

INTEGRATION OF PUBLIC TRANSPORT AND MICROMOBILITY IN LARGE CITIES OF UZBEKISTAN (TASHKENT AS AN EXAMPLE)

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Annotation: The integration of public transport and micromobility is emerging as a key solution for addressing urban mobility challenges in large cities. This literature review focuses on the context of Tashkent, Uzbekistan, exploring the benefits, challenges, and strategies for integrating micromobility with existing public transport systems. The paper synthesizes findings from global studies and local research to provide a comprehensive overview of the potential for enhancing urban transportation through integration. Key areas discussed include accessibility, environmental impact, infrastructure requirements, safety concerns, regulatory frameworks, and best practices. The review concludes with recommendations for future research and policy development in Tashkent and similar urban contexts.

Keywords: Public transport, micromobility, integration, Tashkent, Uzbekistan, urban mobility, urban transportation, bike-sharing, accessibility and e-scooters

ИНТЕГРАЦИЯ ОБЩЕСТВЕННОГО ТРАНСПОРТА И МИКРОМОБИЛЬНОСТИ В КРУПНЫХ ГОРОДАХ УЗБЕКИСТАНА (НА ПРИМЕРЕ ТАШКЕНТА)

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Аннотация: Интеграция общественного транспорта и микромобильности становится ключевым решением для решения проблем городской мобильности в крупных городах. В этом обзоре литературы основное внимание уделяется контексту Ташкента, Узбекистан, изучению преимуществ, проблем и стратегий интеграции микромобильности в существующие системы общественного транспорта. В документе синтезируются результаты глобальных исследований и местных исследований, чтобы предоставить всесторонний обзор потенциала улучшения городского транспорта посредством интеграции. Ключевые обсуждаемые области включают доступность, воздействие на окружающую среду, требования к инфраструктуре, проблемы безопасности, нормативно-правовую базу и передовой опыт. Обзор завершается рекомендациями для будущих исследований и разработки политики в Ташкенте и аналогичных городских условиях.

Ключевые слова: Общественный транспорт, микромобильность, интеграция, Ташкент, Узбекистан, городская мобильность, городской транспорт, велопрокат, доступность и электронные самокаты.

Introduction

Urban transportation systems face significant challenges, including congestion, pollution, and inefficiencies. As cities grow, these problems intensify, necessitating innovative solutions. The integration of micromobility options, such as bicycles and electric scooters, with traditional public transport is one such solution that has gained traction globally. This paper reviews the literature on this integration, with a specific focus on Tashkent, Uzbekistan. By examining international case studies and local research, the paper aims to provide insights into how Tashkent can enhance its urban mobility through the effective integration of micromobility and public transport.

Background on Tashkent's Urban Mobility

Tashkent, the capital city of Uzbekistan, is the largest city in Central Asia with a population exceeding 2.5 million. The city has a well-developed public transport network that includes buses and a metro system. However, Tashkent faces typical urban transportation challenges such as traffic congestion, air pollution, and limited first-mile/last-mile connectivity. The city's transport infrastructure is in the process of modernization, and there is increasing interest in incorporating sustainable mobility solutions, including micromobility options.

Benefits of Integrating Micromobility with Public Transport

Increased Accessibility and Convenience

One of the primary benefits of integrating micromobility with public transport is the improvement of first-mile and last-mile connectivity. This integration makes it easier for commuters to access public transport services from their homes or workplaces, thereby increasing the overall convenience and attractiveness of public transport. According to Shaheen et al. (2020), micromobility options can reduce travel time and enhance convenience, particularly in urban areas with limited public transit coverage.

Environmental Benefits

The integration of micromobility with public transport has significant environmental benefits. Research by Zhang and Mi (2019) indicates that such integration can reduce greenhouse gas emissions by decreasing the reliance on private vehicles. This is particularly relevant for Tashkent, where air pollution is a growing concern. By promoting the use of bicycles and e-scooters for short trips, the city can reduce emissions and improve air quality.

Economic Benefits

Economically, the integration of micromobility with public transport can lead to reduced infrastructure costs and increased ridership revenue. Cervero and Duncan (2020) highlight that cities with integrated systems experience higher public transport ridership, leading to better financial performance for transit agencies. Additionally, micromobility options often require less investment compared to traditional transport infrastructure, making them a cost-effective solution for enhancing urban mobility.

Challenges of Integration

Infrastructure and Urban Planning

A significant challenge in integrating micromobility with public transport is the need for appropriate infrastructure. As Fishman et al. (2019) note, urban areas often lack the necessary bike lanes, parking facilities, and docking stations required for seamless integration. In Tashkent, the existing transport infrastructure is primarily designed for motor vehicles, and substantial investment is needed to develop infrastructure that supports micromobility, on the other hand, it is necessary to reconstruct the existing ones and make them comfortable for micromobility users.

Safety Concerns

Safety is a major concern for micromobility users. Studies such as James et al. (2021) report higher rates of accidents involving e-scooters and bicycles compared to other modes of transport. Ensuring the safety of micromobility users requires comprehensive regulations, dedicated infrastructure, and public awareness campaigns. In Tashkent, where road safety is already a critical issue, integrating micromobility will require concerted efforts to mitigate safety risks. It proposes evidence-based solutions to overcome these obstacles, drawing on lessons learned from other cities. According to the Traffic Safety Department of the Ministry of Internal Affairs, 839 road traffic accidents were committed in 2021 with the participation of cyclists. As a result, 212 cyclists were lost their life due to a car accident and 650 cyclists were injured in various degrees. In January-July 2022, there were 516 accidents involving bicycle drivers, in which 125 cyclists were lost their life due to a car accident and 401 were injured in various degrees.

Regulatory and Policy Issues

The regulatory landscape for micromobility is still evolving. As McKenzie (2020) points out, inconsistencies in policies and regulations across different jurisdictions can hinder effective integration. In Tashkent, the absence of a clear regulatory framework for micromobility poses a challenge. Developing standardized regulations and policies that support integration while ensuring user safety and operational efficiency is crucial.

Global Case Studies on Integration

Copenhagen, Denmark

Copenhagen is often cited as a model city for integrating micromobility with public transport. The city has an extensive network of bike lanes, and its public transport system is designed to accommodate bicycles. Nielsen et al. (2018) illustrate how integrated infrastructure planning in Copenhagen facilitates seamless transitions between cycling and public transport, enhancing overall mobility and reducing car dependency.

Paris, France

Paris has implemented several initiatives to integrate micromobility with its public transport network. The Vélib' bike-sharing system and extensive e-scooter services complement the city's metro and bus networks. A study by Smith et al. (2019) shows that Paris has successfully leveraged technological solutions, such as mobile apps and integrated payment systems, to improve the user experience and encourage the use of combined mobility options.

New York City, USA

New York City has made significant strides in integrating micromobility with its public transport system through the implementation of the Citi Bike program and various e-scooter pilots. According to Zipper (2020), public-private partnerships have been crucial in these efforts, with collaboration between transit agencies, micromobility providers, and local governments leading to innovative solutions and shared infrastructure investments.

Current State of Micromobility and Public Transport in Tashkent

Public Transport System

Tashkent's public transport system includes buses and a metro network (figure 1.), total 165 bus lines and 5 metro lines. While the metro system is efficient and well-used, the bus network faces challenges such as outdated vehicles and infrastructure. The city is investing in modernizing its public transport, but issues like traffic congestion and limited coverage still impact overall efficiency.

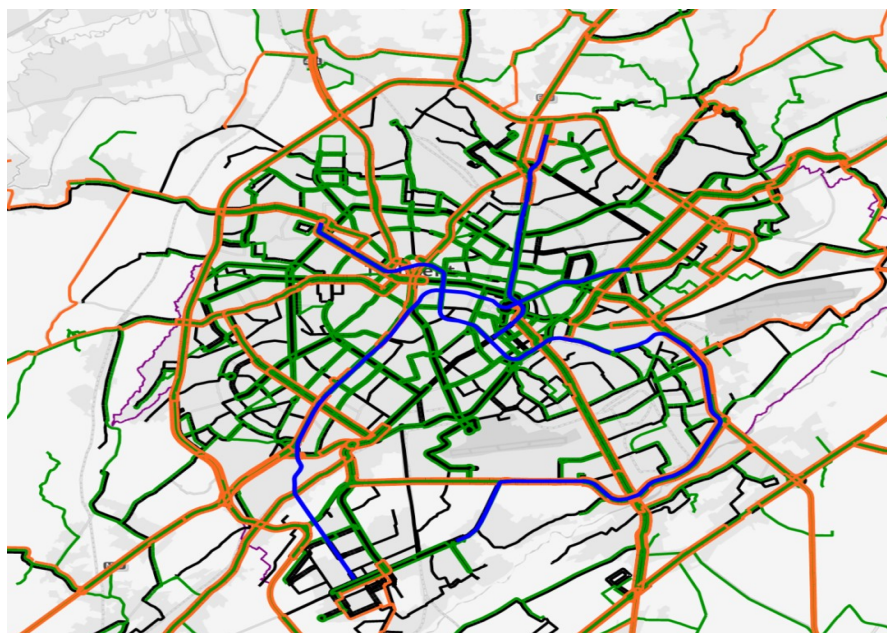


Figure 1. Public transport systems in Tashkent includes buses and a metro network.

Micromobility in Tashkent

Micromobility is relatively new in Tashkent. There have been some pilot projects such as Jet, IZZY involving bike-sharing and e-scooters, but widespread adoption has been limited. Factors such as insufficient infrastructure, lack of awareness, and regulatory hurdles have hindered the growth of micromobility in the city. However, there is increasing interest from both the government and private sector in exploring the potential of micromobility to enhance urban mobility.

Integration Strategies for Tashkent

Infrastructure Development

Developing dedicated infrastructure for micromobility is essential for integration. This includes building bike lanes, installing docking stations, and ensuring safe parking facilities. Learning from cities like Copenhagen, Tashkent can adopt integrated infrastructure planning to create a network that supports both public transport and micromobility.

Technological Solutions

Leveraging technology is crucial for successful integration. Mobile apps that provide real-time information on the availability of micromobility options and public transport schedules can enhance user experience. Additionally, integrated payment systems that allow users to pay for multiple modes of transport with a single card or app can simplify the process and encourage adoption.

Policy and Regulatory Framework

Developing a clear regulatory framework is vital for the integration of micromobility and public transport. This includes setting safety standards, defining operational guidelines, and creating incentives for micromobility providers. Engaging stakeholders in the policy development process can ensure that the regulations are practical and supportive of integration efforts.

Public Awareness and Engagement

Raising public awareness about the benefits of integrated mobility and educating citizens on how to use micromobility options safely is essential. Public awareness campaigns, community engagement initiatives, and pilot projects can help build public trust and encourage the adoption of micromobility.

Discussion and Analysis

Potential Benefits for Tashkent

Integrating micromobility with public transport in Tashkent can bring numerous benefits. Improved first-mile and last-mile connectivity can make public transport more accessible, reducing reliance on private vehicles and easing traffic congestion. Environmental benefits include reduced emissions and better air quality, contributing to the city's sustainability goals. Economically, increased public transport ridership can enhance revenue, while micromobility options offer a cost-effective way to expand the transport network.

Addressing Challenges

Addressing the challenges of integration requires a multifaceted approach. Infrastructure development should prioritize the safety and convenience of micromobility users. Regulatory frameworks need to be clear, consistent, and supportive of innovation. Safety concerns must be addressed through comprehensive measures, including dedicated infrastructure, regulations, and public education. Collaboration between the government, private sector, and community is essential for overcoming these challenges.

Lessons from Global Case Studies

Global case studies provide valuable insights for Tashkent. Copenhagen's success demonstrates the importance of integrated infrastructure planning. Paris highlights the role of technological solutions in enhancing user experience. New York City shows the value of public-private partnerships in driving innovation and shared investments. By adapting these lessons to the local context, Tashkent can develop a robust strategy for integrating micromobility with public transport.

Conclusion

Summary of Findings

The integration of public transport and micromobility in Tashkent has the potential to significantly enhance urban mobility. The literature review highlights the benefits, challenges, and best practices associated with this integration. Key benefits include improved accessibility, environmental gains, and economic advantages. Challenges include the need for appropriate infrastructure, safety concerns, and regulatory issues. Best practices emphasize integrated planning, technological solutions, and public-private partnerships.

Recommendations for Future Research and Policy Development

Future research should focus on understanding the long-term impacts of micromobility integration on urban mobility in Tashkent. Studies on user behavior, safety, and environmental benefits can provide valuable insights. Policy development should prioritize creating a supportive regulatory framework, investing in infrastructure, and promoting public awareness. Collaboration between stakeholders is crucial for successful implementation.

Implications for Tashkent

For Tashkent, integrating micromobility with public transport offers a promising path toward a more efficient, accessible, and sustainable urban transportation system. By learning from global best practices and addressing local challenges, the city can develop a comprehensive strategy that enhances mobility, reduces environmental impact, and improves the quality of life for its residents.

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