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DEVELOPMENT OF AN INTEGRATED TARIFF BASED ON THE ATTO TRANSPORT CARD

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Annotation: This paper examines the development of an integrated "city–suburb" tariff system for the Tashkent agglomeration, based on the ATTO transport card. The study highlights the fragmentation of the current fare structure, in which suburban railway services remain excluded from the existing digital integration of urban transport modes (bus and metro). Drawing upon international best practices, the research proposes a methodological framework for incorporating suburban train journeys into a unified tariff zone, applying transfer discounts, and preventing fare duplication. The proposed model aims to reduce overall passenger expenditures, enhance the attractiveness of public transport, and support the establishment of a sustainable "city–suburb" mobility system.
Keywords: Integrated tariff; ATTO transport card; suburban railway; public transport integration; transfer compensation; urban–suburban mobility; fare unification; Tashkent agglomeration.

Introduction. The dynamics of contemporary urbanization highlight the urgent necessity for coherent integration between metropolitan and suburban public transport networks. In Tashkent, a partial model of digital integration has already been introduced through the ATTO unified transport card, which facilitates cashless fare payments and ensures transfer compensation across urban modes of travel—particularly bus and metro—within a one-hour timeframe. Nevertheless, suburban railway services remain excluded from this integration, creating systemic fragmentation and imposing additional financial burdens on passengers, especially those engaged in daily commuting between suburban settlements and the city core.

Given the technical capacities of the ATTO transport card and the availability of mobile payment terminals on suburban trains, there is significant potential for the development of an integrated tariff scheme. Such a model must incorporate suburban rail trips as an inseparable element of the overall route, eliminate duplication in payments, and provide transfer compensation in line with the existing urban framework [7].

Current framework of ATTO-based integration. Under the current regulations, passengers may utilize the ATTO card for non-cash payments across urban public transport. The compensation mechanism is structured as follows:

– The accounting period begins from the moment of the first card validation.
– The compensation window is fixed at one hour.
– An additional restriction imposes a 30-minute limit in cases of repeated validation on the same bus.
– A repeated entry into the metro is not subject to compensation: the system records such an action as a new journey, triggering a new hourly interval.

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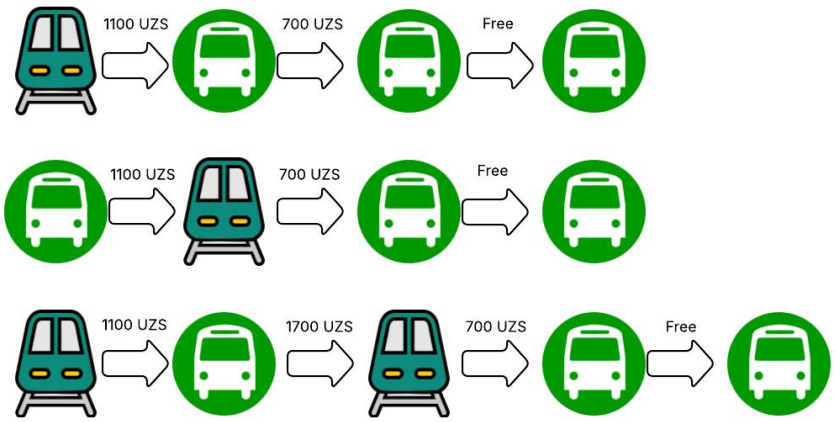

Pic.1. Fare payment during transfers between modes of urban public transport

This arrangement enables partial tariff integration in Tashkent, limited to bus and metro transfers. However, suburban railway routes fall outside its scope. At present, travel on suburban trains of the Tashkent railway hub requires either the purchase of a single-ride paper ticket at ticket offices located at major stations, or direct payment to a conductor inside the train at intermediate stops. Additionally, conductors are equipped with mobile terminals that allow payment via ATTO cards or online banking cards.

Despite the availability of digital payment options, the interaction between the urban and suburban fare systems remains fragmented. The primary obstacles include:

1. The absence of automatic data transfer regarding train journeys into the ATTO system.
2. The lack of algorithmic logic enabling suburban trips to be recognized as part of the one-hour compensation framework.
3. Insufficient unification of fare policies and ticketing practices.

As a result, passengers encounter duplicated payments when transferring from buses to suburban trains, which increases their cumulative transport expenditures. In the context of rapid urban expansion and growing suburbanization, such systemic barriers impede the development of a sustainable “city–suburb” transport model.

Proposal for an integrated “city + suburb” tariff. The ATTO platform, combined with the functionality of mobile terminals used by train conductors, already provides the technical basis for an integrated fare system. By enhancing the underlying software and payment algorithms, it is possible to ensure that suburban train trips are automatically recognized as a continuation of urban routes. This would enable transfer discounts between city and suburban modes, prevent fare duplication, and promote public transport usage across longer commuting distances.

To establish a fair and incentive-based model, the following principles are recommended:

– Suburban train trips should be accounted for as an integral part of the journey within the one-hour compensation window.

– A fixed discount should be applied to suburban rail tickets when the passenger transfers from urban transport (and vice versa).

– The existing 30-minute limit for repeated validations and the general one-hour interval should be preserved to ensure consistency with the current urban framework.

International experience in fare integration

Global practice demonstrates that the implementation of integrated fare systems in metropolitan

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regions with intensive commuter flows contributes to reducing household transport expenditures, enhancing the efficiency of transport operations, and increasing the modal share of public transport. Several international cases illustrate successful digital integration between urban and suburban services.

Jakarta (Indonesia) — Jak Lingko system. The capital city of Indonesia has established Jak Lingko, a comprehensive fare integration scheme uniting buses, minibuses, metro, and suburban railway lines. A single payment platform operates through transport cards, bank cards, and mobile applications. Transfers within a 90-minute window incur no additional cost, while government subsidies offset revenue losses. Within the first year of its operation, the system reduced passenger expenses by 20–30% and increased ridership by 27%.

Kochi (India) — Kochi Metro. The city of Kochi implemented an innovative model combining metro, bus, and river transport (Kochi Water Metro) under a unified ticketing scheme. Passengers can transfer between modes without duplication of payments, provided time limits are observed. The project proved that even under conditions of multiple operators and fragmented infrastructure, a unified digital fare environment can be established.

London (United Kingdom) — Transport for London (TfL). TfL is regarded as a benchmark in fare integration. The system incorporates metro, buses, trams, suburban trains (Overground), river services, and city bicycles under a single tariff policy. The Oyster card and bank cards serve as the principal media. Algorithms automatically calculate the most economical fare, applying the "fare capping" mechanism that limits passengers' maximum daily and weekly expenses. Transfers between all modes of transport, including rail, are permitted within a 60-minute window without additional payment. TfL exemplifies deep digital integration focused on user convenience and economic efficiency.

These cases collectively confirm several key principles:

– A unified digital payment platform is the cornerstone of integration.

– Transfer windows ranging from 60 to 90 minutes are a critical element of fare logic.

– Automatic discounts and compensations significantly enhance the attractiveness of public transport.

– Government subsidies ensure financial sustainability when integrating commercially diverse operators.

Such approaches hold practical value for adaptation in the Tashkent agglomeration, particularly in extending the ATTO system to suburban railway routes.

Conclusion. In the Tashkent agglomeration, a digital fare payment system based on the ATTO card has already been implemented for urban transport, covering buses and metro, and allowing for one-hour transfer compensation. However, suburban railway routes remain excluded, leading to fragmented tariff structures and higher transport costs for passengers undertaking complex multimodal trips [8].

The methodology proposed in this study seeks to design a mathematically and logically substantiated scheme for calculating an integrated fare, one that incorporates suburban train journeys as a structural component of the overall route within the urban transport system. The methodology accounts for transfer timeframes, existing discount mechanisms, digital validation procedures, and the technical capabilities of the ATTO card. Its objectives include:

– Formalizing the concept of an "integrated journey" and identifying the criteria under which discounted tariffs should be applied;

– Developing an algorithm that accommodates transfers between urban and suburban modes within a single route;

– Establishing a fair and economically balanced discount rate applicable under transfer conditions;

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– Designing a calculation formula compatible with automated fare collection systems;
– Demonstrating practical examples of application to test its effectiveness under Tashkent conditions.
The methodology is intended for digital implementation via the ATTO card, which is already used across most urban routes and supported by mobile terminals on suburban trains. Consequently, the integrated tariff design is grounded not only in principles of fairness and passenger convenience but also in the existing technical infrastructure.
The proposed approach is expected to:
– Treat suburban train journeys as an inherent part of the overall route;
– Apply compensation mechanisms to transfers between different modes within a single journey;
– Reduce cumulative passenger expenses by eliminating duplicate payments;
– Increase the attractiveness of public transport for suburban and agglomeration travel.
Ultimately, the methodology is built upon the technical feasibility of digital validation across both urban and suburban segments of travel, already supported by the ATTO card and conductor-operated mobile terminals.

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