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DETERMINING THE TOTAL DISTANCES BETWEEN STATIONS AND ALONG THE ROUTE, DISTRIBUTION OF PASSENGER FLOW BY HOURS OF THE DAY

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Abstract: The article examines issues of the quality of transport services for passengers. By analyzing passenger flow on a bus route, the main factors influencing the quality of transport services for passengers were identified. Based on the results of the research, the author proposed a number of organizational and technical measures on bus route № 61 in order to improve the quality of passenger service, such as increasing the number and reducing the frequency of buses, updating vehicles, ensuring the sanitary condition of buses at the required level, increasing comfort in the bus cabin.

Keywords: passengers, bus, direction, driver, quality of service, information and communication technologies, standard of living, crossroads, intersections, traffic, conflict points, vehicle trajectories.

ИЗУЧЕНИЕ РАСПРЕДЕЛЕНИЯ ПАССАЖИРОПОТОКА ПО ЧАСАМ СУТОК И ОПРЕДЕЛЕНИЕ РАССТОЯНИЙ МЕЖДУ ОСТАНОВКАМИ АВТОБУСНОГО МАРШРУТА

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Аннотация: В статье исследуются вопросы качества транспортного обслуживания пассажиров. С помощью анализа пассажиропотока на автобусном маршруте выявлены основные факторы, влияющие на качество транспортного обслуживания пассажиров. По результатам исследований автором предложены ряд организационно-технических мероприятий на автобусном маршруту № 61 с целью повышения качества обслуживания пассажиров, такие как увеличение количества и сокращение интервала движения автобусов, обновления транспортных средств, обеспечения санитарного состояния автобусов на необходимом уровне, повышение комфортности в салоне автобуса.

Ключевые слова: пассажиры, автобус, маршрут, водитель, качество обслуживания, информационно-коммуникационные технологии, уровень жизни, перекресток, перекрестки, движение транспорта, конфликтные точки, маршруты движения транспортных средств.

INTRODUCTION. Providing transportation services to the population worldwide, including meeting the needs of passengers, optimizing the operational performance of vehicles on the routes, the work and rest of drivers, organizing intra-city, suburban, inter-city and international transportation, issues

of improving the tariff system, improving the quality of service, modern solutions to existing problems are gaining importance. In this regard, special attention is being paid to the development of new scientific and technical solutions to these issues in developed foreign countries, including the USA, England, Germany, France, Singapore, Japan, and South Korea. Large-scale researches are being carried out in the directions of providing transport services to the population, increasing its quality, and improving the work of passenger transportation based on comprehensive approaches. At the same time, it is considered necessary to create modern passenger transportation technologies. Today, the most urgent problems facing passenger transport are to deliver passengers to their destinations on time, safely, comfortably, with minimal expenses. In order to solve these problems, as well as to further improve the country's transport system, it is necessary to train personnel with deep knowledge and skills in the field of transport, in line with global requirements.

MATERIAL AND METHODS. In order to measure the length of the route, a committee will be formed consisting of the representatives of the road industry and car dealership. The board measures exact distances between stops on highways, as well as in cities and towns, in a car equipped with a technically calibrated and branded speedometer[1,2].

1-table

Certificate of measurement of distances of buses (In the right direction)

№	Name of stations	Speedometer indicator	Stations Between Distance km/h
1	Yangiabad district	0,00	0
2	Chilonota street	0,6	0,6
3	School 198	0,9	0,3
4	Gastronomist	1,2	0,3
5	Zanjirsoy street	1,5	0,2
6	Nadirabegim street	1,9	0,5
7	Shop	2,4	0,5
8	Slo'nima street	2,8	0,4

9	Arslanabad district	3,0	0,2
10	Aircraft market	3,6	0,6
11	Kozonkhana	4,5	0,9
12	Kozonkhana	4,6	0,2
13	Shop	5,0	0,3
14	Khavas street	5,5	0,5
15	Khatirchi street	5,9	0,4
16	Combination of refrigerators	6,6	0,7
17	Expedition	7,0	0,4
18	Fergana market	8,1	1,1
19	Oltinkol 2-tor street	8,4	0,3
20	11th maternity hospital	8,9	0,6
21	Sarakul Street	9,2	0,3
22	Fitrat 2-tor street	9,8	0,6
23	Mirabad TIIB	10,2	0,4
24	Institute of Transport	11,0	0,8
25	City of pilots	11,3	0,3
26	Margilan street	12,0	0,7
27	Solo TIIB	13,3	1,4
28	Thermal energy center	14,0	0,7
29	Yakasaroy TIIB	14,5	0,5
30	International Airport-2	15,6	1,1
	Total		**15,6**

The distance between stations should be measured to the nearest tenth of a kilometer. The commission draws up a document based on the measurement results.

Reverse direction

№	Name of stations	Speedometer indicator	Stations Between Distance km/h
1	International Airport-2	0	0
2	Margilan street	0,7	0,7
3	City of pilots	1,4	0,7
4	Institute of Transport	1,8	0,4
5	Ret plant	2,1	0,3
6	Mirabad TIIB	2,4	0,3
7	Fitrat 2-tor street	2,9	0,5

8	Sarakul Street	3,5	0,6
9	11th maternity hospital	3,8	0,3
10	Oltinkol 2-tor street	4,3	0,5
11	Fergana market	4,7	0,4
12	Fergana market	5,4	0,6
13	Expedition	5,8	0,4
14	Combination of refrigerators	6,2	0,4
15	Khatirchi street	6,6	0,5
16	Khavas street	7,0	0,3
17	Shop	7,6	0,6
18	Kozonkhana	8,2	0,6
19	Arslanabad district	8,6	0,4
20	Aircraft market	9,2	0,7
21	Aviazozol AShB	9,8	0,5
22	Shop	10,8	1,0
23	Nadirabegim street	11,2	0,4
24	Zanjirsoy street	11,6	0,4
25	Gastronomist	12,0	0,4
26	School 198	12,2	0,2
27	Chilonota street	12,4	0,2
28	Yangiabad district	13,1	0,7
	Total		**13,1**

The distance between the stops (peregon length) is determined by the speedometer indicator.

$$L_{per} = SK_{n+1} - SK_n; \text{ km},$$

In the right direction

Institute of Transport - Mirabad TIIB

10.99-10.18=0.81; km.

Reverse direction

Yangiabad district - Chilonota street

13.16-12.41=0.65; km.

here: SK - speedometer reading, SKn+1 - speedometer reading at the next point, SKn - speedometer reading at the previous point.

The calculation results are included in Table 1.

Distances from the starting point to the next and the entire length of the route

$$L = SK_n - SK_1 \text{ ; km. ,}$$

In the right direction

Yakkasaroy TIIB- Yangiabad district

14,52-0=14,52; km.

Reverse direction

Chilonota street - International Airport-2

12,41-0=12.41; km.

here: SK_n is the reading of the speedometer at point n,SK_1 is the speedometer reading at the starting pointю The calculation results are included in Table-1.

Determination of traffic, communication, flight and round-trip flight times. Chronometric observations are carried out using the lowest technical and operational indicators that can be used in the researched direction[3,4]. The driver of the bus, which is subject to chronometric observation, must have the appropriate qualifications and know the route being studied well. Chronometric observation is carried out on typical days of the week (one of the working days, Saturday, Sunday) throughout the working day, in each season of the year, as well as when the mode of operation of the transport and the flow of passengers change[5,6]. The position of the bus timekeeper is determined in a place where the traffic route, exit and exit doors are clearly visible. The observation is recorded on the map showing the stops of the route, and a document is drawn up based on it (Table 2).

2-table

Map of processing chronometric observations in the direction (In the right direction)

Name of stations	Time, min.			Technical speed, km/h
	movement	Stopping at intermediate	stop at the last	

		stations	stop	
Yangiabad district	0	0	5	32,4
Chilonota street	1,2	0.5		32,4
School 198	0,6	0.5		32,4
Gastronomist	0,5	0.5		32,4
Zanjirsoy street	0,4	0.5		32,4
Nadirabegim street	0,8	0.5		32,4
Shop	0,9	0.5		32,4
Slo'nima street	0,7	0.5		32,4
Arslanabad district	0,3	0.5		32,4
Aircraft market	1,2	0.5		32,4
Kozonkhana	1,7	0.5		32,4
Kozonkhana	0,3	0.5		32,4
Shop	0,6	0.5		32,4
Khavas street	0,9	0.5		32,4
Khatirchi street	0,8	0.5		32,4
Combination of refrigerators	1,3	0.5		32,4
Expedition	0,6	0.5		32,4
Fergana market	2,0	0.5		32,4
Oltinkol 2-tor street	0,5	0.5		32,4
11th maternity hospital	1,1	0.5		32,4
Sarakul Street	0,6	0.5		32,4
Fitrat 2-tor street	1,1	0.5		32,4
Mirabad TIIB	0,7	0.5		32,4

Institute of Transport	1,5	0.5		32,4
City of pilots	0,6	0.5		32,4
Margilan street	1,2	0.5		32,4
Solo TIIB	2,5	0.5		32,4
Thermal energy center	1,3	0.5		32,4
Yakasaroy TIIB	1,0	0.5		32,4
International Airport-2	2,1	0.5		32,4
Total	**29**	**14**	**5**	**32,4**

Reverse direction

Name of stations	Time, min.			Technical speed, km/h
	movement	Stopping at intermediate stations	oxirgi bekatda turish	
International Airport-2	0	0	5 min	34,1
Margilan street	1,3	0.5		34,1
City of pilots	1,2	0.5		34,1
Institute of Transport	0,7	0.5		34,1
Ret plant	0,6	0.5		34,1
Mirabad TIIB	0,4	0.5		34,1
Fitrat 2-tor street	0,9	0.5		34,1
Sarakul Street	1,0	0.5		34,1
11th maternity hospital	0,6	0.5		34,1
Oltinkol 2-tor street	0,9	0.5		34,1
Fergana market	0,7	0.5		34,1
Fergana market	1,1	0.5		34,1
Expedition	0,8	0.5		34,1

Combination of refrigerators	0,6	0.5		34,1
Khatirchi street	0,8	0.5		34,1
Khavas street	0,6	0.5		34,1
Shop	1,1	0.5		34,1
Kozonkhana	1,1	0.5		34,1
Arslanabad district	0,7	0.5		34,1
Aircraft market	1,2	0.5		34,1
Aviazozol AShB	1,0	0.5		34,1
Shop	1,8	0.5		34,1
Nadirabegim street	0,8	0.5		34,1
Zanjirsoy street	0,7	0.5		34,1
Gastronomist	0,7	0.5		34,1
School 198	0,4	0.5		34,1
Chilonota street	0,4	0.5		34,1
Yangiabad district	1,1	0.5		34,1
Total	**23**	**13**	**5**	**34,1**

RESULTS AND DISCUSSION. Movement time. A map of processing chronometric observations is used to determine the running time of buses (Table 2). During the flight, the movement time in the direction is calculated by the sum of the movement times in each zone. $t_m = \sum t'_m$; min.

In the right direction

t_m=1,2+0,6+0,5+0,4+0,8+0,9+0,7+0,3+1,2+1,7+0,3+0,6+0,9+0,8+1,3+0,6+2,0+0,5+1,1+0,6+1,1+0,7+1,5+0,6+1,2+2,5+1,3+1,0+2,1=29 min.

Reverse direction

t_m=1,3+1,2+0,7+0,6+0,4+0,9+1,0+0,6+0,9+0,7+1,1+0,8+0,6+0,8+0,6+1,1+1,1+0,7+12+1,0+1,8+0,8+0,7+0,7+0,4+0,4+1,1=23 min.

here: t' - movement time in one peregon, min.,

n – is the number of peregons in the direction.

Stopover time at intermediate points during the flight. The stopover time at intermediate points during the flight consists of the sum of stopover times at each individual stop:

$$t_{st} = \sum t'_{st};\ \text{min.}$$

t_{st}- stopover time at intermediate stops

In the right direction

t_{is}=0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5=14 min.

Reverse direction

t_{is}=0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5+0.5=13 min.

here: t' - stopping time at intermediate points, min.;

k-is the number of intermediate stops.

Contact time. The connection time is the time from the time of departure from one last stop to the second last stop, which includes travel time and stopover time at intermediate stops:

$$t_c = t_m + t_{st};\ \text{min.}$$

In the right direction

t_c=29+14=43 min.

Reverse direction

t_c =23+13=36 min.

Flight time. Flight time is - the time it takes for a bus to reach one final stop on a route, including travel times, stops at intermediate stops, and stops at one final stop:

$$t_f = t_m + t_{st} + t_{ls}\ ;\ \text{min.}$$

In the right direction

$$t_f = 29+14+5 = 48\ \text{min.}$$

Reverse direction

$$t_f = 23+13+5 = 41\ \text{min.}$$

One round trip time of the bus. The time of one round of the bus consists of the sum of flight times in both directions:

$$t_{rt} = t_f^{right} + t_f^{reverse};\ \text{h.}$$

$$t_{rt} = (48+41)/60 = 1.48\ \text{h.}$$

3-Table

Distribution of passenger flow by hours of the day

Hours of the day	Number of passengers	
	Direction	
	right	back
5 – 6	20	12
6 – 7	55	43
7 – 8	95	89
8 – 9	143	111
9 – 10	104	87
10 – 11	89	80
11 – 12	74	57
12 – 13	65	50
13 – 14	68	62
14 – 15	73	68
15 – 16	78	80
16-17	87	99
17 – 18	111	124
18 – 19	87	105
19 – 20	72	74

20 – 21	42	46
21 – 22	26	31
22 – 23	14	19
Total	**1304**	**1238**

Passenger flow chart by hours of the day. On the basis of the data obtained as a result of processing the monitoring results (Table 3) and by selecting the scale, a passenger flow diagram is built by hours of the day[7,8].

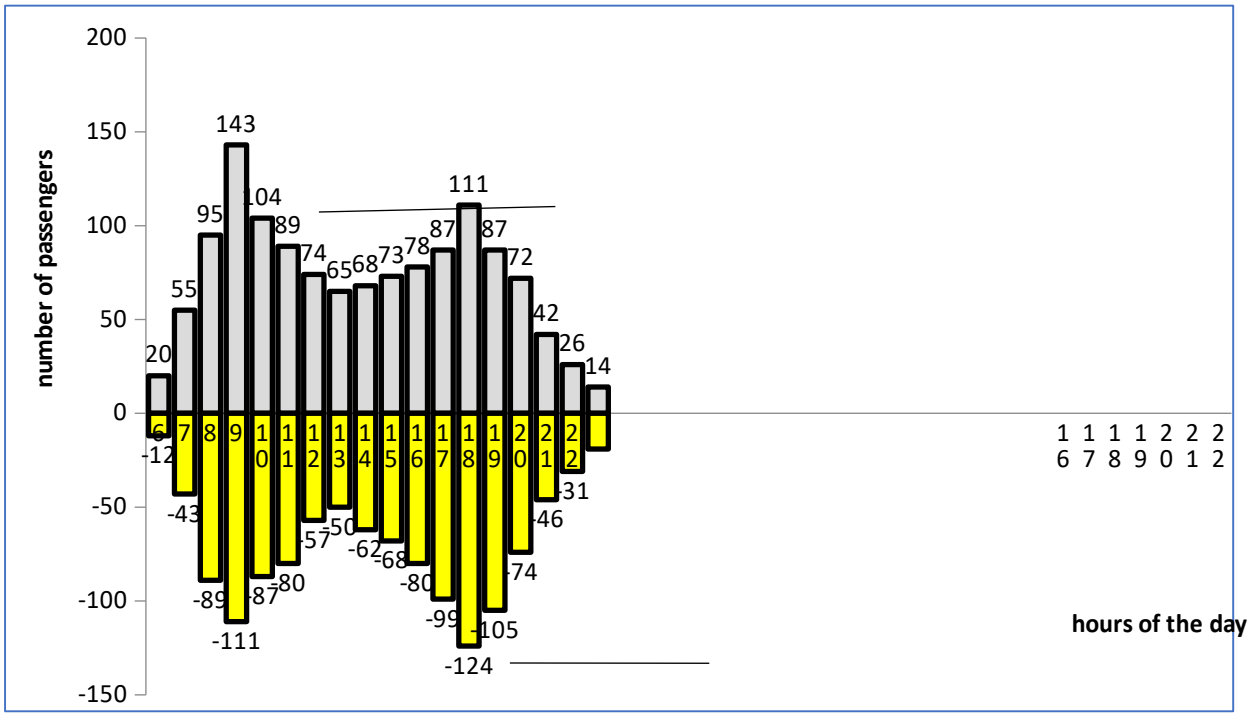

Fig.1. Hourly passenger flow chart

CONCLUSION

In conclusion, in the production of this course project, I changed the production of bus performance indicators in the direction of "Yangiabad Region-International Airport-2" No. 61. Studying this is divided into two parts. I studied accounting, technological and organizational parts. In the computer-technological part, the total distances between the stops and along the route of bus No. 61 were determined and the information was entered into the document. According to it, the distance in the right direction is 15.4 km, the number of stops was 30, and the distance in the back direction was 13.06 km, the number of stops was 28. Also, the movement, communication, flight and round trip times of bus route 61 were determined by chronometric observations

and included in the relevant table.

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