Rationale for the Conceptual Model of Project Management for Modernizing Transport Mobility in Ukraine's Territorial Communities under Martial Law and During Post-war Recovery

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Received: 30.11.2025; Accepted: 30.12.2025
https://doi.org/10.32347/ tit 2025.9.2.01.01

Abstract. The full-scale armed aggression against Ukraine has substantially transformed the operating principles of transport systems: the threats of martial law have compounded pre-war shortcomings, exacerbating existing problems in the transport sector. The conditions of martial law have affected the transport mobility of territorial communities through a combination of direct and indirect destructive factors, leading to a systemic deterioration of these systems. The article is devoted to addressing the modernization of transport systems in Ukraine's territorial communities, which had pre-war systemic deficiencies and have suffered large-scale destruction because of the armed aggression against Ukraine. The research is grounded in a qualitative theoretical methodology that combines a critical review of scientific literature with conceptual modeling. The model is constructed by synthesizing theories of sustainable urban mobility, the resilience of critical infrastructure, and contemporary project management. The principal result is the proposed Conceptual Model that defines the project management system for modernizing the transport systems of territorial communities. The scholarly contribution lies in formulating model-specific principles, including dual-use infrastructure (civil and defense), heightened resilience, adaptability, and sustainability-based prioritization. The model specifies the key structural elements, stakeholders, resources, an adapted project life cycle (initiation and prioritization, adaptive planning, execution and monitoring, closure and operations), technologies and tools (GIS, BIM), external and internal environmental factors, and the core processes (project portfolio initiation and formation; planning and resource allocation; execution and monitoring & control; communications and reporting). Its practical value is in providing a systematic and transparent

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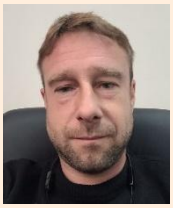

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instrument for public authorities and project teams. Its implementation will make it possible to harmonize approaches to recovery, improve the efficiency of resource use, and ensure that the modernization of transport systems contributes to building safer, more sustainable, and more resilient transport systems in territorial communities, capable of withstanding future threats.

Keywords: Infrastructure Resilience, Post-war Recovery, Sustainable Urban Mobility, Project Portfolio Management, Dual-use Infrastructure, Risk Management, Decision-making.

INTRODUCTION

Modernizing transport mobility is among the key challenges for the sustainable development of contemporary societies worldwide. Recent scholarly discourse has increasingly focused on the problem of excessive reliance on private automobiles as a root cause of chronic congestion, the degradation of the urban environment, and declining road safety. Empirical research confirms that traditional extensive approaches-particularly the expansion of road infrastructure do not resolve congestion in the long run and, on the contrary, stimulate further growth in car use through induced demand. This creates both a scholarly and practical imperative to identify and implement innovative solutions aimed at a paradigm shift in mobility [1, 2, 3].

The current state of research offers a range of technological and policy innovations; however, their effectiveness and social implications remain the subject of vigorous debate. On the one hand, considerable attention is devoted to the concept of Mobility as a Service (MaaS) and the digital integration of transport services as instruments capable of providing a convenient alternative to private car use. Yet this optimistic hypothesis is far from universally accepted. Several studies raise well-founded concerns about potential unintended consequences of MaaS for social equity and urban governance. They underscore that the rollout of digital innovations may erect new barriers for vulnerable population groups, thereby reinforcing existing inequalities in access to transport services. Thus, the scholarly literature reflects a tension between technological optimism and social skepticism, indicating the absence of a unified vision for balanced implementation of innovations [4, 5, 6, 7, 8].

Against this global backdrop, the modernization of transport systems under conditions of armed conflict and post-war recovery as in Ukraine constitutes a unique and exceptionally complex challenge. The war has not only intensified pre-existing systemic problems but has also fundamentally altered user behavior and transport preferences, necessitating a reassessment of traditional planning approaches. Moreover, the imperative to reconstruct damaged infrastructure under persistent threats brings to the fore issues of resilience and adaptability that are insufficiently addressed within standard project management models [9, 10, 11].

A review of the literature reveals a critical gap: the absence of a comprehensive, integrated project management model for modernizing transport mobility that simultaneously accounts for the need to remedy legacy infrastructure problems, the contested nature of contemporary technological solutions, and the unique challenges associated with martial law and post-war recovery. The purpose of this study is to fill that gap by developing a Conceptual Model of project management for modernizing transport mobility in Ukraine's territorial communities. The model is intended to serve as a practical instrument that integrates principles of sustainability, threat resilience, and effective project management to ensure a successful, transparent, and socially oriented reconstruction of Ukraine's transport systems.

PURPOSE AND METHODS

The aim of the study is to develop a comprehensive conceptual model of project management for the modernization of transport systems in territorial communities, adapted to the conditions of martial law and post-war recovery amid the armed aggression against Ukraine.

The study is grounded in a qualitative theoretical methodology, with conceptual modeling as its central method. The work is based on a systematic and critical analysis of current scholarly literature to identify key challenges,

theoretical contradictions, and the existing research gap.

The model is developed by synthesizing propositions from three core domains: theories of sustainable urban mobility, the resilience of critical infrastructure, and project management theory. Employing a systems approach, the proposed Conceptual Model is treated as an integrated architecture that specifies not only its static components but also the dynamic processes and interdependencies among them. This approach is optimal for designing a new, integrated managerial instrument adapted to the complex and unique conditions of Ukraine's post-war recovery.

RESULTS AND EXPLANATIONS

1. Pre-war challenges of transport mobility in Ukraine's territorial communities. In the pre-war period, the transport systems of Ukraine's territorial communities faced a complex set of challenges whose manifestation and intensity varied markedly across space. Mobility problems in large metropolitan areas differed substantially from those in medium and small towns or rural territories, yet together they constituted a systemic crisis in the sector.

For large cities, the primary destabilizing factor was the high concentration of private motor vehicles against a street network that had not been adapted accordingly. This produced chronic congestion, generating significant economic losses and social tension. The persistent saturation of traffic flows increased noise exposure, while emissions of harmful substances into the ambient air routinely exceeded regulatory thresholds [1]. In combination, these factors degraded the urban environment and turned certain districts into areas that were increasingly unfit for comfortable living.

At the national scale, road traffic safety remained unsatisfactory. Elevated crash rates were observed both in cities due to high traffic intensity and on interurban links owing to poor pavement conditions and the absence of modern road engineering and safety features [2].

Another cross-cutting issue was the progressive decline in the profitability of transport services, particularly in the public transport segment. In large cities, congestion was a major driver; in smaller settlements, the key causes included an aging vehicle fleet, low passenger demand, and the lack of effective compensation mechanisms for concessionary fares. The result was a contraction of route networks and service degradation, which constrained the mobility of the most vulnerable population groups. In sum, the accumulation of problems from urban congestion to systemic non-profitability of services called for new approaches to transport system management at all levels [12].

2. Causal Analysis of the Transport Mobility Crisis. The root causes of the systemic crisis of transport mobility in Ukraine's territorial communities are multifaceted and stem from longstanding shortcomings in governance approaches. The primary driver is a profound disconnect between spatial planning and transport planning. New residential and commercial developments were frequently implemented without adequate transport impact assessment or integration into the existing territorial system, generating new trip attractors that were not matched by a commensurate supply of transport services. This practice created areas of enforced car dependence and embedded long-term infrastructural imbalances.

These planning deficits were reinforced by the dominance of an extensive development path for the transport system. Policy decisions prioritized "hard" infrastructure measures such as carriageway widening, the construction of interchanges, and new roads. Oriented toward increasing capacity for private automobiles, this approach effectively stimulated further motorization through the mechanism of induced demand [3], deferring rather than resolving the underlying problem. Meanwhile, more intensive mobility-management instruments particularly demand-management measures, the development of Intelligent Transport Systems (ITS), and systematic public transport priority received insufficient attention from public authorities, local self-government, and civil society.

Against this backdrop, public transport and, more broadly, the transport systems of territorial communities experienced progressive degradation. Chronic underfunding, wear and obsolescence of rolling stock, inefficient route

networks, and the absence of unified service quality standards especially where private operators predominated made public transport an unattractive alternative. Underdeveloped public transport acted as a catalyst for car dependence: in the absence of reliable, comfortable, and rapid service, residents with the means to do so chose the private car as the only way to guarantee personal mobility. This produced a vicious circle in which poor public transport quality encouraged greater car use, which in turn further deteriorated operating conditions for public transport due to congestion.

3. Transformation of Mobility Challenges under Armed Aggression and Martial Law. The full-scale armed aggression against Ukraine fundamentally changed the paradigm of transport system operations, adding unprecedented challenges to the pre-war problems and exacerbating those already present. The impact of martial law on the transport mobility of territorial communities manifested through a set of direct and indirect disruptive factors that led to systemic degradation of transport systems [9]. First and foremost, direct physical damage to transport infrastructure became a critical factor. Targeted strikes on bridges, overpasses, roads, railway junctions, airports, and public transport assets such as depots and traction substations severed established transport links at both national and local scales. The destruction or damage of a substantial share of rolling stock owned by municipal and private operators in many communities made it impossible to provide passenger services even at a minimally required level, resulting in the full or partial transport isolation of certain districts and settlements.

A second major factor was large-scale demographic change driven by internal displacement. Territorial communities in rear regions faced a sharp and unpredictable surge in demand on systems that were not designed for such user volumes. This overloaded public transport and the street–road network, intensifying congestion and undermining service accessibility. By contrast, frontline and de-occupied communities experienced substantial population outflows, which precipitated a critical collapse in passenger flows and, consequently, the complete economic non-viability of transport routes. In addition, the transport sector's functioning was heavily constrained by nationwide economic and security measures. Fuel supply disruptions, broken supply chains for spare parts and materials, and the reallocation of budgetary resources toward defense made not only system development but even proper maintenance and state-of-good-repair practically impossible. The imposition of curfews, movement restrictions in designated zones, and ongoing safety threats to staff and passengers further destabilized operations, eroding reliability and regularity. Taken together, the consequences of armed aggression transformed chronic mobility problems into a systemic crisis that threatens the functioning of territorial communities [13].

4. Strategic Imperative to Modernize Transport Mobility in the Context of National Security and Sustainable Development. The current crisis caused by armed aggression, together with the prospect of post-war recovery, creates a unique window of opportunity to fundamentally rethink approaches to managing transport systems. The need for modernization extends far beyond the mere reconstruction of damaged infrastructure; it is a strategic imperative with a dual purpose. On the one hand, modernization makes it possible to resolve deeply rooted, chronic problems from the pre-war period; on the other, it enables the formation of a resilient and controllable system capable of operating effectively under conditions of existential threat while strengthening the country's defense posture.

Implementing recovery projects on the basis of outdated concepts would not only reproduce an inefficient and unsustainable model but also lock in its fundamental defects: dependence on private automobiles, high pollution levels, poor safety, and economic unviability. By contrast, integrating contemporary principles of Sustainable Urban Mobility Planning (SUMP) into reconstruction processes helps avoid repeating past mistakes. Prioritizing public transport, creating safe infrastructure for walking and cycling, deploying ITS, and introducing demand-management measures would not merely restore but qualitatively transform the transport supply, making it more efficient,

environmentally sound, and socially equitable [4, 5]. Concepts such as MaaS involve the digital integration of multiple modes to reduce dependence on private cars [4, 6, 7]. It is essential that such innovations be implemented in ways that safeguard social inclusivity and equity [5].

At the same time, under the continuing threat posed by aggressor states, parameters such as operational controllability and resilience become paramount. Modernization that decentralizes transport hubs, establishes redundant routes, and develops multimodal corridors significantly enhances the transport resilience of territorial communities. Such a system can maintain core functionality even when specific components are deliberately targeted, thereby ensuring the capacity to evacuate the population, deliver humanitarian supplies, and redeploy forces.

Strengthening controllability through digitalization and the deployment of ITS is critically important for bolstering national defense. Modern traffic management centers can adapt flows in real time, grant priority to military and specialized vehicles, and promptly inform the public about safe movement corridors. In this way, modernized transport mobility ceases to be purely a civil service and becomes a strategic asset integrated into the national security architecture an essential precondition for Ukraine's continued existence and successful development in the new geopolitical reality.

5. Priority Areas and Methodological Foundations for Modernizing Transport Mobility. Effective modernization of transport mobility in territorial communities under martial law and during post-war recovery requires a systems approach that combines strategic transformation pathways with a robust implementation toolkit. The principal avenues of modernization are institutional reform, the prioritization of sustainable modes, technological integration, and the embedding of resilience principles in engineering and urban-planning decisions. The foundation for delivering these directions should be a project-based approach (project management) that ensures the controllability, transparency, and efficiency of complex infrastructure transformations.

A first-order priority is deep institutional transformation at both national and local levels, including the development and implementation of a modern regulatory framework and, in particular, the mandatory adoption of SUMPs for all large and medium-sized communities. In parallel, it is necessary to move from an autocentric model to a human-centered mobility paradigm. This entails priority investment in restoring and expanding public transport, including the renewal of rolling stock with low-emission vehicles, optimization of route networks, and the creation of dedicated lanes. An integral component is the build-out of safe, continuous infrastructure for active mobility pedestrian areas and bicycle corridors [14].

Technological modernization should focus on the widespread deployment of ITS. Such systems enable the optimization of traffic flows, management of parking supply, real-time passenger information, and unified electronic fare payment. Under resource constraints, ITS provides an intensive-development lever, improving the performance of existing infrastructure without costly physical expansion [8]. Moreover, the design of new assets and the reconstruction of damaged infrastructure must be grounded in enhanced resilience and safety principles that explicitly account for potential wartime threats [10].

Successful delivery of these complex and interdependent tasks hinges on the application of project management methodology. The development and implementation of each modernization element from a new tram line to the launch of a citywide bikeshare should be treated as a distinct project with clearly defined objectives, timelines, budgets, and success criteria. This approach ensures transparent use of financial resources, including international assistance; enables effective risk management; coordinates the activities of multiple stakeholders; and supports appropriate monitoring and control across all phases of the project life cycle [11, 15]. Building a community-level portfolio of modernization projects will allow systematic, stepwise progress toward the strategic goal of safe, resilient, and efficient transport mobility.

6. The need to develop a Conceptual Model for managing modernization projects.

Under the conditions created by armed aggression, traditional management approaches in the infrastructure sector prove insufficiently effective. The scale of destruction, resource scarcity, high levels of uncertainty, and the urgent need for rapid yet high-quality recovery impose strict requirements on process controllability. Consequently, adopting a project-based approach is not merely a recommended practice but a critically necessary methodology for the successful modernization of transport mobility in territorial communities.

First, project management provides structure and direction for implementing complex, multicomponent initiatives. Modernizing a transport system is not a monolithic process but a portfolio of interrelated projects, each with its own objectives, resources, and stakeholders. Project management methodology enables the decomposition of the overall task into manageable phases, precise definition of scope, the setting of realistic schedules and budgets, and the clear assignment of responsibilities. This approach prevents ad hoc action and resource dissipation, channeling efforts toward specific, measurable results.

Second, under severe constraints on financial, material, and human resources, the project approach is an instrument for optimal allocation and control. The planning processes at the core of project management require detailed justification of every cost item, which is critical for the effective use of public funds and international financial assistance. Implementing the transparent monitoring and reporting procedures inherent to project management ensures a high level of accountability and transparency key requirements of international partners and Ukrainian society [11].

Third, project management is an effective mechanism for addressing risk and uncertainty, which are exceptionally high in wartime and the post-war period. Systematic identification and analysis of potential risks security, financial, logistical, and political together with the development of response strategies, help minimize their negative impact on project delivery. In contrast to reactive, ad hoc responses, this proactive approach substantially increases the likelihood of completing projects on time and within the approved budget, thereby underpinning the resilience of the overall recovery process [15].

Recognizing project management as the optimal methodology is a necessary but insufficient step for the successful delivery of modernization objectives. Standard, one-size-fits-all approaches and frameworks, while embedding fundamental principles, do not account for the full spectrum of Ukraine's unique challenges. The operational specifics of martial law and post-war recovery where civil and defense needs are tightly interwoven require a specialized, context-adapted toolkit. Hence the urgent need to develop a Conceptual Model of project management for modernizing transport mobility in territorial communities.

Such a model is essential because it must integrate context-specific factors into classical project management processes. Unlike generic approaches, the proposed model should systematically account for unique aspects such as dual-use infrastructure (civil and defense), extraordinarily high security risks, operation under resource scarcity and disrupted supply chains, and a complex stakeholder landscape that includes military administrations, international donors, and civil society organizations. Without the systematic integration of these factors across the project life cycle, initiatives will remain vulnerable and may prove ineffective [10].

The Conceptual Model should offer adapted decision-support mechanisms and tools. For example, it should include a specialized project-prioritization methodology that evaluates not only socio-economic impact but also each project's contribution to community resilience and defense capability. The model should incorporate an expanded risk management framework tailored to wartime threats and agile planning practices that make it possible to adjust projects rapidly in response to shifts in the security situation or the emergence of new funding opportunities [11].

In sum, developing the Conceptual Model means creating a practical, viable instrument. It is intended to translate general principles of project management into a clear, sequential, and Ukraine-specific algorithm of action. Such a model will standardize approaches across

communities, foster synergy among projects, and ensure that recovery is not a chaotic set of isolated initiatives but a strategically calibrated, well-governed, and successful program at the national scale.

7. Principles of the Conceptual Model for Project Management of Transport Mobility Modernization. The Conceptual Model designed to systematize and steer modernization processes rests on a set of interrelated principles. These principles constitute foundational rules that guide decision-making across all phases of the project life cycle and ensure alignment with the unique challenges of wartime and post-war periods.

The dual-use principle requires that every modernization project be assessed and designed in terms of its simultaneous contribution to improving civil mobility and quality of life, and to strengthening a community's defense capacity and resilience. Infrastructure assets roads, bridges, and transport hubs must be conceived not only as enablers of daily travel but also as potential corridors for evacuation, logistics, and humanitarian response.

The Resilience-by-Design principle mandates engineering and managerial solutions that enhance the system's ability to withstand deliberate attacks or other crises and to restore functionality rapidly. This includes the creation of redundant routes, the decentralization of critical nodes, the use of robust materials and technologies, and the preparation of rapid-recovery plans.

The principle of adaptability and flexibility shifts the emphasis from rigid long-range planning to iterative, agile approaches. Project governance should allow for swift adjustment of plans, scope, and priorities in response to changes in the security, economic, or humanitarian situation, thereby enabling effective management of unforeseen shocks.

The principle of sustainability-driven prioritization stipulates that project selection and resource allocation be based on a multifactor assessment in which, alongside conventional economic indicators, criticality for community functioning, humanitarian impact, speed of restoring essential services, and contribution to local economic development play a decisive role.

The principle of maximal resource efficiency recognizes acute constraints on finance and materials and favors projects that deliver the largest positive effect at the lowest cost. This encourages repair and upgrading of existing assets rather than full rebuilds, the use of locally available materials, and the engagement of local contractors to stimulate economic recovery.

The principle of full transparency and accountability requires that all processes—from project initiation to closure remain as open as possible to the public, oversight bodies, and international partners. This entails the deployment of open procurement systems, regular public reporting, and a clear delineation of responsibilities among all participants.

The human-centered and socially inclusive principle keeps people at the heart of modernization despite the focus on security and resilience. Project decisions must account for the needs of all population groups including internally displaced persons, veterans, and persons with disabilities ensuring barrier-free design, accessibility, and a fair distribution of the benefits arising from improved mobility.

8. Structural Elements and Processes of the Conceptual Model for Project Management. Governing entity and object of management. The governing entity comprises the bodies that take decisions and execute projects: project management teams, local self-government and military administrations, line ministries, and state recovery agencies. The object of management is the portfolio of transport-mobility modernization projects for a given territorial community, encompassing both physical infrastructure (roads, bridges, rolling stock) and "soft" components (traffic management systems, digital services, regulatory change).

Key stakeholders. The model identifies and classifies all participants, specifying their roles, interests, and levels of influence. The main groups include decision-makers (state authorities and local self-government), financing partners (international financial institutions and donor governments), the military (as sponsors of specific infrastructure requirements and

guarantors of security), implementers (project teams and contractors), and end users (residents, businesses, and civil society organizations).

Resources. The model provides for managing four core resource types: financial (state and local budgets, international assistance, private investment); material–technical (construction materials, machinery, equipment); human (engineers, designers, managers, skilled workers); and informational (damage-assessment data, GIS layers, design documentation).

Project life cycle (implementation stages). The model proposes an adapted life cycle tailored to the specifics of martial law. Initiation and prioritization involve rapid needs assessment based on damage analysis and the humanitarian situation, followed by the selection of critical projects. Adaptive planning develops a flexible plan that accounts for elevated risks and plausible scenarios. Implementation and monitoring cover works carried out with enhanced safety measures and continuous control of risks and performance. Closure and operation introduce the asset into service with its dual-use functions in view and incorporate a lessons-learned review.

Technologies and tools. Delivery relies on modern digital instruments: Project Management Information Systems (PMIS) for planning and control; Geographic Information Systems (GIS) for spatial analysis and modeling [16]; Building Information Modeling (BIM) to design resilient and efficient infrastructure assets; and communication platforms that ensure transparency and stakeholder engagement.

Environmental factors. The model operates with two groups of contextual factors. External factors include the security situation, macroeconomic conditions, and the policies of international partners. Internal factors comprise national legislation, the institutional capacity of the community, the condition of surviving infrastructure, and the socio-political climate.

The effectiveness of the Conceptual Model is determined not only by the presence of its structural elements but also by clearly articulated processes and interconnections among them. These linkages provide the model with dynamism, adaptability, and coherence, turning it into a functioning managerial mechanism. At its core lies a cyclical, iterative process that begins with needs analysis and culminates in project delivery, the results of which feed back into subsequent planning.

The initiation and portfolio formation phase is triggered by interaction among stakeholders community members, the military, and businesses who articulate demand, and the governing entity, which consolidates it. The governing entity assesses these needs in the context of environmental factors such as damage assessments and the security situation, identifies potential projects, and, using specialized tools for prioritization, shapes the object of management: a balanced portfolio of modernization projects.

The planning and resource-provision phase translates priorities into implementable designs. For each priority project, the governing entity launches detailed planning supported by appropriate technologies, including Building Information Modeling and Geographic Information Systems for spatial analysis and modeling [17]. The critical linkage at this stage is between project requirements and available resources. The governing entity negotiates with financial stakeholders to secure funding and plans the allocation of material and human resources, adjusting scope and timelines in line with their availability.

The implementation and control phase forms the operational core of interaction among the governing entity, delivery stakeholders, and the project life cycle. The governing entity continuously monitors progress, expenditures, and risks at every stage, using Project Management Information Systems to track performance. Feedback is constant: any change in environmental factors such as a deterioration in the security situation activates the risk-management process and may necessitate immediate plan adjustments.

The communication and reporting phase is transversal and underpins transparency and steerability. The governing entity maintains ongoing engagement with all stakeholders, relying on communication platforms to inform them about project progress and to gather feedback. This two-way exchange is essential for

sustaining the confidence of international partners and retaining community support.

CONCLUSIONS AND RECOMMENDATIONS

The principal outcome of the research is the development of a Conceptual Model for project management of transport mobility modernization in territorial communities an integrated managerial framework adapted to Ukraine's specific conditions. The proposed Conceptual Model is a coherent system composed of several key, interrelated structural elements (components). Clear definition of these elements and their interactions forms the basis for applying the model in planning and delivering modernization projects. The model is grounded in a synthesis of theories of sustainable development, critical infrastructure resilience, and project management. Although the model is presented at a theoretical level, it lays the groundwork for further research. Priority directions include empirical validation through pilot projects in affected communities, the development of quantitative tools for project prioritization, and analysis of pathways for integrating the model into national recovery policy. Subsequent work will enable this conceptual foundation to be transformed into a practical instrument for building a modern, safe, and resilient transport system in Ukraine.

ACKNOWLEDGMENTS

The research was carried out within the R&D project "Methodology for Project Management of Modernizing Traffic Organization for the Wartime and Post-War Recovery of Territorial Communities", state registration No. 0123U101943, and is funded by the State Budget of Ukraine. The project leader is Serhii D. Bushuyev, D.Sc. (Eng.), Professor, Head of the Department of Project Management, Kyiv National University of Construction and Architecture.

We would like to thank A. H. Limonov for his critical comments during the study and in preparing the materials for publication.

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Обґрунтування концептуальної моделі менеджменту проєктів модернізації транспортної мобільності територіальних громад в умовах воєнного стану та повоєнного відновлення України

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Анотація. Повномасштабна збройна агресія проти України суттєво трансформувала засади функціонування транспортних систем: до недоліків довоєнного часу додались загрози воєнного стану, що призвело до загострення наявних проблем у сфері транспорту. Умови воєнного стану вплинули на транспортну мобільність територіальних громад через сукупність прямих і опосередкованих руйнівних чинників, що спричинили системне погіршення цих систем. Стаття присвячена вирішенню проблеми модернізації транспортних систем територіальних громад в Україні, які мали системні недоліки довоєнного часу та зазнали масштабних руйнувань внаслідок збройної агресії проти України. Дослідження ґрунтується на якісній теоретичній методології, що включає критичний аналіз наукової літератури та концептуальне моделювання. Модель розроблено шляхом синтезу теорій сталої міської мобільності, стійкості критичної інфраструктури та сучасного проєктного менеджменту. Основним результатом є запропонована Концептуальна модель, що визначає систему менеджменту проєктів модернізації транспортних систем територіальних громад. Наукова новизна полягає у формулюванні специфічних принципів моделі, таких як подвійне призначення інфраструктури (цивільне та оборонне), підвищена стійкість (resilience), адаптивність та пріоритезація за критеріями сталості. Модель визначає ключові структурні елементи, стейкхолдерів, ресурси, адаптований життєвий цикл проєктів (ініціація та пріоритезація, адаптивне планування, реалізація та моніторинг, завершення та експлуатація), технології та інструменти (GIS, BIM), зовнішні та внутрішні фактори середовища, процеси (ініціації та формування портфеля проєктів, планування та ресурсного забезпечення, реалізації та контролю, комунікації та звітності). Практична цінність моделі полягає в тому, що вона пропонує системний та прозорий інструмент для органів влади та проєктних команд. Її впровадження дозволить уніфікувати підходи до відновлення, підвищити ефективність використання ресурсів та

гарантувати, що модернізація транспортних систем сприятиме створенню більш безпечних, сталих та стійких до майбутніх загроз транспортних систем територіальних громад.

Ключові слова: стійкість інфраструктури, повоєнне відновлення, стала міська мобільність, управління портфелем проєктів, інфраструктура подвійного призначення, управління ризиками, прийняття рішень.