INTERRELATIONS OF SUSTAINABLE TRANSPORTATION SYSTEMS AND REGIONAL ECONOMIC DEVELOPMENT

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Abstract: This paper explores the intricate interrelations between sustainable transportation systems and regional economic development, with a focus on the evolving policies and strategies in Uzbekistan. By examining both the opportunities and barriers to developing sustainable transport systems, this paper underscores the importance of innovative financing mechanisms, policy reforms, and strategic partnerships to support regional economic growth and environmental sustainability.

Абстракт: В этой статье исследуются сложные взаимосвязи между устойчивыми транспортными системами и региональным экономическим развитием с акцентом на развивающиеся политики и стратегии в Узбекистане. Рассматривая как возможности, так и препятствия для развития устойчивых транспортных систем, в этой статье подчеркивается важность инновационных механизмов финансирования, политических реформ и стратегических партнерств для поддержки регионального экономического роста и экологической устойчивости.

Annotatsiya: Ushbu maqola barqaror transport tizimlari va mintaqaviy iqtisodiy rivojlanish o'rtasidagi murakkab o'zaro bog'liqlikni o'rganib, O'zbekistonda rivojlanayotgan siyosat va strategiyalarga e'tibor qaratadi. Barqaror transport tizimlarini rivojlantirish yo‘lidagi imkoniyatlar va to‘siqlarni o‘rganib chiqib, ushbu maqola mintaqaviy iqtisodiy o‘sishni va ekologik barqarorlikni qo‘llab-quvvatlash uchun innovatsion moliyalashtirish mexanizmlari, siyosat islohotlari va strategik sheriklik muhimligini ta’kidlaydi.

Keywords: Sustainable transportation, regional economic development, public transport, environmental sustainability, sustainable urban mobility, infrastructure investment.

Kalit so'zlar: Barqaror transport, mintaqaviy iqtisodiy rivojlanish, jamoat transporti, ekologik barqarorlik, barqaror shahar harakatchanligi, infratuzilmaga investitsiyalar.

Ключевые слова: Устойчивый транспорт, региональное экономическое развитие, общественный транспорт, экологическая устойчивость, устойчивая городская мобильность, инвестиции в инфраструктуру.

The concept of sustainability is easily understood at its most basic level. It means simply that in a global context any economic or social development should improve, not harm, the environment [1]. In line with the concept of sustainability, the Council of the European Union (2001) defined sustainable transport as a system that (1) *“allows the basic access and development needs of individuals, companies and societies to be met safely and in a manner consistent with human and ecosystem health, and promises equity within and between successive generations*,” (2) “*is affordable, operates fairly and efficiently, offers choice of transport mode, and supports a competitive economy, as well as balanced regional development*,” and

(3) “*limits emissions and waste within the planet’s ability to absorb them, uses renewable resources at or below their rates of generation, and, uses non-renewable resources at or below the rates of development of renewable substitutes while minimizing the impact on land and the generation of noise*”. Uzbekistan is committed to develop the sustainable transportation systems and has already begun steps towards it by introducing regulations and reforms. By 2030, it is proposed to update the entire surface public transport system in Uzbekistan with electric buses and electric cars, stated in the "Uzbekistan - 2030" strategy project. The main goal of the strategy is the directions, approaches and mechanisms of development and improvement of the highway network, roads, improvement of their operation characteristics in Uzbekistan [2].

Although many sustainability solutions have positive effects on public budgets in the mid- to long-run, the transformation of mobility systems requires capital investments that often exceed the direct costs of conventional solutions. The transition towards sustainable urban mobility systems requires both upfront financing and long-term funding for re-paying the initial expenses. Most added values that sustainable mobility options provide – such as increased livability of cities, positive health impacts, increased accessibility – are not considered in cost- benefit estimates since they are diffuse and often hard to monetize, they reduce the burden on other departments’ budgets or other tiers of government (e.g. the national level) profit [3]. While the public sector often has a limited capacity of financing, private investors often are reluctant to invest in sustainable transport and mobility projects, as they consider the provision of urban mobility a public service and thus do not expect high financial returns [4].

Transportation planning should be an inclusive and holistic process involving all communities and groups impacted by transportation infrastructure, knowing that the construction of transportation infrastructure, whether roadways or public transit, has far-reaching regional implications [5]. Transportation planning is a cooperative, performance-driven process by which long- and short-range transportation improvement priorities and investments are determined. It includes 1) a comprehensive consideration of possible strategies; 2) an evaluation process that encompasses diverse viewpoints; 3) the collaborative participation of relevant transportation-related agencies and organizations; and 4) open, timely, and meaningful public involvement. Transportation planning plays a crucial role in shaping urban and regional development, with significant implications for economic, social, and environmental outcomes. A well-planned transportation system serves as a fundamental driver of economic prosperity, enabling efficient movement of goods and services, reducing travel time, and enhancing connectivity within and between regions. Beyond economic benefits, transportation planning is a key factor in fostering environmental sustainability. By minimizing negative impacts such as air pollution, greenhouse gas emissions, and resource depletion, sustainable transport systems contribute to the global efforts in combating climate change. This is particularly important in the context of urbanization, where the demand for mobility increases and the consequences of poorly planned transport systems—such as congestion and increased emissions—become more pronounced. Social equity is another vital dimension of transportation planning. Well-designed transport systems ensure that all members of society, regardless of their socio- economic status, have access to safe, reliable, and affordable mobility options. Equitable access to transportation is

essential for promoting social inclusion, enabling individuals to access employment, education, healthcare, and other essential services. By bridging the mobility gap, transportation planning helps to mitigate social inequalities and promotes a more inclusive society. Moreover, the integration of transportation planning with land-use development is crucial for ensuring the efficient and sustainable growth of urban areas. A synergistic approach to land use and transport infrastructure can significantly reduce urban sprawl, promote compact city development, and enhance the overall livability of cities. Well-coordinated planning ensures that transportation networks support sustainable patterns of development, such as mixed-use neighborhoods, walkability, and the provision of public transit, all of which contribute to reducing car dependency and lowering environmental impacts. When considering the financial aspects of transportation planning, it is essential to incorporate principles of sustainability. This involves not only assessing the immediate costs of infrastructure projects but also accounting for the long-term economic, social, and environmental benefits. Sustainable financing solutions must prioritize investments in infrastructure that promote resilience, reduce environmental degradation, and improve public health outcomes. Furthermore, the long-term maintenance and operational costs of transportation systems should be included in financial forecasts to ensure their sustainability over time. In addition, innovative financing models, such as public- private partnerships (PPPs), can be instrumental in mobilizing the necessary resources for sustainable transportation projects. While governments may face constraints in public budgets, private sector involvement can provide the capital and expertise needed to accelerate the transition to sustainable mobility solutions. However, it is essential that such partnerships align with the broader goals of sustainability and equity, ensuring that projects do not disproportionately burden certain segments of society or contribute to environmental degradation (fig.1).

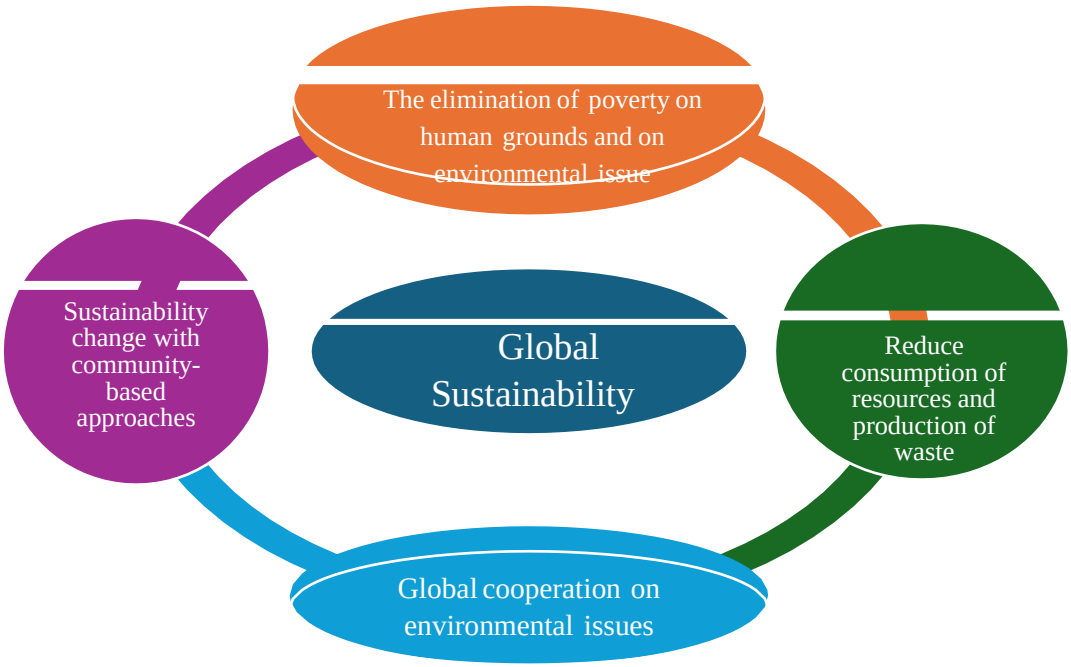

Figure 1. Principles of Sustainability

Financing of transportation infrastructure is diverse and depends on the intrinsic characteristics of a country or region. Ardilla-Gomez and Ortegón-Sanchez (2016) identify 24 main financing mechanisms that have been used for sustainable urban transportation internationally. Based on the *Beneficiary Pays concept,* they present a standardized approach in which each of the mechanisms is analyzed and evaluated, taking into account the beneficiaries, periodicity, financial sustainability, equity, and other desirable characteristics of an optimal financing system. On the other hand, Rode et al. (2019) interviewed 77 global experts to determine the best policy interventions to drive compact and connected urban growth. Among the political instruments, those that had the greatest approval by the people surveyed in this study were the economic ones, particularly budget reallocation, congestion pricing, and value capture [6]. Present-day financing systems in cities, which used to finance sustainable transport and mobility, tend to comprise public and private finance, although the types of public and private finance tend to vary from city to city. Existing literature suggests that most cities receive some level of national funding, although small to medium-sized cities tend to receive much less national funding compared to larger cities [7]. The cities and towns around the world faces major gap between the need for efficient, environmentally friendly transportation systems and the financial resources available to meet those demands. At the same time, the number of motorized traffic and people in cities are growing, it surely gives more pressure and financial costs to the city budget, eventually falling back to citizens as burdens. When cities face financing problems for sustainable transportation, there are direct, general public and indirect mechanisms as instruments to fill the financing gap [8]. Direct instruments are charged to the users of PT for certain benefits that they take advantage of. As direct mechanisms, there are parking fees, toll/congestion pricing, taxes on fuel, vehicle taxes and transportation fares that can be implemented in regions considering potentials, characteristics and conditions. General public instruments have the population as a whole as beneficiary and financier. For general public mechanisms, good examples can be subsidies/budget reallocation for transportation systems, national and international grants and loans, increased property taxes relevant to regions and financing from funds and other associations. Indirect benefit instruments are charged to actors for the benefits they obtain derived from public investments. For instance, sale of advertising spaces in PT, employer contributions, developers´ contributions are most popular and efficient instruments of indirect financing.

In conclusion, the interrelations between sustainable transportation systems and regional economic development are pivotal in fostering long-term economic growth while addressing environmental challenges. As Uzbekistan progresses toward achieving its "Uzbekistan - 2030" strategy, the modernization of its public transport infrastructure, particularly through the introduction of electric buses and cars, exemplifies a strong commitment to sustainability. However, the transition to sustainable mobility requires overcoming significant barriers, including high upfront investment costs, insufficient recognition of the broader socio-economic benefits, and a general reluctance from private investors to engage in what is perceived as a public service sector. For Uzbekistan and other developing regions, achieving sustainable transportation requires not only strategic investment in green infrastructure but also innovative funding models

that encourage both public and private sector participation. Additionally, integrating the wider social and environmental benefits of sustainable transport into financial evaluations is critical to attract long-term support. As sustainable mobility becomes an increasingly central element of regional economic planning, its role in reducing emissions, improving public health, and fostering balanced regional development will become more pronounced, contributing to the overall prosperity and well-being of future generations.

Foydalanilgan adabiyotlar:

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