

# Perceptions of Urban Logistics by the Residents of Cities: The Case of Almaty in Kazakhstan

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## Abstract

It is the suburbs, not the center, that forms a city. The infrastructure and transport state of a city affects the way people design and perceive the city centers. A citizen-oriented urban logistics system helps in making cities people-friendly. This issue attracts the interest of researchers from different research fields, not only architecture, urban planning and urban design but even social sciences, because it involves people

This paper analyses the perceptions of the districts of a city by its residents. City-planning, if based on the information delivered 'bottom-up', meets the interests and the real needs of its people. Such an approach to city planning promotes the formation of city policies that addresses the challenges which arise in the context of sustainable developments. The study relied on the concept of functional urban areas, according to which a city consists of a densely populated center and adjacent suburbs.

The empirical data was obtained by administering a questionnaire with the residents of Almaty, Kazakhstan on the issues that reflect the realities of city logistics. These involve the geographic and psychological definitions of their places of residence, the city center; transport infrastructure and intracity mobility; leisure; places of purchase, and the potential for the development of online shopping.

The analysis of the real interests and needs of the Almaty population revealed the inefficient approaches to city planning, economics, and infrastructure development in Kazakhstan. The paper argues that instead, it should be based on sustainable development concepts.

**Keywords:** city, polycentrism, transport infrastructure, city logistics, accessibility of amenities.

## Introduction

In the modern society, urban planning implies the creation of a comfortable and convenient living environment. Information and technological changes today create many opportunities but also pose new requirements for planning and the rational use of resources by a single person as well as a whole society. This raises an interesting question about the organization of urban living environments and puts forward demands for planning traffic, urban planning and the careful use of resources. This study focuses on city transport infrastructure. In

this paper, “city logistics” refers to the provision of comfortable access to places of work, recreation, as well as goods and services, regardless of their places of residence in the city.

Modern cities and megalopolises have been a subject of thorough studies based on various methodological approaches and empirical data. Nevertheless, the known urban topics are often related to new challenges associated with various development factors. For example, the development of information technologies have brought up many innovations into urban living. Online commerce has shifted the accents in the delivery to end consumers. Accessibility of those benefits for all segments of the urban population are relevant regardless of their places of residence and the remoteness from the central areas.

The ongoing integration of Kazakhstan into the global economy (Taisarinova et al., 2020) is impossible without creating a reliable, cost-effective, safe, and eco-friendly systems of urban logistics meeting the needs of the urban residents, entrepreneurs, markets, and society as a whole. Almaty is the largest city in Kazakhstan, and the core of the Almaty agglomeration. Today, Almaty is a global business center, an important transport, logistics, and tourist hub on the New Silk Road (Tulinova, 2019).

This article analyzes the level of development of urban logistics through the perception by the residents of Almaty in relation to the infrastructure and transport capabilities of the city. It analyzes the data about the urban districts provided by the residents of the city to understand the modern situation in the city, as seen by its residents. Besides, when analyzing the movement of people between places of residences and work, shopping, and recreation, one can get a view on the zoning of urban territories as perceived by the citizens. This methodology allows overcoming the limitations set by the administrative city borders and provides a better understanding of the accessibility of certain elements of urban spaces.

The analysis also includes a polycentric approach, which allows studying the connections of the city center from the point of accessibility of public amenities (Langford and Higgs, 2010). Polycentrism is closely related to the problem of spatial justice and the ability to meet human needs, e.g., the need for a comfortable, aesthetic, and functional environment (fountains, small architecture, paths, convenient crossings, etc.) and places of communication (public gardens, benches, parks, walking areas).

This paper also provides an important understanding of inclusive and equitable development (United Nations Human Settlements Programme, 2015), which is valuable for both local authorities and many interested parties and groups that collaborate to create sustainable urban mobility plans. Approaches to urban planning based on the information and “bottom-up” data, that is, subordinate to the interests and real needs of the city population contribute to developing an urban policy that will respond to the challenges arising in the context of sustainable development.

It addresses the following research questions:

- How are the urban spaces in Kazakhstan perceived by the city residents in the context of places of residence, work, and entertainment with the existing transport infrastructure?
- Which places in the city do the residents consider as the city center?
- What are the assumptions about the prospects for logistics and online trade development?

The paper is based on a number of hypotheses as follows.

**Hypothesis 1:** Passenger transport logistics of Almaty in Kazakhstan does not provide comfortable access to the places of work/study.

**Hypothesis 2:** Advanced food logistics is ensured by a network of corner shops that can become sub-centers for selling other types of goods due to a good level of trust established between the local inhabitants and the store owners.

**Hypothesis 3:** Some districts poorly utilize online services due to the lack of an affordable connection to high-quality internet services, the deficit of the equipment for making online orders, and the fact that many online shops do not deliver to the suburbs.

## Literature Review

Cities are large settlements with a certain size of the population where people can live, work, have access to amenities, and interact socially. Thus, the cities are both territorial and functional units. The inhabitants assess any territory from the point of view of its convenience and comfort of living. At the same time, a city is a single organism and a business entity. Therefore, the policies of the city administrations are fundamental for the development of the region and the dynamics of its socio-economic growth. According to Rodrigue and Dablanc (2020), city logistics comprises the provision of services that help efficiently manage the movements of goods in cities and provide innovative responses to the customer demands. The interest in city logistics is growing due to ongoing urbanization, rising standards of living, globalization, and new forms of consumption, such as e-commerce (Rodrigue, 2020).

Christaller (1933) interprets a city as a central place that supplies goods and services to the surrounding area. Lösch (1940) gives meaning to the existence of borders between economic regions. He explores the connections between the regions and the relevant inter-regional highways. Such a stage-by-stage consideration produces the theory a dynamic aspect, complicates the description of the initially homogeneous space, and brings about the picture closer to reality. However, such a picture requires a more comprehensive theoretical analysis that can and provide more room for empirical research and semi-intuitive reasoning.

The center-periphery classification of city forms requires updates and modifications. The traditional location theories may still be valid for understanding structures inherited from earlier stages of urban development (Hall, 1999). However, the model of heterogeneous specialized subway hubs seems to be much more suitable for understanding the current developments. In this context, the European metropolises demonstrate a scenario of emergence and further consolidation of polycentric configurations. Among the European cities analyzed by Van Criekingen, Bachmann, Guisset, & Lennert (2007), the modern frameworks and urban planning strategies of Amsterdam seem to be most clearly based on the conceptualization of the capital space as a polycentric system.

There are many literature sources on the empirical study of polycentrism in the cities of the world based on different approaches. A study of the spatial structures of three functional urban areas in Finland shows that functional connections between the city system centers are another important part of polycentricity (Vasanen, 2012). In a narrower sense, a polycentric model assumes the accessibility of a set of amenities related to education, shops and services, restaurants and leisure (cafés and restaurants, swimming pools, sports centers), the administrative and community services, health care and social services (Decoville and Klein, 2014). Accessibility means proximity, which is a key aspect of everyday life of people, with a focus on transport infrastructure. According to Haugen (2011), polycentrism, manifested by the co-location of important daily activities (job, services) near residential areas, contributes to satisfaction with living conditions. Thus, the key factors that determine the social landscape of a city are the location and distance that suburbanites travel to and from the city (Montgomery, 2019).

While an increasing role of cities in economic growth and technological innovations is widely recognized today, there are contradictive views on urban polycentrism (Cusin, 2016). For example, in Mexico City, most jobs are concentrated in the large central agglomeration, which hosts internal nodes and corridor-like structures that have been identified as sub-centers (Suárez and Delgado, 2009). However, the transition to polycentric models of spatial development does not necessarily seem beneficial. While studying the commuting behavior in the three largest French urban areas in 2005, Aguilera finds that polycentric subcenter systems tend to increase the average distances people have to travel, since more people travel between subcenters rather than commuting within their subcenters (Haugen, 2011). The findings by Aguilera echoes those of Breheny, who analyzes the real-time job patterns in the UK and finds that people tend to spend more time traveling to work, and the use of private cars for that purpose is growing (Green, 2007).

A comparative analysis shows that even though urban superpositions are more often associated with the centers of political, business activities (management and control,

technology and creativity), cultural activities, shopping, education, and tourism, some studies reveal new centers associated with the places of logistics, mass consumption, and modern business services (in the fields of technology and creativity). These centers are related to transport, logistics, and wholesale activities. As for the logistics center, it is clearly connected to transport infrastructure. It is located either at the main motor crossroads or next to the major infrastructure facilities like the airports and the ports (Van Crieking et al., 2007).

Moreover, the very concept of city functions has also evolved. Functional zoning was once created by experts and managers in a “top to bottom” approach. Today, the “bottom-up” approaches dictated by the needs in the city functions are gaining more popularity. This is evidenced by an increasing number of social studies carried out by polling city residents. According to Lynch (1960), the perception by a person of his/her environment should be the main criterion of its value. Movable elements in a city, especially the people and their activities, are as essential as their immovable, material parts. We are not only spectators in this performance; we are its participants. More often, the perception of a city is not consistent; it is rather fragmentary, intertwined with other concerns (Lynch, 1960).

Gehl (2012) convinces that people are the greatest beauty of a city. People gather where something is happening and subconsciously seek out the presence of other people. The rise in interest to public spaces could be explained by the significant social changes, especially in the wealthiest parts of the world. Increased life expectancy, an abundance of free time, and a generally prosperous economy create more opportunities for recreation and entertainment (Gehl, 2012).

Currently, shopping and entertainment centers are actively developing. They are not only commercial buildings, but also play an important role in the development of cultural, economic, and social aspects of urban service infrastructure. The global practice utilizes several classifications of shopping malls. One of the classification criteria is the shopping mall’s zone of influence (micro-district, district, area, regional). Additional factors of attractiveness are the availability of catering outlets with high quality and original concepts and the competitive advantage of the entertainment zone, which contributes to the formation of “loyalty to the place,” the gradual transformation of the shopping and entertainment centers into a place of recreation. Shopping and entertainment centers combine two main functions, one of which develops mainly horizontally (shopping and leisure activities), and the other – vertically (office, business, and entertainment activities).

At the same time, over the past decade, the economic world has changed markedly. First, the value-conscious meaning of the offered goods and services has changed radically towards the specific needs of a particular consumer who clearly understands his/her position and all the relevant benefits and opportunities. Second, new technological and production means have emerged. Information technologies have added their value to become a tool for delivering information to consumers. Active information communication significantly affects the “tangible” structure of a space. The growth of online shopping for consumers (B2C) impacts the urban logistic systems (Taniguchi et al., 2016).

Inclusive development of urban spaces is essential to ensure equal opportunities. The concept of inclusive development utilizes the micro-level approach by Sen (1999), who considers the development as a process of expanding human freedoms, including those that contribute to the growth of personal income. In this view, an inclusive development provides for the involvement of isolated groups of people and the employment of their capabilities. An “inclusive space” is an urban environment that is comfortable, visually attractive, and accessible in every sense. Thus, an inclusive city is a city for everyone, for the widest range of users, regardless of their social or property status.

## Research Methods

This research followed the assumption that, in the city, people usually utilize at least three types of territories that vary in their significance for city residents and the extent to which they can control the situation in these territories. First is the place of residence, second, the place of work, and the last, the public area which people utilize shortly but frequently as an

entertainment area. All these areas are connected by transport infrastructure: the roads, and the public and private transport. Every day, the residents interact in these urban areas while they lay their routes, and use the urban amenities; they create an image of the city and assess it from the point of view of the ability to meet their needs. The key concepts (ideas) that reveal this scheme include the identification and description of the place of residence, geographic and mental perception of the urban space and the city center; the transport infrastructure; the actions made in the places of entertainment, as well as the potential to develop online shopping.

The research used a questionnaire to study the movements between the place of residence and the place of work among the residents of Almaty in Kazakhstan. The questionnaire was administered to 1016 households from 8 urban districts and 2 agglomerations. This sampling was representative according to the statistical data of the SC MNE RK as of the beginning of 2019 (Statistics Committee, 2020). The map of the survey made by the Kazakh National University and the University of International Business shows the place of residence in red and the place of survey in green.

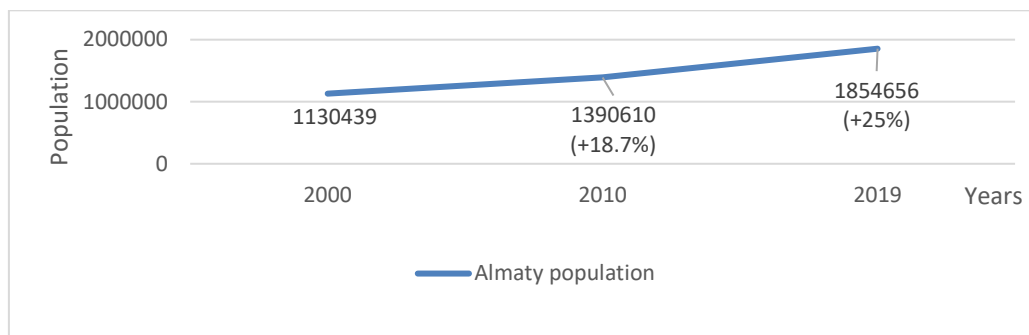
The questionnaire included three interconnected blocks divided by topics which were: the place of residence, the place of work, and the places of entertainment. The answers to open questions in the questionnaire also provided some narrative information for qualitative analysis. The questionnaire included some open questions to clarify some ambiguities in the interpretation of the collected quantitative data. The topics in the questionnaire were chosen by analyzing the comments obtained during a pilot study in the Nauryzbai district of Almaty, annexed to the city as a result of gentrification.

An average household consisted of 4.21 persons (modal and median averages = 4). Distribution of the respondents by age: 16-22 years: 38.4%; 23-29 years: 27.6%; 30-45 years: 20.8%; over 45 years: 13.3%. Distribution by gender: women: 53.8%; men: 46.2%. Distribution by the level of education: higher education: 39.1%; undergraduates: 21.5%; specialized secondary education (college, technical school, specialized school): 20.1%; secondary education: 13.9%; postgraduate education: 1.4%.

## Findings and Discussion

The city of Almaty is the leader among other regions of the country in almost all socio-economic indicators. In 2019, the city contributed to 20.6% of the national GDP, being significantly ahead of the following regions: Atyrau region (13.2%), and the city of Nur-Sultan (9.8%). In the past few years, the average annual Gross Rating Point (GRP) grew by 14.1 times a year in nominal values. At that, the real GRP growth of 4.6% was achieved mainly due to the growth of service and trade markets. The city possesses the necessary labor, consumer, and infrastructural potential (Almaty City Maslikhat, 2017) and is positioned as one of the most investment-attractive regions of Kazakhstan.

In 2017, the OECD methodology was employed to define the functional boundaries of urban agglomerations functional urban area (FUA) of three cities of Kazakhstan, including Almaty city, based on the 1999 and 2009 census data (Organisation for Economic Co-operation and Development, 2017). The promising growth points of the urban economy were logistics, construction, finance, insurance, smart industry, fashion, arts, leisure, tourism, and real estate market. The population of Almaty was growing steadily: by 18.7% from 2000 to 2010, and by 25% over the next decade (Statistics Committee, 2020) (Figure 1).



**Fig. 1:** Almaty population dynamics, 2010 to 2019

Source: Authors

Three main factors contributed to such an increase in population, significant on the national scale: joining new territories to the city, natural population growth, and positive migration. In 2014, suburban areas with a population of about 92 thousand people were annexed to Almaty. The age structure of the Almaty population is dominated by the people of college-age due to a developed network of educational institutions in the city. In 2014-2015, the positive migration amounted to 62.6 thousand persons; commuting is increasing. People from nearby areas come to work and study in the city, thus increasing the pressure on the urban infrastructure, including transport.

Today, Almaty (FUA) is a polycentric agglomeration that includes the urban settlements of Kaskelen, Talgar, and Esik. According to the 2009 census, 35% of the employed population of Talgar, 31% of the employed population of Kaskelen, and 21% of the employed population of Esik commuted to work in Almaty. Along with the urban population, 51% of the employed population of the settlement of Boraldai, 46% of the employed population of the settlement of Pokrovka, and 45% of the employed population of the settlement of Utegen-Batyr were working in Almaty. As of 2009, the Almaty agglomeration commuting zone included 80 municipalities (rural districts, cities, and village administrations). The latest expansion of Almaty administrative boundaries led to the inclusion of many rural territories that formed a new district of Almaty. The city also annexed the neighboring cottage settlements. This has resulted in a basic imbalance along the center – suburbs line.

The expansion of the city boundaries has not only changed the scale of tasks for the development of territories but also significantly affected the urban spatial structure, which became even more heterogeneous, multifaceted, and unbalanced (Bukeeva et al., 2019). At that, the newly formed districts which are far from the city center experience great difficulties with the adaptation of the environment to urban conditions (Fig. 2).



**Fig. 2:** New Nauryzbai District that recently joined to Almaty

Source: Authors

Currently, the activities of the authorities are limited to road building and repaving, while the people have to spend a lot of time and money to access the places of work, leisure, selling of goods and services. Passenger traffic in the “city-suburb” zone is the most massive, regular, and socially significant, and its optimal organization is the most challenging. The main problem of the Almaty agglomeration transport system is the lack of modern high-speed urban and suburban passenger transport with a large carrying capacity (LRT, BRT, commuter trains). On the suburban routes, only road transport is now satisfying the needs of existing passenger traffic. According to a 2016 study, 19% of all movements of urban residents were made on foot, 1% – by bicycle, 39% – by public transport, and 41% (the highest share) by car (Almaty City Akimat, 2019). The shopping malls’ map analysis shows that almost all of them are located in the center of the city, away from highways and highway hubs. A big shopping mall is available only on A2 road (Almaty-Tashkent) (Capital Business Information Center, 2015) out of three highways incoming into the city.

For many years, Almaty is among the cities of Kazakhstan with a high level of air pollution. Such a high level of pollution is due to local natural-climatic features and the anthropogenic impact on the environment. Two hundred thousand cars that enter the city each day from other places further worsen the ecological situation (Aubakirov, 2020). Almaty residents divide the city into the “upper” and “lower” parts. The upper part is located closer to the mountains and is more environmentally favorable. Therefore, it hosts more expensive houses, better roads, is associated with higher social status, and provides transport accessibility to many social facilities. The “lower” part is ecologically less safe, with lower social indicators and less municipal benefits.

The “Almaty-2050” Development Strategy defines the city as a place with no suburbs, a place of equal opportunities. Almaty should become a city with no physical, social, or mental barriers that would divide it into a prosperous “upper part,” a working “lower part,” and underdeveloped suburbs. It also states that the city will develop poly-centrally so that each district has its own unique characteristics and possesses the entire range of efficient daily social services (Almaty City Akimat, 2019). However, the views of Kazakhstani scholars on this polycentric approach vary. According to the comparison made by Ibragimova, Karakbayeva, Tekenova (2019), the significance of open public spaces, which comprise the city center, has sufficiently decreased since Almaty was a capital. The public space system, which has evolved in Almaty while it has been the capital of Kazakhstan (till 1998), includes public gardens, parks, and pedestrian streets. Their formation in the direction southward has been linked to the historical development of the capital’s center and has reflected the growing needs of the administrative apparatus and the capital city ambitions. It is argued that the inefficient use of open public spaces is a consequence of the general degradation of the city center’s environment. It is suggested that the danger for further Almaty urban system development is in the observed decentralization and the huge size of the existing city center.

The public transport system of the city provides transport communication between the districts for conducting labor, public, cultural, household trips of the population, in full compliance with the established standards, rules, and regulations for passenger transportation. It ensures the ultimate satisfaction of public demand in transport services.

To understand inclusive development, we should identify the categories of the population which are isolated, understand which processes they are isolated from, why, and how it happens (Ibragimova et al., 2019; Aubakirov, 2020). The residence, job, education, leisure, the ability to satisfy the cultural and educational needs are essential in human life. Currently, it is impossible to satisfy all these needs in one place, which makes it necessary to move around the city.

### **Responses to the Questionnaire**

The first question in the questionnaire was aimed to determine how the city residents define their places of residence. The respondents were asked to indicate the borders of their places of residence. Some respondents found it difficult to answer. Instead, they would more

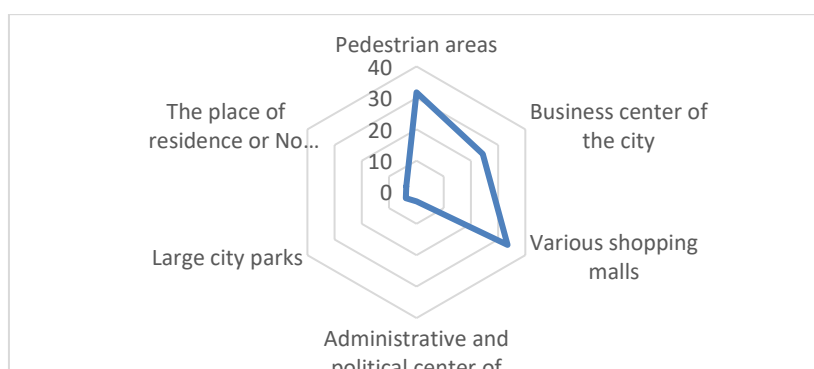
often name the intersection of streets, a point of interest, a park, or a large shopping mall located nearby, or some significant places in that part of the city.

Then we tried to identify the perception of the city center asking an open question, “What place in the city would you consider as the center?” The city residents most often named a shopping mall, an area with a universal market, the pedestrian areas, or the places of leisure and entertainment.

The answers of the respondents were divided into the following groups:

1. Shopping malls in various parts of the city – 33%. Physically, these new urban centers are located in different parts of the city but do not cover the entire city area.
2. Pedestrian areas, including the old city center and the area near the Yessentai river – 32%.
3. The business center of the city – 24%. Here, the respondents mainly named the streets, street intersections, or buildings associated with doing business. However, the named business center of the city occupied quite a small area. We assumed that the respondents who named the street intersections meant some large shopping mall in that corner. If the very shopping mall was named, we assigned the answer to Group 1.
4. The political and administrative center of the city – 3%.
5. Large city parks (there are only three of them) – 4%.
6. The place of residence or do not know – 4%.

Thus, the city residents identify three “centers” of the city, and the shopping malls are the most popular among them (Figure 3).



**Fig. 3:** Objects perceived by Almaty residents as city centers  
Source: Authors

The city passenger transport system is aimed at the complete satisfaction of the need for public transport. The residents mentioned the following types of transport they use daily to travel from the place of residence to the place of work/study: public transport – about 59%, private car, taxi or a passing car – 25%, mixed transport (taxi to a bus stop then public transport, or vice versa) – 2.5%.

It is revealed that Almaty residents usually spend more than 40 minutes to get to work from home (Table 1).

**Table 1:** Climate Data  
Source: Authors

How do you usually get to work	Mean	N	Std. Deviation
By public transport	43.19	157	31.908
By private car	36.48	44	21.743
By taxi	35.38	13	30.514
By a passing car	45.63	8	26.651
On a shuttle bus	28.00	50	21.830



By bicycle	30.00	4	20.412
On foot	38.88	276	28.909
Mixed (taxi/public)	43.19	157	31.908
Others	36.48	44	21.743
Total	35.38	13	30.514

**Table 2:** Places for purchasing daily consumption products  
Source: Authors

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	Near my place of residence	695	60.9	68.9	68.9
	Near my place of work	64	5.6	6.3	75.3
	I visit big shopping malls	97	8.5	9.6	84.9
	At the open/wholesale market	94	8.2	9.3	94.2
	Others	58	5.1	5.8	100.0
	Total	1008	88.3	100.0	
<b>Missing</b>	System	134	11.7		
<b>Total</b>		1142	100.0		

The respondents used to purchase non-food goods (clothing, shoes, etc.) in shopping malls – about 68%, at the open/wholesale markets – 18.1%, and online – 43.2%.

According to the results of correlation analysis, the likelihood of shopping online was related to such factors as the place of purchasing daily consumption products (Table 3). The possibility that peoples who prefer buying daily consumption products at the open market will not buy online was small. The gender difference was revealed: women were more likely to shop online. The revealed correlation was poor, but the significance value indicated a dependence between the variables and could represent certain trends.

**Table 3:** Correlations of different places of online purchasing  
Source: Authors

			Places of purchase	Online purchases	Gender	
<b>Spearman's rank correlation coefficient</b>	Places of purchase	Correlation	1.000	0.202*	-0.015	
		Coefficient				
		Sig. (2-tailed)		0.000	0.652	
			N	1008	546	941
	Online purchase	Correlation	0.202*	1.000	-0.246*	
		Coefficient				
		Sig. (2-tailed)	0.000		0.000	
			N	546	565	555
	Gender	Correlation	-0.015	-0.246*	1.000	
Coefficient						
Sig. (2-tailed)		0.652	0.000			
		N	941	555	1069	

Note: \* The correlation was significant at 0.01 (2-tailed)

The residents were asked to describe their area of residence using a suggested set of 40 positive and negative characteristics (20 of them describes the attractiveness of the place of residence for the respondent, and 20 – the disadvantages). The response analysis showed that the most advantageous characteristic was “Friendly place/people/neighbors” (12.4%, n=3247), followed by “The possibility of living in a private house,” “Generally comfortable, quiet area,” “Safe area for living,” “Good quality houses, many new buildings” (from 7.2% to 6.8%). Other positive characteristics were related to transport infrastructure and the place of work: “There is

subway line/a subway line under construction,” “A lot of potential jobs,” “The accessibility of public transport/bus stops” (from 5.2% to 4.8%).

The most common negative characteristic was “There is no place for leisure/entertainment” (12.8%). Then came “Poor social infrastructure (medical services, education, culture, etc.)” (9.1%) and “The absence of shopping malls, leisure centers, cinemas” (8.7%). The answers “The neighbors do not get along with each other/Strong division into the well-off and the poor,” “The area is not attractive,” “Poor ecology,” “Bus stops are far away/public transport does not go to our area, or only in a limited mode,” “Lack of pedestrian crossings, lack of traffic lights» scored from 6.8% to 5.6%. The respondents from the lower part of the city, distant from the center, also commented on the absence of public gardens, alleys, parks, fountains to cool this place in hot weather, and mentioned the migrants from rural areas and other regions. The large and needy families arriving from other regions in search of a job and a better life usually settle down in the suburbs, where the land is cheaper, and there is an opportunity to build at least a simple house from affordable materials.

A seller from a small shop selling daily consumption products to the residents of a micro-district commented on the peculiarities of the territories that recently joined the city,

*“Everyone comes here, both old residents and new ones. Often, the neighbors do not know each other well. New residents build large houses with high fences and isolate themselves from the others; they are more prosperous than the former settlers. »* The interviewers also mentioned this peculiarity, *«They would not let us in, and if we accidentally met the owners entering the own gates, they refused to talk to us. Nevertheless, later we realized that we could communicate with them at the small minimarkets near the house. The sellers of these stores knew everyone: when people return home and can visit the shop and who lives in which house and sometimes who has which business. It helped us a lot”.*

Source: The survey.

After the pilot study, the IT specialists developed the survey. Using GIS, they determined the number and location of such small corner shops and divided the sample population by district according to the number of such shops. It is noted that the neighborhood as a communicative factor plays an important role in describing the push-and-pull effects of the place of residence. Apart from the quantitative and qualitative parameters, a city is characterized by the social and spatial structure based on the city’s uniqueness, originality, and specific logic (Berking and Low, 2018).

Thus, all the hypotheses of the study are validated:

- Hypothesis 1: the city may need to invest in improving public transportation options to make commuting more efficient for residents, particularly those living in the suburbs. This could involve adding more routes, increasing frequency of service, or exploring alternative modes of transportation such as light rail or bus rapid transit.
- Hypothesis 2: local businesses in Almaty may benefit from leveraging the trust they have built with their customers to expand their product offerings beyond just food. This could help meet the needs of residents who may have limited access to other types of retail stores or online shopping options.
- Hypothesis 3: efforts could be made to improve internet connectivity and technology access in underserved areas, as well as working with online retailers to expand their delivery options. This could help increase the adoption and use of online services in these areas, potentially leading to greater economic opportunities and quality of life for residents.

## Conclusions

All three research hypotheses were validated. It was defined that the city's residents have varied perceptions of their places of residence and the center of the city, with shopping malls, pedestrian areas, and the business center all being identified as potential centers. This

suggests that the city's urban planning and development need to focus on creating cohesive and recognizable areas that residents can identify as centers or landmarks. It was established that the city's passenger transport system not providing comfortable access to places of work/study, particularly for residents living in the suburbs who spend more than an hour on the road. This highlights the need for investment in public transportation options, such as increasing frequency or adding alternative modes of transportation, to better serve these areas.

Finally, it was determined that the characteristics that residents value in their areas of residence include friendly people and neighbors, accessibility to transport infrastructure, and the possibility of living in a private house. Negative characteristics include the lack of leisure and entertainment options, poor social infrastructure, and limited green spaces. Addressing these concerns could improve residents' quality of life and make the city more attractive to new residents and businesses.

The issues of quality, quantity, and accessibility of services, such as the distance to bus stops, the time for access, and the time of waiting for public transport, remained outside the scope of this study. That is why, in further studies, it is suggested that they are raised.

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