

MAIN TASKS FOR THE SUCCESSFUL DEVELOPMENT OF THE LOGISTICS CENTRE

Olga Girvica

*66 North Delivery&Logistics
Jurmālas str., Pīnķi, Babītes district, Riga, Latvia
Ph: 29203422, e-mail: olga@66north.lv*

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1. Introduction

One of the main objectives for any logistics company is to simplify the supply chain, minimize storage and maximize speed and efficiency for delivery of goods.

Warehousing and distribution is an important part of any supply chain. The essential part is the information technology and efficient flow of information between the members of the chain as well as understanding the business and needs of clients.

2. The Specific Tasks of the Logistics Centre

There are some specific tasks for the successful development of the Logistics centre.

1. *Creating of the system for receiving of full loaded and groupage containers and trailers into warehouse.* The first task for the Logistics centre is to get the goods into stock without any delay and in good conditions of goods and packing materials. In case the income of goods is quite rare event on the warehouse in general it does not bring any problem. However, if the goods unloading process is happened without termination because of many incoming cargo lots (trailers, sea containers or railway wagons), the certain managing system is needed in order to avoid transport queues and waiting time for delivery and unloading equipments. For an example it reduces the time for unloading due to the driver gets unloading instructions on the way to warehouse or just on the gates during the territory entering.
2. *Sorting and selecting of cargoes in the warehouse.* In case there are many or a few different cargoes or they are owned by different clients in one transport lot they have to be sorted and selected very carefully according to transport documents (CMR, Packing list) in order to avoid of any mixing and missing of goods. Most of the cargoes demand own way of sorting based on the cargo and package type.
3. *Developing of the system for goods storage on the warehouse.* System for goods storage is created based on the Logistics centre internal rules and specific of cargo. In case of fresh products and frozen products the special temperature control equipment is needed. General cargo could be stored with normal working temperature from +10 till +25. Here temperature is regulated for warehouse workers comfort and in costs safe conditions. Anyway the storage conditions exist for each type of goods and manager of the warehouse should check and follow them. For instance, the general cargo warehouse textile materials should not be stored near of high smell goods (onion, perfumes, chemical goods), because the cloth quickly takes the smell inside. Another example if there are products like tea, sugar, corns and others the air humidity becomes of great importance, as it has high influence on such products quality conditions.

After all technical storage conditions are observed, the next step is to create the storage system. Cargoes could be stored just on the floor, on the pallets shelves for goods which are packed on the pallets, on the box size shelves that depends on the box sizes. In other words it could be any way of storage depending on the goods package type and size. On modern warehouses in order to reduce the expenses per square meter many floors shelves system is in use. Here each company uses own storage place marking with letters and figures based on the control and monitoring system. So each lot (counting pack) of cargo has own unique address on the warehouse. It makes very easy for the warehouse employees to find the needed goods, thus saving a lot of time.

4. *Control and monitoring of goods movements in/out warehouse.* In modern Logistics centres specially created computer system for control and monitoring of goods movements in/out warehouse is used.

Often it is one of the standard package like Microsoft AXAPTA (Dynamics AX) or Navision plus some specific modules based on company demands. However the human force is still the main in control and monitoring the goods on the warehouse. Usually double, sometimes even triple controlling system is used. It means that in this case 2 or 3 persons physically check the goods when goods come in/out of warehouse. It is related to not only the quantity of goods, but based on importance to check the quality of packaging materials or goods physical look too. For example: the goods coming to retail shops should have the good look not only of goods themselves but of packaging materials too, as it is important advertising tool for the trade owner. Clothing should be clean and accurately packed into plastic bags. Pairs of shoes and boots should be in carton boxes usually each pair separately in order not to destroy the form of the boots or shoes. Food should be well packed into clean and not destroyable form of package.

5. *Organization of local distribution and further delivery of goods till final consumer. Decreasing of the lean time for the goods.* In this point distribution company has a chance of saving or wasting of money and time. So it is extremely important to optimise the using of transport tools (lorries, trucks and others). There are some different ways for optimisation of resources. It is important to maximally use the loading capacity of transport tools and to minimize the tracking race for each single transport unit. There could be shuttle service or circular trip system. The shuttle service is usually used for the certain constant destinations. For example, for deliveries between warehouses or cargo terminals, or on the railway. The circular route is more flexible and therefore more popular. The creation of special distribution route for the Logistics centre of the company “Impex” is showed in the example bellow. It is the task for each distributor to create the optimal route to save time and financial and material resources.
6. *To design together the facility and delivery process to better reveal and support customer purposes.* Positive iteration within the process is supported and negative iteration reduced. The highest level of logistics supposes the full service which means transportation, goods storage and distribution for the customer. Often the supply of goods includes the research of supply market, finding of the best solution, based on the client requirements, and financing of the goods purchase with further resell to the client, who has ordered the goods. In this case the Logistics centre becomes a chain in the customer sales net. So it is in the interest of the Logistics centre and with it support that customer achieves his goals. For example: All the customers want to get goods just in time and without any problems. It is the task of the logistics specialists to predict all possible problems and difficulties that client may have during the goods delivery.

Let us view the task for creation of circular delivery routes. Company “Impex” sells the products and household goods. The considerable part of the goods (about 60%) is imported from the East Europe, Russia and Ukraine. In the same time about 40 % of goods are of Latvian origin. The trade activity of the company could not be without a good work of the Logistics centre of the company. The Logistics centre has five own trucks with the cargo capacity of 22 tons each. Three of the trucks deliver goods from Europe, Russia and Ukraine, the rest two distribute the goods from warehouse in Riga to clients in Latvia. The analysis of the activity and cost evaluation of the Logistics centre showed that goods are often arrived with delays and expenses are constantly growing during last few months. The expanding of the trade activity and appearing of the new clients demanded additional transport services from the Logistics centre. Often all five trucks were using on the local Latvian market. Therefore some goods from Europe were coming late to the stock in Riga. That brought the additional costs to the company because of the shortage of the import goods, additional payments to the drivers, working extra hours, and expenses related to the empty race. The main reason for that was the wrong planning of the distribution routes, which demand additional time and fuel. The real task was put for the Logistics centre.

The initial sources for the task were the net of the clients with the destinations of their location (in km) shown on the Figure 1. and the volume of the deliveries (in kg). There are 41 tons of cargo should be distributed between clients in the following points of Latvia: Ventspils – 5000 kg, Daugavpils – 6000 kg, Rezekne – 3000 kg, Jelgava – 1200 kg, Saldus – 5650 kg, Jekabpils – 6850 kg, Liepaja - 4250 kg, Tukums – 3700 kg, Madona – 5350 kg.

The Logistics centre has two trucks with the capacity of 22 t each. The task is to create 2 circular routes with the minimal summary extension for delivery of goods (see Figure 1). In the same time each route should be connected to the truck in such way that the initial cargo volume does not exceed 22t.

This task has been solved by the following way.

1. The points of destination are grouped according to their geographical location and the truck capacity (see Table 1).
2. We have made the optimal route which provides the minimal delivery destination for each group of the delivery points.

The “minimal tree” for connection between all the points is created. After that we group the delivery points in routes based on the quantity of goods for delivery and loading capacity for transport unit.

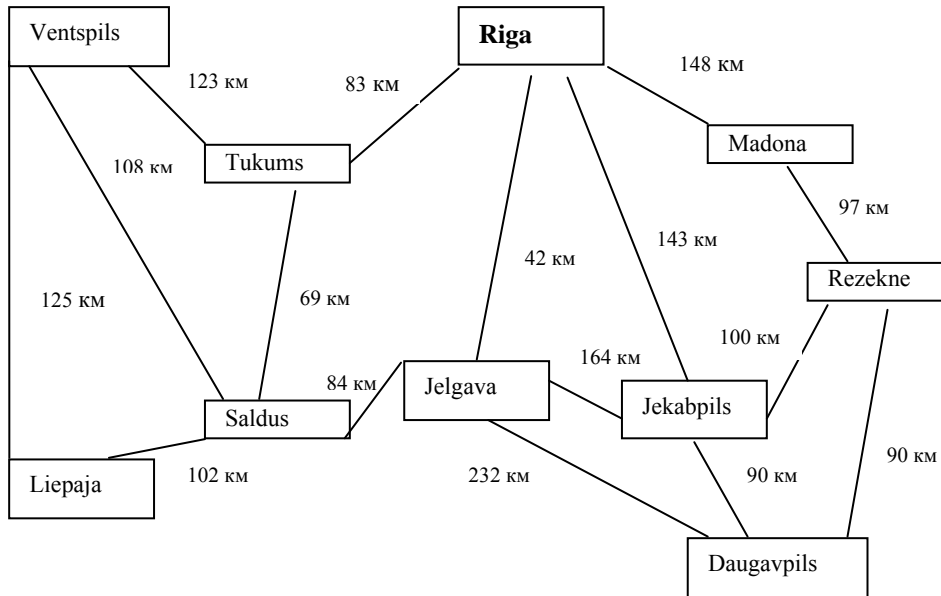


Figure 1. The points location and destination between them

Table 1. Grouping of delivery routes based on the transport unit capacity

Route 1		Route 2	
Delivery Point	Delivery Volume, kg	Delivery Point	Delivery Volume, kg
Tukums (T)	3700	Madona (M)	5350
Ventspils (V)	5000	Rezekne (Re)	3000
Liepaja (L)	4250	Jekabpils (J)	6850
Saldus (S)	5650	Daugavpils (D)	6000
Jelgava (J)	1200	-	-
Total	19800	Total	21200

As soon as routes are created it is important to make the optimal order for goods delivery (visiting of points) for each single route. The successful way is to make the matrix for each route, where the points included into route and the start point Riga are placed diagonally. The data of the shortest destinations between points are filled in the rest squares.

Solving both matrixes and using the increment formula the final optimal routes can be determined.

Route 1: R – J – S – L – V – T – R.

Route 2: R – M – Re – D – J – R.

The optimal routes are shown on Figure 2. From this could be seen that one truck has a circular route starting from Riga with delivery to Jelgava, then Saldus, Liepaja, Ventspils, Tukums and back to Riga. Another truck also starting from Riga with the first delivery to Madona, then Rezekne, Daugavpils, Jekabpils and returning back to Riga.

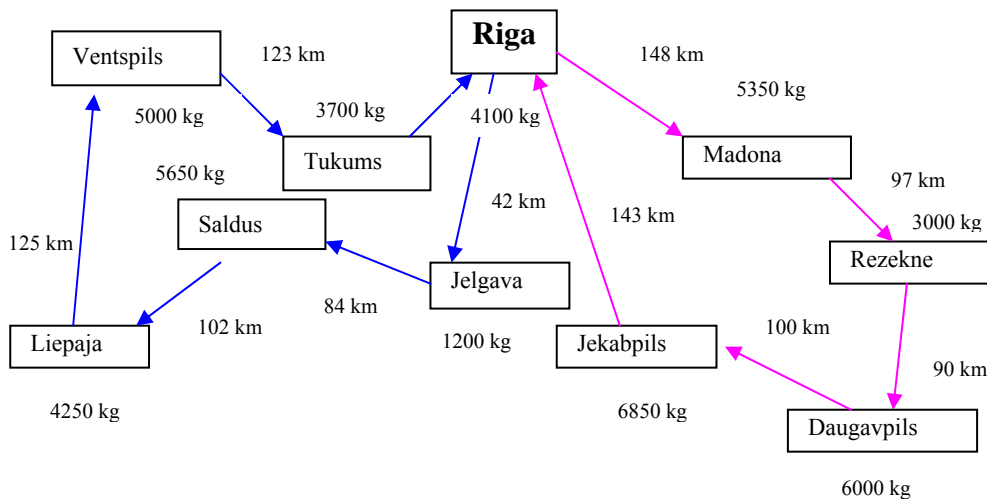


Figure 2. The final optimal routes

Here each unit of km equals to a certain unit of costs. Transport costs of the company consist of driver's salary, transport unit depreciation, cost of fuel, taxes, administration costs and others. Thus by using the optimal route for cargoes deliveries the distribution company (Logistics Company) can minimize the transport costs and improve the effect of transport use.

Conclusions

During the developing time of the Logistics centre's activity any logistics company faces the list of the barriers and some specific problems. The problem solving process is the significant part of the work of the Logistics centre. The success in the work of the Logistics centre often depends on the success of the problem solving. In this article the typical tasks for the Logistics centre have been considered. The considered decisions allow analysing the costs as it is shown on the concrete example of the article.

References

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