

Andrii Duiun

O.O.Novikova, research supervisor

O.V. Khazova, language adviser

National TU «Dnipro Polytechnic», Dnipro, Ukraine

## **Ukraine-Belgium freight transport logistics improvement**

This publication describes the research of the freight transport logistics between Ukraine and Belgium. The calculations of the road transport vehicle capacity necessary to meet the freight market demands are based on the export data between Ukraine and Belgium in 2013-2017. The data about the export volume are received with help of the regression analysis.

First, it was found out that 3147 round trips are required to transport 62930 tons of cargo between Ukraine and Belgium over a distance of 4960 km. Each round trip takes 15 days.

The next step involved the analysis of cargo types with relation to the technological and freight transport logistics peculiarities, specific requirements for vehicles, and transportation and cargo safety demands. The type of cargo that is vulnerable to atmospheric influence and can be transported only in the covered trucks has been taken for further consideration as this cargo type share is the biggest in the total amount.

Taking into account the nature of transportation, vehicle technical characteristics, the cost of technical service, and vehicle compliance with the international standards, the decision to use a heavy truck Volvo FH12D12C420i and a semi-trailer Kogel S24-1 was made. To minimize the risk of downtime because of unstable demand during a year, the optimal number of 56 vehicle units has been identified taking into consideration a maximum annual profit of 803846 UAH.

The total cost of an international round trip counted for 205006,167 UAH in 2017 and included payments for driver, benefit-related deduction, fuel and lubricant costs, operation costs, costs of maintenance, cost of car tires, amortization, etc. The optimal travel cost per km was 56,43 UAH/km and transport work rate - 2,25 UAH/tkm (tonne - km)

According to the freight transport logistics arrangements and the international agreement on the driver mode of operation and work on vehicles with trailers or semi-trailers, the “relay” method of transportation with three drivers has been chosen as the most productive and cost efficient. In this case the drivers can meet the requirements for safety which prescribe that crew members must change each other after 450 km with each person minimum daily rest period of 11 hours. If a vehicle is not equipped with the sleeping space, each driver must have a daily rest of 10 consecutive hours within the 27 hour period. If a truck has sleeping facilities, the drivers should have at least 8 hour daily rest within the 30 hour period outside the vehicle or in the vehicle when it is stationary.

All the calculations are effective for the period of 2017 and should be modified according to price and cost fluctuations in the future.