complex interpersonal relations.
2. Technical component - the complex includes means of transport, equipment and tools.

3. Information-technological component - technical and technological means that ensure the transfer of information and management of the organisation.
4. Sales component - provides customer satisfaction through marketing, pricing, advertising and market impact to increase market share and profitability (see Figure 11) (Розенков, 2012, p. 3).

According to Orzekausas (2016), the road transport logistics system in a company consists of five key elements: personnel, freight customers, transported goods and vehicles, and all these components are linked by information on which the management and interaction of the entire system is based (see Figure 15).

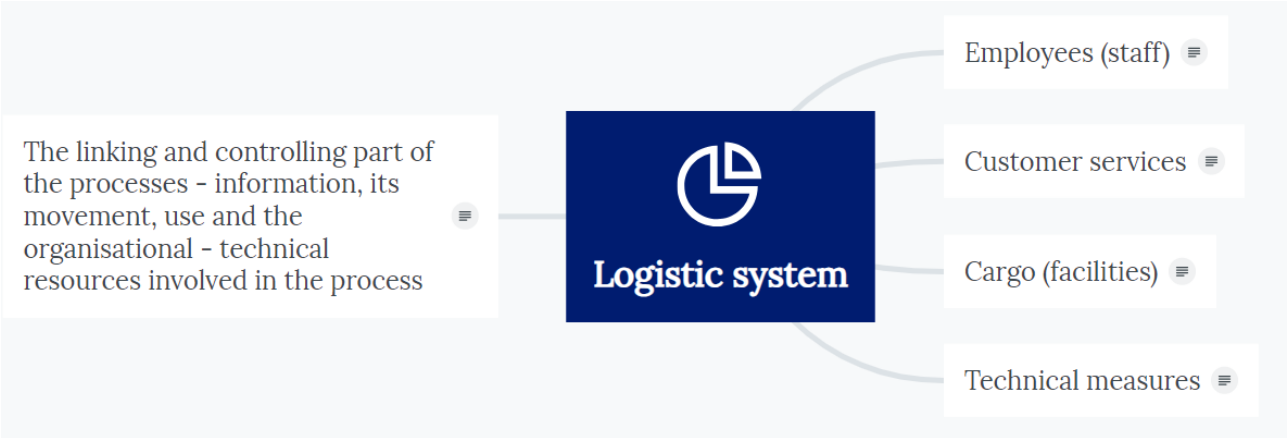

Figure 15: Elements of a road transport logistics system

Without a developed road transport system, logistics at an enterprise cannot function fully. Therefore, effective management of the logistics system includes optimisation of each of its components and overall integration of the entire system, taking into account the interrelationships. A properly organised transport system within the logistics system can guarantee maximum logistics efficiency.

2.2 Modern transport and freight management systems

2.2.1 Applying Just-in-Time in freight transport

Various logistics strategies have been introduced to coordinate transport operations. One of the most widely used in transport is the Just-in-time (JIT) system. It consists of organising transport with minimum time intervals at precisely defined times. Just-in-time allows goods to be delivered exactly when they are needed (neither earlier nor later), thus reducing inventory levels

in both production and distribution. Effective utilisation of this concept requires sustainable telecommunication systems and information technology.

According to Karlsson and Nore (1994), "Just in Time" is a set of operational processes designed to maximise value and quality while using the minimum amount of raw materials. This philosophy aims to eliminate excessive costs in the transport process and inefficient use of time.

"Just in Time" is considered as a "lean" management strategy and is seen as a way of simplifying business processes to a minimum. By applying this methodology, companies increase productivity and quality of transport, optimise their processes and achieve efficiency with minimal use of equipment, personnel and inventory.

The Just in Time principle involves minimising the following aspects: the distance travelled by the vehicle, the time required to travel, the cost of the journey and the risk of damage to the cargo.

Zidonis (2002) identifies four key objectives of the on-time system:

- ✓ Reduce resource utilisation;
- ✓ Improve quality;
- ✓ Improve operational efficiency;
- ✓ Provide optimal customer service.

The on-time system is usually effective in most cases, but the successful implementation of this system in a transport company requires some preparation, including:

- ✓ Balanced operations;
- ✓ Minimising time at all stages of operations;
- ✓ Establishing time standards;
- ✓ Rational use of vehicles;
- ✓ A change in staff mentality (moving from the stereotype of "more is better" to "less is better");
- ✓ Systematic quality control;

Continuous optimisation of structure and management to promptly eliminate errors and misunderstandings.

According to W. Hadid (2011), there are six strategic areas of the on-time system that are applied to optimise transport services: alignment and balancing of information and work processes, analysis of all aspects of the process, continuous process improvement, elimination of wastage, flexibility in the use of resources and respect for employees.

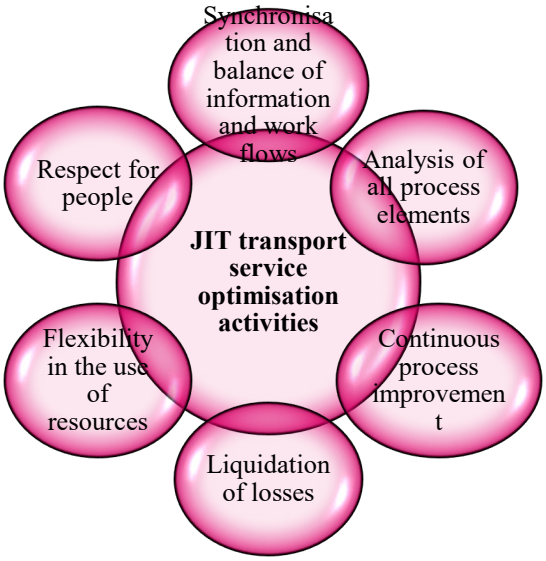

Figure 16: JIT transport service optimization activities

An efficient logistics system must provide the six golden rules of logistics - the right product, the right quantity, the right quality, in the right place, at the right time, at the right cost, for the right customer (Тимашев, Кучеров, 2010, p. 1) (see Figure 17).

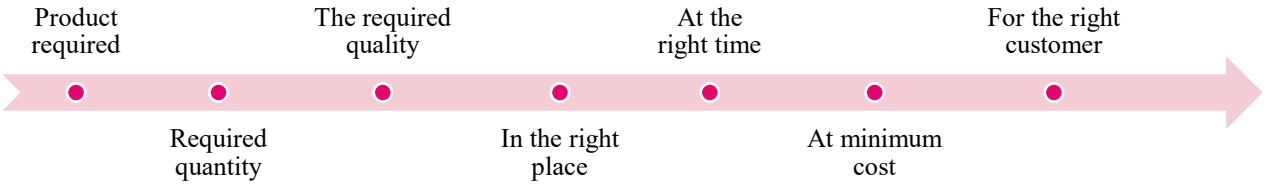

Figure 17: Transport logistics challenges (Тимашев, Кучеров, 2010, p. 1)

In other words, it can be said that the goal of a logistics operation in a transportation company is achieved when the right quantity of high quality products are delivered to the right place at the right time with minimum cost. Thus, in terms of transportation logistics, the just-in-time model can be explained as follows:

- Planning - determining what will be transported, where and when, as well as planning the necessary resources such as modes of transportation, required number of vehicles, petroleum products and other necessary materials and other things.
- Coordination and Control - it is important to continually coordinate and control the execution of plans when delivering products to customers. The earlier notifications of negative deviations occur, the faster the necessary actions can be taken to correct them. Responding quickly to errors helps reduce losses. For example, if there is a deviation in the delivery schedule, the customer can be contacted quickly, alerted and alternatives can be offered.

- Analysis - After the delivery is completed, an analysis is carried out to check whether everything has been completed as planned and to examine in detail the causes and consequences of any discrepancies. If the discrepancies were positive, this may indicate 'overruns', which means there are hidden reserves. If the variances were negative, then it is necessary to analyze whether they were caused by planning errors or unavoidable circumstances. In any case, such analysis helps to continuously improve transport logistics management processes (Тимашев, Кучеров, 2010, p. 2).

A successful Just-in-time system eliminates time, cost and delivery losses, improves the quality of transport services and increases operational efficiency. A successful just-in-time approach is not possible without a stable transport system that allows for a continuous flow of goods to be delivered on time (Gnich, 2012, p. 15).

2.2.2 Information technology-based transport logistics process management systems

Providing the right information at the right time, in the right place and in a clear and understandable format is one of the most important tasks of information technology, and this is relevant not only for different business and management sectors, but also for the field of transportation logistics.

Generally speaking, information technology is applied in transportation logistics in the following areas:

(a) Order receiving - the most common means are a variety of databases that provide fast and efficient processing of orders and their distribution to different centers, headquarters and departments. This also provides an opportunity for the collection of a variety of data on the number of orders, their fulfillment, planned inventories, and so on;

(b) Identification of various modes of transportation, vehicles and drivers;

(c) Determination of the location of vehicles and cargo;

(d) Tracking and controlling the movement of vehicles and goods;

(e) Selection of the most optimal route.

The information technologies on which systems in the transportation domain are based can be classified into four main groups:

- Geopositioning;
- Vehicle monitoring and control systems;

- Telecommunication systems;
- Technologies for information collection, processing, storage and accounting (according to Vlasov, Efimenko, Bogumil, 2013, p. 7).

There are three methods of data organization in information technologies: manual, computerized and combined. Currently, there are almost no companies that rely entirely on the computerized method and, as a rule, companies use a combined approach to data organization.

The use of advanced information technology offers significant opportunities to increase the efficiency of different modes of transportation. This is achieved through the application of modern and innovative information technologies to improve infrastructure, traffic and fleet management, monitoring and tracking the movement of goods in transportation networks, and improving communication between businesses and administrative bodies.

Table 2 presents the variety of information technologies and their systems that can be used in transport logistics to ensure effective, efficient and sustainable business operations.

Table 2: Main information technologies used in transport logistics

Nr	Information technology	Description	Opportunities
1	2	3	4
1.	**Barcodes and magnetic cards**	Electronic identification technologies are widely used around the world.	Identification of goods in the transport process.
2.	**RFID radio frequencies**	Allows quick identification of moving objects.	Radio frequency transponders, also known as 'toll tags', enable toll collection without the need to stop the vehicle at a toll booth. They are also capable of identifying vehicles, marking where they stop, and identifying drivers who violate work and rest periods.
3.	**Automatic Vehicle Location (AVL) and long-distance, two-way communication technologies**	Information technology is widely used in transport logistics to save time and the cost of communication services, to exchange information between drivers and dispatchers, to better match loads to vehicles in order to avoid idling, and to establish realistic delivery times.	AVL and two-way communication systems allow various loads to be routed directly to a new end point and to pick up an important cargo. Delivery times can be altered to accommodate production schedules or depending on the loading location.
4.	**"Real-time routes"**	It's automatic door-to-door delivery. "Real-time routing" is the most promising innovation in transport logistics, resulting from advances in information technology.	Detailed information about the type of cargo - size, weight, special handling requirements, destination, pick-up time, estimated delivery time, etc. electronic exchange of information speeds up transport logistics algorithms.
5.	**Data clearing**	It is a distribution centre, located in a network, between domestic and foreign market partners. At its heart is an attempt to simplify the exchange of data between the foreign supplier and the manufacturer.	The most popular information technology systems are ACTIS-DFU-BOX, ALFA, COMPASS, DAKOSY, DDIVS.
6.	**WAP technologies**	Mobile technology applications, including mobile phones themselves. Here, a wireless information channel is used.	WAP gives you the freedom of mobility and ensures seamless communication, while avoiding time-consuming interruptions.

Table 2 continued on next page

1	2	3	4
7.	**"E. freight"**	The term "e-freight" refers to the electronic transmission of information, linking the physical movement of goods to an IT-based computerised tracking system that can track and monitor the cargo throughout its transport by various means. These operations will be made more convenient and affordable through the use of new technologies such as radio-frequency identification equipment and the GALILEO satellite navigation system.	The "e-freight" concept could lead to a future "Internet of Freight" where information could be published securely.
8.	**EDIFACT - ISO 9735 "Electronic Data Interchange for Management, Trade and Transport"**	EDIFACT is a standard that "speaks" a common language for the global exchange of information between different modes of transport, shippers and consignees, banks, customs and other actors in the delivery process.	This information technology, which is versatile in terms of hardware and software, enables all transport participants with this conversion software to transmit data electronically to each other and to keep track of the cargo and its transport progress.
9.	**„Hermis“ information technology system**	Manages the various cargo flows in international transport with the main objective of reducing the time and cost of delivering goods across border and customs points and guaranteeing on-time delivery. This information technology system enables the exchange of data.	This information technology system can be used to control various freight flows even more efficiently in the future.
10.	**DOCIMEL information technology system**	The development of this system has shown that around 10 - 15% of all freight costs are spent on "paper" documents. Replacing "paper documents" with electronic counterparts will allow synchronisation of material and information flows.	The DOCIMEL information technology system will enable the exchange of information between the partners of the single market - producers, buyers, suppliers and customers.
11.	**Information technology system "CAR"**	The CAR system is used to optimise the distribution of vehicles.	The participants in this system always have access to information on e.g. production planning, downtime, which vehicles are on the road, etc.
12.	**„Baltic way“ information technology system**	Provides real services for the technological transport chain: load-transport-hold.	Access to information and analytical material, transport business news and an e-commerce system.

Table 2 continued on next page

1	2	3	4
13.	**Information technology system "LOGIC system"**	This IT system consists of two interlinked core modules - remote order management and freight accounting.	
14.	**Information technology system "KIPIS" for Klaipėda State Seaport**	Enables pre-declaration of cargo and goods, ordering of handling work and management of other ongoing processes. The system will be used by 12 user groups - freight forwarding companies, the Customs Department, Lithuanian Railways, ship agency companies and other organisations.	This system will significantly reduce the time it takes to transport cargo through the Port of Klaipėda, increase the port's throughput and improve competitiveness.
15.	**Information technology system "OPKIS"**	OPKIS is an operational freight information system connecting 68 railway stations.	The system enables real-time monitoring of freight train movements in the territory of Lithuania, and the solution, based on modern information technologies, has provided new functionalities - it is possible to obtain a broader range of information on freight movements, and to analyse the information in different "cross-sections".
16.	**Information technology system "CARGO system"**	It is a system that covers all production processes in the port.	It allows you to reduce your company's administration costs and focus on analysing business processes and costs rather than rewriting documents.
17.	**Information technology system "CRM"**	It is a business contact module that enables efficient project management and the collection and accessibility of information for all project participants - customers, transporters, freight forwarders, and employees of the relevant authorities (customs, insurance).	
18.	**Information technology systems** - TRIS, ISCIS, Espace Cat, STS - are a range of information technology-based systems that efficiently support the administration and optimisation of transport logistics processes.		

Source: ECC Commission Communication "Freight Transport Logistics Action Plan", 2007

Advanced information technologies offer significant opportunities to increase the optimal use of all modes of transport by improving infrastructure, traffic and fleet management, monitoring and tracking the movement of goods through transport networks, and better communication between businesses and administrations (European Commission, 2007).

According to P. Nijkamp, G. Pepping, D. Banister (2012), companies that use IT-based systems experience a 15-20% increase in operational efficiency. This is due to optimal planning, efficient vehicle management, reduction of time costs, the possibility of receiving more shipments (as

many shippers prefer companies using satellite navigation systems), the possibility of working in 'just-in-time' conditions, and a reduction in fuel and other costs.

However, there are several barriers to a wider and more harmonised adoption of information technology in transport logistics. Some of these obstacles include the lack of standardisation in the exchange of necessary information and the diverse ways in which market players can adopt, use and adapt information technology (according to the Commission of the European Communities in 2007).

Many information technology systems have been introduced in the field of transport logistics, but the situation in this sector could be significantly improved through the development of a coherent and well-structured strategy for the introduction of information technology with clearly defined requirements for the transport of different types of goods on different modes of transport, such as navigation systems, digital tachographs, payment systems and others.

2.3 Methods and options for optimising the transport logistics system

High business performance is directly linked to the existence of a coordinated, competent road transport logistics system. Competence is achieved through the coordination of activities in specific areas. The priority areas in the road transport logistics system are:

- optimally designed logistics infrastructure,
- an information management system based on information technology that meets modern requirements;
- precise coordination of the transport process,
- an efficient cost management scheme (Хыйсаевна, 2014, p. 17) (see Figure 18).

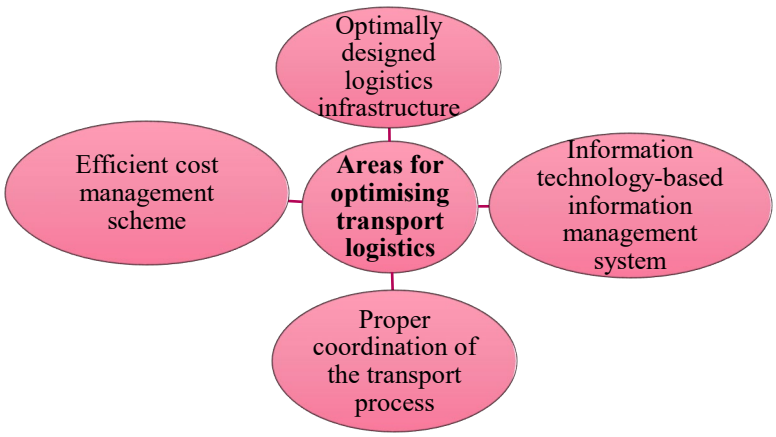

Figure 18: Priority areas for optimisation of the transport logistics system (based on Хыйсаевна, 2014, p. 17)

The transport logistics infrastructure is the basis on which the logistics system is built and operates. In today's world, information flows into the logistics system in the form of sales reports, orders and other data. The importance of information in transport logistics has gained relevance relatively recently. In particular, this is due to the development of software products capable of meeting the requirements in information collection and storage technologies. However, nowadays it is impossible to imagine a successful transport company without the use of information technology (according to Хыйсаевна, 2014, p. 17) (see Figure 19).

In the field of transport logistics, optimisation means achieving a state of the transport and logistics system in which it is the most efficient according to a certain criterion. It is possible to optimise any element (subsystem) of the transport and logistics system, so the range of works in this direction is very extensive.

In order to achieve optimisation of the transport company's performance, it is of paramount importance to carry out an assessment of the transport system. According to P. Orzekauskas (2012), a transport logistics audit is a comprehensive assessment of an organisation's logistics activities. This assessment includes a systematic analysis of logistics plans, objectives, strategy, programmes, activities, as well as organisational structure and staffing. Management and performance audit focuses on assessing the organisation and management performance. It assesses the final results of operations, including revenues, expenses and losses. It also identifies how efficiently all types of resources are utilised and looks for ways to increase productivity and quality. He also develops and investigates alternative solutions to increase performance.

According to P. Orzekausas (2012), the management and evaluation of transport logistics performance in a transport company should be based on four stages:

1. The first stage includes the analysis and evaluation of management and administrative documentation of the organisation, its structural units and employees (documentary audit). This stage also includes the analysis and evaluation of all documents of internal and external origin that are legally approved and used in the organisation. It is also based on the recording, analysis and evaluation of the actual level of management and dispositions of the organisation, its condition, effectiveness and validity. This includes documenting and defining the functions, tasks, responsibilities, duties, rights, assignment of responsibilities and legalisation, as well as the systems of coordination, control, accountability and their operation in the organisation.

2. comparison of the formal and actual management and operational situations and their impact on performance (analysis, preparation of conclusions and proposals for necessary and recommended changes (on the basis of the report)).
3. Implementation of necessary and recommended changes.
4. Monitoring of the implemented changes (see Figure 19).

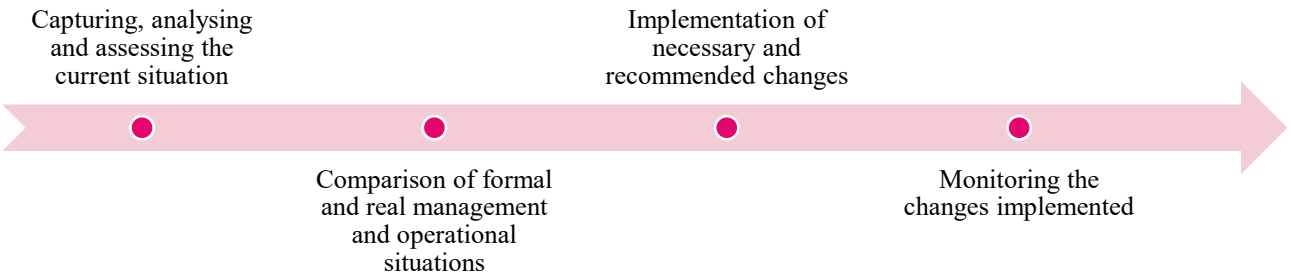

Figure 19: Stages of a transport logistics system audit (Oržekauskas, 2012, p. 58)

According to T. Singurtekino (2010), corporate governance and performance audits are usually conducted by internal auditors or internal audit services. In large companies, when designing their corporate structure, an internal audit department is usually included, the task of which is to control management decisions and results of the company, as well as to eliminate discrepancies. However, in companies without such a department, specialists from private audit firms are often engaged.

Logistics audit in a transport company is a comprehensive assessment of an organisation's logistics activities, including a systematic evaluation of logistics plans, objectives, strategy, programmes, activities, as well as organisational structure and staffing. Logistics audit can be divided into several subaudits:

- Logistics environmental audit;
- Logistics strategy audit;
- Logistics organisation audit;
- Logistics systems audit;
- Logistics productivity audit (Oržekauskas, 2012, p. 47).

The result of a logistics audit is the auditor's final conclusion on the company's logistics activities, planning, organisation, control, etc. A logistics audit identifies problematic and successful logistics activities of a company and recommends short-term and long-term plans to improve the situation and increase logistics efficiency.

The audit reveals solutions for companies to improve operational efficiency and helps them to achieve long-term results in these areas:

- Cost reduction;
- Increasing revenues, in particular by improving processes for assessing customer needs and service delivery;
- improving the efficiency of key business processes and internal controls;
- Effective management of major changes in the organisation (large-scale reorganisation, process re-engineering, etc.) (Cieśla, Gąska, 2015, p. 83).

A management and performance audit in a transport undertaking can be carried out as a review of individual elements of the system (communication, personnel management system, marketing activities, qualification and training system, corporate image or logistics system, marketing or occupational health and safety, information management), or it can be a cross-cutting audit, which covers all the areas that affect performance management.

In summary, the efficient functioning of a logistics system requires the optimal functioning of all elements of the system (staff, technical means, cargo, customers, the information, its movement and use, and the organisational-technical resources involved in the process). In order to optimise the automotive logistics system, the company carries out a logistics process audit, the results of which help to eliminate operational deficiencies and increase the efficiency of the company as a whole. Optimisation of the logistics system and the integration of the elements into a single system requires the application of modern logistics methods, models and systems, which ensure that the necessary amount of goods is not only handled, but also in the right place, at the right time and at the optimum price.

3 Study on the road transport system of UAB Transporto vystymo grupė

3.1 Rationale for the study methodology

Planning a study involves evaluating several aspects such as determining the need to collect information, assessing the quality and quantity of information, determining the feasibility of the study, setting timelines and clarifying expectations.

The research process can be broken down into the following steps: formulating the problem, defining the research object, setting the aim and objectives, determining the sample size, selecting the sampling method, selecting the research method, selecting the research type, designing the research instruments, collecting the data, organising the research process, analysing the data and interpreting the results.

The problem to be investigated is to optimise the freight transportation system to meet the needs of customers at minimum cost. For this purpose, it is necessary to study the existing freight transport system in UAB "Transporto Vystymo Grupė", to identify its advantages and disadvantages, and to develop a comprehensive plan to improve this system.

The object of the study is the freight transport system in UAB "Transporto Vystymo Grupė".

The aim of the study is to evaluate the freight transport system in UAB "Transporto Vystymo Grupė".

The objectives of the study include:

1. Development of a methodology for the study of freight transport in UAB "Transporto Vystymo Grupė";
2. Study of the freight transport system in UAB "Transporto Vystymo Group";
3. Preparation of a plan for comprehensive improvement of the freight transport system in UAB Transporto Vystymo Grupė.

The choice of research method is critical, as it determines the successful solution of the problem and achievement of the research objective. To achieve the objective, the following data collection methods were chosen: analysis of the freight transport organisation in the company, SWOT-analysis and survey.

Analysis of the organisation of freight transport in the company is a descriptive analysis of the process of providing freight transport services in UAB Transporto Vystymo Grupė, which includes a description of the entire process of providing freight transport services in the company.

An SWOT analysis is a way of uncovering a company's current situation and helping to develop a plan for the future: to reveal current strengths, review current weaknesses, identify opportunities and threats. A SWOT analysis is essentially a way of assessing an organisation's performance from a critical perspective and developing a strategy for the future that will help to expand the company's capabilities by building on its strengths and addressing emerging challenges and risks.

The third way of obtaining information about the company's performance and its results is the use of questionnaire survey. According to Puškorius (2004), questionnaire survey is the most common method of sociological research. In questionnaire surveys, respondents answer in writing to the researcher's questions. What is valued here is that employees can reflect on each question quietly at their convenience, avoiding the influence of the researcher. This method does not create tension, which in turn affects the accuracy of responses. The use of standardised questionnaires also simplifies data processing, statistical measurements, quantification and analysis of the information collected. In addition, it is a more convenient way to compare the responses of the subjects.

A questionnaire survey sample is a part of the total group that has been selected for research or evaluation purposes. In this study, we used the questionnaire survey method and randomly selected questionnaires of top and middle level managers in UAB Transporto Vystymo Grupė, i.e. experts in the field. Experts are those who have deep knowledge, special skills and are recognised as authorities in their field. Our research focuses on these management levels, as it is here that key decisions affecting the company's efficiency are made. A total of 25 questionnaires were distributed and 15 were returned.

In order to prepare the research instrument, a questionnaire was developed and structured to fulfil the objectives of the study. This questionnaire contains both closed and open ended questions, 38 questions in total. You can find this questionnaire in Appendix 1. The wording of the questions in the questionnaire was determined based on the analysis of the relevant literature.

The questions are divided into blocks according to what you want to know. The first block consists of questions 1 to 4, which collect demographic data about the respondents. The second block consists of questions 5 to 19, which are expected to gather information on the transport system in place and the advantages and disadvantages of the system in the company. The third block consists of questions 20 to 38, which aim to obtain information on how to improve the

transport system in the company (what, how and who should implement the improvement actions) (see Table 3).

Table 3: Rationale for questionnaire items

Block of questions in the questionnaire	Benefits of information
Demographic questions (questions 1-4)	These questions seek to find out the respondents' position and length of service in the company, education and gender.
Advantages and disadvantages of operating a transport system in an enterprise (Questions 5-19)	These questions aim to identify and highlight the strengths and weaknesses of the operation of the transport system within the company.
Gathering information to improve the performance of the transport system (Questions 20-38)	These questions aim to gather information on how to improve the transport system in the company (what, how and who should implement improvement actions)

3.2 Characteristics of Transporto vystymo grupė UAB

UAB "Transporto vystymo grupė" (Transport Development Group) started its activity in 1992 with the establishment of A. Sitavičius' commercial firm "Karlas". During the economic reforms and political changes in the world and in Lithuania, the firm, thanks to successful planning and efficient use of funds, expanded not only qualitatively but also quantitatively.

With the successful development of business and commercial relations with various clients, in 1997 UAB "Transporto vystymo grupė" was established. The company employed 8 people and had a fleet of 6 cars. In the same year, the company became a full member of the Lithuanian National Association of Carriers "Linava".

In 2010, the rapidly expanding company moved to new premises.

Figure 20: Logo of UAB Transporto vystymo grupė

Today, Transporto Vystymo Grupė celebrates its 26th anniversary and is one of the largest international transport groups in Lithuania. The company employs more than 400 people and has a fleet of around 400 vehicles.

The company's hierarchical management structure (see Annex 2) shows that the company has a large number of employees reporting directly to the CEO. This often complicates the work of the whole company: both the employees working under the CEO and the CEO himself.

UAB "Transporto vystymo grupė" is a freight transport and forwarding services company. The company's vehicles meet the Euro3/Euro4/Euro5/Euro6 safety requirements, and the trucks are equipped with ADR kits, radios and GSM mobile phones for transporting dangerous goods.

The provision of navigation aids helps to ensure the protection of the goods being transported, especially high-value goods, as well as the control of the transport process itself. The GPS satellite system provides precise information on the movement and location of the vehicle (see Table 4).

Table 4: Information technology-based systems in UAB Transporto Vystymo grupė

Information-based system	Description	Opportunities
1	2	3
GSM mobile phones	Real-time information and communication at any time of the day	It allows you to get the information you need in real time from any employee in the company (driver, manager, accountant).
Map & Guide Truck Navigator	A computer-based freight route planner that is tailored for freight vehicle route planning.	Allows you to accurately select the most cost-effective routes for freight vehicles.
Fleet management solution LocTracker	This is a vehicle control system.	It allows you to know in real time where and what your vehicles are doing, reduce fuel costs, increase staff efficiency, make better use of your fleet, and optimise planning and control.
„Transport“	Order processing and accounting system.	Allows you to process, store and account for your company's service orders.
Microsoft Office software package	Office suite.	Allows you to collect, process and manage the information you receive.
Intranet	Internal communication technologies.	Allows information to be transferred within the company during work.
„Skype“	Communication system	Enables real-time, operational transmission of information

Internet	World Wide Area Computer Network System	Allows you to transmit and receive the information, data, documents and web-based applications you need.

Services provided by UAB "Transporto vystymo grupė":

- International freight transport;
- Cargo warehousing services, storage and assembly of cargo at Kaunas District Customs Terminal;
- Transformation of cargo at the customs terminal and terminal warehouses in the Free Economic Zone.

The company transports goods in refrigerated semi-trailers and tarpaulin semi-trailers from Central European countries to Western European countries and from Western European countries to Eastern European countries (see Figure 21).

Figure 21 : UAB Transporto vystymo grupė's transport destinations

Freight is usually transported to destinations that are geographically convenient and attractive to transport companies. The main clients of UAB "Transporto vystymo grupė" are from Lithuania, Russia, Belarus, Kazakhstan and Uzbekistan. Lithuania is in a very good geographical position, it is the main transit country to Russia, therefore the main direction of the company's transport is the Russian market and countries that need to be reached by transit through the Russian Federation. Lithuania is also very well located. The company's base and headquarters are

located in the geographical centre of Lithuania - Kėdainiai. From this location, all loading points in Lithuania for exports to Western European countries are accessible.

Over 23 years, the company has developed a wide range of services, enabling it to provide a full range of services to the customer:

- Transport,
- Warehousing,
- Handling,
- Customs brokerage services both in Lithuania and Russia.

Subsidiaries Altrans and Angelis have been set up in Russia and Alzantrans in Kazakhstan. These companies are formal and have no specific commercial activities. Shipments to Russia and other Asian countries are carried out by trucks registered in Russia and Kazakhstan. Trailers returning from Europe are hitched from Lithuanian-registered trucks to Russian- or Kazakh-registered trucks. It is well known that the entry into Russia is difficult, so trucks registered in Russia or Kazakhstan facilitate the transport through border crossings. Also, Kazakhstan and Russian registered vehicles allow uninterrupted work despite the lack of permits to the CIS countries (Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Uzbekistan).

3.2.1 Analysis of the performance of freight forwarding services of UAB "Transporto vystymo grupė"

The company transports a wide range of goods. The semi-trailers are used for transporting a wide range of chemicals, equipment, furniture, building materials and other temperature-neutral goods. The company has a larger fleet of refrigerated trucks, which means that more temperature-controlled loads are transported. Refrigerators are used to transport perishable products, fruit, vegetables, etc. (see Figure 22). Most of the time these goods were transported from Europe to the Russian Federation (RF), but since the introduction of the Russian economic sanctions in 2014 and the ban on the import of certain nomenclature of agro-food products and raw materials to the RF, the company has suffered huge losses, which have forced it to look for new ways and new transport destinations to survive. At present, particular attention is being paid to cargo shipments to Kazakhstan, Uzbekistan, Kyrgyzstan and Tajikistan. The possibility of shipments to Armenia, Georgia, Azerbaijan and China has also recently been analysed.

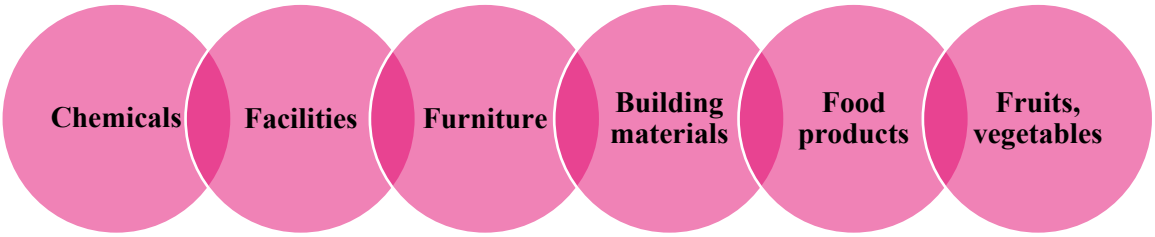

Figure 22: Structure of the main cargoes transported by UAB Transporto vystymo grupė

The company focuses on short-term contracts, and has very few long-term contracts, as the company's management believes that short-term or one-off contracts are more profitable for the company. Long-term contracts have a fixed price for a certain period of time, at least one year, and the price also stays the same during a market boom, whereas the price of short-term or one-off contracts rises by a third or even double, which increases the company's profits significantly. However, the absence of long-term contracts leads to instability and lack of specificity, which requires very responsible and timely planning and important decision-making in problematic situations. In the same way, in a company based on one-off contracts, it is essential to maintain existing customers and find new ones quickly and efficiently. The instability factor often leads to delays, customer dissatisfaction and, of course, additional stress for employees in their direct work (see Figure 23).

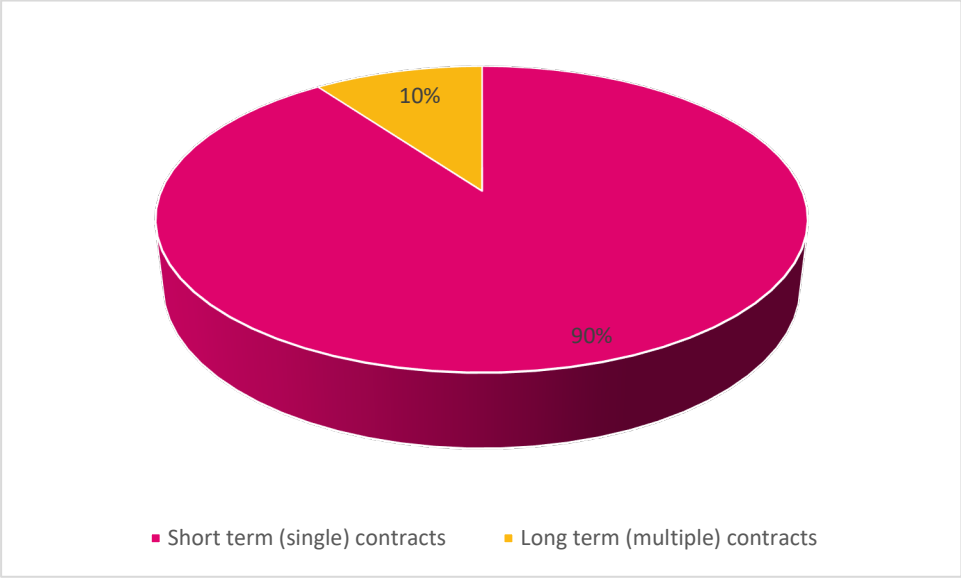

Figure 23: Structure of short- and long-term freight contracts

Loctracker is used to calculate freight routes. It is the most commonly used application in the company. System features:

- Real-time vehicle monitoring (position, on-board computer and tachograph data);
- Driving history (route, distance, driving time, fuel level changes, on-board computer and tachograph readings);
- Reporting of distance travelled and driving time;
- Fuel consumption reports (based on tank level and on-board computer);
- Work/rest mode reports (based on tachograph data);
- Data input from the vehicle computer (fuel, rpm, axle load, tachograph, odometer);
- Downtime reports (comparison of engine start and movement, calculation of downtime);
- Eco-driving assessment;
- Equipment parameter reports: engine running time, temperature, door opening, other;
- Generation of trip sheets;
- Report on visits to sites/clients;
- Recording of irregularities in the mode of operation or in the trajectory of movement;
- Communication with drivers (sending messages and tasks and receiving replies);
- Ability to grant monitoring permission to others;
- The most detailed maps of the world;
- Timesheets - ability to distinguish between day and night driving, and to distinguish kilometres driven by country.

The company also uses an accounting system and an intranet. Mobile phones are widely used to transmit information in real time.

Figure 24 shows the flow of international freight transport.

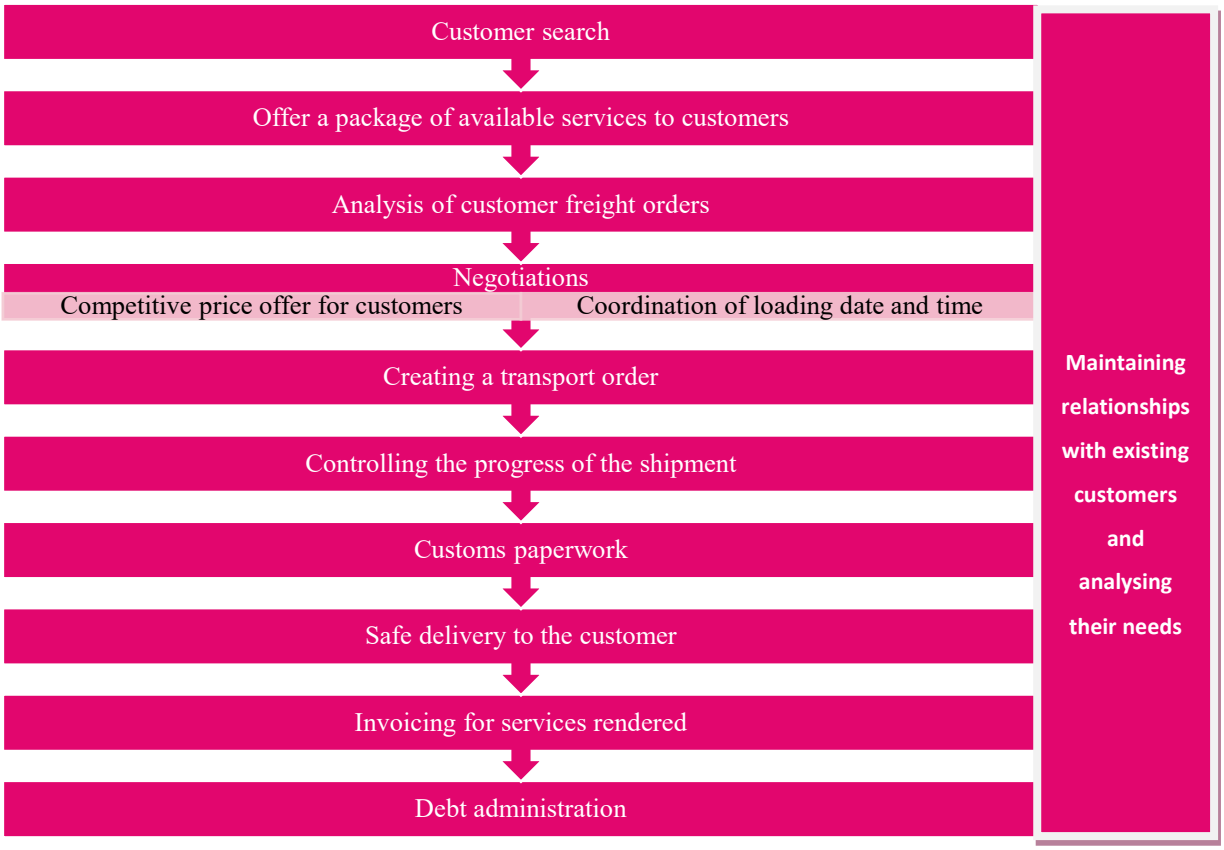

Figure 24: Plan for the organisation of international freight transport in UAB "Transporto vystymo grupė"

Finding new customers in the company is an additional responsibility for employees responsible for optimal cargo transportation, customer satisfaction and retention of existing clientele, due to the fact that it is managed by managers in contact with current customers, monitoring cargo in real time and following the entire transportation process. The company's customer base is very diverse, including both freight forwarding companies and large manufacturers who are direct customers.

In previous years, the company was often unable to fully satisfy the transportation needs of its current clients, which led to the decision to establish a freight forwarding and brokerage company TVG Logistika UAB in 2020 year. This decision gave the company a competitive advantage over other transportation organizations. In the past, if existing customers could not meet their needs, TVG Logistika UAB turned to other transportation companies. Today, however, there is no need for such appeals, as the company either satisfies all freight transportation needs on its own or outsources them to other firms engaged in similar activities for a certain fee.

As regards the promotion of international transportation services, it should be noted that providers of such services usually apply marketing methods less actively than providers of other types of services. This is explained by the fact that in most cases international transportation services are ordered and used by legal entities from Lithuania and other countries. Considering the sponsorship measures applied by UAB Transporto Vystymo Grupė, it can be said that the most common sponsorship methods for it are personal sales and advertising.

Personal sales are used by UAB Transporto Vystymo Grupė only in cases when the company has no orders or when conditions, prices and other factors of existing orders do not correspond to its interests. In such situations, personal selling is a necessary measure rather than the primary way of promoting services. For example, when an organization needs to get an order, the manager contacts potential customers with whom he or she has previously worked with and clarifies whether they require international shipping services by offering their services. In case the service company has enough orders to satisfy them, personal selling loses its relevance and becomes redundant.

Many organisations providing international freight services use external advertising, i.e. advertising their organisation's name, logo and services on vehicles (trucks, tractors, trailers and semi-trailers). Such advertising is one of the most effective, cheapest and easiest ways for organisations providing these services to attract potential customers, but UAB Transporto vystymo grupė uses external advertising only on Alzantrans' vehicles.

UAB 'Transporto vystymo grupė' is very active in promoting its services at international specialised exhibitions. The company is a regular participant of exhibitions organised in Germany, France, Russia, Kazakhstan, Uzbekistan, Armenia and other countries.

Both new and existing customers are introduced to the company and offered the services they may need. When a client offers to transport a load, the manager tries to find out as much detail as possible about the transport in order to assess the most suitable transport, delivery time, price and other aspects. Once our services and the price have been identified, negotiations are held to reach a compromise. A loading date and, if necessary, a time are also agreed. If a compromise is reached, a transport order is formed.

After loading, it is very important to meet all the customer's requirements before loading and during the transport of the cargo. If the shipment is moving from the Baltic States to Western Europe, the next point of transport is unloading. And if the cargo is being transported from Western Europe to Eastern European countries, the next point is the base of UAB Transporto vystymo grupė in Kėdainiai. This is where the vehicle's technical condition and roadworthiness is

checked and the semi-trailer is hooked onto a truck registered in Russia or Kazakhstan. This can take from a few hours to 24 hours (see Figure 25).

Figure 25: Freight transport points from Europe to CIS countries

After moving the semi-trailer, the truck, registered in Russia or Kazakhstan, goes to the Kaunas District Customs Terminal, where customs documents are prepared for the cargo to be transported to the CIS countries, and all the necessary permits for transporting the cargo are checked.

Once the customs documents have been prepared, the cargo is then transported to the country of delivery, where it first goes to the local customs office, where the customs documents are processed within 24 hours, and then the cargo is delivered to the final consignee, the place of unloading. Once unloaded, the semi-trailer, towed by a truck registered in Russia or Kazakhstan, either returns to the base empty (usually not loaded back from near Russia) or is loaded in Europe or near Russia (from far away Russia and other Asian countries), where it is hooked up to a semi-trailer returning from Western Europe, and then proceeds on its way to the unloading point.

Once the cargo has been transported, an accounting of the transport costs is made and an invoice for the services rendered is submitted and sent to the customer. This is followed by debt management.

As feedback, the needs of existing customers are continuously analysed, relationships with them are maintained, and frequent meetings are organised to reinforce the relationship with existing customers and to establish new relationships with new customers.

Altrans, a subsidiary of Transporto Vystymo Grupė UAB, became a customs carrier in October 2014. This is another competitive advantage that gives preference when choosing a carrier.

3.3 Analysis and presentation of survey results

3.3.1 SWOT analysis

Table 5 below shows the Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis.

Table 5: SWOT analysis of UAB "Transporto vystymo grupė"

Strengths	**Weaknesses**
1. Large fleet; 2. New fleet (Euro5/Euro6 vehicles); 3. Customs carrier status; 4. Ownership of vehicles registered in Lithuania, Russia, Kazakhstan; 5. Long-haul cost-effective destinations; 6. "Possession of TIR carnets".	1. Imperfections in the freight transport system; 2. Lack of application of information technology-based systems; 3. Untimely and often inadequate information; 4. Lack of teamwork; 5. Staff irresponsibility; 6. Lack of qualified staff (drivers, managers); 7. Failure to organise freight forwarding services properly; 8. Untimely maintenance of vehicles; 9. Inadequate funding for driver and management training, refresher training and programme development; 10. Lack of stability - short-term contracts.
Opportunities	**Threats**
1. Possibility to transport goods without paying customs fees in the territory of the New Customs Union (Russia, Belarus, Kazakhstan, Kyrgyzstan, Armenia) and transport of dangerous goods (ADR) in Europe and CIS countries. 2. Transport of dangerous goods (ADR); 3. Possession of permits for the transport of cargo to CIS countries; 4. Development of freight transport opportunities to new markets on the basis of existing experience; 5. Pursuing improvements in freight transport; 6. Reducing idling.	1. Increasing competition from carriers in the old EU countries; 2. Potential political decisions unfavourable to international freight transport; 3. Increasing taxes and other charges; 4. Migration of skilled labour; 5. Loss of competitiveness due to lack of investment in skills and modern technology; 6. Restrictions on the issuance of permits for freight transport to CIS countries; 7. Decrease in freight prices.

The SWOT analysis shows that there are weaknesses and vulnerabilities in the company's operations, but that its strengths allow it to continue its activities. However, in order to optimise the company's performance and increase efficiency, it is necessary to carry out an assessment and implement changes.

3.3.2 Analysis of survey results

On the basis of the demographic data collected (job title, length of service, education), it can be concluded that the interviewees can be called experts.

The survey (question 1) shows that the largest number of respondents are forwarding managers (8), followed by dispatching managers (5). The Director and the Deputy Director of Finance also responded to the questionnaire (see Figure 26).

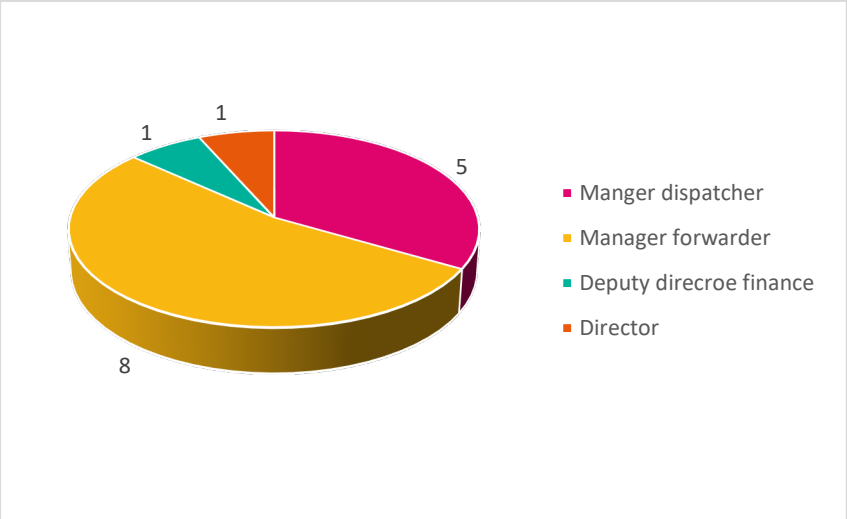

Figure 26: Responsibilities of respondents

Respondents are reasonably competent and it can be assumed that their answers will be accurate, as the largest number of respondents have between 3 and 10 years of experience in the company (see Figure 27) ("Question 2").

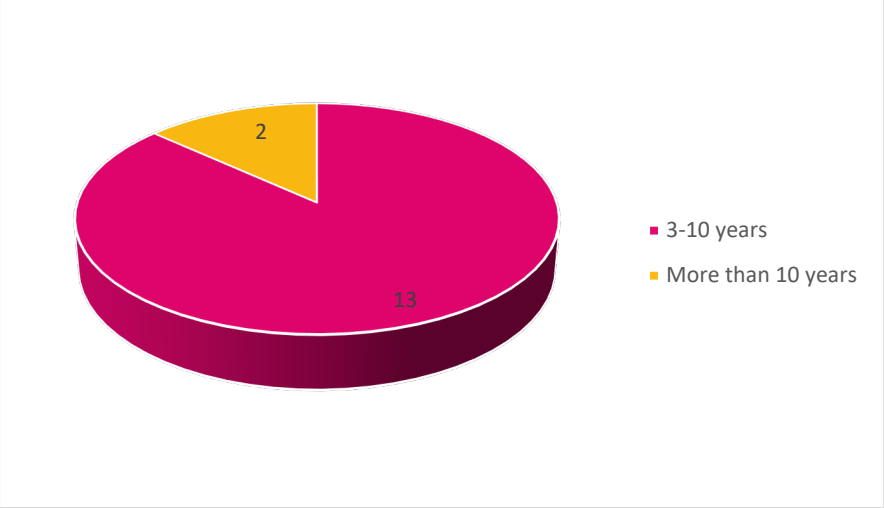

Figure 27: Respondents' length of service in the company

The educational background of the respondents (question 3) also suggests that they are sufficiently competent to answer the questions. 8 respondents have a university degree, 4 have a post-secondary degree, and 3 have started but not completed higher education (see Figure 28).

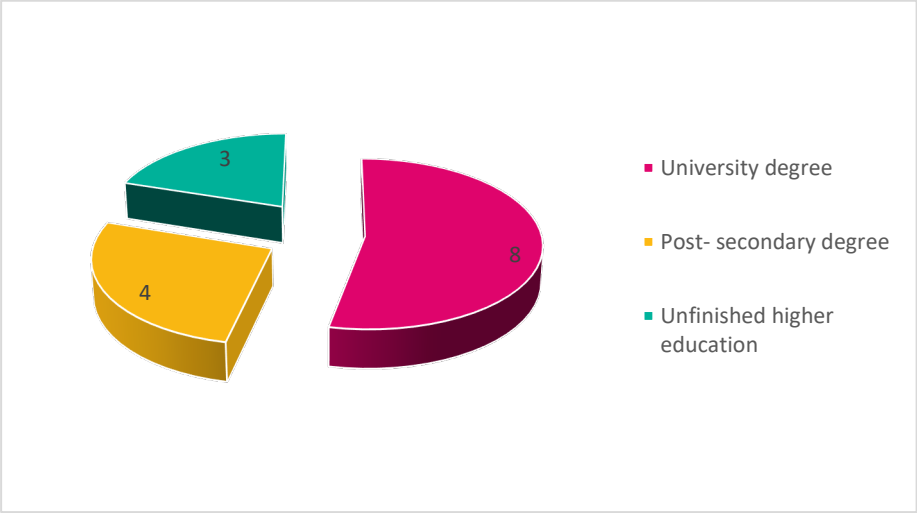

Figure 28: Educational background of respondents

According to Table 6 (Question 5), the largest number of respondents (13) argue that freight transportation is a set of loading, transportation and unloading operations that are part of the transport logistics system, while 4 respondents define freight transportation as simply the movement of cargo from point A to point B. Another 2 respondents consider freight transportation as the movement of cargo with the use of means of transportation or as a set of operations, starting with the preparation of cargo for shipment and ending with the receipt of cargo, all this is associated with the movement of cargo in space without changing its geometric shape, dimensions and physical and chemical characteristics. Based on these answers, it can be concluded that respondents have a fairly accurate understanding of freight transportation.

Table 6: Understanding the concept of freight transport

Concept of freight transport	Number of responses
Moving a load from point A to point B	4
It is a change in the location of a load using a vehicle	2
The totality of loading, transport, unloading operations that form the basis of a transport logistics system	13
The totality of operations from the preparation of the cargo for shipment to the receipt of the cargo, involving the movement of the cargo in space without altering its geometric shapes, sizes and physical-chemical properties	2

According to Figure 29 (question 6), the company's freight transport is organised and carried out in a reasonably efficient manner, with 11 respondents choosing this answer. 3 respondents say that the company's freight transport is organised satisfactorily and only one respondent says that the company's freight transport process is efficient. Respondents almost

unanimously answered that the current freight transport process should be evaluated in a combined way - by the employees and by the consultancy companies. In terms of the form in which the evaluation should be carried out, 6 respondents said that an audit of the freight system would be the most effective way to carry out the evaluation. 5 respondents said that a discussion at a meeting would be sufficient, and 4 respondents said that an employee survey would be the most appropriate way to do it. To summarise the results of the respondents' answers (questions 7 to 8), it can be concluded that in order to assess the efficiency of the current freight transport process, it would be optimal to carry out an analysis in a meeting and to hire a consultancy firm to carry out an audit.

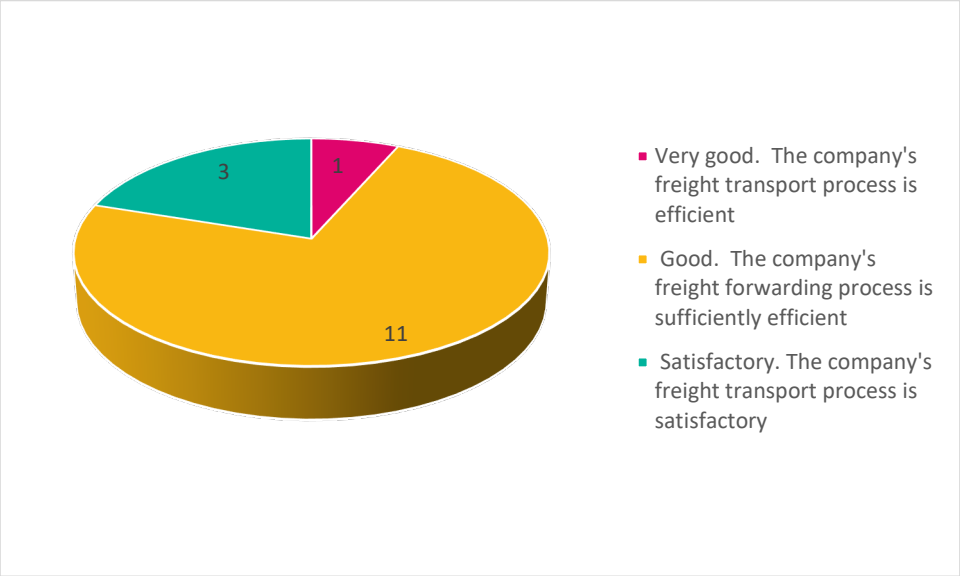

Figure 29: Evaluation of the organisation and performance of the freight transport process in the company

According to the data presented in Figure 30 (question 9), 80% of respondents claim that the company's trucking process can be described as a formalized road transportation system, while 14% say it has some degree of formalization and 6% express a negative opinion. The positive responses indicate that the company has a road transport system in place, but the number of negative responses indicates that this system is not clearly defined and does not have a degree of formalization (see Figure 29). In addition, there is general agreement that the road transportation system should be improved rather than restructured (question 10).

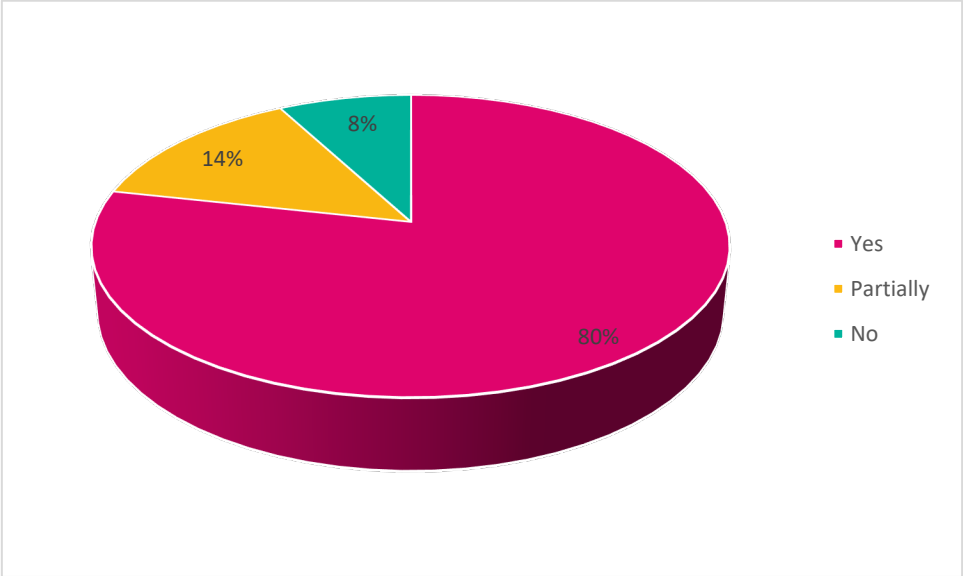

Figure 30: The in-house freight transport process - a formalised road haulage system?

Based on the data presented in Table 7 (Question 11), it can be concluded that one of the main management strengths in the company is efficient freight planning (11 respondents). Efficient organisation, execution and management of freight transport are also considered to be strengths of the company, according to 7 respondents each. Coordination, control and having and applying a system for freight transport are seen as positive in freight management.

Table 7: Benefits of freight management

Benefits of Freight Management	Number of responses
Efficient freight planning	11
Efficient organisation of freight transport	7
Efficient freight transport	7
Efficient freight management	7
Efficient coordination of freight transport	3
Efficient control of freight transport	4
Efficient freight analysis	1
Timely and efficient freight accounting	1
Having and applying an efficient road haulage system	3

In terms of the advantages of the freight transport process (Q12), the main advantages of the process are: having and managing the necessary and relevant information for freight transport (location, time, method of loading/unloading, etc.) (9 respondents); ensuring the necessary documentation for freight transport (permits, certificates, certificates) (6 respondents); and ensuring the timely and efficient execution of the freight transport (6 respondents). Other positive aspects of the freight transport process are: the involvement of qualified professionals in the process (5), the choice of the optimal type of vehicle for freight transport (3), the efficient preparation of freight transport instructions and training of drivers (3), the efficient preparation of

freight transport routes (4), the efficient execution of the necessary customs procedures (3), and the possession and application of an efficient system of freight transport by road (3) (see Table 8).

Table 8: Advantages of the freight transport process

Advantages of the freight transport process	Number of responses
Involvement of qualified professionals in the process	5
Choosing the optimum mode of transport for your goods	3
Efficient preparation of transport instructions and driver training	3
Possession and management of the information required and necessary for the transport of goods (loading/unloading location, time, method of loading/unloading, etc.)	9
Ensuring the necessary documentation for freight transport (permits, certificates, attestations)	6
Efficient freight routing	4
Timely and efficient freight transport	6
Efficient execution of the necessary customs procedures	3
Having and applying an efficient road haulage system	3

Regarding technical and technological advantages in freight transport (question 13), respondents highlighted the effective use of information technology. This was emphasised by 11 respondents. In addition, the following aspects in the technical and technological process of trucking are positively evaluated: availability of garage service, which ensures a minimum number of breakdowns during transport (3 respondents), maximum utilisation of vehicles (4 respondents), guaranteed safety of cargo transportation (5 respondents) and availability of an efficient road freight transport system (3 respondents) (see Table 9).

Table 9: Technical/technological advantages of freight transport

Technical/technological advantages of freight transport	Atsakymų skaičius
Efficient use of information technology-based systems (communication, video, navigation, vehicle maintenance and control parameter systems, management systems, etc.)	11
Efficient preparation of the vehicle for freight transport of goods	1
Availability of a workshop service that guarantees a minimum number of breakdowns during transport	3
Availability and application of an effective IT-based vehicle maintenance and costing system	2
Technical efficiency and safety of loading/unloading operations	
Maximum utilisation of vehicle load	4
Managing and ensuring the rectification of unforeseen breakdowns, problems on the road	1
Ensuring the security of freight transport	5

Having and applying an efficient road haulage system	3

According to the data from Table 10, it can be concluded (question 14) that the main advantages in selling freight forwarding services are successful attraction of qualified personnel to customers (8 respondents) and effective informing of customers about the provided services and actual freight forwarding data (7 respondents). Other positive aspects include: reliability of customers (5 respondents), reliability of partners (4 respondents) and availability of long-term freight forwarding contracts (4 respondents).

Table 10: Advantages of selling a freight transport service

Advantages of selling a freight transport service	Number of responses
Customer reliability	5
Reliability of partners	4
Long-term freight contracts	4
Availability of short-term freight contracts	4
Having and executing an effective marketing strategy	1
Effective communication with customers by qualified staff	8
Effective communication of service information and relevant freight information to customers	7

In addition, the weaknesses of the freight transport process were analysed in the assessment of the current freight transport process in UAB Transporto vystymo grupė. The most significant shortcoming of freight management (question 15) is the ineffective analysis of freight transport, as stated by 8 respondents. There is also a lack of effective planning, organisation, execution, coordination, control, accounting and, of course application of the system itself (see Table 11).

Table 11: Weaknesses in freight management

Weaknesses in freight management	Number of responses
Inefficient freight planning	3
Inefficient organisation of freight transport	3
Inefficient freight transport	4
Inefficient freight management	2
Inefficient coordination of freight transport	4
Ineffective control of freight transport	3
Inefficient analysis of freight transport	8
Untimely and inefficient freight transport accounting	4
Lack of or ineffective application of an efficient road haulage system	3

When analyzing the shortcomings in the freight transportation process (question 16), four aspects were clearly identified: lack of qualified specialists or employment of unqualified staff (6 respondents), inefficient preparation of vehicles for freight transportation (6 respondents), inefficient development of freight transportation instructions and training of drivers (6

respondents), lack of or improper management of information required for freight transportation (5 respondents). Based on these responses, there is a clear conclusion that there is a need to improve or even radically redesign freight training and staff development procedures. This includes stricter consideration of qualifications when hiring and training of existing staff through trainings and courses (see Table 12).

Table 12: Disadvantages of the freight transport process

Disadvantages of the freight transport process	Number of responses
Lack of skilled or unskilled workers (drivers, managers, accountants, mechanics) in the process	6
Inefficient preparation of the vehicle for transporting goods	6
Inefficient preparation of transport instructions and driver training	6
Lack of, or inability to manage, the information required and necessary for the carriage of goods (place of loading/unloading, time, method of loading/unloading, etc.)	5
Lack of documentation required for the carriage of goods (permits, certificates, attestations)	2
Untimely and inefficient freight transport	1
Inefficient implementation of the required customs procedures	1
Untimely delivery of goods to their destination	1
Lack of or ineffective application of an efficient road haulage system	1

The data presented in Table 13 indicate the need to improve or even significantly revise the procedures related to cargo preparation (question 17). This is especially true for the technical preparation of vehicles. The most significant deficiencies in the company are considered to be the lack of efficient garage services or garage services that do not ensure minimum breakdowns during cargo transportation (6 respondents), inefficient preparation of vehicles for cargo transportation (5 respondents), and inability to deal with unexpected breakdowns and road problems as well as failure to address them promptly (3 respondents). Technical and technological deficiencies in the company's cargo transportation also include: insufficient use or ineffective use of IT systems for vehicle and cost management (3 respondents), ineffective use of IT systems (2 respondents), insufficient use of maximum utilization of vehicles (2 respondents), and insufficient measures to ensure the safety of cargo transportation (2 respondents).

Table 13: Technical/technological disadvantages of freight transport

Technical/technological deficiencies in freight transport	Number of responses
Inefficient use of information technology-based systems (communication, video, navigation, vehicle maintenance and control parameter systems, management systems, etc.)	2
Inefficient preparation of the vehicle for transporting goods	5
Lack of efficient garage services or garage services that do not guarantee a minimum number of breakdowns during transport	6
Lack of, or inability to use, an efficient IT-based system for vehicle maintenance and costs	3
Not using the maximum load of the car	2
Failure to manage unforeseen breakdowns, problems on the road and ensure their rectification	3
Failure to ensure the safety of cargo transport	2
Lack of or ineffective application of an efficient road haulage system	1

According to the data collected in Table 14 (question 18), it is clear and confirms the results of the analysis of the freight forwarding services that the lack of stability in the company, i.e. the lack of long-term freight contracts, causes the most problems in selling the services, as stated by 8 respondents. It is also stated that the lack of an effective marketing strategy or the inability to execute it effectively is a disadvantage for the sales of the company's freight service (5 respondents). This implies that it is necessary to update the marketing strategy and to analyse the advantages of having long-term freight transport contracts. The 3 respondents who chose the answers 'ineffective communication of qualified staff to customers' and 'ineffective communication of information on services provided and relevant freight forwarding information to customers' each confirm the above observation of the need to upgrade the qualifications of the staff of UAB 'Transporto vystymo grupė'.

Table 14: Disadvantages of selling a freight transport service

Disadvantages of selling a freight transport service	Number of responses
Customer unreliability	2
Unreliability of partners	
No long-term freight contracts	8
No short-term freight contracts	2
Lack of an effective marketing strategy or the inability to execute it effectively	5
Ineffective communication between qualified staff and customers	3
Ineffective communication of service information and relevant freight information to customers	3

On the basis of the data in Figure 31 (question 19), it can be concluded that modern developments in transport logistics are not being applied in the company in a fully effective way, but only partially, and that there is a need to update the knowledge of modern developments in transport logistics and to apply them in a potentially effective way in the company

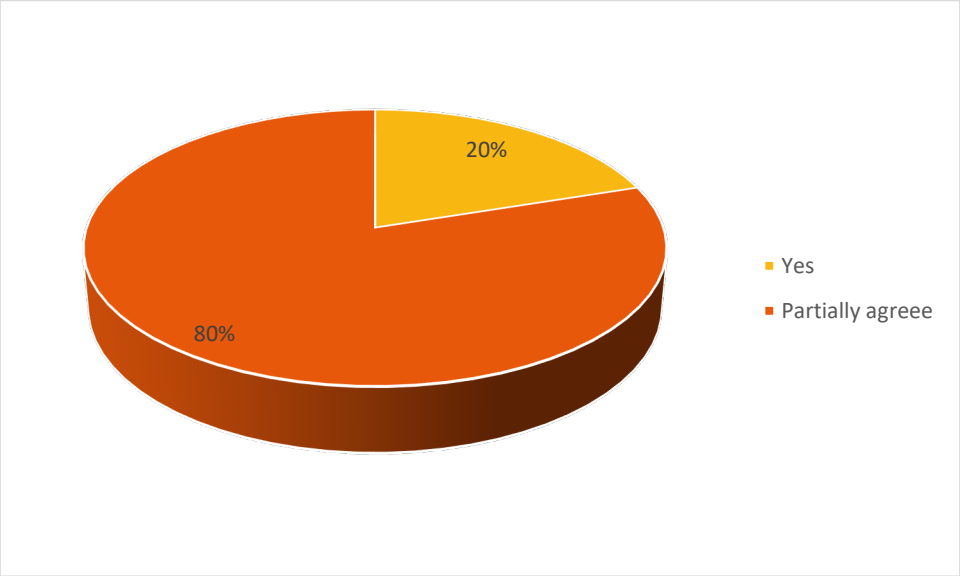

Figure 31: Does the company effectively apply modern developments in transport logistics?

According to Table 15 (question 20), it can be argued that, in general, the functioning of freight management is influenced by a number of factors, but the most important ones are: the effective organisation of freight transport (12 respondents), the planning (11 respondents), the execution (11 respondents), the control (10 respondents), and the possession and application of an effective system of road freight transport (10 respondents)

Table 15: Factors contributing to the effective functioning of freight management

Factors	Number of responses
Efficient freight planning	11
Efficient organisation of freight transport	12
Efficient freight transport	11
Efficient freight management	8
Efficient coordination of freight transport	9
Efficient control of freight transport	10
Efficient freight analysis	8
Timely and efficient freight accounting	7
Having and applying an efficient road haulage system	10

According to Table 16, the effective functioning of the freight transport process (Q21) is mainly determined by the involvement of qualified professionals in the process (13), the provision of the necessary documentation for freight transport (12), the effective preparation of the instructions for freight transport and the training of the drivers (10), the availability and management of the information required and necessary for the transport of freight (10), and the effective development of the routes for the transport of goods (10). The data collected also show that in a company, qualified staff and adequate preparation for the transport process are key factors for successful transport (see Table 16).

Table 16: Factors contributing to the efficient functioning of the freight transport process

Factors	Number of responses
Involvement of qualified professionals in the process	13
Choosing the optimum mode of transport for your goods	4
Efficient preparation of transport instructions and driver training	10
Possession and management of the information required and necessary for the transport of goods (loading/unloading location, time, method of loading/unloading, etc.)	10
Ensuring the necessary documentation for freight transport (permits, certificates, approvals)	12
Efficient freight routing	10
Timely and efficient freight transport	6
Efficient execution of the necessary customs procedures	8
Having and applying an efficient road haulage system	7

The technical/technological functioning of freight transport (Question 22) is, according to the respondents, influenced by a number of factors, but the most important ones are the efficient use of IT-based systems (11 respondents), the management of unforeseen breakdowns and problems on the road and the assurance of their elimination (11 respondents), having a garage service that guarantees a minimum of breakdowns during the transport of goods (10 respondents), efficient preparation of the vehicle for the transport of goods (9 respondents), and having and applying an efficient road haulage system (8 respondents). On the basis of these responses, it can be concluded that the technical/technological aspects of freight transport are the application of modern information technology, the technical preparation of the vehicles and the possession and application of an efficient system (see Table 17).

Table 17: Factors influencing the efficient technical/technological functioning of freight transport

Factors	Number of responses
Efficient use of information technology-based systems (communication, video, navigation, vehicle maintenance and control parameter systems, management systems, etc.)	11
Efficient preparation of the vehicle for freight transport	9
Availability of a garage that guarantees a minimum number of breakdowns during transport	10
Availability and application of an effective IT-based vehicle maintenance and costing system	6
Technical efficiency and safety of loading/unloading operations	7
Maximum utilisation of vehicle load	3
Managing and ensuring the rectification of unforeseen breakdowns, problems on the road	11
Ensuring the security of freight transport	7
Having and applying an efficient road haulage system	8

Looking at the information presented in Table 18, the main elements of a successful trucking service (question 23) are customer reliability (12 respondents), the use and implementation of an effective marketing strategy (12 respondents) and the conclusion of long-term trucking contracts (10 respondents). Also effective dissemination of information about the services provided and related information about trucking, as well as effective interaction with customers by qualified personnel are also factors contributing to successful selling of trucking service (see Table 18).

Table 18: Factors influencing the performance of a freight forwarding service

Factors	Number of responses
Customer reliability	12
Reliability of partners	6
Long-term freight contracts	10
Availability of short-term freight contracts	2
Possession and execution of an effective marketing strategy	12
Effective communication with customers by qualified staff	8
Effective communication of service information and relevant freight information to customers	9

The survey also aimed to find out which information-based systems are used in the company's operations (question 24). According to Figure 32, all the applications mentioned in the answers are used in the company:

- Navigation systems;
- Car maintenance and control parameter systems;
- Telecommunication systems (including mobile technology, radio frequency systems);
- Management information systems
- Accounting applications.

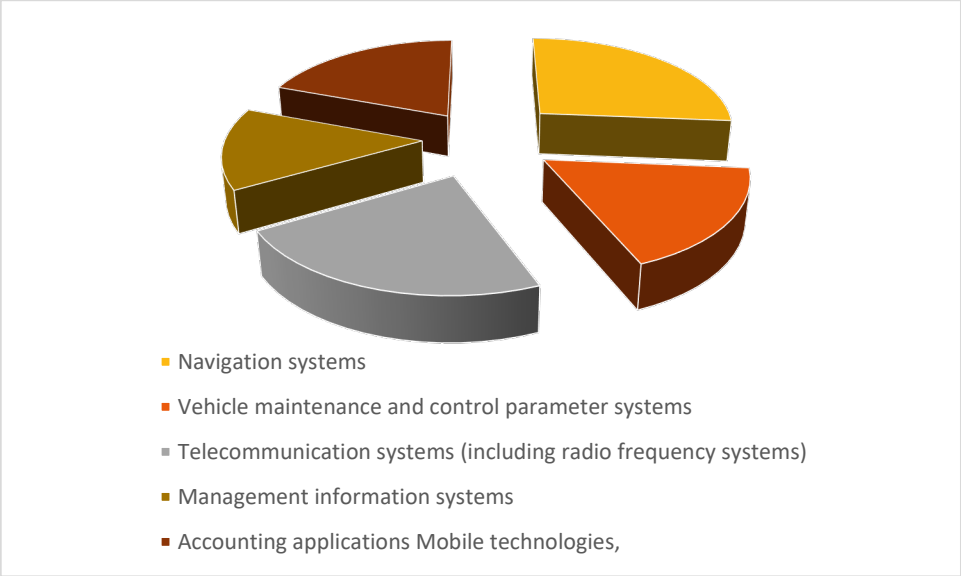

Figure 32: Information technology-based systems in the enterprise

In order to assess the effectiveness of IT-based systems in the company (question 25), the majority of respondents (11) stated that IT-based systems in the company are only partially effective and therefore need to be improved (see Figure 33).

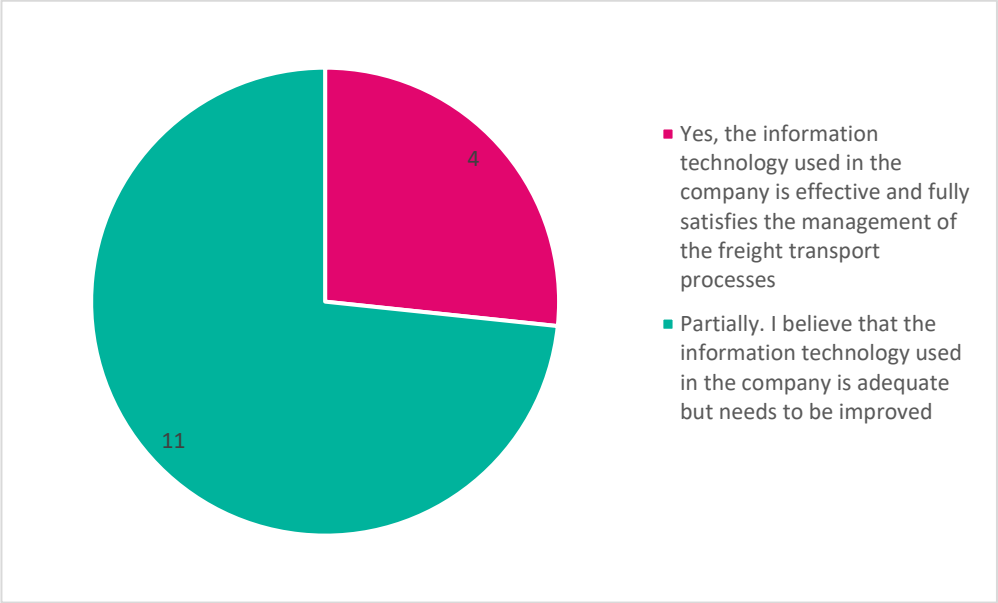

Figure 33: Effectiveness of information technology-based enterprise systems

Based on the respondents' opinion on the need to improve information technology (IT) in the company, it is necessary to clarify in which aspects IT systems should be improved (question 26). According to the data presented in Figure 34, it can be concluded that there is no need to radically replace the IT systems in the company. Instead, there is only a need to improve the existing systems and their application. According to 5 respondents, there is a need to improve IT systems and maximize their use. Another 4 respondents believe that it is important to integrate the entire IT system in the company and train employees to maximize the use of IT systems.

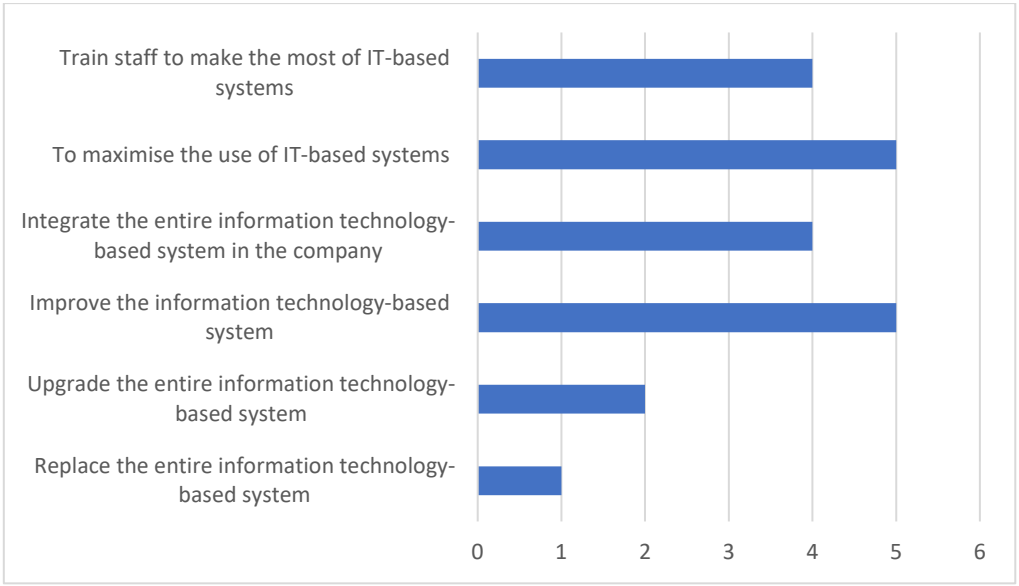

Figure 34: What needs to be improved in the area of information technology-based systems

Respondents were surveyed to find out what would be most effective to improve road freight management (question 27). The majority of respondents said that in order to improve road freight management it is important to:

- Improving freight planning (50% of respondents);
- Improving freight transport organisation (66%);
- Improving freight transport performance (47%);
- Improving freight control (47%);
- Improving freight analysis (47%).

According to respondents, it would be moderately important to improve freight management:

- Improving freight management (60% of respondents);
- Improving freight coordination (53%);
- Improving freight accounting (53%);
- Changing or improving the road haulage system (47%) (see Table 19).

Table 19: What would be most effective to improve road freight management

Statement	Number of people who ticked "not very important"	Number of people who marked "moderately important"	Number of people who marked "important"
1	2	3	4
Improving freight transport planning	3	5	**7**
Improving the organisation of freight transport	2	3	**10**
Improving freight transport performance	2	6	**7**
Improving freight management	1	**9**	5
Improving coordination of freight transport	2	**8**	5
Improving freight transport control	3	5	**7**
Improving analysis of freight transport	4	4	**7**
Improving freight transport accounting	4	**8**	3
Changing or improving the road haulage system	2	**7**	6

In order to improve the road transport process (Q28), the majority of respondents considered almost all elements important, except for the moderate importance of improving staff skills. Three key factors can be identified which were chosen as essential by the majority of respondents:

- Preparation of transport instructions and driver training;
- Possession and management of the information required and necessary for freight transport;
- Ensuring the necessary documentation for the transport of goods (see Table 20).

Table 20: What would be most effective to improve the road haulage process

Statement	Number of people who ticked "not very important"	Number of people who marked "moderately important"	Number of people who marked "important"
1	2	3	4
Staff development		**8**	7
Choosing the right mode of transport for your cargo	**5**	4	6
Preparation of transport instructions and driver training		4	**11**
Possession and management of the information required and necessary for the transport of goods (loading/unloading location, time, method of loading/unloading, etc.)	1	4	**10**
Ensuring that the documentation necessary for the transport of goods is in place (permits, certificates, attestations)		5	**10**
Improvement of routing of freight transport	3	5	**7**
Improving the execution of the necessary customs procedures	3	5	**7**
Modifying or improving an efficient road haulage system	1	5	**9**

Based on the information in Table 3, the most effective way to improve the technical/technological process of road haulage (Q29) would be:

- Improving the activity of preparing the vehicle for freight transport;
- Ensuring that the service of the workshop guarantees a minimum of breakdowns during the transport of the goods;
- Introducing an IT-based vehicle maintenance and costing system or improving the existing system;
- Improving the maximum utilisation of vehicle load;
- Improving the management of unforeseen breakdowns, on-road failures and ensuring their elimination;
- Replacing or improving an efficient road haulage system.

Moderately important and effective improvements to the technical/technological process of freight transport would include:

- Improvement of information technology based systems;
- Ensuring technical efficiency and safety of loading/unloading operations;
- Ensuring the security of freight transport.

Table 21: What would be the most effective way to improve the technical/technological process of road freight transport

Statement	Number of people who ticked "not very important"	Number of people who marked "moderately important"	Number of people who marked "important"
1	2	3	4
Improvement of information technology-based systems (communication, video, navigation, vehicle maintenance and control parameter systems, management systems, etc.)	1	**9**	5
Improvement of vehicle preparation activities for freight transport	1	6	**8**
Ensuring that the service provided by the workshop guarantees a minimum of breakdowns during the transport of goods	1	6	**8**
Implementation of an IT-based vehicle operation and costing system or improvement of an existing system	2	**7**	**7**
Ensuring the technical efficiency and safety of loading/unloading operations	3	**7**	5
Improving the maximum utilisation of vehicle load	6	3	**7**
Improving the management of unforeseen breakdowns, on-road problems and ensuring their elimination	3	6	**7**
Ensuring the safety of cargo transport	2	**8**	5
Replacing or improving an efficient road haulage system	3	5	**7**

The most effective way to improve the sale of a freight transport service would be to (Question 30):

- Having customer guarantees;
- Partner guarantees;
- Improving the system of dissemination and distribution of the company's services.

Moderately important would be:

- Availability of short-term freight contracts;
- Improvement of the marketing strategy currently used;
- Improvement of the communication and work with customers and partners of.

Table 22: What would be most effective to improve the sale of a freight transport service

Statement	Number of people who ticked "not very important"	Number of people who marked "moderately important"	Number of people who marked "important"
1	2	3	4
Guarantees from customers	2	2	**11**
Guarantees held by partners	1	4	**10**
Long-term freight contracts	2	4	**9**
Possession of short-term freight contracts	4	**8**	3
Improvement of current marketing strategy	1	**9**	5
Improvement of communication and work with customers and partners		**8**	7
Improvement of the system for the dissemination and distribution of the company's services	2	4	**9**

According to Figure 35 (question 31), the implementation of improvement actions in the company's freight transport activities should be done by a combination of employees and consultancies (8 respondents). 4 respondents say that employees and 3 respondents say that consultancies and specialists should implement improvement actions.

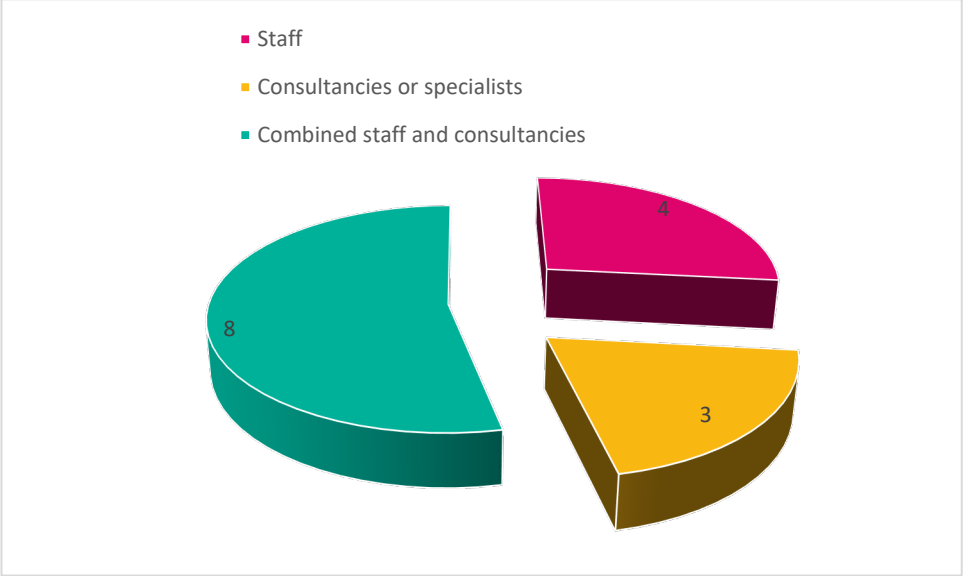

Figure 35: Who should implement improvement actions?

In terms of respondents' involvement in the improvement of the freight transport system (question 32), the majority of the respondents, i.e. 8 respondents, say that they are only partially involved in the improvement activities. 2 respondents answered that they are involved in improving the freight transport system. Two respondents answered that they did not think that their participation would contribute to the improvement of the road haulage system or that they were not qualified to do so. Also 1 respondent states that his/her suggestions for improving the freight transport process are ignored and therefore he/she avoids participating in the

improvement process. Based on the responses of a minority of respondents, it can be concluded that employees lack the motivation to seek improvements in the company's freight transport processes, and that it is necessary to understand the reasons for this and to strive to improve motivation, as the company is potentially losing out on important improvement solutions from skilled employees (see Figure 36).

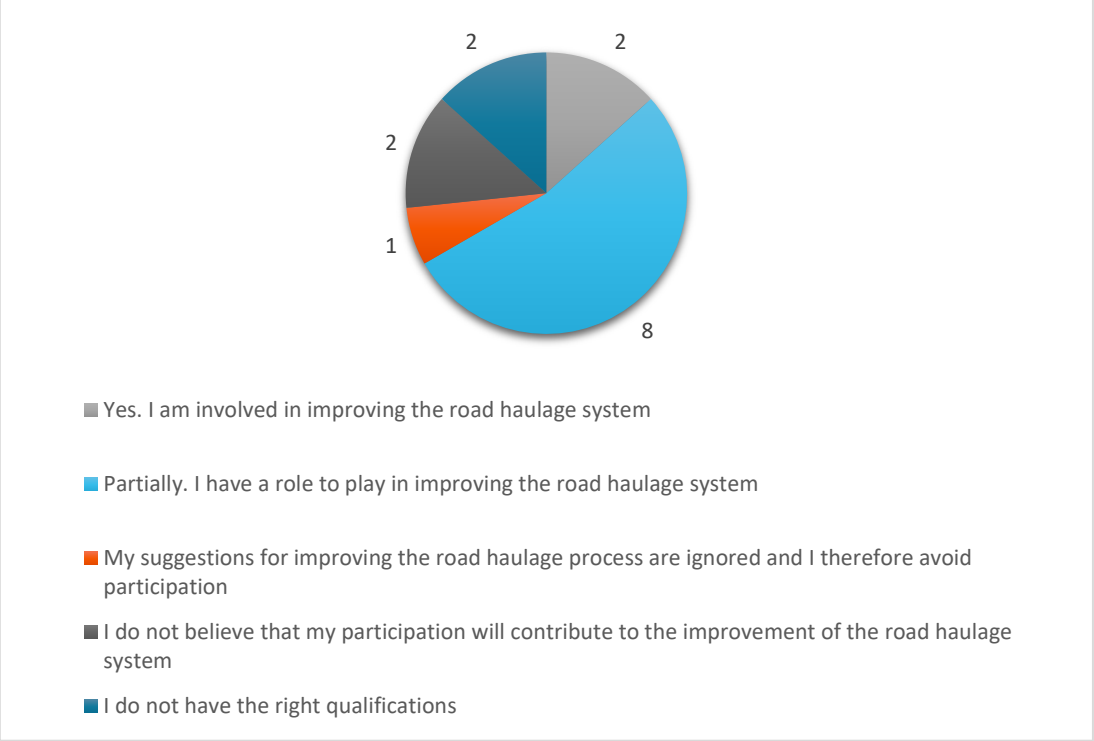

Figure 36: Respondents' involvement in improving the company's road haulage system

According to Figure 37 (question 33), respondents are mainly involved in improving the road haulage system as a team (12 respondents) and only 3 respondents say they are involved independently.

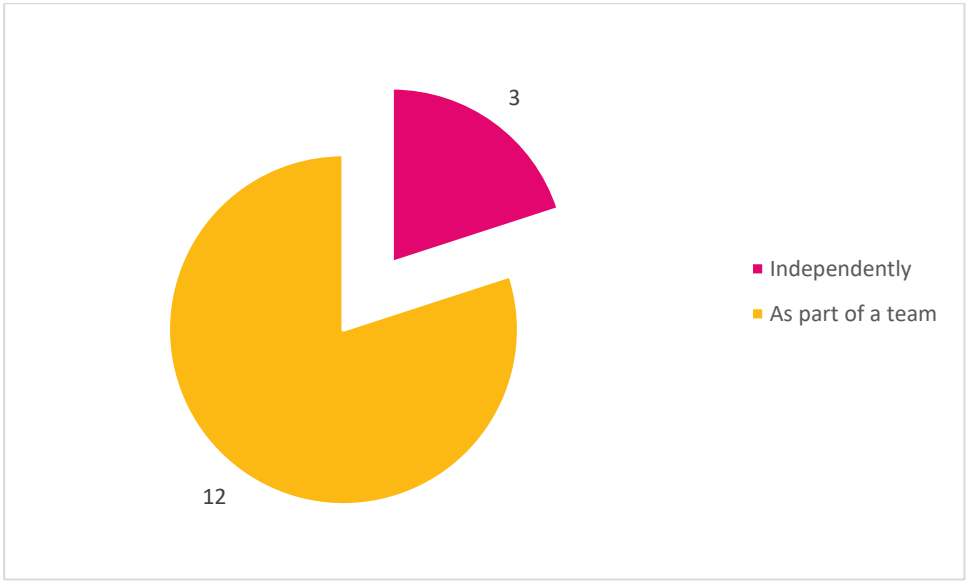

Figure 37: Participation of respondents in the improvement of the freight transport system

The survey also analysed the form in which changes in freight management, process, technical/technological and service sales improvements should be implemented.

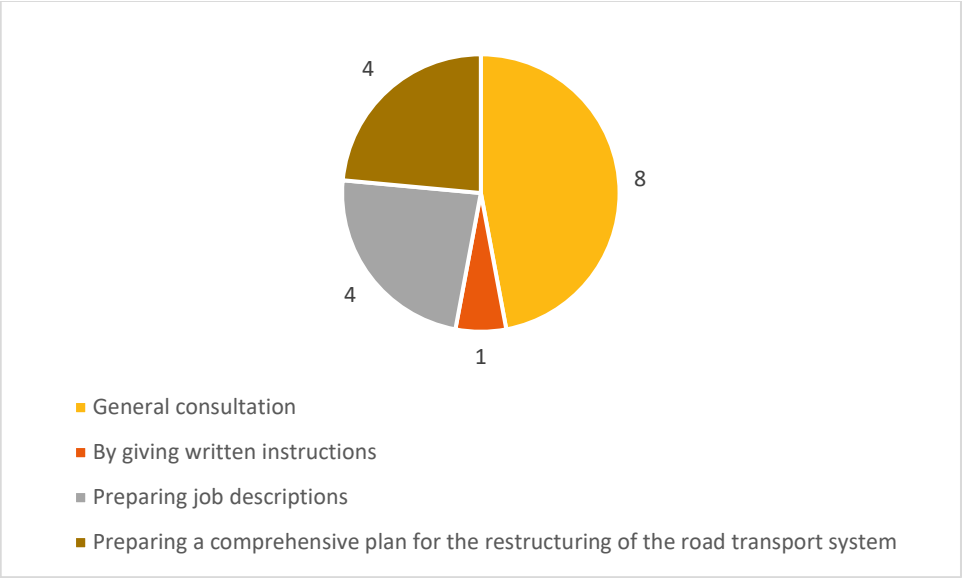

Figure 38: Survey of respondents' involvement in improving freight management

The majority of participants felt that actions to improve freight management performance (Question 34) should be formalized for implementation in a joint meeting (8 respondents). Four respondents each say that, however, job descriptions and a comprehensive plan for the transformation of the freight transport system should be developed. 1 respondent states that written instructions should be developed (see Figure 38).

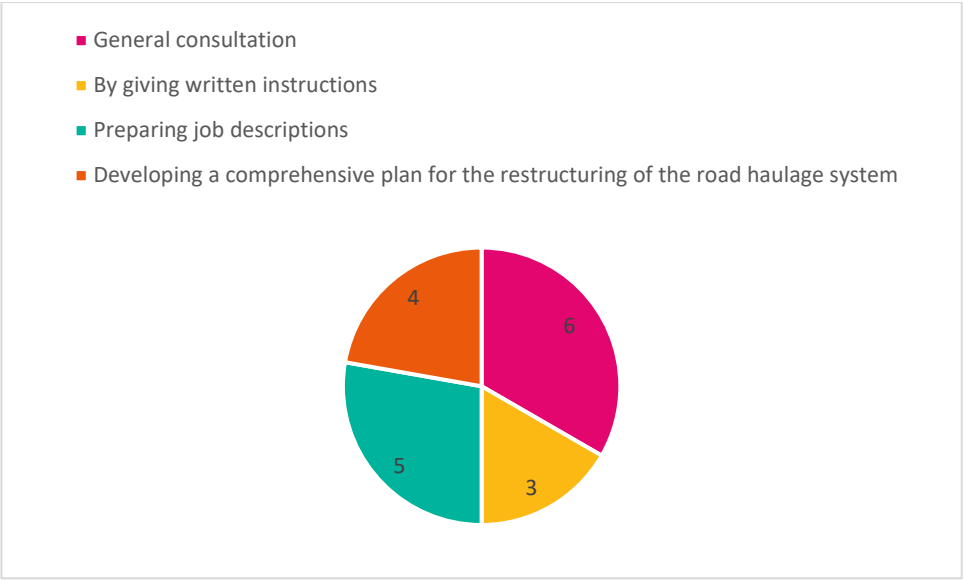

Figure 39: Form of respondents' participation in improving the freight transport process

The majority, i.e. 6 respondents, say that the actions to improve the freight transport process (question 35) should be formalised for implementation in a joint meeting. 5 respondents argue that job descriptions should still be prepared, 4 respondents argue that a comprehensive

plan for the transformation of the freight transport system should be developed and 3 respondents argue that written instructions should be given (see Figure 39).

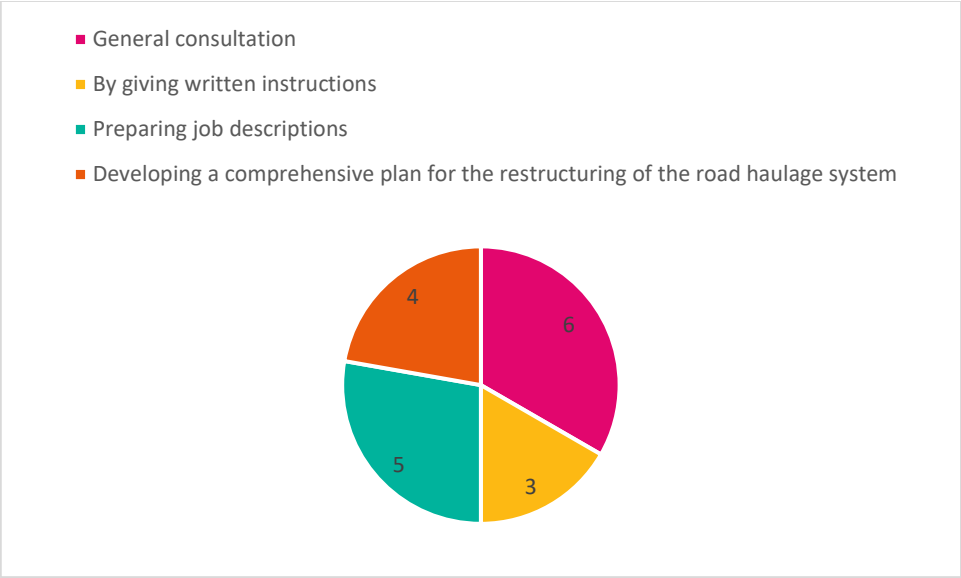

Figure 40: Form of respondents' participation in improving the technical/technological process of freight transport

According to the data presented in Figure 40, 6 respondents stated that the actions to improve the technical/technological process of freight transport (Q36) should be carried out in a general consultation. 5 respondents say that the improvement actions should be implemented through the preparing of job descriptions. 4 respondents say that improvement actions should be addresed through the preparation of a comprehensive plan for the restructuring of the road freight transport system and a minority (3 respondents) say that written instructions should be given.

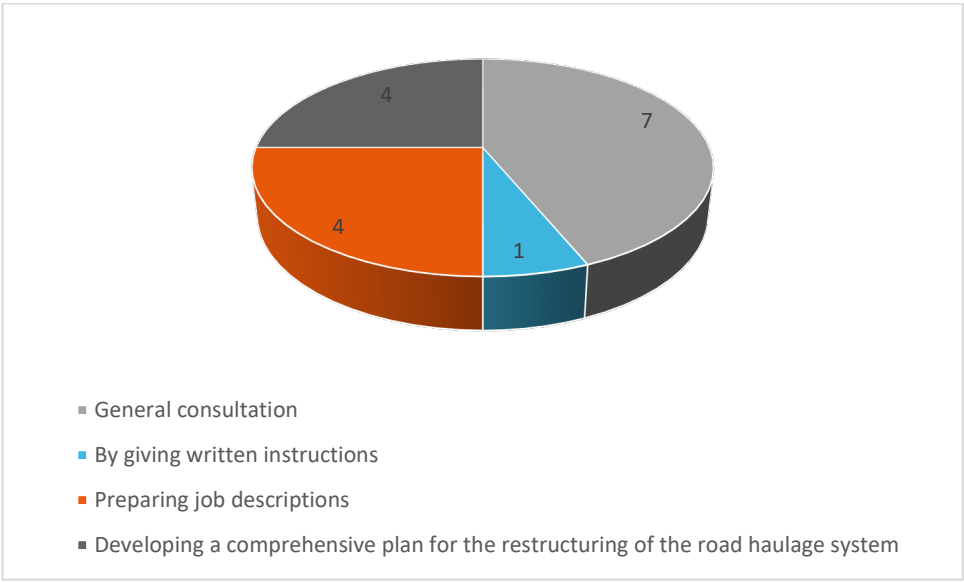

Figure 41: Form of respondents' participation in the improvement of freight transport service sales

Actions to improve the marketing of the freight service (question 37) should be formalised for implementation in a general consultation (7), according to Figure 41. 4 respondents say that job descriptions should still be drawn up, 4 respondents think that a comprehensive plan for the transformation of the freight transport system should be prepared and 1 respondent thinks that written instructions should be given (see Figure 41).

The last question (question 38) allowed respondents to express their opinions, observations or other suggestions on how to improve the freight transport performance of UAB Transporto vystymo grupė. Unfortunately, no respondents expressed their thoughts here. This shows the indifference and lack of motivation of the respondents when it comes to helping the company to improve its operations and freight transport processes.

To summarise the results of the SWOT analysis, the company's market position is quite competitive. Based on the analysis of the strengths and opportunities of the company, it can be concluded that the situation of the company has a good potential to achieve the set objectives. The firm also has the ability to mitigate some threats and to avoid others completely by using its strengths: experience, market position, innovation and the knowledge of its employees. However, the enterprise has a number of weaknesses which, in order to develop successfully, need to be eliminated by assessing the existing system and introducing changes that will allow the optimisation and efficient integration of all the enterprise's activities into the overall system.

The study of the freight transport system in UAB "Transporto vystymo grupė" has shown that the main problem in the freight transport management process is the ineffective analysis of freight transport, which leads to the same mistakes being made in the subsequent activities, which have not been analysed and eliminated. The main problems identified in the freight management process are the lack of qualification of the staff and the ineffective preparation of the freight management process. In the technical/technological freight transport process, the following problems are identified: inefficient preparation of the vehicle for the transport of goods and failure to manage and ensure the elimination of unforeseen breakdowns, road problems. In the marketing of services, the problems of not having long-term freight contracts and not having or not being able to effectively implement an effective marketing strategy.

To optimise freight management, it has been proposed to improve the planning and organisation of freight transport. It was suggested to improve the freight transport process at the initial stage of preparation for freight transport, i.e. to prepare freight transport instructions and

train drivers, to ensure that the necessary information for freight transport is available and managed efficiently, and to provide the necessary documentation for the transport of cargo. In order to optimise the technical/technological process, the most effective way would be to upgrade the process of preparing vehicles for freight transport and to ensure a minimum of breakdowns on the road, as well as to introduce or renew an IT-based vehicle operation and cost system. The most effective way to improve the sales of the freight transport service would be to improve customer and partner reliability and to modernise the system for the dissemination and distribution of the company's services.

4 A comprehensive plan for improving the road haulage system

In order to eliminate the shortcomings and problems of the freight transport system of UAB Transporto Vystymo Grupė, a comprehensive plan for the improvement of the freight transport system has been prepared on the basis of the analysed literature and the research carried out on the freight transport system in the company (see Table 23).

The improvement plan for the freight forwarding system is complex in that it brings together the objects to be improved, the measures, the actions, the deadlines and the persons responsible for developing the freight forwarding system. The following are the objects of the freight transport system improvement: freight planning and organisation, staff development, vehicle maintenance, development of freight transport services and customer relations.

The means of improving the freight transport system is through a targeted assessment of the facilities to be enhanced, which is planned to take place between 1 September 2023 and 1 October 2023. The evaluation of the freight system shall be the basis for the planned improvement actions, i.e. the development of an advanced freight system operating in a subsystem format within the overall freight system. The individual objects to be developed are interlinked, so that if one part of the system is not properly organised, the overall system will not function effectively. The upgraded freight system is planned to be ready by 31 October 2023. Once developed, the freight system shall be adapted and implemented by 20 November 2023.

UAB Transporto Vystymo Grupė constantly monitors and, if necessary, implements improvements to maximise the efficiency of the freight forwarding system. In addition, heads of

departments responsible for specific areas of activity are assigned to implement improvements at freight forwarding facilities.

However, in order to implement a comprehensive plan to improve the road transport system in UAB Transporto Vystymo Grupė, it is necessary to change the management structure. The division by functions includes commercial (logistics and finance), transport maintenance and repair, and personnel (see Fig. 42). The organisation of personnel by functional groups and their effective allocation are aimed at ensuring high quality of cargo transportation services, uninterrupted operation of the service and maximum financial efficiency.

The implementation and effectiveness of the comprehensive road transport system development plan directly depend on the attitude of management, availability of financial resources and staff motivation.

Improving the facility	Improvement measure	Deadlines for implementing improvement measures	Form of implementation of improvement actions	Deadline for implementing improvement actions	Persons responsible for implementing improvement actions	Observations, comments
1	**2**	**3**	**4**	**5**	**6**	**7**
1. The current freight transport system	A comprehensive audit of the freight transport system, analysing the performance, strengths, weaknesses and problems of the freight transport system.	To be carried out between 1 July 2023 and 1 August 2023.	On the basis of an audit of the integrated freight transport system: a) Develop an improved freight transport system, including: ➢ Cargo transport planning and organisation; ➢ Staff development; ➢ Car maintenance; ➢ Development of freight transport services and work with customers . b) adapting the freight transport system ; c) the introduction of a freight transport system; d) monitoring the operation of the implemented freight transport system; e) improving the system where necessary.	Implement the actions : a) by 31 September 2023. b) by 30 October 2023. c) by 20 November 2023. d) continuous monitoring of the implemented system and the introduction of improvements where necessary .	Director-General	A comprehensive audit of the freight transport system is carried out by a specialised audit firm with the participation of the company's responsible staff. The Logistics Manager is responsible for planning and organising freight transport, the Personnel Manager for staff development, the Head of Transport Maintenance and Repair for vehicle maintenance, the Commercial Director for service development and customer relations

2. Freight transport planning and organisation activities	Targeted assessment of freight planning and organisation performance, analysing the performance, strengths, weaknesses and problems of the freight planning and organisation system .	To be carried out between 1 July 2023 and 1 August 2023.	On the basis of an assessment of the planning and organisation of targeted freight transport : a) the development of an improved system for planning and organising freight transport, operating in a subsystem format within a common freight transport system, including: ➢ setting up departments within the company; ➢ implementation of integrated planning and analytical software; ➢ shifting performance management from managerial to divisional; ➢ preparation of detailed descriptions of the operational activities of the freight transport organisation. b) adapting the freight planning and organisation system; c) the introduction of a system for planning and organising freight transport; d) monitoring the operation of the implemented freight planning and organisation system; e) improve the system where necessary.	Implement the actions: a) by 31 September 2023. b) by 30 October 2023. c) by 20 November 2023. d) continuous monitoring of the implemented system and the introduction of improvements where necessary.	Logistics Manager	A comprehensive audit of the freight transport system is carried out by a specialised audit firm with the participation of the company's responsible staff. Responsible personnel - Commercial Manager, Customer Service Managers, Transport Managers, Marketing Managers.
3. Staff development	Targeted evaluation of the staff development system, analysing the state of play,	To be carried out between 1 July 2023 and 1 August 2023.	On the basis of the evaluation of the targeted staff development system: a) the development of an improved staff development system operating in a	Implement the actions:	Personnel Manager	Training is essential for drivers and managers in today's workforce skills assessment.

	strengths, weaknesses and problems of the staff development system.		subsystem format within the common freight system, including: ➢ a system for collecting information to assess existing staff skills and training needs; ➢ development of a qualification framework. b) adapting the in-service training system; c) introducing a system of in-service training; d) monitoring the implementation of the CPD system; e) improve the system where necessary.	a) by 31 September 2023. b) by 30 October 2023. c) by 20 November 2023. d) continuous monitoring of the implemented system and the introduction of improvements where necessary .		
4. Car maintenance	Targeted assessment of the performance of the car maintenance system	To be carried out between 1 July 2023 and 1 August 2023.	On the basis of a targeted evaluation of the car maintenance system: a) the development of an improved vehicle maintenance system operating in a subsystem format within the common freight transport system, including: ➢ quality garage services; ➢ prompt management of troubleshooting on the road; ➢ development of technical training courses for drivers for preliminary fault diagnosis.	Implement the actions: a) by 31 September 2023.	Head of Vehicle Maintenance and Repair	As a prerequisite, all drivers must be included in the training.

			b) adapting the car maintenance system; c) introduce a car maintenance system; d) monitoring of the implemented car maintenance system; e) improve the system where necessary.	b) by 30 October 2023. c) by 20 November 2023. d) continuous monitoring of the implemented system and the introduction of improvements where necessary.		
5. Developing freight transport services and working with customers	Targeted evaluation of the development of freight transport services and customer service	To be carried out between 1 July 2023 and 1 August 2023.	On the basis of an evaluation of the development of targeted freight transport services and customer service: a) the development of an improved system for the development of freight transport services and customer relations, operating in a subsystem format within a common freight transport system, including: ➢ setting up a market, competitor and service analysis system; ➢ maintaining prompt and constructive communication with existing customers; ➢ setting up a new customer discovery system for. b) adapting the system for the development of freight transport services and customer relations;	Implement the actions: a) by 31 September 2023. b) by 30 October 2023. c) by 20 November 2023.	Commercial Director	Work must be differentiated by region.

			c) the introduction of a system for the development of freight transport services and customer relations; d) monitoring the development of the implemented freight transport services and the customer relations system; e) improve the system where necessary.	d) continuous monitoring of the implemented system and the introduction of improvements where necessary .		

Table 23: A comprehensive plan to improve the road haulage system

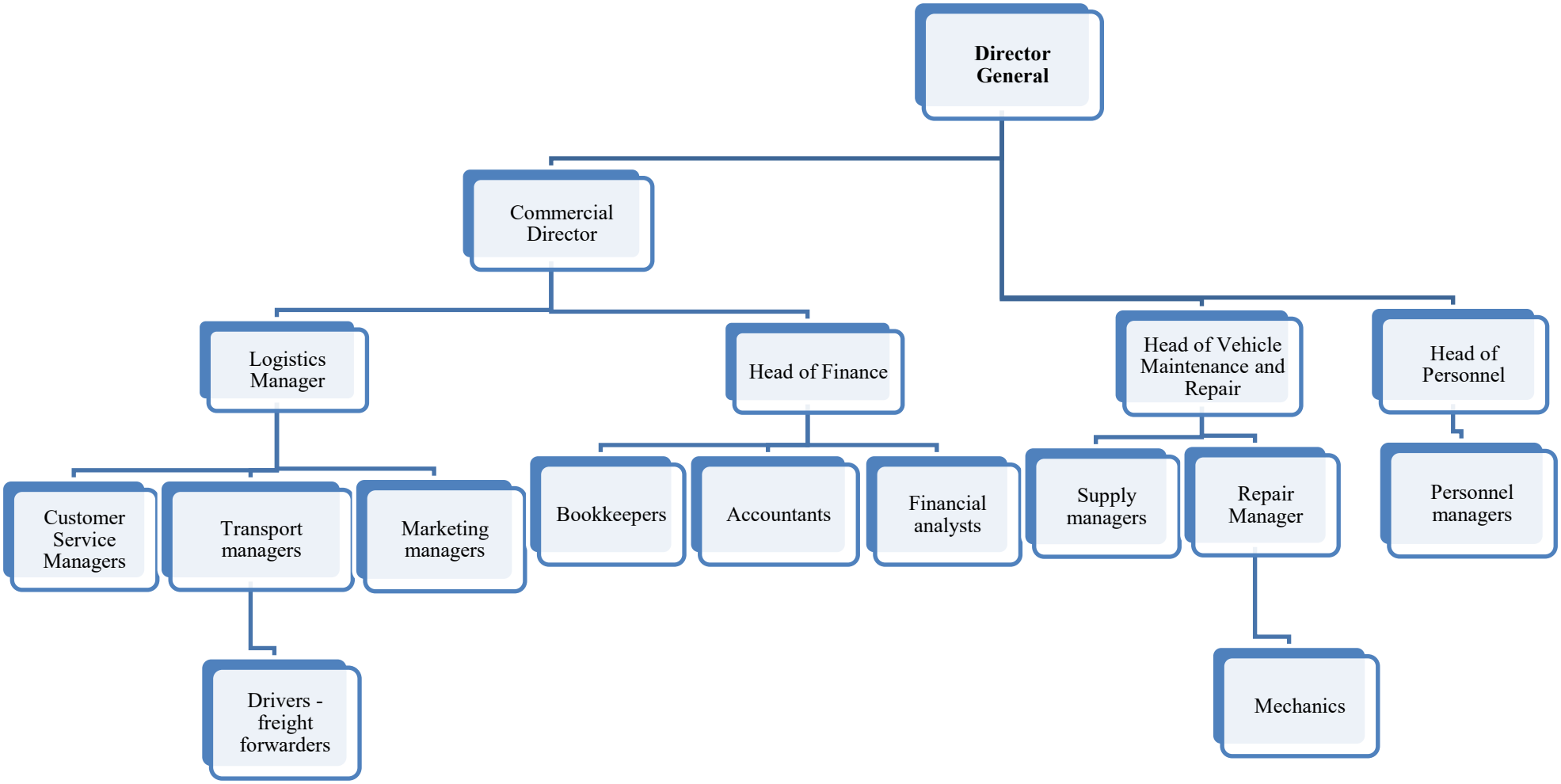

Figure 42: Update of the management structure of UAB "Transporto vystymo grupė"

5 Conclusion

The theoretical analysis has shown that transport, both in Europe and in Lithuania, is one of the largest basic branches of the economy, which ensures the functioning of the economy and the needs of the society in all types of transport. The functioning of transport is based on the following modes of transport: rail, water, road, air, pipeline. At present, water, rail, road and air transport are developed in Lithuania, but the individual modes of transport are not integrated into a single system as in Europe factors such as distance, urgency and cost play a crucial role in choosing the most appropriate method, since road freight transport services are provided by the private sector, rail and maritime transport by the public sector, and air transport is a mixed transport. In Lithuania, road transport is the most prominent sector, so optimisation and modernisation of this business sector is a priority not only for the country as a whole, but also for each road transport company individually.

The road transport logistics system in a company consists of employees, technical means, goods, service customers and the part that connects and manages the processes - information, its movement and use, and the organisational-technical resources involved in this process. The efficient functioning of the road transport logistics system requires the application of modern logistics optimisation models (such as Just-in-time) and modern information technology-based systems, and the optimisation of the functioning of the elements of the road transport logistics system is facilitated by the evaluation of the management and performance of the system and the implementation of the necessary changes.

The study of the road haulage activities of UAB Transporto vystymo grupė shows that the company's market position is quite competitive. The results of the SWOT showed that the company's strengths and capabilities enable the company to achieve its objectives. It also shows that UAB 'Transporto vystymo grupė' has the potential to mitigate some threats and to avoid others by using its strengths: experience, market position, innovation and the knowledge of its employees. However, there are weaknesses in the company that can be addressed through an assessment of the existing system and the introduction of changes that will improve the company's freight transport system

The study of the road transport system revealed major management and operational problems at UAB Transporto Vystymo Grupė. The main problems in the road freight transport system of UAB 'Transporto vystymo grupė' are:

- Inefficient organisation of sales of freight transport services;
- Lack of staff skills;
- Inefficient preparation for the freight transport process;
- Inefficient preparation of the vehicle for transporting the goods;
- Failure to manage unforeseen breakdowns, problems on the road and to ensure that they are resolved;
- Ineffective analysis of freight transport, leading to the same mistakes being made in subsequent operations that were not analysed and eliminated

The shortcomings of the road haulage system of UAB Transporto vystymo grupė confirm that the system needs to be improved.

During the theoretical analysis and research of the freight transport system in UAB Transporto vystymo grupė it was revealed that comprehensive changes are necessary to optimise the whole freight transport process. These changes can be realised through the implementation of a comprehensive plan presented in the fourth chapter of my project. In order to successfully implement this plan for the freight transport development, it is important to adjust the management structure of the company by dividing the employees into the following divisions: commercial management (logistics and finance), vehicle maintenance and repair, and human resources. Formation of such a management structure of the organisation will help us to successfully implement the improvement plan of the trucking system. The implementation of measures aimed at improving the freight transport system will ensure high quality of transport service, continuous operation of the service and achievement of maximum financial efficiency.

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Appendices

Appendix 1. Questionnaire

Abdukokhkhor Irismetov- the student of the faculty purchasing logistics and engineering of JAMK university of applied sciences, is conducting a research on the improvement of the system of freight transportation by road in UAB "Transporto vystymo grupė". The questionnaire is anonymous and the results will be used for the Bachelor's thesis. Please mark the most appropriate answer with an X.

Before the questions, I would like to briefly introduce the concept of 'system'. A system is a set of interacting elements. In a road transport company, a system consists of the following main elements: employees, vehicles, IT-based systems to manage information, financial and capital flows, customers and partners. All these elements are interlinked in the enterprise system and the efficiency of the interaction between all these elements determines the efficiency of the whole enterprise.

1. What are your responsibilities within the company?

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2. How long have you worked for the company?

- ☐ Less than 1 year
- ☐ 1-3 m.
- ☐ 3-10 m.
- ☐ More than 10 years

3. What is your educational background?

- ☐ Higher education;
- ☐ Higher;
- ☐ Unfinished higher education, post-secondary;
- ☐ Vocational;
- ☐ Secondary.

4. What is your gender?

- ☐ Male;
- ☐ Female.

5. What do you think freight transport is (multiple choice)?

- ☐ Moving a load from point A to point B;
- ☐ It is the changing of the location of a load using a vehicle;
- ☐ The totality of loading, transporting, unloading operations that form the basis of a transport logistics system;

- ☐ The totality of operations from the preparation of the cargo for shipment to the receipt of the cargo, involving the movement of the cargo in space without altering its geometric shapes, sizes and physical-chemical properties;
- ☐ Other (Add)

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6. How do you assess the organisation and performance of the freight transport process in your company?

- ☐ Very good. The freight transport process in the company is efficient;
- ☐ Good. The freight forwarding process in the company is sufficiently efficient;
- ☐ Satisfactory. The company's freight transport process is satisfactory;
- ☐ Poor. The company's freight transport process is inadequate;
- ☐ I have no opinion.

7. In your opinion, who should evaluate the current efficiency of the freight transport process in the company (multiple choice)?

- ☐ Employees;
- ☐ Consultancy firms and their specialists;
- ☐ Combined - employees and consultancy firms;
- ☐ I have no opinion.

8. In your opinion, in what form should the evaluation be conducted?

- ☐ Discussed in a meeting;
- ☐ By means of a survey of all employees;
- ☐ A survey of management level staff;
- ☐ Audit of the freight transport system;
- ☐ Other (Add)

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9. In your opinion, can freight transport in your company be seen as a formalised road freight transport system?

- ☐ Yes;
- ☐ Partially;
- ☐ No;
- ☐ I have no opinion.

10. If you answered 'yes' or 'partially' to Q9, do you think this road haulage system should be redesigned or would improvements be sufficient?

- ☐ I think that the road haulage system in the company needs to be redesigned;
- ☐ I think that the in-house road haulage system could be improved;
- ☐ I have no opinion.

11. What do you see as the advantages of freight management in your company (multiple choice)?

- ☐ Efficient freight planning;
- ☐ Efficient organisation of freight transport;
- ☐ Efficient freight transport;
- ☐ Efficient freight management;
- ☐ Efficient freight coordination;
- ☐ Efficient freight control;
- ☐ Efficient freight Analysis;
- ☐ Timely and efficient freight accounting;
- ☐ Possession and application of an efficient road haulage system;
- ☐ Other (Add)

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12. What do you see as the advantages of the freight forwarding process in your company (multiple choice)?

- ☐ Involvement of qualified professionals in the process;
- ☐ Choosing the optimal mode of transport for the freight;
- ☐ Efficient preparation of instructions and driver training;
- ☐ Possession and management of the information required and necessary for the transport of goods (loading/unloading location, time, method of loading/unloading, etc.);
- ☐ Ensuring the documentation necessary for the transport of goods (possession of permits, certificates, attestations);
- ☐ Efficient freight routing;
- ☐ Timely and efficient of freight transport;
- ☐ Efficient execution of required customs procedures;
- ☐ Possession and application of an efficient road haulage system;
- ☐ Other (Add)

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13. What do you see as the technical/technological advantages of freight transport in your company (multiple options)?

- ☐ Efficient use of IT-based systems (communication, video, navigation, vehicle maintenance and control parameter systems, management systems, etc.);
- ☐ Efficient preparation of the vehicle for the transport of goods;
- ☐ Availability of a workshop service that guarantees a minimum of breakdowns during the transport of goods;
- ☐ Possession and application of an efficient IT-based vehicle maintenance and cost system;

- ☐ Technical efficiency and safety of loading/unloading operations;
- ☐ Maximum utilisation of vehicle load;
- ☐ Managing and resolving unforeseen breakdowns, problems on the road;
- ☐ Ensuring the safety of cargo transport;
- ☐ Having and applying an efficient road haulage system;
- ☐ Other (Add)

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14. What do you see as the advantages of selling a freight forwarding service in your company (multiple choice)?

- ☐ Customer reliability;
- ☐ Reliability of partners;
- ☐ Availability of long-term freight contracts;
- ☐ Availability of short-term freight contracts;
- ☐ Possession and implementation of an effective marketing strategy;
- ☐ Effective communication with customers by qualified staff;
- ☐ Effective communication of service information and relevant freight information to customers;
- ☐ Other (Add)

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15.What do you see as the shortcomings of freight management in your company (multiple choice)?

- ☐ Inefficient freight planning;
- ☐ Inefficient organisation of freight transport;
- ☐ Inefficient freight management;
- ☐ Inefficient freight management;
- ☐ Inefficient coordination of freight transport;
- ☐ Ineffective freight control;
- ☐ Inefficient freight analysis;
- ☐ Untimely and inefficient freight accounting;
- ☐ Lack of or ineffective application of an efficient road haulage system;
- ☐ Other (Add)

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16. What do you see as the shortcomings of the freight transport process in your company (multiple choice)?

- ☐ Lack of qualified specialists or the involvement of unqualified staff (drivers, managers, accountants, mechanics) in the process;
- ☐ Sub-optimal choice of the type of transport vehicle;
- ☐ Inefficient preparation of the vehicle for transporting the goods;
- ☐ Inefficient preparation of instructions and training of drivers;
- ☐ Lack of or inability to manage the information required and necessary for the transport of goods (loading/unloading location, time, method of loading/unloading, etc.);
- ☐ Lack of documentation necessary for the transport of goods (possession of permits, certificates, attestations);
- ☐ Inefficient routing of freight;
- ☐ Untimely and inefficient execution of freight transport;
- ☐ Inefficient execution of required customs procedures;
- ☐ Untimely delivery of goods to their destination;
- ☐ Lack of or ineffective application of an efficient road haulage system;
- ☐ Other (Add)

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17. What do you see as the technical/technological shortcomings of freight transport in your company (multiple options)?

- ☐ Inefficient use of IT-based systems (communication, video, navigation, vehicle maintenance and control parameter systems, management systems, etc.);
- ☐ Inefficient preparation of the vehicle for transporting goods;
- ☐ Lack of efficient garage services or garage services that do not guarantee a minimum number of breakdowns during the transport of goods;
- ☐ Lack of or inability to use an efficient IT-based vehicle maintenance and cost system;
- ☐ Technical inefficiency or insecurity in loading/unloading operations;
- ☐ Failure to use the maximum vehicle load;
- ☐ Failure to manage and ensure the rectification of unforeseen breakdowns, problems on the road;
- ☐ Failure to ensure the safety of the transport of cargo;
- ☐ Lack of or ineffective application of an efficient road haulage system;
- ☐ Other (Add)

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18. What do you see as the shortcomings in the sale of freight forwarding services in your company (multiple choice)?

- ☐ Unreliability of customers;
- ☐ Unreliability of partners;
- ☐ Lack of long-term freight contracts;
- ☐ Lack of short-term freight contracts;
- ☐ Lack of or inability to execute an effective marketing strategy;
- ☐ Ineffective communication of qualified staff to customers;
- ☐ Ineffective communication of service information and relevant freight information to customers;
- ☐ Other (Add)

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19. Do you think that modern developments in transport logistics are effectively applied in your company?

- ☐ Yes;
- ☐ Partially;
- ☐ No;
- ☐ I have no opinion

20. In your opinion, what makes freight management work effectively (multiple choice)?

- ☐ Efficient freight planning;
- ☐ Efficient freight management;
- ☐ Efficient freight management;
- ☐ Efficient freight management;
- ☐ Efficient freight coordination;
- ☐ Efficient freight control;
- ☐ Efficient Freight Analysis;
- ☐ Timely and efficient freight accounting;
- ☐ Possession and application of an efficient road haulage system;
- ☐ Other (Add)

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21. In your opinion, what determines the efficient functioning of the freight transport process (multiple choice)?

- ☐ Involvement of qualified professionals in the process;
- ☐ Choice of the optimum mode of transport for the freight;
- ☐ Efficient preparation of instructions and training of drivers;
- ☐ Possession and management of the information required and necessary for the transport of goods (loading/unloading location, time, method of loading/unloading, etc.);

- ☐ Ensuring the documentation necessary for the transport of goods (possession of permits, certificates, attestations);
- ☐ Efficient freight routing;
- ☐ Timely and efficient execution of freight transport;
- ☐ Efficient execution of required customs procedures;
- ☐ Possession and application of an efficient road haulage system;
- ☐ Other (Add)

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22. In your opinion, what determines the efficient technical/technological functioning of freight transport (multiple choice)?

- ☐ Efficient use of information technology-based systems (communication, video, navigation, vehicle maintenance and control parameter systems, management systems, etc.);
- ☐ Efficient preparation of the vehicle for the transport of goods;
- ☐ Availability of a workshop service that guarantees a minimum of breakdowns during the transport of goods;
- ☐ Possession and application of an efficient IT-based vehicle maintenance and cost system;
- ☐ Technical efficiency/safety of loading/unloading operations;
- ☐ Maximum utilisation of vehicle load;
- ☐ Managing and resolving unforeseen breakdowns, problems on the road;
- ☐ Ensuring the safety of cargo transport;
- ☐ Having and applying an efficient road haulage system;
- ☐ Other (Add)

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23. In your opinion, what determines the effective functioning of the freight transport service sales (multiple choice)?

- ☐ Customer reliability;
- ☐ Reliability of partners;
- ☐ Availability of long-term freight contracts;
- ☐ Availability of short-term freight contracts;
- ☐ Possession and implementation of an effective marketing strategy;
- ☐ Effective communication with customers by qualified staff;
- ☐ Effective communication of service information and relevant freight information to customers;
- ☐ Other (Add)

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24. Which IT-based systems are used in your company? (multiple choice)

- ☐ Navigation systems;
- ☐ Car maintenance and control parameter systems;
- ☐ Telecommunication systems (including mobile technologies, radio frequency systems);
- ☐ Management information systems
- ☐ Accounting applications;
- ☐ Other (Add)

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25. Do you think that the information technology-based systems in place in your company are sufficient for the effective management of the road haulage system processes?

- ☐ Yes, the information technology used in the company is effective and fully satisfies the management of the freight transport processes;
- ☐ Partially. I think that the information technology in the company is sufficient but needs to be improved;
- ☐ No, the information technology in the company does not fully fulfil the necessary functions for the management of the freight transport system;
- ☐ I have no opinion.

26. In your opinion, what should be improved in the area of information technology-based systems in your company?

- ☐ Replace the entire IT-based system;
- ☐ Upgrade the entire IT-based system;
- ☐ Improve the information technology-based system;
- ☐ Integrate the entire information technology-based system in the company;
- ☐ Achieve maximum utilisation of the IT-based system;
- ☐ Train employees to maximise the use of IT-based systems;
- ☐ Other (Add)

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27. If your company decided to improve the management of road freight transport, what do you think would be most effective? Please rate in order of importance: 3 - important, 2 - moderately important, 1- not important.

Statement	1	2	3
Improving freight transport planning			
Improving the organisation of freight transport			
Improving freight transport performance			
Improving freight management			
Improving coordination of freight transport			
Improving freight transport control			
Improving freight analysis			
Improving freight transport accounting			
Changing or improving the road haulage system			
Other(Add)_____ _____ _____ _____ _____			

28. If your company decided to improve its freight transport process, what would be the most effective in your opinion? Please rate in order of importance: 3 - important, 2 - moderately important, 1- not important.

Statement	1	2	3
Staff development			
Choosing the right mode of transport for your cargo			
Preparation of transport instructions and driver training			
Possession and management of the information required and necessary for the transport of goods (loading/unloading location, time, method of loading/unloading, etc.)			
Ensuring that the documentation necessary for the transport of goods is in place (permits, certificates, attestations)			
Improvement of routing of freight transport			
Improving the execution of the necessary customs procedures			
Modifying or improving an efficient road haulage system			
Other (Add) _____ _____ _____ _____			

29. If your company decided to improve the technical/technological process of freight transport, what would be the most effective in your opinion? Please rate in order of importance: 3 - important, 2 - moderately important, 1- not important.

Statement	1	2	3
Improvement of information technology-based systems (communication, video, navigation, vehicle maintenance and control parameter systems, management systems, etc.)			
Improvement of vehicle preparation activities for freight transport			
Ensuring that the service provided by the workshop guarantees a minimum of breakdowns during the transport of goods			
Implementation of an IT-based vehicle operation and costing system or improvement of an existing system			
Ensuring the technical efficiency and safety of loading/unloading operations			
Improving the maximum utilisation of vehicle load			
Improving the management of unforeseen breakdowns, on-road problems and ensuring their elimination			
Ensuring the safety of cargo transport			
Replacing or improving an efficient road haulage system			
Other (Add) _____ _____ _____			

30. If your company decided to improve the way it sells its freight transport service, what would be the most effective in your opinion? Please rank in order of importance: 3 - important, 2 - moderately important, 1- not very important.

Statement	1	2	3
Guarantees from customers			
Guarantees held by partners			
Long-term freight contracts			
Possession of short-term freight contracts			
Improvement of current marketing strategy			
Improvement of communication and work with customers and partners			
Improvement of the system for the dissemination and distribution of the company's services			
Other (Add) _____ _____ _____			

31. Who should implement these improvement actions?

- ☐ Staff;
- ☐ Consultancy firms or specialists;
- ☐ Combined staff and consultancy firms;
- ☐ I have no opinion.

32. Are you involved in the development of the company's road haulage system?

- ☐ Yes. I am involved in the development of the road haulage system;
- ☐ Partially. I am involved in improving the road haulage system;

- ☐ My suggestions for improving the road haulage process are ignored and I avoid participation.
- ☐ I do not believe that my participation will contribute to improving the road haulage system;
- ☐ I do not have the right qualifications.

33. If you have to participate, in what form?

- ☐ On my own;
- ☐ In a team;
- ☐ Invited by management.

34. In your opinion, in what form should the envisaged changes to improve freight management be formalised for implementation?

- ☐ In a joint meeting;
- ☐ By written instructions;
- ☐ By means of job descriptions;
- ☐ Preparation of a comprehensive plan for the transformation of the road haulage system.

35. In your opinion, in what form should the envisaged changes to improve the freight transport process be formalised for implementation?

- ☐ In a joint consultation;
- ☐ By written instructions;
- ☐ By means of job descriptions;
- ☐ Preparation of a comprehensive plan for the transformation of the road haulage system.

36. In your opinion, in what form should the envisaged technical/technological improvements in freight transport be formalised for implementation?

- ☐ In a joint consultation;
- ☐ By means of written instructions;
- ☐ By means of job descriptions;
- ☐ Preparation of a comprehensive plan for the transformation of the road haulage system.

37. In your opinion, in what form should the changes envisaged to improve the marketing of the freight transport service be formalised for implementation?

- ☐ In a joint consultation;
- ☐ By written instructions;
- ☐ By means of job descriptions;
- ☐ Preparation of a comprehensive plan for the transformation of the road haulage system.

38. Other observations, opinions and comments you may have on issues related to the improvement of freight transport activities in your company:

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