



Increasing The Efficiency of Cargo Delivery to Consumers

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ABSTRACT

At present, in a market economy, it is important to ensure the prompt delivery of goods to consumers. To fully meet the needs of consumers and manage the volume of goods, it is also important to rationalize the values of indicators that affect the efficiency of the transport enterprise. The article presents ways to reduce unproductive waiting time for loading and unloading vehicles and vehicles and loading vehicles by increasing the productivity of the loading and unloading points of the consignor and consumers.

Keywords:

Vehicle, cargo, efficiency, consumer, consignor, loading and unloading, working hours

The efficiency of delivery of goods to consumers is a complex indicator that takes into account all aspects of the activity, especially the delivery of goods on time and with proper quality.

The analysis of statistical data shows that the time spent on the production of a product is only 2% of the time spent on the movement of raw materials for its production from the first sources to production, and then to the consumer of the finished product. The remaining 98% of the total time is spent on the passage of various logistics channels, including transportation by road. A cost effective, energy efficient and reliable delivery system is essential to meet the growing demands of the industry [2, 3]. Optimization of freight traffic should also solve the problem of developing the transport network, including road and rail transport [4, 5]. Methods for organizing the transportation of construction materials, coordinating the work of shipping and receiving points, and improving the efficiency of transportation [6]. A systematic analysis of the processes occurring at the points of shipment or reception along the route, the determination of their composition, the elimination of vehicle downtime, and the

formation of vehicle performance indicators are required [7, 8].

In a modern market economy, it is important to ensure the prompt delivery of goods to consumers. In practice, when assessing the quality of delivery of goods to consumers, consumers mainly pay attention to transportation costs. At the same time, production costs usually include other costs determined by the quality of delivery. Improving the quality and efficiency of delivery of goods to consumers will be of interest not only in the overall cost of production, but also in a significant part of the cost of transport services. The effectiveness of various options for delivering goods to consumers is primarily determined by the price of the transport service. Since the reduction in the cost of transporting consumers is one of the important requirements for its spending, in this case, the option of transport service within the minimum cost or the cost does not exceed a certain level is considered desirable. The price of the service for the delivery of goods to consumers can be determined by the sum of the costs spent on the performance of all transport operations.

To fully meet the needs of consumers and manage the volume of goods, it is also important to rationalize the values of indicators that affect the efficiency of the transport enterprise. In particular, it is desirable to reduce unproductive waiting times for loading and unloading vehicles and vehicles and loading vehicles by improving the efficiency of the loading and unloading points of the consignor and consumers. At the same time, the number of vehicles that must operate in each direction, their operational performance, i.e. loading and unloading times, parking time in points, travel time, average daily number of trips, productivity in tons and ton-kilometers, and so on, are determined. In many cases, daily acceptance and delivery capabilities and needs are not taken into account, due to the internal conditions of shipping points and consumers, the uneven distribution of the cargo transportation capabilities of motor transport enterprises. over time are not taken into account. If transportation planning is carried out over relatively long periods, then it is almost impossible to take into account the daily real conditions of transportation, the possibilities and changing needs of consumers in traffic volumes. For this reason, there is a need for operational planning of the operation of vehicles, taking into account the daily, real conditions of transportation, the needs for traffic volumes, the number of vehicles and their carrying capacity, as well as their carrying capacity. transport. In a market economy, the main goal is not to meet the planned transport indicators in the period of the former planned economy, but to fully satisfy the changing needs of consumers in the volume and duration of transportation in various transport conditions. It is important to fully meet the real demand of shipping and receiving points in traffic volumes. The volumes of goods reflected in the contract for the carriage of goods, that is, the planned volumes of goods, may not correspond to the exact period for one period. For example, for a number of reasons, as a result of a decrease in the volume of cargo consumption of a cargo consumer, an increase in the amount of raw materials that has not yet reached consumption in its warehouses requires a reduction in the planned volumes of transportation. in the

following days. Or, due to the fact that some cargo consumers are constantly increasing their production plans, the average daily volume of cargo transportation may not be enough to ensure the continuous operation of the enterprise. To ensure the smooth operation and efficiency of such enterprises, in the first case, it is necessary to slightly reduce the volume of traffic compared to the previously planned volume, and in the second case, on the contrary, to increase the volume of freight traffic. In many cases, the needs of shipping companies or recipient companies are unevenly distributed over time.

Despite the above difficulties, it is advisable to adapt the transportation process as much as possible to the needs of cargo consumers.

It is possible to increase or decrease the total amount of transported cargo or cycle due to the optimal distribution of available vehicles in the transport company along the routes, that is, the number of vehicles operating in each direction, in accordance with the real possibilities for the volume of transportation. The amount of cargo delivered to consumers is calculated by decreasing or increasing the total cargo cycle performed on the routes. For example, if it is necessary to carry out a large volume of cargo transportation, using the relatively small transport capabilities of a motor transport company, then it is necessary to achieve a reduction in freight turnover. When there are a large number of vehicles, it is necessary to increase the volume of cargo turnover in order to fulfill a given volume of transportation and fully utilize a large number of vehicles. In many cases, goods consuming points receive a certain amount of cargo from several points, or vice versa, in which case the amount of daily transported cargo from each sender can be determined in different volumes. At the same time, the main goal is to satisfy the needs of the consumer's point in the volume of cargo.

And the shipping points are located at different distances from the addresses of cargo consumers (B_1, B_2, \dots, B_n) (Pic. 1), which means that the average volume of cargo transportation

When it is necessary to manage a constant and large cargo flow, more vehicles are allocated for short distances, and vice versa, when a relatively small amount of cargo needs to be transported, more transport is determined over long distances.

If the transport capacity of the transport company is insufficient, the set operating time of the vehicles must be used in full. In most cases, the underutilization of operating time is due to the absence of an integer relationship between the cycle time of vehicles on the route (t_{ayl}) and the specified operating time ($T_{шт}$). It is known that this gives the number of daily revolutions relative to the rolling stock.

In practice, the number of daily revolutions made in the direction is taken as an integer, i.e.

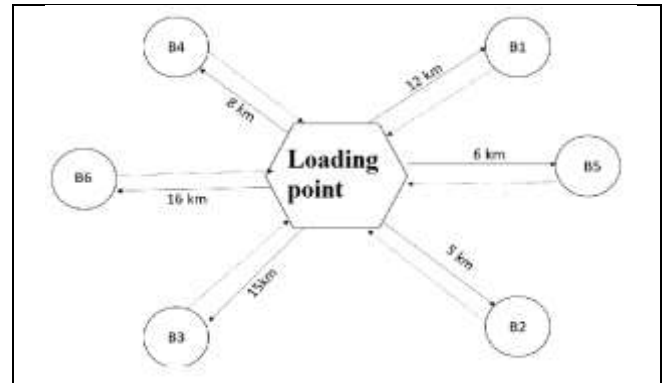
$$Z_{ayl} = \frac{T_{шт}}{t_{ayl}} \approx Z'_{ayl}$$

here - (Z_{ayl}) the number of daily rounds of the car; - t_{ayl} time of one cycle of the car, hours; $T_{шт}$ - daily duration of the vehicle, hours; (Z'_{ayl}) - the number of daily detours of the composite vehicle.

The operating time (T_m) on the route is determined based on the mode of operation of consumers and the funds of drivers working hours, and the value of the number of daily detours of the combined vehicle is always rounded to a smaller number (Z_{ayl}) than the value of the number (Z'_{ayl}) of daily detours of the vehicle. As a result, a certain part of the daily working time of each vehicle is lost or not used. Having determined these lost times, we can determine its cost per day for one car as follows, i.e.

$$t_{\text{пот}} = T_{шт} - Z'_{ayl} \cdot t_{ayl} \quad \text{cost} \quad (2).$$

In order to use this lost time $t_{\text{пот}}$ it is necessary to see the possibility of using each car in different directions during a certain day. The sum of daily time losses ($\sum t_{\text{пот}}$) of vehicles



Picture 1. Layout of senders and recipients

operating on the route at a transport enterprise is determined as follows:

$$\sum t_{\text{пот}} = T_{шт} \cdot A_{\text{п}} \quad \text{cost} \quad (3)$$

where is the number of cars on the route, bus. here is the number of cars on the route, bus. In other words, it is necessary to plan the operation of each vehicle in the transport company between routes in such a way that the sum of the lost time for the entire transport company is the smallest, and the value of χ should be minimal. Also, the real transport capabilities of a motor transport enterprise are seriously affected by excessive waiting time at the points of loading and unloading of rolling stock, and the time it takes for vehicles to complete one circle increases. It is especially desirable to rationally resolve this issue at cargo generating points, since such addresses are the collection point for vehicles transporting goods along several routes, and in the absence of unloading sites on them that ensure high work efficiency, the time spent in the process of loading or unloading is several times longer than norm. This results in insufficient completion of the number of daily trips (rounds) set for each vehicle and performance.

The service time for each vehicle arriving at the point of shipment (reception) (loading, unloading, maneuvering, paperwork, etc.) depends on the number of loading and unloading machines and various service points, their average productivity, the number of vehicles and the interval between successive arrivals for the purpose of using the service depends on the volume of traffic intended for

this point and the average carrying capacity of the rolling stock.

In conclusion, in order to increase the efficiency and optimize the maintenance of vehicles at cargo-generating (receiving) points, on the one hand, it is necessary to rationally determine the number of service points, and on the other hand, to agree on the interval between successive car arrivals with an average service time.

List of used literature:

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