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Mapping hierarchies of mobility in the Baikal Amur Mainline region: a quantitative account of needs and expectations relating to railroad usage

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ABSTRACT

The construction of railroad infrastructure in East Siberia and the Russian Far East was a key aspect of Soviet industrialization during the 1970s and 1980s. Although built primarily for freight transportation, the Baikal-Amur Mainline (BAM) and the Amur-Yakutsk Mainline (AYaM) have also been used for passenger transport and have thus contributed to increased mobility and heightened local expectations about future mobility. This article presents the results of an extensive survey carried out in the BAM/AYaM region, which maps experiences of individual mobility, including usage-related needs, practices, and expectations. The findings show low levels of satisfaction differing across the region's social and spatial diversity. The paper argues that hierarchies of mobility prevail at two related levels in the BAM/AYaM region: 1) the state's regional development policies favor industrial development, focusing on freight transportation while neglecting local passengers' needs for improved individual mobility; and 2) intersectional structural conditions along lines of diversity, such as gender, age, ethnicity, and place of residence, result in mobility disadvantage and lower mobility satisfaction. These hierarchies are embedded in the broader social and spatial inequality structures in the Russian Federation.

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Introduction

The Baikal-Amur Mainline (BAM), together with its major branch line, the Amur-Yakutsk Mainline (AYaM), comprise Russia's longest northern railroad, running parallel to the Trans-Siberian Railway further south. The BAM crosses six federal subjects, four in East Siberia (Irkutskaya Oblast', the Republic of Buryatiya, the Sakha Republic/Yakutiya and Zabaikal'skiy Kray) and two in the Russian Far East (Amurskaya Oblast' and Khabarovskiy Kray) [see Map 1 in the methodology chapter]. The AYaM, which has a more recent history as a passenger transport route (the passenger train service was only opened in July 2019),¹ leads to the central part of the Sakha Republic (Yakutiya) in the northeast. This article

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explores the role of the BAM and AYaM as a means of transport for local residents, with a focus on their human mobility, including the practices, needs, and expectations of different population groups. Based on people's opinions about the usage of these railroads, this paper aims to provide a broader picture of the BAM/AYaM region, with insights into regional differences that illustrate the area's social, spatial, and ethnic heterogeneity.

Mainly built during the Brezhnev era as part of the Soviet program of 'mastering the North' (*osvoyeniye Severa*) (Slavin, 1982), the BAM can be considered the last 'megalomaniac' communist industrial project (Ward, 2009; Mote, 2003) carried out in a sparsely populated region that was barely accessible, with very few permanent roads or other means of modern transportation.² The BAM and the AYaM have had unprecedented impacts on the population and on social dynamics in the entire region. During the construction period, a new multicultural group emerged, consisting of young or middle-aged migrants from across the former USSR, who identified themselves as 'BAM builders' (*bamovtsy*) (Povoroznyuk, 2017). With the inflow of BAM builders, there was a sharp decline in the proportion of the overall population made up of indigenous peoples (primarily Evenki and Tungusic groups) and Russian old settlers. Today, the BAM builders and their descendants constitute the majority population in the central BAM region, while indigenous minorities constitute 1% to 5% of the total population and live mostly in villages that lie along the railroad, along roads away from the railroad, or sometimes away from both railroad and roads. By contrast, Sakha (Yakut) people live mainly in the multi-cultural (central) Sakha Republic (Yakutiya), where 49% of the population identifies as Sakha (Yakut).³

Even though the railroad's *raison d'être* was resource extraction and, therefore, it was never primarily designed for people's mobility and comfort, but for freight transportation (Kuklina et al., 2019), people had high expectations of using it for travel, particularly during the Soviet period, when private cars were scarce. The dissolution of the USSR and subsequent withdrawal of the state led to dramatic changes in the region, including the abandonment of planned and (half-)finished infrastructure, the cancellation of social benefits and the devaluation of salaries, ultimately resulting in massive outmigration. Under the current ongoing economic transition, state investment is insufficient to cover the necessary technological modernization of the railroad. Commuter trains, which once served as an important means of transport connecting communities along the BAM, are now facing significant cuts in state subsidies, which affects their frequency and, ultimately, people's mobility.

Aim and research design

In a context marked by the industrial decline that followed the collapse of the Soviet Union and subsequent broken promises of a better life and increased mobility, which were embodied in the BAM/AYaM, we assume that there is a certain degree of public disillusionment, and that this is projected onto the BAM/AYaM as symbols of state power. This hypothesis provides the background to our major research question: *Does the railroad meet people's needs and expectations for better mobility infrastructure in the BAM/AYaM region?* We investigate whether there is disillusionment and to what extent it is grounded in respondents' actual needs and expectations relating to the railroad.

This article presents the results of a survey carried out in the BAM/AYaM region, mapping peoples' opinions about individual mobility, including usage-related needs, practices, and expectations. The survey is based on a questionnaire that has enabled the intersectional analysis of these aspects through the lens of selected socio-demographic factors (gender, age, place of residence, and ethnicity) that will allow us to understand social heterogeneity. These factors

have been chosen from a wider list of factors selected for analysis at the start of the project because they are grounded in the data showing their statistical significance. Although this is not a mixed methods paper, but first and foremost a quantitative data-based analysis, the authors deliver interpretations that are also informed by their insights gathered during several long-term ethnographic field visits (see methodology section for more details).

This introduction is followed by an outline of the theoretical framework, including an overview of our conceptual notion, *hierarchies of mobility*. A detailed chapter on methods then precedes the presentation of the statistical data. The discussion section and conclusion explain the current (partly limited) mobility opportunities for various (overlapping) disadvantaged groups, and how these are embedded in a setting of hierarchies of mobility. These hierarchies are evident at two scales that are relevant in understanding people's mobility options and the underlying conditions: 1) the state decision-making power and policies that emphasize freight transportation over local passenger's transport needs in the BAM/AYaM regional development strategy; and 2) intersectional structural conditions along lines of diversity, such as gender, age, ethnicity, and place of residence, that have shown significance in terms of mobility disadvantage and lower mobility satisfaction.

Theoretical considerations

In recent years, academic writings on the circumpolar North have dealt extensively with issues relating to the mobility of indigenous groups (e.g. Davydov, 2017; Dwyer & Istomin, 2008), as well as non-indigenous groups (e.g. Bærenholdt & Granås, 2008; Kuklina, Povoroznyuk & Saxinger, 2019; Laruelle, 2016; Saxinger 2016b; Schweitzer & Povoroznyuk, 2019; Wentzel, 2021). Besides differences along lines of ways of life, it is obvious that overlapping patterns of mobility prevail. The BAM was intended to bring (ideologically presumed) *modernization* to the region in terms of industrial growth, resource extraction, and internal colonization (Kotkin, 1997), through the construction of the railroad itself, as well as new towns and industrial sites, as part of the massive industrial and infrastructural transformation of the Russian North in the twentieth century (Eilmsteiner-Saxinger, 2011; Schweitzer, Povoroznyuk, & Schiesser, 2017, Saxinger 2016b). The construction of the AYaM (firstly as a road and later as a railroad) raised very similar expectations in South Yakutiya (Argounova-Low & Prisyazhnyi 2016). According to Hetherington (2016, p. 40), 'infrastructure has always been a central part of development thinking because both concepts share a similar progressive temporality'.

Infrastructure is 'intimately caught up with the sense of shaping modern society and realizing the future' (Larkin, 2013, p. 332). The 'promise of infrastructure' (Anand, Gupta, & Appel, 2018) precedes its construction, and thus such projects can become the materialization of promises (Abram & Weszkalnys, 2013, Harvey & Knox, 2012). Scholars have pointed to infrastructure's potential for 'enchantment' (Harvey and Knox, 2012), even more so when it is still on the horizon and as a future project endowed with often positive imaginaries. However, the way in which infrastructure materializes often has the disadvantage of being less grandiose than the imaginaries preceding it, thereby turning enchantment into disappointment (Wentzel, 2021). We refer later to the *disenchantment* observed among people in the BAM/AYaM region, relating to unfulfilled mobility expectations. This suggests that the temporality of the imagination of infrastructure (Abram & Weszkalnys, 2013) is extremely relevant when investigating people's needs and expectations for better mobility infrastructure associated with the BAM/AYaM. In this way the question also arises whether the promises and expectations built up by the Soviet Union can be

fulfilled by its successor state, the Russian Federation, operating with different societal goals in an unfinished infrastructural environment inherited from its predecessor.

Gender studies, including the strand of gender studies related to post-Soviet Russia (e.g. Gapova, Usmanova & Peto, 2002; Haraway, 1988; Moore, 1994; Povoroznyuk, Habeck & Vaté, 2010; Vladimirova & Habeck 2018), enables us to identify the ways in which social categories overlap as we explore the influence of different socio-demographic factors on people's travel practices, needs, and expectations. Intersectionality in particular involves the study of power relations. Concepts such as the 'new mobilities paradigm' (Sheller & Urry, 2006) and 'regimes of mobility' (Glick Schiller & Salazar, 2013) tackle the differences, inequalities, and structural conditions of mobility and immobility, providing a key metaphor for the contemporary world and its imagined futures (Salazar & Smart, 2011; Sheller, 2018). Using quantitative methods, Yerra & Levinson (2005) identify hierarchies in transportation networks related to investment and network structures, while Alessandretti et al. (2020) also employ quantitative methods to explore scale-related dynamics in human mobility within spatial 'containers' that restrict mobility behavior. Here, we go beyond the geographical 'container' space, employing a power-relations approach in a spatial setting that is constructed through material and social qualities (Lefebvre, 1992).

In order to understand power relations distributed over different scales, we employ the notion of hierarchies of mobility. With this concept, we capture two specific inequality phenomena, which – in a multi-scalar manner (cf. Glick Schiller and Çağlar, 2009) – link the politico-economic and individual-local levels. These are, as mentioned above, the state's powerful industrial development strategy manifested in the emphasis on freight transportation at the expense of meeting the mobility needs and expectations of local people, which results in an exacerbated infrastructural discrimination along the lines of gender, age, ethnicity, and place of residence.

Some people are more vulnerable than others in their need for mobility and regarding their state of immobility. Dissatisfaction at the local level also arises because people are still expecting the (current) Russian state to take responsibility for improving the transport infrastructure (cf. Saxinger, Krasnoshtanova & Illmeier, 2021), while the 'glorious' past of the BAM project and Soviet care for its citizens have vanished in time. This relates to the politico-economic dimension of hierarchies of mobility. Hierarchies prevail when looking at the social and societal consequences of regional development, driven by an extended BAM/AYaM network that is not intended to promote passenger transport or to serve people's mobility needs, but is rather the product of politically top-down decision making, with the primary purpose of promoting freight transportation. Capturing this phenomenon in terms of 'hierarchies of mobility' – at the twin levels of state prioritization and individual disadvantage – enables greater understanding of the power relations related to regimes of mobility in general and people's personal mobility demands in particular, as opposed to the demands articulated by the various industries in the region and the Russian state.

Methodology

In this paper, we refer to the 'BAM/AYaM region' to delineate our study area. This notion is inspired by the so-called 'BAM zone', which has existed in economic planning and regional development programs since the Soviet period (e.g. Aganbegyan et al., 1984). While there is no clear legal definition of the term, the BAM zone implicitly includes the railroad transportation corridor, the railroad stations and settlements, and other adjacent infrastructure. As shown in Map 1, the geographical focus of our research is concentrated around the western and central sections of the BAM, in particular (although not exclusively) in Ust'-Kutskiy, Severobaikal'skiy, Kalarskiy and



Map 1. Location of the study area, including the ten districts where the majority of the questionnaire respondents live, and the research sites (numbered): 1) Novaia Chara, 2) Severobaykal'sk, 3) Tynda, 4) Ust'-Kut, 5) Baikalskoe, 6) Chapo-Ologo, 7) Chara, 8) Kholodnoe, 9) Nizhneangarsk, 10) Niya, 11) Pervomayskoe, 12) Tokma, 13) Ust'-Nyukzha, 14) Verkhnemarkovo, 15) Yuktali, 16) Zvezdnyi, 17) Yakutsk, 18) Nizhniy Bestyakh, 19) Pavlovsk. Source: authors.

Tyndinskiy districts (*rayony*), as well as in the AYAM region, including Neryungrinskiy, Aldanskiy, Khantalasskiy and Megino-Khantalasskiy districts (*ulusy*), and the city of Yakutsk.

The primary source of data for this paper is an extensive questionnaire-based survey. The questionnaire was developed by the authors' consortium based on their profound understanding of the matter that results from proceeding fieldwork in the case study area and related literature review. The questionnaire consists of fifty questions and is divided into four sections: 1) demographic information; 2) general transport related questions; 3) expectations about future development/satisfaction with the past development of transport; and 4) questions related to an exemplary trip that respondents have taken. For the purposes of this paper, only the data from sections 1, 2, and 3 have been used. While the questions in section 1 and 2 were in the form of multiple choice, the ones in section 3 were in form of statements respondents had to show a certain degree of agreement/disagreement (in a scale from 1 to 4, meaning '1' 'I do not agree at all' and '4' 'I strongly agree' plus an extra option 'I cannot answer that').

The survey results were statistically analyzed by crossing a series of independent variables from section 1 (gender, age, place of residence, ethnicity, income, employment, and education) with selected dependent variables from sections 2 (general degree of satisfaction with the usage of transport infrastructure) and 3 (a series of eleven statements associated with four topics about people's mobility and usage of transport infrastructure: accessibility to the transport network, improvement of the transport network, barriers to individual mobility, and importance of the BAM/AYAM in the respondents' lives).

The questionnaire survey was carried out digitally in the field, using customized tablets, which were configured in such a way as to be able to conduct the survey both online and offline. The questionnaire was distributed in Russian language in nineteen research sites [see Table 1] as well as on board BAM and AYAM trains and in train stations along the way.

Table 1. Time periods for carrying out questionnaire survey in research sites.

Time period	Research sites																		
	BAM region																	AYaM region	
	Cities				Villages													City	Villages
	Novaia Chara (1)	Severobaykal'sk (2)	Tynda (3)	Ust'-Kut (4)	Baykalskoe (5)	Chapo-Ologo (6)	Chara (7)	Kholodnoe (8)	Nizhneangarsk (9)	Niya (10)	Pervomayskoe (11)	Tokma (12)	Ust'-Nyukzha (13)	Verkhemarkovo (14)	Yuktali (15)	Zvezdnyi (16)	Yakutsk (17)	Nizhnyi Bestyakh (18)	Pavlovsk (19)
07-08/2016																			
09-10/2016																			
05-06/2017																			
07-08/2017																			
02-07/2018																			

The black cells indicate the application of the survey. The numbers in brackets denote their location on [Map 1](#). Source: Authors.

In order to obtain the statistical significance of these correlations (i.e. the difference between the expected and observed frequencies of the outcomes), the so-called chi-square (χ^2) test was run. We measured the probability that the observed difference could have occurred just by random chance by calculating the p -value. We assumed that those correlations showing a p -value below 5% cannot be explained just by chance, meaning that both variables influence each other. In this paper, only those correlations showing significance have been included, except for two non-significant correlations that will be explicitly indicated in the text. The lack of statistical significance is the reason why certain independent variables of key importance (relating to income, education and employment) have been excluded from the results of this paper.

In order to interpret the questionnaire results in a more solid manner and explain possible biases that the sample may contain, we have used complementary qualitative data (Noble & Healey, 2019). Most of the authors of this paper conducted ethnographic research during several long-term (i.e. more than one month) and short-term (i.e. less than one month) field visits to the BAM/AYaM regions between 2016 and 2018. The methods included participant observation (i.e. informal conversations and observations of everyday practices) as well as semi-structured interviews ($n = 209$) and focus groups ($n = 9$). The target groups of the interviews and the focus groups included political figures and administrators, representatives from cultural institutions (such as museums and cultural centers), oil companies, the educational sector, and local people of different ages and ethnic backgrounds, gender, and place of residence along the BAM/AYaM.⁴ A last critical issue to be borne in mind is that the survey was carried out prior to the opening of the AYaM passenger route between the towns of Tommot and Nizhniy Bestyakh [see Map 1] in July 2019. Therefore, the questionnaire results do not reflect the consequences of presumed changes resulting from this development.

Survey results

The survey sample comprises 476 respondents. It has a certain bias towards women, while young people (aged 25 or under) are underrepresented, compared with the composition of the population in official population statistics (cf. N.N., 2015; Nekrasova, 2015).⁵ The sample is dominated by ethnic Russians, although their actual presence in the region is proportionally greater. The other non-indigenous groups (mainly Ukrainians and respondents from other former Soviet Republics) are represented in the aggregate data in a more or less proportionate way. The Evenki are overrepresented, with a proportion of the sample that is ten times their representation in the actual population statistics. The opposite is the case for the Sakha (Yakut) people, since their representation in the survey is lower than their actual representation in the overall population, particularly in the central region of the Sakha Republic (Yakutiya).

The overwhelming majority of respondents live in the study area as their permanent place of residence, specifically in the selected districts. Their places of residence were classified according to their degree of connectivity to the (major) infrastructure network in Map 2. Those with both rail and road connections constitute 64%, while 28% have road connections, but no rail connection, and 8% have neither rail nor road connections. In this regard, it is worth noting that some of the places with limited rail or road connections can be reached by ice roads, which are accessible only during the winter. The only reliable means of transport during the rest of the year is by air, typically helicopter.



Map 2. Locations of permanent residence of the survey respondents. Source: authors.

Ethnicity and place of residence

After having crossed the variables of ethnicity and place of residence (which is a correlation highly significant in statistical terms), we can confirm that respondents with Russian ethnicity mostly live in places connected by railroad and road, while respondents who affiliate themselves to indigenous groups mostly live away from the railroad. Among the latter, however, there are significant differences between Evenki and Sakha (Yakut). While a relatively high percentage (in comparison to the rest of the ethnic groups) of Evenki respondents tend to live off railroad, most Sakha (Yakut) live away from the railroad, but along roads. As mentioned above, during the data collection period, passenger trains operated in the AYaM region only as far as Tommot, in the southern Sakha Republic (Yakutiya), therefore Sakha (Yakut) people from the central Sakha Republic (Yakutiya), including the capital city of Yakutsk, did not have access to passenger train services.

Respondents' levels of satisfaction regarding personal mobility

The aggregated results from the questionnaire show that 35% of the respondents were satisfied with their level of mobility; thus, the majority stated that they were not satisfied. Fifty-six percent (56%) of respondents stated that the reason why they are not satisfied is that they would like to travel more, while only a few respondents (9%) stated that they travelled too much. The qualitative research gives us some clues for an initial interpretation of these figures. According to our interviews, focus groups and informal conversations, respondents considered mobility to be an advantage, since they associated it with the opportunity to travel, mostly relating to leisure and vacations. People have experienced an improvement in their mobility because they don't need to change trains so often to get from A to B as they did in the past. Given the large distances in the Russian Federation, longer travels (e.g. to southern summer destinations) in the past were difficult, tiring, and time consuming in comparison to nowadays, as people often pointed out in our conversations, whereas today the BAM runs direct trains to the city of Adler on the Black Sea. The few survey responses, where people did not want to be more mobile were most probably due to the fact that they have to travel long distances to their workplace, for example

those residents travelling to their extended shift work in mining and oil extraction regions (Saxinger, 2016a), or those who commute daily to a workplace in another settlement along the BAM.

The overall low levels of satisfaction should be interpreted through the lens of the region's social diversity. First, there is a fairly large gender gap among respondents in relation to satisfaction levels. Women were 1.5 times more likely than men (66% vs 43%) to state that they 'would like to travel more than [they] currently do', and only 6% of women stated that they '[felt] like [they had] to travel too much in [their] daily [lives]', compared to 13% of men. In addition, only 25% of women were content with their level of mobility, compared to 44% of men.

Concerning ethnicity, there are major differences between Sakha (Yakut) respondents and the rest of the sample. The former clearly showed a greater level of satisfaction (61%) about their personal mobility than other groups, such as the Russian majority (35%) and the Evenki (28%). The latter have the highest rates of dissatisfaction related to travelling too much in everyday life (20%) compared to 8% of Russians and 0% (!) of Sakha (Yakut).

Finally, the degree of remoteness of respondents' place of residence shows that, surprisingly, people living away from both rail and road expressed the highest degree of satisfaction with their personal mobility among all respondents (41%). Paradoxically, people living close to both rail and road – as an overall group – were the least likely to express satisfaction with their personal mobility (33%) and were also most likely to express their wish to travel more than currently (59%). This result relates to the fact that certain settlements that are located next to the BAM do not have a proper connection to the railroad for passengers, so that locals typically do not have access to train services. The opposite can be observed from respondents living in places with only a road connection (i.e. located at a distance from the railroad), who have the highest share of those stating that they feel they have to travel too much already (12%). After examining the degree of correlation between both variables (remoteness and satisfaction), the *p*-value showed a statistically non-significant correlation. In the next section we will explore further to what extent the degree of remoteness from road and rail transport links influences people's satisfaction about their mobility.

Social and spatial insights explaining low levels of satisfaction about mobility

Of the eleven statements related to respondents' experience and usage of the transport infrastructure provided in Section 3 of the questionnaire, five show particularly relevant results after being crossed with the socio-demographic variables. These relate to the following areas: accessibility of the transport network, improvement of the transport network, barriers to individual mobility, and the importance of the BAM/AYaM in respondents' lives. The responses are analyzed here in order to understand in a deeper way respondents' low levels of satisfaction about their mobility. Figure 1 below summarizes the trends of respondents' level of agreement on the questionnaire statements. Each topic is associated with a statement from the questionnaire (except for the topic *importance of the railroad*, which is associated with two statements).

Views on the accessibility of the transport network were elicited through the following statement: *'I have good access to a high-quality transport network'* [see Figure 1]. The aggregate results show that 10% more respondents disagreed with the statement (52%) than agreed with it (42%). If we focus on the influence of respondents' place of residence on

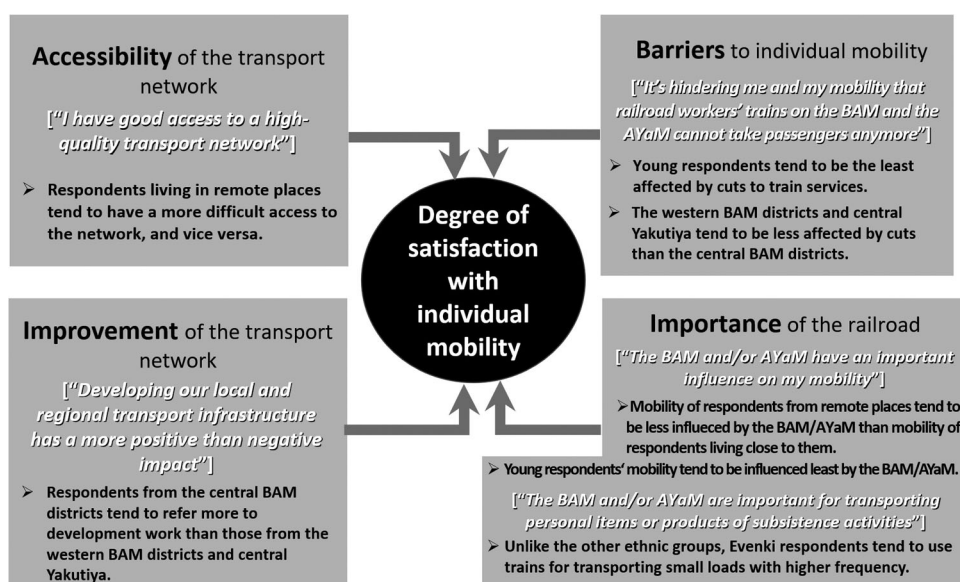
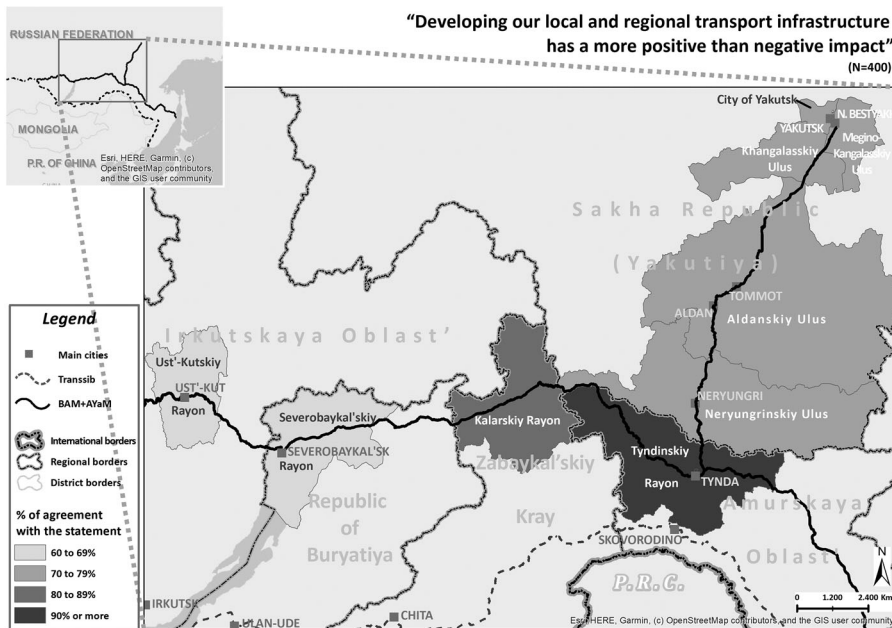


Figure 1. Summary of the main findings, focused on trends resulting from respondents' level of agreement on questionnaire statements. Source: authors.

perceived accessibility of the network, major differences are revealed, particularly between those living close to a railroad and/or a road and those living away from railroads and roads. Therefore, a general finding is that the greater the degree of remoteness of a place, the more difficult it is to access the transport network, and vice versa [see Figure 1], although, as noted above, our ethnographic research shows examples of 'neglected accessibility' to the railroad (i.e. proximity to the railroad without passenger access) in places located along the BAM.

Views on improvement of the transport network were elicited through the following statement: *'Developing our local and regional transport infrastructure has a more positive than negative impact'* [see Figure 1]. Not surprisingly, the general results show a picture in which the vast majority (75%) consider that developing local and regional transport infrastructure has a more positive than negative impact. It seems self-evident that people appreciate the local and regional infrastructure. However, significant differences arise when breaking the responses down into regional units. Map 3 shows these differences in levels of agreement (see methodology section), being the strongest in the central BAM districts (Tyndinskiy and Kalarskiy) and less marked (i.e. much more 'agreement' than 'strong agreement') in the southern and central part of the Sakha Republic (Yakutiya), as well as in the western BAM districts (Ust'-Kutskiy and Severobaykalskiy), where levels of disagreement are also noticeably higher [see Figure 1].

These spatial differences are particularly difficult to interpret, because they contradict other results. Map 3 shows that those districts where respondents stated that infrastructure development has not necessarily had a positive impact are dominated by Russians, although this ethnic group is the least satisfied with their mobility because they would like to travel more than they currently do (see previous section). On the other hand, those districts where indigenous people make up a greater share of the population show the strongest agreement with the idea of improving local and regional infrastructure. This result contrasts with the



Map 3. Respondents' levels of agreement about the statement relating to whether [future] development of the transport network would have a more positive than negative impact. Due to the low number of respondents, all districts in the Sakha Republic (Yakutiya) were merged into one value. Responses from other areas outside the BAM/AYaM region were not included. Source: authors.

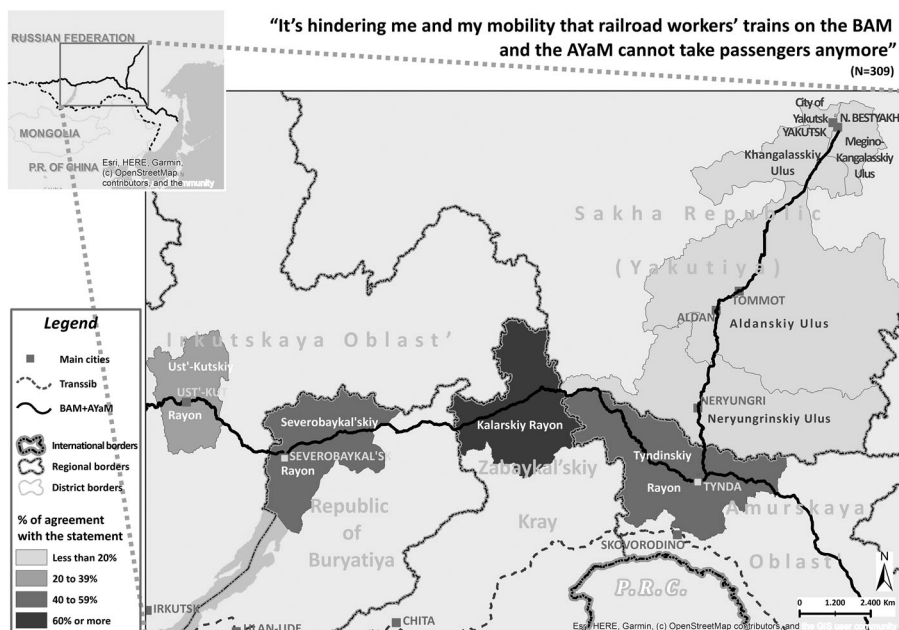
qualitative interviews with Evenki people, who argued that improved transport networks between centers and more remote places can also lead to negative effects, for example poaching and environmental problems, due to a greater influx of incomers, such as tourists and sports hunters from cities. As our qualitative data indicate, these perceptions are to some extent gendered, too. While men are primarily hunters and overhunting (stimulated by better access) is their key concern, women (but also to some extent the male hunters themselves) trade their local food produce or crafts in town and, thus, are more dependent upon good transport infrastructure connecting their remote places of residence with the markets.

The third topic is related to barriers to individual mobility at the informal and local level: *'It's hindering me and my mobility that railroad workers' trains on the BAM and the AYaM cannot take passengers anymore'* [see Fig. 1]. This statement requires some background explanation. In the BAM/AYaM region, long-distance trains (*poezda dal'nego sledovaniia*) are not at all relevant to local people's everyday mobility, because they are too expensive, tickets are difficult to get hold of, and they have inconvenient schedules (particularly in areas outside major centers, trains depart very early in the morning or very late at night), so they do not connect with other means of transport such as minibuses (*marsh-rutki*). In general, for local mobility along the BAM, only local passenger trains (*prigorodnye poezda* or *elektrichki*) are relevant. In order to meet the mobility demands in light of cuts to the local passenger trains, people have been using railroad workers' trains. Local railway company trains that transport their workforce by rail have been informally taking passengers, which in some areas has been especially useful for indigenous people to travel locally (Kuklina & Baikalov 2021).

The survey results for this statement show fairly balanced ratios of agreement and disagreement. Respondents are divided into two symmetrical groups, the ones who are satisfied with the current train service and the others who are unsatisfied. However, there is a relevant nuance: namely, unsatisfied respondents are more convinced about their attitude than satisfied ones (i.e. more of them ‘strongly agreed’ with the statement). In addition to this, it is important to note that one fifth of the respondents selected ‘I cannot answer that’ (see methodology section), i.e. they answered the question, yet were unable to give a clear response to this statement, which has the lowest overall response rate of all statements (67%). One explanation for this is that the question refers to a specific problem in certain places, so it is not relevant in other places (such as Ust’-Kut, where passenger train connections are good enough).

For this statement, we highlight two correlations. The first one features age groups, and shows that it is mainly young respondents who are unable to answer this question (almost 40%), and that they declared themselves the least affected by cuts to train services (only 14% agreed with the statement). The opposite picture can be observed for people aged between 26 and 54 and for those aged 55 and above. Most people agreed with the statement, while a minority (mostly among the elderly) disagreed.

The second correlation regarding this statement involves respondents’ place of residence [see Map 4]. This shows major differences between districts concerning levels of agreement about cuts in passenger train services hindering mobility. Ust’-Kutskiy District, in the western section of the BAM, has by far the lowest levels of agreement with the statement. Our observations in the region show that people use the bad permanent automobile roads in spite of their extremely bad condition, because it is still more attractive than using



Map 4. Respondents’ levels of agreement about barriers to individual mobility based on the circumstances that railroad workers’ trains do not take passengers anymore. Due to the low number of respondents, all districts in the Sakha Republic (Yakutiya) were merged into one value. Responses from other areas outside the BAM/AYam region were not included. Source: authors.

workers' trains due to rare frequency and inconvenient schedules as well as because of lack of comfort. As a matter of fact, there is no local public transport either on railroad or on the road. The fact that workers' trains have not (yet) been affected by cuts in this district seems therefore to be of secondary importance. The other side of the coin is Tyndinskiy District and especially in Kalarskiy District (the latter counting with the highest proportion of Evenki respondents), in the central section of the BAM, where people seem to be the most negatively affected by the cuts. Not surprisingly, Evenki respondents agreed the most with this statement (53,6%) and (as also shown below) this group apparently desires further development of the railroad network that better meets their demands.

The fourth and last topic is the importance of the railroad to respondents' daily life. Sixty-two percent (62%) of respondents agreed with the statement '*The BAM and/or AYam have an important influence on my mobility*'. The correlation of age and place can illuminate a high degree of intersectional differences: the degree of agreement dramatically decreases among young respondents, as young people do not seem to be as affected by cuts to passenger train services as older respondents. The reasons seem to be manifold. For instance, there is a rather high degree of availability of cars as we could observe (even if these are old, less expensive cars) for young adults; teenagers are busy with schooling and have less need for mobility; or if schoolchildren are traveling, they do so on trips organized by schools and travel on the bus or by airplane. By contrast, for the elderly, the BAM/AYam is crucially important for their mobility. The correlation between importance of the railroad and place of residence shows even greater differences, especially between respondents living close to the railroad (78% of which consider that the BAM/AYam are important for their lives) and the rest (among which only 31% consider that these railroads are important for their life). At this point, we have to bear in mind what was shown at the beginning of this chapter: namely, that most respondents living away from the railroad belong to indigenous minorities, while practically all respondents living on the railroad are ethnically Russian.

The last statement '*The BAM and/or AYam are important for transporting personal items or products of subsistence activities*' requires some previous explanation. The transportation of small loads and large luggage in passenger trains has been a long and almost unregulated practice in Russia. This is especially true in remote areas, such as the case study area. Local residents, from town dwellers to reindeer herders, use the railroad to deliver not only clothes and personal items, but also foodstuffs and local produce, such as reindeer meat, fish, berry jam, and mushrooms.

The correlation between responses to this statement and gender is statistically not significant, with only slightly more women than men agreeing with the statement. Yet, our long-term field observations among the Evenki show that small-scale food supply is often organized within networks of relatives and/or friends, with women playing the central role. Women process and cook the products and bring them to their children and other relatives from villages to towns as a symbol of care, but also as a source of subsistence and for bartering. While Evenki men who work for the Russian Railway Company (RZhD) can carry goods informally on the above-mentioned railroad workers' trains, the women also, to a great extent, do the shopping in towns along the BAM and bring clothes and consumer goods back to their homes in the remote villages.

Ethnicity plays a central role in understanding the level of agreement about the relevance of the railroad for transporting personal items and subsistence produce. Evenki respondents agree more strongly with this statement than the other groups. This is not surprising, since

(as outlined above) many of them are hunters, herders, fishermen, and berry and mushroom pickers who use the railway to transport products. Interestingly, the other major indigenous group, the Sakha (Yakut) people, responded in a similar way to the Russian majority in terms of disagreement with the statement. Again, the reason for this might be that, at the time of the survey, there was no functioning railroad in the central Sakha Republic (Yakutiya).

Discussion

Our data show that, in the BAM/AYaM region, there is a great diversity of practices, needs, and expectations related to people's individual mobility and better mobility infrastructure. This leads us to argue for the existence of hierarchies of mobility: behind the overall low levels of satisfaction about the way that people's mobility needs and expectations are being met lie a wide range of reasons why respondents experience mobility disadvantage or discrimination, depending on respondents' gender, age, ethnicity, and place of residence. These socio-spatial and demographic factors have shown statistical significance when crossed with the results from the general question about respondents' satisfaction about personal mobility.

Spatial diversity plays a central role in the way that people perceive their needs about mobility in the BAM/AYaM region. Place of residence influences all dimensions of satisfaction about individual mobility: accessibility, improvement of the transport network, barriers, and importance in daily life [see [Fig. 1](#)]. This spatial component has two dimensions: first, the location of the place of residence relative to the major mobility infrastructure (railroads and roads), which is an indicator of the degree of remoteness; second, the location of the place of residence in the context of the territorial administrative division, which enables a regional analysis of the responses [see [maps 3 and 4](#)].

As already argued in the theoretical considerations above, the fact that hierarchies are embedded in socio-spatial configurations is not only related to the geographical container space (in our case e.g. through the very location of settlements with different access to transport infrastructure), but how a region is constituted by social factors and, subsequently, how a region's social framing impacts on social structures and opportunities of practice in everyday life (cf. Lefebvre 1992). In the case of Siberia, the wider understanding in the Russian society and among political decision makers refers to the socio-spatial connotation of Siberia as a resource frontier (Ulturgasheva et al., 2007, Saxinger 2016c). The today's industrial run for minerals is embedded in historical legacies dating back already to early Russian colonization of the area, as well as in later industrialization through forced labour in the *GULag system* (Saxinger 2016c). The current state and policy makers at different scales follow an extractivist logic of regional development of remote regions (Saxinger et al., [forthcoming b](#); Illmeier and Krasnoshtanova, [forthcoming](#)) in conjunction with interest of industrial actors.

A further spatial-related issue concerns demand for the development of local and regional transport infrastructure. After the dissolution of the Soviet Union, a regional reshaping process took place with resettlement projects of e.g. pensioners who are not active anymore in industrial life of remote Siberian resource regions; likewise, a trend to abandon small settlements without economic significance occurred (Nuykina 2011, Nuikina 2014). This leads to unequal opportunities for settlements and people to realize their needs for wellbeing, which includes mobility opportunities (Saxinger et al.,

forthcoming b; Illmeier and Krasnoshtanova, forthcoming). According to our results, transport development is seen as necessary particularly by respondents from the BAM central districts (Kalarskiy and Tyndinskiy), regardless of their ethnic affiliation. The results demonstrate that support for infrastructure development does not necessarily correspond to the experience of inconvenience related to train services (e.g. those who support more infrastructure development are not necessarily those who are most inconvenienced by cuts to passenger services).

When interpreting hierarchies of mobility, the spatial factor is intertwined with socio-demographic categories. There is a number of dimensions of intersectional inequality embedded in the broader Russian society, such as the existence of historically grown, multiple, and structural discrimination and ‘exotization’ of indigenous groups. This is critical to understand the sudden social and spatial neglect of these groups when the BAM entailed the influx of ‘BAM builders’ (see Introduction). According to our research results, the degree of remoteness of respondents’ place of residence determines the accessibility to the network as well as the influence of the railroad on daily life, yet not respondents’ general level of satisfaction. Bearing in mind that indigenous people are proportionally more present in remote places with no direct access to transport networks (both in our sample and according to official statistics), one might expect these groups to perceive the railroad as something secondary to their lives. In line with Davydov (2017), our results demonstrate that this is not always true, at least if we focus on the importance of trains, for instance, as a means of transporting goods for Evenki respondents.

Another example are the regional disparities relating to the issue of barriers to individual mobility: areas with low population density and small settlements in the central BAM districts, where the proportion of Evenki is the highest, seem to be most affected by passenger service cuts, confirming the importance of this service for this ethnic group. Their products are traded at local markets, and trains are also important for maintaining social and cultural bonds with friends and relatives living in towns along the railroad. They depend on the BAM working well. In contrast, the Sakha (Yakut) seem more satisfied with their levels of mobility than respondents self-identifying with other ethnic groups.

Age is another highly relevant factor in this matter. Differences between young people and the older generations arise when approaching the existing barriers to individual mobility, as well as the influence that the railroad has on people’s daily lives. Young respondents seem to have a pragmatic approach to the BAM/AYaM, i.e. they do not perceive it as the (ideological) flagship project that it once was. This would partially explain why most of them state a low level of influence of the railroad on their lives. However, the main explanatory factor is that they do not seem to depend on the train, since the service cuts on the *elektrichka* (local/suburban train) do not seem to have affected this population group much, according to the survey results. Most of those who travel regularly in towns and cities prefer buses, since they are cheaper, while the young adults among the respondents use their own cars, even if they buy them on credit. In contrast, people over the age of 55 seem to use the railroad infrastructure more frequently and, therefore, they are most affected by the passenger service cuts. They remember those times when access to the railroad was much better. In addition, they tend to see the railroad not just as something to travel by, but they recognize its role as a symbol of the Soviet narrative of progress, as our field observations also indicate.

The final relevant factor is gender. Even though this does not have a statistically significant influence on any of the four dimensions related to satisfaction (i.e. accessibility of the

transport network, improvement of the transport network, barriers to individual mobility, and importance of the BAM/AYaM in respondents' lives), it can be stated that there is a gender dimension to the general question of (im)mobility. In terms of labor opportunities, for instance, and albeit the history of gender equality politics in the Soviet Union, there is an increasing exclusion of women in well-paid jobs, which is extremely visible in the resource extraction industry nowadays (Saxinger 2016a). Our research results show that women seem to be much less satisfied, specifically because their survey responses indicate the wish to travel more. This finding might reflect a stronger aspiration for both social and geographical mobility among women, who are getting more public visibility as activists, professionals, and administrators at the local level. This 'gender shift' (cf. Vladimirova & Habeck, 2018) is especially pronounced in indigenous villages, where women are usually well educated and occupy more stable social and professional positions. In addition, Evenki women use the transport infrastructure to distribute small loads of food, produce, and crafts across the BAM/AYaM region.

All these expressions of intersectional disparity reflect the different lifestyles (cf. Habeck, 2019) that are pursued on the one hand by residents of the larger settlements on or close to the BAM/AYaM, where the most diverse and mobile populations are made up of BAM builders or other migrants, and, on the other, the more spatially rooted indigenous/old settler residents living in villages away from permanent road and rail links. Their lifestyles imply different concepts of travel in connection to work and leisure. The desire for long-distance travel for a vacation at the seaside or to visit relatives in their home regions/countries is widespread among former BAM/AYaM builders and their descendants. In contrast to this, the BAM/AYaM appears to be less relevant for indigenous people in terms of travelling for vacation.

After revisiting the research question *Does the railroad meet people's needs and expectations for better mobility infrastructure in the BAM/AYaM region?* in light of the survey results, it appears to be evident that there is an overall wish or need to improve individual mobility. One way to achieve this would be to improve passenger transport services. However, this conflicts with the fact that the primary aim of the BAM/AYaM was to provide a freight transportation system to serve new industrial and resource-extraction activities. Regional development has focused on place-based industrialization and the movement of natural resources and industrial products, but not on movement of regular citizens. Although state-driven, the large-scale migration of a new population to build a new and 'ideal' Soviet society meant that this society was engineered to remain in place without the need for individual mobility. Considering contemporary policies and plans to boost the region (Pravitel'stva Rossiyskoy Federatsii, 2008), and in spite of the recent inauguration of passenger services along the AYaM, we assert that passenger transport and peoples' mobility are not key objectives of this development. The mismanaged schedules and downsizing of passenger train services show that passenger transport is a secondary priority. As to the question of whether there is disillusionment among the people living in the BAM/AYaM region, our conclusion is that (dis)satisfaction levels differ, depending on gender, age, ethnicity, and place of residence, and they intersectionally overlap between these categories. Levels of disappointment also differ within the different social groups and within places and regions. Not least, as outlined above, these categories of inequality in the mobility context in Siberia relate to inequality in the Russian society at large and discriminative policymaking on different scales in particular.

The intersectional heterogeneity confirms the existence of different levels in the observed hierarchies of mobility, which we have identified as reflecting two related phenomena. Firstly, they reflect the power relations embedded in (im)mobility regimes and actual needs and dissatisfaction in the context of the different, intersectionally unequal societal positionality of population groups or individuals. Furthermore, people expect the state to care for their mobility needs, but these expectations are not fulfilled (Saxinger et al., forthcoming). Secondly, in politico-economic terms, the state- and corporate-driven regional and transport infrastructure development favors the country's further industrial needs in contrast to passengers' obvious needs at the local level. This brings to light the hierarchy of usage options of transport infrastructure among different stakeholder groups in the transport-mobility nexus: those who are deemed more vulnerable regarding their mobility aspirations (which are widely neglected), versus others, such as the different industry sectors, whose needs are favorably addressed by state regional policymaking.

Conclusion

The findings presented in this paper, based on a questionnaire survey, show that people are generally not satisfied with their mobility in the BAM/AYaM region in East Siberia. The reasons for the low levels of satisfaction are: (i) difficulties in accessing the transportation network, particularly for those respondents living in remote places; (ii) the lack of convenience when using the network, which leads to general calls for further development at local and regional level, although regional differences appear; (iii) a series of barriers to individual mobility, mainly related to cuts in passenger train services; and (iv) the uneven influence of the BAM and the AYaM on people's daily lives (in contrast to the elderly, young respondents revealed that the railroad played only a secondary role in their lives).

We identified hierarchies of mobility through the lens of a series of socioeconomic, spatial, and demographic factors that are intersectionally configured primarily along the lines of gender, age, ethnicity, and place of residence in the peculiar social-spatial setting in remote Siberia and in the context of social inequalities in Russia at large. As stated above, the setting of hierarchies of mobility refers to two scales that are relevant to consider in the understanding of people's mobility options and conditions: 1) the state's decision power regarding emphasizing freight transportation over passenger transport in the BAM/AYaM development strategy; and 2) intersectional structural conditions along the lines of diversity such as gender, age, ethnicity, and place of residence that have shown significance in terms of disadvantage and lower mobility satisfaction.

We can clearly observe in the data the prevailing disadvantages in terms of (im)mobility and usefulness of the BAM/AYaM for those people who occupy weaker positions in societal power configurations.

We identified hierarchies of mobility based on the fundamental differences in state politics and policy making, which favor industrial development and follow the idea of remote Siberia as a resource frontier. This is exemplified in the primary use and purpose of the railroads for freight transportation rather than advancing local people's mobility in terms of meeting their infrastructural expectations and convenience needs. There is a clear gap in current development policies by the Russian Federation to tackle this and to ease the prevailing dissatisfaction of people living along the BAM/AYaM.

Notes

1. 'In Yakutiya a new railroad was opened' (article from the *Rossiyskaya Gazeta*, in Russian, 28 July 2019). Retrieved from <https://rg.ru/2019/07/28/reg-dfo/v-iakutii-otkryli-passazhirscoe-dvizhenie-so-stancii-nizhnij-bestiah.html> [28 May 2021].
2. While the central section of the BAM had a very poorly developed transport network, the AYam was a road long before there was a railroad.
3. The Sakha (Yakut) people are indigenous to Sakha (Yakutiya), nevertheless, according to Russian legislation, only small-numbered peoples of the North and the Far East numbering less than 50,000 are legally protected as 'indigenous'. According to the 2010 national census, there are 478,085 Sakha in the Russian Federation (retrieved from <https://minorityrights.org/minorities/sakha/> [28 May 2021]).
4. The qualitative data have been analyzed and interpreted separately for use in other articles.
5. We divided the sample for the analysis into 3 age groups: 1) people aged 25 or under, 2) people aged between 25 and 55, and 3) people aged 55 or above. According to the administrative law of the Russian Federation, a large part of the territory of the country is classified as "regions of the Far North" and "regions equivalent to the Far North". This status is given to regions that are located in high latitudes and/or are characterized by harsh climatic conditions, being remote and poorly connected. People who live and work in these regions enjoy particular benefits, such as higher wages, a lower retirement age, lower fares for transport, and/or longer vacations. The retirement age ranges between 50 and 60 for men and between 45 and 55 for women.

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