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# Transport and infrastructural basis of the tourism development strategy in the Arkhangelsk Oblast*

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**Abstract.** The article, devoted to the analysis of transport and geographical locations, describes possible strategies for the development of tourism in the Arkhangelsk Oblast. The main goal of the research was the development of logistic schemes of the transportation of tourists from the places of formation of tourist flows to the Arkhangelsk Oblast. The methodological basis of the article is to determine the economic distances between potential tourist distribution centers and their places of interest in the area. Moscow, St. Petersburg, and Arkhangelsk were considered as the main towns of departure. Kargopol, Solvychegodsk, Kholmogory and Lomonosovo, Solovki, Kenozersky National Park, and Pinega caves are regarded as the main sites of tourist interest in the Arkhangelsk Oblast. It was determined that Kargopol is the most accessible for tourists, and Kenozersky National Park is the most recognizable by tourists but the least accessible. The object of world cultural heritage, the Monastery of the Transfiguration of the Saviour on Solovki is the most accessible for tourists from the territory of Karelia. It is recommended to optimize the schedule and to synchronize the work of transport for tourists to improve the transport accessibility of recreational facilities in the area. Composed logistic transport schemes allow optimizing the planning of tourist routes in the Arkhangelsk Oblast.
**Keywords:** *transport and geographical location, destination, tourist flow, tourism development strategy.*

## *Introduction*

The lack of roads and convenient transport links between tourist flow-forming centers and places of tourist interest reduces the possibilities of using recreational resources for the development of tourism. For many territories of the country with a specific recreational potential, only active and extreme types of tourism can develop regardless of the degree the local infrastructure development. It applies to the Arkhangelsk Oblast. But the development of the future regional tourism strategy should be based on the competitive advantages of the territory, strengths, and weaknesses, and consider all possible types of tourism to be developed due to available recreational resources [1, Tsvetkov A.Yu., p. 52; 2, Tsvetkov A.Yu., p. 282]. It is necessary, first, to consider the transport accessibility of places of tourist interest and develop appropriate logistic schemes that contribute to the competitiveness of the local tourist product due to cheaper tours and reduced travel time. The long-term effective recreational development of the territory must necessarily point to the improvement in the quality of life of the local population, which, in turn, depends on its investment attractiveness, impossible without good transport accessibility.

The study aims to develop logistics schemes for the recreational facilities of the Arkhangelsk Oblast.

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## Materials and study methods

In work, we analyzed the current state of the transport system of the Arkhangelsk Oblast, assessed the transport accessibility of the most famous destinations, and developed the transport and infrastructure foundations of a tourism development strategy. As the most valuable objects for recreational development, we considered the Solovetsky Islands (1), Kargopol (2), Kenozersky National Park (3), the village of Lomonosovo (4), Pinega Karst Caves (5) and Solvychegodsk (6). These objects are among the "miracles" of the Arkhangelsk Oblast, according to the official tourist portal of the administration[1] (Fig. 1).

Under the transport and infrastructure fundamentals of the tourism development strategy, we mean the transport scheme for promoting tourists to their objects of interest fundamental for the development of tourist routes. It includes the most acceptable routes for various types of transport in terms of speed, cost, and convenience of travel from the places of the main tourist flows formation. We considered all possible logistic schemes, consisting of regular flights from large towns, which are the starting points of most tourists visiting the Arkhangelsk Oblast. We evaluated the transport and geographical position of the above destinations concerning the places of tourist flows formation using each logistics scheme. The most convenient logistics schemes for the delivery of tourists revealed. Besides, we examined the transport connectivity of the listed destinations with each other or with other recreational facilities located along the tourist routes for the possible creation of combined tours. The identification of the transport basis helps to identify the weak links in the transport system of the territory, the elimination of which will help to develop the tourism business more successfully.

The modern transport system of the Arkhangelsk Oblast is represented by railways and highways, inland waterways, and airlines. However, the overall level of the transport system development is low. The density of motor roads is 11.4 km per 1,000 km$^2$ territory, railways — 3 km per 1,000 km2, which is lower than the national average [3, Potapov I.A., p. 79]. The hard-surfaced road network does not cover the entire territory of the region; in some areas, it is possible to get only by the “winter road”. Ferries are often used as river crossings, so in the off-season, during lereach or ice drift, it is not always possible to cross, which makes many areas remote from the main routes challenging to access. The Arkhangelsk-Vologda railway, which crosses the region in the western part from north to south, has branches from Obozerskaya station to the west, to Belomorsk (Karelia), from the Konosha station in the south of the region, a branch runs east to Vorkuta (Komi Republic), and from Kotlas station — south to Kirov. Another railway line connects Arkhangelsk with the regional center of Karpogory. There is a project according to which this road should extend from the Karpogory station to the Vendinga station, which will provide access through the Komi Republic to the Urals (the Belko-Mur project). Most of the region is not covered by railways.

[1] Ofitsial'nyy turistskiy portal Arhangel'skoy oblasti [Official tourist portal of the Arkhangelsk Oblast]. URL: www.pomorland.travel.ru (accessed 30 April 2018).

The federal highway M8 crosses the region from north to south in the center and connects it with the Vologda region. Roads of regional and local significance depart from it, but not all of them are paved. The length of the M8 highway within the region is 535 km, and the range of local roads with improved coverage is 1,642 km. The territories adjacent to these roads are the most accessible. If we consider the gravity zones of all the roads listed above as territories that are 10 km away on both sides, then the most available ones include only 22% of the region's area. Most of the region's road network does not have improved coverage (4,540 km), and 49% of its mainland is difficult for tourists [3, Potapov I.A., p. 80].

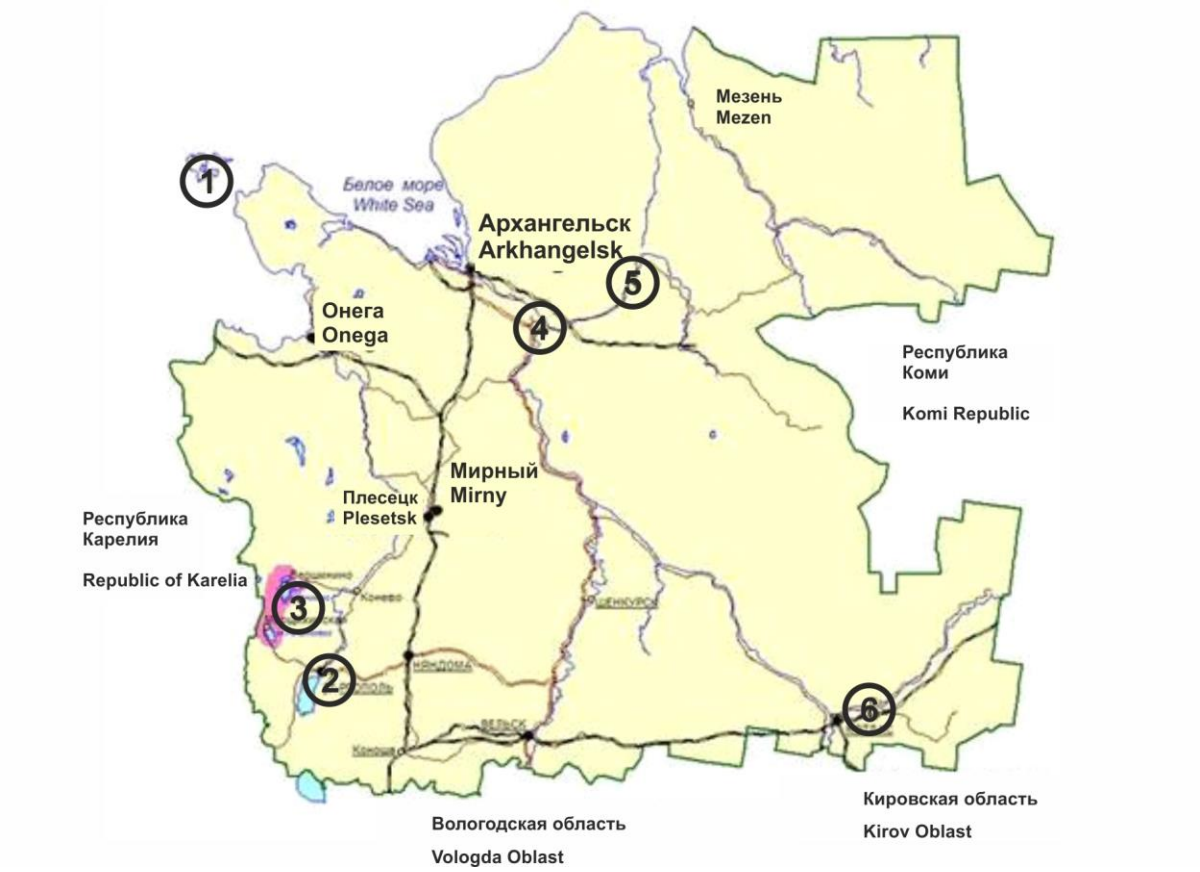


Fig.1. Objects of tourist interest and transport network of the Arkhangelsk Oblast [2].

There are operating airports in Arkhangelsk (Talagi International Airport, and Vaskovo Airport serving local airlines), in Kotlas (accepts only flights from Arkhangelsk and Syktyvkar), as well as in remote places (Sovetsky Islands, Leshukonskoe, and Mezen).

Tourists, to get to the territory of the region, can take a train (regular connections with Moscow, St. Petersburg, Murmansk, Syktyvkar, Minsk, Adler), and an airplane (regular flights with Moscow, St. Petersburg, Murmansk, Naryan-Mar, Petrozavodsk, and Syktyvkar) or motor transport port on the federal highway M8.

All the key tourist destinations of the Arkhangelsk Oblast considered in our work are located away from the main transport routes. Solvychegodsk is located closest to the railway and the

[2] 1 — Solovetsky Islands, 2 — Kargopol, 3 — Kenozersky National Park, 4 — the village of Lomonosovo, 5 — Pinega caves, 6 — Solvychegodsk.

airport (17 km from the Kotlas station and airport). Still, it is separated from them by the Vychegda River, on which there is no bridge, which makes it difficult for the city to reach tourists (Fig. 1).

The geographical position of the M.V. Lomonosov's homeland could be the most advantageous of all the objects under consideration since it is 11 km from the M8 federal highway. However, the island position of the village, where the scientist's memorial museum, is located makes it difficult for tourists to reach. Tourists usually visit the village of Kholmogory, located 8 km from the M8 highway and 60 km straight from Arkhangelsk, and then cross the river channel on a ferry to Kurostrov, where the village of Lomonosovo is located. But in the offseason, it is problematic. In winter, there is an ice crossing.

Kargopol is 78 km from the nearest railway station of Nyandoma. They are connected by a regional highway, which then goes to the territory of Karelia.

The Solovetsky Islands, located in the White Sea, 240 km north-west of Arkhangelsk, are removed from the main transport routes, which makes their accessibility difficult, depending on the season of the year and weather. The Karelian town of Kem has a railway station and port and is the transport and distribution hub closest to the islands, through which the most of tourists arrive.

Kenozersky National Park is in the western part of the Arkhangelsk Oblast, 300 km southwest of Arkhangelsk. However, the difficulty of its accessibility is associated with a considerable distance from the main roads (120 km straight to the nearest railway station Plesetskaya). Kargopol and Kenozersky National Park are the most remote from the airports.

Pinezhsky karst caves (some of them are on the territory of the reserve and are unaccessible for tourists) are located 100 km east of Arkhangelsk and relate to it by a single road that mostly lacks a hard surface. The Arkhangelsk-Karpogory railway line is 85 km from the caves.

Studies on the transport and geographical location of recreational facilities of the Arkhangelsk Oblast were carried out by I.A. Potapov [4, 5, 6]. His methodology is based on a score of time and economic distances between recreational facilities and places of tourist flows formation. Factors affecting the transport accessibility of recreational facilities were used as criteria for the assessment. It is, first of all, the fare, travel time, the number of modes of transport, as well as the waiting time for their docking in the transport scheme, the regularity and seasonality of traffic, and the type of road coverage. Large cities (Moscow, St. Petersburg, and Arkhangelsk) were considered as places for the tourist flows formation. When delivering tourists, regular transport routes were considered. They would help tourists to achieve their destinations quickly and cost-effectively. All factors contributing to or obstructing the movement of tourists were rated in points. In this case, the score is higher, the stronger it impedes the achievement of tourist goals. The lower the total score, the more advantageous is the transport-geographical position of the object (Table 1) [6, Potapov I.A.].

We supplemented this methodology by studying the transport connectivity of the considered recreational facilities, which is vital for developing tourist logistics schemes and further plan-

ning routes in the region. To do so, we studied the transport map of the Arkhangelsk Oblast and determined the position of recreational facilities relative to roads and concerning each other. Objects that have a favorable transport and geographical location relative to each other, we recommended for inclusion in combined routes.

*Table 1*

*Assessment of the transport-geographical position profitability of the main destinations in the Arkhangelsk Oblast regarding the places of tourist flows formation when using various transport schemes*

| Town/city | Score | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Destination | | | | | | | | | | | | | | | |
| | Transport scheme number | | | | | | | | | | | | | | | |
| | Kargopol | | | Solvychegodsk | | Kenozer'e | | Lomonosovo | | | Pinega caves | | | Solovki | | |
| | 1 [3] | 2 | 9 | 2 | 7 | 1 | 2 | 7 | 8 | 10 | 2 | 7 | 9 | 3 | 4 | 6 |
| Arkhangelsk | - | 7 | 11 | 13 | 10 | - | 11 | - | - | 4 | - | - | 5 | - | 9 | 22 |
| Saint Petersburg | 11 | 16 | - | 15 | - | 15 | 19 | 9 | 22 | - | 22 | 9 | - | - | 12 | 16 |
| Moscow | 13 | 11 | - | 12 | - | 17 | 18 | 10 | 17 | - | 18 | 9 | - | 24 | 13 | 22 |

## *Results and their discussion*

As follows from the table, one mode of transport can be used only from Arkhangelsk and only to three of the considered recreational facilities (Kargopol and Pinega caves — by regular bus, and to Solovki — by plane). Moreover, the score for assessing the position of Kargopol relative to Arkhangelsk when using a bus is worse than when using the "train — bus" transport scheme because of the small frequency of flights. For the delivery of tourists from Arkhangelsk to Kargopol, it is more profitable to use the "train — bus" scheme (transit via the Nyandoma station), to Solvychegodsk — "airplane — bus" (transit via Kotlas), to Lomonosovo — "bus — ferry", to Pinega caves — a bus, to Solovki — a plane. All these destinations are more advantageously located relative to Arkhangelsk than to Moscow and St. Petersburg [4].

The position of the destinations relative to Moscow and St. Petersburg is about the same; for each of these centers of tourist flow formation, there are the most advantageous schemes. Thus, the position of Kargopol compare to Moscow is most beneficial when using the train-bus scheme (transit via Nyandoma station). However, the scheme "airplane — train — bus" (transit via Arkhangelsk airport and Nyandoma station) differ slightly in the assessment. From St. Petersburg, the most advantageous is the use of the "airplane – train – bus" scheme. The scheme has advantages over the train-bus scheme since the train from St. Petersburg runs less frequently (once a day in summer, four times a week in winter). Solvychegodsk is accessible from Moscow and St. Petersburg using the "train — bus" scheme (transit via Kotlas station), it is possible to use the "airplane — plane — bus" scheme (transit via the airports of Arkhangelsk or Syktyvkar and Kotlas). Still, the rarity of flights and the price of tickets reduce its profitability.

[3] The number of the transport scheme with a certain combination of modes of transport: 1 — plane — train — bus; 2- train — bus; 3 — train — plane; 4 — plane — plane; 5 — train — plane; 6 — train — ship; 7 — plane — bus; 8 — train — bus — ferry; 9 — bus; 10 — bus — ferry.

[4] Atlas avtomobil'nykh dorog Rossii. Arhangel'skaya oblast' [Atlas of highways of Russia]. Saint Petersburg, Karta, Roskartografiya, 2008. [In Russian]

The position of the Kenozero National Park relative to Moscow and St. Petersburg is awkward due to its remoteness from the main transport routes. At the same time, it is somewhat more advantageous to use the "airplane — train — bus" scheme with transit via Arkhangelsk airport and Plesetskaya station. Lomonosovo, like Pinega caves, is accessible for tourists only with transit via Arkhangelsk. At the same time, the most advantageous is the use of an "airplane – bus" scheme (compare to Lomonosovo, you still need a ferry). Caves are most accessible from Moscow and St. Petersburg when tourists use the "plane-plane" scheme with transit via Arkhangelsk.

But for tourists from St. Petersburg, it is also beneficial to use the "train — motor ship" route with transit through Kem. Of the three centers under consideration for the formation of tourist flows, it is for tourists from St. Petersburg that this scheme is most acceptable.

Of great importance in strategic planning are the fame and status ("recognition") of destinations. It gives recreational facilities advantages that contribute to the sustained interest of tourists in them. Therefore, such destinations should be in priority development.

In the Arkhangelsk Oblast, the Transfiguration Monastery on the Solovetsky Islands, which is included in the UNESCO World Heritage List, is the most "status", and therefore the most famous and visited tourist destination in the Oblast. In the historical town of Kargopol, founded in 1146, and its district, there are 28 monuments of urban planning and architecture of federal and 150 regional significance. It is also a popular destination for tourists in the area. Kenozero National Park is included in the UNESCO global network of biosphere reserves; this is a unique surviving example of the North European cultural landscape [7, Heldt Cassel S.; 8, Pashkevich A., p. 120].

Solvychegodsk is a historic town, founded in 1492, with monuments of architecture and urban planning (4 objects of federal and 33 of regional significance). But this destination has a significant additional advantage. Solvychegodsk is a balneological resort with unique mineral waters of the Matsesta type and mud. An adult and a children's sanatorium work in the town [9, Potapov I.A., p. 103].

These destinations attract tourists who stay for more than two days. These places can exist and develop as independent destinations and as part of prefabricated tourist routes. However, the distance from the main transport routes reduces their accessibility. Therefore, when working out a concept for tourism development in the Arkhangelsk Oblast, this problem should be considered as the major.

Among the places of tourist interest of the Arkhangelsk Oblast, as shown in the Table 1, Kargopol has the most favorable transport and geographical position concerning the areas of tourist flow formation. It should be considered when developing the concept for tourism development in the region since the attention of the regional administration to solving transport and infrastructure problems contributes to the investment attractiveness of the place and increase the tourist flow.

Kenozersky National Park can only be reached by bus from the railway (from Plesetskaya station, a 150 km terrible road). The advantage of the proximity of the park to Kargopo should be

used to attract tourists. Kargopolskiy sector of the park is located 50 km from the town on a regional asphalt road, which then goes to Karelia. The central part of the park and the largest lake, Kenozero lace, are in its Plesetsk sector. The way from the center of the park, the village of Vershinino, to Kargopol is 130 km. However, 50 of them (between the villages of Shiryaiha and Samkovo) are not covered. So, the use of the road is currently problematic. The combination of Kargopol and Kenozersky National Park in one cluster could make these destinations more attractive, expand the possibilities for developing tours, and increase the time tourists spend there. Kargopol can become the "gateway to the Kenozersky National Park", which is facilitated by the presence of a regional highway connecting it with Karelia. So, the town can become a transportation and distribution hub for a vast territory with attractive display facilities.

The Solovetsky Islands are accessible to tourists only in transit via Arkhangelsk or Kem. At the same time, the most budgetary route passes through Karelia; therefore it is advisable to make joint tours to Solovki with a visit to the destinations of Karelia during the navigation period on the White Sea. With the closure of navigation, islands become accessible only by air from Arkhangelsk. Consequently, winter programs begin in Arkhangelsk, which we need to use, combining them with a visit to the Arkhangelsk area.

Due to its isolated geographical location and limited attractiveness, the village of Lomonosovo cannot currently exist as an independent destination. In Lomonosov's homeland, the points of tourist interest can only be the memorial museum of the scientist and the bone carving of the local population. But these attractions will take tourists only a few hours. The proximity of Arkhangelsk allows organizing time-limited excursions and traveling on a sightseeing bus linked to the ferry timetable. Individual trips by regular bus, for this reason, are complicated. Attention should be paid to tourists traveling by personal transport. The proximity of the federal highway dictates the need to create conditions for cars in the village of Lomonosovo, which can increase the flow of individual tourists, not connected with tour operators and the schedule of organized excursions. But the flow of any tourists to the island is limited by the time of freezing.

There are two hotel complexes near the Pinega caves. Still, the set of elementary recreational activities there is limited to visiting the caves, the buffer zone of the Pinezhsky Reserve, and active recreation (a ski slope on Krasnaya Gorka). The availability of this destination is limited to the only road that connects it with Arkhangelsk and the village of Pinega. The caves are located 117 km from the village of Lomonosovo, and there is a ferry crossing between the right bank of the Northern Dvina and Kurostrov. Therefore, you can connect these destinations in one route, which, first, can be designed for caravans. It is 85 km from the caves to the nearest Palen'ga railway station. However, this railway is dead-end and currently does not matter for the delivery of tourists, but after the Belkomur project will be completed and its connection to the Komi Republic, it will be possible to invite tourists from this area.

## Conclusion

Thus, the strategy for the recreational development of the Arkhangelsk Oblast should include measures aimed at improving the transport and geographical position of the main destinations, esp. those with high status. It is necessary to improve transport infrastructure and select priority logistics schemes for delivering tourists.

Among all the destinations considered in the study, the most advantageous transport and geographical location has Kargopol. Kenozersky National Park, on the contrary, occupies the least favorable transport and geographical position compare to the mentioned centers due to the most significant distance from the main transport routes. But the proximity of the park to Kargopol and the connectedness of these destinations by road make it possible to combine these tourist destinations into a single cluster. Thus, when planning tourism development in Kargopol, it should be considered as an attractive investment destination that promises to pay off the fastest with the least investment. It is facilitated by the most advantageous transport and geographical location. And the inclusion of a visit to the Kenozersky National Park in the program of stay in Kargopol will make this destination attractive for more categories of tourists. But without reconstruction of the road connecting the town and the park, the development of the direction is impossible.

The Solovetsky Islands have a difficult transport and geographical position, but its heritage has the highest status, recognition, and popularity among tourists. It is necessary to consider the seasonality of navigation on the White Sea to improve the logistics of tourist delivery to the islands. Therefore, in the summer, during navigation, for trips to Solovki, it is cheaper to use transit via the Karelian port of Kem according to the “train — motor ship” scheme. This route is especially beneficial for tourists traveling from St. Petersburg. One must use this advantage to organize budget tours to Solovki. When navigation is closed, only air traffic is possible. The plane is from Arkhangelsk, but not every day, which is an obstacle to organizing tours. Therefore, winter trips to the Solovetsky Islands entail high costs for tourists. One might reduce them when organizing charter flights. Programs of the visit should be attractive enough for different categories of tourists; otherwise, winter tourism on Solovki will be unprofitable. The proximity to Karelia and the best transport connection with it during the navigation period contribute to the creation of combined tours with a visit and its sights.

Solvychegodsk is a town with significant recreational potential, which is currently poorly used due to the absence of a bridge over the river and difficulty when reaching the airport and railway station (only a pontoon ferry available). Currently, tourism in the town is developing only at the expense of visitors to the sanatorium. Solving the river crossing issue would make this destination more accessible for both tourist groups and individual tourists. There is a project for a bridge over Vychegda, but it remains frozen for a long time. Another advantage of Solvychegodsk is its transport connection with Veliky Ustyug, “the birthplace of Father Frost”, one of the most popular tourist destinations located in the neighboring Vologda Oblast. It makes it possible to develop interesting combined routes there.

Pinega caves are currently available for tourists only in transit via Arkhangelsk. The transport-geographical situation will improve after the completion of the railway construction from the Karpogory station to the Vendinga station in the Komi Republic (Belkomur project) when there will be a transport connection with the Ural region. In this case, there will be new centers for the formation of tourist flows. The Palenga station closest to the caves will become a transportation and distribution center. But to attract tourists, it is necessary to increase the attractiveness of this tourist destination.

Among the destinations considered, M.V. Lomonosov's homeland is the closest to the main federal highway M8. Still, the island location of the village reduces the advantage of its transport and geographical location. Currently, the use of this destination as an independent one is not advisable, but its inclusion into combined routes looks promising. It is possible to develop a route connecting the village of Lomonosovo and Pinega caves, as there is a transport connection between these tourist destinations (a ferry from Kurostrov, a road from the village of Srednepogostskaya). It is especially true for car tourists. Therefore, when planning tourism development in the region, it is necessary to consider the possibilities for individual car tourists, esp. for places difficult to get on regular means of transport. It is required to create motels, campsites, and organize regular ferry crossings across rivers, improve the road surface.

The quality of roads in the Oblast is a serious obstacle to the development of tourism. If we eliminate the factors that impede the transport accessibility of destinations, then their transport and geographical position will improve. In addition to the repair and construction of roads, it is necessary to increase the regularity of transportation, synchronize and make connections to different types of transport more convenient for tourists.

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