

INFORMATION AND COMMUNICATIONS TECHNOLOGY
AND DISASTER RISK REDUCTION DIVISION

Infrastructure Corridor Development Series

Part I: In-Depth Analysis of Three Promising Infrastructure Corridors

Vadim Kaptur

Aida Karazhanova

ASIA-PACIFIC INFORMATION SUPERHIGHWAY
WORKING PAPER SERIES JUNE 2021



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Correspondence concerning this working paper should be addressed to the email:

escap-ids@un.org.

Contact:

Information and Communications Technology and Development Section
Information and Communications Technology and Disaster Risk Reduction Division
United Nations Economic and Social Commission for Asia and the Pacific
United Nations Building
Rajadamnern Nok Avenue
Bangkok 10200, Thailand
Email: escap-ids@un.org

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Please cite this paper as: Vadim Kaptur, Aida Karazhanova (2021). Infrastructure Corridor Series Part 1: In-depth Analysis of Three Promising Infrastructure Corridors. United Nations ESCAP, IDD, July 2021. Bangkok.

Available at: <http://www.unescap.org/kp>

About the author: Dr. Vadim Kaptur, ESCAP Consultant and Vice Rector of the A.S. Popov Odessa National Academy of Telecommunications (ONAT), Ukraine and Ms. Aida Karazhanova, Economic Affairs Officer of IDD, ESCAP

June 2021

Tracking number ESCAP / 5-WP / 13

Acknowledgements

Under the guidance of Tiziana Bonapace, Director, Information and Communications Technology and Disaster Risk Reduction Division (IDD) of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), the English and Russian versions of this Infrastructure Corridor Development Series were prepared by Vadym Kaptur, ESCAP Consultant and Vice Rector of the A.S. Popov Odessa National Academy of Telecommunications (ONAT), Ukraine Aida Karazhanova, Economic Affairs Officer of IDD, ESCAP.

Substantive comments were provided by Tae Hyung Kim, Chief, Information and Communications Technology and Development Section (IDS) of IDD and Elena Dyakonova of IDS, IDD. Christine Apikul reviewed and edited the English version of the series. Sakollerd Limkriangkrai of IDS, IDD provided administrative support and other necessary assistance to support the development of the series.

The ESCAP Secretariat expresses gratitude to the following scientific and technical consultants from A.S. Popov ONAT, Ukraine: Olena Kniazieva, Volodymir Baliar, Iryna Tymchenko, Elena Mazurkiewicz, Lubov Terletska, Tamara Kancur and Bohdana Yamniuk; to Bekhzod Rakhmatov of the Transport Division of ESCAP and to Anna Lobanova of Energy Division of ESCAP, who also provided substantive inputs to the documents in both languages.

Representatives of ministries, government agencies, public and private organizations, operators, and nominated entities working in the sectors of information and communications technology and telecommunications infrastructure, road and rail transport, electricity, and oil and gas pipelines from Kazakhstan, Kyrgyzstan and Mongolia reviewed this toolkit during a series of training workshops organized in May 2021 and were the first group to be trained on two web-based toolkits – the Infrastructure Corridor Simulator and the Partnership Portal on Co-deployment.

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Abstract

The Regional Economic Cooperation and Integration (RECI) initiative of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) aims to promote integrated markets for goods, services, information and capital; infrastructure connectivity; financial cooperation; and economic and technical cooperation through a multidimensional and multidisciplinary approach. Promoting seamless connectivity in transport, energy and information and communications technology (ICT) is a central pillar of the RECI initiative.

As part of the RECI initiative, ESCAP is implementing a United Nations Development Account (DA) Project on “Addressing the Transboundary Dimensions of the 2030 Agenda for Sustainable Development through RECI in Asia and the Pacific” from 2018 to 2021. This project aims to develop knowledge products such as analysis reports, and build capacity of member States in promoting seamless regional connectivity with a focus on the co-deployment of ICT, transport and energy infrastructures.

Following the recommendations to national capacity building workshops for policymakers of Kazakhstan, Kyrgyzstan, Mongolia, and subregional workshop for countries in East and North-East Asia in October-November 2019, this analysis report is aimed to enhance understanding for planning interstate infrastructure corridors. The scope of this report covers in-depth analysis of the co-deployment of ICT infrastructure along transport and energy infrastructure corridors and support identification of key needs and the selection of the priority projects.

In response to the needs of member States and considering the complex challenges of limited national and regional infrastructures, the key objectives of this research are to: (1) provide in-depth cross-sectoral analysis of three potential interstate infrastructure corridors in the target countries of the RECI project (Kazakhstan and Kyrgyzstan); (2) provide knowledge and capacity building in determining the most promising scenario for infrastructure corridor development; and (3) promote enabling environments for infrastructure corridor development in the modality of co-deployment of ICT, transport and energy infrastructures.

An integrated infrastructure corridor approach is used as an attractive smart solution to improve regional and transboundary connectivity by linking geographical territories with ICT, transport and energy components. An integrated infrastructure corridor means a high-tech transportation system integrated with a wide range of ICTs and energy to facilitate the flow of goods, services, knowledge and capital in a cost- and time-effective way towards achieving the 2030 Agenda for Sustainable Development.

This research paper is a part of the Infrastructure Corridor Development Series that supports decision makers and infrastructure owners in their decisions on the development of new infrastructure corridors. The Infrastructure Corridor Development Series consists of three main parts:

Part 1: An in-depth analysis of three promising infrastructure corridors.

Almaty (Kazakhstan) – Cholpon-Ata (Kyrgyzstan)

Semey (Kazakhstan) – Rubtsovsk (Russian Federation)

Urzhar (Kazakhstan) – Chuguchak (China)

Part 2: A toolkit for determining the most promising scenario for infrastructure corridor development.

Part 3: Calculation results for determining the most promising scenario for infrastructure corridor development.

This Part One paper presents an overview of the history of transport routes which can be the promising infrastructure corridors in the region; the geographic, sociodemographic and economic characteristics of the region; and the characteristics of existing infrastructures in the region. The challenges and opportunities for each corridor development are analysed, and the best options for forming partnerships are determined by using the paired comparison method,.

Key findings and outcomes from part one include the following:

- The Semey–Rubtsovsk and Urzhar–Chuguchak corridors have the greatest macroeconomic significance. The Almaty–Cholpon-Ata corridor has mainly regional significance, and is strategically important for subregional development and cooperation with other North and Central Asian countries, especially for economic development and tourism.
- The main beneficiaries of infrastructure corridor development are entities that rely on optimal routes for freight and passenger traffic. Businesses and residents located in corridor territories also benefit economically from the development of infrastructure corridors (both for business development and for personal mobility).
- Factors affecting infrastructure corridor development include environmental factors (e.g., presence of protected areas for wildlife and high-risk zones), social factors (e.g., labour migration and the exploitation of migrant workers), and political factors (e.g., domestic and foreign policies of the participating countries).
- The main risks common to all corridors are the difficulties in forecasting traffic volumes, the COVID-19 pandemic and related restrictions for border crossings and labour migration, and the economic crisis.
- The potential capacity to finance the development of infrastructure corridors is largely unequal among the participating countries. China and the Russian Federation possess much wider opportunities and capacity to finance the development of infrastructure corridors, compared with Kazakhstan and Kyrgyzstan.

Keywords

Broadband access: Wide bandwidth data transmission that transports multiple signals and traffic types within access network. The medium can be coaxial cable, optical fibre, radio or twisted pair (source: <https://www.wikipedia.org>).

Broadband Internet access: Internet access with a bit rate exceeding the maximum possible bit rate for modem dial-up connection via a public telephone network. It is carried out using wired, fibre-optic and wireless communications lines of various types (source: <https://www.wikipedia.org>).

Co-deployment (infrastructure): The simultaneous deployment of cable ducts and/or fibre-optic cables during the construction of infrastructure such as new roads, highways, railways, power transmission lines and oil/gas pipelines (source: <https://www.unescap.org>).

Electricity infrastructure / electrical grid: An integrated network for delivering electricity from supplier to consumers (source: <https://www.wikipedia.org>).

Energy infrastructure: An organizational structure that allows large-scale transmission of energy from supplier to consumer, as well as directs and controls energy flow. It includes, but is not limited to, the oil and gas transportation infrastructure and the electricity transportation infrastructure (source: <https://www.designingbuildings.co.uk>).

Fibre-optic communications line: A fibre-optic system consisting of passive and active elements, designed to transmit information in the optical range (source: <https://www.wikipedia.org>).

ICT infrastructure: The information and communications technology (ICT) infrastructure and systems, including software, hardware, networks and websites (source: <https://www.lawinsider.com>).

Infrastructure corridor: A high-tech transportation system integrated with a wide range of ICTs to facilitate the flow of goods, services, knowledge and capital in a cost- and time-effective way towards achieving the 2030 Agenda for Sustainable Development (source: <https://www.unescap.org>).

Infrastructure sharing: The sharing of real estate and fixed assets, including land, conduits, ducts, manholes and handholes, base station sites, AC networks, trunk lines, radio links, and other resources to avoid infrastructure duplication and reduce costs (source: author).

Internet access: The ability of individuals and organizations to connect to the Internet using computer terminals, computers and other devices; and to access services such as email and the World Wide Web (source: <https://www.wikipedia.org>).

Road transport infrastructure: The road network and associated physical infrastructure, such as road signs, roadway lighting and petrol stations (source: <https://iea-etsap.org>).

Transport corridor: A linear area that is defined by one or more modes of transport, such as roads, railways or public transport that share a common route (source: <https://www.wikipedia.org>).

Abbreviations and Acronyms

AP-IS	Asia-Pacific Information Superhighway
CICTSTI	Committee on Information and Communications Technology, Science, Technology and Innovation
CNY	Chinese Yuan
ESCAP	Economic and Social Commission for Asia and the Pacific
EUR	Euro
GDP	Gross Domestic Product
GRP	Gross Regional Product
GW	Gigawatt
ICT	Information and Communications Technology
IDD	Information and Communications Technology and Disaster Risk Reduction Division
KGS	Kyrgyzstani Som
KPI	Key Performance Indicator
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt-hour
KZT	Kazakhstani Tenge
Mbps	Megabit per Second
OBOR	One Belt One Road
ONAT	Odessa National Academy of Telecommunications
PPP	Public-Private Partnership
RECI	Regional Economic Cooperation and Integration
SWOT	Strengths, Weaknesses, Opportunities and Threats
USD	United States Dollar

1. Introduction

Infrastructure corridors have contributed to enhanced economic and social ties across countries and states, and promoted intercivilizational expansion and intercultural interactions. The utilization of compatible transport technologies for integrating national and global transport systems has enhanced international cooperation, which in turn has led to the further development of infrastructure corridors along the most significant freight and passenger routes.

An infrastructure corridor is defined as a high-tech transportation system integrated with a wide range of information and communications technologies (ICTs) to facilitate the flow of goods, services, knowledge and capital in a cost- and time-effective way towards achieving the 2030 Agenda for Sustainable Development.² The tasks of forming and maintaining infrastructure corridors include the use of ICTs for:³

- Coordination in forming and maintaining the transport and logistics infrastructure of the participating countries to ensure unobstructed movement of passengers and goods across national borders;
- Effective interaction between various types of transport;
- Optimization of the transportation processes and improvement of the quality of logistics services;
- Reduction in the share of transport and logistics expenses in final product cost and, as a result, in price;
- Increasing population mobility including tourist flows, medical tourism, and students and teaching staff mobility; and

- Development of cross-border cooperation, exploration of new territories and new trade markets, and strengthening of cultural ties.

The process of infrastructure corridor development requires cooperation among participating countries in the financing, development of technologies, planning of logistics routes, and harmonization of customs rules and other regulations and policies. Asian countries, including China, are implementing the largest transport corridor called "One Belt One Road" (OBOR), bringing together 125 countries and 29 international organizations that have signed 173 cooperation agreements.⁴

In the first four months of 2020 alone, the foreign trade turnover between China and the countries along the OBOR reached CNY2.76 trillion, which corresponds to an increase of 0.9 per cent in annual terms. Moreover, in the first four months of 2020, Chinese businesses invested USD4.2 billion in 52 countries that are participating in OBOR, which is 11.7 per cent more compared to the same period of 2019.⁵ The OBOR is expected to form a global infrastructure of trade routes uniting two other transport corridors, namely the "Silk Road Economic Belt" and "21st Century Maritime Silk Road".

The Silk Road Economic Belt comprises the following routes:

- From China to Europe (Baltic Sea) through Central Asia and the Russian Federation;

² Сущность и иерархия понятия международный транспортный коридор. Available at <https://cyberleninka.ru/article/n/suschnost-i-ierarhiya-ponyatiya-mezhdunarodnyy-transportnyy-koridor/viewer>.

³ Logistics and cargo transportation systems: Handbook for students of High Schools / V. I. Apatsev, S. B. Levin, V. M. Nikolashin and others; Ed. V.M. Nikolashin. М.: Publishing Center "Academy", 2003. S. 55.

⁴ Один пояс и один путь. Available at <https://ru.wikipedia.org/>.

⁵ Страны партнёры вместе строят "Шёлковый путь здоровья". Available at <https://rg.ru/2020/05/25/odin-poyas-odin-put-stimuliruet-razvitie-mirovoj-ekonomiki.html>.

- From China to the Persian Gulf and the Mediterranean Sea through Central and Western Asia; and
- From China to South-East Asia, South Asia and the Indian Ocean.

The 21st Century Maritime Silk Road comprises the following routes:

- From the seaports of China through the South China Sea to the Indian Ocean and to Europe; and
- From Chinese ports across the South China Sea to the southern Pacific Ocean.

Another transport corridor is the Baku–Tbilisi–Kars railway and the Baku–Batumi highway in the South Caucasus that continues in Central Asia as the Aktau–Dostyk railway and the Aktau–Khorgos highway within the framework of the Western Europe–Western China road connection in Kazakhstan. There is also the road infrastructure connecting the port of Turkmenbashi in Turkmenistan with transport lines in Uzbekistan and neighbouring countries.

Some potential infrastructure corridors include the following:

- International corridors for economic cooperation, e.g., China–Mongolia–Russian Federation, China–Central Asia–Western Asia, China–Indochina, China–Pakistan and Bangladesh–India–Myanmar–China;
- An alternative route within the East–West Railway Corridor that allows the transport of goods from the southern regions of China to Europe through Kyrgyzstan, Uzbekistan, Turkmenistan and further through Azerbaijan. An important component of this corridor is the Trans-Caspian International Transport Route;
- The Lazurit Project⁶ (Afghanistan–Turkmenistan–Azerbaijan–Georgia–Turkey) aimed at land and marine transport development; and

- The Caspian Sea–Black Sea Corridor, which is expected to ensure cross-border traffic over sea, rivers, roads and rails between Central and Northern Europe, the South Caucasus and Central Asia.

The key challenges in developing infrastructure corridors include the following:

- Harmonizing the regulatory and legal framework of participating countries;
- Complex procedures for joining the infrastructure corridor, preventing its growth.
- Different levels of technological readiness of participating countries (e.g., in some post-Soviet countries, infrastructure assets have depreciated by 80 per cent);
- Different principles, approaches and methods in the management of state infrastructural projects in participating countries;
- The high risks involved, including: the risk of inadequate throughput and its synchronization, especially when crossing borders; the risk of insufficient income for participating countries or excessive expenses due to poor planning of incomes and expenses; the risk of infrastructure corridor monopolization; geopolitical risks (e.g., sanctions and ethnic conflicts); social risks (e.g., lack of qualified labour resources); and the risk of the infrastructure corridor losing its strategic advantage for a participating country or for the entire chain of participants;
- Difficulties in financing in terms of allocating budget or attracting investors, especially when the infrastructure corridor runs through federal lands, provinces, territories or municipalities;
- Difficulties in attracting the interests of more influential participating countries;
- The need for all participating countries to commit to personal and anti-terrorist safety and security, environmental friendliness, energy efficiency, and

⁶ Transport Corridors of Central Asia, “Turkmenistan implements projects to develop transport logistics”, 9 April

2019. Available at http://transport-koridori.blogspot.com/2019/04/blog-post_29.html.

- measures to prevent smuggling and trafficking; and
- Uncertainty of development trends in global and national markets, including tourist flows due to the COVID-19 pandemic.

The most promising areas for infrastructure corridor development include multimodal systems, which allow the effective integration of organizational, technical, economic and other aspects of rail, sea, river and road transport to ensure seamless transport management. Multimodal transportation is a priority for the world transport policy of our time, since it enables modal interoperability and integration at the regional, national and international levels, and thus, enhances overall systems efficiency.

The basic conceptual foundations for multimodal infrastructure corridor development include the following:

- Application of ICTs to ensure optimal interaction between system elements and convenient consumer interfaces;
- Environmental awareness and responsibility of multimodal transportation participants;
- Adoption of an integrated approach, which implies international coordination and throughput growth over the internal (domestic) and external (transboundary) lines of multimodal transportation;
- Stimulation of a high level of employment (social aspect) while ensuring implementation of the latest technological solutions (technical aspect);
- Balanced development of all the elements of the multimodal infrastructure corridor to ensure the most effective utilization of their potential, along with optimal business models for each specific element; and
- Systematic planning, which guarantees equal involvement of all the elements of

the multimodal infrastructure corridor in the development processes (in proportion to their capabilities).

Another promising direction for infrastructure corridor development is the co-deployment and operation of the ICT, road transport and energy⁷ infrastructures. The economic benefits and efficient use of limited resources are the main factors driving the co-deployment and operation of infrastructures. However, key obstacles to the co-deployment and operation of infrastructures is the lack of coordination between regulators of different sectors for large infrastructure projects that are underway, and the lack of intersectoral national and international government policies related to access and sharing of infrastructures.

To address the obstacles to co-deployment, the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) secretariat is taking many significant steps to develop human capital, including the creation of useful knowledge products and tools, such as the in-depth national studies on the co-deployment of ICT infrastructure along transport and energy infrastructures in Kazakhstan and Kyrgyzstan. Based on these studies, a capacity building toolkit was developed that provides methodologies, training packets and tools for planning and implementing the co-deployment.⁸ These knowledge products and tools aim to create an enabling environment for the co-deployment of ICT, transport and energy infrastructures.

In Kazakhstan, one of the strategic directions for economic development is to “identify needs and projects for the co-deployment of ICT infrastructure along with transport and energy infrastructures”. In an ESCAP meeting held with experts in Almaty, Kazakhstan on 24-25 October 2019, participants proposed to analyse the following three interstate corridors:

⁷ More information on the strategic plans for energy sector development is available at <https://asiapacificenergy.org/> and <https://www.unescap.org/resources/policy-perspectives-2019-sustainable-energy-asia-and-pacific>.

⁸ All the resources can be found at: https://www.unescap.org/kp?f%5B0%5D=kp_programme_of_work_facet%3A284.

1. Almaty (Kazakhstan) – Cholpon-Ata (Kyrgyzstan);
2. Semey (Kazakhstan) – Rubtsovsk (Russian Federation); and
3. Urzhar (Kazakhstan) – Chuguchak (China).

This proposal was supported by participants from multiple ESCAP events. In particular, at the online meeting on "E-resilience for Pandemic Recovery: Intercountry Consultations in Preparation for the Committee on ICT, Science, Technology and Innovation (CICTSTI)" that was held on 3 July 2020, participants recommended research on the costs and benefits of developing and digitalizing the above three corridors. It was further recommended that the research include: (1) a simulation model designed to determine the development scenario for digitalized transport corridors; and (2) more accurate quantification of the

economic and social benefits resulting from the development of these corridors.

Subsequently, members of the United Nations Special Programme for the Economies of Central Asia Working Group on Innovation and Technologies for Sustainable Development, which met on 30 July 2020, requested the ESCAP secretariat to develop a unified information platform with automation and modelling modules to determine the compatibility and cost-effectiveness of infrastructure projects that are suitable for ICT deployment in infrastructure corridors.

These ideas and recommendations for research were presented at the fourth session of the Asia-Pacific Information Superhighway Steering Committee on 11 August 2020, as well as at the third session of the CICTSTI on 19-20 August 2020.

2. Almaty (Kazakhstan) – Cholpon-Ata (Kyrgyzstan) Corridor

2.1 Transport History

The journey by road from Kazakhstan to Issyk-Kul, a major tourist destination in Kyrgyzstan, takes seven to eight hours. The optimal route is to take the Almaty–Bishkek highway (about four to five hours), and then from the capital of Kyrgyzstan to the Cholpon-Ata resort (about three to four hours). The length of the route is 454.5km with an estimated travel time of 6 hours 35 minutes by the A-2 and A365 highways, or 470km with an estimated travel time of 7 hours and 3 minutes by the A363 highway.⁹ However, when taking into account the need for stops, the journey takes about eight hours. Considering the rather high average temperature in summer of 32°C, the long drive hampers the growth of tourism in this region.

The need to build alternative roads for a shorter route has been raised since 2007. At that time, negotiations took place between representatives of the ministries of transport and communications of Kazakhstan and Kyrgyzstan with the involvement of the

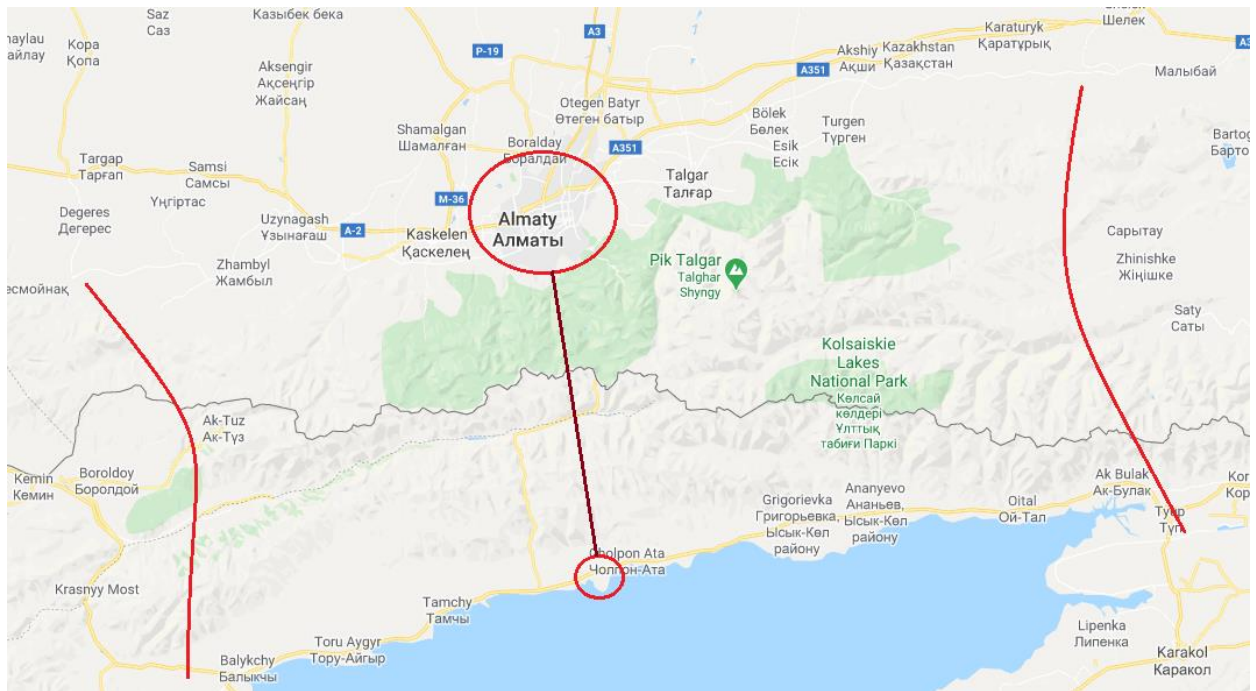
European Bank for Reconstruction and Development. Possible routes and mechanisms to finance them were discussed. However, negotiations and subsequent design activities were suspended due to the global economic crisis in 2008.

Another significant problem is that along the proposed route on the border of Kazakhstan and Kyrgyzstan, there was a storage of liquid radioactive waste from the Ak-Tuz uranium mine during the Soviet period. The earthquake in December 1964 destroyed the dam around the storage, which resulted in about 680,000m³ of hazardous waste dumped into the Kichi-Kemin River over a distance of 40km or more. The waste covered the lands, gardens and orchards in the form of mudflow deposits that were 5-60cm thick. The danger has not yet been completely eliminated. The waste still partially poses a threat to the health of the people living in the lower reaches of the river in the Kyrgyz villages of Ilyichevskoye, Dzhany-Dzhol, Kichi-Kemin, Boroldoy, Mikhailovka and Enbek (Kazakhstan).¹⁰

⁹ Routes between Almaty, Kazakhstan and Cholpon-Ata, Kyrgyzstan. Available at <https://www.google.com/maps/>.

¹⁰ Новости inform-бюро. Available at <https://informburo.kz/stati/-masimov-proshyol-po-radioaktivnoy-doroge-do-issyk-kulya-8832.html>.

Figure 1: Area suitable for deploying the Almaty–Cholpon-Ata corridor



The radioactive waste situation was assessed in 2009 as part of a project, and four possible cross-border transport routes were proposed. These are in chronological order:

1. Almaty–Uzanagash–Bystrovka–Balykchi–Cholpon-Ata (280km) – It was planned that most of this new road would be built by Kazakhstan. Kyrgyzstan had to construct 1.5km of highway from the border to Kemin and a bridge over the Chu River. According to preliminary calculations, this project required about USD5 million.
2. Almaty–Cholpon-Ata through the Ile-Alatau National Park. This project was abandoned due to the possible environmental impact on the National Park.
3. Almaty–Kaskelen–Kemin–Cholpon-Ata (117km) – In 2006, representatives of Erkin TransService LLP (affiliated with Erkin Motors LLP) were ready to invest USD30 million in the project.¹¹ A permit was obtained to construct the Chyrpykty–Chon-Kemin–Kaskelen road. According to the statements of the involved parties

made in 2008, the construction of the highway on the territory of Kazakhstan was 70 per cent complete. Later, Erkin Motors LLP turned out to be a rogue company and by 2011 it was declared inactive. It became public that the money allocated for the construction of the road was spent on other projects, including the construction of the Western Europe–Western China highway and the development of international transit corridors. The official announcement on the incompleteness of the project explained that the construction of roads in the permafrost zone could lead to harmful consequences for the environment, and it was also practically impossible given the technologies available in the region. The project was paused due to the global economic crisis that hit the economy of Kazakhstan.

4. Almaty–Kegen–Tyup – This project is the last in the list and so far it remains the most attractive because the route from Almaty to Kegen already exists, as well as the road from Kegen to the Kazakh–Kyrgyz border and further to the village of

¹¹ Строительство трассы Алматы – Иссык-Куль отложили до 2015 года. Available at

<https://www.zakon.kz/4564668-stroitelstvo-trassy-almaty-issyk-kul.html>.

Sary-Tologoy in the Tyup district.¹² Only a 76km segment of the Kegen–Tyup road remains unfinished.

2.2 Geographic and Sociodemographic Characteristics of the Region

The main challenge of the Almaty–Cholpon-Ata corridor construction is the high-altitude terrain (through mountain saddle and permafrost areas), which requires special equipment and technologies, and significantly increases construction costs. Moreover, segments of the route may pass through protected areas for wildlife, which requires additional expertise.

The starting point of the corridor is Almaty, a large city in Kazakhstan with a population of 1,916,822 people in 2020. It is a large transport hub with buses, trolleybuses, fixed-route taxis, railways (two railway stations: Almaty-1 and Almaty-2), highways, three subway lines and an airport. There are large enterprises in the city, including carpet factories, cotton mills, sewing and haberdashery factories, and heavy machine building plants.

The end point of the corridor is Cholpon-Ata, a large tourist centre of Kyrgyzstan. The transport infrastructure there is represented by local wheel transport, including horse-drawn ones. There are 12,500 people living in the town. However, in the summer months, the population of the city increases significantly due to the tourists heading to Issyk-Kul from other regions of Kyrgyzstan and from other countries (primarily from Kazakhstan and the Russian Federation). Due to the small local population, a lack of funding from the state budget and other factors, the infrastructure of the town is underdeveloped and requires significant investments.

Issyk-Kul has many sanatorium and resort facilities and attracts restaurant and hotel businesses. However, statistical data of tourism activities in Kyrgyzstan indicates that the tourism potential is not fully utilized (Table 1). For example, of the 1.4 million tourists that visit Issyk-Kul, only 0.9 million stay near Issyk-Kul.

In Kyrgyzstan, the number of tourism-associated businesses has been increasing by 2.7 per cent in recent years, while the share of income from tourism in gross domestic product (GDP) has been increasing by 4 per cent. Investments in tourism increased by 5 per cent, while tourism revenues increased by 1.8 per cent. This means investments have not brought expected revenues. As a result, people spend twice more money on trips abroad compared to domestic tours.

In Kazakhstan, there are about 8.5 million tourists annually, and the tourism business forms 9.6 per cent of GDP. The main tourist centres are its capital city, Nur-Sultan (where tourism is combined with business trips) and Almaty (with visits to the Ile-Alatau National Park and the Issyk-Kul Lake for recreation).

Generally, tourist services for both domestic and foreign tourists is much more developed in Kazakhstan than Kyrgyzstan. The strong point of tourism in Kazakhstan is its domestic market, while in Kyrgyzstan tourism is mostly inbound (from other countries). Despite the existence of various types of public and private transport services (railways, roads, airports, buses and taxis) and sufficiently high-quality roads of international importance, the effective functioning of the Almaty–Cholpon-Ata corridor could be hindered by the topography of both countries, especially the presence of mountainous areas.

¹² Через Кеген быстрее. Available at <https://rg.ru/2018/12/05/v-2019-m-nachnutsia-raboty-na-trasse-mezhdu-kirgiziej-i-kazahstanom.html>.

Table 1: Core indicators of tourism development in

Indicators	2018	2019
The number of registered economic entities related to tourism (thousand units)	111.3	114.2
Among them, entities providing recreation and recovery services (thousand units)	12.6	13.4
Tourism gross value added (KGS million)	28,720.5	30,389.5
Tourism gross value added (% of GDP)	5.0	5.2
Manufacturing of industrial products that contribute to the development of tourism business (KGS million)	883.1	823.2
Fixed investment in tourism (KGS million)	25,757.4	27,223.0
Income received from the transportation of tourists by all types of transport (KGS million)	10,485.8	10,683.2
Tourism retail trade turnover (KGS million)	21,843.6	23,786.0
Turnover of restaurants, bars, canteens and other enterprises for delivering ready meals (KGS million)	12,333.4	13,310.7
Market-related services to the public (KGS million)		
Travel agency services	1,794.6	1,806.6
Sanatorium and spa services	703.9	730.4
Hotel services for tourist accommodation	3,277.4	3,361.0
Export of tourism services (income from admission of foreign citizens) (USD million)	453.4	613.1
Import of tourism services (expenses of Kyrgyzstan citizens abroad) (USD million)	275.5	379.8

Source: National Statistical Committee of the Kyrgyz Republic. Available at <http://www.stat.kg/>.

2.3 Economic Characteristics of the Region

The economic characteristics of the region around the Almaty–Cholpon-Ata corridor are rather uneven. In the areas that belong to Kazakhstan, there are 396 enterprises and industries that represent more than 25 per cent of all enterprises in the country. These enterprises employ 22,500 people, and the average monthly nominal salary of residents in the region is KZT98,360 (above the national average). The profitability of industrial production in the region is 145 per cent (the highest in the country).¹³

This region in Kazakhstan produces oil and natural gas, and specializes in the extractive industry. The largest enterprises in the region are:

- LLP Zhaikmunay (Nostrum Oil & Gas LP) – An exploration and production oil company;
- Karachaganak Petroleum Operating B.V. (Kazakhstan branch) – A consortium of companies that is jointly implementing the Karachaganak Oil Project;
- LUCOIL overseas Karachaganak B.V. – The Russian OJSC LUCOIL oil and gas company branch;
- JSC Kondensat – An enterprise for the processing of unstable gas condensate, and the production and sale of petroleum products;
- Chevron International Petroleum Company (Kazakhstan branch) – A

¹³ Промышленная карта Казахстана: западные регионы. Available at

https://vlast.kz/jekonomika/promyshlennaja_karta_kazahstana_zapadnye_regiony-9846.html.

- company that conducts exploration and produces crude petroleum; and
- A large sausage factory.

Tourism in this region in Kazakhstan is undeveloped. However, there are tourist flows in the direction of Ile-Alatau National Park and the Almaty mountain cluster.

In the areas that belong to Kyrgyzstan, the level of development is lower compared to Kazakhstan. The extractive industry is only 6 per cent of all industries, and the largest gross income is brought by manufacturing industries that make up 40 per cent of all industries. The production of food and beverages is developing, while tourism generates negligible income despite the presence of a significant number of tourist sites around the Issyk-Kul Lake.

The share of profitable enterprises in Kyrgyzstan is 37 per cent, while the share of unprofitable enterprises is 23 per cent.¹⁴ Most of the losses are from enterprises in Jalal-Abad, Talas and Batken regions. The Bishkek and Issyk-Kul regions bring the greatest profits.

The standard of living between the areas in Kazakhstan and Kyrgyzstan along the Almaty–Cholpon-Ata corridor differs significantly. While the average wage in Almaty is KZT248,700 (USD600), and in the region, KZT150,500 (USD365),¹⁵ the average wage in Cholpon-Ata is KGS14,600 (USD210), and in the country, KGS15,200 (USD218).¹⁶

Due to significant differences in the level and quality of life, the average educational level at the final points of the route also differs, which may result in labour migration between the countries.

¹⁴ Kaktus-Media. Available at https://kaktus.media/doc/399275_vse_chno_nyjno_znat_o_promyshlennosti_ona_est_v_kyrgyzstane_glavnye_cifry_vidео.html.

¹⁵ Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, Bureau of National Statistics. Available at <https://stat.gov.kz/>.

2.4 Characteristics of Existing Infrastructure in the Region

The development of the transport, energy and ICT infrastructures in the region around the Almaty–Cholpon-Ata corridor is unequal.

2.4.1 Transport Infrastructure

On the Kazakhstan side, there are highways between Astana and Shchuchinsk: Almaty–Nur-Sultan–Kostanay with access to Chelyabinsk; Almaty–Petropavlovsk with access to Omsk; Almaty–Semey–Pavlodar with access to Omsk; Almaty–Shymkent with access to Tashkent; and Shymkent–Aktobe–Uralsk with access to Samara.

There are two railway stations in the city of Almaty: Almaty-1 is a transit station on the way from the Siberian regions of the Russian Federation to Central Asia; and Almaty-2 is a city station. There is a modern international airport and the Boraldai airport for local flights on the administrative territory of Almaty.

On the Kyrgyzstan side, there is a 570km E010 highway going through the Tien Shan, Fergana and Chuy valleys.¹⁷ Cholpon-Ata is adjacent to two actively developing villages of Kara-Oy and Bosteri, and is connected with them by highways. At present, almost all major roads have been rehabilitated using international banks loans. In high-altitude conditions, however, road maintenance and traffic safety during winter is a particular problem. Thus, in addition to road rehabilitation work, the road maintenance service of Kyrgyzstan that unites nine road departments is responsible for ensuring traffic safety along the entire network of roads.

Although there are transport routes in both Kazakhstan and Kyrgyzstan sides, road

¹⁶ National Statistical Committee of the Kyrgyz Republic, “Wages”. Available at <http://www.stat.kg/ru/statistics/trud-i-zarabotnaya-plata/>.

¹⁷ Транспорт в Киргизии. Available at <https://ru.wikipedia.org/>.

conditions are generally poor in Kyrgyzstan. In Kazakhstan, there are well-developed alternatives to road transportation, by air (both local and international) and rail. A common challenge for both sides is the availability and safety of roads in the mountainous regions. Thus, in the development of the infrastructure corridor, it would be necessary to ensure traffic safety on international highways.

2.4.2 Energy Infrastructure

In Kazakhstan, the energy infrastructure is provided by LLP AlmatyEnergoSbyt, which is the legal successor of JSC Almaty Power Consolidated. According to the country's legislation, LLP AlmatyEnergoSbyt has the status of "last-resort" supplier in the territory of the city of Almaty and the region of Almaty. The main activity of LLP AlmatyEnergoSbyt is the purchase of electricity in the wholesale and retail electricity markets for its subsequent sale in the retail electricity market to consumers. The company provides services throughout the region.

In 2016, in the city of Almaty and the Almaty region, a large-scale programme was launched to develop automated systems for commercial accounting of electric energy. Since 2018, within the framework of the Digital Kazakhstan Programme and the World Bank's Doing Business rating, a system of electronic signing of power supply contracts has been introduced through the corporate website of LLP AlmatyEnergoSbyt. Until a certain period, the price of electricity for consumers was lower than the prime cost, but recently, there has been both an increase in prices and a differentiation in consumption volumes by introducing a consumption rate per person, which are affecting energy access in Kazakhstan.

In Kyrgyzstan, power supply to the region is mostly provided by OJSC Natsionalnaya Energeticheskaya Kholdingovaya Kompaniya. In recent years, the company

has carried out an inspection of power lines and transformer substations on site and implemented several initiatives:¹⁸

Reconstruction of the 110kV Grigorievka substation, supplying power to the Kyrchyn Gorge; Preparation of the 110kV reserve Ananyevo substation; and Day-and-night duty at the 110kV Cholpon-Ata substation.

The energy infrastructure of Kyrgyzstan is in a state of modernization and reconstruction, and does not guarantee a regular and reliable supply of electricity to consumers at a constant voltage level. In 2018, for example, the malfunction of one of the consumer transformer substations resulted in a major emergency power network shutdown in the Kyrchyn Gorge.

2.4.3 ICT infrastructure

In Kazakhstan, revenues from telecommunications services have been increasing at an average rate of 4-5 per cent annually. Due to the growth of mobile telephony, fixed telephone services are gradually losing revenues by 6 per cent annually. In the region, there are 1.5 SIM cards per inhabitant due to the waning trend of using two SIM cards. This no longer makes sense since customers are now offered integrated service packages that allow calls across the networks, and provide Internet access and other services. As a result, mobile data transmission is showing high growth. In Kazakhstan, more than half of the investments in telecommunications development are in the city of Almaty (52 per cent). Investments in other regions are significantly lower (e.g., 22 per cent in Nur-Sultan and 4 per cent in South Kazakhstan).¹⁹

In Kyrgyzstan, the telecommunications infrastructure of Cholpon-Ata is represented by fixed-line communications, dominated by the state company, OJSC Kyrgyztelecom. An alternative operator is CJSC Saima

¹⁸ Национальный энергохолдинг. Available at <http://www.energo.gov.kg/content/page/74-investicionnye-proekty>.

¹⁹ Телекоммуникационная отрасль Республики Казахстан. Available at https://kase.kz/files/presentations/ru/KASE_telecommunications.pdf.

Telecom, which focuses on the cities of Bishkek and Chui. The mobile penetration rate in the region is 97.5 per cent. Some non-mobile companies provide mobile Internet services based on Long-Term Evolution or LTE (Saima Telecom) and Worldwide Interoperability for Microwave Access or WiMAX (MaxLink) technologies. Their coverage is limited to large cities such as Bishkek, Osh, Jalalabad, Karakol and Cholpon-Ata. The target users are those who do not have access to fixed-line infrastructure.

Just over half of the region's population in Kyrgyzstan regularly use the Internet. A large share of traffic until 2015 passed through Kazakhstan, making Kyrgyzstan almost completely dependent on Kazakhstan for Internet access. However, the laying of fibre-optic cable in the southern regions of the country allowed Kyrgyzstan to become a transit country between China and Tajikistan

in terms of Internet traffic. Overall, the ICT infrastructure in Kyrgyzstan requires significant development, especially in increasing access to the Internet and mobile services in regions not covered by fixed telephony.

2.5 Challenges and Opportunities in the Construction of the Almaty–Cholpon-Ata Corridor

Based on the characteristics described above, the construction of the Almaty–Cholpon-Ata corridor provides an opportunity to modernize the energy and ICT infrastructures in Kyrgyzstan, as well as coordinate and harmonize the energy pricing policy in the region (in case of a significant difference in tariff rates). A summary of the opportunities and issues to consider is given in Table 2.

Table 2: Opportunities and challenges in the construction of the Almaty–Cholpon-Ata corridor

Parameters	Kazakhstan (KZ)	Kyrgyzstan (KG)	Opportunities	Challenges
Form of government	Presidential republic	Mixed government	Cross-country cooperation development	Political instability and change of geopolitical landmarks
GDP per capita (USD in 2019)	9,139	5,471	Mutually beneficial development and GDP growth due to the functioning of corridor	Inconsistency of investment opportunities, high maintenance cost for KG and maintenance of the required quality level of corridor
Average wage (USD)	483	218	Growth of wages in both regions	Limited demand from KG
Economic orientation	Domestic demand and international cooperation	Internal and external demand, and raw material base	Formation of a mutually beneficial corridor	Resource depletion in KG by external residents
Dependence on international financial	Dependence on external demand for oil, gas and	Significant dependence on loans from China,	Decrease in credit dependence in KG, and increase in the	Lack of interest of KG creditors in corridor

institutions and loans	other natural resources	USA and the Russian Federation	independence of KZ	development could lead to financial and political problems
Disunity of territories and industrial centres	High	High	Localization of businesses in the region	Isolation of corridor from industrial and financial centres, and indirect transit
Priority mode of transport, and condition of rolling stock and roads	Road and rail are mostly good	Roads unsatisfactory	Improvement of indicators for the state of transport	Wear of roads and rolling stock in KG requires significant investments
Primary audience	Internal	External	Attraction of external audience for KZ and internal audience for KG	The need to create incentives to expand the target audience, including those abroad
Main beneficiaries	National tourism	Local businesses	Development of tourist zone and expansion of other types of businesses	Inconsistency in the quality of services in KG, and pollution of the Issyk-Kul Lake (in the case of growth of industrial enterprises in KZ)
Possible obstacles	Priority of foreign tourism and high requirements for service quality	Low level of service quality and difficulties with financing	Development of regional tourism and business partnerships in the region, and formation of a tourism cluster	Difficulties with financing, and topographic challenges in corridor construction
Basic risks	Lack of expected benefits due to lower (compared to expected) traffic volumes	Insufficient volume of tourist and business flows due to the low quality of services provided locally	Formation of a unified approach in the development of corridor and adjacent territories, and development of uniform quality standards	Lack of skilled labour and political will, and external influence and lobbying of alternative projects

From the analysis provided in this section, the countries participating in the Almaty–Cholpon-Ata corridor have quite different financial, technological and socioeconomic basis. But since both countries do not have access to the open sea and Issyk-Kul Lake is the only alternative to sea tourism, the construction of the Almaty–Cholpon-Ata corridor could increase the flow of tourists by up to 60 per cent, according to experts.²⁰

Thus, the Almaty–Cholpon-Ata corridor is of social and economic importance for both countries. It could enhance tourism and the economic potential of the region. It could

contribute to the development of business partnerships between Kazakhstan and Kyrgyzstan, as well as with other countries. It could also reduce the unemployment rate in the region, and increase the performance of economic and social indicators (e.g., development of telecommunications, education and health services, and businesses). At the same time, it is necessary to take measures to prevent negative environmental consequences from the intensification of traffic and an increase in tourist flows in the recreation zones of Issyk-Kul and adjacent territories.

²⁰ Дорога Алматы – Иссык-Куль. Available at <https://kloop.kg/blog/2014/10/15/doroga-almaty-issyk-kul-pohoronennyj-proekt-na-milliony/>.

3. Urzhar (Kazakhstan) – Chuguchak (China) Corridor

3.1. Transport History

Until the 19th century, economic cooperation between China and Kazakhstan was mostly episodic and was represented by the local population caravan trade. The Treaty of Kulja in 1851 increased the trading of tea, sugar and silk between Kazakhstan and the cities of Zharkent, Aksu and Chuguchak.²¹

By the end of the 19th century, due to internal difficulties in China, economic connections with Kazakhstan weakened, and after the uprising in Xinjiang in 1864, Chinese–Kazakh connections underwent changes and began to depend on the political situation.

Trade relations between China and Kazakhstan were carried out along waterways – along the Ili River to the Chinese fortress of Suidong. However, the major part of Kazakhstan's trade with China was carried out through customs borders and cities. By the end of the 19th century, Jinho, Shikho, Manas, Urumqi, Turfan, Aksu, Kashgar and Chuguchak traded with Kazakhstan. Trade and economic relations between the countries were historically mutually beneficial, and cattle was the basic commodity from Kazakhstan to China.

Figure 2: Area suitable for deploying the Urzhar–Chuguchak corridor



Urzhar is located at the foot of the western part of the Tarbagatai Mountains. The

nearest railway station, Ayaguz, is 175 km away. The village of Urzhar was founded in

²¹ Казахско-китайские торговые связи. Available at <https://tak-to-ent.net/publ/10-1-0-268>.

the middle of the 1950s as a Cossack settlement; in 1867-1879 it housed the Chinese trade mission. Caravan routes to Tashkent and Semipalatinsk passed through Urzhar in 1905-1915. The Migration Administration was located here.

The potential Urzhar–Chuguchak corridor passes through the China–Kazakhstan border, crossing the A356 highway in Kazakhstan, and the S221 and G3015 highways in China, and the Bakhty checkpoint, which is located 17km from the city.

Chuguchak is located in the Xinjiang Uygur Autonomous Region, Ili-Kazakh Autonomous Prefecture, Chuguchak District, and is 621km from Urumqi. The East Kazakhstan region is located on the Kazakh side of the border, which is 800m from the Kazakh checkpoint, 60km from Makanchi town, and 700km from Semey town, the regional centre.

The border trade hub, Bakhty checkpoint, is the “window” for China to Central Asia and Europe. In August 1992, by mutual agreement between the governments of China and Kazakhstan, the Bakhty checkpoint was opened for other countries and for international transit communications. On 1 July 1995, the Bakhty checkpoint was officially opened to all countries. Bakhty’s capacity is 200,000 tons of cargo and 100,000 passengers per year. The main trade partner for China in this region is Kazakhstan, with a share of 44 per cent in imports and 39 per cent in exports.

In December 2013, the “green corridor” was officially launched at the Bakhty checkpoint, enabling visa-free visits to Chuguchak for 72 hours to promote trading of agricultural products. In one month of green corridor operation, 6,400 tons of agricultural products were imported to Kazakhstan, and since the opening of the green corridor in the city of Chuguchak located near the Kazakh

customs post, 11 additional enterprises have been registered.

The visa-free regime at the Bakhty checkpoint enhanced trade and communications between the local population of the two countries living along the China–Kazakhstan border. Citizens of Kazakhstan often visit China to purchase consumer goods, visit relatives living in Xinjiang, and for medical examinations.

Mostly, Chuguchak is visited by residents at the border of the Urzhar region, and by those living in the cities of Ayagoz and Semey of the East Kazakhstan region. With the introduction of the “three-day non-visa visit” policy through the Bakhty checkpoint for citizens of Kazakhstan, the flow of tourists from Kazakhstan is increasing daily. During the year, more than 10,000 tourists from Kazakhstan visit Chuguchak under this programme, and the trade turnover amounts to about CNY40 million (USD6.5 million). Kazakhstanis visiting China has the privilege of being exempted from customs duties if the goods do not exceed EUR2,000 in value and 50kg in weight.

Kazakhstan has also introduced the “three-day non-visa visit” policy for Chinese tourists, which allows them to spend a short stay at Lake Alakol in the East Kazakhstan region.²² The opening of this route for Chinese tourists has stimulated the development of a tourist cluster in the East Kazakhstan region.

The Urzhar–Chuguchak corridor aligns with the Silk Road Economic Belt and could be geopolitically beneficial for both China and Kazakhstan. In the future, Kazakhstan could increase not only the import of agricultural products, but also the transit of other Chinese goods through its territory. China, in turn, by developing cross-border routes in this direction could weaken its dependence on sea transport.

Geographically, the Urzhar–Chuguchak corridor already exists through the Bakhty

²² Казахстан продлил безвизовый режим для транзитных туристов из Китая и Индии. Available at

<https://tengritravel.kz/my-country/kazakhstan-prodlil-bezvizovyy-rejim-tranzitnyih-turistov-388047/>.

checkpoint. The route is 103km on the Urzhar–Bakhty segment and 23km on the Bakhty–Chuguchak segment. Probably, after geodetic and topographic surveying, experts would come to the conclusion that deploying a parallel or alternative road does not make sense, since, due to the topography of the terrain, this route itself is optimal. However, the proposal for the Urzhar–Chuguchak corridor has not been specified in the development plans of the region in both China and Kazakhstan.

Despite the route being optimal, its road quality, roadside infrastructure and rate of development of related services are low and do not meet international standards. It should be noted that according to the Programme of Cross-Border Cooperation for 2015-2020

3.2 Geographic and Sociodemographic Characteristics of the Region

On the Kazakhstan side, Urzhar is located in the south-eastern part of the East Kazakhstan region. It has an area of 23,400km² and a population of 79,617 people living in 20,430 households. The regional centre of Urzhar has a population of 15,350 people. Along the Urzhar–Chuguchak corridor, the route passes the foothill region and crosses two localities in Kazakhstan – Nauali with a population of 3,421 people and Makanchi with a population of 12,242 people.²³ The main advantage of the Urzhar region is its favourable geographical location – in the north-west it borders the city of Ayaguz, in the south with the Almaty region, and in the east with China.

Demographically, the population in Urzhar is ageing due to the low proportion of young

between the governments of China and Kazakhstan,²³ the construction of the Karamay–Tacheng–Ayaguz railway is underway, which passes through Bakhty. The segment of the Bakhty–Ayaguz route will become part of the international Trans-Siberian Railway and will connect the north-east of China, Kazakhstan and the Russian Federation with European countries. Today, China delivers goods to Europe through Mongolia and the northern part of the Russian Federation, which is quite expensive and time consuming. The new route will allow access to the European Union through Kazakhstan and directly through the centre of the Russian Federation.²⁴

people (22.4 per cent). The main factor influencing the demographic situation is rural depopulation of young people of working age. As a result of migration, twice as many people regularly leave the region as they arrive. There is internal migration (99.3 per cent of the total number of migrated/immigrated people) and immigration to neighbouring countries (0.7 per cent). At the same time, there is a high birth rate at 18.5 per cent (regionally 17.1 per cent) and a low mortality rate at 8.1 per cent (regionally 10.4 per cent). The percentage of the region's economically active population is 11.3 per cent lower than the regional average of 53.2 per cent, and the unemployment rate is 0.4 per cent lower than the regional average of 4.4 per cent.

Chuguchak is the administrative centre of the Tacheng Prefecture in the Xinjiang Uygur Autonomous Region of China. Chuguchak's territory stretches along the southern foot of the Tarbagatai Mountains. The Bakhty checkpoint operates 17km west of the city outskirts. The population of Chuguchak is

²³ О подписании Программы приграничного сотрудничества между Правительством Республики Казахстан и Правительством Китайской Народной Республики на 2015 - 2020 годы. Available at <https://zakon.uchet.kz/rus/history/P1500001004/11.12.2015>

²⁴ Строительство километра транзитной ветки "Бахты-Аягоз" может составить млрд тенге. Available at <https://astanatv.kz/ru/news/12150/>.

²⁵ Для казахстанцев открыто безвизовое посещение китайского Чугучака на 72 часа. Available at [inform.kz https://www.inform.kz/ru/dlya-kazahstancsev-otkryto-bezvizovoe-poseshchenie-kitayskogo-chuguchaka-na-72-chasa_a2616513](https://www.inform.kz/ru/dlya-kazahstancsev-otkryto-bezvizovoe-poseshchenie-kitayskogo-chuguchaka-na-72-chasa_a2616513).

1,219,369 people, and the population of the prefecture is 994,776 people. The Xinjiang Uygur Autonomous Region is the largest region in China with rich reserves of coal, oil and natural gas.

3.3 Economic Characteristics of the Region

The Urzhar region is characterized by positive dynamics of development, both in the economic and the social sectors, which is promising due to the creation of tourist potential in the recreation area of Lake Alakol and the Barlyk-Arasan sanatorium. The region's main economy is agriculture and animal husbandry. In the agriculture sector, more than 56 per cent of the population are engaged in crop production, mainly producing grain crops through dry farming.

Investments in the region are targeted at the development of the agro-industrial complex and the construction of a transport and logistics centre for the Bakhty checkpoint. The latter lays the foundation for the construction of the Urzhar–Chuguchak corridor. Investors are also interested in the tourism business, particularly in constructing rest houses and other tourist facilities, since the Urzhar region is one of the most suitable recreation areas in East Kazakhstan due to the Alakol Lake and the Barlyk-Arasan sanatorium with healing springs and mineral waters.

Alakol is a lake with the world's only black beach of rounded pebbles and gravel, containing a large amount of silicon. Clean steppe air, mineral waters and sources of mineralized hydrogen sulfide mud create extremely favourable conditions for rest and treatment. The water temperature in summer reaches 20-25°C. The composition of Lake Alakol is comparable to the waters of the Black Sea and the Dead Sea, which contributes to the treatment of skin diseases, respiratory diseases, and diseases of the musculoskeletal and nervous systems. In the recreation area of Lake Alakol, about 200 business facilities (rest houses and catering facilities) provide services to tourists.

The main enterprises in Urzhar are: LLP Shvabskie Kolbaski that processes meat and produces more than 70 types of sausages with a capacity of up to 3 tons per day; LLP Arystanbek Urzhar that processes milk and dairy products; and LLP Madina that is engaged in coal mining.

In Chuguchak, agriculture plays an important role in the economy, particularly in the production of cotton, beets, wheat, corn, rice and gourds, and cattle breeding. Other sectors that are being developed include the oil and petrochemical industry, the consumer industry and the automobile industry.

Chuguchak is the only city with a unique state strategic position along the Silk Road Economic Belt. The Bakhty checkpoint is the only green channel for fast customs clearance of agricultural products. Chuguchak is also actively pursuing economic cooperation both within the country and abroad.

3.4 Characteristics of Existing Infrastructure in the Region

The transport infrastructure along the Urzhar–Chuguchak corridor can generally be described as equivalent in China and Kazakhstan, although road quality is slightly higher in China. However, the energy and ICT infrastructures differ between the China and Kazakhstan sides of the region.

3.4.1 Transport Infrastructure

In Urzhar, the length of the region's highways is 965km, comprised of 277km that are of republican significance, 204km of regional significance and 484km of district significance; 161km of the highways are with asphalt pavement, 258km of gravel and crushed stone, and 65km of unpaved roads.

Transportation of passengers in the Urzhar district is carried out by road and air. Transportation of passengers and freight by road is carried out on 12 regular routes, including 7 locality-wide routes and 5

intraregional routes. There are 46 bus stops in the district, including 36 in Urzhar and 10 in Makanchi.

A main problem is the wearing of local roads (about 30 per cent of local roads are in unsatisfactory condition), and a lack of funds from the local budget for rural road maintenance and rehabilitation. Out of the 55 localities in the Urzhar district, 34 localities (61.8 per cent) are covered by regular passenger traffic, and 21 localities (38.2 per cent) are not. The main reason for the incomplete coverage is the lack of profitability of intraregional transportation and the lack of subsidies from the local budget.

There are 58 units of snow-sweeping equipment that enable regular transport connection in the Urzhar district in the autumn-winter period, providing access to 60 educational facilities, 50 healthcare facilities, 16 cultural facilities, 1 social facility, 1 centralized boiler house and 39 autonomous boiler facilities.²⁶

Currently, the district operates a category “D” airport located in the village of Urzhar. From the airport, there is a regular intraregional route (Ust-Kamenogorsk–Semej–Urzhar) and a republican route (Urzhar–Almaty).

In Chuguchak, highways are being developed to match the region’s growing economy. The increase in investment inflow, growth in business profitability and household income, and China’s accession to the World Trade Organization and other factors have contributed to the growing road network in the region.

3.4.2 Energy Infrastructure

In Urzhar, the energy infrastructure is provided by the regional Urzhar energy company with 4 substations of 110kW, 19 substations of 35kW, 470 transformers, 910.45km of air lines of 10kV and 940.39km of air lines of 0.4kV.

²⁶ ЖКХ и транспорт. Available at <https://www.gov.kz/memleket/entities/vko-urzhar/activities/1050?lang=ru>.

In Chuguchak, the energy infrastructure is largely dependent on energy imports. This is due to the rapid development of the region and the lack of its own energy resources to meet all the needs of private and industrial consumers. The total capacity of 17 Chinese nuclear power plants is 28.8GW, which accounts for just over 3 per cent of the country’s total electricity generation.

There is a road map for nuclear energy development in the latest release of the national strategy for China’s energy sector development for the period up to 2030. China is planning to increase the number of nuclear reactors and become one of the world’s largest consumers of nuclear energy.

3.4.3 ICT Infrastructure

In Urzhar, there is a decrease in the number of fixed telephone lines due to the growth of mobile telephony. The region is characterized by high mobile communications coverage – the mobile coverage of localities with a population of more than 1,000 people is 100 per cent. The number of villages provided with fixed-broadband high-speed Internet network is 76.4 per cent.

In Chuguchak, telecommunications development is quite high. Priority is given to mobile communications and Internet services, particularly in increasing access to 5G services. In China, the largest telecom operators are China Mobile (31.7 million users) and China Telecom (16.6 million). Ninety eight per cent of all Internet traffic comes from China Mobile, China Telecom and China Unicom.²⁷ The most popular services are messengers (used by 99.2 per cent of Internet users) and video hosting (94 per cent). Also widespread are online payments (85 per cent), search engines (83 per cent), online media (81 per cent), music (70 per cent), video streaming (62 per cent) and gaming services (59 per cent).

²⁷ Количество интернет-пользователей в Китае превысило 900 млн. Available at <https://regnum.ru/news/it/2966894.html>.

3.5 Challenges and Opportunities in the Construction of the Urzhar–Chuguchak Corridor

Based on the characteristics described above, the construction of the Urzhar–Chuguchak corridor provides an opportunity for road reconstruction in Kazakhstan, and for exploring the use of nuclear energy. In the

construction process, China’s move away from fixed telephony in favour of mobile and Internet communications should be taken into account, and it is advisable to plan for the co-deployment of 5G on the Kazakhstan side, which is currently in test mode in the large cities of Almaty, Nur-Sultan and Shymkent.

A summary of the opportunities and issues to consider is given in Table 3.

Table 3: Opportunities and challenges in the construction of the Urzhar–Chuguchak corridor

Parameters	Kazakhstan (KZ)	China (CN)	Opportunities	Challenges
Form of government	Presidential republic	One-party state	Cross-country cooperation development	Differences in economic systems and political benchmarks
GDP per capita (USD in 2019)	9,139	9,580	Mutually beneficial development and GDP growth due to corridor functioning	The planned economy of CN may lead to pace mismatch in corridor development
Average wage (USD)	399	995	Regional income growth (especially important for KZ)	Significant differences in the paying capacity of the population, and challenges in providing equivalent quality of work and services
Economic orientation	Domestic demand and international cooperation	Socialist planned and export oriented	Formation of a mutually beneficial corridor for the development of trade and tourism, and creation of jobs	Possible expansion of the region’s economy by residents of CN
Dependence on international financial institutions and loans	Dependence on external demand for oil, gas and other natural resources	80 per cent of foreign investments are ethnic Chinese	Reducing dependence of KZ on resources demand in favour of developing trade, and expanding	Expansion of external (ethnic) creditors of CN into the region may lead to dependence on them

			investment in CN	
Disunity of territories and industrial centres	High	Centralization of management in the presence of a depressive north-west and a developed south-east	Regional business localization	Isolation of corridor from industrial and financial centres may lead to corridor underload
Priority mode of transport, and condition of rolling stock and roads	Road and rail are mostly good	Road, rail and air transport are excellent	Improvement of indicators for the state of transport in KZ	Inability of KZ to meet the road quality requirements of CN
Primary audience	Internal	Internal and external	Attracting external audience for KZ, and foreign audience for both countries	Difficulty in attracting audience from abroad due to the internal policy of CN
Main beneficiaries	National tourism and local business units	Local business units and Chinese tourists	Development of the tourist zone of KZ and development of the region's economy	The need to increase the period of visa-free visit (more than 72 hours)
Possible obstacles	Relatively low level of service quality	Political cooperation with countries that have foreign policy challenges (e.g., the Russian Federation and the Democratic People's Republic of Korea)	Reducing political challenges by prioritizing economic cooperation	Risk of halting corridor construction due to political disagreements
Basic risks	Lack of tourist volumes and business flows due to low local service quality, and active expansion of business units and the population	Lack of expected benefits from the functioning of corridor due to lower (compared to expected) traffic volumes, labour migration and exploitation of migrant workers	Forming a unified approach to quality standards and the cost of labour resources, and the setting of quotas for starting a business by non-residents and for labour migration	Lack of qualified labour, difficulty attracting the interests of external CN investors, and unmonitored migration

From the analysis provided in this section, the countries participating in the Urzhar–Chuguchak corridor have quite different financial, technological and socioeconomic basis. In this case, China is in a better position to finance the corridor, and given the state of the economy and transport routes, China is also in a more advantageous position and does not require significant investments in forming the Urzhar–Chuguchak corridor. In contrast, given the condition of the road surface and infrastructure facilities in Kazakhstan, substantial investment would be required to bring them up to Chinese standards.

Nevertheless, the Urzhar–Chuguchak corridor is favourable for both countries in that it contributes to the activation of economic relations in the border regions, which (for both sides) are relatively

underdeveloped. The Urzhar–Chuguchak corridor could be used to form longer routes of international trade using the Karamay–Tacheng–Ayagoz railway. In addition, it could raise the tourism potential of Lake Alakol and the Barlyk-Arasan springs in Kazakhstan.

Thus, the Urzhar–Chuguchak corridor has economic and social significance. It could contribute to the development of business partnerships between China and Kazakhstan, and with other countries. It could reduce the unemployment rate in the region and could increase the performance of other indicators (e.g., development of telecommunications, education and health services, and businesses). At the same time, there are great risks of unmonitored migration and expansion of economic agents.

4. Semey (Kazakhstan) – Rubtsovsk (Russian Federation) Corridor

4.1 Transport History

Historical relations between Eastern Europe and Western Asia in the 21st century has prompted large-scale Eurasian cooperation, where Kazakhstan plays a significant role as an important transport and transit hub that forms continental unity. This role is behind the state development strategy of Kazakhstan.

The geographical location of the Russian Federation makes it one of the initiators of Eurasian integration. Kazakhstan, due to its geostrategic position, is the Russian Federation's main economic partner of Eurasian cooperation.

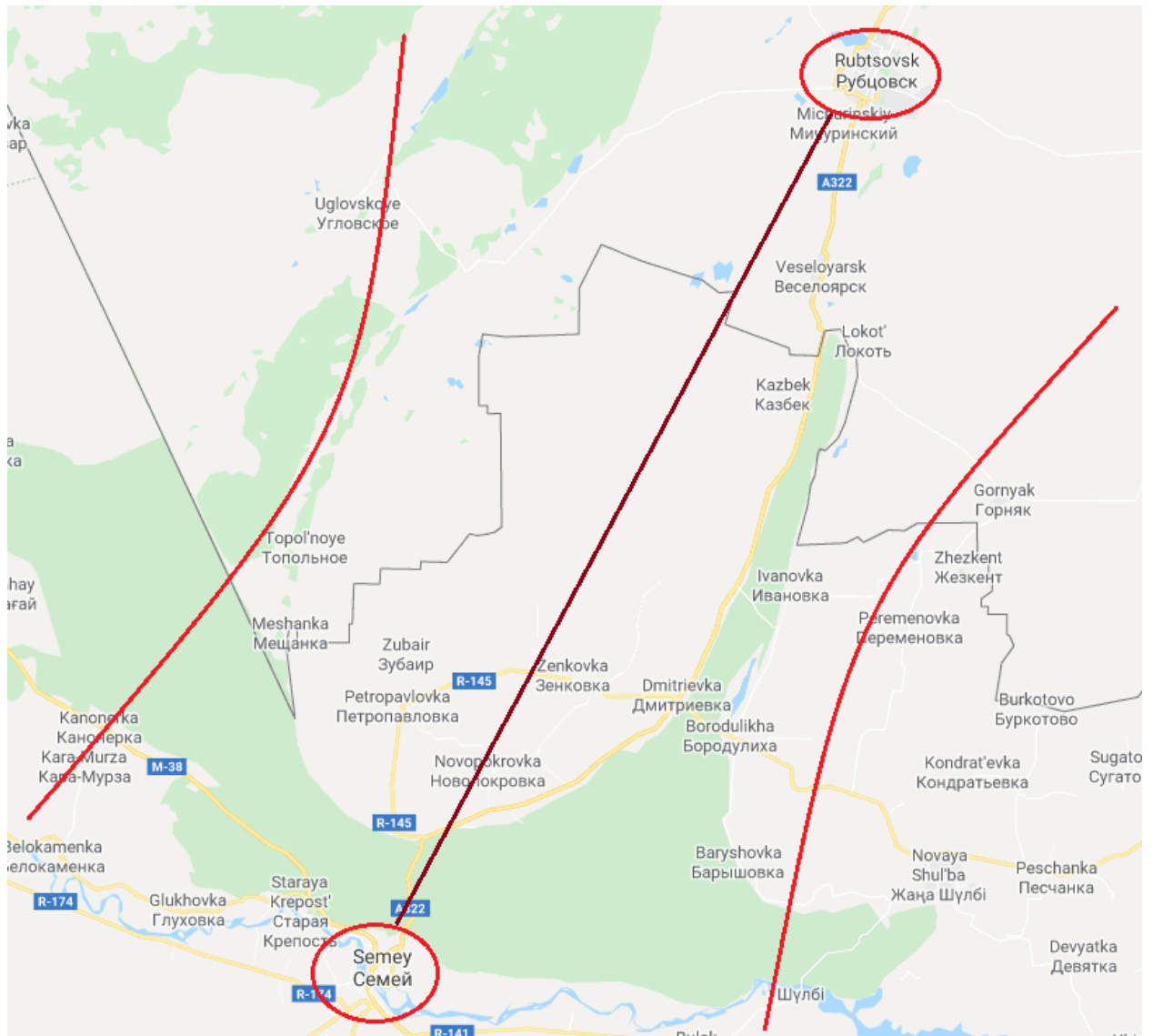
The Kazakhstan–Russian Federation border is one of the longest in the world at 7,512km. Seven regions of Kazakhstan and 12 federal states of the Russian Federation lie at the border, representing strategically important zones for both Kazakhstan and the Russian Federation. This border area is also industrially well developed, and the majority of the Russian diaspora, numbering 3.6 million people,²⁸ is concentrated here. The gross regional product (GRP) of the Kazakhstan–Russian Federation border area is over 42 per cent of Kazakhstan GDP and almost 23 per cent of Russian GDP. An important trend is the growth in freight volume between the world's largest producer – China, and the world largest consumer-continent – Europe, making Kazakhstan the main Eurasian transcontinental bridge.

Kazakhstan is able to use existing transit resource to ensure regular Eurasian transport communications. Sixteen railways and over 200 roads pass through the Kazakhstan–Russian Federation border area, some of which are of international importance, including nine railways, seven roads and four air corridors. Fifty five per cent of freight turnover in Kazakhstan is carried out by rail, 23 per cent by pipeline and 21 per cent by road. The share of air and sea transport is less than 1 per cent.

Close cooperation between Kazakhstan and the Russian Federation in transit traffic, primarily through the Northern Corridor of the Trans-Asian Railway (on the Dostyk–Aktogay–Sayak–Mointy–Nur-Sultan–Petrovavlovsk segment) has the necessary material and technical foundations and significant development potential. The transport infrastructure built during the Soviet period was created as a single national economic complex without taking into account the administrative borders between Kazakhstan and the Russian Federation, therefore there are numerous border crossings. For example, the South Ural railway crosses the border of Kazakhstan nine times, and the main branch of the Trans-Siberian Railway between Kurgan and Omsk passes through the territory of the North Kazakhstan region for 118km. The crossing of the territory of Kazakhstan by the Southern Trans-Siberian Railway (Magnitogorsk–Nur-Sultan–Pavlodar–Barnaul) is even greater at 1,214km.

²⁸ Симонян Р. Х. Российско-казахстанское сторудничество в контексте евразийского транзита. *Восточная аналитика*. Вып. 3, 2019. С. 97-104.

Figure 3: Area suitable for deploying the Semey–Rubtsovsk corridor



The formation of the International Asian Network is an important project for Asian countries, which contributes to the improvement of the highway network in Kazakhstan and the Russian Federation. The main roads of North, North-West and Central Asia are:²⁹

- AH60 (2,158km) Omsk–Pavlodar–Semey–Taldykorgan–Almaty–Burubay (Kazakhstan)

- AH64 (1,666km) Petropavlovsk–Nur-Sultan–Pavlodar–Semey–Rubtsovsk–Barnaul

One of the important transport corridors is Semey (Kazakhstan) – Rubtsovsk (Russian Federation), which is part of the AH64. The 156km route runs along the relief without significant differences in elevation and could serve as a transit point in the direction of the Chuysky Tract (Novosibirsk–Tashanta) and the border with Mongolia. Localities with a

²⁹ Международная азиатская сеть. Available at <https://ru.wikipedia.org/>.

population of several thousand people are located near this segment of the highway on the territory of Kazakhstan.

The Semey–Rubtsovsk segment of the highway could be a transit route from Kazakhstan to Mongolia and has good potential for passenger and freight transportation. Mongolia has a relatively favourable trade regime that is flexible and has low customs duties compared to most other emerging economies in Central Asia. The Mongolian government seeks to strengthen foreign trade ties, and Mongolia is a potential market for the export of Kazakhstani metal, chemical, animal and vegetable products.³⁰

There is active traffic on the Semey–Rubtsovsk segment. The daily bus services on a direct route takes 3 hours and 45 minutes at a cost of USD5. The train route is almost 6 hours at a cost of USD3-5. The car route is slightly over 2 hours. The condition of the road surface along the Semey–Rubtsovsk segment varies. Large overweight vehicles cause damage to the road surface, especially in summer, when the air temperature reaches 40-42°C.

4.2 Geographic and Sociodemographic Characteristics of the Region

Rubtsovsk city is an administrative centre of the Rubtsovsky district in the southern part of the Russian Federation. Prior to the dissolution of the Soviet Union, it was a large machinery centre in Western Siberia.

Rubtsovsk city is situated in the Aleiskaya steppe (Pre-Altai plain), on the left bank of the Alei River (a tributary of the Ob), 290km south-west of Barnaul. The city is located 40km away from the Kazakhstan border, but does not have the status of a border town. Before the First World War, a branch of the Turkestan-Siberian Railway and other

infrastructure facilities of the railway station were built in the city. Today, the city is an important transport hub connecting Siberia and Central Asia. The federal highway A-322 and the Turkestan-Siberian Railway pass through Rubtsovsk.

The population of the city in 2019 was 142,551 people, and since 2000 it has been steadily decreasing. The majority of the population is Russians (96 per cent), and the other 4 per cent are comprised of Russian Germans, Ukrainians, Armenians, Tatars and others. There are four territorial public self-governments in the city – North, Central, South and West.

Rubtsovsk occupies a favourable geographical position on major transport routes, which creates the preconditions for the active development of trade and economic relations with neighbouring territories. The favourable location of the city, together with the development of transport infrastructure, provide great opportunities for the export and import of various types of products, and the development of trade relations with the countries of Central Asia, China and Kazakhstan. At the same time, there is a risk of loss of geographical advantages, caused by the underdevelopment of the transport and logistics infrastructure (i.e., transport systems, terminals and specialized warehouse logistics), weak motivation of economic entities to initiate foreign economic activities, and a lack of qualified personnel.

Semey (until 2007, the official name was Semipalatinsk) is a city of regional significance in the East Kazakhstan region, located on both banks of the Irtysh River. The city of Semey, excluding its subordinate rural districts, occupies an area of 210km². When the 14 suburban rural districts are included, the total area is 27,490km². It is the largest city in Kazakhstan, which is not a regional centre or a city of republican significance. Semey is considered to be the cultural capital because many of its descendants are the

³⁰ Монголия. Страновой обзор. Available at https://kazcic.kz/media/analytics/22/%D0%9C%D0%BE%20%D0%BD%D0%B3%D0%BE%D0%BB%D0%B8%D1%8F_2016.pdf.

D0%BD%D0%B3%D0%BE%D0%BB%D0%B8%D1%8F_2016.pdf.

founders of Kazakh culture and creativity. The distance from Semey to the regional centre of Ust-Kamenogorsk is 200km.

The climate is distinctly continental with large variations in annual and daily temperature due to its distance from the oceans. The Semey region is open to the Arctic Basin, but is isolated by the mountain systems of Asia away from the influence of the Indian Ocean. The average annual temperature is 4.3°C, but in winter, the temperature can reach -48.6°C, and in summer, 42.5°C.

The population of Semey grew dynamically since its establishment until the dissolution of the Soviet Union. According to the 1989 census, more than 317,000 people lived in the city. As of 2020, the population is over 324,000 people. The ethnic composition of the territory is 72 per cent Kazakhs, 24 per cent Russians, 2 per cent Tatars, and 2 per cent other nationalities (Germans, Ukrainians, Belarusians, Uighurs, Koreans and Uzbeks).

In 1949, the first nuclear weapon of the Soviet Union was tested in Semey – a bomb with a capacity of 22 kilotons. From 1949 to 1989, at least 456 nuclear tests were carried out at the Semey nuclear test site, in which at least 616 nuclear and thermonuclear devices were detonated, including at least 30 ground-based nuclear explosions and at least 86 air explosions. In 1991 the test site was closed.

According to the classification of territories exposed to radioactive fallout during nuclear tests at the Semey nuclear test site, Semey belongs to an area of increased radiation risk (exposure dose to the population is from 7 to 35 rem for the entire test period). The areas surrounding Semey were categorized as maximum risk.

4.3 Economic Characteristics of the Region

Rubtsovsk experienced significant economic growth during the Second World War through the development of the Odessa Agricultural Engineering Plant and the Kharkov Tractor Plant, which laid the foundation for the Altaielmash plants and the Altai Tractor Plant. Subsequently, the Altai Plant of Tractor Electrical Equipment and the Rubtsovsk Plant of Tractor Spare Parts were also put into operation in the city.

With the dissolution of the Soviet Union, the economic and social indicators of Rubtsovsk dropped significantly. Nevertheless, industry makes up 87 per cent of shipment volume and plays a key role in the city's economy. Rubtsovsk's main industries include the following:

- Manufacturing of machinery, equipment (agricultural machinery) and metalwork (iron and steel casting);
- Food production; and
- Production and distribution of heat, electricity, gas and water for the needs of organizations and the population.

Currently, about 60 per cent of the volume of shipped products are food products. The advantage of the city is availability of energy facilities and transport terminals. Most of the enterprises can in a short time increase the volume of industrial production from the use of existing capacities and the labour potential of the city, almost without significant investments. Future growth is projected in the mining and processing industry, as well as the food industry. Rubtsovsk's economic risks include traditional industries that are equipped with obsolete, significantly worn out fixed assets, as well as low diversification since the share of the extractive industry sector is more than 90 per cent.³¹

³¹ Показатели социально-экономического развития города Рубцовска. Available at <http://rubtsovsk.org/gorod/ser>.

4.4 Characteristics of Existing Infrastructure in the Region

The development of the region's infrastructure can be described as equivalent in Kazakhstan and the Russian Federation.

4.4.1 Transport Infrastructure

Semey is an important transport hub in Kazakhstan. A number of major highways pass through the city, as well as the Turkestan-Siberian Railway. There are two railway stations in the city – Semipalatinsk and Zhana-Semey. The city has an airport that serves domestic flights and flights to Moscow. The recovery of an abandoned airport is under discussion. Previously, the airport received Yak-40, An-24 and L-410 aircrafts. There are three bridges across the Irtysh River – one railway and two automobile bridges – as well as a pontoon crossing.

Public highways in the suburbs of Rubtsovsk and in the Altai Territory have a length of about 17,000km in total (including over 600km of federal highways), as follows:

- About 8,500km (50 per cent) have asphalt concrete;
- 6,500km (38 per cent) crushed rock surface; and
- 2,000km (12 per cent) dirt roads.

The main regional road transport infrastructure in Semey is the following two federal highways:

- P256 (formerly M52) Chuysky Tract, which is the main road in the Altai Republic connecting the Russian Federation with Mongolia. Its route includes Novosibirsk – Novoaltaisk (access road to Barnaul) – Biysk – Maima (access road to Gorno-Altaiisk).
- A322 (formerly A349) Zmeinogorsk Tract, which runs from Barnaul in a south-west direction to the border of Kazakhstan, 40km south of Rubtsovsk. It is part of the AH64.

Other roads of regional importance in Semey include the following:

- Biysk–Novokuznetsk, Biysk–Belokurikha, and Aleysk – Rodino – Kulunda – state border with Kazakhstan; and
- Novosibirsk–Kamen-na-Obi–Barnaul, and the Altai–Kuzbass highway connecting with the cities of the Kemerovo region.

The main intercity highways are Auezov and Shakarim avenues.

Based on the programme for the development of highways in the Altai Territory until 2025, there are plans to increase the throughput of transport routes through the reconstruction or construction of bypass roads around the cities of Barnaul, Biysk, Novoaltaisk and Rubtsovsk in order to reduce transit through the city, reduce time and minimize traffic congestions.

In the Altai Territory, a public-private partnership (PPP) system is being introduced for highway construction. The construction of the Zmeinogorsk–Rubtsovsk–Mikhailovka–Slavgorod–Karasuk highway is based on a PPP.

Public transport in Rubtsovsk is represented by trolleybuses, buses and minibuses. The city is connected by bus services with the districts of the East Kazakhstan region, as well as with other regions of the country, including Pavlodar, Almaty and Akmola regions, and the cities of Almaty and Nur-Sultan. There are also regular bus routes to the cities of the Russian Federation, including Rubtsovsk, Barnaul, Novosibirsk, Omsk and Tomsk. In addition to public transport, there are several taxi services in the city. Projects for the formation of electric transport were not implemented.

4.4.2 Energy Infrastructure

On the Kazakhstan side, the energy infrastructure in the region is provided by JSC East Kazakhstan Regional Energy

Company. As of 2019, the service area is 283,300km², the annual sales volume is 2,515 million kWh, and the number of consumers is 510,374. The company supplies electricity to 10 cities, 15 districts, 30 villages and 870 other localities in the territory of East Kazakhstan. The company is positioned as a reliable supplier of high-quality energy to the East Kazakhstan region, which has passed a certification audit of the quality management system in compliance with the requirements of the international standard ISO 9001: 2015.

On the Russian Federation side, the energy infrastructure in the region is provided by JSC Altayenergosbyt, the largest power supply company in the Siberian region with the status of a Guaranteeing Energy Supplier. JSC Altayenergosbyt covers the Altai Territory and the Altai Republic. For efficient management of energy supply within the boundaries of its service area, the company operates an extensive branch network servicing more than 13,000 corporate body consumers and more than 440,000 individual consumers.³² More information on the strategic plans of energy sector development is available on energy portal³³ and in the ESCAP paper “Policy Perspectives: Sustainable Energy in Asia and the Pacific”³⁴.

4.4.3 ICT Infrastructure

The telecommunications infrastructure of the region is largely represented by fixed-line communications, although its share in total volume is decreasing, giving way to mobile communications. The number of registered mobile subscribers is constantly increasing.

In Kazakhstan, about 20 telecom operators are currently operating in the telecommunications market, providing long-distance and international telephone

services, Internet access and satellite mobile communications. In addition, there are three mobile network operators.

The number of subscribers with access to high-speed broadband Internet is constantly growing. In order to provide high-speed Internet to rural localities, two large projects are being implemented with the aim to provide all rural localities with a population of 250 people and more with broadband Internet access. In villages where the population is less than 250 people, the possibility of broadband Internet access of at least 2Mbps is planned by the end of 2022, using alternative technologies such as satellite communications, radio relay communications, third-generation universal mobile telecommunications system and radio bridges.³⁵

In the Russian Federation, 142 companies have licenses to provide telecommunications services in the Altai Territory. The rapid development of the telecommunications market has made it possible to provide more than 90 per cent of the region's population with a digital local telephone network. About 98 per cent of the population has access to a mobile network, and coverage of the population with terrestrial television and radio broadcasting is 97.8 per cent.

Competition for the provision of broadband access services is most developed in the cities of Barnaul, Biysk, Novoaltaisk and Rubtsovsk, each of which has more than 10 telecom operators. In the municipal districts, the telecommunications market is less developed. Rostelecom is one of the largest providers of wired broadband access in the region. In general, positive dynamics is observed in all key indicators of the development of Internet access in the region.

³² Алтайэнергосбыт. Available at <https://altaiensb.com/about/history/>.

³³ Energy Portal at <https://asiapacificenergy.org/>

³⁴ Paper available at <https://www.unescap.org/resources/policy-perspectives-2019-sustainable-energy-asia-and-pacific>

³⁵ Ministry of Digital Development, Innovations and Aerospace Industry of the Republic of Kazakhstan, “Telecommunications and communications”. Available at <https://www.gov.kz/memleket/entities/mdai/activities/8?lang=ru>.

Mobile network operators continue to deploy high-speed Internet access networks in the Altai Territory using Long-Term Evolution mobile data transmission technology. Currently, about 78 per cent of rural and urban localities in the region have wired Internet access, and more than 70 per cent have mobile Internet access.

4.5 Challenges and Opportunities in the Construction of the Semey–Rubtsovsk Corridor

Based on the characteristics described above, the current level of infrastructure development in the region of the Semey–Rubtsovsk corridor in both Kazakhstan and the Russian Federation is on par. Therefore, the construction of the Semey–Rubtsovsk corridor needs to be carefully detailed to avoid the creation of development gaps, which may negatively affect the quality of

services provided by the corridor. A summary of the opportunities and issues to consider is given in Table 4. From the analysis provided in this section, the countries participating in the Semey–Rubtsovsk corridor have quite different financial, technological and socioeconomic basis. There is a significant difference in the GDP of the countries, although the average wage in the region is similar. Despite the fact that the Russian Federation has significantly larger financial and technological resources, in general, the region of the infrastructure corridor does not have a sufficiently large socioeconomic base. In this case, Kazakhstan is in a more advantageous position in terms of project development opportunities, since the region is closer to the capital city, and authorities are interested in the development of this region. The region's transport routes, including the AH64 highway, requires investment from both countries to improve its quality.

Table 4: Opportunities and challenges in the construction of the Semey–Rubtsovsk corridor

Parameters	Kazakhstan (KZ)	Russian Federation (RU)	Opportunities	Challenges
Form of government	Presidential republic	Semi-presidential republic	Development of mutually beneficial, historically established cooperation	Possible problems due to sanctions imposed on RU
GDP per capita (USD in 2019)	9,139	29,181	GDP growth in KZ due to increased transit via corridor	Differences in project financing opportunities
Average wage (USD)	355	335	Population income growth in the region, and uniformity of labour prices	Changes in the balance of average wages could lead to unmonitored migration (by visa-free regime)
Economic orientation	Domestic demand and international cooperation	Resource-based economy	The functioning of corridor contributes to the development of trade and tourism in KZ, and the optimization of export routes for resources in RU	Changes in the global market for resources may negatively affect corridor loading

Dependence on international financial institutions and loans	Dependence on external demand for oil, gas and other natural resources	Dependence on external demand for resources, especially oil and gas	Reducing the region's dependence on resources demand in favour of the development of trade and logistics services	Instability of demand for services could reduce the efficiency of corridor
Disunity of territories and industrial centres	High	Centralization of the economy and management against territorial disunity	Localization of business and regional management	Isolation of corridor from industrial, financial and administrative centres, and dependence on the central government could lead to problems with management
Priority mode of transport, and condition of rolling stock and roads	Road and rail are mostly good	Road and rail are of average quality	Improvement of indicators for road and transport conditions	Varying road quality, and high road repair intervals
Primary audience	Internal	Internal and external	Attract external audience for transit	Difficulties in attracting an audience due to the condition of the roads and the presence of sanctions
Main beneficiaries	Local businesses and countries using corridor for transit		Mutually beneficial development of the regional economy	Possible changes in foreign policy
Possible obstacles	Relatively low level of service quality could not meet the requirements of transit transporters	Political policy, relatively low level of service quality and sanctions	Improved quality due to transit revenues	Halting of corridor construction due to political and economic challenges
Basic risks	Insufficient business volume	Insufficient business volume, limited benefits from corridor functioning, and political risks	Forming of common approach to quality standards	Prolongation of political challenges and, as a result, economic sanctions

Thus, the Semey–Rubtsovsk corridor has economic and social significance and is favourable for both countries. It could contribute to the development of business partnerships between Kazakhstan and the Russian Federation, and with other countries, including China and Mongolia. It

could also increase the performance of economic and social indicators (e.g., development of telecommunications, education and health services, and businesses. At the same time, there are foreign policy risks.

5. Cross-Sectoral Analysis of the Three Promising Infrastructure Corridors

The Urzhar–Chuguchak and Semey–Rubtsovsk corridors are of macroeconomic importance because in addition to the establishment of direct linkage with neighbouring countries, they contribute to the integration with other countries along the Silk Road Economic Belt, and the Trans-Siberian and Eurasian highways. The Almaty–Cholpon-Ata corridor is predominantly of regional importance. It is strategically important for the development of the respective regions in Kazakhstan and Kyrgyzstan since there is a lack of an equivalent alternative. It also contributes to their cooperation with other countries, particularly in the tourism sector.

The three proposed infrastructure corridors differ in primary purpose:

- The Almaty–Cholpon-Ata corridor is mainly for promoting tourism in the region;
- The Urzhar–Chuguchak corridor is for further development of existing economic and cultural relations between China and Kazakhstan; and
- The Semey–Rubtsovsk corridor is for economic development in the border areas and for the establishment of transit linkage with neighbouring countries (China and Mongolia) and the European Union.

However, these infrastructure corridors could provide additional benefits. For example, although the Almaty–Cholpon-Ata corridor is primarily for promoting tourism, it may also be of interest for freight carriers, and although the Urzhar–Chuguchak corridor is primarily for business-oriented transportation, it may also simultaneously receive tourist flows. The Semey–Rubtsovsk corridor has almost no tourism potential, but it is attractive for local transport companies due to the diversification of logistics offers.

It should be noted that all three proposed corridors are characterized by unequal socioeconomic state between the respective two countries that the corridors cut across. The unequal socioeconomic factors include the following:

- Population, and socioeconomic and educational levels;
- Level of GDP per capita and average wage;
- Condition of the roads, and social facilities along the roads and other assets; and
- Coverage and quality of the ICT infrastructure.

These and other factors could lead to an imbalance in the construction and maintenance of the infrastructure corridors.

All analysed infrastructure corridors have alternative logistics routes in their regions. In the case of the Urzhar–Chuguchak and Semey–Rubtsovsk corridors, the alternatives have existed for a long time and are actively used. For the Almaty–Cholpon-Ata corridor, however, there is no route equivalent by distance and time, except for the aviation route, which, requires an additional 35km transfer from the Issyk-Kul Airport to Cholpon-Ata.

The capacity of participating parties to finance the construction of the proposed infrastructure corridors is mostly unequal. China and the Russian Federation have broader opportunities for financing projects. Although Kyrgyzstan is interested in the construction of the Almaty–Cholpon-Ata corridor for tourism, its investment capacity is comparatively weak.

The main beneficiaries of the proposed infrastructure corridors are corporate bodies that would have access to a more optimal route for passenger and freight

transportation. The local population would also benefit from improved business development opportunities and personal travel. Other countries along the Eurasian transport routes would be interested in the development of the Urzhar–Chuguchak and Semey–Rubtsovsk corridors, while the Almaty–Cholpon-Ata corridor is less interesting for other countries from an economic point of view because of the focus on regional tourism.

The key oppositions related to the construction of the three proposed infrastructure corridors are largely due to environmental conditions (e.g., the presence of protected areas and high-risk zones), social conditions (e.g., labour migration and the exploitation of migrant workers), and political conditions (e.g., domestic and foreign policies of the participating countries, and the geopolitical situation in China and the Russian Federation). Another key problem is the difficulty in estimation of future traffic volumes. The factors affecting the traffic volume of each corridor include the following:

- Almaty–Cholpon-Ata – Demand for tourist services;
- Urzhar–Chuguchak – State of the economy of the border territories and terms of visa-free regime; and
- Semey–Rubtsovsk – Volume of transnational freight traffic and geopolitical trends.

The main sources of cash flows for all infrastructure corridors are transport, tourist and customs fees, as well as income from services. Discount factors include the inflation and growth of interest rates (in case of availability of credit funds). For the infrastructure corridors that include the participation of China and the Russian Federation, the discount factor may be political in nature.

The main motivators for all countries participating in the construction of the infrastructure corridors are the development of mutually beneficial cross-border

cooperation in the regions, and the activation of international tourism and economic, social and cultural interactions. Moreover, each country has specific motivators as follows:

- Kazakhstan – Strengthening its position as a centre of the Eurasian transit corridor;
- Kyrgyzstan – Development of its own tourism infrastructure and increasing the share of income in GDP and GRP;
- China – Development of cross-border and international cooperation; and
- Russian Federation – Expanding the horizons of import and export operations, diversifying trade towards Asia and the Middle East, and import substitution (in case of continued sanctions and food embargo).

Common risks for all countries participating in the construction of the infrastructure corridors include the COVID-19 pandemic and uncertainty about the duration of the restrictions, and growing geopolitical instability. Moreover, each country has specific risks as follows:

- Kazakhstan – A resource-related economy and strict economic regulations;
- Kyrgyzstan – Low investment attractiveness and difficulties with financing large projects;
- China – An export-oriented economy against decreasing confidence in the country and weak development of democracy; and
- Russian Federation – Sanction squeeze, political instability and fluctuations in oil prices.

Generally, all analysed infrastructure corridors are promising for development. Since they have different purposes and conditions for deployment, topography of the area and socioeconomic base, they require different approaches in design and construction, as well as assessment of the potential effect of their operation. Table 5 presents a summary of the analysis.

Table 5: Analysis summary of the three promising infrastructure corridors

	Almaty (Kazakhstan) – Cholpon-Ata (Kyrgyzstan)	Urzhar (Kazakhstan) – Chuguchak (China)	Semey (Kazakhstan) - Rubtsovsk (Russian Federation)
External profile	Mountainous area, Issyk-Kul Lake and Ile-Alatau National Park	Conceptually integrates into the Trans-Siberian Railway and the Silk Road Economic Belt	Strategic importance for cross-country and transit Eurasian traffic, and for the International Asian Network
Internal profile	Optimal tourism and economic interaction along cross-border route	The traditionally established traffic of the local population for small- and medium-sized wholesalers, visiting relatives and medical services. Tourism to Lake Alakol and Barlyk-Arasan springs	Potential development of passenger and freight transportation with the involvement of China and Mongolia
Distance between the start and end points (estimated length along the shortest route in km)	117	126	156
Homogeneity within population and quality of life	In Kazakhstan, significantly greater (160 times) population, average wage, educational level and other socioeconomic indicators	In China, significantly greater (81 times) population and average wage, but similar GDP per capita	In Kazakhstan greater (2 times) population, and similar average wage. In the Russian Federation, greater (3 times) GDP per capita
Main purpose	Tourism	Transit of goods, mainly regional	Transit of goods, mainly transnational, including Eurasian traffic
Other purposes	Transportation of goods. Predominantly one-way traffic is expected from Almaty to Cholpon-Ata, associated with the economic development of the region	Tourism	Regular regional service
Alternative routes	Several highways, and air travel between Almaty and Bishkek to the Issyk-Kul Airport	Railway route Karamay–Tacheng–Ayagoz, and air travel (poorly developed)	Major highways, Turkestan-Siberian Railway, and air travel
Opportunities of the parties to finance the project	Unequal, with the involvement of side investors	Slightly equivalent due to the wider opportunities of China to attract foreign	Unequal in terms of GDP of countries

		investors, particularly ethnic Chinese (motivated by the idea of national unity)	
Main beneficiaries	Corporate bodies: Hotels and restaurants, travel agencies, transport and service companies. Individuals: Tourists (by reducing travel time and costs), and citizens of both countries (by creating new jobs)	Corporate bodies: Industrial, transport and service enterprises, trade, hotels and restaurants (from Kazakhstan). Individuals: Local small- and medium-sized businesses, tourists from China, and citizens of both countries (by creating new jobs and optimizing traffic in border areas)	Corporate bodies: Industrial, transport and service enterprises, and multinational corporations. Individuals: Local small- and medium-sized businesses in the region, and citizens of both countries (by creating new jobs and simplifying travel to other countries)
Project opposition	Environmental concerns (protected areas and permafrost zones), and tour operators in Kazakhstan promote international tourism destinations	Social challenges related to labour migration and the exploitation of migrant workers with the provision of low wages and poor working and living conditions, and growing geopolitical tensions among participating countries	Semey belongs to a zone of high radiation risk, and foreign policies imposing sanctions and barriers to transit traffic for other countries
Risks	Insufficient tourist volumes and business flows due to the low quality of services provided locally, and topographical and climatic challenges	Insufficient traffic volumes due to the poor quality of some segments of the road and the availability of railway alternatives, expansion of business units and the population of China, and lobbying of the interests of external investors (if attracted)	Political risks (e.g., sanctions squeeze in case of aggravation of the international situation), and environmental risks (e.g., increased traffic could lead to environmental consequences)
Presence of road transport infrastructure on the territory of the planned corridor	Yes	Yes	Yes
Main sources of cash flows	Tourist traffic and related services	Transport tax from the traffic of economic agents and services	Transport tax from the traffic of international economic agents and services
Discount factors	Inflation and growth of interest rates (in case of	Inflation and growth of interest rates (in case of	Inflation and growth of interest rates (in case of

	availability of credit funds)	availability of credit funds), and political risks	availability of credit funds), significant political risks, and changes in demand for resources (oil, gas)
Common motivators	Development of mutually beneficial cross-border cooperation in the regions, activation of international tourism and economic relations, and sociocultural interactions		
Common risks	Uncertainty related to the duration of the COVID-19 restrictions, geopolitical instability, and foreign and domestic policy of the participating countries		

6. Analysis of Potential Partners for Infrastructure Corridor Development

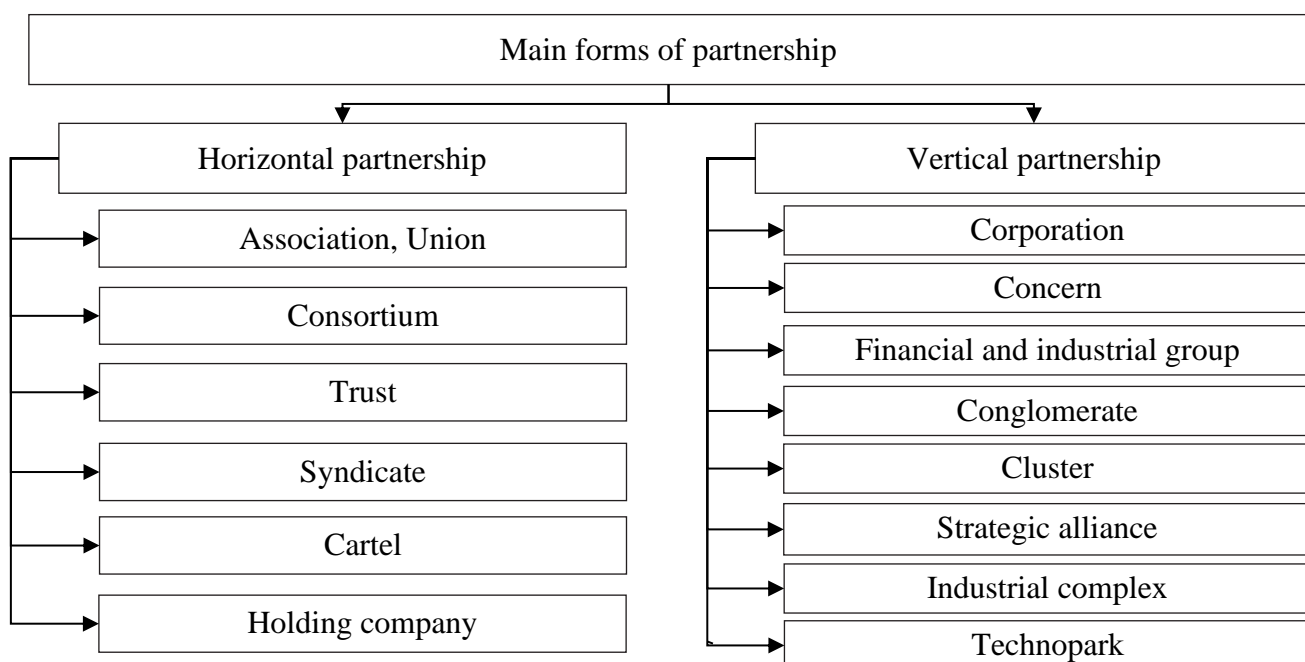
6.1 The Theoretical Basis for Forming Partnerships

The theoretical foundation for partnership formation in the modern economy is constantly developing under the influence of the processes of globalization, glocalization, changes in geopolitical trends and other factors. The ideology of partnerships – ensuring a balanced interaction of partners in permanent or temporary projects – remains unchanged. For this, the optimal form of partnership for the given conditions should be chosen.

In theory, partnerships are forms of interaction between different parties (state, enterprise, institutions, financial structures, etc.) aimed at combining the possibilities of public administration, high-tech production and concentrated financial capital in order to ensure the stability of the functioning of the combined structure. For the purposes of this study, infrastructure corridors are placed in the context of this combined structure.

The classification for the main forms of partnership is given in Figure 4.

Figure 4: Classification of the main forms of partnership



Source: Попов А. А. Трансфертное финансирование в концепциях эффективности корпоративной интеграции : монография / под науч. ред. В. В. Гаврилова. Воронеж : Воронеж. госуд. ун-т, 2003. 174 с.

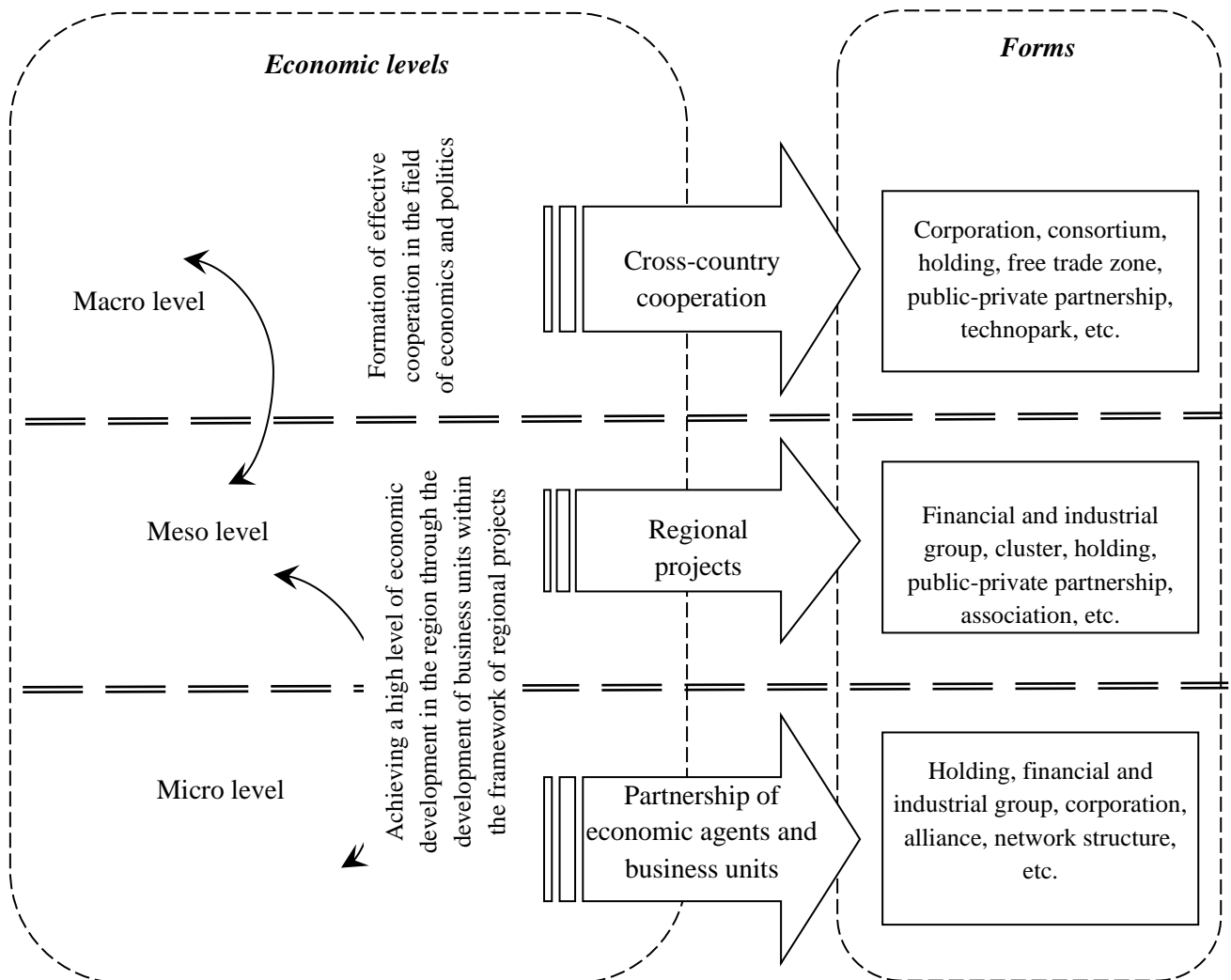
There are also PPPs, which are the interactions between the state and business within the framework of a project. The

appropriate partnership form would depend on a range of factors, including the goals of the infrastructure corridor, the initial

conditions for its formation, the type of organizational culture, the country's values, and the geopolitical and economic

orientation. Different forms of partnership would be appropriate for different levels of cooperation, as shown in Figure 5.

Figure 5: Forms of partnership based on level of cooperation



With the promotion of Eurasian integration, regional (meso-level) cooperation is of particular importance because it requires participating countries to form common approaches to regional development, and apply appropriate mechanisms for the formation and implementation of regional policies. This is particularly relevant in the development of infrastructure corridors. In establishing partnerships for infrastructure

corridor planning and deployment, it is important to take into consideration the participating countries' similarities and differences in topography and climate, the economic, social, cultural and geopolitical characteristics, population mentality, etc. in the region.

The European Charter of Territorial Self-Government defines "region" as: "A territory

that is geographically a clear whole, or is a homogeneous set of territories that create a closed whole, whose populations are characterized by common elements, some of which are appropriately consolidated and expanded in order to stimulate cultural, social and economic progress”.³⁶

Regional cooperation and interaction can take many forms, each requiring its own regulatory approaches:

- Selection of administrative regions within the country;
- Organization of a self-governing community or the emergence of a new region within the existing administrative scheme, different from others; and

The pyramid shows that the greatest impact on the development of the infrastructure corridor lies at the macro level (top of the pyramid), namely the participating countries of the infrastructure corridor represented by government and other bodies directly implementing the project.

The next level of impact is made by large regional business units and management bodies, which are proportional to the number of administrative units in the infrastructure corridor coverage region. Their influence extends to the part of the corridor that passes through their territory.

The third level of impact is made by enterprises operating along the infrastructure corridor. Their impact is largely related to the provision of functional services of the infrastructure corridor while their impact on corridor management is negligible.

- Formation of cross-border regions and blocs of countries or associations of regions.

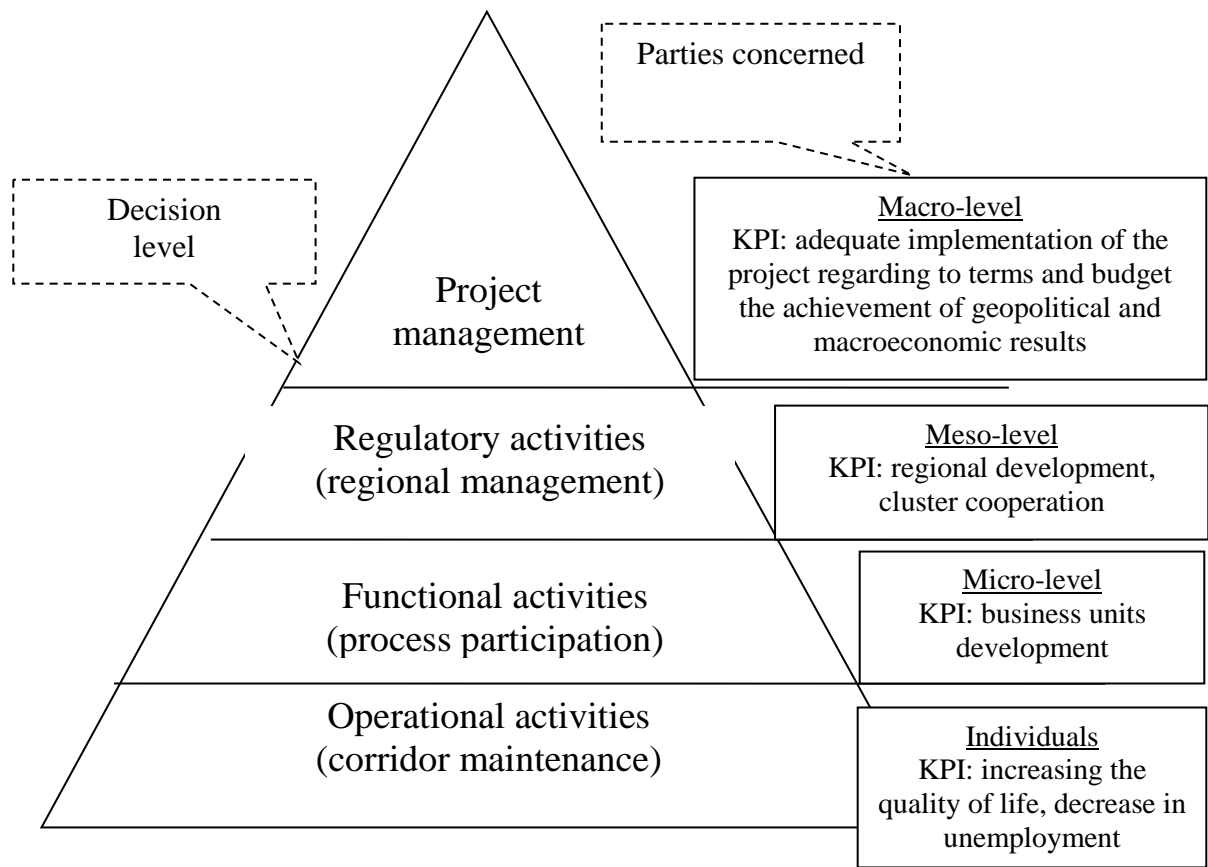
The process of selecting the best interregional partnership model for infrastructure corridor development can be seen as a process of engaging with participating countries’ business partners to gain competitive advantage. At each economic level there are significant differences in strategic purpose and in other parameters. Therefore, it is advisable to systematically analyse stakeholders’ influence on the development of infrastructure corridors. Figure 6 shows a pyramid of stakeholder influences on the development of infrastructure corridors. Each level of the pyramid is characterized by its respective key performance indicator (KPI) for efficiency and effectiveness.

At the fourth level, the individuals are either consumers of corridor services or participants in the labour force. The degree of their impact on the management and functioning of the infrastructure corridor is indirect, through the quality and qualifications of the labour force, the level of solvency, and their participation in business, migration and tourism activities.

Therefore, it can be concluded that the highest influence on the successful development of the infrastructure corridor is exerted by those at the macro level (e.g., public bodies, large private capital, transnational corporations, international financial institutions). Thus, in determining the best mechanisms for forming partnerships for infrastructure corridor development, it is advisable to consider the interests and strategic objectives of participants at the macro level without forgetting the interests of other stakeholders.

³⁶ Глобалізація та регіоналізація : виклики для економіки України : колективна монографія / за заг. ред. В. С. Лощенко. Чернівці : Рута, 2010. 516 с.

Figure 6: Pyramid of stakeholder influences on the development of infrastructure corridors



6.2 The Best Options for Forming Partnerships

In order to determine the best options for forming partnerships at the different levels, a

paired comparison analysis was used (Tables 6-8).³⁷

³⁷ Ларичев О.И. Теория и методы принятия решений. М.: Логос, 2000. 296 с.

Table 6: Paired comparison matrix for the Almaty–Cholpon-Ata corridor

Almaty Cholpon-Ata	Kazakhstan (ministries and other state structures)	Other countries and international organizations (Russian Federation, China)	Meso level (industrial, processing, transport enterprises)	Micro level (small- and medium- sized businesses in tourism, trade, logistics)	Individuals (hired workers and small business owners)
Kyrgyzstan (ministries and other state structures)	PPP, direct interstate agreement	Interstate agreement	Multinational corporation, consortium	Outsourcing, alliance, networking	Contractual relationship
Other countries and international organizations (Mongolia, Tajikistan)	Interstate agreement	Free trade zone, transit agreement	Holding, consortium, financial and industrial group	Alliance, network structure, franchising	Contractual relationship (employment contract)
Meso level (food processing, transport enterprises, services)	PPP, holding	PPP, holding, financial and industrial group	Cluster, alliance	Corporation, alliance, network structure	Contractual relationship (employment contract)
Micro level (small- and medium-sized businesses in tourism, trade and hospitality)	PPP, network structure	Network structure	Alliance, network structure, franchising	Alliance, direct contractual relation	Contractual relationship (employment contract)
Individuals (labour migration)	Employment contract (if there is a work permit and other documents)	Employment contract (in case of visa, work permit and other documents)	Employment contract (if there is a work permit and other documents)	Employment contract (if there is a work permit and other documents)	Employment contract (with necessary documents)

Table 7: Paired comparison matrix for the Semey–Rubtsovsk corridor

Semey Rubtsovsk	Kazakhstan (ministries and other state structures)	Other countries and international organizations	Meso level (industrial, processing, transport enterprises)	Micro level (small- and medium- sized businesses in tourism, trade, logistics)	Individuals (hired workers and small business owners)
Russian Federation (ministries and other state structures)	PPP, direct interstate agreement	Interstate agreement	Multinational corporation, consortium	Outsourcing, alliance, networking	Contractual relationship
Other countries and international organization	Interstate agreement	Free trade agreement, transit and trade agreement	Holding, consortium, financial and industrial group	Alliance, network structure	Contractual relationship (employment contract)
Meso level (mining and processing, transport enterprises)	PPP, holding	PPP, holding, financial and industrial group	Cluster	Corporation, alliance, network structure	Contractual relationship (employment contract)
Micro level (small- and medium-sized businesses in logistics and trade)	PPP, network structure	Network structure	Alliance, network structure, franchising	Alliance, direct contractual relation	Contractual relationship (employment contract)
Individuals (hired workers and small business owners)	Employment contract (if there is a work permit and other documents)	Employment contract (in case of visa, work permit and other documents)	Employment contract (if there is a work permit and other documents)	Employment contract (if there is a work permit and other documents)	Employment contract (with necessary documents)

Table 8: Paired comparison matrix for the Urzhar–Chuguchak corridor

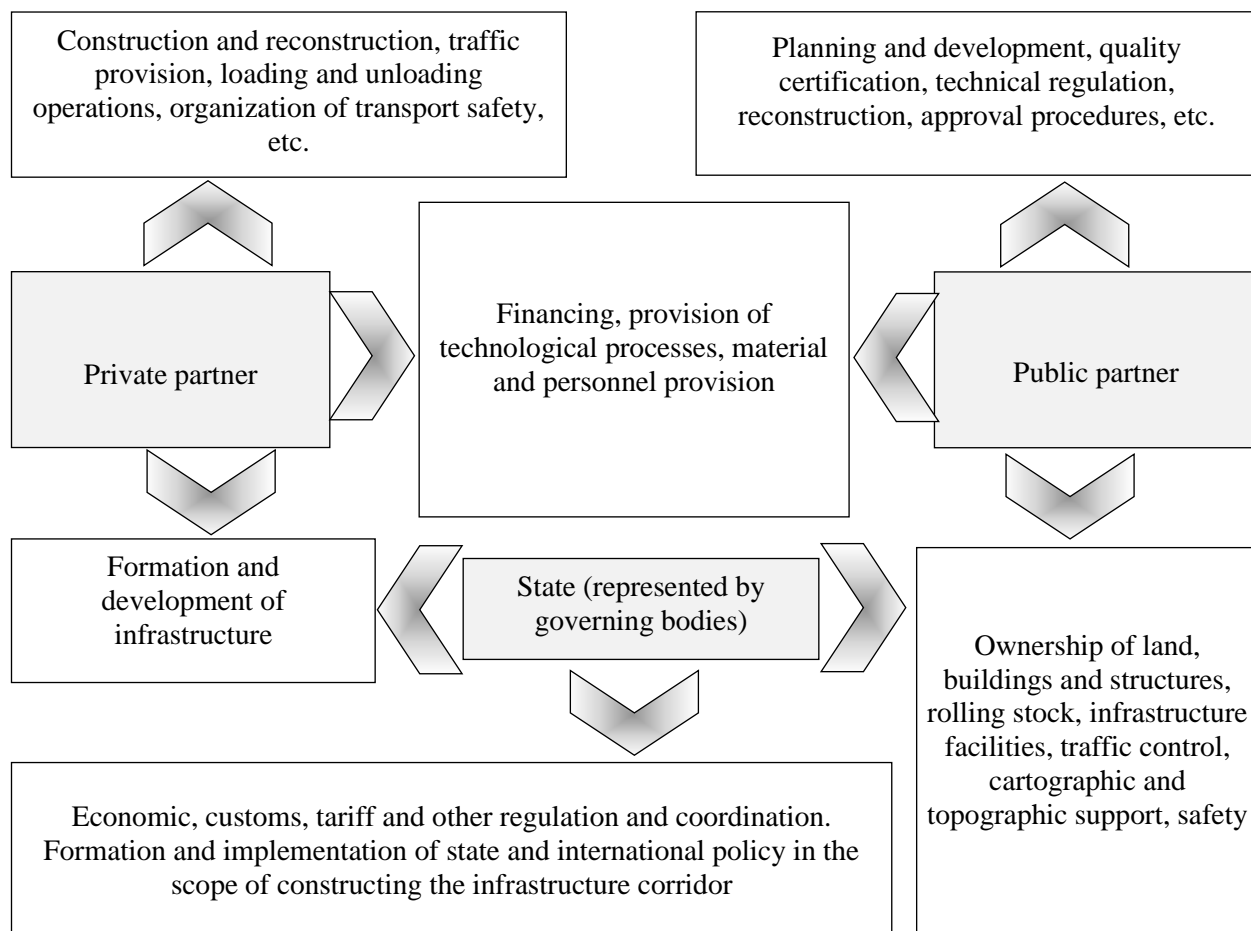
Urzhar Chuguchak	Kazakhstan (ministries and other state structures)	Other countries and international organizations (Russian Federation, Kyrgyzstan)	Meso level (transport companies)	Micro level (small- and medium- sized businesses in logistics, trade and service)	Individuals (hired workers and small business owners)
China (ministries and other state structures)	Direct interstate agreement	Interstate agreements	Multinational corporation, consortium	Outsourcing, alliance, networking	Contractual relationship
Other countries and international organizations (Mongolia, Kyrgyzstan)	Interstate agreements	PPP, free trade zone, transit agreement	Holding, consortium, financial and industrial group	Alliance, network structure, franchising	Contractual relationship (employment contract)
Meso level (transport, service and export- oriented enterprises)	Free trade zone	PPP, holding, financial and industrial group	Cluster	Corporation, alliance, network structure	Contractual relationship (employment contract)
Micro level (small- and medium-sized businesses in logistics and trade)	Network structure	Network structure	Alliance, network structure, franchising	Alliance, direct contractual relation	Contractual relationship (employment contract)
Individuals (hired workers and small business owners)	Employment contract (in case of visa, work permit and other documents)	Employment contract (in case of visa, work permit and other documents)	Employment contract (in case of visa, work permit and other documents)	Employment contract (in case of visa, work permit and other documents)	Employment contract (with necessary documents)

6.2.1 Public-Private Partnership is the Best Option for Partnerships at the Macro Level

The results of the analysis show that when it comes to cooperation at the interstate level with the participation of state and interstate bodies and organizations, PPPs and/or direct interstate agreements are the most

popular. PPP is a form of medium- and long-term interaction between the state and business to solve socially significant problems on mutually beneficial terms. In the implementation of large international projects such as infrastructure corridors, PPPs can integrate all the necessary organizational, regulatory, financial, human and other resources. The main forms of PPP interaction are shown in Figure 7.

Figure 7: Main forms of PPP interaction



In the context of infrastructure corridors, the PPP should focus on the harmonization of the legal framework (from the design stage to its operation), the definition of principles and procedures for choosing a private partner (tender procedure or the possibility of direct contracts), and measures for countering corruption and laundering of

budget funds. The features of the PPP should include the following:

- A clear definition of the rights and responsibilities of the parties in the partnership;
- Intermediaries to prevent geopolitical conflict in corridors involving countries

- under various sanctions, such as in the case of the Semey–Rubtsovsk corridor;
- Development of common standards for road surface quality, service and roadside infrastructure;
- Taking into account the environmental features and topography of the area

(e.g., the mountains and nature reserve along the Almaty–Cholpon-Ata corridor, and the presence of radioactive risk along the Semey–Rubtsovsk corridor).

Motivational factors for PPPs in infrastructure corridor development are summarized in Table 9.

Table 9: Motivational factors for PPPs in infrastructure corridor development

Project participant and KPI	Motivational factors				
	Economical	Social	Technological	Political	Personal
State Achieve geopolitical and macroeconomic results	Cost reduction	Maintain image of a socially-oriented government. Job creation	Development of a logistics base by sharing cutting-edge technologies with project participants	Building of coalitions with partner countries. A successful PPP project is a positive factor for upcoming elections	–
Private partner Increase in financial returns	Benefits of participating in the PPP	Build image of a socially-responsible business that is aligned with country’s development goals	Opportunity to access advanced technologies, including technology transfer from other countries	Usually absent. Appear in case of promotion of leadership in political circles	Business development and business networking

Examples of successful PPPs include the Pulkovo International Airport in St. Petersburg, the construction of a tunnel under Lamanche and the London Underground, and the launch of the Skynet satellite system.³⁸ State participation contributes to optimal interaction at the international level. International financial institutions that deal with business development, such as the International Bank for Reconstruction and Development, the European Bank for Reconstruction and Development, the Islamic Development

Bank, the International Development Association and others are also important in ensuring successful PPPs.

6.2.2 Direct Interstate Agreements at the Macro Level

When working at the macro level, it is necessary for all projects to enter into interstate agreements. These agreements are a legal act between the parties, and govern the relationship between the parties

³⁸ Зарубежный опыт развития механизмов государственно-частного партнерства. Available at <https://cyberleninka.ru/article/n/zarubezhnyy-opyt->

[razvitiya-mehanizmov-gosudarstvenno-chastnogo-partnerstva-1.](https://cyberleninka.ru/article/n/zarubezhnyy-opyt-razvitiya-mehanizmov-gosudarstvenno-chastnogo-partnerstva-1)

by specifying the rights and responsibilities in politics, cultural activities and other areas.³⁹

Such agreements protect the interests and/or assets of the parties in the event of force majeure, project termination, conflict between parties and geopolitical differences. The agreements should cover issues related to the financial, technological, personnel and information support of the project, harmonization of the legislative framework, the rights and responsibilities of the parties, the definition of force majeure circumstances and actions related to them.

In the context of infrastructure corridors, features of direct interstate agreements include:

- Clear definition of the rights and responsibilities of the parties on all issues (from design to corridor maintenance);
- Development of common quality standards based on international standards;
- Taking into account environmental features and topography of the region; and
- Accounting for the current geopolitical situation.

Motivational factors for direct interstate agreements in infrastructure corridor development are summarized in Table 10.

Table 10: Motivational factors for direct interstate agreements in infrastructure corridor development

Project participant and KPI	Motivational factors				
	Economical	Social	Technological	Political	Personal
Almaty–Cholpon-Ata corridor					
<u>Kazakhstan</u> Optimization of access to tourist sites	Reduction of transit costs	Tourism development	Logistics optimization	Enhanced cooperation	–
<u>Kyrgyzstan</u> Tourism development	Development of the region’s economy	Additional jobs	Improvement of roads in the region	Enhanced cooperation with Kazakhstan and other countries	–
Semey–Rubtsovsk corridor					
<u>Kazakhstan</u> Centre of the Eurasian transit corridor	Benefits from traffic	Additional jobs and improved local logistics	Integration into the Eurasian corridors	Cooperation centre in the region	–
<u>Russian Federation</u> Optimization of Eurasian logistics	Benefits from traffic with access to Mongolia and China	Additional jobs and improved local logistics	Improvement of roads in the region	Enhanced cooperation in the region and in Asia	–

³⁹ Виды международных договоров. Available at <http://www.iccwbo.ru/blog/2016/vidy-mezhdunarodnykh-dogovorov/>.

Urzhar–Chuguchak corridor					
<u>Kazakhstan</u> Optimization of regional logistics and business	Regional business development	Additional jobs. Improved local logistics. Improved business and personal communications in the region	Improvement of roads in the region	Maintenance of relationship with partners	–
<u>China</u> Access to new products and markets	Enter new markets	Additional jobs. Labour migration. Improved business and personal communications in the region	Using corridor opportunities for further transit	Build a positive image of the socialist planned economy	–

There are many international agreements on the development and sharing of infrastructure. Examples include the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways, the Intergovernmental Agreement on the Asian Highway Network, and the Convention on International Customs Transit Procedures for the Carriage of Goods by Rail under Cover of SMGS Consignment Notes.⁴⁰

There are also successfully implemented local agreements, for example, agreements between the Government of Kazakhstan and other countries on international road transport, and on mutual regulation of international passenger and freight transport by road.⁴¹

6.2.3 Clustering as a Form of Meso-Level Partnership

At the meso level, the optimal form of partnership for infrastructure corridors is as a cluster. The cluster is an autonomous group of interconnected companies that are

concentrated in a certain area to provide mutually beneficial operating conditions for all stakeholders and business units. The formation of a cluster contributes to the development of multimodal transportation by combining resource capabilities and assets in the area.

The cluster should include not only the stakeholders interested in the project, but also those who are ready to bring real benefits to the project and act as a guarantor of project performance. Thus, as part of the development of infrastructure corridors, the cluster could include:

- Regional and international authorities as guarantors of the legitimacy of the project's legal framework;
- Banking and financial structures as guarantors of financial and credit support for the project;
- Regional transport, service and other enterprises as guarantors of material resources and assets;
- Local and international employment agencies, and visa support centres as

⁴⁰ Конвенции и соглашения. Available at https://www.un.org/ru/documents/decl_conv/conv_transport.shtml.

⁴¹ Перечень заключенных Республикой Казахстан с иностранными государствами двусторонних международных договоров в области автомобильного

транспорта. Available at <https://www.kazato.kz/posts/perechen-zaklyuchennyx-respublikoj-kazaxstan-s-inostrannymi-gosudarstvami-dvustoronnix-mezhdunarodnyx-dogovorov-v-oblasti-avtomobilnogo-transporta>.

- guarantors of personnel support and legalization of labour migration;
- Higher education institutions at all levels, scientific institutes and consulting firms as guarantors of information and intellectual support for the project; and
- Business representatives as both stakeholders and guarantors.

In the context of infrastructure corridors, the features of clusters include the following:

- A diversity of participants from small- and medium-sized businesses to state and international authorities; and

- The flexibility of the structure based on the different stages of corridor construction and the region's context (e.g., the Almaty–Cholpon-Ata corridor would require the participation of representatives of environmental control and surveyors, the Semey–Rubtsovsk corridor would require specialists to analyse the radioactivity of the area, and the Urzhar–Chuguchak corridor would require centres of visa support and migration control).

Motivational factors for clustering in infrastructure corridor development are summarized in Table 11.

Table 11: Motivational factors for clustering in infrastructure corridor development

Integral motivator	Motivational factors				
	Economical	Social	Technological	Political	Personal
Almaty–Cholpon-Ata corridor					
Development of the tourist cluster and additional logistics function	Development of the region's economy. Development of the restaurant business. Reduction of transit costs	Development of tourism. Additional jobs. Improvement of the transport infrastructure	Improvement of roads in the region. Logistics optimization. Improvement in the use of recreation areas	Development of international and regional cooperation. Promotion of domestic tourism	Personal benefits from the functioning of corridor
Semey–Rubtsovsk corridor					
Development of corridor as part of the Eurasian transport corridor	Benefits from regional traffic and optimization of Eurasian transport	Additional jobs and improved local logistics	Improvement of roads in the region, and development of international road and transport standards	Enhanced cooperation in the region and in Asia	Personal benefits from the functioning of corridor
Urzhar–Chuguchak corridor					
Kazakhstan	Regional business development, and entering new markets	Additional jobs and legalization of existing business hubs	Use corridor for further transit, and sharing of best practices	Build a positive image within the framework of combining multidirectional economic systems	Personal benefits from the functioning of corridor. Improved business and personal communications in the region

Examples of successful clustering include the following:

- Valencia port cluster – Ports of Valencia, Sagunto and Gandia have a common port administration and multimodal terminals;
- Transport and logistics clusters – Frankfurt-on-Main, Randstad Holland, and Padborg Port and Logistics Cluster; and
- AllianceTexas Global Logistics Hub.

6.2.4 Forming Alliances and Financial and Industrial Groups as Forms of Micro-Level Partnership

At the micro level, alliances, financial and industrial groups, or direct contractual relationships may be the best forms of partnership. These forms are similar in that they bring together diverse organizations to jointly achieve goals, produce synergies and create greater impact (compared to impact that can be achieved by a single organization).

An alliance is based on formal or informal contractual obligations. A financial and industrial group brings together industrial enterprises and financial institutions to promote economic and financial interactions. A direct contractual relationship is a contract with a specific supplier (contractor or executor) without considering competing offers. There may be legislative constraints in forming the latter due to, for example, state structures or the contract amount exceeding acceptable limits, and a tender process needs to be carried out. Therefore, the focus here is on alliances and financial and industrial groups.

A key aspect of alliances and financial and industrial groups is the unification of stakeholders and business units of different areas of economic activity, mainly industries

and/or services with financial and banking structures, and the participation, if necessary, of logistics, services and other enterprises. This type of partnership is relevant at the micro level because the participation of the financial sector in the partnership addresses issues related to investment and financial security.

In the development of a contractual agreement for the partnership, the distribution of financial results based on a predetermined criterion would be important. Difficulties may arise in assessing the value of the project's invested resources (financial, material, human and intellectual) and their effectiveness.

In the context of infrastructure corridors, the features of alliances and financial and industrial groups include the following:

- Participation not only of industrial, transport and logistics enterprises, but also those in the processing, agriculture and tourism sectors that are directly interested in the development of the corridor and awaiting the benefits of its use;
- Participation of international financial organizations and national foreign investors (e.g., in the Urzhar–Chuguchak corridor); and
- There may be some imbalances in this type of partnership, as the participation of the extractive and processing industry and its effectiveness depends on the global prices of these resources (e.g., for the Semey–Rubtsovsk corridor, the Russian Federation plans to use the corridor to transit these resources).

Motivational factors for alliances and financial and industrial groups in infrastructure corridor development are summarized in Table 12.

Table 12: Motivational factors for alliances and financial and industrial groups in infrastructure corridor development

Integral motivator	Motivational factors				
	Economical	Social	Technological	Political	Personal
Almaty–Cholpon-Ata corridor					
Harmonious development of businesses in the region	Generation of financial resources and achieving synergies	Additional jobs and the ability to rotate staff	Improved efficiency of processes, and delegation of authority	In its purest form, there are none. Enhanced cooperation	Personal benefits from the functioning of corridor
Semey–Rubtsovsk corridor					
Development of businesses with the introduction of Eurasian transport corridors	Optimization of cost structure and achieving synergies	Additional jobs, and opportunity to expand the boundaries of employment, qualifications and competencies	Upgradation of assets through access to non-credit financial resources and new partner technologies	In its purest form, there are none. Enhanced cooperation	Personal benefits from the functioning of corridor
Urzhar–Chuguchak corridor					
Development of a unified structure at the regional level with access to the Eurasian market	Regional business development with access to new markets	New jobs. Expansion of the labour market. Minimization of regional and international migration	Sharing of best practices and standardization of processes	For China, promotion of the planned economy. Enhanced cooperation	Personal benefits from the functioning of corridor. Simplification of procedures for migration and employment. Additional income and dividend from shares

An example of a successful alliance is the East Transport Alliance, which organizes the transportation of all types of goods in all directions between China, Japan, the Republic of Korea, Taiwan and other countries of South-East Asia through the Port of East on the Trans-Siberian Railway.

An example of a successful financial and industrial group is the Chase Group, which includes Chase Manhattan Corp., two life insurance companies, five transportation companies (three airlines and two railways), two aircraft companies, two chemical companies, two retailers, and other companies.

Due to the different levels of development of business units in participating countries, the financial and industrial group could be difficult to implement. For example, it is difficult for the Almaty–Cholpon-Ata corridor to form a financial and industrial group for the following reasons:

- The infrastructure corridor is more focused on tourism;
- There are significant differences between the parties in the ability to provide financial resources; and
- There are no industrial enterprises directly interested in the development of the corridor.

6.2.5 Employment Contract for Partnerships at the Individual Level

At the individual level and for small business owners, the optimal form of partnership is an employment contract. An employment contract is an agreement between the employer and the employee, where the employer provides the employee with work based on agreed upon working conditions and labour wages. The employee performs the work under the management of the employer, and in compliance with labour rules.

However, a number of difficulties can be foreseen, as follows:

- Illegal employment by small business owners;
- The absence or the short-term nature of the visa-free regime is not suitable for employment. For example, the 72-hour visa-free regime at Urzhar–Chuguchak is too short for an employment contract; and
- The need for a work permit, which is difficult to obtain in today's conditions, and further complicated by the COVID-19 pandemic. It can also lead to illegal employment.

In the development of an employment contract, employment regulations of the respective countries must be taken into account. This is especially important during the COVID-19 pandemic, when rules and procedures for full-time employment, border crossings and quarantine could change unexpectedly depending on the number of active infections in the region and recommendations from the World Health Organization.

In addition to the basic provisions of a typical employment agreement, measures of compliance with the rules of personal safety, and actions of the parties when employees are infected with COVID-19, must be detailed.

Motivational factors for employment contracts in infrastructure corridor development are summarized in Table 13.

Table 13: Motivational factors for employment contracts in infrastructure corridor development

Motivational factors				
Economical	Social	Technological	Political	Personal
Almaty–Cholpon-Ata and Semey–Rubtsovsk corridors				
Revenue growth	Career growth and improved social status	Skills development and mastery of new competencies	Usually absent	Improvement of the quality of life
Urzhar–Chuguchak corridor				
Revenue growth and opportunity to develop small businesses in related areas	Career growth and improved social status. Simplification of migration process	Learning of new competencies and specialties	Usually absent. Possible motive of foreign employment for residents of China	Improvement of the quality of life, and improvement of personal communications

6.2.6 Forms of Partnership Across Levels

The best forms of partnership across different levels are also noted. Thus, when the state interacts with parties of other levels, the following forms of partnership could be considered:

- Multinational corporations, which are by definition focused on inter-ethnic cooperation (e.g., Nestle, Coca-Cola and DHL);
- Network structures and franchising that delegate the rights to do business according to the developed business model. An example is McDonald's, which has representation in more than 120 countries. Brand recognition contributes to the success of business deployment,

especially in inter-ethnic partnerships; and

- Direct contractual relationships that can be implemented at any level if one of the parties is directly interested in cooperating with a particular enterprise.

In some cases, it is advisable to form a financial and industrial group, especially when interested parties are from the financial and industrial sectors, and the planned infrastructure corridor provide benefits across sectors (e.g., the Urzhar–Chuguchak and Semey–Rubtsovsk corridors).

An analysis of the strengths, weaknesses, opportunities and threats (SWOT) for infrastructure corridor development is summarized in Table 14.

Table 14: SWOT analysis for infrastructure corridor development

Strengths	Weaknesses
<ul style="list-style-type: none"> • Presence and prioritization of interstate policy for infrastructure corridor development • Interest of local authorities, businesses and the public in infrastructure corridor development • Interest of other countries in infrastructure corridor development • Partial availability of corridor sectors and infrastructure • Potential investment attractiveness and the possibility of profit diversification 	<ul style="list-style-type: none"> • Unsatisfactory condition of the road fund and high maintenance cost for some sectors • Weak control of maximum load during freight traffic, which leads to deterioration in the quality of roads • Weak system for multimodal transport • Differences in parties' capacity to develop the infrastructure corridor
Opportunities	Threats
<ul style="list-style-type: none"> • Implementation of projects involving PPP • Introduction of tolls for heavy vehicles • Bringing the network of regional roads to international standards • Development of related business and infrastructure • Development of multimodal transport 	<ul style="list-style-type: none"> • Insufficient control by the state regarding the loading of roads and targeted spending • Corruption in the implementation of PPP projects • Geopolitical changes and the COVID-19 pandemic • Natural, environmental and social threats • In some cases, the presence of an alternative route and/or mode of transport