

Секція
«ЛОГІСТИЧНІ ТЕХНОЛОГІЇ НА ПІДПРИЄМСТВАХ
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**USE OF HORIZONTAL TRANSSHIPMENT TECHNOLOGIES TO
IMPROVE MULTIMODAL CARGO TRANSPORTATION**

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Currently, the main direction of improving the technologies of freight transportation (especially long-distance, international and intercontinental) is the desire to reduce the costs of logistics services by optimizing supply chains. An effective solution that helps transport and logistics companies adapt their service offering to the needs of modern business is multimodal transportation using different types of transport, especially rail and road. Their combination optimizes supply chains in terms of time and is an effective alternative to long-distance unimodal road transportation.

The Committee of the European Parliament on Tourism and Transport plans to develop multimodal transportation on the European transport market in order to significantly increase the share of multimodal freight transportation in the overall structure of freight traffic in the near future. It is primarily about the intensification of the development of mixed road and rail transportation [1].

Multimodal transportation has a number of significant advantages over unimodal transportation, which include the ability to deliver cargo to almost any point in the world; reducing the cost of transportation; improving the quality of transport services; reducing the risk of cargo damage; ensuring fast and timely delivery [2].

In multimodal transportation technologies, vertical and horizontal methods of overloading are used [2]. With the vertical method of loading, lifting cranes or heavy-duty forklifts are used. Containers and swap bodies, as well as semi-trailers, are overloaded in this way. The latter are loaded on special platforms with pockets for the car chassis.

To reduce the barriers for combined transportation can allow the use of the technology of horizontal transshipment of a container or a changeable body with the help of the car itself. By slightly expanding the possibilities of road transport, the use of expensive stationary terminal equipment can be avoided, and the transition to multimodal transportation can be carried out very easily and efficiently.

One of the effective solutions in this direction are Mobiler and ContainerMover-3000 technologies, which are a further development of existing technologies for horizontal loading of containers.

The ContainerMover-3000 transshipment system, which provides lifting and lateral movement of containers and swap bodies, can be installed on a standard truck chassis. ContainerMover equipment on a container car (so-called transfer frames) can simply be placed on the car using the standard container pins of the car. The container wagon does not require any changes, and in case of major repair or maintenance, it is possible to simply reinstall the adapter frames on a replacement wagon [4, 5].

The actual transfer of the container begins with increasing the air pressure in the pneumatic system to lift the container. At the next stage, a hydraulic push system with a chain drive and integrated ball bearings moves the container horizontally from the car to the wagon or vice versa. The entire procedure takes only 5 minutes and is controlled by the car driver himself using a remote control. By pressing a button, the driver can open and close 4 automatic rotary locks of the container car, which significantly saves the time of transshipment work.

This intelligent and fast transfer of standard containers can be done almost anywhere. All that is necessary for this is the presence of a railway dead end and an asphalt road surface along it with a width of only three meters to connect the car and the railway platform. The principle of operation of this system is shown in Fig. 1.



Figure 1 – The principle of operation of the system ContainerMover

Analysis of the characteristics of the ContainerMover-3000 transshipment system allows us to conclude that this system:

- compatible with standard 20-foot containers and removable bodies (C715, C745, C782);
- can be used anywhere and easily moved between loading points;
- does not require the presence of expensive infrastructure (only a railway dead end and a small section of asphalted road surface along it is necessary);
- compatible with ordinary standard container wagons;
- easily controlled by the car driver using the remote control.

However, it should be assumed that vertical loading will not lose its relevance in the future, as it is a globally recognized technology that uses standard components.

Conclusions. The above shows that in order to improve the process of cargo transportation, it is advisable to combine the use of existing efficient transportation technologies and the implementation of cargo operations with the introduction of new, multimodal supply chains using promising horizontal transshipment technologies.

1. Evrosojuz delaet stavku na mul'timodal'nye perevozki. [Electronic resource]. - Access mode: <https://www.cargo-ukraine.com/ru/evrosoyuz-ultimodalnye-perevozki>
2. Noveye tehnologii smeshannyh perevozok/ Zheleznye dorogi mira, 2014, № 3, s. 21-25.
3. Rail Cargo Group naroshchue park platform dlja perevezennja kontejneriv MOBILER. [Electronic resource]. - Access mode: https://cfts.org.ua/news/2023/12/22/rail_cargo_group_naroshchue_park_platform_dlya_perevezennya_konteyneriv_mobiler_77618
4. InnovaTrain ContainerMover-3000. [Electronic resource]. - Access mode: https://www.innovatrain.ch/fileadmin/Medien/Bilder/Brosch%C3%BCren/ContainerMover_E.pdf
5. ContainerMover-3000 truck-mounted rail-road transshipment technology for ISO-containers and swap-bodies. [Electronic resource]. - Access mode: https://www.innovatrain.ch/fileadmin/Medien/Bilder/Presseberichte/bestfact_Quick_info_greenlogistics_2-055_Containermover-3000.pdf

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THE DEVELOPMENT OF INTELLIGENT CONTAINERS AS A PROSPECT FOR THE DEVELOPMENT OF CONTAINER TRANSPORTATION TECHNOLOGY

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Container transportation constitutes a significant share of freight traffic during international trade. In the conditions of constant growth of container flows in the implementation of global supply chains, the task of introducing innovative technologies to optimize logistics and increase their efficiency is faced.

One of the most promising directions is the development and application of intelligent containers (smart containers) [1].

A smart container is a container equipped with various sensors, geolocation systems and other devices that allow monitoring its location and the condition of the cargo in real time. This is a key point for all participants in the global supply chain.

The main technologies and devices that turn an ordinary container into an intelligent one are: