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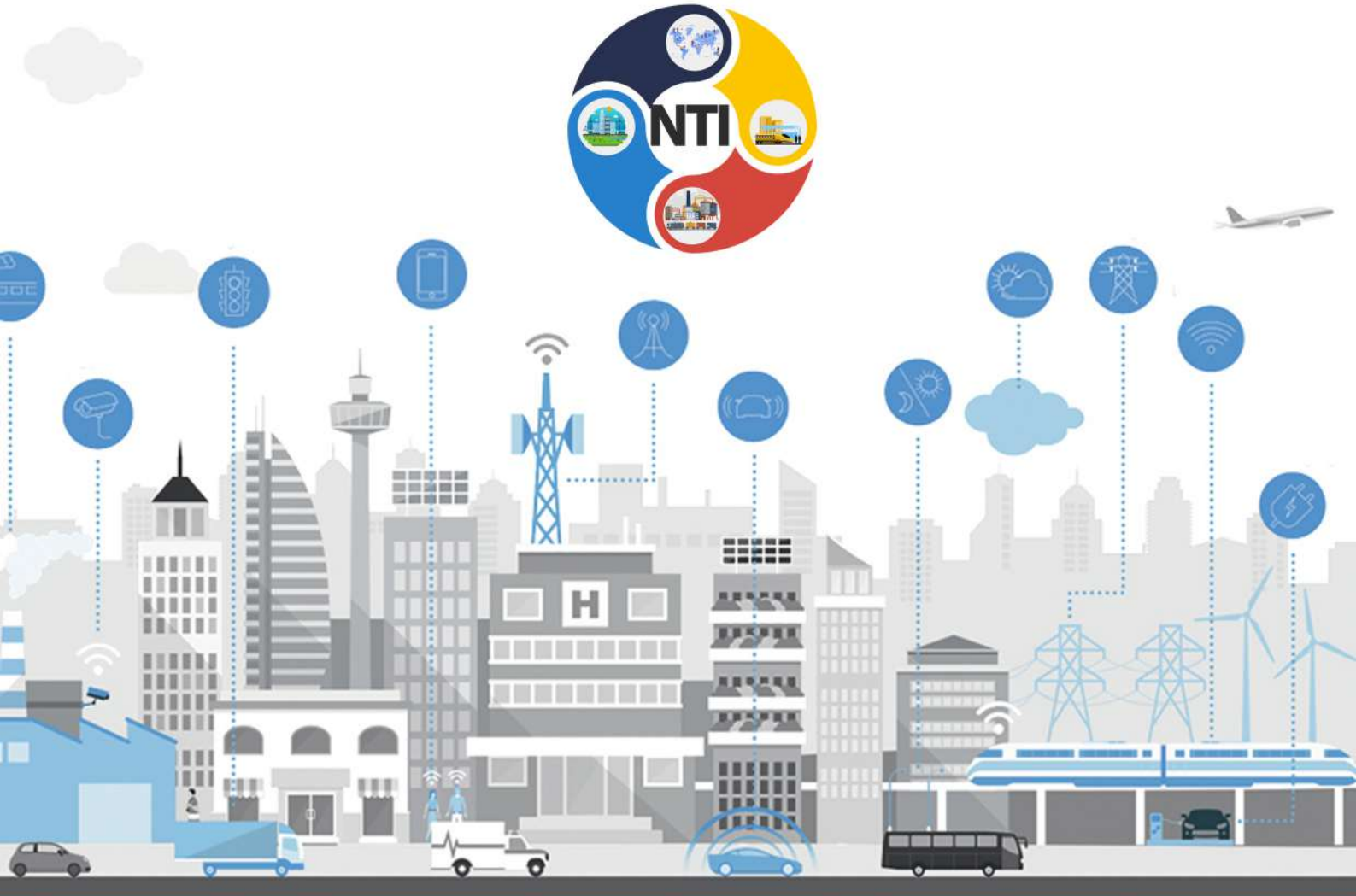

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
МІНІСТЕРСТВО ІНФРАСТРУКТУРИ УКРАЇНИ
ТРАНСПОРТНА АКАДЕМІЯ УКРАЇНИ
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ІНСТИТУТ ЕКОНОМІКИ ПРОМИСЛОВОСТІ НАН УКРАЇНИ

Матеріали

Двадцять першої науково-практичної

міжнародної конференції

«МІЖНАРОДНА ТРАНСПОРТНА ІНФРАСТРУКТУРА, ІНДУСТРІАЛЬНІ ЦЕНТРИ ТА КОРПОРАТИВНА ЛОГІСТИКА»

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ENHANCING THE EFFICIENCY OF RAILWAY INFRASTRUCTURE UTILIZATION IN INTERNATIONAL FREIGHT TRANSPORTATION

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Railway infrastructure plays a crucial role in Ukraine's economy, especially in the context of ongoing military aggression. The implementation of projects aimed at integrating the transport sector with the requirements of the European Union has a direct impact on Ukraine's economic growth. Currently, the railway infrastructure is in a critical state due to the war, and its continued operation necessitates comprehensive modernization.

Ukraine's current transport sector does not meet the standards of European integration and requires alignment of its transport network with the Trans-European Transport Network (TEN-T). A top priority for Ukraine is the integration of its railway infrastructure into the European transport network. This integration will foster an increase in international freight flows. To support this growth, measures must be implemented to reduce cargo delivery times and enhance the quality of international logistics services. The export of transport services is a highly profitable sector for the country. However, progress hinges on addressing key challenges, particularly the modernization and development of cross-border railway checkpoints.

The EU transport sector operates under technical standards that promote the liberalization of various modes of transport: road, rail, waterborne, and multimodal. Ukraine's further integration into the European Union requires the adoption of EU transport standards, which implies addressing the following priorities:

Increasing the throughput capacity of border infrastructure by reconstructing existing checkpoints and constructing new ones:

- Introducing joint border controls with neighboring countries and developing service zone networks to reduce waiting times.
- International rail freight transport is of strategic importance for Ukraine's economic resilience. Therefore, significant attention is devoted to improving operational technologies and modernizing the infrastructure of railway border crossings.

Ukraine's railway network features 14 principal border crossing points, which facilitate the transit of international freight traffic to Poland, Slovakia, Hungary, Romania, and Moldova. The total theoretical capacity of these crossings amounts to 220,000 tons per day, but due to technical constraints, only about half of this potential is currently utilized. One of the major limiting factors is the gauge disparity between the 1520 mm broad gauge and the 1435

mm European standard gauge. Overcoming this obstacle requires the implementation of 1435 mm gauge tracks within Ukrainian territory and the construction of transshipment terminals.

The modernization of existing track layouts and the construction of new infrastructure demand significant investment. Consequently, as part of Ukraine's cooperation with the EU and international organizations, several transnational infrastructure projects are being advanced to accelerate Ukraine's integration into the European transport network and bolster international trade.

Currently, projects are underway to construct standard-gauge (1435 mm) railway lines through Ukrainian territory. These initiatives are expected to significantly enhance the capacity of border crossings. The development of 1435 mm tracks will facilitate the economic revitalization of adjacent regions in western Ukraine, which are distant from combat zones and possess a higher degree of security. For the railway sector, these projects offer a pathway to upgrade border infrastructure.

The development of standard-gauge lines will improve connectivity between Poland and Ukraine, as well as between Romania and Moldova. One proposed alignment includes the Kraków – Lviv – Chernivtsi - Chișinău corridor, constructed alongside the existing 1520 mm gauge route. Based on existing demand and line capacities, initial implementation may also include connections between Kraków/Katowice (Poland) and Lviv (Ukraine), and Iași (Romania) and Chișinău (Moldova). These routes could provide seamless interoperability from Poland through Ukraine, Moldova, and Romania, while also enhancing passenger mobility.

Toward Moldova, it is planned to extend the standard-gauge line between Chișinău and Odesa via the Basarabeasca - Giurgiulești section. This will ensure direct access to port infrastructure in Galați and Constanța, Romania.

In 2024, construction began on a 1435 mm line from the Polish border through the Mostyska - Sknyliv section. Given wartime conditions, the project is scheduled for rapid implementation. The plan includes the construction of an 80 km section, including 12 km of dual-gauge track. The project should be divided into subprojects, as it will require embankment widening, upgrading automated train control systems at stations, modernization of heating infrastructure, and, in some cases, the construction of new station facilities.

Another standard-gauge project was launched between Chop and Uzhhorod, with the next phase extending the line to Lviv - thereby connecting Lviv to the TEN-T corridors. Further development is envisioned for the Uzhhorod - Matevtsi segment (10 km), enabling access to the Slovakian border.

Addressing these challenges necessitates the modernization of railway infrastructure at junctions between the 1520 mm and 1435 mm gauges. Optimization of technological processes at these crossings will significantly enhance the efficiency of international rail transport by reducing delays. The implementation of advanced technologies and modernization of infrastructure

are urgent priorities for the railway sector.

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IMPROVING RAILWAY INFRASTRUCTURE FOR HIGH-SPEED RAIL OPERATIONS

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Rail transport is one of the foundational sectors of the national economy. Effective management of this sector is a key condition for ensuring spatial economic cohesion, protecting national economic interests, and enhancing the quality of life for the population. Passenger transportation plays a particularly important role in this regard, as it enables population mobility and the rapid movement of the labor force.

High-speed rail operations are based on the application of advanced technologies across multiple domains. The implementation of high-speed services requires significant capital investment. The growing demand for high-speed transport has underscored the relevance of studies assessing the feasibility of using existing railway infrastructure for this purpose. Upgrading the existing infrastructure can substantially reduce the cost of designing new high-speed lines, although it necessitates justification of new technical solutions.

Among the main factors constraining the implementation of high-speed rail in Ukraine are the geometric and operational characteristics of existing railway alignments. One key aspect is identifying specific sections where train speeds can be increased on active lines without full-scale reconstruction or with only minimal investment in infrastructure upgrades.

When preparing lines for high-speed operations, the bulk of capital expenditures is typically associated with the modernization of intermediate stations and junctions due to their large number. This raises the issue of