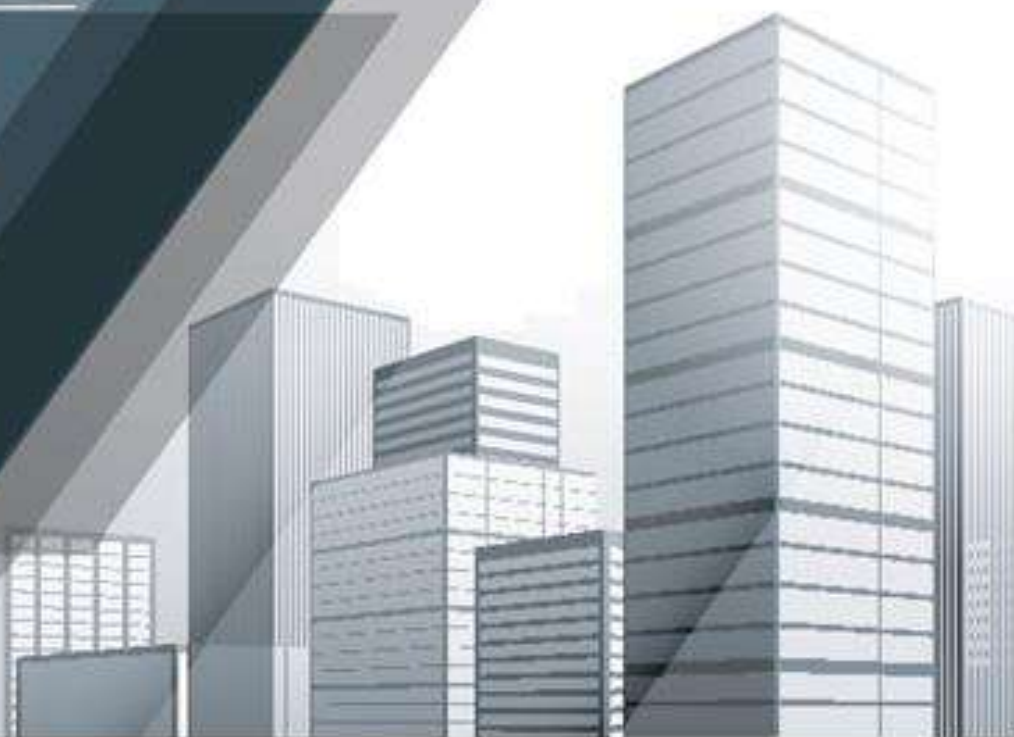


ТЕЗИ ДОПОВІДЕЙ

10-ї Міжнародної науково-технічної конференції

**«ПРОБЛЕМИ НАДІЙНОСТІ ТА ДОВГОВІЧНОСТІ
ІНЖЕНЕРНИХ СПОРУД І БУДІВЕЛЬ
НА ЗАЛІЗНИЧНОМУ ТРАНСПОРТІ»**



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UKRAINIAN STATE UNIVERSITY OF RAILWAY TRANSPORT

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**«ПРОБЛЕМИ НАДІЙНОСТІ ТА ДОВГОВІЧНОСТІ
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Abstracts of the 10th International Scientific and Technical Conference

**«RELIABILITY AND DURABILITY OF RAILWAY TRANSPORT
ENGINEERING STRUCTURES AND BUILDINGS»**

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Збірник містить тези доповідей науковців вищих навчальних закладів України та інших країн, підприємств транспортної та будівельної галузі за трьома напрямками: залізниці, автомобільні дороги, промисловий транспорт і геодезичне забезпечення; будівельні конструкції, будівлі та споруди; будівельні матеріали, захист і ремонт конструкцій та споруд.

10th International Scientific and Technical Conference "Reliability and durability of railway transport engineering structures and buildings" Kharkiv, November 20-22, 2024: Abstracts. - Kharkiv: UkrSURT, 2024. - 225 p.

The proceedings include abstracts of presentations by researchers from higher education institutions in Ukraine and other countries, as well as representatives of enterprises in the transport and construction industries. The topics are organized into three main areas: railways, highways, industrial transport, and geodetic support; building structures, buildings, and facilities; and construction materials, including the protection and repair of structures and facilities.

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**СЕКЦІЯ
ШЛЯХИ СПОЛУЧЕННЯ, БЕЗПЕКА РУХУ
ТА УПРАВЛІННЯ НА ТРАНСПОРТІ**

**SECTION
TRANSPORTATION WAYS, TRAFFIC SAFETY
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UDC 625.46(100)

BENCHMARKING OF TRAM WAY INFRASTRUCTURE

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Tram systems play a critical role in urban transportation, offering a sustainable, cost-effective, and efficient mode of public transportation [1], [2]. However, the characteristics of tram infrastructure and vehicles varies significantly across cities and countries, influenced by diverse historical, technical, operational, topological, and socioeconomic factors [3]. This paper presents an extensive benchmarking framework [4] designed to evaluate and compare tram infrastructure across multiple urban contexts. The benchmarking questionnaire consists of 76 questions integrating key performance indicators (KPIs) related to operation, topology, track infrastructure, maintenance, and repair, as well as traction power installation and telecommunications. Comparable benchmarks are scarce and have been undertaken mostly in less detail, confidential and mostly focusing operational characteristics (e.g. Verein für den zwischenbetrieblichen Vergleich (ZBV) [5], S·for·T Management Consultants GmbH & Co. KG [6] and BOLTS International Light Rail and Tram Benchmarking Group [7]) or on new construction projects (e.g. Andersson P. G. (2010) [8]). In total 213 questionnaires were sent to tram and light rail operators worldwide in October 2023 with 38 usable returns from cities in Europe and Oceania, a response rate of 17.8 % has been achieved. Considering the extent of the questionnaire, this is a reasonable response rate considering response rates for e-mail notification surveys [9].

To compare the anonymized results of tram networks with different sizes and characteristics, the data has been normalized by total length of track and the number of available seat kilometers in the network. Results highlight the disparities in infrastructure performance and offer insights into best practices for optimizing tram systems.

With focus on the reliability of structures and buildings in Railway Transport, the benchmark shows the differences in service life of rails (straight and curved), turnouts, track covering, slab track as well as the great varieties of maintenance

principles, immediate action limits, interventions, and track renewal rates. Moreover, it is greatly visible that open track is more standardized than closed track.

The benchmarking approach can serve as a decision-making tool for scientists, policymakers, transit authorities, and urban planners, promoting targeted investments and policy interventions to enhance the effectiveness and sustainability of tram networks globally. Based on the results, standardization is desirable, as it can foster uniformity in best practices and facilitate the exchange of knowledge and resources across regions, leading to more efficient and scalable improvements in tram systems worldwide.

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UDC 528.4

SURVEYING THE TERRAIN AND OBSERVING DAMAGE AND DESTRUCTION OF INFRASTRUCTURE FACILITIES AS A RESULT OF HOSTILITIES ON THE TERRITORY OF UKRAINE

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The infrastructure was almost the first to take the brunt of a full-scale war at dawn on February 24, 2022, and the enemy still does not stop his attacks. In addition to damage, infrastructure suffers less visible but no less painful financial and economic losses (fig. 1-2).