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Evaluation of the Ecological And Economic Benefits Mobility Policy in Baku

Abstract

This study focuses on evaluating the ecological and economic benefits of mobility policy in Baku City. As the capital and the most densely populated urban area of Azerbaijan, Baku faces significant challenges related to traffic congestion, air pollution and inefficient energy consumption. The adoption of sustainable mobility policies, such as the development of public transportation networks, the promotion of non-motorized transport (cycling and walking) and the introduction of environmentally friendly vehicles, plays a crucial role in reducing greenhouse gas emissions, improving air quality and enhancing urban living standards. From an economic perspective, effective mobility strategies help minimize transportation costs, increase energy efficiency and improve workforce productivity by reducing time losses caused by traffic congestion. Moreover, the integration of smart technologies in transportation management contributes to long-term savings and sustainable urban development. By assessing both ecological and economic impacts, this research underlines the necessity of a complex mobility policy framework to ensure sustainable growth and improved quality of life in Baku City.

Keywords: *Baku city, mobility policy, sustainable transportation, ecological benefits, economic efficiency, urban development, air quality, traffic congestion, energy consumption, smart mobility*

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Ekoloji və iqtisadi faydaların qiymətləndirilməsi Bakı şəhərində mobillik siyasəti

Xülasə

Bu tədqiqat Bakı şəhərində mobillik siyasətinin ekoloji və iqtisadi faydalarının qiymətləndirilməsinə həsr olunmuşdur. Azərbaycanın paytaxtı və ən sıx məskunlaşmış şəhəri olan Bakı nəqliyyat sıxlığı, hava çirkliliyi və enerji səmərəsizliyi ilə bağlı ciddi problemlərlə üzləşir. Davamlı mobillik siyasətinin həyata keçirilməsi – ictimai nəqliyyat şəbəkələrinin inkişafı, qeyri-motorlu nəqliyyatın (velosiped və piyada hərəkətinin) təşviqi, eləcə də ekoloji cəhətdən təmiz nəqliyyat vasitələrinin tətbiqi istixana qazı emissiyalarının azaldılmasına, hava keyfiyyətinin yaxşılaşmasına və şəhər həyat standartlarının yüksəlməsinə mühüm töhfə verir.

İqtisadi baxımdan, səmərəli mobillik strategiyaları nəqliyyat xərclərini minimuma endirir, enerji səmərəliliyini artırır və nəqliyyat sıxlığından yaranan vaxt itkilərinin azalması hesabına işçi qüvvəsinin məhsuldarlığını yüksəldir. Bundan əlavə, nəqliyyatın idarə olunmasında ağıllı texnologiyaların tətbiqi uzunmüddətli qənaətə, həmçinin davamlı şəhər inkişafına şərait yaradır.

Bu tədqiqat həm ekoloji, həm də iqtisadi təsirləri qiymətləndirməklə, Bakı şəhərində davamlı inkişafı və əhalinin həyat keyfiyyətinin yüksəldilməsini təmin edəcək kompleks mobillik siyasəti çərçivəsinin zəruriliyini vurğulayır.

Açar sözlər: Bakı şəhəri, mobillik siyasəti, davamlı nəqliyyat, ekoloji faydalar, iqtisadi səmərəlilik, şəhər inkişafı, hava keyfiyyəti, nəqliyyat sıxlığı, enerji istehlakı, ağıllı mobillik

Introduction

Urban mobility has become one of the central issues in the sustainable development agenda of modern cities. As metropolitan areas expand and populations increase, cities encounter growing challenges in transportation management, environmental protection, and economic efficiency. Baku, the capital of Azerbaijan, is no exception. With rapid urbanization, rising car ownership, and insufficiently developed public transportation infrastructure, the city has been facing critical problems such as traffic congestion, air pollution, and high energy consumption. These challenges not only affect the daily lives of citizens but also have long-term implications for environmental sustainability and economic growth.

Research

Mobility policy plays a vital role in shaping the quality of urban life and ensuring balanced development. In the context of Baku, sustainable mobility solutions are increasingly recognized as necessary to address the dual concerns of ecological preservation and economic optimization. Measures such as expanding public transport networks, encouraging non-motorized modes of transport, implementing eco-friendly vehicle technologies, and adopting intelligent traffic management systems are among the key strategies that can contribute to both environmental improvement and economic resilience.

From an ecological perspective, effective mobility policies directly influence air quality, noise reduction, and greenhouse gas emissions, thus supporting the city's alignment with global sustainability goals. From an economic perspective, they reduce transportation costs, enhance energy efficiency, improve labor productivity, and generate long-term savings through efficient resource allocation. Moreover, sustainable mobility strengthens the city's attractiveness for investment, tourism, and overall competitiveness in the global arena. (International Transport Forum (ITF), 2020)

Given these interrelated aspects, assessing the ecological and economic benefits of mobility policy in Baku City is of paramount importance. Such an evaluation not only provides insights into the effectiveness of current strategies but also offers guidance for future policy frameworks. Ultimately, mobility policy in Baku should be designed as a holistic system that integrates ecological sustainability with economic efficiency to ensure the well-being of its citizens and the city's sustainable development in the long run (Mejia, 2023).

Mobility policy is therefore essential for addressing these problems and ensuring that urban growth in Baku aligns with principles of sustainability. The implementation of sustainable mobility solutions provides opportunities to both protect the environment and strengthen the city's economy. Strategies such as the expansion and modernization of public transportation systems, the encouragement of non-motorized transport including cycling and walking, the adoption of electric and hybrid vehicles, and the application of intelligent transport management technologies represent effective pathways toward sustainable development. These measures collectively reduce dependency on fossil fuels, minimize harmful emissions, and enhance the efficiency of urban transport systems. (World Bank, 2020).

From an ecological perspective, mobility policy has a direct impact on environmental quality. Reducing the number of private cars in daily use can significantly lower greenhouse gas emissions, leading to improved air quality and a healthier urban atmosphere. Encouraging alternative modes of transportation such as cycling, walking, and electric public transport helps to decrease environmental degradation while simultaneously contributing to climate change mitigation efforts. Noise reduction, more efficient land use, and less pollution-related damage to public health are also vital ecological benefits of adopting a sustainable mobility framework in Baku.

The economic advantages of mobility policy are equally significant. Effective transport strategies can help reduce fuel consumption, lower overall transportation costs, and improve energy efficiency. By decreasing the time wasted in traffic congestion, productivity in the labor market can be enhanced, ultimately contributing to economic growth. Furthermore, investments in smart transport systems and sustainable infrastructure generate long-term financial savings for both the government and citizens. They also create new opportunities for technological innovation, job creation, and international partnerships, thereby strengthening Baku's position as a competitive urban center in the region (Mejia, 2023).

Mobility policies that successfully combine ecological and economic considerations not only improve the immediate living conditions of city residents but also ensure long-term urban resilience. For Baku, the transition to sustainable mobility is not merely an option but a necessity, as the city must adapt to global standards of sustainable development while addressing its local challenges. By designing policies that balance environmental protection with economic growth, Baku can achieve a model of urban mobility that enhances the quality of life, fosters sustainable urbanization, and positions the city as a leader in ecological and economic innovation in the South Caucasus region. (Asian Transport Observatory, 2023)

Conclusion

The evaluation of the ecological and economic benefits of mobility policy in Baku clearly demonstrates that sustainable transportation is not only a matter of environmental protection, but also a strategic tool for economic growth and long-term urban resilience. As a rapidly developing metropolis, Baku faces pressing challenges including rising traffic congestion, deteriorating air quality, inefficient fuel consumption, and growing social costs linked to health and productivity losses. These challenges highlight the urgent need for comprehensive mobility strategies that can address multiple dimensions of urban sustainability simultaneously.

From an ecological perspective, the adoption of cleaner transport technologies, expansion of public transportation, and promotion of cycling and walking can significantly reduce greenhouse gas emissions, improve air quality, and mitigate the negative effects of urbanization on the environment. By reducing dependence on private vehicles, Baku can lower noise pollution, enhance energy efficiency, and create a healthier and more livable urban atmosphere. Such ecological improvements are closely tied to the global commitments Azerbaijan has undertaken regarding climate change mitigation and sustainable development goals.

From an economic perspective, sustainable mobility policies bring measurable benefits in terms of cost savings, increased efficiency, and improved productivity. Reducing time lost in traffic congestion directly enhances workforce efficiency, while the shift to energy-efficient transport systems lowers operational and maintenance expenses. Moreover, smart mobility solutions, such as intelligent traffic management and digital monitoring systems, generate long-term financial benefits by optimizing resource allocation and minimizing waste. Beyond direct economic returns, sustainable mobility policies enhance Baku's image as an attractive destination for investment, tourism, and international cooperation. (OECD International Transport Forum (ITF). 2020)

Overall, the findings of this research underline that mobility policy should be treated as an integrated system where ecological sustainability and economic efficiency are mutually reinforcing. For Baku, the path forward lies in developing a holistic framework that combines infrastructure development, technological innovation, and behavioral change. By doing so, the city can achieve a balanced model of growth that protects the environment, strengthens the economy, and improves the quality of life for its residents. In this regard, mobility policy is not simply a technical or infrastructural concern but a fundamental pillar of sustainable urban development in Baku City.

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