CHAPTER 4
TRANSPORT MANAGEMENT IN ENTERPRISES

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Abstract

During continuous market competition, focusing on the customer service level, lead times and supply flexibility is very important to analyze the efficiency of transport processes. Transport processes are a key process that provides physical material flow in enterprises and the supply chain.. This chapter presents problems of transport processes, taking into account the specifics of manufacturing and service enterprises. This chapter contains both theoretical aspects concerning transport in the supply and distribution processes, as well as descriptions of the most commonly used solutions in business practice.
Keywords: transport course planning, transport processes rationalization

4.1. Introduction

The organisation of transport-related tasks is an extremely important process in the operations of production, transport, forwarding or distributing enterprises. The central goal of all of these enterprises is to deliver goods from the place of shipment to the place of reception. Each of them has its own priorities. Some expect that the goods will be delivered in a fast, cost-effective and safe manner, others want to earn more on the transport, so they will expect the price of the goods to be respectively high. Therefore, for commercial exchange to exist, detailed cost analyses for each single transport must be carried out. The calculations should not be limited only to one branch of transport.

Kolinski A. (ed.), Logistics Management - modern development trends, Poznan School of Logistics Press, Poznan 2016; DOI: 10.17270/B.M.978-83-62285-25-9.1.4

It is crucial for every transport enterprise to organise transport processes in an appropriate and efficient way. It should be borne in mind that these processes, on the one hand, must be planned so that they provide for delivering all transport orders (goods must be delivered to a reception point in appropriate time and without any damages or losses). On the other, while planning transport, transport enterprises must remember to minimise costs.

It needs to be emphasized that a person responsible for organising transport in a specific enterprise has an extremely challenging task to handle. They must reconcile the expectations of clients, who want to move their goods in a fast, cheap and safe way, with the goals of a transport enterprise, which wants to achieve maximum profit. During the organisation of transport processes, enterprises must remember to:

- select the best branch of transport to move goods or people from point A to point B,
- select a proper vehicle and driver to perform the task,
- set the best route for transporting goods or people from point A to point B.

It seems the elements listed above are very easy to handle. In practice, things may turn out different. If one has one or two vehicles and only a couple of orders a week, problems will probably be avoided. But what if a enterprise starts taking more orders? Things may get very complicated, as it may turn out that, despite that we have a sufficient number of vehicles to handle orders, we lack staff. In such case, route planning or assigning a vehicle to handle a specific transport order becomes much more complex and time-consuming.

It should be also borne in mind that the process of organising transport-related tasks is entirely different for individual branches of transport. It results from the fact that each branch of transport has different features: road transport, for instance, is very fast as compared to maritime transport. In the case of road transport, one must only find a proper vehicle and rent it, which is not that simple in the case of maritime transport owing to a number of reasons, such as access of certain areas to the sea.

4.2. Planning the course of a transport process

The duration of transport is an integral part of the process of moving goods. In present logistics processes, including transport processes, time is an important, or even crucial, factor determining order completion. The production enterprises and service-providing entities of today pay much greater attention to timely deliveries, which provides not only for eliminating delays, but also for avoiding earlier

arrivals at reception points. Such an approach to the issue is related to a more effective use of means of transport and human labour, which, in turn, leads to the optimisation of transport-related costs.

When organising a transport task, it must be remembered that transport processes are organised differently for each branch of transport. It directly affects the time in which out customer will receive their goods, starting from the moment when they made the order. The elements which influence the duration of delivery, irrespective of the branch, are, therefore (Stajniak, et. al, 2008):

- accepting customer's order,
- route planning,
- picking the order from the warehouse,
- loading the goods on the selected means of transport,
- transport,
- unloading at a place specified by the customer.

Planning the course of a transport process at a enterprise is related to a number of aspects which concern transport itself and various acenterpriseing elements which might occur. Since the transport process itself consists in delivering goods from a shipment point to a destination specified by a customer, the process is composed of several stages. One should be aware that for the goods to reach destination in time and in accordance with customer's expectations, all transport-related actions must be properly planned.

To plan the transport process properly, the following aspects must be taken into account:

- route optimisation should provide for shorter duration of the transport process. If necessary, continuity and flexibility in the transport or products should also be taken into account,
- choosing the best possible route and vehicle in terms of client's requirements, avoiding empty mileage, which allows reducing transport costs.

Organisation of the course of a transport process is monitored by properly-trained experts, such as experts in logistics (e.g. a transport logistician) and/or freight forwarders. When planning the course of a transport task, one must remember that each analysed order has its own nature, each task, even a similar one, should therefore be handled with due diligence, taking all necessary aspects related to the task into consideration. Complexity of a transport process and the number of its participants also matters. Process participants include:

1. A Principal who, by ordering transport, expects it to be executed in a specific way, which is not always compliant with service provider's capacities.
2. A Service Provider who, on their own or with their partners, executes the order. To execute it, they require assistance of such partners as:

– customer service specialists, whose task is to effectively communicate with customers and persons within the organisation,
– transport logisticians who organise, coordinate and monitor the tasks within the transport process,
– freight forwarders who, like transport logisticians, organise, coordinate and monitor the tasks within the transport process,
– experts in assessment and transport cost analysis who assess the profitability of transport tasks,
– drivers who are the basic participants or transport processes, responsible for physical flows of goods,
– forklift operators – persons responsible for loading and unloading external means of transport,
– warehouse operatives, packers – persons indirectly involved in transport processes, but often of key significance in transport.

Planning the course of a transport process depends on its participants, goals, type of transported goods and specific stages of a transport process, which are:

– accepting customer's order – developing an initial concept for preparing the transport process, negotiations concerning fees etc.,
– route planning – at this stage, organisation of the transport process is discussed in detail, taking the means of transport and transport routes into account,
– picking the order at the warehouse – preparing the goods for transport, providing for all necessary protective measures,
– loading the goods on an external means of transport,
– transport i.e. physical transport of goods from the shipment point to the reception point,
– unloading at a place specified by the customer.

It should be borne in mind that depending on the type of transported goods, planning of the course of a transport process may provide for a different structure of stages, and unloading of the goods at the site chosen by the customer does not end the transport process. To ensure effective planning of new transport processes, more elements should be taken into account, such as:

- handling the process in legal and financial terms,
- settlement of fees,
- assessment and analysis of costs incurred in relation to the course of a transport process.

4.3. Planning transport-related tasks

Service level significantly affects the planning of transport-related tasks. It should be emphasized that service level in transport is influenced not only by the elements mentioned in previous subchapters. Other important elements which have impact on service level include, above all, enterprise's capacities, reliability and flexibility of the transport system. The transport system obviously relies upon other factors beyond the control of a service provider or a principal, such as unexpected obstacles on roads (traffic jams) or road collisions, to name but a few.

What should, therefore, the process of planning transport-related tasks look like, what should be taken into consideration and where to begin? The starting point for planning transport tasks should, in general, result from the need to execute transport under a placed order. To put it in a general way, the most important element in planning transport tasks is to deliver certain goods. One of the aspects of transporting is to develop a plan to move the goods from the sender to the recipient. The plan may consist only of the stage of transporting goods, or all related elements from order acceptance to organisation of loading, physical transport, unloading, and financial and legal service.

It has already been said that a transport enterprise must be able to properly organise its transport-related tasks. These processes must, on the one hand, be organised in a way that allows executing all transport orders (i.e. deliver goods to the reception point). On the other hand, however, one should remember to minimise costs incurred by a enterprise which organises transport. Thus, a person responsible for organising transport at a specific enterprise has an extremely tough job, as they must reconcile the expectations of customers, who want to move their goods in a fast, cheap and safe way, with the goals of a transport enterprise, which wants to achieve maximum profit. During the organisation of transport processes, enterprises must, in particular, remember to:

- select a proper vehicle and driver to perform the task,
- set the best route for transporting goods or people from point A to point B.

Then, what should the process of transport task planning look like? The answer is not that simple, because there is no universal method for planning transport tasks, which is a consequence of a great diversity of tasks themselves, but not only

that. Every transport enterprise has its own method for planning transport tasks. Nevertheless, most enterprises apply specific algorithms for that purpose. Proper algorithms for planning transport tasks are the starting point here, because they are ordered schemes of behaviours at individual stages of planning a specific task.

One should be aware, however, that the structure and content of an algorithm depends on a number of factors, it is therefore important for a enterprise to establish a specific procedure for planning certain tasks, since it streamlines the planning and monitoring of transport tasks. What should also be remembered is that an algorithm (a procedure) once developed is not rigid and is subject to changes. Both in logistics and economy, things change, because nothing is eternal. The changes must be followed and enterprises must update their internal procedures accordingly to maximise profits and maintain appropriate customer service level.

4.4. Transport in logistics processes

In logistics, transport is a kind of activity directly responsible for the movement of goods (materials and loads) between stationary elements of logistics networks

and systems, such as production facilities, warehouses or points of retail sale. Logistics is therefore directly focused on the transport of goods, which is a link in a logistics chain which connects its other components, which include (Kisperska-Moroń, Krzyżaniak, 2009, p. 140):

- suppliers of raw materials and other materials,
- manufacturers of semi-finished and finished products,
- wholesalers and agents,
- points of retails sale (shops, market chains),
- end consumers.

It should be stressed that transport not only handles the processes of movement, but is also the basic element of the structure of specific supplier-consumer relations. Without sufficient knowledge on the characteristics of transport, in contemporary economic conditions it is not possible to create an effective and efficient transport system for a potential customer. The transport system is also a link connecting enterprise's customers and suppliers of raw materials with economic entities, i.e. it has an established place in a logistics channel. Transport makes it possible to move goods between these two spots, thus filling a gap and building a bridge between the buyer and the seller. Knowledge of the transport system is of fundamental significance for performing effective logistics activities in the domain of transporting goods. Transport is a physical thread which sews

geographically scattered places together (Stank, Goldsby, 2000, p. 71-77). It also grants additional value to enterprise products, creating the usefulness of time and place as a result of physical movement of goods (as added value) to specific places and in agreed time. Without effective transport, enterprises operating in contemporary global markets are virtually unable to function (Tracey, 2004, p. 31-49).

Integration of the transport sector and globalisation of economy have highlighted a number of problems in the transport, forwarding and logistics market. Entities operating in this market must compete with entities from other European countries and expand their offers, take actions to reduce costs and increase customer satisfaction (Lipińska-Słota, 2005, p. 7). Furthermore, present economic development is characterised by evident globalisation and specialisation of social and economic processes. It is a trend which is contrary to opinions and slogans popularised in Poland that full liberalisation of economy is required, that small is beautiful and that everything which is not banned, is allowed. This global trend consequently leads to intensified commercial exchange between economic entities, thus to a situation where the intensity of movement of raw materials and finished products systematically grows. This clear phenomenon forces enterprises to seek new technical and organisational solutions, which in specific economic conditions would guarantee effective movement from one place to the other, in accordance with customers' requirements. These processes are presently handled by logistics operators, who plan, execute and monitor the entire process of movement in a supply chain - from places where raw materials were purchased, through production, to the end buyer, caring to meet customers' requirements in terms of time, place and appropriate prices.

On the other hand, integration in combined transport is a set of different undertakings aiming at connecting individual links of complex combined transport into one functionally and institutionally coherent transport system Groothedde, Ruijghrok, Tavasszy, 2005, p. 567-583). It is also the basic tool for meeting the complex requirements of combined transport users, as it leads to the achievement of a number of partial goals, which are set in order to streamline the process of movement (Semenov, Filina, Pluciński, Kotowska, Wiktorowska-Jasik, 2008, p. 54).

The main ones among them include (Szwankowski, 1998, p. 10-11):

- limiting the degradation of natural environment
- improving safety in transport,
- meeting customers' expectations.

These goals are possible to achieve, if the following partial goals are achieved first:

- increasing work efficiency in transport,
- accelerating and simplifying the reloading operations
- possibility to expand transport in the house-house relation,
- accelerating the trade of goods by reducing the duration of transport processes and lowering the social costs of transport,
- lowering the cost of packaging along with reducing damages in transport,
- improved continuity of transport processes,
- reduced share of human labour in transport, reloading and warehousing.

While observing contemporary transport in a enterprise which handles the movement of goods, the following trends may be distinguished (Burnewicz, Szałucki, 2003, p. 80):

- development of intensive flows of mass goods, which, in accordance with customers' requirements, should be delivered in a house-house system,
- due to growing specialisation of production, and, at the same time, multitude of small and medium economic entities, logistics operators need better organised movement of small item deliveries,
- customers have stricter requirements in terms of delivery time, availability of vehicles, protection of goods during transport, quality of the entire movement process and possibly low prices,
- customers need logistics operators to provide a comprehensive set of services, not only the ones related to transport.

Integration in the transport/logistics chain is yet another domain characterised by the fact that it is most favourable from the perspective of a transport user, since they seek reliable and comprehensive services, and from the perspective of a service provider for whom quality, competitiveness and innovation matter most (Crum, Palmatier, 2004, p. 54-61; Zhao, et. al, 2010, p. 913-925).

On the other hand, at the lowest level of integration, we find (Semenov, Filina, Pluciński, Kotowska, Wiktorowska-Jasik, 2008, p. 56):

- integration of parties to an agreement,
- integration of participants in the transport chain,
- integration as part of distribution channels etc. which are characterised by horizontal and vertical links.

Recent changes in logistics services in the market have put production and service enterprises in a position characterised by new quality, in which their existence and development have become dependent on an ability to adapt to

occurring transformations. The situation forces them to introduce deep structural changes to their behaviours. The changes concern the entire set of actions programmed by the system, such as the method of making operative decisions, strategic actions, rules for developing plans in terms of market activity, fleet renewal schedules, increase in effectiveness of using transport- and forwarding-related production factors, and sources of collecting and allocating capital.

The issue of integrated role of transport in logistics process at enterprises is new and it is gaining on particular significance in the conditions of continuous improvement in the market of logistics services. It is visible, above all, in the area of supply and distribution, mainly because it improves the quality of services and is a competition-boosting factor (Potter, 2003, p. 67-68).

4.5. Transport services referring to goods transported by enterprises

In handling their tasks related to logistics, production enterprises are starting to rely on external operators. Simple economic balance is the reason that draws them to this solution. The following premises form the basis of the concept:

- a enterprise must have a department or dedicated staff who will handle the organisation of transport services,
- it must hold a relatively large database of logistics operators,
- the database should ensure flexibility and competitive choice of logistics operators,
- organising frequent competitive bids for specific transport orders, since it allows obtaining favourable prices.

It should be emphasized that the model is commonly applied by Polish enterprises which usually have their own department dedicated to transport, freight forwarding or logistics. The task of the department is to provide logistics services which correspond to its needs. It means that the transport department receives orders from the production department or the commercial department, must order an appropriate means of transport in due time, perform all organisational and technical works with the purpose of preparing full transport documentation, and, after the delivery, carry out a general inspection of the course of transport. In this case it is evident that the department plans, executes and monitors the process, it therefore performs purely logistical functions. It should also be stressed that the department is organisationally linked to a specific production facility, which means that it often deals with a problem of the key for the distribution of general costs among its individual organisational units (Burnewicz, Szałucki, 2003, p. 75).

The part below presents the way the transport department selects road transport operators who will satisfy reported needs. The procedure of choosing road transport operators is as follows:

- a production enterprise announces a bidding procedure for the provision of transport services,
- all bids are thoroughly verified. The task is time-consuming, because in Poland there is an oversupply of transport services and the enterprise has to process several dozens of bids,
- approximately ten bids are selected and a list of enterprises is prepared: there are "primary" enterprises, which have priority in being awarded specific orders, and "secondary" enterprises, which are awarded the orders when the primary ones are unable to accept them.

The above-described method of handling logistics- and transport-related tasks is applied by a number of enterprises which maintain dedicated departments whose obligation is to coordinate all works related to the planning, execution and monitoring of logistics processes (Burnewicz, Szałucki, 2003, p. 76).

Transport in service enterprises should be interpreted as a concept of movement which assumes different forms and measures (Stajniak, 2007). The function of transport covers an entire set of activities which differ depending on a specific type of a service enterprise (Kisperska-Moroń, Płaczek, Liniecki, 2003, p. 20:

- supplying warehouses with parts, materials and equipment,
- moving a part of materials from warehouses to repair facilities and service points,
- supplying service provision places with construction equipment and materials,
- transporting staff (service staff), parts and equipment to homes and customers' enterprises,
- moving parts and materials between warehouse locations within the service chain, delivering equipment to customers.

Actions related to coordination are of greater significance than in production enterprises, because in the domain of services, they are taken in the course of service provision. Wrong functioning of the system might therefore result in excessive waiting time and lost profits. In the case of business relying on production, most of actions related to coordination are taken before starting the production of a specific article, and it is frequently possible to remove the consequences of a failure with the use of available stocks of products. Coordination activities in the management of logistics processes are therefore focused on:

- minimisation of waiting time (reduced service provision time),
- active management of production capacity,
- selection of the most suitable channels (methods) of service provision.

Time spent on waiting for a service is related to its execution. It is, for instance:

- time spent on waiting for someone to answer the phone while requesting for a repair or installation,
- time spent in a queue at a service centre,
- time spent on waiting for a repair date to be set,
- time from setting the date to the actual repair,
- waiting time in the event of a failure or emergency,
- time spent on waiting for a service, installation or repair to end.

Time is gaining on significance, especially for enterprises which subcontract services, and may become an element of local competition leading to the diversity of methods which minimise waiting time. Some of them are:

- quality improvement scheme,
- automated answering machine, systems redirecting calls automatically to an appropriate speaker,
- simplification of service provision procedures,
- improved communication with customers,
- improved systems of customer information and service provision status etc.

4.6. Transport in logistics processes of supply and distribution

Effective and proper management of supply at a enterprise is usually handled by a supply department, which ensures supply of raw materials, other materials and parts (Kisperska-Moroń, Płaczek, Liniecki, 2003, p. 20). To execute these processes, criteria related to quality, accuracy and flexibility must be met.

The quality of supply shows that appropriate goods reached appropriate destination in appropriate quantity and in an appropriate condition. Transport, or, to put it less generally, the quality of transport-related processes plays a crucial role here.

The completeness of supply, expressed by delivered goods' compliance in terms of type and quantity, is determined by a degree to which the transport-related process is accordant with the agreement. Both organisers of a transport-related process, and its direct contractors, are factors that determine whether the supply

will be complete. The fact that the consignment reaches its destination in a proper condition proves that it was duly protected during the process of transportation.

Flexibility of delivery, on the other hand, describes the ability of a logistics system to react to changes to its terms. Its success is determined, among others, by the availability of transport services in time, i.e. the degree of synchronising the moment the need for transport arises with the moment of actual possibility to satisfy it. As these two moments get more distant from each other, access to transport services in time becomes less flexible (Morlok, Chang, 2004, p. 405-420).

The above considerations lead to a conclusion that the way of interpreting the role and tasks of transport in supply processes is similar. It is the consequence of the very essence of logistics, whose central goal is to rationalise the flow of goods and services in space and time, thus a task which strictly depends on the smooth course of a transport process. This role varies depending on the degree of complexity of a logistics process and delivery service level, but is always important, which is proved by high average share of movement costs, representing approx. 40% of costs related to logistics.

Transport may contribute to specific basic benefits by: improving timeliness, which results in less stocks, increased frequency of deliveries with reduced one-off delivery volumes, which allows lowering the level of stocks, accelerating deliveries and improving the technology of movement.

Many enterprises deal, or used to deal, with a problem of choosing the method of transport in supply processes. A question arises, if they should use their own means of transport, or the service of external providers. Both solutions have their pros and cons. With one's own means of transport, one may advertise their name on a car, and a driver may act as a sales representative. On the other hand, however, enterprises which base their business mainly on the production of finished products or the sale of goods must additionally handle transport, plan vehicle routes, manage issues related to insurance, perform periodic technical inspections of the fleet etc (Abt, 2003, p. 112).

As a consequence, a trend to subcontract transport services in supply processes to specialised external transporting enterprises has recently appeared.

From the organisational point of view, it is necessary to manage the fleet to satisfy enterprise's transport-related as good and as cheap as possible. Thus, it is about optimised use of vehicle labour time, mileage, load and proper protection of goods during transportation (Dembińska-Cyran, Jedliński, Milewska, 2001, p. 149).

Every system of the distribution of goods is characterised by a set of parametres in a spacial, temporal, technical, organisational and economic scope, which are measurable, and a set of features which are hard to measure, which we can call immeasurable quantities. The same refers to its processes. When intending to analyse a distribution system, one should assign proper metrics for the measurement of quantity and value at system input and output to system parametres. The degree of distribution intensity is also of considerable significance.

The basic factors determining the degree of distribution intensity include (Czubała, 2001, p. 164-165):

- purchasers' needs and requirements pertaining to physical availability of specific products, terms of purchase or scope of required services,
- type of products, their value, their durability and complexity, meaning to the purchaser, process of making a decision to purchase,
- density of the distribution network in a specific market and the possibility to include it in a specific distribution channel.

A thorough assessment of the process of managing distribution, including transport processes, directed towards the enterprise's environment, should also involve:

- measuring customers' perception by organising regular polls and interviews, which could provide information on the degree of information availability they perceive, the ability to solve problems or product service support,
- benchmarking aimed at permanent comparison of operations of enterprises representing specific industry in the market.

Following such detailed study, it is possible to assess a distribution system and the integrating role of transport, and, at a later stage, evaluate the system of physical flow of materials and information in distribution channels.

Distribution channels occurring in economic practice most commonly include (Ficoń, 2008, p. 186):

- direct delivery from a producer to a retail shop,
- producer's warehouses (central, regional) as an indirect lick,
- retail warehouses related to a specific chain of retail trade,
- wholesale warehouses as a classic indirect link,
- an agent – a broker organising the process of distribution,
- an agent handling supplies to small points of retail sale.

4.7. Conclusions

Transport is not only a process of moving goods, but also a basic element of the supplier-customer relationship. Insufficient knowledge of efficiency requirements, which determines the purchaser, it is not possible to develop of transport services in current economic conditions (Stajniak, Koliński, 2016). Transport can contribute to the improvement of logistics customer service indicators, such as timeliness, which will result in decrease in the provision of goods, increase the frequency of deliveries etc.

The success of the enterprise in the market is increasingly determined by high productivity and efficiency of used the transport resources, quality of service, low operating costs and the ability to continuously and quickly adapt to changing environments. Enterprises that improve efficiency come to this in different ways, sometimes using very different action. This is because of volatility and complexity of the modern logistics market.

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