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Logistics Capabilities of the Russian Arctic Regions for the Development of Automobile Tourism

Aleksandr Yu. Tsvetkov [1]✉, Cand. Sci. (Econ.), Associate Professor
Konstantin Yu. Timoshenko [2], PhD, Associate Professor

[1] Higher School of Economics, Management and Law, Northern (Arctic) Federal University named after M.V. Lomonosov, Naberezhnaya Severnoy Dviny, 17, Arkhangelsk, Russia
[2] Department of Business, Marketing and Law, USN School of Business, University of South-Eastern Norway, Hønefoss, Norway
[1] a.cvetkov@narfu.ru ✉, ORCID: https://orcid.org/0000-0003-1092-1295
[2] konstantin.timochenko@usn.no, ORCID: https://orcid.org/0000-0001-5368-6980

Abstract. The development of automobile tourism in Russia has reached a new stage due to the concept approved by the Government of the Russian Federation. The relevance of this type of tourism is associated with the increased demand of Russians for travel within the country and the difficulties in providing of transportation for the increased tourist flows. The stimulus to its development is the increase in motorization of citizens and the great recreational potential of Russia. For the Arctic Zone of the Russian Federation, auto tourism is one of the ways to develop the territory. In our work, based on the analysis of reviews of auto tourists in the Internet, we studied the demand for the regions of the Russian Arctic, the directions of the main car routes, the impressions gained from travelling on the Arctic roads. It turned out that the most popular regions among Russian auto tourists are the western sector of the Russian Arctic — Murmansk Oblast and the Republic of Karelia. Most trips are made in warm season. Tourists note the poor quality of the surface on some sections of the roads and the lack of roadside service facilities. Based on the materials of the highway departments, the Ministry of Transport and road maps, we studied the accessibility of the Arctic regions of Russia for auto tourists, their suitability for the development of tourist routes. As a result, we divided the Arctic regions into four groups: the most accessible, accessible, conditionally accessible and difficult to access. For each group, we proposed the types of auto tourism that can be developed there. Currently, development of auto tourism in the first two groups is the most promising.
Keywords: *automobile tourism, Concept, Arctic, highways, transport accessibility*

Introduction

On April 25, 2024, the Government of the Russian Federation approved the Concept for the Development of Automobile Tourism in the Russian Federation until 2035 (hereinafter referred to as the Concept) [1]. The first stage of the Concept's implementation (2024–2025) envisages the elaboration of a program for the development of automobile tourism in Russia until 2035. The second stage (2025–2035) will involve the implementation of the planned activities. The develop-

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[1] Order of the Government of the Russian Federation of 25 April 2024 No. 1025-r "On approval of the Concept for the Development of Automobile Tourism in the Russian Federation until 2035". URL: https://www.garant.ru/products/ipo/prime/doc/408865491/ (accessed 30 September 2024).

ment of automobile tourism in Russia is a consequence of the increased demand in the domestic tourism market due to the current restrictions on outbound tourism. This has increased the load on passenger transport and demonstrated its limited carrying capacity. The incentive for the development of automobile tourism has become the increasing motorization of the Russian population. The Concept draws attention to the difficulties that limit the development of automobile tourism in the Arctic zone of the Russian Federation. First of all, they are related to the problems of road logistics in many Arctic regions. Automobile tourism is one of the ways to develop Arctic tourism due to the lack of regular passenger flights in many of its regions. It is a relatively low-cost way of tourist development of territories. In addition, it allows developing infrastructure that can serve not only tourists, but also local residents. In order to elaborate a general program for the development of automobile tourism in Russia, it is necessary to draw up recommendations on the selection of Arctic territories where it is possible to create the most accessible routes with minimal economic costs. The purpose of this work is to analyze the logistical capabilities of the regions of the Arctic zone of the Russian Federation for laying sustainable routes for automobile tourism.

Materials and methods

The emergence of automobile tourism in the world coincides with the appearance of personal cars. Interest in this type of recreation has not disappeared since then, as the traveler is not limited in space, is mobile, and has the opportunity to choose a travel route in accordance with desires, financial possibilities and current traffic situation [1, Martyshenko N.S., Loksha A.V.].

There are different definitions of the concept of automobile tourism. They all agree that this is a type of travel in which the main means of transportation for tourists is a personal car [2]. The purposes of travel are cultural, educational and sports, the direction of the route should be to countries and localities other than the tourist's place of residence [1; 2, Valkova T.M., Shabalin A.D., Shabalina N.V.]. Automobile tourism is divided into several types: vacation trips with camping in a specially designated place (usually on the sea coast); trips with educational purposes, during which tourists are constantly on the route, staying at campsites or local hotels. If tourists use a motorhome or a caravan for ease of travel, this type of tourism is called "caravanning". Traveling by jeep-class cars or all-terrain vehicles off-road is called "jeeping" or "off-roading". In this case, either a personal car or transport provided by a travel agency organizing the trip can be used. A common type of auto tourism is a car rally, although it is distinguished by the fact that it is usually organized by sponsors for specific purposes (promotion, sports, testing). Several cars take part in them [1; 2].

The development of auto tourism attracted the attention of scientists, representatives of the tourism business and government bodies even before the adoption of the Concept by the Government of the Russian Federation. According to the Federal Target Program "Development of

[2] Buranov I. Tomorrow of an Auto Traveler. URL: https://www.kommersant.ru/doc/6428069 (accessed 23 September 2024).

Domestic and Inbound Tourism in the Russian Federation for 2011–2018", budget funding was received, among other things, for the development of auto tourism clusters [2]. According to surveys, every fourth adult resident of Russia makes one car trip per year [2]. Based on the All-Russian Public Opinion Research Center (VCIOM) surveys conducted in 2023, 39% of Russians have gone on vacation by car over the past 5 years, 67% of surveyed auto tourists prefer outdoor recreation, and 62% — visit attractions [3]. Earlier works cited the expansion of the inbound tourism market, Russia's great recreational potential, the interest of foreign tourists, the creation of cross-border automobile routes, and the growth of motorization of Russians as incentives for the development of automobile tourism [1]. From 2000 to 2018, the number of cars among the population of Russia increased by 2.3 times, among residents of the Arctic regions — by 2.5 times [3, Serova N.A., Serova V.A.]. In articles published later, in addition to the growth of motorization of Russians, the increase in demand for trips within the country due to the difficulties for outbound tourism that have arisen for political reasons was cited as factor actualizing automobile tourism in Russia. At the same time, the growth of automobile tourism by 25-30% per year is noted, which, provided that the appropriate tourist infrastructure is created, can turn automobile tourism into one of the most popular and accessible types of tourism. In this case, this type of tourism becomes a factor affecting the growth of profitability of territories, their investment attractiveness, makes the Russian tourist product more competitive [2].

The main frameworks for the development of automobile tourism infrastructure are federal highways, especially those that go to the territories of neighboring states [2, p. 61]. According to the level of development of transport infrastructure, the Arctic zone of the Russian Federation can be divided into two sectors: the western sector with fairly developed road networks, having a year-round land connection with the rest of the country, and the eastern sector with autonomous transport systems concentrated in the most developed areas, not connected to each other, having no year-round land connection with other areas of the country [3]. Federal highways in the Russian Arctic pass through the territories of the Murmansk and Arkhangelsk oblasts, Karelia and the Yamalo-Nenets Autonomous Okrug. In other Arctic regions, there are only regional and local roads, with federal highways ending in the more southern parts of these subjects. The Arctic regions of the north of Krasnoyarsk Krai, the Sakha Republic (Yakutia) and the Chukotka Autonomous Okrug are connected with the rest of Russia only by temporary winter roads. The length of public roads in the Arctic regions of Russia is 112.2 thousand km, in the entirely Arctic regions their length is 8.5 thousand km. Including the length of roads with hard surfaces is 67.3% and 79.5%, respectively [3; 4, Mitryukova K.A.]. The quality of roads varies: in the Arkhangelsk Oblast and the Nenets Autonomous Okrug, 80% of regional roads and 90% of local roads do not meet the standards [3]. According to the results of the VCIOM survey in 2023, 81% of drivers note the low

[3] Autotourism in Russia: opportunities and challenges. URL: https://wciom.ru/analytical-reviews/analiticheskii-obzor/avtoturizm-v-rossii-vozmozhnosti-i-problemy (accessed 23 September 2024).

quality of the road surface, and 26% are not satisfied with the quality of roadside service [4]. According to A.Yu. Kudrevich, in the Murmansk Oblast, on the roads leading to the most popular tourist sites in the village of Teriberka, the urban-type settlement of Umba, there is no high-quality road surface, and there are not enough gas stations. At the same time, the tourist flow to the village of Teriberka in 2023 increased by 51% compared to 2022 [5].

The development of automobile tourism is limited by the underdeveloped infrastructure of road service facilities, poor quality of roads, lack of information on the availability of campsites in the locations of objects of tourist interest [6, Valkova T.M., Kruzhalin V.I., Shabalina N.V.]. Roadside infrastructure includes gas stations, catering, trade, communication, medical care, service stations, hotels, motels. For reasons of economic feasibility, these facilities should be located together as part of multifunctional zones (MFZ) [5]. In addition, there is no legal regulation of automobile tourism outside public roads that would regulate safety requirements, including environmental protection, which is especially relevant for the regions of the Arctic zone [5].

In Russia, there are practically no professionally developed auto-tourism routes [2, p. 64]. The following auto-tourism clusters are developing: “Golden Gate” (Altai Krai), “Zadonshchina” (Lipetsk Oblast), “Kyakhta”, “Tunkinskaya Valley”, “Baikal” (Buryatia), “Samotsvetnoe Ring of the Urals” (Sverdlovsk Oblast), “Belomorskie Petroglyphs” (Karelia) [2]. But for the most part, modern automobile tourism in Russia is unorganized; therefore, it does not bring income to the state [1]. The fact that inexperienced developers are engaged in the organization of routes is a problem for the development of tourism in the Russian Arctic [7, Paskevich A., Stjernstrom O.].

There are no organized auto-tourism clusters in the Arctic zone of the Russian Federation, although there is interest in its development. A conference on the development of auto-tourism in the Arctic zone was held in Kargopol on June 15, 2021. The conference resolution states that the Russian Arctic has the potential to increase tourist arrivals, but it is necessary to develop infrastructure for auto-tourists and monitor roadside service facilities. The interregional automobile route “Protected Lands of the Russian North” was presented at the conference [6]. The regional auto route “Protected Lands of the Russian North” is 1,920 km long and runs through the territory of the Arkhangelsk Oblast, including areas that are referred to the Arctic zone of Russia (Velsk — Kargopol — Kenozero National Park — Onega — Arkhangelsk — Golubino — Zeleny Gorodok — Velsk). According to the results of a survey of auto-tourists, this route, developed by the national association of auto-tourism and caravanning, was awarded the status of “people’s route” on February 17, 2020. The association’s experts note that there are no campsites along the route, gas stations are located no more than 330 km away, but Arhautodor brings the highways to a normal

[4] Ibid.
[5] Order of the Government of the Russian Federation of 25 April 2024 No. 1025-r “On approval of the Concept for the Development of Automobile Tourism in the Russian Federation until 2035”. URL: https://www.garant.ru/products/ipo/prime/doc/408865491/ (accessed 30 September 2024).
[6] Resolution of the participants of the conference on autotourism in the Arctic. URL: https://pomorland.travel/upload/iblock/a18/22ilpxawm2u2ibsstd0bzfxqsh7qjo42.pdf (accessed 14 September 2024).

condition. Restrictions exist for cars and motorhomes during the thaw season for a month on sections of the Savinskiy–Onega and Belogorskiy–Golubino roads. During the period of ice formation and ice drift, ferry crossings are closed for 5–10 days [7].

In order to achieve our goal, we have studied the demand for the Russian Arctic regions among car tourists. For this purpose, we conducted a content analysis of reviews left by car travelers on the Vinskiy forum (random selection) [8]. We analyzed 195 reviews related to car trips to all regions of Russia. Not all travelers leave reviews. But the amount of content that is available on different sites on the Internet can be considered proportional to the number of travelers visiting a particular region or route. Therefore, to get a general idea of the state of car tourism, we can rely on the analysis of these reviews. Territories not mentioned in the reviews are visited by car tourists occasionally. In the analysis, we paid attention to the route direction, mode of travel, season, visited tourist sites and reviews of the state of the roads. Information about motorways, their status and condition in different subjects that are fully or partially included in the Arctic zone was obtained from reference materials published on the official websites of the motorway administrations and the Ministry of Transport of the Russian Federation, as well as from articles, press releases, reviews of drivers and travelers who have visited them. Analysis of motorway maps was of great importance for understanding the information. Generalization of the collected material allowed us to classify subjects of the Arctic zone of the Russian Federation by their accessibility for automobile tourists and readiness to develop tourist routes for them. The main criterion of accessibility is the status of roads by which automobile tourists can arrive in a given region. The most accessible regions are crossed by federal highways with access to the state border; most regional roads are open year-round. Accessible regions can be reached by federal highways, but the condition of regional roads implies temporary travel restrictions in the off-season. Conditionally accessible regions can be reached by regional highways; the nearest federal motorways to which they are connected are outside their borders. Regional roads there are characterized by seasonal restrictions, lack of bridges and asphalt pavement in some areas. Hard-to-reach regions can be reached by land only by winter roads during the cold season.

Results and discussion

Content analysis of reviews of auto travelers' routes showed that 11% of them are fully or partially referred to the Russian Arctic zone. At the same time, all the trips described in them took place in the western sector of the Arctic. It is characterized by the highest indicators of the share of transport in the gross regional product (more than 10%) [3]. In addition, 45% of auto tourists in Russia live in the Northwestern Federal District, which includes the territories of the western sec-

[7] Regional auto route "Protected Lands of the Russian North". URL: https://automototravel.com/dzhip-tury/regionalnyy-avtomarshrut-zapovednye-zemli-russkogo-severa/ (accessed 01 October 2024).
[8] Vinskiy Forum. Independent Travel. URL: https://forum.awd.ru/viewforum.php?f=1399 (accessed 04 October 2024).

tor of the Russian Arctic [9]. We identified the starting points of the routes and points in the Arctic regions visited by tourists. We found that the main season for car trips to the Arctic is summer, since in spring and autumn the problem of poor road quality limits the possibilities of free movement in the Arctic territories. The exceptions are territories where motor transport can only travel along the winter road. As the main means of transportation, travelers use a personal car of various classes. Only one review described travelling on a swamp buggy across the Bolshezemelskaya tundra in the Nenets Autonomous Okrug (however, the tourist got to the swamp buggy's departure point by car). In cases of travelling to the islands (the Solovetsky Islands were most often mentioned in the reviews), in addition to the car, people used motor ships. Most tourists travelled by car to Kem, Rabocheostrovsk, parked there and transferred to motor ships; only in one case they flew by plane from Arkhangelsk. The Solovetsky Islands were most often named in the reviews as the main destinations of the route (settlements or tourist sites). An option for a car trip is the case when tourists arrived in Arkhangelsk by plane, and then travelled in a rented car around the Arkhangelsk Oblast.

Popular destinations for travelers were Murmansk, the village of Teriberka, the Khibiny Mountains, the Lovozero Tundra, Seidozero, the Rybachiy Peninsula, the Terskiy Coast (Murmansk Oblast), the city of Onega, Kiy Island, Arkhangelsk, settlements on the Pinega and Mezen Rivers (Pinega, Karpogory, Verkola, Mezen, Kimzha, Leshukonskoe), the Pinega Caves and occasionally other objects in the territories classified as Arctic (Table 1).

Table 1

Main routes for auto tourists visiting Russian Arctic regions [10]

Departure	Percentage of total number of departures, %	Direction (from all departure points)	Percentage of total number of directions, %	Month of visit (all destinations)	Frequency of trips from the total number, month, %
Moscow	50	Karelia and the Solovetsky Islands	40.9	January	9
Saint Petersburg	36	Arkhangelsk Oblast	27.3	May	5
other cities	14	Murmansk Oblast	27.3	June	18
		Komi Republic and NAO	4.5	July	18
				August	50

Table 1 shows that most car trips start in Moscow and St. Petersburg; the northern regions of Karelia, which are part of the Arctic zone, are the most visited by car tourists. At the same time, some routes pass through them in transit, tourists visit the Solovetsky Islands, then some of them continue their journey northwards to the Murmansk Oblast. Tourists with Schengen visas continued their route from the Murmansk Oblast to Norway, to the North Cape. In the Arkhangelsk Oblast, car tourists mainly go to Arkhangelsk, visiting tourist sites along the way, which are located

[9] Autotourism in Russia: opportunities and challenges. URL: https://wciom.ru/analytical-reviews/analiticheskii-obzor/avtoturizm-v-rossii-vozmozhnosti-i-problemy (accessed 23 September 2024).
[10] Vinskiy Forum. Independent Travel. URL: https://forum.awd.ru/viewforum.php?f=1399 (accessed 04 October 2024).

both in the Arctic territories and outside them (Onega, Kiy Island, Malye Korely, Severodvinsk, Velsk, Kargopol, Kenozero National Park, Kholmogory, etc.). The Pinezhskiy, Leshukonskiy and Mezenskiy districts located away from the federal highway are of interest, however, due to complex logistics, these destinations are not popular. The Komi Republic and the Nenets Autonomous Okrug are mentioned in the reviews once. An analysis of travel dates showed that most of them were made in 2012 (18% of reviews). From 2014 to 2019, the number of reviews did not change (9% per year). Then, a decrease in the number of reviews to 4.5% per year is noted (this may also be due to the emergence of other forums where travelers leave reviews).

In order to determine the accessibility of the regions of the Russian Arctic for auto tourists, we studied the connectivity of these territories with the country's unified road network. We paid attention to the presence of federal highways within these regions as the main routes for tourists (Table 2).

Table 2

Availability of motorways in the Russian Arctic regions [11, 12, 13, 14, 15, 16, 17, 18]

Region	Motorway	Administrative-territorial unit	Motorway features
Murmansk Oblast	R-21 federal motorway "Kola"	districts: Kandalaksha, Kola, Pechenga cities with subordinate territories: Polyarnye Zori, Apatity, Kirovsk	runs from south to north in the central-western part of the region and west to the borders with Norway (Borysoglebsk BCP) and Finland (Lotta BCP).
	47A-001 Kandalaksha — Salma BCP (border with Finland), 47K-010 Kandalaksha — Umba, 47K-021 Pirenga — Kovdor, 47K-037 Kirovsk — Umba, 47K-043 Olenegorsk — Lovozero, 47K-050 Kola — Serebryanskie HPPs (with access to Teriberka village)	districts: Kandalaksha, Tersk, Kovdorskiy, Olenegorskiy, Kola city with subordinate territories: Kirovsk	roads are connected to the federal motorway "Kola" and branch off to the west and east of it
Karelia Republic	R-21 federal	districts: Segezhskiy,	runs from south to

[11] Murmanskavtodor. URL: https://www.madroad.ru/index.php/press-centr/shema-avtodorog (accessed 14 October 2024).
[12] Upravtodor. URL: https://www.upravtodor-rk.ru/ (accessed 14 October 2024).
[13] Road agency "Arkhangelskavtodor". URL: https://ador.ru/roads.shtml (accessed 14 October 2024).
[14] State budgetary institution of the Komi Republic "Road Administration of the Komi Republic". URL: https://dor.rkomi.ru/ (accessed 14 October 2024).
[15] Public roads of regional importance in the Yamalo-Nenets Autonomous Okrug. URL: https://map.yanao.ru/eks/transport_map (accessed 14 October 2024)
[16] Regional State Budgetary Institution "Road Administration for Krasnoyarsk Krai". URL: https://krudor.ru/about/roads-list/ (accessed 14 October 2024).
[17] URL: https://gnkk.ru/news/tysyachi-kilometrov-zimnikh-dorog-prolo/ (accessed 14 October 2024).
[18] System of control over the formation and use of road funds. URL: https://скдф.рф/roads (accessed 14 October 2024).

	motorway “Kola”	Belomorskiy, Kemskiy, Louhskiy	north in the eastern part of the republic
	A-135 Kem — Kostomuksha — Lyuttya BCP (border with Finland), A-137 Belomorsk — Kostomuksha — border with Finland, 86K-127 Loukhi — Päozero — border with Finland	districts: Segezhskiy, Belomorskiy, Kemskiy, Louhskiy, Kostomuksha urban district	roads branch off the federal motorway “Kola” from east to west
Arkhangelsk Oblast	M-8 federal motorway “Kholmogory”	Primorskiy district	runs from south to north, has access to Severodvinsk
	11A-005 Arkhangelsk — Onega	districts: Primorskiy, Onega	connects to the M-8 motorway
	11A-004 Arkhangelsk — Pinega — Mezen, 11K-571 Savinskiy — Onega, 11K-461 Karpogory — Leshukonskoe, 11K-462 Leshukonskoe — Mezen, 11K-611 Pinega — Pirinem, Karpogory — Nyukhcha — Komi border	districts: Primorskiy, Pinezhskiy, Mezenskiy, Onega, Leshukonskiy	with hard surface (without asphalt), without bridges, with ferry crossings, covering part of the territories of the districts
Komi Republic	R87-001 Syktyvkar — Usinsk, 87R-005 Irayol — Ust-Tsilma	Usinsk urban district, Ust-Tsilemskiy district	connect to the federal motorway R-176 “Vyatka”
	Ukhta — Inta — Vorkuta winter motorway	Inta and Vorkuta urban districts	access to the federal motorway via road R87-001
Nenets AO	R87-001 Usinsk — Naryan-Mar	Zapolyarny district	continuation of the Syktyvkar — Usinsk road, no bridge over the Pechora River near Usinsk
Yamalo-Nenets AO	71P-1 Surgut — Novy Urengoy — Salekhard	districts: Purovskiy, Tazovskiy, Nadymskiy, Priuralskiy	transferred into federal ownership, under construction, has access to the federal motorway R-404 Tyumen — Tobolsk — Surgut
Krasnoyarsk Krai	Yeniseysk — Vorogovo — Bor winter motorway	Turukhanskiy district	with access to federal motorways R-255 and R-257
	Urengoy — Vankor — Igarka winter motorway		from Yamalo-Nenets Autonomous Okrug, departmental winter motorway
	winter motorways: Tura — Ust-Ilimsk, Tura — Severo-Yeniseiskiy, Tura — border with Boguchanskiy district	Tura rural settlement, from which there is a connection via winter roads with other arctic territories of Evenkiya	connected by federal motorways A-331 (in Irkutsk Oblast), R-255, R-257 (in Krasnoyarsk Krai)
Republic of Sakha	winter motorways:	Uluses: Olenyokskiy,	run from south to

(Yakutia)	Anabar (Udachny — Yuryung-Khaya), Yana (Tonoksha — Tiksi), Indigir (Ust-Nera — Russkoe Ustye).	Anabarskiy, Verkhoyanskiy, Ust-Yanskiy, Bulunskiy, Eveno-Bytantayskiy, Momskiy, Abyiskiy, Allaihskiy	north, via regional roads to the federal motorways A-331 “Vilyui” (“Anabar”), R-504 “Kolyma” (“Yana” and “Indigir”).
Chukotka AO	Arktika winter motorway (Burustakh — Cherskiy in Yakutia— Bilibino — Pevek)	Uluses of Yakutia: Momskiy, Verkhnekolymskiy, Srednekolymskiy	access to the federal motorway R-504 in Yakutia

We have analyzed the road network features of the regions included in the Arctic Zone of the Russian Federation and have come to the following conclusions. The most popular areas among car tourists in Karelia and Murmansk Oblast are best connected by roads of relatively good quality with other regions of the country and neighboring states [19, 20]. The fact that these subjects of Russia are consistently located on the same federal highway “Kola” allows combining visits to their tourist sites into one route. A common feature of the roads of Murmansk Oblast and Karelia is the fact that from the federal highway running from south to north, there are roads from east to west in the direction of the state border with Finland and Norway, and there are several border crossings. This expands the possibilities for modeling car routes and allows attracting foreign auto tourists. The problem of Murmansk Oblast is the poor coverage of roads in the central-eastern, north-eastern, southern and south-eastern parts. Not everywhere the roads and road service facilities have proper quality. In the Arkhangelsk Oblast, the federal highway M8 “Kholmogory” ends in the territory of the Primorskiy district, classified as the Arctic zone. Automobile routes, as a rule, go to Arkhangelsk, from which it is possible to get to Severodvinsk, to the White Sea coast, to visit the main sights of the region, which are concentrated in the area of this road (the museum “Malye Korely”, Kurtyaevo, etc.). Arkhangelsk can be used as a departure point for radial trips [8]. The rest of the Arctic regions can be reached only by regional roads that are connected to the M8 highway. However, only small parts of their territories are covered by roads. The most difficult to access are the Mezenskiy, Leshukonskiy and Pinezhskiy districts. They are especially remote from the federal highway, and it is possible to get there only by regional roads, which do not have asphalt pavement and bridges [21]. In this regard, routes should take into account the schedule of ferries across the rivers crossed by the road and the seasonality of their operation. During the thaw, roads may be washed out in some areas, and ferry services may be cancelled. The condition of the 11A-005 “Arkhangelsk — Onega” road, which provides access to the Onega Peninsula, currently depends on the season and weather conditions. Its repair and the project to extend it to the Belomorskiy district of the Republic of Karelia (with the planned transfer of the new road to federal ownership) will open up opportunities for creating interregional automobile routes and will improve the ac-

[19] Murmanskavtodor. URL: https://www.madroad.ru/index.php/press-centr/shema-avtodorog (accessed 14 October 2024).
[20] Upravtodor RK. URL: https://www.upravtodor-rk.ru/ (accessed 14 October 2024).
[21] Road agency "Arkhangelskavtodor". URL: https://ador.ru/roads.shtml (accessed 14 October 2024).

cessibility of the northwestern Arctic part of the Arkhangelsk Oblast. In the Komi Republic, the only federal highway R-176 Vyatka ends in Syktyvkar, significantly south of those areas that are part of the Arctic zone. The regional highway, connected to the federal highway, provides access to the Ust-Tsilemskiy district. The obstacle to year-round automobile communication is the lack of a bridge and the poor condition of the road in areas without asphalt. Despite the existing road P87-001 “Syktyvkar — Usinsk — Naryan-Mar”, the urban district of Usinsk can only be reached via the ferry crossing on the Pechora River, its operation may be interrupted during ice formation and ice drift [22]. The Inta and Vorkuta urban districts included in the Arctic Zone of the Russian Federation can only be reached via the winter road, which operates on average from December to March (depending on the weather). Driving on it is problematic, since the condition of its surface depends on traffic and weather. In addition, it is a departmental road and therefore requires permission from the owner. In summer, cars are transported to these urban districts on railway platforms. The construction of a year-round road to Vorkuta with an exit to Salekhard (Yamalo-Nenets Autonomous Okrug) is planned. The continuation of the road P87-001 “Syktyvkar — Usinsk — Naryan-Mar” leads to the capital of the Nenets Autonomous Okrug. For a long time, a winter road was laid from Usinsk to Naryan-Mar, but recently a year-round road was opened along its route. The road surface is not satisfactory on all sections, and in the area of the village of Ust-Usa, there is no bridge across the Pechora, its construction is planned for 2026. This limits movement from the southern regions of the Komi Republic to the northern ones and to the Nenets Autonomous Okrug. In addition, in order to preserve the road surface, traffic is limited in the off-season in some areas. Within the Okrug, there are motorways for year-round use only in populated areas. Access to the Yamalo-Nenets Autonomous Okrug is currently possible only by one road (71R-1 “Surgut — Novy Urengoy — Nadym — Salekhard”) [23]. However, it is not fully completed, and the condition of its pavement is unsatisfactory for a large part of its length. In addition, the road only partially covers the territory of the Okrug (eastern and northern regions). Many areas can only be reached by winter roads. Surgut (Khanty-Mansiysk Autonomous Okrug) can be reached by federal highway P404 “Tyumen — Tobolsk — Khanty-Mansiysk — Surgut”. It can be assumed that after the repair and completion of the road “Surgut — Salekhard”, there will be new prospects for attracting auto tourists to the Yamalo-Nenets Autonomous Okrug. The Arctic regions of Krasnoyarsk Krai (Taimyr and Turukhanskiy districts, Ilimpiyskiy group of settlements of Evenki district) are difficult to access. They can only be reached by winter roads. They, as a rule, have access to regional roads that connect with federal highways in the south of Krasnoyarsk Krai (P255 “Siberia” and P257 “Yenisei”) [24]. From the Evenki District, one winter road goes to the territory of the neighboring Irkutsk

[22] State budgetary institution of the Komi Republic "Road Administration of the Komi Republic". URL: https://dor.rkomi.ru/ (accessed 14 October 2024).
[23] Public roads of regional importance in the Yamalo-Nenets Autonomous Okrug. URL: https://map.yanao.ru/eks/transport_map (accessed 14 October 2024).
[24] Regional State Budgetary Institution "Road Administration for Krasnoyarsk Krai". URL: https://krudor.ru/about/roads-list/ (accessed 14 October 2024).

Oblast and connects with the federal highway A331 “Vilyuy” [25]. The Turukhanskiy district can be accessed via a departmental winter road from the neighboring Yamalo-Nenets Autonomous Okrug (with a permit from the owner). This should be taken into account when planning possible routes for auto tourists. The Taimyr district is the least accessible for cars, since there are no direct winter roads starting from federal highways. The Sakha Republic (Yakutia) is located far from the beginning of the potential flows of auto tourists, and its uluses, classified as part of the Arctic zone, are accessible only by winter roads. Only 8.7% of the region’s area beyond the Arctic Circle has year-round transport service [9, Kuklina V.V., Osipova M.E., p. 108]. However, all winter roads heading north are connected to federal highways (A331 “Vilyuy” and P504 “Kolyma”). The Chukotka Autonomous Okrug is the least accessible to auto tourists. It can only be reached by land via the “Arktika” winter road from the Sakha Republic (Yakutia), where it starts from the P504 “Kolyma” federal highway. It ends in the western regions of Chukotka (Bilibino, Pevek). Further east, there are other winter roads. Although in the summer there is a summer road in the Okrug, which crosses it from west to east; it is impossible to reach it by land from the mainland at this time. Since 2011, the “Kolyma — Anadyr” road (with a stop in Bilibino and Pevek) has been under construction, which will connect Chukotka with the rest of Russia [26]. All roads in the regions of the Russian Arctic are characterized by the absence of multifunctional zones that should provide roadside services for travelers. The sparse location of settlements, large distances between gas and service stations, the absence of mobile communications in some places, and low temperatures in winter make car travelling in many areas of the Arctic potentially dangerous. Seasonal temperature fluctuations create problems in the operation of Arctic roads and increase the risk of accidents [10, Shojaei Barjouei A., Gudmestad O.T., Barabady J.]. In addition, coastal areas are a border zone, and a pass is required.

Based on the summary of the presented materials, the regions classified as the Arctic zone can be divided into four groups based on their accessibility for auto tourists and their readiness to develop tourist routes.

The most accessible regions include the territories of the Murmansk Oblast and the Arctic regions of the Republic of Karelia. The presence of a through federal highway, a network of roads with access to the state border makes them convenient for Russian and foreign tourists. Here, caravanning, jeeping, auto rallies and other types of auto tourism can be developed. To increase the attractiveness of the regions, it is necessary to monitor the quality of roads, especially to the locations of tourist sites. The creation of multifunctional zones on the highways will make auto travel more comfortable and popular.

Accessible regions include the Arctic regions of the Arkhangelsk Oblast (Primorskiy, Onega). It should be noted that only the territories directly adjacent to the roads are accessible; large are-

[25] URL: https://gnkk.ru/news/tysyachi-kilometrov-zimnikh-dorog-prolo/ (accessed 14 October 2024).
[26] Construction of the Kolyma–Anadyr road in Chukotka continues. URL: https://dorinfo.ru/news/obekty-i-proekty/prodolzhaetsya-stroitelstvo-dorogi-kolyma-anadyr-na-chukotke/ (accessed 14 October 2024).

as of the Arctic territories are inaccessible due to the lack of roads. All types of auto tourism are also possible here. It is necessary to expand the road network and monitor the condition of their surfaces, as well as to create roadside service facilities.

The group of *conditionally accessible* regions includes those that auto tourists can reach on roads that have seasonal restrictions, without bridges over rivers, without asphalt pavement in some areas. They have no direct connection with federal highways. They include some Arctic regions of the Arkhangelsk Oblast (Pinezhskiy, Mezenskiy, Leshukonskiy), Ust-Tsilemskiy district and the urban district of Usinsk in the Komi Republic, Nenets and Yamalo-Nenets Autonomous Okrugs. They are potentially accessible for all types of auto tourism in the summer or in the cold season, when the rivers freeze.

The group of *difficult to access regions* includes the Intinskiy and Vorkuta urban districts of the Komi Republic, the Turukhanskiy and Taimyrskiy (Dolgano-Nenets) districts of the Krasnoyarsk Krai, rural settlements of the Ilimpiyskiy group of the Evenki district of the Krasnoyarsk Krai, the Arctic uluses of the Sakha Republic (Yakutia) (Olenekskiy, Anabarskiy, Verkhoyanskiy, Ust-Yanskiy, Bulunskiy, Eveno-Bytantayskiy, Momskiy, Abyyskiy, Allaikhskiy, Verkhnekolymskiy and Srednekolymskiy), and the Chukotka Autonomous Okrug. The conditions here are extreme for travelers, so only group road trips, motor rallies, and jeep tours can be recommended, where tourists are provided with constant support from the rescue service. The Taimyrskiy (Dolgano-Nenets) district of the Krasnoyarsk Krai and the Chukotka Autonomous Okrug are the least connected with the rest of Russia by winter roads. The nearest federal highways are located several thousand kilometers away from them, there is no direct connection. The harsh climate and the lack of roadside service limit their opportunities for the development of automobile tourism. Mass automobile tourism is impossible here.

Conclusion

Thus, automobile tourism in the Arctic zone of the Russian Federation has the greatest prospects in regions connected by federal highways with the rest of the country, especially if they go to the state border. This expands the potential tourist market. First of all, these include the Murmansk Oblast and the Republic of Karelia. There are prospects for the Arkhangelsk Oblast, the Komi Republic and the Nenets Autonomous Okrug. This is also due to the fact that 45% of auto tourists live in the Northwestern Federal District, which includes the named regions. Auto tourists prefer to travel by private car in the warm season, when the Arctic roads are accessible in the most problematic areas without paved roads or bridge crossings over rivers. Car tourists can also use other types of transport if necessary to get to the start of the route or when visiting interesting places far from the road. Many auto tourists visit the Solovetsky Islands, leaving their cars on the shore and transferring to a boat or plane. It is also possible to travel by rented car at the starting point of the route, having arrived there by plane or train. The northern territories are characterized by the sparse location of roadside service facilities, including gas stations. Multifunctional

service centers, created on the roads in the central and southern parts of European Russia, are not found in the Arctic territories. This makes car tourism in the Arctic less comfortable and attractive. A major obstacle to car travel is the lack of bridges on many roads, especially in the off-season, when river ferry services are canceled. Transport accessibility of the Arctic territories of Russia for auto tourists decreases when moving from west to east. In the Asian part of the Arctic, most regions do not have permanent automobile communication with the rest of the country. In cold season, winter roads are built, which usually operate from December to April. In such conditions, the development of auto tourism is problematic.

We have divided all Arctic regions of Russia into four groups based on their accessibility for auto tourists and readiness for developing tourist routes. We classified the territories of the Murmansk Oblast and the Arctic regions of the Republic of Karelia as the most accessible regions, and the Arctic regions of the Arkhangelsk Oblast (Primorskiy, Onega) as accessible regions. It should be noted that the existing road networks cover only part of the named territories. Conditionally accessible regions are some Arctic regions of the Arkhangelsk Oblast (Pinezhskiy, Mezenskiy, Leshukonskiy), the Ust-Tsilemskiy district and the urban district of Usinsk in the Komi Republic, the Nenets and Yamalo-Nenets Autonomous Okrugs. The group of difficult to access regions includes the Intinskiy and Vorkuta urban districts of the Komi Republic, the Turukhanskiy and Taimyrskiy (Dolgano-Nenets) districts of the Krasnoyarsk Krai, rural settlements of the Ilimpiyskiy group of the Evenki district of the Krasnoyarsk Krai, the Arctic uluses of the Sakha Republic (Yakutia) (Olenekskiy, Anabarskiy, Verkhoyanskiy, Ust-Yanskiy, Bulunskiy, Eveno-Bytantayskiy, Momskiy, Abyyskiy, Allaikhskiy, Verkhnekolymskiy and Srednekolymskiy), and the Chukotka Autonomous Okrug.

The group of the most accessible regions is more promising and ready for the development of permanent routes for automobile tourism, since they are best connected with potential places of concentration of auto tourists both in Russia and abroad. The group of accessible regions has great potential, but it is necessary to create an additional road network and maintain high-quality road surfaces. All regions need to create roadside service facilities. The last two groups are problematic for organizing car tours due to their inaccessibility, harsh climate and lack of year-round road communication with the rest of the country. Here it is possible to organize car rallies in columns, off-road (jeeping) tourism arranged by travel agencies with access to the routes by air transport. At the same time, it is important to organize the safety of tourists on all routes.

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