

УДК 338.2

OPTIMIZATION OF LOGISTIC ROUTES
IN THE CITY OF MOGILEVИ. А. ПОЗДНЯКОВ, Е. М. РАЗУМОВА
Научный руководитель А. В. КАРПЕНКО
Белорусско-Российский университет

The purpose of the project is to analyze the anticipated performance of the alternative road Yakubovskiy - Zagorodnoye Highway in the area of Kazimirovka microdistrict. The General Plan for the construction of the city of Mogilev by 2030 has been considered.

The most densely packed point in the city of Mogilev in terms of transport is the ring where Mira Avenue, Kosmonavtov Street and Yakubovskogo Street meet. In this regard, in 2012 a tender was held which was won by the project worked out by "Mogilevgrazhdanproekt". It took the team of the Institute six months to develop the project. According to the General Plan it was decided to build an alternative road by 2030 [1].

It is noted that the construction of the overpass is included in the State Investment Program for 2019 which approved 5 more facilities of the Mogilev region to be financed. They comprise route Mogilev-Cherikov (P-122), the bridge across the Sozh River in Slavgorod district, the Palace Ensemble in the village of Zhilichi, Uspenski monastery in Pustynki, engineering and transport infrastructure in Klimovichi [2]. This Program was certified by Government officials Viktor Kishkel and Igor Klisho.

The reason of the construction is that the recent renewal of the city entry with two-lane traffic from Minsk did not bring the expected results. Regular maintenance work on Yakubovskogo Street makes traffic heavier. The only fully functional highway leading to the center of Mogilev from the west is inefficient, as a result of which the so-called "bottle neck effect" appears.

The route of the new bypass road is as follows: the beginning is from the entrance arch, skirting Kazimirovka district and passing by the village of Gorodshchina and the regional hospitals, between Sputnik microdistricts, the garage community, House Construction Works and Yamnitsky and ends in Kosmonavtov Street.

A number of objects will have to be destroyed, and tens of kilometers of utilities will have to be knocked down and relocated. The new alternative road will cross the railroad lines which run in Osipovichy and another in Bykhov directions twice, so two three-storey house height embankments will have to be built by the years 2022–2023.

According to the plan of "Mogilevgrazhdanproekt", the future project is a four-lane route which length is to be approximately 7 kilometers [3]. This project can be

implemented only if there is a competent allocation of funding and a number of objects are dismantled and kilometers of utility networks are transferred.

It is planned that the project will be implemented in 3 stages, the first of which according to the plan will begin in autumn 2019, immediately after the development and verification of the relevant design and estimate documentation which will cost 2 million BYN.

In general, the tasks for this year are purely preparatory and cosmetic: site preparation, garbage collection, relocation of engineering networks from the construction area and ensuring the property rights of citizens and business entities. In addition, two more stages are planned, the total cost of which is estimated at 100 million BYN. Completion of the project is scheduled for approximately 2022–2023.

The entrance to Mogilev from the side of the capital was renewed while preparing to host the last year's Forum of the Regions of Belarus and Russia. At the same time, the average price for the sale of apartments increased by 10,4 % over the past year [4].

A few questions still remain unsolved. For example, the issue of social security in terms of high concentration of the population in the area. Considering the infrastructure of the region (OSC “Obuv”, 2 hospitals and the service sector) and the population density calculated below, people will have to look for jobs to the south of the railway.

Developing the project, careful study of passenger traffic from Kazimirovka-Sputnik areas to other areas of the city has not been taken into account.

We as researchers have decided to calculate some indexes (1), (2) related to this project based on the study of Economic Geography of Transport (1st year, 2nd semester):

$$PD = N : S = 40000:8 = 5000 \text{ people/sq.km} - 2019, \quad (1)$$

$$PD = N : S = 120000:8 = 15000 \text{ people/sq.km} - 2030, \quad (2)$$

where PD – population density, people/sq.km; N – size of population, person; S – area of the territory, sq.km.

Options of moving from Kosmonavtov Square only worsen the transport situation in the center of Mogilev. Knowing the dynamics of changes in the population of the area [5] it is possible to track the change in passenger traffic indexes (3), (4):

$$Q = N \times L = 30000 \times 7,5 = 225000 \text{ pass.km} - 2019, \quad (3)$$

$$Q = N \times L = 55000 \times 8 = 440000 \text{ pass.km} - 2030, \quad (4)$$

where Q – passenger traffic, pass.km; N – number of transported employed passengers, passenger; L – distance, km.

In addition, during rush hours, traffic flows mainly to the city center, to the eastern and northern parts of Mogilev where the largest industrial enterprises of the city are located. This issue calls into question the possibilities of the bypass to reduce traffic.

Upon completion, the length of the backup road will be 8 km, and the number of traffic lights is planned to be halved. New four-lane traffic in the future will help get rid of constant traffic jams and congestion.

In our opinion, the construction of the logistic route under consideration will contribute to the solution of the following problems:

1. Provision of faster and easier access to remote parts of the city both for transport units and city inhabitants;
2. Lowering costs of the route maintenance;
3. More dynamic and accelerated development of the infrastructure of outlying districts;
4. Social security issues solution.

REFERENCES

1. Официальный сайт новостного белорусского телеграфного агентства [Электронный ресурс]. – Минск, 1999. – Режим доступа: <https://www.belta.by/regions/view/v-mogileve-v-stroitelstvo-puteprovida-dublera-po-minskomu-napravleniju-investirujut-okolo-vr100-mln-336337-2019/>. – Дата доступа: 27.04.2019.

2. Официальный сайт телерадиокомпании Могилёв 4 [Электронный ресурс]. – Могилёв, 2019. – Режим доступа: <https://www.tvrmogilev.by/ru/news/region/dublyu-trassu-na-minskoe-napravlenie-postroyat-v-mogileve-video.html>. – Дата доступа: 27.04.2019.

3. Статистика и анализ цен на недвижимость г. Могилёва [Электронный ресурс]. – Могилёв, 2019. – Режим доступа: <https://realt.by/mogilev-region/statistics/>. – Дата доступа: 29.04.2019.

4. Официальный документ: статистический сборник социально-экономического положения г. Могилёва [Электронный ресурс]. – Могилёв, 1988. – Режим доступа: <http://mogilev.belstat.gov.by>. – Дата доступа: 29.04.2019.

5. Официальный сайт новостного могилёвского агентства [Электронный ресурс]. – Могилёв, 1999. – Режим доступа: <https://mogilevnews.by/news/28-02-2019-12-25/55804>. – Дата доступа: 30.04.2019.