The analysis of passengers travel time to the distant from a central area transportation districts in the city of Rostov-on-Don

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Abstract. The paper describes one of the indicators of the passenger traffic quality – passengers travel time in the city of Rostov-on-Don. The studied quality index is analyzed in comparison with the standard value for urban passenger transport in Rostov-on-Don.The paper suggests the measures to improve the operation of urban passenger transport.

1 Introduction

The level of urban passenger transport has an impact on the life quality of urban residents and the development of the economy. Therefore, urban passenger transport services should be accessible to all segments of the population and meet their need for transportation. In accordance with GOST 51004-96 [1], evaluating the quality of passenger traffic, the total costs for the passengers delivery from the point of departure to the destination point, as well as the travel time, are taken into account.

2 The analysis of the passengers travel

For the analysis of the passengers travel time we used the Pikas software complex, which allows online monitoring of the operation of municipal public transport vehicles. The software complex Pikas allows to plan the efficient route of passengers traffic. This software provides the following information: city routes considering mode of transport; directions of the chosen route, as well as the schedule of public transport vehicles for all stops of urban passenger traffic with possible changings; departure time on the route (i.e, when the passenger arrives at the next stop of the route, if he leaves this stop at the chosen time), etc.[2,3,4,5,6,7]

For the analysis we calculated the travel time from the city center to the transportation districts of the city, in the forward and backward directions. An example is shown in Fig.1. The example shows passengers travelling to a distant from a central area district with a changing and walking to the stopping point. From the analyzed route alternatives, routes with the least travel time were selected, considering a number of changings. For all directions, the studies were carried out with a change in the planning parameters for passengers travelling, on the basis of which operational calculations were made. The analysis was carried out according to the following parameters [8-21]:

- departure time;
- options for the use of various modes of transport (tram, trolley, bus, fixed-route taxi);
- time for changing;
- distance of the pedestrian walking; average walking speed.

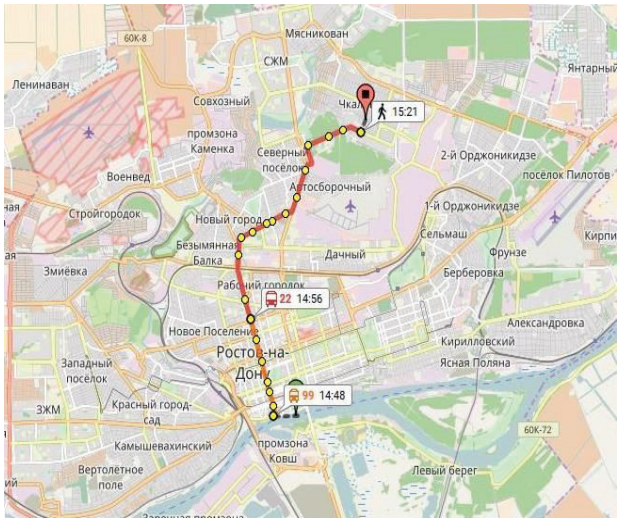

Fig. 1. The example of passengers travelling with a changing

An example of the rolling stock schedule for stops, used to estimate the number of vehicles of a particular route passing through one stop, is shown in Fig.2.

Fig. 3, 4 presents a graphical interpretation of the passengers travel time study going by public transport on a weekday.

The paper studies the directions from the city center to transportation districts in real time. These values are compared with the standard value, which is 40 minutes for the city of Rostov-on-Don.

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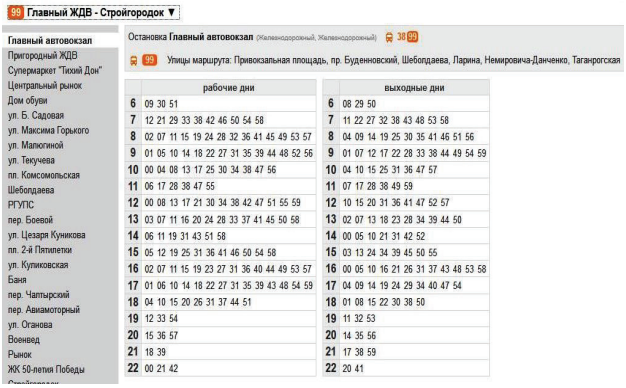

Fig. 2. Example of a timetable for the route № 99

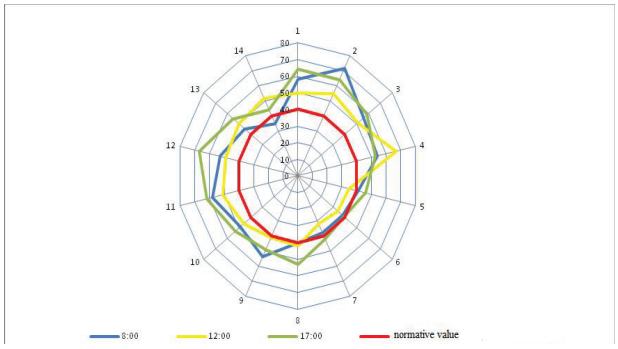

Fig. 3. Analysis of the passengers real time travel compared with the standard value on a weekday from the city center to transportation districts

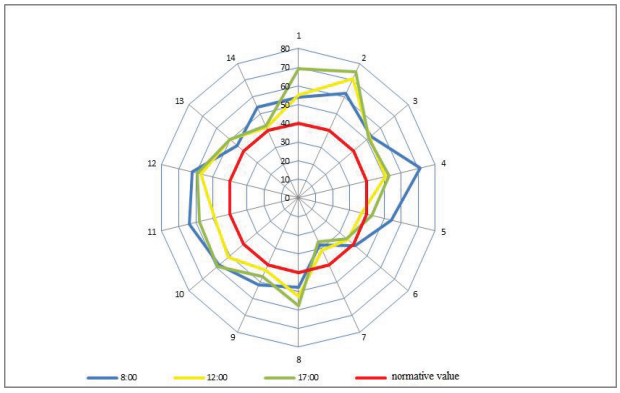

Fig. 4. Analysis of the passengers real time travel compared with the standard value on a weekday from the transportation districts to city center

Fig. 5, 6 shows the values of the passengers travel time by public transport on a day off from the city center to transportation districts in real time.

3 Conclusion

The undertaken study indicates that the travelling on the same routes at the weekend is faster because of less and faster traffic. The change in the urban transport speeds on different sections of the road network at different time periods has also been determined during our research.

On the basis of the study, recommendations for improving the routing network in Rostov-on-Don are proposed, which allow to reduce the average travel time and improve the quality of passenger service.

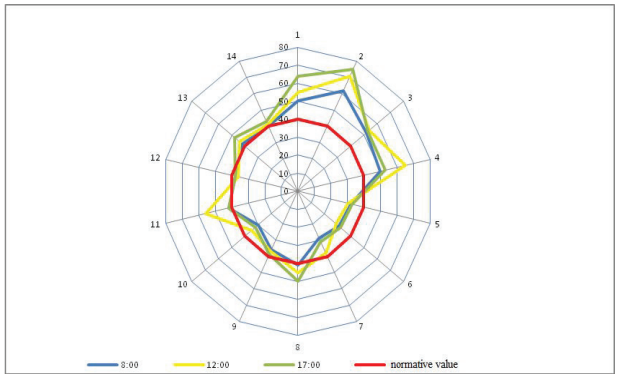

Fig. 5. Analysis of the real time travel of passengers compared to the normative value on a day off from the city center to transport areas

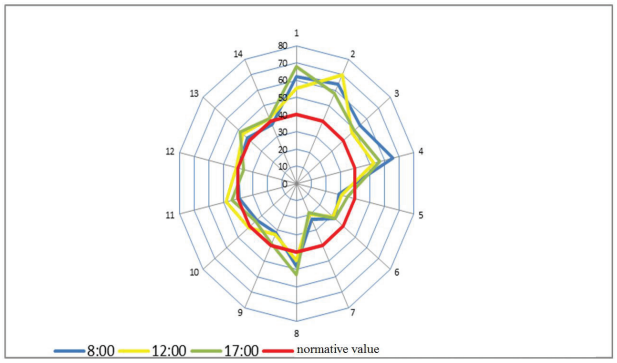

Fig. 6. Analysis of the real time travel of passengers compared to the normative value on a day off from the transport areas to city center

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