AMERICAN JOURNALS
Open Access, Peer Reviewed Journals

American Journal of Pedagogical and Educational Research
ISSN (E): 2832-9791| Volume 12, | May, 2023

STOP CAPACITY MODEL (BY THE EXAMPLE OF TERMEZ)

Комилов Аъзамжон Лутфуллоевич
учитель, Термезский инженерно-технологический институт (ТИТИ)

A B S T R A C T	K E Y W O R D S
This article provides a route system for city bus stops. In this article, it is necessary to ensure the normal quality of the work of urban passenger transport, as well as to choose the exact and normative growth of buses and take into account the conditions for their regular operation. Fuel savings on buses can reduce costs for businesses. The demand for passenger transport is growing, taking into account the expansion and development of the city. However, there are also problems with the provision of transport services to the population. Passenger transportation is aimed at improving the quality of service. Ecology also aims to reduce exhaust emissions.	Bus stop, interval between stops, break, interval, possibility of transfer, stop with pocket and without pocket.

INTRODUCTION

In recent years, large-scale measures have been taken in the country aimed at developing the sphere of transport and transport communications, ensuring a high level of transportation safety, improving the management system in the field of transport, and training qualified specialists for the industry. In 2019, the Ministry of Transport of the Republic of Uzbekistan was established, which is entrusted with the main task of developing a unified state transport policy aimed at the harmonious development of all modes of transport based on their integration into a single transport network and the use of new efficient transport and logistics systems . The Ministry of Transport has developed a Strategy for the Development of the Transport System of the Republic of Uzbekistan for the period up to 2030. The main goal of the Strategy is to deepen the ongoing reforms aimed at creating an integrated unified transport system, increasing the competitiveness of the transport sector and the efficiency of using the transport infrastructure to fully meet the needs of the state economy, population and business. In large cities around the world, indicators of the quality of transport services to the population are becoming important, including the issues of timely arrival of passengers to their destination without excessive delays on the road, comfortable conditions, modern solutions to existing problems and improving the quality of service.[1] In this regard, special attention is paid to the development of new scientific and technical solutions to improve the quality of service on urban bus routes in developed foreign countries, including the United States, England, Germany, France, Singapore, Japan, and South Korea. Scientific research is carried out in the areas of providing transport services to the population in the world, improving its quality indicators, improving the operation of urban public transport based on integrated approaches. It is important to conduct targeted scientific research on this route, including the criterion for an integral assessment of the quality of transport services on city bus routes, determining the dependence of controlled intersections on their traffic mode, and ensuring the planned traffic interval at the crossing sections.

The maximum allowable level of territorial pedestrian accessibility for the population to stops of ground urban public passenger transport should be:

- from places of residence or places of employment - no more than 400 m;
- from objects of mass visiting - no more than 250 m;
- from social service facilities and clinics - no more than 150 m;
- from entrance enterprises in industrial and communal storage areas - no more than 400 m;
- from the main entrance of the public recreation and sports areas - no more than 800 m.
- in areas of individual residential development, the distance of pedestrian approaches to the nearest stop of ground urban public passenger transport can be increased to 600 m.
- The maximum allowable level of territorial pedestrian accessibility for the population to the stations of high-speed off-street public passenger transport should be:
- to metro stations in the central part of the city - no more than 500 m;

APPROBATION AND IMPLEMENTATION OF THE RESULTS OF THE WORK:

The peculiarities of the operation of the PPP are such that in order to eliminate vehicle downtime while waiting for arrival, especially in conditions of a significant increase in passenger traffic, intervention in the management of the transportation process is required based on the consistency of the temporal characteristics of the transportation process along routes and at stopping points.

The organization and technology of transportation of passengers on regular routes and the technology of using the transport vehicle and passengers of the OPP have so far been considered separately without proper coordination among themselves. In order to establish the rules for such coordination, regular transportation routes and OPPs are combined into a system of "traffic routes - OPPs", which is capable of ensuring the rhythmic interaction of vehicles and passengers in the OPP.

The classical approach to scheduling bus operation uses the interval of bus movement and the amount of time spent by passengers on waiting for the trip and the trip itself. At the same time, the interval of bus traffic on various routes is planned to be evenly distributed [2,3,].

Orenburg specialists in their works [4] point out the mechanistic nature of existing approaches to determining the PS of OP. The authors consider typological models of behavior of drivers when occupying a free place on the OP, however, they do not provide a methodology for calculating the TP that takes into account the "human factor".

A large number of works on the topic of OP are related to the study of bus delays during the boarding and disembarking of passengers (you can also find the term "passenger service time"). This is due to the fact that this time is, as a rule, the largest among all bus delays at the OP.

RESEARCH METHODS

Before considering complex schemes of OP with a non-constant number of service points, let us consider the simplest model with the operation of single-brand (or the same type) rolling stock on the route.

Let's imagine an OP capable of accommodating only one bus. Each MTS spends some time on arrival, maintenance and departure from the OP. Let's designate it $\sum t_3$ (total delay of MTS on OP). The PS

of such an OP will be maximum if the next one immediately arrives at the place of the departed bus. Therefore, we will make the assumption that our OP has a queue of unlimited length.
PS OP (unit / h) in this case will be equal to:

$$ПС_{оп} \frac{\mathbf{3600}}{\boldsymbol{\Sigma}_{t_3}}\mathbf{(1)}$$

Now imagine that the OP is able to accommodate several buses at the same time. As a result, for each service location, additional downtime will begin to occur due to mutual interference between simultaneously served buses. For example, Figure 2.4 shows the situation when the first bus that arrived at the OP has already departed, and the second one is still being serviced. At the OP with the possibility of maneuvering, this will lead to additional time delays associated with the need to maneuver ahead of the vehicle in front. In a similar situation, but for the OP without the possibility of maneuvering, time delays will be associated with downtime of the first service location (Figure 2.1).
Thus, the PS for two or more service locations will be equal to:

$$ПС_{оп} \frac{\mathbf{3600}}{\boldsymbol{\Sigma}_{t_3}} \boldsymbol{k}_{н} \boldsymbol{N_M}\mathbf{(2)}$$

where is $\boldsymbol{N_M}$the number of seats for simultaneous service (two or more); is $\boldsymbol{k}_{н}$the coefficient of inefficiency in the use of several service points.
Studies conducted in the field of functioning of the EP [7] show that with a linear scheme of functioning of the EP, the PS of the latter grows disproportionately to the number of seats in the OP. For this reason, in practice and in the scientific literature, it is not recommended to design an EP for more than 3-5 seats. In current models, this is taken into account by the coefficient of inefficiency in the use of the corresponding number of seats - k_H(it can be denoted differently). In a number of sources [8,9] k_H , the coefficients obtained experimentally are constant and tabulated. According to the results of a comprehensive study, it was found thatk_H is not a constant value, but depends on a number of factors, and the decrease in the PS itself when the number of seats on it is more than one occurs for two main reasons:
□□temporary loss $t_{конф}$of each of the service locations due to mutual interference and conflicts between buses; □
□□reducing the number of seats due to their inefficient use, for example, in a situation where the bus stops right at the entrance to the OP.
In the course of studying the technology of MTS operation at the OP, as part of their comprehensive study, several situations of inefficient use of service places were identified:
1. Stopping transport not at the beginning of the OP, and thereby reducing the possible number of seats. In Figure 3.18, the bus did not stop at the beginning of the OP, thus, instead of two service places, one remained. Situations were also identified when buses stopped immediately at the entrance to the OP, ignoring the 2-3 vacant seats ahead.
2. Dispersal of buses within the PS, when instead of the possible three, only 2 buses are served at the PS.
3. Ignoring the free space at the OP due to the fact that in order to enter it, it is necessary to make a maneuver to get ahead of the MTS in front.
Therefore, the coefficient $k_H$can be divided into two components: n k

$$k_H = k_{нt} = k_{нм}(3)$$

where $k_{\text{н}t}$is a coefficient that takes into account the reduction in PS due to temporary losses due to mutual interference and conflicts between buses; $k_{\text{НМ}}$is a coefficient taking into account the reduction in PS due to the inefficient use of service places.

the coefficient $k_{\text{н}t}$ −in the form of a corresponding parameter $t_{\text{конф}}$ −characterizing the loss of time by service places when several buses operate at the OP.

Thus, the PS OP model (2.3) for the same type of rolling stock can be written as:

$$\text{ПС}_{\text{оп}} = \frac{\mathbf{3600}}{\boldsymbol{\Sigma}_{\boldsymbol{t}_{\text{з}}} + \boldsymbol{t}_{\text{конф}}} \boldsymbol{k}_{\text{н}} \boldsymbol{N}_{\boldsymbol{M}} \quad (4)$$

Consider now the delay structure$\Sigma_{t_{\text{з}}}$

$$\Sigma_{t_{\text{з}}} = t_{\text{доп}} + t_{\text{од}} + t_{\text{обсл}} + t_{\text{ПвО}} + t_{\text{зд}} + t_{\text{уб}} (5)$$

Where -$\boldsymbol{t}_{\text{доп}}$ additional time required for the receipt (change) of MTS at the OP, s;$\boldsymbol{t}_{\text{од}}$ - the time spent on opening the doors of the MTS, s;$\boldsymbol{t}_{\text{обсл}}$ – service time (passenger embarkation and disembarkation), s; – $\boldsymbol{t}_{\text{пво}}$ “idle waiting time”, s; $\boldsymbol{t}_{\text{зд}}$– door closing time, s; $\boldsymbol{t}_{\text{уб}}$– time of departure from the OP (if there is a check-in pocket)

Let us compare, in general, all the delays for the two types of operation of the OP considered by us in the presence and absence of a driving pocket. In total, we have four types of OP:

1. OP without pocket and maneuvering. The simplest case, considered in most of the dissertation examples. Total delays (s):

$$\Sigma_{t_{\text{з}}} = t_{\text{конф}} = t_{\text{доп}} + (t_{\text{од}} + t_{\text{обсл}} + t_{\text{пво}} + t_{\text{зд}}) + t_{\text{конф}} \ (6)$$

In this case, $\boldsymbol{t}_{\text{доп}}$this is the time between the end of service for the bus located at the last place (closer to the entrance) and the start of service for the bus from the queue in the first place (closer to the exit).

2. OP with pocket and without maneuvering. In this case, there are additional delays associated with the need to change lanes and merge into the general traffic flow. Total delays (s):

$$\Sigma_{t_{\text{з}}} = t_{\text{конф}} = t_{\text{доп}} + (t_{\text{од}} + t_{\text{обсл}} + t_{\text{пво}} + t_{\text{зд}}) + t_{\text{уб}} + t_{\text{конф}} \ (7)$$

It looks like there is a delay $t_{\text{уб}}$(c), which in the absence of maneuvers can be calculated by formula (1) without the last term :

$$t_{\text{уб}} = 0{,}003 * N + 0{,}056 * Q \quad (8)$$

3. OP with a pocket and with maneuvering. The presence of a driving pocket, as noted above, adds a delay $t_{\text{уб}}$-. However, now it will become more important, since it will take into account the need to maneuver ahead of the buses in front and will be calculated using formula (1). The component - will also change $t_{\text{доп}}$, which will have a slightly different meaning, in contrast to the similar one for the OP without maneuvering. In this case, $t_{\text{доп}}$this is the idle time of the service point between the end of the service of the previous bus and the start of the service of the next one. As noted above in this section, $t_{\text{доп}}$- will be the sum of the time of movement within the borders of the OP - $t_{\text{движ}}$and the time to change lanes - $t_{\text{движ}}$. Due to the fact that it takes a slightly different time to drive to each service point, $t_{\text{доп}}$ −it is necessary to find as an average for all service points. Otherwise, the components of the total bus delay will remain the same as in (2).

4. OP without pocket and with maneuvering (Figure 1). Lack of entry

The pocket leads to the need to maneuver twice ahead of the bus in front, first to enter the OP, then to leave the snow. As a result, the delay$t_{уб}$ doubles, but $t_{доп}$ is calculated as for the previous OP.

Thus, we have obtained a model for determining the PS OP with a constant number of service points. Now it is necessary to consider the cases of operation of early-class rolling stock at the base station, to obtain patterns of change in time losses *t* conf, and also to take into account other factors.

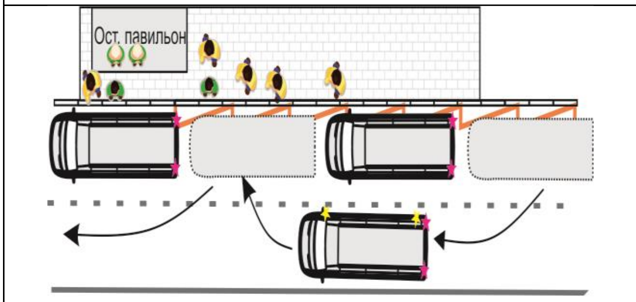
According to the standard	Real
	

Figure 1. The maneuvering scheme for the OP without a pocket should be

With this scheme of operation, some buses will have to perform as many as three maneuvers to release the OP: a maneuver to get ahead of the bus in front in order to enter the OP, a reverse maneuver to occupy an empty seat on the OP, and one more maneuver to get ahead of the vehicle in front in order to release the OP. It can be assumed that the time spent on these maneuvers will be too long, and drivers will not behave in this way. So the possibility of functioning of the OP without a pocket and with maneuvering is doubtful.

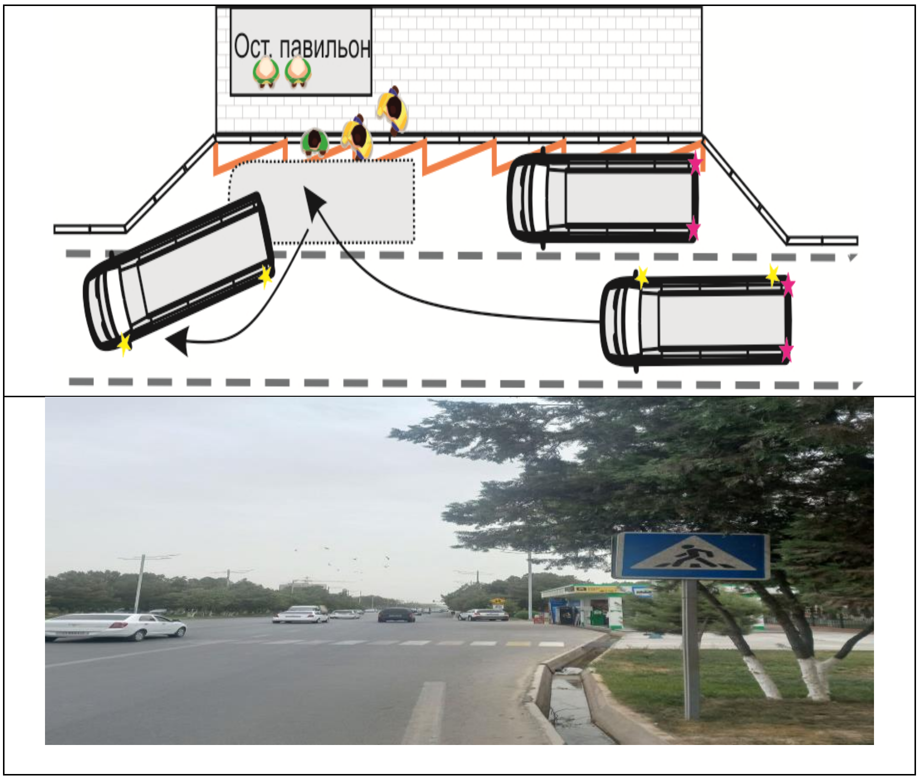


Figure 2. - Scheme of maneuvering on the OP with a pocket

In the case of a drive-in pocket, the entry to the OP is, as a rule, carried out freely in the adjacent lane, however, upon departure, there is a delay associated with the need to change lanes and departure from the drive-in pocket (Figure 2.).

With this scheme, maneuvering no longer looks so irrational and, under certain conditions, allows the bus to leave the OP sooner.

Note that in the case of a maneuvering scheme, the bus does not have to wait for the release of the OP by other buses. He immediately, in the presence of free space, makes a maneuver ahead of the vehicle in front. However, there are additional delays due to mutual interference between buses. For example, one bus has finished servicing and is ready to depart from the OP, but the second bus is preventing it, making a maneuver in front of it.

It can be seen that, depending on the operation scheme, both the factors affecting the PS and the time delays generated by these factors fundamentally change. Thus, it is necessary to determine these factors, as well as the conditions under which the EP will operate in one mode or another. At first glance, it may seem erroneous that most of the OPs of urban passenger road transport belong to the group of OPs with maneuvering. In practice, the possibilities of maneuvering can be limited, for example, by the movement of individual vehicles in neighboring lanes, the intensity of which can be very high in modern conditions of growing motorization of the population .

Under the scheme "with maneuvering" we will consider the following: let's assume that all the places on the OP are occupied. As soon as any of the buses finishes service, it starts to leave the OP without waiting for the end of service for those in front. If he is at the first place of service, then he can freely leave the OP. If there is another bus in front of him, then he maneuvers ahead of the one in front. As soon as the place for service is vacated, a bus enters it from the queue, also with the help of being ahead of the one in front or simply entering the OP if the last of the service places is free. In the course of monitoring the process of functioning of the MTS at the OP, it was noted that with an increase in the degree of its workload and, as a result, the exhaustion of the resource of the PS, changes are observed in the characteristics of the process of functioning of the OP. For example, with a high load of the OP, MTS drivers try to free the latter as quickly as possible, the number of all kinds of violations increases: driving past the OP, boarding and disembarking passengers in the second row, outside the OP, etc. OP "adapts" to the maximum traffic intensity. Thus, it can be assumed that the PS OP is not a constant value, but a certain function of the traffic intensity.

CONCLUSION

In conclusion, it can be said that the city depends on stopping stations in order to reduce the time losses in the movement and movement of public transport. The bus relies on the lack of pockets in order to increase the flexibility of stops. Bus stops depend as much as possible on the bus routes passing through this station. The capacity of a bus stop depends on the length of the buses. It is preferable to install pocket stops in the opposite direction. The permeability of pocket bus stops can provide ham grip. It is necessary to design and build pocket stations in the city of Termez.

USED LITERATURE

1. Bratzel, S. (1999). Conditions of success in sustainable urban transport policy - policy change in “relatively successful” European cities. Transport Reviews, 19(2), pp . 177–190.
2. Dios Ortiizar, J.; Willumsen, LG: Transport Modelling. Chichester: John Wiley & Sons, LTD, 2004.
3. Dimova I.P. Improving the efficiency of the functioning of stopping points of urban passenger transport and the movement of vehicles in the zone of their influence: auto-abstract of dissertation .... cand. tech. Sciences / I.P. Dimov. - Tyumen, 2009. - 18 p.
4. Efremov I. S. Theory of urban passenger transportation: textbook. manual for universities / I.S. Efremov, V.M. Kobozev, V.A. Yudin. - M.: Higher. School, 1980. - 535 p.
5. Zatonsky A.V. Simulation balance model of urban public transport stops /A.V. Zatonsky, Yu.I. Volodina// "Cargo and passenger vehicles". - 2013. - No. 12. - With. 70-77.
6. Iskhakov M. M. Selection of a site at a stopping point for servicing passengers of route vehicles // Bulletin of the Orenburg State University. - 2011. - No. 10. - p. 59–63.
7. Iskhakov M. M., Rassokha V.I. "Human factor" in the organization of the work of route vehicles at stopping points // "Bulletin of the Orenburg State University". - 2008. - No. 1. - p. 144–149.
8. Strategies for the development of the transport system of the Republic of Uzbekistan for the period up to 2030.
9. Komilov, A. L. (2020). Methods for Optimizing and Modeling Routes for Selecting a Routing Scheme for Passenger Transport in Buses (On the example of Surkhandarya). International Journal of Advanced Research in Science, Engineering and Technology, 7(9).
10. Komilov, A. L. (2021). Research and verification of urban public transport routes using mathematical methods (On the example of the city of termez). Asian Journal of Multidimensional Research, 10(10), 810-818.
11. Kuziev, AU, Alikulov, SR, Muratov, AX, & Komilov, AL (2019). Statement of Optimization Vehicle Routing Problems on Transport Network. International Journal of Advanced Research in Science. Engineering and Technology , 6 , 12.
12. Komilov, A. L. (2021). Distribution of passenger flow by hours of the day on a rational route (in the example of Termiz city). Scientific progress , 2 (2), 1449-1456.