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TOPICAL PROBLEMS AND DEVELOPMENT PERSPECTIVES OF
INTERNATIONAL FREIGHT TRANSPORT

Bachelor's Thesis 2014

ABSTRACT

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Typical Problems and Development

Perspectives of International Freight

Transport

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The title of thesis is Typical Problems and Development Perspectives of International Freight Transport. This study was dedicated to different modes of international transportation, freight and logistics their advantages and disadvantages. Another essential part of the work was related to different way for transport development and its efficient usage.

The objective was to explore modes of freight transport and logistics in details and, thereof, reveal advantages and disadvantages. On the basis of this information, suggestions to improve the international freight transport will be made.

In this research were used qualitative research methods. Interviews were done with the suppliers from logistical and marketing companies. For collection of more different data, several companies with different transportation logistics, like shipping agencies, railway stations and airports were interviewed. For the purpose of the objective, the following tasks were proposed Research of transport infrastructure's development; Research of transport logistics; Definition of the role of transit in economy. Summarisation of conclusions and suggestions made theory on transport infrastructure development, advantages and disadvantages.

Based on the theoretical conclusions can be seen that modern transport infrastructure and its development are of important role not only in freight transport but also in the daily life of residents. Also problems and their possible solutions were identified. The suggestions were made according to the researched topical problems of freight transport, such as the reduction of air pollution, the creation of logistics centres and modernized containers.

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1 INTRODUCTION

Long time ago transport has already been recognised as one of the main sectors of the national economy and social development. The global transport infrastructure serves as carriers of foreign freight and passengers. Effective transport and its communications are the basis for the free movement of capital, goods, services, and persons.

Transport is of great importance in the provision of economical and welfare development in all regions, and it helps the poor regions to grow.

Developed transport infrastructure is important for economic development due to two reasons:

1. It promotes economy growth?
2. It allows entering the market of other countries with competitive goods and services.

In the market conditions, the importance of transport increases all the time as fast and safe delivery is one of the main conditions convincing customers to buy goods and services. Therefore it must be reminded that substantial changes are caused by the distance as it comprises not only the price but also availability of market information, contacts with suppliers, and dislocation.

Research subject is to analyse the role of transport within the world economy in order to gain more knowledge on development of global transport infrastructure.

Research object – the transport field and international freight transport problems within the world economy.

The objective of the paper is:

- To explore modes of freight transport and logistics thereof revealing advantages and disadvantages.
- For the purpose of the Paper, two hypotheses are proposed:
- Solving international freight transport problems causes a necessity of endless improvement in the transport infrastructure;
- Problems caused by transportation and solutions thereof.

Tasks are as follows:

- Research of the freight transport structure and paying attention to freight transport processes;
- Analysis of the positive and negative aspects of each mode of transport;
- Definition of problems caused by the freight transport process;
- Making conclusions and suggestions.

The research object is the topical problems of freight transport including such subchapters as transport structure, logistics companies and other enterprises dealing with transportation, and freight transport safety.

The first chapter examines theory on transport importance and essence, the structure of logistics, and freight transport safety. Theoretical basis is gathered of different books on marketing and logistics theory, and sea business, as well as internet resources incorporating transport laws and regulations, international conventions, and sea conventions. In the second and third chapter, there are description and analysis of the topical problems of international freight transport and solutions thereof are named.

For the purpose of the Paper, qualitative research method was used, and it includes oral data and interviews. Negotiations and interviews with entrepreneurs from different logistics enterprises and ports, for instance, of Helsinki, Kotka, and Riga, were made thus helping to reveal the problems and obtain more information on the subject chosen by the

Paper's author and to find out more aspects of their approach in seeking solutions to daily problems.

2 LOGISTICS

Each mode of transport has its own set of peculiarities from the point of view of logistics management, as well as advantages and disadvantages defining its usage in the logistics system.

2.1. ESSENCE OF LOGISTICS

Logistics is planning, implementation, and control process of raw materials, materials, manufacturing, finished production, services, and information starting from their place of origin to the customer with an aim to reduce costs and fully satisfy the customer's needs. Logistics in business organises freight material movement. The term at first was related to military operation but gradually it has broadened to cover economical activities. [18]

Logistics means that a number of separate activities is harmonised. In 1991 Council of Logistics Management that is a trade organisation located in the United State of America defined logistics as “a planning process that implements and effectively controls goods flow and storage and controls the service and related information about the freight transportation from its starting point that is indicated by the customer's consumption intention and corresponds to the his or her needs.” [25]

Logistics – it is a science of planning, control, and management of operations of transportation, loading in the warehouse, and other tangible and intangible operations that transport raw materials and materials to manufacturing enterprises, processing of raw materials, materials, and semi-finished products, transportation of finished production to the customer according to his/her interests and requirements, as well as handling, processing, and storage of the corresponding information. [22]

Logistics as a subject has formed comparatively recently therefore also various wordings and explanations can be offered to the definition of logistics. [37]

Logistics is an economically effective planning, implementation, and control process of raw materials, stock, finished production and their related information flow from their place of origin to the chosen consumption place with an objective to satisfy the customer's needs. Besides, logistics can be defined as a comprehensive and systematic planning, governing, and controlling of information, materials, production, labour force, and energy. [18]

In the essence of logistics there is a set of operations that consist of definition of the needed production and potential suppliers, development of a tender provisions, announcement of the tender, evaluation of the applications received, drawing the sales contract, fulfilment of the contract provisions, production receipt and the related clearance procedures, loading, transportation, unloading, deployment planning, use of assist, storage, selection from the storage place, freight completion, registration, accounting, preparation of accompanying documentation, and other operations that are related with material flow. [25]

Logistics is an economically effective planning, implementation, and control process of raw materials, stock, finished production, and their related information flow from their place of origin to the chosen consumption place with an objective to satisfy the customer's needs. Logistics is vital for any enterprise that operates in the developed economical environment. [22]

Logistics services allow delivering goods where there they are consumed. The task of logistics in an enterprise is to make the needed goods or services to be delivered to the necessary place and quality using the most effective methods.

A Russian professor, M. Gordon, that logistics can be looked at in two levels [20]:

- Logistics as an economical process. There are features of logistics in any field or sector, and they are concisely and knowingly used in the modern global economy conditions. It could substantially facilitate the general economy growth.
- Logistics as a management system. It allows looking to the current processes from other point of view and seeing not only activity of a particular enterprise but also examining its achievement and task in a unified and integrated system. In fact, logistics as a set of operations is not anything new. It does not need inexperienced by now operations but new and inexperienced vision of these operations and mutual coordination emphasising the harmony and impact of these operations on the result of the process – a satisfied customer – and not separate actions, as the author thinks that any process of goods production ends only when goods are delivered to their direct customer.

2.1.2. STRATEGIC PLANNING OF LOGISTICS

For logistics efficiency, strategic planning has become as important as the improvement of manufacturing and trade. As enterprises are globalised activities, factors of logistics planning and decisions have become more complicated. [20]

The integrated world economy and world competition arena make enterprises to develop their products in the world market and rationalise their manufacturing processes in order to increase the enterprise's resources. Enterprises need to coordinate their functional operations and harmonise their global character in the business. [3]

Unfortunately what regards the enterprise's strategy, the major part of operational / logistics functions still remain unchanged and have a role of being traditionally reactive or tactical. There is an opinion of the management that operations and strategies in logistics enterprise are

developed in their tactical nature without the management's contribution and approval, thus reducing the costs. There are a number of reasons for old-fashioned attitude of the management including [9]:

- functional dominance in several fields when defining the corporate strategy;
- short-term vision to the operation / logistics for payments;
- confidence that operations and logistics are technical specialties and not strategic business functions.

Delivery of goods from a manufacturing unit or warehouse directly affects the total costs of the delivery system. The main task of deployment planning is to find the most effective possible (lower costs / higher profit) solutions to provide goods or service flow. [25]

2.1.3. DIFFERENCES IN LOGISTICS

International logistics enterprises differ from national logistics enterprises, and it is not so only in the terms of transfer for the same measures to another place. Often the differences are the following [9]:

- International trade usually means much bigger shipment sizes in order to cover the costs and transport-caused problems.
- International markets are more complicated, with big changes in demand and serious importance in any market.
- Majority organisations are less experienced with international logistics enterprises as they are operating in the places where there is less knowledge on international transportation. [9]
- More work and documentation with intermediaries, for instance, freight expeditors and clearance agents.
- Contacts are not so easy accessible due to distance and different cultures.
- Trade term for freight transportation differs, and it is longer.
- Financial provisions can be not so specific.
- Documentation is more complicated.

Logistics refers to the procedure of managing goods, resources and information from the source to the consumers in a manner that fits the requirements of both parties. On the other hand, transport is the movements of the goods from one point to the other. Transportation is often considered as a part of logistics.[10]

2.2 TRANSPORT LOGISTICS

Transport deals with introduction of means of conveyance using freight or warehouses. The product is transferred by various modes of transport. Transport is the most expensive type of logistics activity making 50 per cent of the total costs of logistics. [10]

2.2.1. IMPORTANCE OF TRANSPORT IN LOGISTICS

Often the term “transport” is understood as a set of infrastructure, vehicle management for transport enterprises making the transport system in economy sector. [7]

Transport is a set of instruments meant to transfer persons and freight from one place to another. [7]

Long time ago transport already has been recognised as one of the main sectors of the national economy and social development. Effective transport and communications thereof are a basis of free movement of capital, goods, services, and persons. [12]

Transport is a part of economical activity related to satisfaction of increasing needs of humans by changing location of goods and persons. By help of transport, raw materials can be delivered to the place where they can be the most easily processed while the finished production is delivered to the place where it is easier for the customers to use it. [24]

Transport is one of the biggest infrastructure sectors. The concept “transport” includes vehicles, traffic roads and routes, as well as

different technical constructions and devices that provide normal operation of vehicles and traffic roads. [11] Each mode of transport comprises three basic components or elements: roads, terminals, and rolling stock (moving stock). [29]

Transport is a mean that deliberates natural, artificial, and labour resources from the places where they are not really useful and transfer them to the places where their usefulness can be implemented in the higher level. This is the way how transport ensures access to the resources and allows gaining an effect that was not obtained previously. Thus transport deliberates natural resources from their geographical restrictions and makes them directly available. [11]

Transport has the main role in economy achievements thus allowing safe and effective distribution of goods and services in the entire supply chain. Transport connects various integrated logistics activities. Without transport, the integrated logistics system would be damaged. Without the transport connection, raw materials cannot flow into warehouses nor can the flow of finished goods be transferred from warehouses to customers. [10]

2.2.3. PROFILE OF TRANSPORT LOGISTICS

Transport logistics can be defined as a discipline covering three main activity fields [26]:

- the process of freight or goods rational and cheap delivery (transportation) planning, organisation, and realisation from manufacturing places to consumption places;
- monitoring of all transportation and other operations occurring during the freight transportation including modern telecommunication, informatics, and other information technology tools;
- provision of the corresponding information to freight owners.

Freight transportation is an integral part of logistics chain management, however traditionally it must be considered as a service that is easy accessible when suppliers and distributors need it. Besides, transport is considered to be a value non-adding activity in the supply chain although this assumption can be contested based on the fact that transport is of important role in this supply chain and if its manager is right, it can allow more effective work of the freight transportation chain. [17]

Transport system carries goods from the starting point to the destination using vehicles, for instance, trucks, tractors, trailers, crews, pallets, containers, cars, and trains. [14]

Transport system is an organisation that designs, organises, makes schedules to freight and transport shipments in time – defined and limited period of time considering technical restrictions and with the lowest possible costs. [22]

In the current development of the fields of science and technology that increase consumption and global commerce, the role of transport must be emphasised in all the processes as there is big competition among manufacturers and transport owners, and the freight to clients must be delivered in a qualitative way. Other critical competition factors reduce preparation time causing delay, and along with that the whole transportation costs increase, as well as transportation efficiency, client loyalty, and freight safety decrease. [22]

A number of international trade agreements and economy unions, for instance, European Union, North America Freight Trade Association (NAFTA), and Association of Southeast Asian Nations (ASEAN), and among them also association enterprises have greatly affected the global trade. Many products are manufactured and distributed in regions and continents where there is huge effect on transport abilities. As these changes have taken place, it has greatly affected structure distribution

and logistics system in the entire Europe and the rest of the world – trade barriers are broken down and new transport networks are launched. [7]

From the perspective of the different modes, it seems that higher productivity and adaptability of freight transport will put additional pressure on the railway by help of trains and along with the growing demand for service level. If such concept as just-in-time (JIT) continues to evolve with the requirement of regular and frequent deliverable, flexible, and reduced stock level, then it will not be so easy for competition of railway and water transport systems. Railway enterprises need to develop their systems thus offering flexible and low-cost advantages if comparing with freight transport and container services. As for long time and distance, railway must be able to compete with road transportation. Air freight field must continue its development niche in the sector providing fast delivery from the world's share detention centres. Computerised systems allow improving reliability and transit time in relation with all modes of transport. [7]

2.3.4. INDUSTRIAL AND TRUNK TRANSPORT

Depending on functions of the manufacturing process, transport can be divided in:

- 1) Internal or industrial that provides the manufacturing process (supply of raw materials and materials from outer roads and transportation of the finished production in the opposite direction);
- 2) External or trunk that provides communication between manufacturers and customers, as well as carriage of passengers.

Industrial modes of transport are very diverse [11]: cranes, motor transport, railway, a. o.

Trunk transport is divided in: [11]

- 1) Car transport;
- 2) Water (river and sea) transport;
- 3) Railway transport;
- 4) Pipeline transport.

Each mode of trunk transport correspondingly is attended by transport roads and vehicles: [11]:

- 1) Streets – cars and car transport;
- 2) Rails – train compositions;
- 3) Navigation routes – vessels;
- 4) Air corridors – airplanes;
- 5) Pipelines – pipelines.

Trunk road, trunk highway, or strategic road main road, usually connecting two or more cities, ports, airports and other locations, which is the recommended route for long-distance and freight traffic. Many highways separated bands in carriageways or motorways are standard.

2.3.4.1 Railway transport

Railway transport means a mobile device that travels only on rails and by its own driving force (pulling vehicle) or that (luxury wagons, car wagon trailers, baggage carriages, or goods wagons) is being pulled by another vehicle. [2]

Focusing on the share of international transport, the geographical location of the countries plays a key role. Countries registering the highest share of international transport are located in key corridors within the European market. In the Baltic States of Latvia and Estonia, situated at the border between Europe and Russia, international transport accounted for 90 % and 87 % respectively of the total transport performance in 2012. [53]

Advantages are high transportation and throughput capacity, independence of climate, seasons, and time of a day, ability of effective organisation of loading and unloading work performance. Relatively low tariffs, relevant discount for transit, big freight delivery speed for bigger distances.

Disadvantages are a limited number of carriers, big capital contributions in the technical basis of manufacturing, high material capacity and energy consumption, limited access to sales (consuming) destinations, insufficient freight safety. [18]

2.3.4.2. Sea transport

Ninety per cent of the world's international trade is being transported by sea. Sending freight by sea is ideal for bulky freight that is not always time-sensitive; in other words, these products allow long time of delivery. However this mode of transport is slow, with possible delay. As globalisation has expanded and manufacturing sources has moved to the East, namely, to India and China, more and more enterprises have transferred their manufacturing to this mode of transport. [7]

Advantages are cross-continental transport opportunities, low transport prime costs in case of big distances, high transportation and throughput capacity, small capital investment. [14]

Disadvantages are transportation limitation, small supply speed (time for transit), dependence on geographical, navigational, and time factors, a necessity to organise complicated postal infrastructure, strict requirements regarding freight packing and fixation, rare sending. [14]

2.3.4.3. Car transport

Car or motor car is a railless vehicle equipped with wheels and driven by a built-in engine. It is a land transport. There are different car types – motorcar, bus, minibus, and lorry. [8]

Advantages for this way transportation are high accessibility, a chance to deliver goods “from door to door”, high manoeuvring ability, plasticity, dynamic features, and opportunities to use different supply routes and schemes, high freight safety level, a chance to send freight in small consignments, a wide range of options of appropriate carrier. [12]

Disadvantages are low productivity, dependence on weather and road condition, comparatively high prime costs for transportation to farther regions, insufficient ecology properties, hurry when unloading, small freight lifting capacity. [12]

2.3.4.4. Air transport

Air traffic has experienced the biggest development of all the diverse modes of transport. Air transport – it is carriage of passengers, freight, and postal transfers by different aircrafts. [44]

Advantages are the maximum freight delivery speed, safety, possibility to reach far regions. [46]

Disadvantages are high prime costs in comparison with other modes of transport – the highest tariffs, big capital consumption, material capacity, and energy consumption, dependence on weather. [46]

2.3.4.5. Pipeline transport

Pipeline transport as a vehicle includes gas and oil pipelines. The pipeline transport cannot be referred to the traditional definition of the transport. Still by help of it, pipeline transport freight carries hundreds of tons of oil and gas. The rolling stock has its role in pipeline transport as the vehicle is the pipeline itself – metal pipes in diameters of various sizes. The freight transportation is carried out under the influence of pressure that is generated by pump-houses. Transportation is made through pipeline devices as a vehicle includes linear units that connect and disconnect the lines. [26]

Advantages: low prime costs, high throughput capacity, freight safety, small capital consumption. [46]

Disadvantages: limited diversity of freight (gas, oil, oil products, raw material emulsions), insufficient availability of small amount of freight to be transported. [46]

2.3.5. TRANSPORTATION MODE SUMMARY

Each mode of transport was described indicating its advantages and disadvantages, as well as these data are summarised in the Table 1.1.

Table 1.1 Modes of transport, their advantages and disadvantages [18]

Mode of transport	Advantages	Disadvantages
Railway transport	<p>Suitable for transportation of different freight consignments.</p> <p>Independent of weather and season.</p> <p>Transportation on a regular basis.</p> <p>Freight supply opportunity in far distances with relatively big speed.</p> <p>Comparatively small freight costs and tariffs.</p>	<p>Limited number of enterprises.</p> <p>Big capital investment.</p> <p>Big transportation material capacity.</p> <p>Practically does not provide “door to door” transportation.</p> <p>Insufficient freight safety.</p>
Sea transport	<p>Opportunity to make cross-continental transportation.</p> <p>Low freight transportation costs and tariffs.</p> <p>Wide transportation opportunities.</p> <p>Low transportation capital and capacity.</p>	<p>Long shipment intervals.</p> <p>Slow speed.</p> <p>Dependence on weather and navigation.</p> <p>Complicated port infrastructure is a request.</p>
Car transport	<p>Widely accessible. An opportunity of “door to door” transportation of freight.</p> <p>High ability of manoeuvring</p>	<p>Small load capacity.</p> <p>Comparatively high freight transportation costs and tariffs.</p> <p>Dependence on weather</p>

	and flexibility. High supply speed. Ensures links among all other vehicles. High level of freight safety and opportunity to supply small freight. Supplies on a regular basis.	and road quality. Insufficient freight safety.
Air transport	The biggest speed. High freight safety. Independence of surrounding infrastructure and topographic conditions.	The highest costs and tariffs. Big transportation material capacity and capital capacity. Dependence on weather. Insufficient geographical accessibility.
Pipeline transport	Low costs. Big throughput capacity. High freight safety. Performance 24/7. Independence of traffic jams and weather conditions.	Small manoeuvring ability. Limitation on freight types. Delivery of small freight is not possible.

All the main modes of transport carry goods in the international level. In logistics the main criteria – costs and customer service – should be balanced. There are very substantial compromises to be reached when weighting alternatives of various logistics factors and modes of transport. [7]

Transport costs are important for transportation of goods, services, or labour. The modes of transport differ not only by its positive and negative side. A number of enterprises when choosing the most suitable mode of transport assess also the financial advantages that are costs created by that particular mode of transport. [49] These costs are summarised in the Table 1.2.

Table 1.2. Costs and relative maintenance qualities of different modes of transport [9]

Mode of transport	Relative costs and relative maintenance qualities of different modes of transport
Car	Fixed costs are low as the physical transport infrastructure such as motor roads are implemented using the public funding; variable costs are medium, for instance, fuel costs are increasing and road maintenance, use, and load are increasing. As for the maintenance qualities, speed can be considered as an indicator of the mode of transport. What is positive about speed – availability, reliability, and frequency on the road but not as good as the ability to limit power, weight, and volume.
Railway	Fixed costs are high, and variable costs are comparatively low. The fixed costs are high due to more expensive equipment requirements, for instance, locomotive, wagons, roads, and freight terminals. The relative maintenance qualities of railway are good speed, safety, and especially the ability to transport bigger amount of freight.
Air	Fixed costs are rather low, while the variable costs are high because they include storage, safety requirements, and others. The main advantage of the air transport is the speed.
Water	Fixed costs are medium, and they consist of the number of ships, processing equipment, and terminals. Variable costs are low and related with mass data savings. Sometimes the operation of ships is restricted by ports that can be used by them. This is also a rather slow mode of transport.
Pipeline	Fixed costs are high because of law, construction, and installation but the variable costs are comparatively low and usually include only daily maintenance and regular verification / safety. As for operation qualities, reliability is great; still this mode of transport

	can be used in very limited cases.
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2.3. COMBINED TRANSPORT

In transport often the term “combined transport” is used. The combined transport means transportation of multiple modes referring to a drive performed by two or more modes of transport. [8]

The combined transport is often called multiple modes’ transport, intermodal, or multimodal transport. All explanatory dictionaries give the same definition and explanation for these terms. The term differs because of different foreign languages, for instance, intermodal and multimodal – both words are in English while one is in American English (intermodal) and the other one is in British English (multimodal).

The aim of multimodal transport is to join all the possible benefits of a number of separate modes of transport. Multimodal transport mainly allows avoiding unprofitable transport costs and time spending, and it can unite low costs for navigating and the speed of air transport. The main problem is that each mode of transport is not protected against delay causing additional problems. [9]

The main thing in the intermodal transport is to ensure freight transport from door to door. The aim is to render services practically without additional time consumption, and the main approach how to do it, is to use modular or unified freight. Multimodal transport is working only when the transaction can be carried out more effectively. [49]

Multimodal transport is used when transportation of goods from the starting point to the destination needs to use more than one mode of transport. Multimodal transport has become popular and has rapidly grown since 1970. This growth in the transport movement can be

referred to several circumstances including the field's liberalisation, expansion of the world business, and application of new methods to improve the multimodal processes. Intermodal transport allows the consigner's compromise with advantages of each mode used to transport the product. [47]

Intermodal transport is used to take advantages given by different modes of transport. For instance, RoRo operates as a ferry with loaded freight. Trucks on the ship are carried to a destination port, and cars carry goods from the ferry to their destination. [12]

In many manufacturing movements, there are a number of transport modes. As road transportation can provide broad product delivery from door to door and other modes of transport often are limited due to their accessibility, the use of combination allows cost-effective and convenient approach to the products and services sent. [14] Air, water, railway, and pipeline transport basically are terminal-to-terminal operations. Water and railway transport can deliver freight only in its territory – port, but air and pipeline transport – only to pipeline terminals and airports. Overall the final delivery is performed by trucks. Intermodal transport includes also the use of a coordinate system called bridges. Land bridges are a shipping assistance way where freight is delivered to a road transport and then again it is carried by water thus ensuring the land bridge between two continents. The land bridges can reduce the total transit time shipment while the time by car transportation can take days or even weeks. The land bridges simplify this process reducing the route of the land transport. [47]

Combined or so called Multimodal transport has its own abbreviations and acronyms (they are often called incoterms) that help the consigner and consignee to communicate and make a contract. These abbreviations and acronyms are written in the main freightage documents such as a bill of lading (B/L or Bill of Lading is a legal document between the consigner and carrier of particular goods; it includes detailed description

of freight type, amount, and delivery destination. The bill of lading also serves as a delivery receipt document if goods are being delivered to the previously defined destination. This document must be attached to goods independently of the transport mode and signed by an authorised representative of the carrier, consigner, and consignee. [46]). It stipulate what is paid by the consigner and what is paid by the consignee, as well as what transport and transit are used for freight transport.




























Incoterm	Named place	Sharing of costs and risk between buyer and seller in international traffic.			
EXW Ex works	Loading location				
FCA Free Carrier	Loading location				
FAS Free Alongside Ship	Port of loading				
FOB Free On Board	Port of loading				
CFR Cost And Freight	Port of destination				
CIF Cost, Insurance And Freight	Port of destination				
CIP Freight And Insurance Paid	Delivery location				
DDU Delivered Duty Unpaid DDP Delivered Duty Paid	Delivery location				
		Seller's cost / risk		Buyer's cost / risk	

Figure 1.1. Incoterms 2010, types and meaning thereof [47]

As it can be seen in the Figure 1.1., there are names of the incoterms, modes of transport used in relation to them. Each incoterm states what do the consigner and consignee pay for. Incoterms used the most often are the following [47]:

EXW (EX WORKS, named place) The only obligation of the seller is to handle goods to the buyer or his/her representative; at this time goods can be located at the seller's production unit or premises. The seller is

not responsible for loading goods on the vehicle. The buyer takes all transportation risk. Ex Works provisions foresee the smallest responsibility for the seller.

FCA (FREE CARRIER an agent, named goods shipment destination) The seller must deliver freight to the carrier or the place indicated by its representative. The seller is responsible for freight damage and loss to the carrier's or its representative's warehouse. After the buyer's request, the seller must present the needed document on goods delivery or receipt issued by the carrier or its representative.

FAS (FREE ALONGSIDE SHIP, named location of the port of delivery) The seller must carry goods to the wharf. The buyer undertakes to deal with export procedures and freight delivery on the board of the vessel. The seller is responsible for goods damage to the set wharf, after that the responsibility is undertaken by the buyer.

FOB (FREE ON BOARD, named port of shipment) The seller must carry goods to the vehicle's board. The seller's responsibility ends when freight is loaded on the board of the vehicle. The seller pays for freight loading and for all the export procedures.

CFR (COST AND FREIGHT, named location of the port of delivery) The seller pays for transport to the indicated port. The seller is responsible for goods damage to the vessel's board, after that the responsibility is undertaken by the buyer. Insurance is the buyer's duty.

CIF (COST, INSURANCE AND FREIGHT, named port of destination) Freight and insurance is paid by the seller to the indicated purchaser's place.

CIP (CARRIAGE AND INSURANCE PAID TO, named place of delivery) Provisions are similar to the ones of CPT but the seller must insure the freight. The insurance premium is paid by the seller. Duties of

the seller end after freight is carried to the carrier's or its representative's warehouse.

DDU (DELIVERED DUTY UNPAID, named goods shipment place) The seller pays for freight shipment to the consignee's door but the buyer pays only taxes to customs. The seller is fully responsible for freight damage all the way till the consignee's door.

DDP (DELIVERED DUTY PAID, named goods shipment place) The seller pays for freight shipment to the consignee's door and taxes to customs. There can be disclaimers regarding taxes, for instance, DDP excluding the natural resource tax. The seller is responsible for freight damage all the way till the consignee's door. [33]

2.4. CONTAINER SYSTEM

The container system can be considered as a specialised type of freight transport although currently it is an important feature to all the main national and international modes of transport – road, railway, sea, and air. The containers give a chance to development known as the intermodal transport or combined transport for the system of freight transportation that allows uncomplicated turnover of goods that are not packed from one mode of transport to another.[34]

The main advantages of containers and container system are the following:

- It allows many small packages to be unified in a big shipment unit.
- Reduction of goods processing, distribution from one place to the destination.
- Lower insurance costs.
- Transfer costs at docks and by help of other modes of transport are reduced.

- Easier and faster use in all modes of transport.
- Suitable for use at the territory of port.
- Delivery time at all levels is shorter, thus improving the service level.
- Documentation is simpler.
- Concept “through transit” becomes real, and it allows truly integrated transport system.
- Easy reloading.
- Initial costs of containers are very high; however they can be reduced when the containers are used repeatedly.
- Return of empty containers often is expensive. Trade rarely is balanced; therefore return load can be unavailable.
- There can be leaks from the containers causing damage in relation to rain or sea water.
- Freight condition can be affected by its loading on or under the deck. [19]

The main container types are defined in ISO Standards Handbook on Freight Containers) (Fig. 1.2.) [4]:

1. General purpose containers.

2. Specific purpose containers:

- closed ventilated container;
- open sided container;
- platform-based open sided container;
- platform-based open sided container with complete superstructure;
- platform-based open sided container with incomplete superstructure and fixed ends;

- platform-based open side container with incomplete superstructure and folded ends;
- platform (container).

3. Specific cargo containers [4]:

- thermal container;
- insulated container;
- refrigerated container (with expendable coolant);
- mechanically refrigerated container;
- heated container;
- refrigerated and heated container;
- tank container;
- dry bulk container;
- named cargo (such as automobile, livestock, and others) container;
- air mode container.

ISO containers are design containers of International Standardisation Organisation so that they could be used wider in the world. The containers usually are rectangles made of steel. There is a common feature to the usual containers and ISO containers – the steel frame corresponds to ISO sizes but the tank that can be fixed inside the container's frame differs. It allows different carriers to transport cargo liquids or powders. [34]

The most common sizes of containers are 20, 40, and 45 feet long. This unit can be transferred to various modes of transport but cargo units remain unchanged all the time. There are a number of types, for instance, TEU (the unit equals twenty feet), the most often standard-sized containers are used (usually 20 ad 40 feet long) suitable both for ships and trains, as well as cars. [17]

20" TEU



Internal length	5.895 m
Internal width	2.350 m
Internal height	2.392 m
Door width	2.340 m
Door height	2.292 m
Container capacity	33 m ³
Container weight	2,230 kg
Maximum load carrying capacity	28,230 kg

40" TEU



Internal length	12.029 m
Internal width	2.350 m
Internal height	2.392 m
Door width	2.340 m
Door height	2.292 m
Container capacity	67 m ³
Container weight	780 kg
Maximum load carrying capacity	26,700 kg

40" TEU HIGH-CUBE



Internal length	12.024 m
Internal width	2.350 m
Internal height	2.697 m
Door width	2.340 m
Door height	2.597 m
Container capacity	76 m ³
Container weight	4,020 kg
Maximum load carrying capacity	26,460 kg

20" OPEN TOP



Internal length	5.888 m
Internal width	2.345 m
Internal height	2.315 m
Door width	2.268 m
Door height	2.184 m
Container capacity	32 m ³
Container weight	250 kg
Maximum load carrying capacity	30,480 kg

40" OPEN TOP



Internal length	12.029 m
Internal width	2.342 m
Internal height	2.362 m
Door width	2.341 m
Door height	2.274 m
Container capacity	65 m ³
Container weight	3,810 kg
Maximum load carrying capacity	26,670 kg

20" REFRIGERATED



Internal length	5.724 m
Internal width	2.268 m
Internal height	2.014 m
Door width	2.286 m
Door height	2.067 m
Container capacity	26 m ³
Container weight	2,550 kg
Maximum load carrying capacity	21,450 kg


40" REFRIGERATED		
	Internal length	11.840 m
	Internal width	2.268 m
	Internal height	2.120 m
	Door width	2.268 m
	Door height	2.195 m
	Container capacity	60 m ³
	Container weight	3850 kg
	Maximum load carrying capacity	26630 kg

Figure 1.2 Container types and sizes [48]


Size of height and width for all the containers are the same – 8 feet long and 8 feet, 6 inches wide. [34] As usual, there are exceptions, but still these are the sizes of containers used the most often.

Regarding intermodal transport, two acronyms are used especially often; they are TEU and FEU. These initials mean “twenty-foot equivalent unit” and “forty-foot equivalent unit”. They are often used as a definition to mobile container ship power. Twenty-foot equivalent unit refers to the 20-foot container. So, two 40-foot containers would equal four TEU or two FEU. (Fig. 1.3.) [17]

SEA CONTAINER SPECIFICATIONS


DRY CARGO CONTAINERS										
Type	Container Weight			Interior Measurement				Door Open		
	Gross (kg)	Tare (kg)	Net (kg)	Length (m)	Width (m)	Height (m)	Capacity (m ³)	Width (m)	Height (m)	
	20 ft	24,000	2,370	21,630	5.898	2.352	2.394	33.20	2.343	2.280
40 ft	30,480	4,000	26,480	12.031	2.352	2.394	67.74	2.343	2.280	

CHARACTERISTICS
 Manufactured from either Aluminium or steel, they are suitable for most types of cargo / general cargo. Aluminium containers have a slightly larger payload than steel, and steel containers have a slightly larger internal cube.



REFRIGERATED CONTAINERS										
Type	Container Weight			Interior Measurement				Door Open		
	Gross (kg)	Tare (kg)	Net (kg)	Length (m)	Width (m)	Height (m)	Capacity (m ³)	Width (m)	Height (m)	
	20 ft	24,000	3,050	20,950	5.449	2.290	2.244	26.70	2.276	2.261
40 ft	30,480	4,520	25,960	11.690	2.250	2.247	57.10	2.280	2.205	

CHARACTERISTICS
 Recommended for delicate cargo. Bottom-air delivery system ensures refrigerated cargo reaches its destination in optimum condition.



OPEN TOP CONTAINERS										
Type	Container Weight			Interior Measurement				Door Open		
	Gross (kg)	Tare (kg)	Net (kg)	Length (m)	Width (m)	Height (m)	Capacity (m ³)	Width (m)	Height (m)	
	20 ft	24,000	2,580	21,420	5.629	2.212	2.311	32.00	2.330	2.263
40 ft	30,480	4,290	26,190	11.783	2.212	2.311	65.40	2.330	2.263	

CHARACTERISTICS
 Allowing cargo to be loaded from the top, open top containers are particularly suitable for bulky cargo such as machinery. They are fitted with a PVC tarpaulin cover and attachable bows with cable sealing devices. The container doors can be removed to make the stuffing of cargo more convenient. Manufactured from steel.




Figure 1.3. ISO ship container specifications [48]

2.5. TRANSPORTATION SAFETY

Safety can be defined as provisions to protect assets – physical, human, or intellectual – against criminal interface, moving, or destruction, or terrorist or domestic criminals, or accidental technology failure, or even physical threat situations. Transport Research Board sets the objectives and grants “safety” money to prevent, solve, eliminate, and diminish the threat. These aims can be reached by interference of a human or dogs or by application of a physical barrier and technology. [11]

2.5.1. Safety, security, and emergency management

Safety considerations at the freight selection level is protection of society against explosions, protection of carrier employees as they load, unload, and transport goods. Some goods are not packed, but safety regulations request packing, for instance, some chemical substances must be put in barrels and not transported as liquid bulk goods. Such questions as how to transport goods, affect the choice of transport mode. It is clear that the package goes hand in hand with the safety consideration and they in their turn affect the safety of the carrier. [1]

Safety, security, and management of emergency situations are the terms that are often used in daily work. Although they are inter-related, each

term makes a separate domain. Each of them provide comprehension about its related functions and is substantial to successful transport safety. [1]

Some strategies that deal with risk include preventive action and resolution as an answer to the event, and they are necessary for reduction of these risks. The risk evaluation must be made, and in the result thereof is approval of threat and danger, weaknesses and consequences that must be solved. In total they include safety environment of transportation. [11]

2.5.2. Transport security management

Security defines the domain to protect something valuable against any type of definite interface. It is the oldest field from the earliest human civilisation. Security asks a physical answer to external deliberate threat, and usually this means human-to-human problems. [23]

As for transportation, the provision includes goods carried and cars used to carry goods, and the owners have their own and different priorities regarding the security. The owner of goods wants to protect them regardless any costs for safe delivery to the destination. [11]

Security equals to the best practice and not to official standards in the transport sector. Each type of freight and transport route has its own set of individual conditions; therefore a safety analysis is needed for each situation. For instance, freight coal has no safety requirement for depleted nuclear fuel bars in the freight even if they use the same route and the same engines. [21]

2.5.3. Human safety management

Safety in the transport sector includes employees' and operators' safety at work place, as well as passenger safety. For instance, driver's license is needed to work with motorised transport, as well as it is a request that

all the drivers know the vehicle codes and Road Traffic Regulations to avoid road accidents. Licenses of different types are needed to drive transport equipment of different levels of complexity. Mass transport work regulations are directed towards the improvement of safety of the team and passengers restricting time when doing shift work and prohibit unsafe behaviour, for instance, sending a text message when driving. Also physical barriers are used, for example, divided highways, and traffic control, such as light and signal systems and regulations to improve safety. [1]

Perfect security does not allow the possibility of open democracy. Technological capabilities allows transport to be easily manageable – screen packets show condition of the vehicle (fuel amount, speed limit), but time and costs are needed in order to change the world's transport profile where vehicles are involved. [6] Higher production costs, which will result in additional safety, will be the price paid by many current customers in the market of flexible products such as exotic fruits and fashion shoes. With the new security costs in the global trade of raw materials and goods, every element of the supply chain could change. The increasing prices can reduce customer demand, thus breaking down the economy market. [5]

2.5.4. Safety at sea

Ships are the main mode of transport in the world trade, and it constitutes 80 per cent of the world trade. [2] This means that sea traffic is important in the global economy. Still there is concern that administrators, economists, and safety experts of the sea transportation system could be the target of terrorists or subjected to other types of threat. [23]

Ports are the most unsecure elements of the sea transport system. Although the port, big commercial banks, freight ships, and cruise ships can be the target of terrorist attacks, it is mainly related to their size,

distance to the city, amount of cargos handled at the free port and availability by road and water. [13]

Protection of ships, ports, and port facilities needs effective measures to prevent attacks and react to the actual threat. Such measures are [5]:

- Modernisation and strengthening of sea and port safety system and program.
- Strengthening of container safety, freight monitoring, and container seal and tracking technology.
- Performance of special investigation on the ships that are included in the risk list or the so called black list, namely, that are related to employment of big number of foreign seafarers and also for ships carrying freight that can cause highly dangerous consequences.
- Granting high priority to transportation safety with all related institutions in the country so that all safety units that are directly involved would protect ships, ports, and port equipment against threat and sea terrorism.
- Development of effective awareness in the navigation using all sources of the corresponding information.
- Forming of society's awareness about terrorism risks and sea terrorism risks by a campaign that includes information to the society and especially to sea communities.
- Performance of a comprehensive analytical research at sea safety organisations and sea enterprises to establish the main weaknesses at ports, port equipment, and navigation. [23]
- Navigation is the biggest of the world's international big manufacturing – and also the most dangerous way to freight transportation. International Maritime Organisation (IMO) always has pointed out that the best way to improve safety at sea is to develop international regulations that must be observed in all transportation countries. [4]

The first task of IMO at its beginning of operation in 1959 was approval of a new edition of International Convention on Safety of Lives at Sea or SOLAS that is the most important of all agreements in relation to navigation safety. [6]

IMO has also elaborated and approved International Regulations for Preventing Collisions at Sea and Global standards for seafarers, as well as international conventions and codes that in relation to search and rescue and has facilitated them in the international sea traffic, load lines, and during transportation of dangerous freight and tonnage measuring. [5]

A comprehensive mandatory safety regime in international navigation entered into force in July 1, 2004, and it comprised a number of amendments. The convention of 1974, Safety of Lives at Sea (SOLAS), that derived from International Ship and Port Facility Security Code (ISPS Code) is the most far-reaching document that describes in detail safety requirements in relation to government, port authorities, and navigation enterprises – a mandatory part (Part A), as well as a number of guidelines on implementation of the requirements – an optional part (Part B). [4]

Objectives of these navigation safety measures are [5]:

- To create international key principles that would include cooperation with the contractor's government, national agency, local administration, and navigation and port economy sectors to recognise and assess safety danger and make preventive measures against safety incidents that affect ships or port equipment used in the international trade;
- To define the particular roles and duties of all the involved parties at the national and international level in order to make the sea traffic safe;
- To ensure due and effective summarisation and exchange of safety-related information;
- To provide methodology of safety assessment in order to make plans and procedures of how to react to changes in the safety level;
- To make confidence that appropriate and reasonable sea traffic measures are implemented.

These objectives are achieved by the designation of appropriate staff / personnel on each ship. The aim of each port facility and navigation enterprise is to elaborate and implement safety plans. [6]

International Maritime Dangerous Goods (IMDG) Code is developed as a unified international code for sea transportation of dangerous freight covering such topics as packing, container traffic and storage especially emphasising segregation of incompatible substances. Elaboration of IMDG Code began in 1960 at Safety of Life at Sea Conference where there was a suggestion to governments to approve a unified code on sea transportation of dangerous freight thus supplementing regulations that are incorporated in the Convention of 1960, Safety of Life at Sea (SOLAS). Amendments to IMDG Code derive from two sources: proposals submitted only by ISO member states and amendments that are necessary in order to consider changes in suggestions of United Nations regarding transportation of dangerous freight defining the principal requirements for all modes of transport. [4]

Amendments to United Nations Organisation's recommendations would be adopted for two-year cycle and about two years after their adoption they would be adopted by the institutions responsible for control of different modes of transport. Thus the set of principal requirements that is applied to all modes of transport is being developed and implemented ensuring that difficulties have not occurred after intermodal connections. [4]

3 CHARACTERISATION OF PROBLEMATIC GROUPS OF INTERNATIONAL FREIGHT TRANSPORT

More interviewees were discussing about the typical problems they met in freight transportations. In front of all problems, what can be finding in freight transportation, the most typical were according with containerisation and logistics problems.

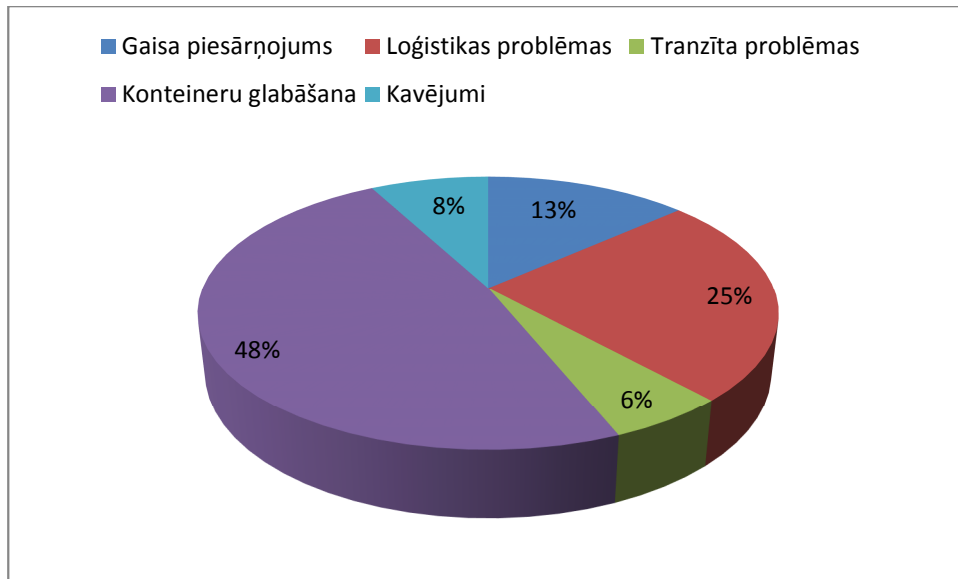


Figure 2.3 Problematic groups of freight transport [51]

Air pollution – Logistics problems – Transit problems – Container storage – Delays

After analysing interview information, in freight transportation is lot of problems, what are shown in figure 2.3., including air pollution, logistics problems, transit problems, container storage and time delays.

3.1. AIR POLLUTION PROBLEMS

Air pollution is the main factor that negatively affects natural environment in cities and other regions. According to World Health Organisation (WHO) 40-50 % of human illnesses in these days can be related with changes in environment and firstly with pollution in atmosphere. [50]

Currently car transport is the main emission source – emission of hazardous substance in atmosphere and their negative effect on environment and human health has reached serious level. For instance, the share of the USA in the car transport sector regarding pollution of environment constitutes more than 60 %, in Great Britain – 34 %, in France – 32 %. In Russia, for instance, in Saint-Petersburg, transport is the biggest air polluter. The main factors that affect air pollution emissions from the mechanic vehicles are increasing population growth and international transport, the slow development of transport infrastructure, deficiencies in the organization movement, as well as the

maintenance accumulation, low environmental performance of vehicles produced in the country, and increasing lack of quality using engine fuel in compliance with the modern requirements. Air emissions in the country are a mixture of a lack of sophistication. This problem solving is related to outdated legal framework for ineffective production and operation of road transport regarding administrative and economic measures. If each vehicle average runs 15,000 km per year, then it emits in the air about 26-30 tons of emissions including oxygen. [38]

Due to vehicles, atmosphere receives (kg/year): CO – 700, nitrogen dioxide – 40, unburned hydrocarbon – 230, and hard particles – 2-5 [49]. Besides there are much lead compound emissions due to use of mainly lead-containing gasoline. Toxic emissions from internal combustion engines (ICEs) are exhaust and crankcase gas, fuel vapour from the carburettor and fuel tank. The main proportion in toxic pollutants' emission in atmosphere is made of combustion engine exhaust. Crankcase gases and fuel vapour make in atmosphere about 45 % of the total hydrocarbon emissions. [32] The car is a small source, that is, the emissions are in the level of personal breathing stimulating their penetration in the respiratory system and harmfully affecting the human body. [2]

The use of lead-free gasoline which contains lead compounds causes air pollution that is very toxic and contains lead compounds. About 70 % of the lead added to gasoline by liquid ethyl includes compounds that get in the atmosphere from the exhaust gas, of which 30 % is deposited on the ground and is directly related to the exhaust pipe of the vehicle while 40 % remains in the atmosphere. On average one truck gives 2.5-3 kg of lead per year [31]. Lead concentration in air depends on the lead composition in gasoline. [2]

The number of hazardous substances that get into atmosphere through exhaust depends on the general technical condition of the car, especially

of the engine. The car's engine is the biggest source of pollution therefore its improvement is an ecological priority. [31]

Hydrogen and fuel cell vehicles taking into account relevant and necessary changes could be seen as a radical technology, and therefore they can be identified as a sector which needs comprehensive research on its acceptability. [31]

In terms of the sustainable benefits of new technologies and fuels, the emphasis is put on environmental benefits especially on the possible carbon reduction and safety of energy supply. When thinking in a wider scale, the concepts are related to ethics, and there is also concern about national independency (such as oil-related). [30]

Table 2.1. Air pollution in the big cities [31]

	PM10 ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)
WHO Air Quality Guidelines:	20	20	40
Beijing	89	90	122
Deli	150	24	41
Tokyo	40	18	68
Seoul	41	44	60
Mexico	51	74	130
Bangkok	79	11	23
London	21	25	77
New York	21	26	79
Paris	11	14	57
Shanghai	73	53	73
Santiago	61	29	81
Sao Paulo	40	43	83

As it is seen in the Table 2.1., the level of some air pollutants in the cities is usually higher than the one recommended by World Health Organisation (WHO). The cities in general find it difficult not to exceed the WHO's recommended levels. [50] In majority of the world's cities car transport industry is the biggest "donor" to air pollution, as well as a source of carbon monoxide and hydrocarbon pollution. [50]

This high-level pollution has its role in different respiratory and cardiovascular diseases. Various epidemiological researches have clearly indicated relation with transportation as transport-caused pollution causes such diseases as asthma, bronchitis, heart attack, and stroke.

This problem can be reduced by various measures but still it cannot be avoided. The main concern of the corporations regarding ecology responsibility has become more diverse and its solving is difficult. This is not only about recycling or energy saving but about management of a bigger phenomenon, for instance, climate change. Regardless the instruments (for instance, ISO standards), it is difficult to manage environmental problems. For green logistics enterprises this is a big challenge as all activities performed by the enterprise to transport freight have negative impact on environment. Time, costs, warehouses, and network structure of logistics enterprises can be regarded as a paradox. [32]

3.2. LOGISTICS PROBLEMS

A number of issues are related to productivity and efficiency of logistics enterprises in transport service industry. They include traffic jams, waste, and empty vehicles in operation, carbon emissions, and regularity directives on maximum allowed work time, road use fees, and lack of skills. These problems cause inefficacy and waste, for instance, excessive latency, bad turnover time, low vehicle fulfilment rates, bad

use of assets, unnecessary administration, and excessive stock in the economy. [17]

Continuing use of just-in-time (JIT) strategy, for instance, has many advantages but one of its sub-points is that it can lead to ineffective use of transport with small, often loads. [51]

In fact JIT can lead to: inconsistent use of fleet, reduced lifting capacity optimisation, reduced ability of effective fleet operation planning, disposable and endlessly flexible resource image in the opinion of customers, and others. [17]

In order to avoid the problems, some enterprises currently are trying to change their main logistics processes. Well-placed processes that have contact with a customer are the ones that need effort to be fulfilled in order to satisfy demands and wishes of the customer. They must be multi-functional or, if it is possible, they should be presented as chain-oriented because they cross not only the enterprise's functions but also cross-business borders. The objective to achieve the cross-border functional process for majority of enterprises is a big and sufficient challenge. And finally, they must set the term based on the client needs to reflect importance of time as the main element in logistics offer. [7]

In organisation of multimodal transport, railway, car transport, sea carriers, ports, and forwarders must be united. [29] Thus such activity must be directed towards complex offer of services, id est, transport service must be offered as a unified services of transport system and not as a sum of a separate mode of transport and operator services. Global experience proved that this task is being successfully solved within logistics centres. [51]

Transport demand currently is affected by such tendencies [48]:

Effective logistics is more needed to product specialisation;

Internationalisation increases competition and make pressure to product prices;

In order to reduce costs of manufacturing according to demand and centralised distribution, more often deliveries and smaller series are needed;

Internet simplifies sales opportunities but impose higher requirements to product delivery organisation;

Increased integration in the value chain causes new distribution scheme and creation of roles;

Internationalisation and new unions among manufacturers change geographical system of transport demand.

These tendencies indicate increase in demand of transportation of goods manufactured and cause [7]:

- Competition advantages for truckers;
- Increase in transportation of containers, wagon containers, and semi-trailers;
- Increase in the number of long-term contracts including those between goods consigners and transport service providers.
- Answer of offer to the changing demand becomes apparent in the following ways:
 - Union in transport and forwarding fields forming bigger enterprises that are able to provide a bigger number of markets;
 - Creation of big centres that ensure unified goods transport flows in order to use large-scale manufacturing advantages;
 - Optimisation of freight supporting units;
 - Increase in the share of intermodal transport to reduce costs.

A competitive transport solution means the right choice of costs and processes and right choice of priorities of the service quality.

Integration of modes of transport must take place amid business processes, operations, services, and requirements of laws and regulations, as well as infrastructure and communications. The problem that is related to promotion of cooperation among these parties are still made more complicated by a fact that participation in intermodal transport often means to give some part of freight to competing modes of transport. The big number of parties involved and additional freight re-loading or processing within the transport chain cause uncertainty and costs. [46]

The main task of logistics centre is effective planning and control of freight flow. The logistics centre is not only a transportation data base but also organisation of freight transport planning and optimisation in accordance with delivery terms, payments, and quality uniting operation of different modes of transport in one technological process by attraction of various enterprises and organisations that ensure freight transport and provide additional services. [33]

Decision-making problems in logistics system are directly or indirectly related to transport operation. When dealing with the transport system, additional standard transport problems cause and form decision-making problems. [14]

Freight transport plans and decision-making problems include many different restrictions. Some of them can be referred to all transport systems but others refer only to operation of particular type or system. For instance, vehicle and driver planning problem is a commonly spread issue having the smallest payment allocation to vehicles and drivers over the time. Thus it is possible to satisfy some provisions and guidelines, for instance, regarding technical maintenance of vehicles and service support restrictions. [19]

3.3. TRANSIT PROBLEMS

A word “transit” means freight sending from one country to another crossing one or more borders of the third country or transit country. From the point of view of the transit country this means that transit transport is carried through its territory from one border to the other. Such approach serves as a reason for many misunderstandings, namely, any activity with transit freight that are not directly related to goods transportation between two border posts from the point of view of the country is not grouped as a part of transit transportation any more. [38]

Baltic Sea Region and its strategy must focus on the regional cooperation objective that cannot be solved within EU general policies. The strategy must include both measures to be implemented by European Union and its member states itself and measures to be implemented in cooperation with Russia. [3]

In the countries of Baltic Sea Region, a special importance is granted to sea transport and close-distance navigation therefore European Commission’s recommendations to simplify close-distance navigation and promote sea transport space without obstacles including the Baltic Sea Region are to be supported. Goods movement would obviously be simplified by implementation of a unified transport document for all goods transportation independently of the mode of transport. [2]

Baltic Sea Region is an important transit route from Russia to Europe and vice versa. In order to promote trade and transit flows including container freight through railway, customs procedures with neighbouring countries, for instance, Russia, must be harmonised. When defining freight transport technical specifications, railway must take into account the peculiarity of Baltic region’s infrastructure – there are wagons made in Russia and Belarus with different rail length that do not allows locomotive traffic of Baltic States with the rest of EU member states and limit use opportunities of mutual compatibility projects of

various EU railways. There already is a unified train movement management system in Baltic States, and it is the same as in Russia and Belarus. So among all the mentioned countries there are no mutual usage problems in traffic. When talking about awareness of a transit procedure, the author would like to briefly describe normal goods transit procedure in countries with modern customs legislation. Customs legislation of European Union similarly to the one of Russia divides transit transportation from the border of one country to another in stages – customs procedures whose application or non-application is chosen by goods possessor or declarant. It is the usual procedure to change during transit the vehicle or mode of transport, i. e., introduce multimodal transport (sea – railway, railway – motor road, and similar). [30]

One more substantial problem in relation to implementation of transit transportation is lack of real simplified customs procedure mechanism in our country. On one hand, it is understood as use of a simplified declaration form when declaring goods for transit, for instance, inaccurately filled in declaration, trade or transport document written instead of the declaration, periodical declaration, and, on the other hand, application of a simplified customs procedure, for instance, conclusion of transit customs procedure at the customs warehouse without customs physical presence needed. [30]

The former border crossing formalities are completely unacceptable from the point of view of fast and effective implementation of transit transportation. Some of the most typical examples are the following [38]:

- 1) formalities applied to transit freight are repeated on both sides of the border requesting the same information about freight, carrier, route, etc.;
- 2) border crossing formalities often are doubled at one and the same side of the border;
- 3) there is no information exchange system between the relevant institutions of both countries and therefore there is no possibility to clear

transit freight quicker and more effectively. As a comparison, the current credit regulation allows obtaining more comprehensive outline on peculiarities of financial services that in future could help to solve also customs transit problems. Along with that, hesitation to simplify border control procedures of the Baltics and Russia thus speeding up freight flow through railway and by car transport is also worth to mention. [38]

Those within trade and being a part of the international supply chain of EU and are actively involved in the clearance operations, can apply for AEO status. The AEO certificate is an internationally recognised quality mark. It tells people that customs control and procedures are effective and adequate, and its owner can be considered to be safe and reliable trade partner in the supply chain. [39]

Owing to the AEO certificate, it is also possible to benefit from the simplified customs provisions and it can grant easier access through the customs control in relation to safety and its procedures. [39]

3.4. CONTAINER TYPES AND STORAGE PROBLEMS THEREOF

Container loading is the main functional operation with efficiency of the supply chain. So it is not surprisingly that container loading problems are often examined in maintenance research literature. It is also said that offered approaches have limited practical value as sufficient attention is not paid to their restrictions in the communication practice. [34]

Actually goods transportation is just a subject of goods transfer from one place to another but not always it is so easy and quickly; it may become complicated. The reason for this is that manufacturing enterprises are thinking about saving money and thus they find the countries where there are the cheapest material, labour force, and manufacturing services. [28]

Container storage problem can be defined as a box packing problem in three dimensions where containers are the places for goods storage at the port or where containers are used as a waste bin on the ship. After reaching each destination port, some containers are unloaded of the container ship and loaded at the port, and must be sent back to the customers. In fact, container is either placed on the ship and waits its unloading at the destination port or place in the port territory or warehouse and waits its loading on the ship and delivery to the client. [33]

There is also a problem with different container types (dry, open sided, open top, tank, empty, and refrigerated). Indeed, many storage restrictions seem to be related with this diversity of types, for instance, refrigerated containers are block-equipped with 'power point', open top containers cannot have any other container or anything placed on its top, the tank must be placed on the other side. This means that one more problem appears, and they are related with money and place. [43]

The main function task of the container terminals is freight arrival at port and freight forwarding without interruption. For this purpose, the terminal must be eligible to manage and coordinate both sea transport and railways transport.[43]

3.5. PROBLEMS OF DELAY AND LOSS IN TIME

There can be a number of reasons of delay and loss in time regarding ship operation. Reasons of delay can be divided in four groups: terminal operations, port accessibility, sea lanes, and coincidences.

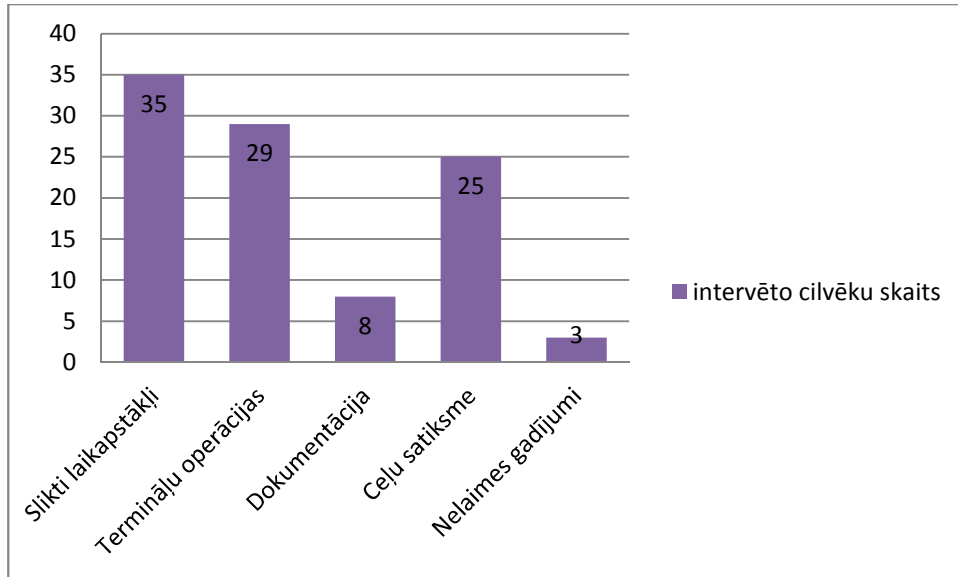


Figure 2.4. Reasons of delay and loss in time [51]

Bad weather – Terminal operations – Documentation – Road traffic – Accidents / Number of respondents

There can be a number of reasons of delay and loss in time regarding ship operation. Reasons of delay can be divided in four groups: terminal operations, port accessibility, sea lanes, and coincidences.

Growing port volumes and capacity restrictions in many ports all around the world mean that the wharf availability upon arrival at the port is not always guaranteed when the allocated time slots to the ports have passed. In some cases port overload can completely ruin liner service schedules. Agreements between shipping line and independent terminal operators usually contain specifications on the minimum efficiency at the wharf. Besides the necessary productive performance of 120 TEU per ship per hour is no longer an exception, which leads to high expectations on both the straddle crane availability and speed of operation in the wharf. In this design loop and when calculating transit times, shipping lines must take into account the expected distribution of terminal operations. They also take into account the flexibility of terminal operators, engaged in “emergency” situations. [48]

Access channels often create traffic jams in the world’s sea transport system. Interruptions to enter a port comes in different forms, ranging

from unexpected waiting time due to violations of pilotage or towage services (for instance, access to small pilots or tugs) to the unexpected waiting time caused by the delay in the sea-locks or access channel morphology conditions of tidal windows. [36]

Unexpected loss of time can be due to weather, mechanical problems during the route, or unexpected waiting time at the bunker place or port. Weather can greatly bother schedules and port operation also for other trade routes. Besides delay in one ship loop can also affect the round trips of other ships operating in the same loop. [42]

4 POSSIBLE SOLUTIONS AND DEVELOPMENT PERSPECTIVES OF INTERNATIONAL FREIGHT TRANSPORT

Possible solutions are depended on the previously researched problems in freight transportation. The transportation model can be extended to the direct transport of goods, including among others, inventory management, planning, employment and assignment of personnel. Transport models play an important role in the field of logistics and supply chain management to reduce costs and improve areas service.

4.1. REDUCTION OF AIR POLLUTION

Well planned and considered traffic organisation in cities can greatly reduce emissions from transport.

A small number of tunnels and a large number of hubs lead to the accumulation of cars idling and results in a dramatic increase in air pollution. Improvement of transport infrastructure and traffic management is one of the fights in air quality areas.

There is a suitable policy applied to solving this problem, reduction of air pollution by car transport, to ensure maximum comfort for the use of public transport at the same time creating an “obstacle” for car use.

Urban public transport development and interest of the air lead to:

- Underground development in the big cities (for instance, with option buildings);
- Development of electric transport in the country;
- Amount of busy buses and other public transport emissions of polluting substances that meet the modern European standards for gasoline and diesel engines;
- The development of material interests of deployment of buses and other road transport of gas converters, particulate filters, and other devices for antitoxin deductions of commercial businesses to reconstruction and social needs of the city’s budget release reduction of purchase of diesel fuel and gasoline, as well as payments for environmental pollution;

- Introduction of tax advantages and payments: for carriers and individual owners of cars that use gas, converters, particulate filters and other devices antitoxin deductions including fuel additions to municipal organisations to build them in vehicle thus ensuring environmental safety;
- Organisational infrastructure to move through the city on the bicycle;
- Develop and implement innovation in the fields of development and public and private transport.

Currently there are various types of alternative fuel for car transport – liquefied petroleum gas, natural gas, biodiesel gas, hydrogen, and other. Liquefied natural gas is a mixture of propane (C₃H₈) and butane (C₄H₁₀), and a small amount (about 1 %) of hydrocarbons. The use of liquefied petroleum gas does not need serious changes in the car's design; only gas device tools are to be installed thus keeping the chance to use both gasoline and natural gas as a fuel. Liquefied petroleum gas is the only environment-friendly fuel that is used worldwide in transportation. Use of this has reduced the big pollution more than twice that means 1.5-2 times less wear of the main cylinder groups that increase the engine speed and reduce fuel costs two times.[50]

Biodiesel fuel is an alternative environment-friendly fuel made of plant oil and used for replacing (saving) the usual diesel fuel. Different plant oils, for instance, rape oil, soya bean oil, peanut oil, palm oil, sunflower and olive oil, and animal fat can be raw material for production of biodiesel fuel. Biodiesel fuel can be used alone in internal combustion engines, as well as when mixed with diesel fuel in the same engine. Having close mineral energy potential of diesel fuel, biodiesel fuel has some important advantages: it is not toxic, almost sulphuric free and carcinogenic benzene free, can be expanded (approximately the same as sugar), provides a significant reduction in harmful emissions into the atmosphere by burning, as the internal combustion engine and process units increase the cetane number and lubricate properties that significantly increase the life of the engine, a high melting point (over 100° C), making it quite safe to use, and its source is renewable

resources; biodiesel is easily organisable including when it faces a small economy. Biodiesel fuel is widely used in many countries all around the world including Germany, Austria, Czech Republic, France, Italy, Sweden, the USA, and other countries. Biodiesel fuel is the most widely used and produced in Germany. Germans produce more than 2 million tons of rape fuel per year, and it significantly reduces the amount of hazardous emissions in the atmosphere.

A fuel alternative that is completely environment-friendly is hydrogen. As it burns, there are no hazardous substances, just water. Taking into account that vehicles in the city can make more than 90 % of the dangerous emissions, use of hydrogen as a fuel will allow solving this problem. Well known car production enterprises are trying to use this fuel design. Still regardless the obvious environmental, energy, and other advantages, implementation of use of hydrogen vehicles can now only be called experimental although these plans are quite ambitious. The main reasons are: problem to maintain the car with hydrogen and economical feasibility of its application.[50]

Sustainable transport system is the one ensuring transportation and mobility by the use of renewable fuel at the same time reducing emissions that do harm to local and global environment and preventing unneeded, deadly, and injury load.

Climate change is the most important factor these days, and it must be reduced. By this motto, environment protection is being performed by majority organisations that are not just green movements but freight transport organisations, such as SES (Community of European Railway and Infrastructure Companies), IATA (International Air Transport Association), IMO (International Maritime Organisation), IUR (International Union of Railways), IRF (International Road Federation), IRU (International Road Transport Union), and others. The objective of transport organisation via air, road, railway, and waterways is to protect

the carrier and elaborate new provisions for improvement of this or other modes of transport.

4.2.CREATION OF LOGISTICS CENTRES

Creation of logistics centres affects different economy sectors and generates work places not only at the centre itself but also in other related areas. Freight flow increases and thus amount of work at ports and for car transport and railway are increasing as well. The local market is provided more steadily, and goods prices are decreasing. Big manufacturing enterprises' interest in the local market is being facilitated. Confidence of freight owners and consigners are increasing. The main factors that affect achievements of logistics centres are their accessibility to transport tasks including diverse modes of transport, sufficient amount of freight flow in order to secure the scale effect, operative efficiency, quality of human resources, and availability of public and private funding.

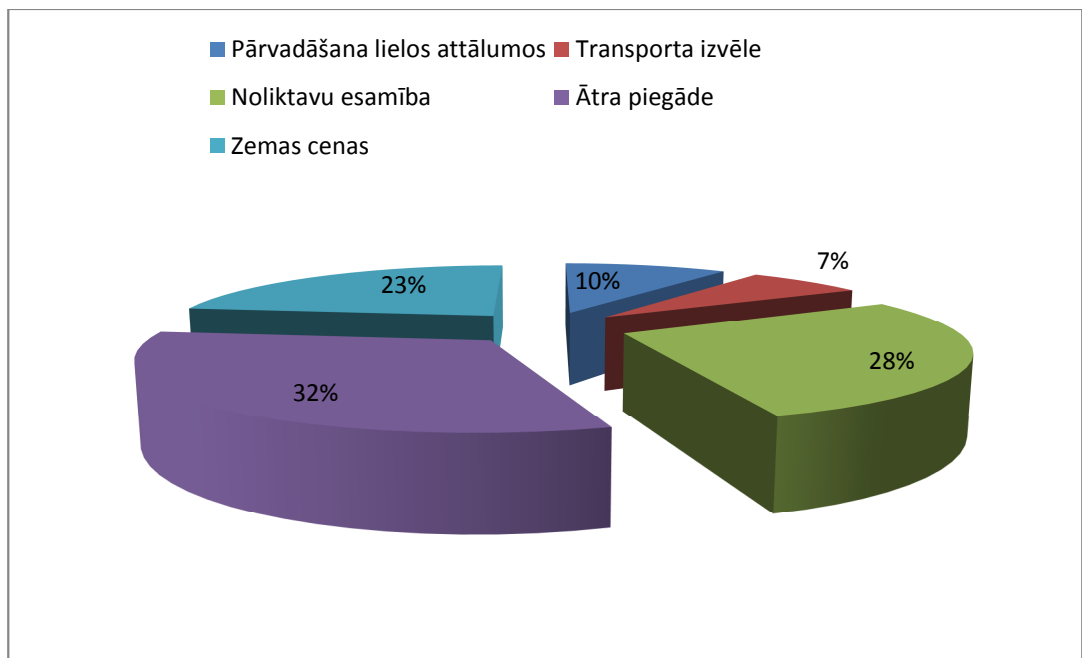


Figure 3.5. Services of logistics centres' infrastructure [51]

*Transportation in big distances – Transport choice – Existence of warehouses – Fast delivery
– Low prices*

Logistics centres must be ready to deal with as many logistics processes as possible:

- Transportation at big distances;
- Distribution transport;
- Storage at warehouses;
- Distribution.

These infrastructure services are significant as the factors to increase attraction of the logistics centres. It is important that location of logistics centres is in important consumption and industrial territories which usually are the big cities and at major transport corridor hubs where it is possible to add value to commodities and accumulate and distribute the flow of goods.

It will help to develop the logistics infrastructure, increase freight movement amount and the number of customers thus raising the income and business interface.

4.3. INTERNATIONAL TRANSIT PROCEDURE

The existing clearing system is maximal adjusted to freight transport, handling, multimodal transport, and other practical requirements of operations in relation to transit transportation.

One of the solutions is to form national transit procedures in all countries in compliance with the international requirements. Provisions are developed according to Convention on Common Transit, and they will accelerate inclusion of freight transit in the European common transit space. At the same time also a new procedure of customs warehouses' operations can be implemented. The storage procedure in the customs warehouse allows storing non-community goods without being subjected to import duties and other charges or trade policy measures, as well as community goods if the community legislation governing specific fields provide that their placing in the customs

warehouse requests application of the measures that normally are associated with export of such goods. They foresee harmonisation of warehouse operation with requirements of European Union and simplify clearing procedure when delivering goods at the warehouse and carrying them further.

After initiative of entrepreneurs, there were discussions started in Baltics on a necessity to expand cooperation with Russia as the biggest transit transportation partner of the Baltic States. In relation with this, a number of solutions were suggested, starting with cooperation agreement signing among Estonia, Latvia, and Lithuania to simplify particular customs formalities (such as implementation of early declaration procedure) and ending with necessity to make joint customs posts on land border, railways border stations, and ports.

4.4. CONTAINER LOADING AND SHAPE KEEPING

In addition to road and railway transport sections in container and freight transport, one more critical aspect that needs special security management is their storage at port terminals and storage yards. However, clear appropriate security is obtained by giving potential benefit from more efficient transport management and reducing costs of the overall supply chain.

Weight and sizes of the container made it very difficult for operators to manually lift them and manipulate with them which eventually could lead to the operators' injury such as back injury or shoulder injury.

ALM developed a design for a stationary lift that allows lifting three containers simultaneously. Both ALM and Pioneer performed a full test, and based on the results Pioneer has purchased a number of units. Since installing stationary ALM elevator and manipulator, Pioneer automated system is easily managed by two operators. And they must do only four tasks: the new stationary lift can rotate horizontally allowing Pioneer to

reduce the space of its container handling processes and increase lift performance. Now, three containers instead of one can be loaded from the conveyor at a time. [42]



Figure 3.6 New Pioneer stationary lift [42]

Container storage is one more problem faced by each port and warehouse. Storage of the empty containers is great money and space wasting. Besides, empty containers must be transported to another country. From the financial point of view, this is very unprofitable and causes losses. For the transportation of an empty container, the same amount of money must be paid as if one would transport freight, therefore in order to avoid unnecessary costs, containers are left at the warehouse until there will be freight for it.

According to Managing Director of Port of Helsinki, Mr Mäki (05.11.2013), there must be a project developed and implemented in full. The idea of the project is that one must make the container that can be folded and once it is folded it looks like a platform. [51]

“It will take less space and it can be transported more conveniently. As we know, entrepreneurs pay for the space the container takes on the ship, although the container is empty. Such folded container will allow transporting 3 or even 4 container for the same price as one 20-foot or 40-foot container.” [51]

For instance, there is a 20-foot container: 5.89 m long, 2.35 m wide, and 2.39 m high; and then there is also the folding container with the same length and width but the high is reduced to 0.5 m.

So, volume of 20-foot container is:

$$V_k = g * p * H = 5.89 \text{ m} * 2.35 \text{ m} * 2.39 \text{ m} = 33.14 \text{ m}^3$$

And volume of the platform is:

$$V_p = g * p * h = 5.89 \text{ m} * 2.35 \text{ m} * 0.5 \text{ m} = 6.93 \text{ m}^3$$

After calculating the volume of container and platform, it can be seen how much space does each of them take on the ship. According to Mr Mäki (2013), it will be possible to transport 3 or 4 folding containers as platforms:

$$V_k / V_p = 33.14 \text{ m}^3 / 6.93 \text{ m}^3 = 4.78$$

We can conclude that really it will be possible to transport 4 folding containers as platforms instead of one container; furthermore, it will be more economically.



Figure 3.7. Half-folding container [43]

As it can be seen in Figure 3.7. there are some containers which are half-folding. But still the idea of folding containers is not organized till the end.

4.5. REDUCTION OF LOSS IN TIME

Traffic jams at ports and port productivity are stimuli for shipping lines to provide capacity of the main port and its service schedule. Shipping lines have many options to reduce the risk, low schedules, and loss in transit time. Firstly, re-grouping of port order is a normal practice. In some cases it is closer to import cargo in the first port of call, along with the shift of containers by land to destinations near the ports that will be invited much later than originally planned.

Secondly, the shipping lines could cancel one or more ports of call in order to reduce the total port time and get the ship back on schedule. Skipping the port of call may have important consequences on the model and costs of land transportation.

Thirdly, shipping lines may use other ships (with delivery to the centre). Delays in shipping may be compensated by the published schedule of other ships. The schedule of delayed vessels is gradually developed over the period, and is placed again on demand.

Fourthly, the shipping companies could speed up discussion time for the next port of call loops to achieve and resume schedule. The number of container terminals is known for its ability to make benefit of table time lost in other ports. In Europe, for example, many shipping companies consider Antwerp as a kind of safety valve with very high terminal productivity that can be reached when considering the ship's putting back on the schedule.

Finally, carriers probably make time by increasing the speed of the intercontinental trunk route. Increasing the speed of the ship makes higher refilling costs. Use of the ship speed is related to higher capital costs on comparison with slower ships, but when the ship is in service, it is generally assumed that the costs of capital are not affected. Additional costs must be balanced by saving time costs.

4.6. DEVELOPMENT PERSPECTIVES IN FREIGHT TRANSPORT

European integration processes aim at necessity to harmonise transport systems of countries and implement objective of the joint transport policy. Gradual tendency in the traffic growth has not been related to the corresponding transport policy, mainly with a compatible developing transport network that balances growth and harmonisation of the transport sector and combined inter-sectors in the regional level.

Strategic objectives of transport development in Europe include integration in the European transport network, strengthening fair prices and transport, environment protection, transport safety, and social cohesion in the transport market.

Implementation of transport development objectives mainly are taken as an administrative capacity in the transport sector and inter-sectoral cooperation to provide the most important aspects of efficiency of regulatory policy, transport management, investment policy, taxation and pricing policy, physical planning, and social policy.

The transport sector can be divided in three large groups – freight transport at ports, car transport, and carriage of passengers. In the case of carriage of passengers, everything is more or less clear – negative tendencies in the local transportation mainly are caused by demographic conditions and small growth in the international ferry and air traffic. There still remain operation of warehouses, air transport, pipeline transport, but contribution of these activities in the total value added of the sector is very low; therefore the author will focus on the three big groups (carriage of passengers will not be separated).

Operation of ports is grounded on the factor of demand and supply. Supply factors are the port infrastructure coordination, price level of services, reduction of bureaucratic barriers, and geopolitical nuances. Most likely, the less and less importance is given to the transportation of such products as coal and oil products while transportation of non-traditional energy products (liquefied natural gas, biomass, etc.), as well as intermodal and container freight are developing. In the coming years, an increasing share of Russian and Asian freight will go to the northern ports of Russia leaving to the Baltic ports only the niche products. Transit of raw materials will always have an important role in the transport sector, however we must think more and more about the products that have higher value added: container freight, freight with special temperature regimes, Ro-Ro freight, and intermodal transport.

Increase in turnover of car transport freight can compensate decrease in freight amount in the rest modes of transport and reduction of the number of passengers in full. However this is unlikely, because the

turnover of freight in ton kilometres for railway at least is bigger than the one for the car transport.

However, the transport policy and planning is not as stable as it should be regarding the sector of freight transport. For instance, how and why the infrastructure planning and power problems reduce the productivity of freight transport and drive costs of industrial production. This is the reason why transport planners and decision-makers cannot predict so easily what infrastructure improvement are needed to freight carriers, industrial customers, and economy in general. With a significant part of the focus on the transport policy and planning-related freight matters, filling the lack of planning is essential.

It is clear that investment in roads that increase the capacity and speed of transport as well as reduce the accidents on the road can improve freight safety. Improvements of transport connections affect freight transport. International transport systems (ITS) are especially important as they reduce accidents on roads and traffic jams.

Determined capacity increasing projects that would balance high-frequency weak system of freight transport can improve transit time variability.

Freight planning can help to make sure that freight movement needs are properly taken into account by decision-makers providing national and municipal transport planners with the necessary instrument in order to effectively influence the system of freight transport by alternative investment.

5 CONCLUSIONS AND SUGGESTIONS

Transport is one of the main sectors of the national economy and social development. Use of different modes of transport, especially mechanical vehicles, reflects price solutions in relation to loads without taxes and fees for use.

1. From the research part of the Paper, it can be concluded that each mode of transport has both its own advantages and disadvantages. Entrepreneurs choose profitable for them mode of transport operating not only with positive but also with negative aspects of the mode of transport and also looking to costs needed by each mode of transport.

2. These days freight container transportation is as maximum simplified process to deliver goods to any distance. Advantages of container transportation are freight safety, reduced costs of freight reloading, and speed of processing in transit terminals when changing the mode of transport.

3. Combined transport makes almost a half of all transportation in the world; they are performed according to the principle “from door to door” and “just-in-time” in the international standard containers. The advantage of intermodal or multimodal freight transport is that they use the most effective combination of freight transport in order to reduce the transport costs.

4. Logistics is a comparatively new sector; however it is being used more and more all around the world. Logistics services allow transporting goods where they are consumed. The task of logistics in the enterprise is to attain that the needed goods or services are delivered to the necessary place and at the necessary quality using the most effective methods.

5. Each year the speed limit for mechanical vehicles greatly affects the number of deaths and injuries on the roads. It is defined at different

levels of government starting with local authorities and the places where there are city or country roads. In some cases, these speed limits are set by national authorities without clear understanding of the consequences they cause to fuel consumption, emissions, or accidents.

6. Air pollution can be reduced by diminished traffic volume regarding any of the mentioned measures. Currently there are 1,100 billion barrels of oil in the known deposits. With the current consumption speed, it will be enough for 41 year.

7. Stationary lifts that allows lifting three containers at the same time not only simplify work of the employees but also save time and accelerate performance productivity.

8. It is unprofitable to store at warehouses and transport empty containers as the transport costs for full containers and empty ones are equal.

Based on the theoretical conclusions we can see that modern transport infrastructure and its development are of important role not only in freight transport but also in daily life of residents. Also problems and their possible solutions were identified. The research object was the topical problems of freight transport and their solution suggestions such as:

1. National authorities must impose bigger taxes to transport or follow where tax revenue is spent making sure that this money is invested in road construction and traffic safety. Good and repaired roads (without potholes) and well located traffic lights will reduce road traffic accidents and incidents, as well as improve human safety on the road.

2. The Road Authority must make separate fee road routes where the speed limit will be bigger than on other motorways. It will allow

reaching the destination faster and without any traffic jams, as well as simplify road traffic in cities.

3. The Road Authority can make a separate lane for freight transport with a separate speed limit. It will not only reduce traffic jams and road accidents but also simplify free movement of other vehicles on the road causing no danger to human lives.

4. Municipal authorities for small distances must use electric cars that are driven by power or the transport that is driven by solar batteries or bicycles in case small cargo is carried in order to reduce air pollution in the city.

5. Car manufacturers must build cars that are driven by autogas. The cars using autogas create less toxic exhaust than then one used gasoline and diesel fuel, thus environment pollution is reduced.

6. IT specialists and logistics enterprises must join together and make a global online site which will include information of all transport companies. The customer should enter data on freight, its location, and destination while the internet portal processes the given data and generates the list of companies that correspond to the customer's wishes the best. This will simplify work for both the customer and company, as well as save time.

7. Pioneer company must elaborate a project that will allow integrating stationary container lifts thus enabling also work on the ships and loading of the bigger amount of containers.

8. Also a project designing a folding container must be made. It will be suitable to convenient storage and transportation of empty containers, they save place and are economically profitable. In the folding shape the container will be more like a platform.

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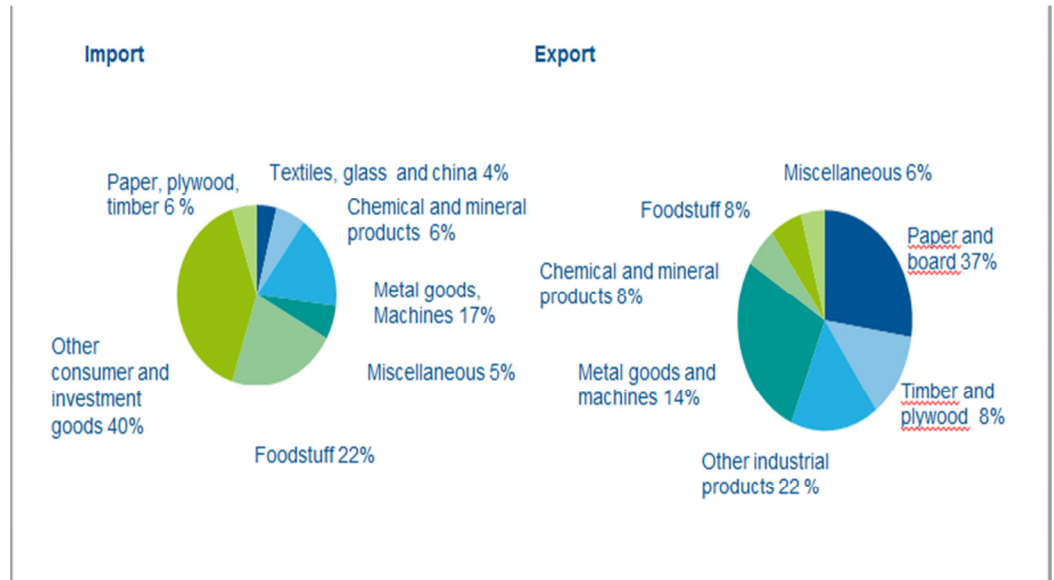
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APPENDICES

Appendix 1 Questions for interview

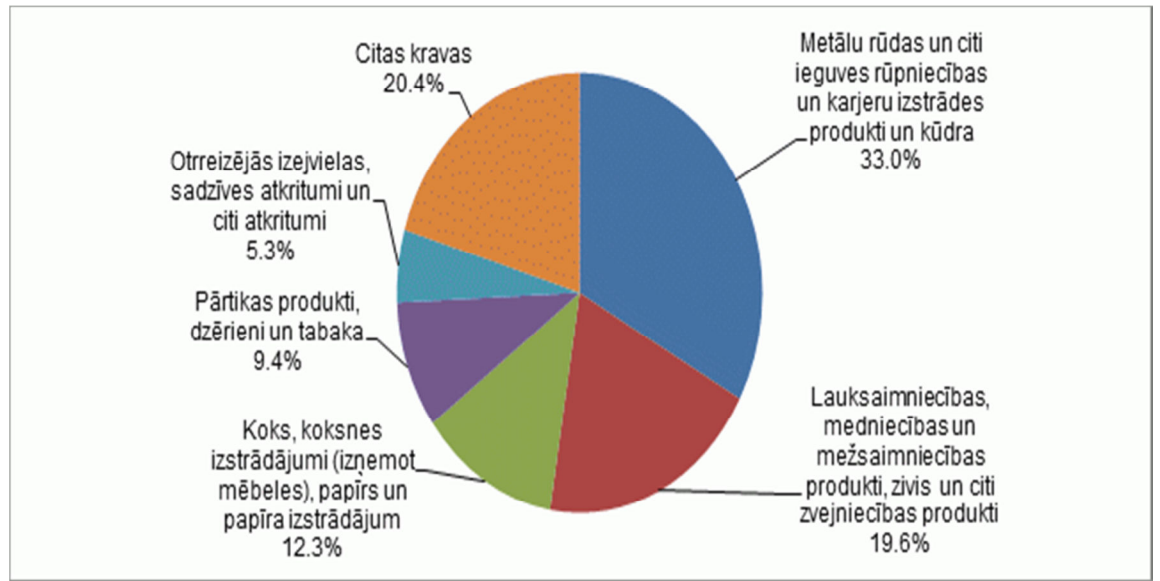
1. Pastāstiet, lūdzu, par kravas transportēšanu jūsu kompānijā. Kādus transporta veidus jūs izmantojat visbiežāk, lai transportētu kravu.
2. Kādas kravas jūs visbiežāk pārvadājat?
3. Ar ko jūs biežāk nodarbojaties ar eksportu vai importu?
4. Ar kādām problēmām, transportēšanas laikā, Jūs sastopaties?
5. Kā Jūs risināt šīs problēmas?
6. Vai jums ir paredzami jauni projekti? Kādi?
 1. Tell me about cargo transportation in your company. What modes of transport do you use most often to transport freight?
 2. What kind of goods you are carrying the most?
 3. What does your company do more export or import?
 4. What kinds of problems you have during transportation?
 5. How do you solve those problems?
 6. Do you have predictable new projects? What?

Appendix 2 Export and Import for goods transportation in Port of Helsinki 2013



[52]

Appendix 3 Most important good transportation in 2013



[41]

33.0 % metal

19.6 % forest products, products, fish

12.3 % wood, furniture, paper

9.4 % alcohol, tabac

5.3 % waste

20.4 % other