PRIORITY ROUTES FOR URBAN PUBLIC TRANSPORTATION

Khamrokulov Rasuljon Madrakhimovich
Tashkent State Transport University
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ABSTRACT

As a result, the competitiveness of urban passenger transport has slightly decreased compared to private vehicles. This is because people choose private vehicles due to their superior qualities, such as greater maneuverability than public transport, convenience for passengers, regularity of travel, and the affordability of transportation costs. In addition to these factors, delays in public transport during peak hours—especially the increase in bus delays—cause a decrease in travel speed and disruptions in service regularity. Consequently, passengers experience longer waiting times and time loss, which contributes to the aforementioned reasons for choosing private transport.

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To study international best practices in improving traffic flow efficiency and develop proposals adapted to local conditions. The results of this research are of practical significance and will serve to improve the public transport system. The findings can be applied to the development of road safety programs, the modernization of urban infrastructure, and the improvement of public transport services. Additionally, within the scope of the research, international experience in ensuring road safety was studied, and the possibilities for assessing their suitability and implementing them in local conditions were considered.

Analysis and Results; The efficiency of the urban transport system directly affects the daily life and economic activity of every citizen. Scheduled buses play an important role in ensuring the convenient, safe, and fast movement of the population. This topic is dedicated to improving the quality of public transport, creating convenience for passengers, and reducing traffic congestion.

The efficiency of the transport infrastructure plays a crucial role in the convenient movement of passengers within the city. Bus routes passing through Tashkent connect densely populated areas with the city center and other districts. Studying the performance of buses operating on these routes is essential for determining passenger flow, service quality, and opportunities for traffic optimization.

-passenger flow volume
-intervals (headway)
-number of stops
-load factor
-service quality

Each bus route has an average of 8-12 stops, and high demand is observed on some routes, which leads to overcrowding on buses.

Instantaneous speed is the actual speed over a specific short distance under real road conditions. It represents the speed of individual vehicles or a traffic stream over a designated short distance (typically 50, 100, 150, or 200 meters). This speed is widely used in organizing traffic on particular road sections. Generally, the length of the measurement distance is set from 50 meters (in areas with low traffic speed) to 150 meters (in areas with high traffic speed). To accurately determine the entry and exit times of vehicles, transverse marking lines were applied to the roadway. The observation results were recorded in a pre-prepared table. The observer starts a stopwatch when a vehicle's front bumper crosses the starting measurement line and stops it as the vehicle exits the measurement distance.

The use of statistical methods is of great importance when studying vehicle speeds. Based on the table presented below and its corresponding graphs, the distribution of public transport vehicle speeds was analyzed. As can be seen from the table, vehicle speeds are distributed in the range of 25 km/h to 85 km/h, divided into 12 intervals. For each interval, the number of vehicles (frequency), the frequency as a percentage, and the cumulative frequency have been calculated.

The frequency graph at the top illustrates the speed intervals at which vehicles travel most frequently. As the graph shows, the highest frequency (15%) is observed in the 65–70 km/h range, which indicates that a large portion of public transport vehicles moves at this particular speed. High frequencies (13.33%) were also recorded in the 40–45 km/h and 50–55 km/h ranges. The cumulative frequency graph at the bottom reflects how the number of vehicles accumulates as speed increases.

This graph can be used to determine statistical indicators such as the median and quartiles. Specifically, the point where the cumulative frequency reaches 50% falls within the 45–50 km/h range, meaning that half of the vehicles travel at speeds up to 50 km/h. A cumulative frequency of 88.33% is concentrated in the speed range up to 70 km/h, meaning the vast majority of all vehicles operate within this range.The results of the analysis above show that the majority of public transport vehicles operate in the 40–70 km/h range. In particular, the 65–70 km/h speed range is the most frequently observed, and in regulating traffic safety and flow in this area, primary attention should be paid to this specific speed range. Data obtained from statistical analysis is of great importance for traffic organization and the optimization of the transport system.

Conclusion and Recommendations; Proposals for improving dedicated bus lanes and infrastructure. The establishment of dedicated lanes for route buses. On central city streets and high-congestion routes, dedicated traffic lanes intended exclusively for public transport will be designated. These lanes will be painted blue or yellow on the asphalt, marked with the text "BUS or A," and equipped with road sign 5.9. A "Bus Lane" sign will be installed along the edges of these lanes. The signs will indicate traffic restrictions and operating hours (e.g., 06:00–10:00 and 17:00–23:00). Using these lanes, buses will bypass traffic congestion and operate according to a set schedule, creating a fast and reliable transportation system for passengers.

Update the lighting system to ensure clear visibility of routes in the evening and at night. Low-mounted LED lights along dedicated bus lanes will make road markings clearly visible, even at night. Bus stops will be illuminated with high-brightness, energy-efficient lamps. Electronic displays will be installed at the stops, showing real-time bus arrival times, route numbers, and other information. The lighting system will automatically adjust to ambient light (for example, turning on automatically after sunset). Currently, there is a dedicated traffic lane for public transport, specifically for buses, designated by road sign 5.9. Overall, based on scientific research and analysis, recommendations have been developed for the safe and efficient organization of public transport. This is one of the key practical projects aimed at developing the Tashkent city transport system, ensuring road safety, and creating a convenient and reliable public transport system for the public.

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