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ANALYSIS OF THE LOCATION OF BUS STOPS ON AMIR TEMUR SHAH STREET

To'raboyev Holmurod Rustamjon o'g'li, *Senior teacher of Andijan Institute of Mechanical Engineering, holmurodturaboyev@gmail.com, +998 94 417 00 91*

Olimjonov Mirobid, *Student of Andijan Mechanical Engineering Institute, +998 94 417 00 91*

Abstract: *This article lists the requirements for the placement of bus stops by giving them standards. Recommendations have also been made for bus stop deployment, analysis of bus stops through Geo locational information systems, and development of an optimal solution for their deployment.*

Keywords words and phrases: *infrastructure, digitization public transport, shed, reconstruction, bench, ramp, ramp, ramp, peregon, Geo Information System, station, route.*

INTRODUCTION

As is known, in order to drastically reduce the number of accidents and deaths on the roads by improving the road infrastructure and creating safe traffic conditions, including the full digitalization of the traffic control system and ensuring broad public participation in this area, the Resolution of the President of the Republic of Uzbekistan No. PQ-316 dated July 12, 2022 "On the National Program "Safe and Smooth Road" for Implementation in 2022-2026" was adopted [1].

Based on this resolution, the following are planned:

- comprehensive improvement of road infrastructure;
- digitalization of the traffic control system on highways;
- development and digitalization of public transport;
- strengthening of advocacy work on ensuring road safety, practical teaching of traffic rules to children;
- it is determined to carry out work on improving the system of training and retraining of drivers and strengthening control over the technical condition of vehicles.

In particular, in the Andijan region, the construction and reconstruction of intermediate bus stops is also determined in the development and digitalization of public transport.

Bus stop standards determine the necessary elements of stops, such as platforms, sheds, lighting, benches and urns. The availability of amenities for the population with reduced mobility, including ramps and ramps, is also important.

LITERATURE REVIEW AND METHODS

A public transport stop standard is a set of rules and requirements that ensure the efficiency, safety and availability of transport services for all categories of passengers. These standards cover a wide range of aspects, from the design and infrastructure of stops to information provision and passenger service.

The following information plays an important role in the location of bus stops:

- demographic data: population density in different districts of the city, age composition and distribution by social groups (for example, pensioners, students, workers), family composition and types of housing (apartment buildings, private houses, etc.).
- transport infrastructure - existing public transport routes (buses, trams, trolleybuses, minibuses), including their frequency and load, existing stops and their location on the city map, transport speed on different sections of the roads, which affects the time between stops, parking spaces for personal vehicles and bicycle parking, and the need for bus stops in these places.

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- traffic congestion data - critical information such as traffic intensity in different parts of the city at different times of the day, traffic congestion on the streets where bus routes are located, and route duration based on GPS data analysis (if available), which helps to understand where the greatest delays occur.

The bus stop standards take into account the following aspects:

- types of vehicles used in the city;
- expected passenger flow;
- characteristics of stops;
- city road layout;
- demographics of the area;
- location of pedestrian crossings;
- intensity of urban traffic;
- density of transport routes in the area.

In populated areas, the distance between stops varies between 200-600 m, with 2-3 stops per kilometer of the route. In America, the length of the route is slightly shorter than in Western Europe - there are 4 to 6 stops per 1 km of route. The distance between stops usually depends on the area where the public transport route passes[2].

RESULTS

Due to the large number of public transport routes in the region and the need to identify bus stops that are relevant to them, the geolocation data of existing bus stops was generated based on Table 1.

Table1

№	Location in a Geo Information System	Naming of the station
1	40.763893, 72.353870	Baxt uyi bekati
2	40.763090, 72.352090	Temir yo'l vokzali bekati
3	40.75977075579622, 72.34801894542844	Avtovokzal bekati
4	40.759763, 72.347330	Avtovokzal bekati
5	40.756730, 72.343636	Muhammad Yusuf maktabi bekati
6	40.757080, 72.343437	Fano Med bekati
7	40.751612, 72.337163	Molochniy bekati
8	40.751252, 72.337480	Molochniy bekati
9	40.745322, 72.329414	Furqat bekati
10	40.744912, 72.329622	Furqat bekati
11	40.740224, 72.322479	UZ TONG HONG CO bekati
12	40.739967, 72.322957	IIB YHXB bekati
13	40.73666761268418, 72.31766648522007	Aeroport bekati
14	40.736593, 72.318246	Aeroport bekati

The data generated based on Table 1 was uploaded to the QGIS platform (Figure 1).

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Figure 1. Geolocation of bus stops on Amir Temur Avenue on the QGIS platform.

It was determined that the existing bus stops on Amir Temur Avenue are sufficient. Of course, the main condition for the effective use of existing bus stops is that all bus stops must be conveniently located for both the population and public transport.

DISCUSSION

In recent years, large-scale work has been carried out to improve the provision of motor transport services to the population, expand the network of public transport routes and update the fleet with modern, environmentally friendly buses. The condition of infrastructure facilities certainly plays an important role in updating the public transport network. Public transport must ensure that the population can quickly and safely reach their desired destinations by collecting them from certain places.

In accordance with the appendix to the Resolution of the President of the Republic of Uzbekistan dated July 12, 2022, No. PQ-316 “National Program “Safe and Smooth Road” for Implementation in 2022-2026”, it is planned to build and reconstruct 76 intermediate stops in the Andijan region in 2022-2026. The implementation of 76 bus stops by year is presented in Figure 2 [1].

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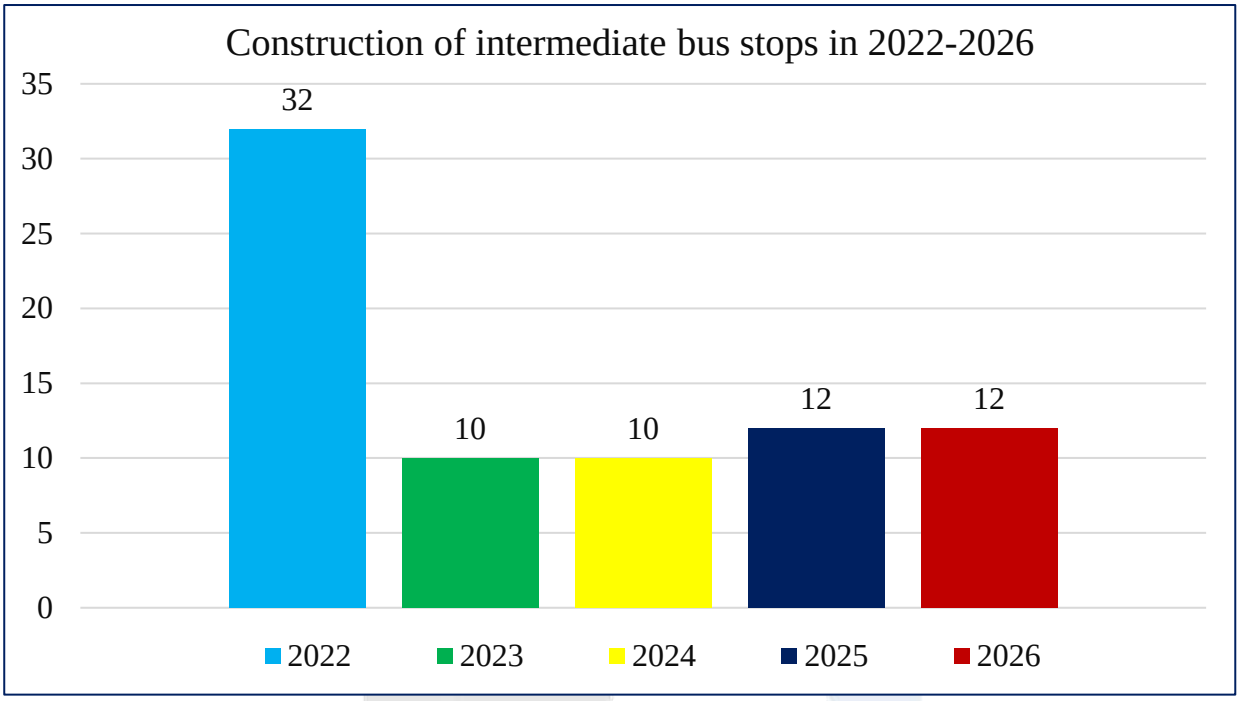

Figure 2. Construction and reconstruction of intermediate bus stops in Andijan region in 2022-2026

The organization of passenger pick-up and drop-off zones is carried out, if necessary, for separate and mixed stops serving buses and trolleybuses. If the station has less than 30 vehicles per hour, separate bus stations are organized. Combined stops intended for several routes, if the traffic intensity exceeds 30 units per hour, require the placement of platforms at a distance of at least 10 meters [3].

The road network includes the following intra-regional routes: City Central Hospital No. 1 - Gulshan MFY, 444 - Marhamat bus station-Andijan bus station, 435 - Asaka bus station-Andijan bus station, 496 - Andijan bus station-Do'stlik, 443 - Shahrikhan bus station-Andijan bus station. At the same time, there are intercity routes: Namangan-Andijan, Fergana - Andijan, Andijan-Kokand, Andijan - Margilan.

All of these routes pass through Amir Temur branch street of Andijan city. This, in turn, demonstrates the importance of bus stops on this road network.

CONCLUSION

Of course, the current location of bus stops on Amir Temur Avenue, as shown in Figure 1, corresponds to the standards of public transport stops in the city. However, according to existing standards, bus stops do not have the standard length to accommodate 2 or more public transport vehicles at the same time. This, in turn, causes public transport to get stuck at stops along the route, creating artificial traffic jams on the route.

In order to address the problems mentioned in a timely manner, it is necessary to re-inventorily and reconstruct each bus stop.

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